
IEEE P802.11
Wireless LANs

Tentative Minutes of the IEEE P802.11 Full Working Group

Sept 9 - 13, 2002

Hyatt Regency Monterey, Monterey, CA

Joint 802.11 / 802.15 Opening Plenary: Monday, Sept 9, 2002**1.1. Introduction**

- 1.1.1. Meeting called to order by Stuart J Kerry and Bob Heile at 08:00
The agenda of the 75th session of 802.11 is in doc.: IEEE 11-02-497r3, This session is including 802.15, 802.18 RREG TAG and 802.19 Coexistence TAG.
- 1.1.2. Secretary – Tim Godfrey
- 1.1.3. New members in the room: 23. Total in room 280.

1.2. Announcements of policies and rules

- 1.2.1. Discussion of Logistics of
 - 1.2.1.1. social.
 - 1.2.1.2. Registration requirements
 - 1.2.1.3. Projectors are the responsibility of the TG/SG chairs
- 1.2.2. The general agenda information with policies and procedures detailed in document 11-00-278r2
 - 1.2.2.1. This document has been newly updated for this meeting
 - 1.2.2.2. Roberts rules of order are V10.
 - 1.2.2.3. Registration is required, with contact information.
 - 1.2.2.4. Electronic Attendance is now being used.
 - 1.2.2.4.1. Seven sessions must be signed in for to get meeting credit.
 - 1.2.2.5. Review of voting rights (more details are in the operating rules)
 - 1.2.2.5.1. Participation requirements.
 - 1.2.2.5.2. Voting tokens (.11 Al Petrick, .15 Mike McInnis, .18 Carl Stephenson, .19 Jim Lansford)
 - 1.2.2.6. Review of Patent Policy per 278r2
 - 1.2.2.6.1. TG chairs are requested to re-state the IP Patent Policy in their sessions
 - 1.2.2.7. Review of individual membership and anti-trust rules.
 - 1.2.2.8. IEEE standards and all generated documents are copyright IEEE.
 - 1.2.2.9. There is a study group on wireless mobility taking place this week.

1.3. Online Attendance

- 1.3.1. The Attendance Server is at <http://PLUTO>.
- 1.3.2. Instructions for using the site and signing in are reviewed by Al Petrick.
- 1.3.3. The server also requests document numbers.
 - 1.3.3.1. The server is not a search engine for documents.

- 1.3.4. If you lose your member ID, you have to see an officer of your group to get it reset.
 - 1.3.5. Voting members of 802.11 or 15 get credit toward their home WG if they attend .18 or .19 meetings. Non-members will get credit towards the .18 or .19 group they attend.
 - 1.3.6. Only 802.11 is using the online document number assignment system.
- 1.4. Approval of the Joint Agenda**
- 1.4.1. Stuart J Kerry reviews the agenda as outlined in 02-497r3.
 - 1.4.2. Any objections to the agenda?
 - 1.4.2.1. The agenda is approved with unanimous consent
- 1.5. Matters arising from the minutes?**
- 1.5.1. None
- 1.6. Key Working Group Events**
- 1.6.1. Review of Interim Meetings
 - 1.6.1.1. Next interim meeting is January 13-17, hosted by Motorola, Fort Lauderdale, marina Marriott. Availability on the web site.
 - 1.6.1.2. May 2003 – May 12-16, Singapore. Hosted by Cisco. We will try to have 802.16 join us there.
 - 1.6.1.2.1. There will be TV and Press coverage at the meeting, not during the meetings, though. There will be interviews with chairs
 - 1.6.1.2.2. The Singapore government will also be present.
 - 1.6.1.3. September 2003 – Location TBD. Looking for an east coast location.
 - 1.6.1.4. January 2004 – We are going back to Vancouver. Hosted by 802. Vancouver Hotel. (because of financial problems with that hotel in the July meeting).
 - 1.6.2. Financials
 - 1.6.2.1. Bob Heile reviews the financial report for the Sydney interim.
 - 1.6.2.2. There was a positive balance of \$9741, or about \$5000 US transferred into the 11/15 operating fund.
 - 1.6.3. ExCom Activities
 - 1.6.3.1. Closing session on Friday in July. Document 15-02-308r1.
 - 1.6.3.2. 802 cash reserves are dropping – registration fees may be raised.
 - 1.6.3.3. Standards remain free.
 - 1.6.3.4. 802.16a, and c received conditional sponsor ballot approval.
 - 1.6.3.5. Other rules changes were approved.
 - 1.6.3.6. 802.19 Coexistence TAG was formed. Affirmed 802.18 actions and charter.
 - 1.6.3.7. 802.11f was forwarded to sponsor ballot.
 - 1.6.3.8. Rules change to modify voting rights expiration to be more consistent with gaining them.
 - 1.6.3.9. The web site gives access to 802.1, 802.11, 802.16, 18, 19. Only 802.3 and 802.17 are not accessible.
- 1.7. Report from Task Groups**
- 1.7.1. TGe – John Fakatselis
 - 1.7.1.1. Still working on comment resolution from the last LB which failed. A lot of work has been done between meetings, and compromise proposals will be reviewed this week.

- 1.7.2. TGf – Dave Bagby
 - 1.7.2.1. Due to delays at the IEEE office, the sponsor ballot has not started. The agenda will be short this week.
- 1.7.3. TGg – Matthew Shoemake
 - 1.7.3.1. Document 02/537 review of status. Reviewing LB on Draft 3.0. Unofficial results are 184: 45: 30. A Yes percentage of 80.35%. LB 41 passed.
 - 1.7.3.2. We have 605 comments to resolve – about 50% editorial. Detailed results in 02-522. Unabridged comments in document 02-534. Comment resolutions in 02-535.
 - 1.7.3.3. Plans are to resolve comments on LB 41 this week.
 - 1.7.3.4. Goal is to have a recirculation ballot at the end of the week.
- 1.7.4. TGh – Mika Kasslin
 - 1.7.4.1. LB 42 results in document 02-539
 - 1.7.4.2. Approval ratio 89.7%. Vote is 208:24:38
 - 1.7.4.3. There are 241 new comments.
- 1.7.5. TGi – David Halasz
 - 1.7.5.1. Continuing comment resolution on LB 35
 - 1.7.5.2. There was an ad-hoc in August to prepare for this meeting.
 - 1.7.5.3. There is still a lot to do – not sure if we will issue a LB this week.
- 1.7.6. WNG SG – TK Tan
 - 1.7.6.1. First WIG meeting yesterday. Will continue this week.
 - 1.7.6.2. There will be a joint session with Radio regulatory.
- 1.7.7. SG – Radio Resources – Richard Paine
 - 1.7.7.1. There have been meetings and teleconferences since Vancouver.
 - 1.7.7.2. Presentations on standardizing RSSI and MIBS
 - 1.7.7.3. Working on PAR and 5 criteria for presentation and approval by SEC in November.
- 1.7.8. HTSG – Jon Rosdahl
 - 1.7.8.1. First meeting on Wednesday. There are two slots this week. Plan on identifying the scope, and work on PAR and 5 criteria.
- 1.7.9. 802.15.1 – Bob Heile
 - 1.7.9.1. Nothing
- 1.7.10. 802.15.2 – Steve Shellhammer
 - 1.7.10.1. There are two parallel letter ballots. Did not pass in 802.11. Management of AWMA mechanism was the issue. Need to have TGe accept a TSPEC that supports AWMA.
- 1.7.11. 802.15.3 – John Barr
 - 1.7.11.1. LB19 has 90% approval. There were 250 technical comments. There will be a final comment resolution ad-hoc in October.
- 1.7.12. 802.15.4 – Bob Heile
 - 1.7.12.1. TG4 completed the confirmation ballot – the last recirculation. It will be cleaned up and be completed before November
- 1.7.13. 802.15. SG3a – Rick Roberts.
 - 1.7.13.1. Editing technical requirements and evaluation matrix. Working on Par and 5 criteria, to approve by WG on Friday. Call for proposals. Proposals will begin in January. Officers will be selected this week, voting in the Wednesday 3:30 session.
 - 1.7.13.2. Publicity – Brian Matthews

- 1.7.13.3. Receiving an update from WECA, review Newsletter. Looking for an update on WiMedia. Prepare for media analyst meeting. Review web site.
- 1.7.13.4. 802.18 – Carl Stephenson
- 1.7.13.5. Document 18-02-027r0
- 1.7.13.6. Peak attendance of 24. Prepared regulatory filings with the FCC.
- 1.7.13.7. Report from August teleconference meeting.
- 1.7.13.8. Discussion
 - 1.7.13.8.1. Were the changes in Chinas allocation just for 802.11? It was for the band, not the standard.
- 1.7.13.9. 802.19 – Jim Lansford
 - 1.7.13.9.1. Not Present
- 1.7.14. Closing Discussion
 - 1.7.14.1. What is the discussion on wireless mobility?
 - 1.7.14.1.1. Mark Klerer is the chair – he is not present.
 - 1.7.14.2. The opening plenary of 802.18 will be at 9:30.
 - 1.7.14.3. Voting tokens are available from Al Petrick if you don't have them.

1.8. Adjourn the joint session at 9:05AM

2. Monday Morning 802.11 Plenary Session

2.1. Opening

- 2.1.1. The meeting is called to order by Stuart J Kerry at 9:30AM.
- 2.1.2. There are 212 people in the room.

2.2. Review of the Agenda

- 2.2.1. Now at R4

2.3. IP Statements

- 2.3.1. No new IP statements have been received by the Chair.

2.4. Review of the schedule graphic

2.5. Documentation

- 2.5.1. Pluto has been overloaded – it has been restarted.
- 2.5.2. The document area is the same as before

2.6. Attendance notes

- 2.6.1. Some of the new participants business cards were lost at the Vancouver meeting. Please send contact information to Al Petrick.

2.7. Rules

- 2.7.1. The chairs and Vice Chairs have a book of the official rules.

2.8. Agenda

- 2.8.1. The chair reviews the agenda
- 2.8.2. The agenda is adopted without objection

2.9. Review of the 802.11 minutes from Vancouver

- 2.9.1. Any Matters arising from the minutes.
 - 2.9.1.1. Jon Rosdahl notes the correct spelling of his name.
 - 2.9.1.2. Plenaries need to show the voting status –

2.9.1.3. We will have a review of the voting members status in the Wednesday plenary

2.9.2. The minutes are approved without objection

2.10. Documentation Update

2.10.1. We have over 500 documents this year. We started at 530

2.10.2. We have many outstanding document numbers without documents. It is necessary to inform Harry Worstell if an number is requested and will not be used.

2.10.3. Members are required to submit documents to the server at meetings or emailed to Harry between meetings.

2.10.4. The formats must be followed

2.11. Update on LB40 – 802.11 operating rules

2.11.1. Al Petrick reviews the status. There are 23 remaining comments. Document 02-460r3. A new draft will be generated 331r4.

2.11.2. The Rules group will meet this week in the Mark Thomas room.

2.12. Web Site overview and changes

2.12.1. A new section has been created for past chairs and officers.

2.12.2. Also the Assigned Numbers Authority has a section.

2.12.3. There are several reflectors for 802.11. A new reflector for WIG will be created, joined with ETSI. Just sign up for one.

2.13. Update on the Standardization rollup

2.13.1. Report in document 02-486r2. Terry Cole.

2.13.2. The new spec is being called 802.11-2002. It includes 802.11-1999, and corrigendum and amendments up to 802.11d

2.13.3. There is a danger that Revcom may not approve further amendments. The rule is that 802 doesn't allow more than 2 outstanding amendments, which we have far exceeded with e, g, h, i.

2.13.4. IEEE staff has identified editorial issues that have been corrected.

2.13.5. We are providing an electronic version of the MIB.

2.13.6. There are some regulatory updates.

2.13.7. IEEE will create the updated document and return it for proofreading. There may be further updates.

2.13.8. The process is owned by the IEEE staff. It is not clear that we have to vote on it until a Sponsor Ballot.

2.13.9. The chair encourages everyone to sign up for the 802.11 Sponsor Ballot Pool.

2.14. New Business Announcements

2.14.1. TK Tan: One of the work items for WNG – the 5GHz allocation for Japan. It will be discussed today. More time will be

needed to review the documents for the PAR and 5 Criteria. There may be some free time slots from TGf that may be used by WNG this week. Monitor the announcements board for any updates.

2.14.2. The WIG is a joint effort between IEEE 802.11, ETSI BRAN and MMAC to put together the activities to create a standard for inter-working between WLAN and 3G cellular.

2.14.3. TGf anticipated handling sponsor ballot comments this week, but the IEEE office didn't start the sponsor ballot, so there is nothing to do. TGf will probably adjourn for the week today at the first session.

2.15. Recess for Subgroups at 10:00AM

3. Wednesday Plenary

3.1. Opening

3.1.1. The session is called to order by Stuart J. Kerry at 10:30AM.

3.1.2. The chair calls for a minute of silence in remembrance for the victims of September 11, 2001.

3.2. Announcements

3.2.1. The chair of TGe announces that there was a scheduled TGe meeting yesterday that didn't take place. There was not a broad announcement that the session was changed to ad-hoc. John apologizes for any inconvenience due to the lack of announcement, and reiterates that ad-hoc sessions have no binding decisions. In addition, there are special orders today for votes at 3:30PM on technical motions.

3.2.2. IP Statements have been received from Broadcom, one for TGe and one for TGg. It will be posted on our web site.

3.2.3. Are there any other IP statements for the Chair? None

3.2.4. CAC meeting tomorrow morning at 7:00AM.

3.2.5. Attendance recording – the Pluto system has crashed. As of now, Monday, Tuesday, and Wednesday will be fully credited for attendance for everyone who is registered. New members are requested to provide contact information in the folder that is circulating.

3.3. Presentation on Wireless Networking

3.3.1. We need to upgrade the hardware and capacity of the network. We need to re-write the Pluto Perl scripts, and hire an on-site support and administrator person.

3.3.2. we also need to provide better support for VPN.

3.3.3. We need to specify some minimal level of outside functionality. Reference to web-based materials is necessary.

3.3.4. As a new member, how can we get access to the documents?

3.3.5. Straw Poll – Is our drive for a wireless networked environment, including outside ISP services, for docs, voting, and attendance the right thing to do?

- 3.3.5.1. If No, are people willing to spend extra for paper reproductions?
- 3.3.5.2. If Yes, are people willing to pay additional for network management services
- 3.3.5.3. Vote: 229: 0 : 5
- 3.3.6. We will consolidate with 802.15 and come back with an official view on Friday.
- 3.4. Documentation**
 - 3.4.1. The Pluto server has been overloaded in the attendance application.
 - 3.4.2. The document numbering system is operational.
- 3.5. Agenda**
 - 3.5.1. The agenda is in document 02/ 497 r5
 - 3.5.2. The agenda is adopted without objection
- 3.6. Old Business**
 - 3.6.1. Rules document
 - 3.6.2. Comment resolution has been completed.
 - 3.6.3. New draft doc is 00/331r3.2
 - 3.6.4. The new document will be 00/331r4
 - 3.6.5. The document on the IEEE web site is version 3.1. This is incorrect.
- 3.7. Coexistence Beacon Element**
 - 3.7.1. Document 11-02-582r1 (Chris Zegelin)
 - 3.7.2. Overview
 - 3.7.2.1. The effort on 802.15 / 802.11 coexistence has stalled in 802.11. 802.11 needs to come up with some solution.
 - 3.7.2.2. We are trying to solve the worst of the coexistence problem. It cannot be solved by detection and mitigation in 802.11 only.
 - 3.7.2.3. TGe has not been able to focus on this issue.
 - 3.7.2.4. The problem is with Station with both 802.11 and Bluetooth in the same box. At a greater distance, the problems go away.
 - 3.7.2.5. Request for 802.11 action. Provide the customer a means to manage the problem in a simple way. Give equipment makers a simple implementation.
 - 3.7.2.6. A new element added to the Beacon, Probe Response, etc. It indicates to the BSS when to keep quiet and how long, to allow Bluetooth traffic.
 - 3.7.2.7. Without this, Bluetooth will kill 802.11 completely, especially with BT phones.
 - 3.7.2.8. Steve Shellhammer, on behalf of 802.15, will own this issue, and define the beacon element.
 - 3.7.2.9. The AP vendors need to support this. This will be an 802.15 Recommended Practice.
 - 3.7.2.10. 802.11 needs to provide a Beacon Element number.
 - 3.7.2.11. 802.15.2 agreed that this issue was best handled in 802.11. It was referred to TGe, but TGe has been unable to pick this up. It is not expected to be addressed in TGe.
 - 3.7.2.12. 802.15.2 will utilize the assigned beacon element, and include it in the next revision of the 802.15.2 draft.

- 3.7.2.13. The chair strongly advises the body to accommodate this request. We will have chances to vote on this in Letter Ballots.

3.7.3. Motion: to direct the ANA (assigned numbers authority) to reserve a specific element ID for ownership and specification by the 802.15 working group.

- 3.7.3.1. Moved Darwin Engwer
 3.7.3.2. Second Tim Wakeley
 3.7.3.3. Motion ID 348

3.7.4. Discussion

- 3.7.4.1. The interference scenario is very localized at the station. The beacon element would ask the entire BSS to defer for a period of time?
- 3.7.4.2. There are two types of coexistence . This is a collaborative solution. This helps when there are a lot of BT nodes in a BSS. There is also the PTA technique which is more localized. The non-collocated solution is AFH.
- 3.7.4.3. What is the basis for invoking the beacon. How will vendors treat this? Is there any requirement to defer?
- 3.7.4.4. It is optional, recommended practice in 802.15.2, not mandatory
- 3.7.4.5. Clarification – 802.11e has not rejected this particular request. In addition, this does not fit in the 802.11e PAR anyway.
- 3.7.4.6. The TGe group yesterday was an ad-hoc session.
- 3.7.4.7. The 802.15.2 group gave it a try, but
- 3.7.4.8. There seems to be a number of mechanisms in groups (TGe, TGh, etc) where stations are asked to be silent for a while. This seems to be yet another mechanism, that is different.
- 3.7.4.9. A valid concern. This would enable 802.15 to work a solution. Without any support from 802.11, 802.15 is kind of stuck.
- 3.7.4.10. The entire 802.11 MAC is CSMA, so this is not unreasonable.
- 3.7.4.11. For the motion. This is a real problem, not only in co-located. This would help the problem. The percentage of quiet time is settable by the administrator.
- 3.7.4.12. This seems to be the least intrusive mechanism. We need to do something to solve this problem. To make it better, it should cover some of the other coexistence scenarios beyond 802.15. The beacon element should be designed for extensibility.
- 3.7.4.13. Will the ANA record 802.15 as the ownership of the bit?
- 3.7.4.14. The chair notes that 802.11 control the ANA, so it's not an issue.
- 3.7.4.15. Supports the idea – 802.19 should adopt it for use by cell phones, UWB, etc.
- 3.7.4.16. Understands the spirit behind this, but there are complexities here. Would like to defer the vote and talk to some other people about this.
- 3.7.4.17. 802.11 members will be able to vote in 802.15.2
- 3.7.4.18. There are still outstanding questions. Maybe we need to discuss more about how this would work.
- 3.7.4.19. The chair notes that the ANA procedure has been posted. It does address outside agencies such as 802.15 as well.
- 3.7.4.20. 802.11 must act to allow 802.15 to handle this. It is not carte-blanche. We are giving 802.15.2 the responsibility to work on this. The responsibility has not been accepted by 802.11 so far.
- 3.7.4.21. People haven't considered the implications – would the movers consider waiting to make the motion until Friday?

3.7.5. Straw poll – who wants to wait until Friday? 104 wait : 44 now : 47 abstain.

3.7.6. Motion to table the ANA motion moved by Engwer/ Wakeley until Friday

3.7.6.1. Steve Halford

3.7.6.2. Bruce Kraemer

3.7.6.3. Motion ID 349

3.7.7. Discussion

3.7.7.1. This has been going around for a long time. There is actually a recommendation in TGe to remove this entirely. This moves it into 802.15.2, and still in our control.

3.7.7.2. In favor of tabling it. We don't have all the information now.

3.7.7.3. Suggestion to modify the motion on Friday to name the element and its definition and function.

3.7.7.4. The ANA procedure says the request must be made by a motion to request. Outside bodies request the WG chair to sponsor the request.

3.7.7.5. The WG chair notes that it is in fact sponsored by the WG chair. He encouraged these members to bring this motion to the body.

3.7.7.6. Call the question – No Objection

3.7.8. Vote on tabling: Passes 87 : 29 : 19

3.7.9. The motion passes.

3.7.10. The chair notes the correction in the voting calculator regarding the movers of the previous motion

3.8. *Regulatory Matters*

3.8.1. Motion: To approve presentation filing with the FCC of document 18-02-028r1_ExParte_re_AMSAT.ppt

3.8.1.1. Moved Carl Stephenson on behalf of 802.18

3.8.1.2. Vote Passes 72 : 0 : 19

3.8.2. Motion: to approve presentation filing with the FCC of document 18-02-029r0_Opp_LMS_Pet_Recon_and_Ex_Parte.doc

3.8.2.1. Moved Carl Stephenson on behalf of 802.18

3.8.2.2. Vote: Passes 72 : 0 : 18

3.9. *Recess at 11:54AM*

4. Friday Closing Plenary

4.1. *Opening*

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

4.1.2. The agenda is in 02/497r6

4.1.3. The chair reviews the current agenda

4.1.3.1. An update on the ANA process and numbers is requested. No update currently available.

4.1.4. Any other agenda items

4.1.4.1. None

4.1.5. The agenda is adopted without objections

4.2. Announcements

- 4.2.1. TG Chairs are requested to provide meeting updates, and are reminded of the CAC meetings
- 4.2.2. IP statements. Are there any new IP statements? No

4.3. Voters Summary

- 4.3.1. Al Petrick reports the current voting status in document 402r9
 - 4.3.1.1. Voters: 388
 - 4.3.1.2. Nearly Voters: 94
 - 4.3.1.3. Potential Voters in Monterey 388
 - 4.3.1.3.1. Voting rights give only at Plenary
 - 4.3.1.4. Aspirants 338
 - 4.3.1.5. Non-voters (total) 630
 - 4.3.1.6. Voters required for a Quorum 194
 - 4.3.1.6.1. Based on 50% of total Voter Membership
- 4.3.2. There are 506 people at this meeting. We are 2/3 of 802 now.

4.4. Attendance

- 4.4.1. Everyone who has registered will get full credit for attendance this week.
- 4.4.2. New participants must send their contact information to apetrick@icefyre.com

4.5. Documents

- 4.5.1. The document server got turned on and was issuing conflicting numbers while numbers were being issued manually.
- 4.5.2. Harry will email any submitters with bad numbers.

4.6. Announcements

- 4.6.1. The chair thanks the body for the hard work and positive progress this week.
- 4.6.2. The chair reminds the group to remember the 9/11/2001 victims.
- 4.6.3. The chair notes that there will be an emergency action plan for our meetings developed by the CAC

4.7. Task Group Reports**4.7.1. TGe – John Fakatselis**

- 4.7.1.1. [Report in Document 02/631r0](#)
- 4.7.1.2. Approved changes to create a new draft, version 3.3
- 4.7.1.3. New normative text was approved by a vote of 129 : 5 : 4
- 4.7.1.4. The vote on draft creation passed 48: 0 : 1
- 4.7.1.5. There are no motions for the plenary.
- 4.7.1.6. A motion was passed in TGe “9.6.1.1. Instruct the chair to send an email to the reflector identifying the state of TGe and the draft, and identifying that comments will not be specifically addressed, except at the request of the commenter. The chair is also instructed to note the situation in the next plenary session.”
- 4.7.1.7. Next meeting will continue refining the draft, and issue a letter ballot.

4.7.2. TGf – Dave Bagby

- 4.7.2.1. The meeting was convened, the minutes were reviewed.

- 4.7.2.2. There was no business to conduct since the sponsor ballot had not been started, so the meeting was adjourned.
- 4.7.2.3. When will the Sponsor Ballot start? They think it may be started next week, but we don't really know.
- 4.7.2.4. It will be a 30 day sponsor ballot.

4.7.3. TGg – Matthew Shoemake

- 4.7.3.1. [Report in document 02/615r0](#)
- 4.7.3.2. Update on LB41 – results in document 522r1
 - 4.7.3.2.1. Currently 186 yes, 45 no, 33 abstain
- 4.7.3.3. The Yes percentage is 80.25%
- 4.7.3.4. The week was spent on comment resolution
- 4.7.3.5. The last comment resolution document is in 02/535r14
- 4.7.3.6. There were 75 comments accepted, 35 countered, and 95 rejected.
- 4.7.3.7. The TGg editor has updated to version 3.2. It may not contain all resolutions adopted this week, but the majority of them are there.
- 4.7.3.8. The next draft will be draft 4.0 based on all the resolutions.
- 4.7.3.9. The TG passed a motion to direct the editor to create draft 4.0 within 2 weeks.
- 4.7.3.10. TGg plan
 - 4.7.3.10.1. Then issue a 15 day letter ballot on whether to start a recirculation ballot
 - 4.7.3.10.2. If that passes, issue an 802.11 WG recirculation ballot on the TGg draft
 - 4.7.3.10.3. In November, review comments and decide if the draft is forwarded to recirculation.
- 4.7.3.11. A motion to issue the 15 day LB will be brought in this plenary session.
- 4.7.3.12. The new draft will be available at the time the 15 day LB begins, so members can review it.
- 4.7.3.13. There are no other technical changes from document 3.2 to 4.0 other than those in document 535r14.

4.7.4. TGh – Mika Kasslin

- 4.7.4.1. [Report in document 02/624r1](#) (At the meeting, a duplicate number 597 was used)
- 4.7.4.2. Had ad hoc groups to address the LB42 comments
- 4.7.4.3. Comments in 02/515r0
- 4.7.4.4. TGh approved 02/515r6 with all the comment resolutions.
- 4.7.4.5. Will follow a similar process to TGg to start a recirculation ballot. An electronic ballot will be used to approve sending the draft to recirculation ballot.
- 4.7.4.6. Hoping for a recirculation ballot to complete before the November meeting.

4.7.5. TGi – David Halasz

- 4.7.5.1. [Closing report in 02/610r0](#)
- 4.7.5.2. There were 729 technical issues, 4 are still open.
- 4.7.5.3. There was a prior interim meeting in San Jose,
- 4.7.5.4. There will be another interim TGi meeting in Virginia, Oct 15-17. Continuing comment resolution.
- 4.7.5.5. Objective is to reach draft 3 and go to letter ballot

4.7.6. WNG / WIG – TK Tan

- 4.7.6.1. [Report in document 560r3](#)
- 4.7.6.2. WIG highlights

- 4.7.6.2.1. Hosted the first meeting this week. Opening in document 02/557r1
- 4.7.6.2.2. Working with 3G and public access network.
- 4.7.6.2.3. Approved liaisons with external bodies.
- 4.7.6.2.4. Next meeting in January/February in Japan.
- 4.7.6.2.5. Liaison statements were created for other standards bodies and organizations.
- 4.7.6.2.6. An email reflector for WIG is being established.
- 4.7.6.3. PAR and 5 criteria for Japanese 4.9-5.0G band
 - 4.7.6.3.1. Changes to 802.11a are needed to support this band.
 - 4.7.6.3.2. This activity was approved in July.
 - 4.7.6.3.3. This will be brought to the ExCom on Monday in the November plenary.
- 4.7.6.4. Objectives for November
 - 4.7.6.4.1. Further WIG activities, UWB channel modeling, directions for WLAN.
 - 4.7.6.4.2. A new secretary is needed for WNG
- 4.7.7. Publicity Standing Committee – Brian Matthews**
 - 4.7.7.1. There was one meeting on Tuesday – about 11 people
 - 4.7.7.2. [Report in 02/554r0](#)
 - 4.7.7.3. There was an update from WECA.
 - 4.7.7.4. Establishing a test bed for 802.11a interop testing.
 - 4.7.7.5. WiMedia update – Similar to WECA but for 802.15. Launched September 3rd.
 - 4.7.7.6. The group reviewed the 802 news bulletin. An update will be created after every 802.11 meeting.
 - 4.7.7.7. There have been plans to have conference calls with journalists and analysts. They have been deferred, and we will focus on web site updating.
 - 4.7.7.8. The 802.11 web site was reviewed.
- 4.7.8. High Throughput Study Group – Jon Rosdahl**
 - 4.7.8.1. First meeting this week
 - 4.7.8.2. [Report in document 02/532r0](#)
 - 4.7.8.3. Worked on scope and purpose for PAR
 - 4.7.8.4. Scope is a throughput increase at the MAC data SAP.
 - 4.7.8.5. Objective for November – complete PAR and 5 criteria
- 4.7.9. Radio Resource Measurements (RRM) SG – Richard Paine**
 - 4.7.9.1. [Report in document 02/489r0](#)
 - 4.7.9.2. Objectives were to finalize PAR and 5 criteria, and have technology inputs.
 - 4.7.9.3. A number of topics were discussed.
- 4.7.10. 802.1 Liaison**
 - 4.7.10.1. No update
- 4.7.11. 802.15 Liaison Update – Michael Seals**
 - 4.7.11.1. [Document number 02/609r0](#)
 - 4.7.11.2. TG2 continues comment resolution. AWMA management depends on element vote
 - 4.7.11.3. TG3 worked on comment resolution. Recirc in November.
 - 4.7.11.4. TG4 comments on LB20. Will go to sponsor ballot
 - 4.7.11.5. SG3a has elected officers. Will request TG status in November. Have been working on UWB channel model and PAR.

4.7.12. 802.16 liaison – Mika Kasslin

- 4.7.12.1. [Report in document 02/626](#) (at the meeting, a duplicate number 598 was used)
- 4.7.12.2. Covering only 802.16a.
- 4.7.12.3. Sponsor ballot passed 46 : 13
- 4.7.12.4. Comment resolution will proceed at next meeting.

4.7.13. 802.18 – Carl Stephenson

- 4.7.13.1. [Report in 18-02-033r0](#)
- 4.7.13.2. Held joint sessions with 802.11 TGs
- 4.7.13.3. Regulatory filings for FCC
- 4.7.13.4. Objectives for Hawaii. Report any new developments, joint meetings, prepare documents, continue work on operating rules.
- 4.7.13.5. Will have email and teleconference between now and November.
- 4.7.13.6. Discussion
 - 4.7.13.6.1. When was the joint meeting with TGg? There was not a joint meeting this week. There will be one in November.

4.7.14. Wi-Fi Alliance – Sheung Li

- 4.7.14.1. [Document 02/619](#) (At the meeting a duplicate number 594 was used)
- 4.7.14.2. Since the last IEEE meeting there hasn't been a WECA meeting.
- 4.7.14.3. Working on security ease of use – mapping of keys.
- 4.7.14.4. Will discuss dual band certifications
- 4.7.14.5. Expecting a letter from chairman of WECA regarding the relationship between SSN and 802.11i . SSN is being pushed by WECA. The letter has not been sent to the 802.11 WG Chair yet.
- 4.7.14.6. When the letter is received it will be on the web site.
- 4.7.14.7. Discussion
 - 4.7.14.7.1. Is the interoperability testing next week official? Yes, it is an official part of the WECA certification process.

4.7.15. Liaison Report to JEDEC JC61 – Benno Ritter

- 4.7.15.1. [Report in document 02/616r0](#)
- 4.7.15.2. Standardizing interface between Radio and BBP, and between MAC and PHY
- 4.7.15.3. 42 companies, 120 participants.
- 4.7.15.4. At last meeting 22 companies
- 4.7.15.5. Next meeting in November in Hawaii before the IEEE meeting.
- 4.7.15.6. MRD and TRD and rules have been approved. JC61 is on the JEDEC web page.
- 4.7.15.7. There are a number of proposals
- 4.7.15.8. Looking at IP issues with the blocks.
- 4.7.15.9. Trying to merge proposals – differences in clocking and data schemes
- 4.7.15.10. A Ballot will be held at the end of the month that will lead to a baseline proposal.
- 4.7.15.11. Selection in November, Approved standard by 1Q 2003

4.7.16. CableLabs liaison – Lior Ophir

- 4.7.16.1. [Report in document 627r1](#) (At the meeting, a duplicate number 599 was used)
- 4.7.16.2. Coordinating use of 802.11 WLANs and DOCSIS cable modem systems
- 4.7.16.3. Met with CableLabs in July. CableLabs is very positive towards the liaison effort.

- 4.7.16.4. CableLabs has formed focus teams working on CableHome 2.0. Will be done 1Q 2003
- 4.7.16.5. Formalizing coordination mechanism between 802.11 and CableHome focus teams.
- 4.7.16.6. Planning a CableHome tutorial for November.
- 4.7.16.7. Discussion
- 4.7.16.8. What is the current status of the CableHome standard? Currently CableHome 1.0 is out. Work is going on to create CableHome 2.0.
- 4.7.16.9. What about exchanging documents? We are working on it.

4.7.17. **Liaison to IEEE 1394.1 – Peter Johansson**

- 4.7.17.1. [Report in document 02/617r0](#)
- 4.7.17.2. This report is regarding wireless bridged 1394
- 4.7.17.3. An adaptation between 1394 SAP to 802.11 SAP.
- 4.7.17.4. 1394.1 processing comments for sponsor ballot comments. Only 21 remain. Meeting again in October. Hoping for recirculation ballot this year or early next year.
- 4.7.17.5. Documents are available to IEEE members.

4.8. **Standing Orders**

4.8.1. **Motions from TGg**

- 4.8.1.1. Move to issue a 15-day IEEE 802.11 Working Group Letter Ballot two weeks after the close of the September 2002 Interim session. The letter ballot shall include a motion to issue a 15-day recirculation ballot on the IEEE 802.11g draft 4.0.
- 4.8.1.2. Motion ID 350
- 4.8.1.3. Matthew Shoemake on behalf of IEEE 802.11 Task Group G
- 4.8.1.4. Discussion

- 4.8.1.4.1. The WG chair notes that electronic balloting is not the preferred method of the LMSC. The WG chair does not personally agree, and supports this approach. This is a discussion in the SEC and is not related to this motion.
- 4.8.1.4.2. When this Letter Ballot is issued, the draft will be available.

- 4.8.1.5. Vote on the motion: Passes 104 : 0 : 1

4.8.2. **Motions from TGh**

- 4.8.2.1. Motion:
 - 1) TGh will make TGh Draft revision 2.2 corresponding to the LB42 comment resolutions (02/515r6) available to the membership via the 802.11 members only area of the web site by October 2002
 - 2) The WG chair is instructed to issue a 15 day electronic ballot (where non-response is taken as assent) asking the membership the following question:
Shall TGh draft 2.2 be issued for WG re-circulation ballot?
 - 3) The TGh chair shall then start the re-circulation ballot depending on the outcome.
- 4.8.2.2. Motion ID 351
- 4.8.2.3. The comments regarding electronic balloting made for TGg are repeated, and are applicable to this motion.
- 4.8.2.4. Discussion

4.8.2.4.1. If no one responds this passes. We need an active response.
 4.8.2.4.2. Motion to amend – strike the parenthetical clause in 2) and add at the start of item 3) “If the electronic ballot of item 2 is successful”

4.8.2.4.2.1. Moved O’Hara
 4.8.2.4.2.2. Seconded Johansson
 4.8.2.4.2.3. Vote on the amendment: Passes 92 : 0 : 8

4.8.2.5. Motion as amended:

1) TGh will make TGh Draft revision 2.2 corresponding to the LB42 comment resolutions (02/515r6) available to the membership via the 802.11 members only area of the web site by October 2002

2) The WG chair is instructed to issue a 15 day electronic ballot asking the membership the following question:

- Shall TGh draft 2.2 be issued for WG re-circulation ballot?

3) If the electronic ballot of item 2 is successful, the TGh chair shall then start the re-circulation ballot depending on the outcome.

4.8.2.6. Vote on the main motion. Passes: 105 : 0 : 0

4.8.3. Motions from WNG / WIG

4.8.3.1. Move to approve the PAR (11-02-564r0) and Five Criteria (11-02-565r0) requesting a task group be established to extend 802.11, 802.11a and 802.11d, as necessary, to the Japanese 4.9GHz-5GHz bands and forward them to LMSC ExCom for task group approval at the November 2002 IEEE 802 Plenary.

4.8.3.1.1. Moved TK Tan on behalf of WNG SC
 4.8.3.1.2. Motion ID 352

4.8.3.2. Discussion

4.8.3.2.1. To extend 802.11, 802.11a, and 802.11d. What about the others that are currently underway?
 4.8.3.2.2. We can only amend the base standard. We cannot amend amendments.
 4.8.3.2.3. Everything we work on is an amendment except 802.11f which is a recommended practice. The term Supplement is no longer used.
 4.8.3.2.4. Everything listed in this motion is incorporated in the 2002 rollup of 802.11. As written, this motion would amend the wrong thing. It should be modified to also include the 2002 rollup if available.
 4.8.3.2.5. The PAR has been changed to bridge that gap. The scope of this activity is as narrow as possible, to address Japanese requirements. Only what is needed to accomplish this task.
 4.8.3.2.6. The way around this is in the PAR to specify 802.11 and any necessary supplements. The issue is the PAR, not this motion.
 4.8.3.2.7. Perhaps the PAR could be modified at the November Plenary opening session if changes are needed?
 4.8.3.2.8. The PAR requires 30 days to create a TG. We need to resolve this today.
 4.8.3.2.9. The WG chair notes that the item needs to be on the agenda 30 days in advance. The SEC can discuss it on Wednesday.

- 4.8.3.2.10. If we wait until November, we couldn't send it to SEC until March 2003.
- 4.8.3.2.11. To prepare for November, we should issue a LB process similar to TGg and TGh. We could then fix the PAR and send it to a LB. We could still be ready for ExCom in November.

4.8.4. Recess for morning break.

4.8.5. The meeting is reconvened at 10:15AM by Stuart J. Kerry

4.8.6. Motions from WNG / WIG

4.8.6.1. Motion to amend the motion to read "Move to issue a 15 day IEEE 802.11 Working group letter ballot within one week after the close of the September 2002 interim session. The letter ballot shall include a motion to approve PAR (11-02-564r1) and five criteria (11-02-565r0) and if approved, forward them by October 11, 2002, to LMSC ExCom for task group approval at the November 2002 IEEE 802 Plenary"

- 4.8.6.1.1. moved Bruce Kraemer
- 4.8.6.1.2. Peter Eccelsine
- 4.8.6.1.3. Vote on the amendment: Motion passes 72: 0: 2

4.8.6.2. Motion on the floor: Move to issue a 15 day IEEE 802.11 Working group letter ballot within one week after the close of the September 2002 interim session. The letter ballot shall include a motion to approve PAR (11-02-564r1) and five criteria (11-02-565r0) and if approved, forward them by October 11, 2002, to LMSC ExCom for task group approval at the November 2002 IEEE 802 Plenary

- 4.8.6.2.1. Vote on the main motion: Passes 78 : 0 :1

4.8.7. RRM Motions

4.8.7.1. Move to have the Working Group confirm 11-02-337r8 PAR and 11-02-340r7 Five Criteria to enhance the 802.11 network measurement and reporting, and forward to the SEC approval at the November 2002 IEEE 802 Plenary.

- 4.8.7.1.1. Motion ID 353
- 4.8.7.1.2. Moved Richard Paine on behalf of RRM SG
- 4.8.7.1.3. Vote on the motion: 78 : 0 : 1

4.8.7.2. Move to allow the Radio Resource Measurement teleconferences starting September 25, 2002 and continue until the November 2002 session

- 4.8.7.2.1. Moved Richard Paine on behalf of RRM
- 4.8.7.2.2. Motion ID 354
- 4.8.7.2.3. Vote on the motion: 79 : 0 : 2

4.8.8. 802.18 Radio Regulatory

4.8.8.1. Motion: to approve filing with the Hong Kong TA of document 18-02-031r0_cmts_hong_kong_wlan_consultation.doc as amended to r1 by 802.15

- 4.8.8.1.1. Moved Carl Stephenson on behalf of 802.18
- 4.8.8.1.2. Motion ID 355
- 4.8.8.1.3. Vote on the motion: 66:0:5

4.8.8.2. Motion: To approve presentation/filing with the FCC of document 18-02-032r0_WRC_A11.5_Presentation.ppt and to further authorize presentations of the document to key Members of Congress and/or their staffs, and key officials of the Department of Commerce in an effort to gain support for the globally harmonized 5 GHz allocations for WAS/RLAN systems contemplated in WRC-03 Agenda Item 1.5 and for

favorable action by the FCC on the related WECA Petition to add the band 5470-5725 MHz to the "U-NII" bands.
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4.8.8.2.1.	Moved Carl Stephenson on behalf of 802.18
4.8.8.2.2.	Motion ID 356
4.8.8.2.3.	Vote on the Motion: 80 : 0 : 2

4.9. Closing Reports

4.9.1. 802.19 – Jim Lansford

- 4.9.1.1. [Report in 802-19-02/007r0](#)
- 4.9.1.2. Have an acting chair and vice chair to be confirmed in November
 - 4.9.1.2.1. Began work on "levels" of coexistence
 - 4.9.1.2.2. Example: Level 0=no sensing or action, level 4=complete collaboration
 - 4.9.1.2.3. Discussion on quantitative definition of coexistence
 - 4.9.1.2.4. Liaison with EMC and EMBS established
 - 4.9.1.2.5. Presentation by Todd Cooper, Chair IEEE 1073 (Medical comm standards) on coexistence requirements of medical community
 - 4.9.1.2.6. Presentation on coexistence in SG3a – UWB. Will issue a joint statement when the SG3a PAR and 5 criteria go out.
- 4.9.1.3. Goals
 - 4.9.1.3.1. First draft of policy document for IEEE 802 coexistence – how 802 will approach the coexistence issue.
 - 4.9.1.3.2. Issue coexistence statement for 802.15 SG3a PAR and 5 criteria
 - 4.9.1.3.3. Further work on "PHY Coexistence Characterization" (PCC), used as first order quantitative model for coexistence.
 - 4.9.1.3.4. A joint meeting with SG3a will take place in November.
 - 4.9.1.3.5. Will nominate official officers in November
- 4.9.1.4. Q&A
 - 4.9.1.4.1. \\802-18-19\Coexistence\September 2002 Monterey.
 - 4.9.1.4.2. 802.19 will fully share documents with 802.11

4.10. Operating rules

- 4.10.1.1. Al Petrick
- 4.10.1.2. Resolved remaining comments
- 4.10.1.3. Will send out Recirculation document 00/331r4
- 4.10.1.4. All comments resolved. Resolutions in 460r4
- 4.10.1.5. Thanks for the team who helped resolve the comments and working on these documents.

4.10.2. Motion: to conduct a 30 day WG recirculation ballot on the revised 802.11 WG operating rules document, doc: 11-00-331r4.
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4.10.2.1.	Moved Al Petrick
4.10.2.2.	Second Jon Rosdahl
4.10.2.3.	Motion ID 357
4.10.2.4.	Discussion

4.10.2.4.1.	What are the current requirements in the rules regarding reviewing the changes in this plenary?
4.10.2.4.2.	The WG chair has chosen to answer the comments, and this is the chosen path.
4.10.2.4.3.	Can we get a 2002 document number for this document?
4.10.2.4.4.	Yes, Harry will re-assign a new number.

4.10.2.4.5.	The new rules have amended the 4 hour rule.
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4.10.2.5.	Vote on the motion: Passes 84 : 0 : 1
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4.11. Standards Roll-up – Terry Cole

4.11.1. [Report in document 486r3](#)

- 4.11.1.1. RevCom requires re-affirming or revising the standard as soon as possible. They may disapprove further amendments.
 - 4.11.1.2. The goal is to complete the work by end of year
 - 4.11.1.3. We held a very good meeting with IEEE staff this week (Angela Ortiz et.al.) to discuss options:
 - 4.11.1.4. Revision:
 - 4.11.1.4.1. Requires approval of a revision PAR, form sponsor ballot, invite, ballot, resolve.
 - 4.11.1.4.2. Reasonably optimistic timeline leads to closure of first ballot March 2003
 - 4.11.1.5. Reaffirmation:
 - 4.11.1.5.1. Requires invitations to existing pool, ballot, resolution.
 - 4.11.1.5.2. Reasonably optimistic timelines leads to ballot results in December 2002.
 - 4.11.1.6. Because of the large timeline difference, IEEE staff and chair recommend the reaffirmation route.
 - 4.11.1.7. Overall Plan:
 - 4.11.1.7.1. A three step program will get us back into good shape on 802.11 amendments
 1. Reaffirm all existing/approved amendments by December 2002.
 2. All projects approved in 2003 & 2004 will be against the base document IEEE 802.11 2002 (802.11e, 802.11g, 802.11h, 802.11i, and future task groups)
 3. Do the editorial work to roll-up each standard as soon as possible after it is published, and reaffirm the 802.11 standard again in the late summer/early fall of 2004.
 - 4.11.1.7.2. Repeat 2 & 3 in two year cycles.
 - 4.11.1.8. There is a catch to the reaffirmation process.
 - 4.11.1.9. Reaffirmation apparently means we must continuing shipping the SDL code with the IEEE standard.
 - 4.11.1.10. Terry Cole redoubles his plea for someone to find the 802.11b SDL code generated during the 1999 project!
 - 4.11.1.10.1. Please search.
 - 4.11.1.10.2. Finder will not need to do further work.
 - 4.11.1.10.3. He will take care of things after it is found!
- 4.11.2. Discussion
- 4.11.2.1. Is the SDL really that important?
 - 4.11.2.2. We would like to forget about it. The IEEE staff wants it. The argument can be made that nobody is using the SDL.
 - 4.11.2.3. Could we be forced to Revise if we don't find it? Maybe that would be a better path?
 - 4.11.2.4. Is it in the 2000 CD in the ZIP files?

4.12. Network and Attendance Update

- 4.12.1. We discussed the wireless networking plan in Wednesday.
- 4.12.2. We will form a team to design a new network. Tim Godfrey will lead team and provide a recommendation.
- 4.12.3. Any other participants?

4.12.3.1. Terry Cole, Tim Wakelely

4.12.4. Straw Poll supports increasing fees to properly support expanding the wireless network.

4.12.5. Motion to forward the results and recommendation of the straw poll as the official position of the 802.11 WG to the 802 ExCom at the November 2002 Plenary Session

4.12.5.1. Moved Al Petrick

4.12.5.2. Second Peter E.

4.12.5.3. Motion ID 358

4.12.6. Discussion

4.12.6.1. The ExCom is becoming favorable to this.

4.12.6.2. We want this to work at Plenaries and Interims, but don't want a \$1000 a week meeting fee.

4.12.6.3. We will look after interims as our first priority, but also consider Plenaries.

4.12.6.4. The chair would like to make this our official opinion, not the results of a straw poll.

4.12.6.5. The chair decides that it would be better to forward the results of the straw poll since the numbers were larger at that point in time.

4.12.6.6. What was the result in 802.15? It was 100% approval.

4.12.6.7. Similar discussion in 802.18 were also in favor.

4.12.7. Vote on the motion: Passes 84 : 0 : 1

4.13. 802.15.2 element

4.13.1. Document 582r1 – Chris Zegelin

4.13.1.1. Two new pages were added.

4.13.1.2. After discussing with people, there were concern that it was a blank check to let 802.15 modify our standard.

4.13.1.3. We need to make an acceptable mechanism for both groups.

4.13.1.4. TGh already has a mechanism for quiet period. We don't want people to do coexistence in their own way by using existing facilities in a manner never intended. Such as bogus RTS/CTS to clear the air.

4.13.1.5. We have created a new motion, so the old motion will be left to expire on the table.

4.13.2. Motion: to direct the 802.11 WG ANA (assigned numbers authority) to reserve a specific element ID for use by the 802.15.2 TG2 working group under the rules established by the ANA. This element will be called the "802.15 coexistence element". That 802.15 make available document "01000D05SP802-15-2_Draft_recommended_practice" or subsequent revisions for review and letter ballot approval by both the 802.11 and 802.15 WGs.

4.13.2.1. Moved Darwin Engwer

4.13.2.2. Second Tim Wakeley

4.13.2.3. Motion ID 359

4.13.2.4. Discussion

4.13.2.4.1. Is this just for 802.15.1 coexistence?

4.13.2.4.2. In favor - we should help 802.15 on this.

- 4.13.2.4.3. In favor – the existing techniques are all aimed at keeping the spectrum clean. This is saying something different.
 4.13.2.4.4. The chair asks for the ANA to fully describe the element when it is assigned.

4.13.2.5. Vote : passes 76 : 0 : 10

4.13.3. The WG chair directs the ANA to issue the element.

4.14. **New Business**

4.14.1. TGe

4.14.1.1. John Fakatselis has been asked to reserve the 3 weeks before the November meeting for potential teleconferences.

4.14.2. HTSG

4.14.2.1. Ready to get PAR and 5 Criteria in November

4.14.3. **WG motions**

4.14.3.1. Motion to authorize the purchase of a new server (by the chairs of 802.11/15) before the November Plenary session if necessary. All attempts will be made to solicit a donation or loan equipment as a first choice.

- 4.14.3.1.1. Moved Al Petrick
 4.14.3.1.2. Second Peter E
 4.14.3.1.3. Motion ID 360
 4.14.3.1.4. Discussion

- 4.14.3.1.4.1. A similar motion was passed by 802.15 with unanimous consent.
 4.14.3.1.4.2. Do we know what the status of our funds are? Are they sufficient?
 4.14.3.1.4.3. The WG chair states we do have sufficient funds, and we have companies that may donate.

4.14.3.1.5. Vote on the motion: Passes 81 : 0 : 1

4.14.3.2. Move to submit draft 802.15.2-D06 with the amended changes to a 15 day recirculation ballot, to complete before the November 2002 Plenary.

- 4.14.3.2.1. Moved Bob Heile
 4.14.3.2.2. Second Jim Lansford
 4.14.3.2.3. Motion ID 361
 4.14.3.2.4. Vote on the motion: Passes 72 : 0 : 3

4.15. **Discussion from the floor / Next Steps**

- 4.15.1. We have 8 letter ballots before the next meeting.
 4.15.2. Aren't the recirculation ballots 15 days? Yes – the minutes record that the recirculation ballot is 15 days.
 4.15.3. Al Petrick reminds everyone to verify their email address and send him any changes.
 4.15.4. Al Petrick will handle the operating rule's Ballot. Harry will do all the others.
 4.15.5. We've had a lot of progress this week. We approve PARs, meetings, drafts, technologies, ballots, and finally send something to RevCom. There will be press releases, and reports. Asks for caution in using the word "approved" – a standard is not approved until the end of the process.

4.15.6. The WG chair agrees with that view, and affirms that the Chair and Vice Chairs are the only official speakers for this group to the press.

4.15.7. The next meeting is November 11-15th at Hyatt Regency Kauai. The wired groups are in the Sheraton.

4.16. *The meeting is adjourned at 11:40AM.*

Attendance list for the meeting held at **Hyatt Regency, Monterey, CA**

<i>Full name</i>	<i>status</i>	<i>att. %</i>	<i>phone</i>	<i>company</i>	<i>e_mail</i>
Dr. Tomoko Adachi ()	voter	100	+81 44 549 2283	Toshiba Corporation	tomo.adachi@toshiba.co.jp
Mr. Jae-Young Ahn ()	nonvoter	100	82 42 860 6421	ETRI	jjahn@etri.re.kr
Mr. Areg Alimian ()	voter	100	408 326 2229	3Com Corporation	areg_alimian@3com.com
Mr. Richard Allen (Dick)	voter	100	+1 408 974 5265	Apple Computer Inc.	rallen@apple.com
Mr. Keith Amann (Keith)	voter	100	+1 303 440 5330 x278	Spectralink	kamann@spectralink.com
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**IEEE P802.11
Wireless LANs**

**Minutes of 802.11 Task Group E
MAC Enhancements - QoS**

Hyatt Regency Monterey, Monterey, CA, USA

Date: Sept 9 - 13, 2002

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1. Monday September 9, 2002

1.1. Opening

1.1.1. Meeting called to order at 10:30AM by John Fakatselis

1.1.1.1. *Secretary Tim Godfrey*

1.1.2. Review of objectives

1.1.2.1. *Review comments from last LB*

1.1.2.2. *Look for compromise.*

1.1.2.3. *See how close we can come to a new draft that can be sent out for LB.*

1.2. Review and Approve Agenda

1.2.1. John Fakatselis will chair all the sessions at this meeting so Duncan Kitchin may participate in technical discussion.

1.2.1.1. *Fixed Time agenda item for vote on compromise proposal at the last session on Wednesday 3:30PM. The decision is needed by Wednesday so we can prepare a draft that can be approved on Thursday.*

1.2.2. Discussion

1.2.2.1. *There are several groups that have proposals. These will be delivered in terms of normative text to the server. Proposes to halt the meeting and reconvene this afternoon when there is a presentation.*

1.2.2.2. *The chair notes that procedural decisions will be made at 1:00PM. There will be informal discussions over lunch.*

1.2.2.3. *There are presentations that may not be relevant – can the be introduced if needed?*

1.2.2.4. *The chair requests that all presentations be entered*

1.2.2.5. *Might we take the slots of TGf tomorrow?*

1.2.2.6. *The agenda for Tuesday is extended from 8:00 to 5:30PM by the chair. There is also an evening session starting at 7:00PM*

1.2.2.6.1. *There is no objection from anyone.*

1.2.3. Approval of the agenda

1.2.3.1. *The agenda is approved without objection.*

1.2.4. How many new participants?

1.2.4.1. *Quite a few. The chair reviews the procedures according to Roberts Rules. Only members can ask for motions. Non-members can suggest a motion to members.*

1.2.4.2. *The chair asks members to be discrete on asking for points of order. This has been abused in the past. It can slow us down.*

1.2.4.3. *There are certain things we cannot do, such as suspend over-riding rules. The intent is only for procedural changes on decisions that were made in this group.*

1.3. Approval of the minutes from July

- 1.3.1. There are no comments
- 1.3.2. The minutes of TGe for July 2002 are approved without objection.

1.4. Call for Papers

- 1.4.1. Document 523r0 – An alternative mechanism to provide parameterized QoS – John Kowalski (20 min)
- 1.4.2. Doc 518r0 – QoS for Managed Services – Damon Wei (15 min)
- 1.4.3. Doc XXX - Automatic Power Save Delivery with QoS – Keith Amman. (10 min) normative
- 1.4.4. 525r0 – Performance results for reservation request – Mathilde (10 min)
- 1.4.5. 526r0 – an EIFS correction – Mathilde B (5 min) normative
- 1.4.6. xxx – PF differentiation and EDCF RR – Mathilde B (10 min) normative
- 1.4.7. 01/409r2 – Persistence Factor - Mathilde B (10 min) normative
- 1.4.8. 524r0 – Fast Track Consensus Proposal – Rolf (20 min) normative, combined with other fast track proposal
- 1.4.9. xxx – EDCF / PCF comparisons – Matthew Sherman (15 min)
- 1.4.10. xxx – Should Parameterized QoS be optional – Matthew Sherman (15 min)
- 1.4.11. 554r0 – Distributed Admission Control – Menzo (15 min)
- 1.4.12. 438r2 – Direct Link Protocol – Menzo (15 min)
- 1.4.13. xxx – User Priority and CFs - menzo (5 min)
- 1.4.14. xxx – Fast Track scheduling – Amjad (20 min) normative
- 1.4.15. Total time 3:20
- 1.4.16. Discussion
 - 1.4.16.1. *Which have motions associated with them, or are introduced into the draft?*
 - 1.4.16.2. *How many overall global proposals do we have? (one from John K, one from Rolf). These will be candidates for Wednesday.*
 - 1.4.16.3. *Who is ready to present? The TGe rule is that the presentations are on the server for 4 working hours, if it contains normative text.*

1.4.17. Recessed: 10:40am

2. Monday Afternoon Session

2.1. Presentation of Papers

2.1.1. Lunch ad-hoc meetings

- 2.1.1.1. *JF met with two compromise groups*
- 2.1.1.2. *The two groups will present today.*
- 2.1.1.3. *No votes will be taken today, so 4 hour limit should not stop any presentation.*
- 2.1.1.4. *Straw Poll will be taken tomorrow morning to check TGe group consensus.*

2.1.2. **11-02/518r0: QoS for Managed Services, Damon Wei, AT&T**

- 2.1.2.1. *Service Provider point of view*
- 2.1.2.2. *Recommendations:*
 - 2.1.2.2.1. *Parameterized interoperable QoS, with Legacy DCF*
 - 2.1.2.2.2. *More user friendly 802.11*
 - 2.1.2.2.3. *Allow market segments to decide QoS rather than "one size fits all"*
- 2.1.2.3. *Q&A*
 - 2.1.2.3.1. *Q: Need guaranteed service over WLAN?*
 - 2.1.2.3.2. *A: Absolutely; some killer applications will absolutely demand it.*
 - 2.1.2.3.3. *Q: Is EDCF good enough for that?*
 - 2.1.2.3.4. *A: That is a joint activity of service providers and IEEE 802.11.*
 - 2.1.2.3.5. *Q: Can you elaborate on what parameters you need? Any examples?*
 - 2.1.2.3.6. *A: Need discussion whether 8 levels is enough.*
 - 2.1.2.3.7. *Q: Used "guaranteed" and "wireless" in same statement. What do you mean by the former?*
 - 2.1.2.3.8. *A: That's a challenge to each operations team; given constraints of the technology, service providers will charge client according to what client claims to need -- there is no such thing as 100% guarantee. Need a "working QoS" concept.*
 - 2.1.2.3.9. *Q: Suggest putting "guarantee" in probabilistic terms. But does working QoS need admission control?*
 - 2.1.2.3.10. *A: Need to discuss that in depth off-line.*
 - 2.1.2.3.11. *Q: Can't even reliably guarantee voice today, so how do more than that?*
 - 2.1.2.3.12. *A: Can't possibly be one size fits all; need to trade off needs.*

2.1.3. Simplifying Polling, Mathilde Benvenista, Avaya Labs Research

2.1.3.1. Discussion on the reasoning and history of the CC/RR mechanism.

2.1.3.2. Presentation of an ECDF RR simulation comparing to CC/RR. EDCF/RR gives better end to end and lower uplink delay.

2.1.3.3. EDCF/RR uses channel more efficiently.

2.1.3.4. Suggests re-introducing Persistence Factor to help improve EDCF performance.

2.1.3.5. .PF differentiation helps EDCF/RR get the RRs out sooner and thus improves HCF performance.

2.1.3.6. Q&A

2.1.3.6.1. Q: Will this cause collision with the beacon?

2.1.3.6.2. A: Any IFS of PIFS will not cause collisions with an AP. The minimum backoff a station will select it 1.

2.1.3.6.3. Q: how do you determine the optimal value for PF?

2.1.3.6.4. A: The APs determine the PFs.

2.1.4. Doc 554 – distributed admission control for EDCF.

2.1.4.1. Menzo Wentink

2.1.4.2. Overview

2.1.4.2.1. AP distributes transmission budget in beacons – the additional time that could be spent by a particular priority.

2.1.4.2.2. Stations limit themselves to the transmission budget of the previous beacon.

2.1.4.2.3. Simulations of video streams with and without admission control: Streams that exceed system capacity are capped at the available rate.

2.1.4.3. Discussion

2.1.4.3.1. Q: Why not just have real admission control?

2.1.4.3.2. A: in that case both flows don't get admitted. This handles the case where flows do not start at the same time.

2.1.4.3.3. Q: It isn't that much harder to just ask the AP for a TSPEC to get the bandwidth.

2.1.4.3.4. A: This works over multiple hops.

2.1.4.3.5. Q: How do you get T(measured)? How do you identify a voice or video transmission from a station?

2.1.4.3.6. A: T(measured) is by the priority in the frame. The duration of the transmission is added to the counter.

2.1.4.3.7. Q: So you can't compensate for bad channel conditions?

2.1.4.3.8. A: If there are collisions, you get a wrong count. Assume that collisions are rare. The damping will filter this.

2.1.4.3.9. Q: Is the transmission budget per access category?

- 2.1.4.3.10. A: *It will be per category – there are 8.*
- 2.1.4.3.11. Q: *The signaling has to be end to end for TSpec? That's not quite right. The TSPEC allows just the require bandwidth to be filled in.*
- 2.1.4.3.12. A: *This allows the available bandwidth to find itself. It is a probing with feedback. If available bandwidth isn't enough a different codec could be used, or the flow stopped.*

2.1.5. Recess for 30 minutes 3:00 to 3:30PM

2.2. Announcements

2.2.1. There is an R5 Agenda posted.

- 2.2.1.1. TGe *will be meeting all day tomorrow in this room.*
- 2.2.1.2. *There is an extra session for WNG*

2.3. Presentation of Papers

2.3.1. Doc 554 – distributed admission control for EDCF.

- 2.3.1.1. Q&A *continued*
- 2.3.1.1.1. Q: *how robust is the damping with different beacon rep rates?*
- 2.3.1.1.2. A: *It has been simulated over a range of beacon repetition rates.*
- 2.3.1.1.3. Q: *This method is based on linking priority with throughput. Couldn't you just use the arrival of traffic to trigger a reservation request?*
- 2.3.1.1.4. A: *Have been thinking about that – an implicit admission control mechanism. The HC would poll that flow so its queue would be empty once and a while.*
- 2.3.1.1.5. Q: *What is the advantage of distributed?*
- 2.3.1.1.6. A: *Simple, end to end method. Let the station administer the rate limit.*
- 2.3.1.1.7. Q: *End to end doesn't have to do with the allocation of bandwidth. Can the HC allocate as much time as it believes is available? The stations haven't reserved bandwidth, can the HC take that away and grant it other ways?*
- 2.3.1.1.8. A: *Yes – the HC could decide to Poll a video stream.*
- 2.3.1.1.9. Q: *could a new stream kill a stream of higher priority?*
- 2.3.1.1.10. A: *The default priorities should suffice to prevent this. The voice stream has the highest category, but once the category budget is depleted, no new traffic would be accepted.*

2.3.2. Document 523r1a - “ An Alternative Mechanism to provide parameterized QoS” John Kowalski.

- 2.3.2.1. Overview

- 2.3.2.1.1. *Proposing a simple time based scheduling scheme that doesn't rely on TSPEC.*
- 2.3.2.1.2. *Provides normative, observable behavior on the air interface, essential for interoperability.*
- 2.3.2.1.3. *Allows stations to request scheduling from the HC in an AP. Applications can use primitives in the MLME SAP.*
- 2.3.2.1.4. *Propose TRS action frame and TRS Element.*
- 2.3.2.1.5. *Reservation is based on "soft state" no explicit feedback. (WME+ proposal does have feedback, doesn't affect this)*
- 2.3.2.1.6. *A comparison chart Time Reservation with TSPEC.*
- 2.3.2.2. **Q&A**
 - 2.3.2.2.1. *Q: How is this testable?*
 - 2.3.2.2.2. *A: Time parameters are transmitted over the air. A sniffer can see and measure conformance.*
 - 2.3.2.2.3. *Q: This doesn't allow testing of delay through the MAC?*
 - 2.3.2.2.4. *A: The idea of the MAC delay is inherently untestable. The MAC is a logical interface.*
 - 2.3.2.2.5. *Q: So there is no way to validate QoS?*
 - 2.3.2.2.6. *A: Our PAR does not require observability at an abstract interface. We are incorporating delay bound.*
 - 2.3.2.2.7. *Q: It is very similar to the EDCF/RR technique. You are specifying a scheduling behavior. The way an AP responds to a request. What parameters been defined for scheduling?*
 - 2.3.2.2.8. *A: All it says it how much time is assigned via TXOPs per interval of time.*
 - 2.3.2.2.9. *Predictability of TXOP scheduling is very important for power save. There may be some loss of optimality, but it is worth.*
 - 2.3.2.2.10. *Q: Does this address the rate based MLME interface?*
 - 2.3.2.2.11. *A: The latest version of the draft does.*
 - 2.3.2.2.12. *Q: Admission control should also be per-flow. The station is responsible for aggregating.*
 - 2.3.2.2.13. *A: Admission control is per application – it's not as bad as it looks. There are only two types of applications that need polling: VoIP, or MPEG video. EDCF is OK for all others. Retransmissions must be completed within the delay bound.*
 - 2.3.2.2.14. *Q: what is the behavior of the scheduler in an error prone environment? If there isn't a predicable way to overbook the bandwidth, then one scheduler may not book adequate time for a flow.*
 - 2.3.2.2.15. *Q: If a schedule has a min and max TXOP, if a retransmit is needed, it couldn't be done? Would it have to re-negotiate?*

- 2.3.2.2.16. A: *This assumes there is other traffic. Why should other flows suffer.*
- 2.3.2.2.17. Q: *Why can't we black-box the scheduler. It shouldn't be normative.*
- 2.3.2.2.18. A: *We are against that – there would be too much variation in schedulers in different APs. We need minimum normative behavior of a scheduler.*
- 2.3.2.2.19. Q: *Agrees that we need a normative scheduling behavior.*
- 2.3.2.2.20. Q: *The AP should be able to decide what scheduler to use.*
- 2.3.2.2.21. A: *Every scheduler needs to provide minimum bounds on behavior. Having no Bound is the problem.*
- 2.3.2.2.22. Q: *What is an example of a device that has multiple flows?*
- 2.3.2.2.23. A: *A video phone. It has separate voice and video streams, with different parameters. This exists today with Netmeeting with a video camera.*
- 2.3.2.2.24. Q: *There is one action code left out. What if the HC needs to cut out a previously admitted streams due to deteriorating conditions? If the flows are aggregated it makes it impossible for the HC to prune streams. A valid objection to aggregation.*
- 2.3.2.2.25. A: *Not opposed to removing aggregation.*
- 2.3.2.2.26. A: *Another example of where two streams are simultaneously: VoIP may use multiple streams for voice and call progress and management. These may have different QoS requirements or go two different paths over the network. They cannot be aggregated.*
- 2.3.2.2.27. A: *The VoIP packets have a certain set of QoS parameters. The management stream would have lower requirements. So the Voice stream could be adjusted to allow extra overhead for the management.*

2.3.3. Document 526aR0. EIFS Correction.

- 2.3.3.1. *Mathilde Benveniste*
- 2.3.3.2. *Overview*
- 2.3.3.2.1. A: *There is a problem with EIFS in the standard. EIFS needs to differentiate between traffic classes.*
- 2.3.3.2.2. A: *There is normative text on the server to make the needed correction.*

2.3.4. Adjourn at 5:30PM until 7:00PM

3. Monday Evening session**3.1. Opening**

3.1.1. The session is called to order at 7:00PM by John Fakatselis

3.2. Presentation of Papers**3.2.1. Document 524r1 – Fast Track Proposal**

3.2.1.1. Rolf Devegts

3.2.1.2. Overview

3.2.1.2.1. Context background of TGe – delays due to different contingencies and market requirements. Delay is causing pressure to create standards outside of TGe

3.2.1.2.1.1. Functionality eliminated :FEC, AP Mobility, CC/RR, (AWMA)

3.2.1.2.1.2. E-DCF as per the latest TGe draft (Mandatory)

3.2.1.2.1.3. Streamlined HCF: Mandatory for AP's / Optional for STA's

3.2.1.2.1.4. Clarified T-spec

3.2.1.2.1.5. Side channel – optional (per document 02/438r2, Direct Link Protocol Specification)

3.2.1.2.1.6. Burst Ack – optional, .

3.2.1.2.2. Addresses needs of all segments. Allows rapid completion in IEEE. Reduces complexity.

3.2.1.3. Q&A

3.2.1.3.1. Q: Since we voted down 802.15.2 and said that it belonged in .11, this would be rejecting that position.

3.2.1.3.2. A: This was in the context in reducing no-votes. It may be inconsistent, but is not unique and being inconsistent.

3.2.1.3.3. Supports AWMA, but there is a limit to what we can put into this spec. We may need a subsequent PAR.

3.2.1.3.4. We may be forcing a separate standard outside of 802.11 to do this.

3.2.2. Document xxx r1 “TGe Fast Track proposed draft normative text changes”

3.2.2.1. Amjad Soomro, et al

3.2.2.2. normative text in 02/524

3.2.2.3. Overview

3.2.2.3.1. Rate Based mechanism: Application request service through MLME based on rate, not time.

3.2.2.3.2. HC negotiates and admits stream, and announces schedule for WSTA.

- 3.2.2.3.3. *Modifications to TSPEC element. Clarify the definitions of parameters. Using TLV encoding for future changes.*
- 3.2.2.3.4. *Schedule element is new Sent as a new action frame. Scheduling addresses power management requirements.*
- 3.2.2.3.5. *Definition of normative behavior in the scheduler*
- 3.2.2.3.6. *Rate based approach supports Variable Bit Rate (VBR)*
- 3.2.2.3.7. *TSPEC negotiation per TS*
- 3.2.2.4. **Q&A**
 - 3.2.2.4.1. *Comment on time vs. rate: If the HC cannot accommodate a request because of a change in conditions, how does this work with signaling that currently exists?*
 - 3.2.2.4.2. *A: It has to be re-negotiated. The rate based parameters completely characterize a stream.*
 - 3.2.2.4.3. *Q: what if the new schedule is unacceptable to the client?*
 - 3.2.2.4.4. *Q: There is less difference to the other schemes than it seems. If the rate request is replied with a schedule, can we be sure that all schedules are OK? How do we satisfy ourselves that a scheduler will meet the needs of the request (in a normative way)?*
 - 3.2.2.4.5. *Q: What does the HC do if conditions deteriorate and TSPECs are no longer attainable?*
 - 3.2.2.4.6. *A: If it is not sustainable, it is dropped.*
 - 3.2.2.4.7. *Q: That is contrary to the existing signaling.*
 - 3.2.2.4.8. *A: That has to be fixed too.*
 - 3.2.2.4.9. *Q: Who is going to write the APIs to control this? Not many applications use RSVP? The application should be agnostic.*
 - 3.2.2.4.10. *A: This may be used in embedded applications – phone, cable modems. DOCSIS uses all these capabilities without application support.*
 - 3.2.2.4.11. *Q: The notion of time is required – rate is insufficient. Time is also needed to plan for buffers. This is missing in the proposal. VBR streams are hard to characterize other than the peak parameters.*
 - 3.2.2.4.12. *A: The peak bit rate and the update rate are known; what more is needed? Also VBR is not a real world example.*
 - 3.2.2.4.13. *Q: Video streams from satellites are MPEG4. There is a upper bound on bit rates and bursts. If you have a transcoder you can adapt the rate based on channel conditions. It creates a VBR stream and deals with the changing channel.*
 - 3.2.2.4.14. *It is also possible to re-negotiate.*

- 3.2.2.4.15. Q: Concern about re-negotiation time. What if the VBR rate changes a lot faster? Some additional buffering is needed?
- 3.2.2.4.16. A: The burst size deals with this. The largest size at a specific rate. The idea is that it is a time limited burst. The size is specifically limited.
- 3.2.2.4.17. Q: The scheduler is not aware of duration to schedule. It shouldn't be the application that has to decide the timing parameters. There is a hybrid need for time based parameters on the air and rate based for the application. The MAC selects rates and knows that they are. The scheduler doesn't know what the rate algorithm is and has to second guess what's going on in the station.
- 3.2.2.4.18. A: The station can communicate the rate to the HC.
- 3.2.2.4.19. The scheduler doesn't know in advance what rate will be used by the station transmitting to the HC.
- 3.2.2.4.20. In the wireless channel, nothing is guaranteed.
- 3.2.2.4.21. The station is specifying both halves of the link. The HC should set the schedule and time for the downlink.
- 3.2.2.4.22. Data rates are measured at the top of the MAC.
- 3.2.2.4.23. Q: What about support of IMS Internet Multimedia Subsystem. TCP networks have QoS parameters also. Those get passed at the application level using STP, RTSP, SIP. Those parameters need to go to the lower layers also. There is a policy control function
- 3.2.2.4.24. Q: How does the MAC know about the overhead for higher layers?
- 3.2.2.4.25. A: We have to assume what is passed into the MAC represents the needs of what is above.
- 3.2.2.4.26. The difference between these proposals are very small. A little more discussion could bring them together.
- 3.2.2.4.27. One issue is higher layers. We need to allow the MAC to autonomously determine stream requirements. But if some higher layer entity wants to, it can override.
- 3.2.2.4.28. Negotiation is supposed to be a one time occurrence. Renegotiation can take place if needed.

3.2.3. Discussion

- 3.2.3.1. Any other papers? None.
- 3.2.3.2. Proposal – spend tomorrow morning with all relevant parties trying to reconcile them. We then have the TGe group reconvene at 1:00PM.
- 3.2.3.3. The chair asks for the groups opinion.
- 3.2.3.3.1. There is so little difference, this is good approach.
- 3.2.3.3.2. What about the joint TGe TGi meeting at 10:30AM? They are coming here.

3.2.3.3.3. *We can honor that. We will allocate all the other time between 8:00AM and 5:30 for these discussions. We will reconvene at the original TGe session time at 7:00PM.*

3.2.3.3.4. *To summarize – between 8:00AM and 5:30PM (with the exception of 10:30 to 12:00), the proposal developers will meet to attempt to generate one joint proposal. TGe will reconvene at 7:00PM.*

3.2.4. Recess at 9:00PM

4. Tuesday 10:30am Session - Joint TGe/TGi meeting

Minutes for this session taken by Frank Ciotti, TGi Secretary
Dave Halasz (TGi Chair) to chair the joint session

Dave: A joint TGe/TGi meeting was requested. Issues have come up in TGi. TGi cannot reference a draft, only a standard. Also, if the architectural model changes in another group whose draft we reference, it affects the work we have done.

Submission: Russ Housley - doc 02/566 - Discussion Points for Joint TGe and TGi.

Russ: The intent is stimulate discussion.

Procedural issues:

- * TGi draft cannot reference TGe draft, and vice versa
- * TGi draft contains references to TGe items.
- * Make submission to address interactions in subsequent PAR.

Comment: Wouldn't it be better simply to duplicate text in both groups?

Russ: This would require a lot of coordination on the part of both editors.

Comment: Wouldn't this simply combine the two groups again?

Comment: No, only the overlap in both.

Comment: There is a security issue with simply pulling pieces out of TGi and putting them into TGe.

Dave: Ongoing maintenance and coordination would be required if doing this.

Why not just do this now?

Russ: Confusing for implementer. TGi text would describe how TGe bits were set, for example.

Russ: The CCMP layering allows multiple transmit queues. One replay counter per queue. One sequence counter per interface. Changes to this architecture would have far reaching affects on TGi.

Comment: This slide shows the transmit architecture. It would be nice to see diagram for the receive side.

Technical Issues identified by TGi:

- * Are there any MAC header fields TGe is introducing that need to be integrity checked?
- * How do we protect side channels communications?
- * TGi assumes 'No ACK' will not be in TGe.
- * Burst ACK changes the architectural layering.

Comment: Can you elaborate on the No ACK issue?

Mike Morton: There is an issue with replay protection. If a frame arrives outside the window, it gets discarded. With No ACK there is a possibility that a large number of frames could be missed, resulting in a large jump in

replay numbers.

Comment: Wouldn't there be the same problem with broadcast and multicast?

Russ: With broadcast and multicast traffic, you have to keep track of the replay counter per transmitter.

Comment: The No ACK issue is the same as the Burst ACK issue.

Russ: Yes.

Comment: What I'm hearing from TGi is "Don't do Side Channel, Burst ACK, No ACK because it the security is too difficult". But what if I really want it?

Dave: What we want to point out is that what is going to be needed is a maintenance PAR. If we plan now, that PAR will be easier. We want to ensure that when it comes time to create the maintenance PAR, that it won't be impossible to bring TGe and TGi together. Otherwise, it could be a huge project.

Comment: It appears the architectural model addresses the issue of fragmentation with respect to TXOPs.

Russ: Correct. The model assumes the fragment is already protected.

Comment: Why does it have to be that way? What are we protecting?

Russ: It is a trade-off between doing crypto ahead, or variably on the way to antenna.

Comment: But if done like currently in OCB, it would be easier.

Russ: We will be having a discussion on MSDU Vs MPDU later in TGi.

Comment: CCMP has two processes - multiplexing and CCMP processing. Why not assign the replay counter on exit of queue instead of entrance?

Russ: It would cause security to be in two places. It is easier to put it all in one place. The processing is the same.

Comment: We need to agree on an architecture that works with vendor's hardware. There are three architecture options.

Russ: Other components can be decomposed and moved. It appears only the replay counter needs to remain here to get the same bits on the air.

Dave: Is there any objections or comments to creating a maintenance PAR?

Comment: How long do you think it will take to complete the maintenance PAR?

Dave: If we make the architectural models agree, the work should be minimal. It is in our interest to do this.

Comment: What if one group finishes its work far ahead. And then the later group incorporates the changes needed?

Dave: If the later group makes changes such that the models don't agree, it will make the maintenance PAR very difficult.

Dave: I haven't talked to Stuart Kerry or John Fakatselis yet, but I see no other way to do this given the procedural issue.

Comment: Given the reality that one group will finish far ahead of the other, TGe won't address any security issues. Likewise TGi will remove all TGe related topics from its draft.

Comment: Clarification - is the procedural rule an IEEE rule or 802.11? In other WGs, we have referenced drafts.

Dave: One group could put another group in perpetual limbo if changes are made to references. TGi doesn't want to limit the work of TGe.

Comment: Isn't there already references to Traffic Classes in the TGi draft?

Dave: We were discussing that these need to be removed to move forward.

Comment: We already have the concept of queues in 802.11 (contention Vs. contention free).

Comment: Shouldn't you plan for the worse?

Dave: That is not very practical.

Comment: The TGi device needs to allow for any device that allows reorder. We need to plan for the existing standard.

Dave: But we can't plan for things that are changing.

Comment: If TGi and TGe can't plan for things that are changing, how can the maintenance PAR?

Dave: Because they will be finished.

Comment: If TGe doesn't consider security, and TGi doesn't consider QoS, you will have two different devices. I'd rather combine them now.

Dave: We should be plan to make the maintenance PAR as easy as possible.

Comment: In IETF it is common practice to reference other drafts. When one group finishes, it becomes frozen.

Comment: These are amendments to standards, not standards. If you say TGi is based on TGe amendments, then TGi can't finish until TGe is finished.

Dave: We want to make sure no group is waiting on another.

Comment: We should make a list of the technical issues between the two groups. I suggest forming an ad hoc group to do this.

Dave: This was the point of the submission by Russ.

Comment: Have we started a group to address the maintenance PAR?

Dave: If this proposal is acceptable to TGe, then we will look into forming the PAR and group. I'm not sure if we can officially start a maintenance PAR on an unfinished PAR. However, there is nothing to prevent us from doing work.

Comment: The main thing I see missing in the list is Side Channel support.

Dave: Side Channel is similar to IBSS. We are addressing IBSS in TGi. Did that answer you question?

Comment: Not really

Comment: How are you supposed to vote on TGe or TGi if there are holes? How can we assume the holes will be fixed in the maintenance PAR?

Dave: Vote on items specific to that draft. What is the alternative?

Comment: The alternative would be that both groups finish at the same time. One may become inactive for some time.

Dave: The whole purpose of splitting the PAR was so that we didn't have to do that.

Comment: We could just lock-step the two groups - basically re-join the two groups. But I advocate what Dave is suggesting.

Comment: It would be foolhardy to hold up TGi for TGe.

Comment: For something like side channel, you need to include the whole protocol in both drafts.

Comment: No, only Clause 7 items. We only care about the bits.

Dave: Is there any further discussion?

None.

Recess for lunch

5. Tuesday Evening

5.1. Opening

5.1.1. The meeting is called to order at 7:00PM by John Fakatselis.

5.1.2. Update of progress

5.1.2.1. We had the Ad Hoc groups with the two proposals working today to sort out differences. They haven't reached an agreement. We have two proposals. One was presented yesterday. One will be presented tonight.

- 5.1.2.2. *We will have straw polls on these two options.*
- 5.1.2.3. *We are going to ask the presenters to clearly outline the differences where they do not agree.*
- 5.1.2.4. *We will ask the membership here to either merge them, or combine them in a more inclusive standard.*
- 5.1.2.5.

5.2. Presentation of Papers

5.2.1. “A New TGe Draft” document (xxx) Duncan Kitchin

5.2.1.1. Overview

- 5.2.1.1.1. *This presentation has gone around the group, and clarification has been added where requested.*
- 5.2.1.1.2. *We have been voting on single pieces of the draft. You never get the whole picture looking at one piece at a time.*
- 5.2.1.1.3. *This presentation is a statement of direction, not a spec. We’re not done deciding on every thing yet.*

5.2.1.1.4. Key points

- 5.2.1.1.4.1. 802.1D/p priorities
 - 5.2.1.1.4.2. EDCF w/ admission control
 - 5.2.1.1.4.3. Time based polling
 - 5.2.1.1.4.4. Optional group acknowledgements
 - 5.2.1.1.4.5. Optional direct link protocol
 - 5.2.1.1.4.6. Higher layer classification entity.
(informative – at layer 3)
 - 5.2.1.1.4.7. Interfaces – no flow IDs or stream IDs.
 - 5.2.1.1.4.8. Polling may be initiated autonomously by the MAC. If there is a higher layer interface for specifying flows, that would override the autonomous operation.
 - 5.2.1.1.4.9. A new formulation of priorities and parameter sets that is unambiguous.
 - 5.2.1.1.4.10. Polling Setup Protocol – A flow handle identifies the flow at the MLME SAP. The AP maintains a list of every maintained flows that it manages. Queues are independent.
 - 5.2.1.1.4.11. “Sandbagging factor” is added to the flow requirements based on MACs knowledge of current conditions.
 - 5.2.1.1.4.12. Allows specification of minimum TXOP size – eliminates need for dynamic fragmentations.
 - 5.2.1.1.4.13. The AP creates a new aggregate schedule from the station request, and informs the STA of the schedule parameters.
- 5.2.1.1.5. *Normative behavior specified for flow admission, flow aggregation, schedule generation. Must be observable and testable.*

- 5.2.1.1.5.1. All parameters must be used in the normative behavior. This makes it observable and testable.
- 5.2.1.1.5.2. *Definition of specification interval for conformance testing – the window where the min/max TXOP intervals are going to be valid within.*
- 5.2.1.1.5.3. *Mean and Max TXOP ratio of time.*
- 5.2.1.1.5.4. *Time based polling allows for momentary peaks of bandwidth, as long as the average doesn't exceed the mean TXOP rate. (It is not the only possible mechanism, though)*
- 5.2.1.1.6. *Group Acks – cleaned up version of burst acknowledgements. More explicit state machine definition, with observable and testable behaviors.*
- 5.2.1.1.7. *Classifier – above the MAC, informative annex for shim layer.*
- 5.2.1.2. Q&A
- 5.2.1.2.1. Q: *there are 4 queues in an AP? Shouldn't there be both EDCF queues and HC queues?*
- 5.2.1.2.2. A: *the MAC SAP only has 3 bit priority. At the MAC SAP of an AP, other classification can be done, since it is an abstract interface. You have to look at reordering with multiple queues.*
- 5.2.1.2.3. *This is the right direction*
- 5.2.1.2.4. Q: *Why the choice of 32uS for the parameters?*
- 5.2.1.2.5. A: *It's the best compromise between granularity and range with a 16 bit number. 32uS gives a range of 2S with 16 bit numbers.*
- 5.2.1.2.6. Q: *The MLME has the 3 bits for priorities. Why not have 7 queues?*
- 5.2.1.2.7. A: *Nobody has any reason for more than 4.*
- 5.2.1.2.8. Q: *Is polling mandatory or optional?*
- 5.2.1.2.9. A: *Not sure yet. An AP should not have to do polling but should respond to a request for admission.*
- 5.2.1.2.10. Q: *We need both requested and admitted parameters. The AP may want to offer other parameters than what were requested.*
- 5.2.1.2.11. A: *Doesn't think there is any benefit. It would result in a longer negotiation process. Yes or No is enough. The STA can try again if the answer is No.*
- 5.2.1.2.12. Q: *Is this proposal unencumbered regarding IP? Request to clear the air on this issue. Would like to see the ATM-like mechanisms be optional. The AP should accept with modified parameters and inform the station. Is this separating channel access from reservation request? Is the request still needed if you want only DCF access? We need to separate the reservation mechanism from the channel access mechanism.*
- 5.2.1.2.13. A: *Agrees that is a good idea*

- 5.2.1.2.14. Q: *would this proposal support parameterized QoS and stream IDs?*
- 5.2.1.2.15. A: *there is no parameterized QoS or stream IDs. Flow handles replace stream IDs. The flow handles do not go on the air.*
- 5.2.1.2.16. Q: *Previous compromises have always include parameterized QoS. How will this achieve consensus?*
- 5.2.1.2.17. Q: *How do I differentiate between the services and flows?*
- 5.2.1.2.18. A: *The higher priorities get sent first, period. You can't match polls to a particular queue or traffic ID.*
- 5.2.1.2.19. Q: *Want to be able to identify the features an AP can offer. There should be a bit in the beacon that indicates if it supports an HC.*

5.3. 15 minute recess

5.4. Straw Polls

5.4.1. TGe "Fast Track" Proposal. Rolf Devegts.

- 5.4.1.1. Clarified t-spec per document 524-temp.
- 5.4.1.2.
- 5.4.1.3. Straw Poll Question: *Will you vote in favor of a TGe draft according to the TGe fast-track proposal?*
- 5.4.1.3.1. Vote: 46 : 23 : 6
- 5.4.1.4. Straw Poll Question: *Who would vote in favor of a TGe draft that covers the fast track proposal plus Menzo's Distributed Access proposal?*
- 5.4.1.4.1. Vote: 41 : 17 : 12
- 5.4.1.5. Straw Poll Question: *Who would vote in favor of a TGe draft that covers the fast track proposal plus a Time Based T-Spec option in STA, Rate Based and Time Based T-Spec mandatory in AP?*
- 5.4.1.5.1. Discussion
- 5.4.1.5.1.1. The key difference from Duncan's proposal – It has a lot of other things in it. There are differences in the parameters.
- 5.4.1.5.1.2. Does this proposal redefine EDCF or the Classification entity? No.
- 5.4.1.5.2. Vote: 39 : 20 : 15
- 5.4.1.6. Straw Poll Question: *Would you vote in favor of a TGe draft that covers the fast track proposal with HCF optional both at AP and STA?*
- 5.4.1.6.1. Vote: 26 : 43 : 10
- 5.4.1.7. Straw Poll Question: *Would you vote in favor of a TGe draft that covers the fast track proposal with HCF optional both at AP and STA, and with distributed access per Menzo's proposal?*
- 5.4.1.7.1. Vote: 25 : 37 : 8

5.4.2. Duncan Kitchin's compromise proposal**5.4.2.1. Discussion**

5.4.2.1.1. *There are two points of contention – Whether HCF is mandatory or optional at an AP. The AP should at least respond to admission requests by rejecting.*

5.4.2.1.2. *The other major issue is the tags at the DSAP interface. Should there be an extra bit for something else beyond the 3 bit field.*

5.4.2.1.3.

5.4.2.2. *Straw Poll Question: Will you support the statement of direction for TGe?*

5.4.2.2.1. *Vote: 32 : 37 : 12*

5.4.2.3. *Straw Poll Question: Will you support the statement of direction for TGe with the modifications that MSDU labels are 4 bits and HCF is optional at the AP.*

5.4.2.3.1. *Vote: 26 : 46 : 9*

5.4.3. Discussion

5.4.3.1. *Puzzled how we got to these voting positions. Need to collect what are the blocking issues.*

5.5. Recess at 9:30PM**6. Wednesday Morning Session****6.1. Opening**

6.1.1. **The meeting is called to order by John Fakatselis at 8:00AM**

6.1.2. **Two new papers are available to present.**

6.1.3. **proposals for adoption into the draft will be entertained for voting at the fixed agenda time of 3:30 today.**

6.1.4. **The straw polls did not reach 75% for any of them.**

6.1.5. **Would like both groups to present a list of things that they don't agree on.**

6.1.6.

6.2. Discussion

6.2.1.1. *A lot of people didn't know what they were voting for or against. They didn't realize the implicit negative was that TGe could fail. Encourages everyone to not weigh the straw poll too heavily.*

6.2.1.2. *What would it take to form a consensus?*

6.2.2. Do we have representatives from each proposal?

6.2.2.1. *No, Duncan is away for the day. Adrian Stephens will represent Duncan.*

6.2.2.2. *Matthew Sherman will represent Rolf.*

- 6.2.3. 5 minute recess for the chair to consult.
- 6.2.4. Each group will prepare a presentation of their status, and the points of contention.

6.3. Presentation of papers

6.3.1. Document XXX “Should Parameterized QoS be Optional?” – Matthew Sherman

6.3.1.1. Overview

- 6.3.1.1.1. *Two type of QoS – Parameterized or Prioritized*
- 6.3.1.1.2. *Two access: Contention and Contention-free*
- 6.3.1.1.3. *Key issue is interoperability – STA and AP must support the same types of QoS. Interoperability in TGe means interoperable QoS mechanism.*
- 6.3.1.1.4. *Two parts of the standard – Interface and system behavior. Some parts of both are required for interoperability.*
- 6.3.1.1.5. *Three communities – Data, AV, and Carrier/Infrastructure. Different interoperability needs.*
- 6.3.1.1.6. *Data group says we don’t need very much QoS – the minimum is all that is needed.*
- 6.3.1.1.7. *Carriers want hard-core QoS – ATM-like functions. Parameterized QoS is required. Carriers control the AP. Don’t have control over the station.*
- 6.3.1.1.8. *The AV group mostly makes stations. They need QoS with arbitrary APs. They want polled access. They want parameterized polled support mandatory in the AP They don’t trust the AP vendors to build in polling if its optional.*
- 6.3.1.1.9. *Intel/Sharp did not establish that Parameterized QoS was mandatory at the AP. The straw poll indicated that removing parameterized QoS drops acceptance significantly.*

6.3.1.2. Discussion

- 6.3.1.2.1. *The Intel/Sharp proposal tried to defer the question of mandatory parameterized QoS.*
- 6.3.1.2.2. *The reason to make Polling mandatory is because of competing solutions in the market.*
- 6.3.1.2.3. *PCF was implemented, but just never shipped.*

6.3.2. Document xxx “EDCF/EPCF comparisons”. Matt Sherman

6.3.2.1. Overview

- 6.3.2.1.1. *Review of differences for newcomers.*
- 6.3.2.1.2. *This approach has been developed and deployed.*

6.3.2.2. Discussion

- 6.3.2.2.1. *EDCF gets some benefit, but HCF gives even more benefits.*

6.3.2.2.2. *Would it be useful to organize a tutorial for newcomers? The chair notes that it would be appropriate, and asks for volunteers to prepare such a tutorial.*

6.3.2.2.3. *The strongest issue is that mandatory HC ability in the AP.*

6.3.3. The chair apologizes that the ad-hoc status of the afternoon sessions yesterday were not announced at the start of those sessions.

6.4. Recess for 30 minutes to prepare presentations from both proposal groups.

6.4.1. John Fakatselis calls meeting to order at 9:30

6.4.2. Bob Miller acting as secretary until Tim returns

6.4.2.1. *John asks for comments from floor regarding proceedings*

6.4.2.2. *Any comments regarding understanding of differences between proposals*

6.4.2.3.

6.4.2.3.1. *Sharp – Kowalski*

6.4.2.3.2. *“The big sticking point---whether HCF mandatory or optional”*

6.4.2.3.3. *John Fakatselis*

6.4.2.4. *Announced close to 400 members, 70 voting members in TGe*

6.4.2.5. *These people will decide on the direction of the standard.*

6.4.2.6. *Need to obtain a 75% vote*

6.4.2.7. *Don't take lightly the influence you have as a voter on the destiny of 802.11 TGe*

6.4.2.8. *Creating a presentation outlining differences between Fast-Track and WME Proposal*

6.4.3. Presentation numbered XXXr0 currently

6.4.3.1. *“WME – Fast-track Differences”, Adrian Stephens, Intel Corporation*

6.4.3.2. *Bob Meier, Cisco asks to present amplification slide.*

6.4.3.3. *Slide “MA-Unitdata.request QoS Type”*

6.4.3.4. - *Overwhelming support for admissions control*

6.4.3.5. - *3-bit priority MA.Unitdata.request parameter not sufficient to support admissions control*

6.4.3.6. - *1999 MA-Unitdata.request primitive included a “contention/CF” flag*

6.4.3.7. - *Classifiers exist above the MLME SAP*

6.4.3.8. - *The 802.11e MA-Unitdata.request primitive should include a QoS type (i.e. Prioritized/Parameterized flag)*

6.5. Straw Poll:

6.5.1. **Should we augment WME D SAP interface which contains a 3 bit request with an additional bit to pass information regarding parameterized or prioritized? Everyone may vote.**

6.5.1.1. Yes – 27

6.5.1.2. No – 4

6.5.1.3. Abstain – 38

6.5.2. Discussion on straw Poll

6.5.2.1. *WME has admission control in two places – when a flow is presented, and in the HC scheduler.*

6.5.2.2. *The real issue is not minor differences between the proposal. The issue is the optionality of polling support in the AP. The majority support mandatory polling in the AP, but it is not 75%.*

6.5.2.3. *There could be a bit indicating that the AP supports polling.*

6.5.2.4. *Suggestion that we need to discuss the high level issue.*

6.5.2.5. *The chair notes that our agenda is set to have technical motions at 3:30PM today. Would like to stay with that plan. The key principals are not present currently. A technical motion is not advised at this point in time.*

6.5.2.6. *Would like to bring a motion when we re-convene.*

6.6. Recess at 10:00AM

7. Wednesday Afternoon

7.1. Opening

7.1.1. **The meeting is called to order at 1:00PM by John Fakatselis**

7.1.2. Discussion

7.1.2.1. *Since we don't have draft text to work with now, suggests that we postpone the special orders for 24 hours.*

7.1.2.2. *Motion – to amend the previously adopted motion on the approval of the agenda, and amend agenda to move the special orders scheduled for 3:30 Wednesday to 3:30 Thursday.*

7.1.2.2.1. *Moved Jim Zyren*

7.1.2.2.2. *Second Frank Howley*

7.1.2.2.3. *The motion passes with unanimous consent.*

7.1.2.3. *The other groups will be notified of this change of agenda.*

7.2. Status Update

7.2.1.1. *There is a lot of negotiating – we are incorporating key items from the WME proposal into the fast track proposal.*

7.2.2. **Are there any new presentations?**

7.3. Presentation of Papers

7.3.1. **Notes on the comparison of EPCF and EDCF.**

7.3.1.1. *Mathilde Benveniste*

7.3.1.2. *One slide on a comparison of EDCF and HCF.*

7.3.1.3. *showing the improvement of HCF over EDCF only.*

7.4. Discussion

7.4.1. **Any guidance to the chair?**

7.4.1.1. *None.*

7.5. Recess until 3:30PM

7.5.1.1. *No Objections.*

7.6. Opening

7.6.1. **The meeting is called to order by John Fakatselis at 3:30PM**

7.7. Update on the proposals

7.7.1. **from Frank Howley**

7.7.1.1. *The WME and Fast Track proposal groups are working on merging.*

7.7.1.2. *the combined proposal will meet the needs of most of the group.*

7.7.1.3. *Any remaining issues will be discussed tomorrow.*

7.7.1.4. *A Presentation is expected by tomorrow morning.*

7.7.2. **Discussion**

7.7.2.1. *Q: Are there any known technical issues?*

7.7.2.2. *A: There are 6 issues of debate. Some are more political than technical. We don't have the complete list.*

7.7.3. **Are there any questions, observations, or actions at this point in time?**

7.7.3.1. *None*

7.7.4. **Are there any suggestions for the chair?**

7.7.4.1. *None*

7.7.5. **Any objection to recess until tomorrow morning?**

7.7.5.1. *None*

7.8. Recess at 3:35PM

8. Thursday Morning

8.1. Opening

8.1.1. The meeting is called to order at 8:10AM by John Fakatselis

8.1.2. The chair asks for any papers to be presented, any suggestions, or any comments for the chair?

8.1.3. New documents

8.1.3.1. *524r1-temp is in the TGe working directory currently – it will get a new number later.*

8.1.3.2. *It is normative text. The presentation will be available until later.*

8.1.3.3. *It will be presented at 9:00AM.*

8.1.4. Any other papers, observations, or suggestions?

8.1.4.1. *None*

8.2. Update

8.2.1.1. *It appears there is a private group of members that have created a proposal they believe will be acceptable to the rest of us. It is not an ad-hoc group, which is sponsored by the task group.*

8.2.1.2. *The chair makes it clear that the outside group is private and not officially sanctioned by TGe. They are keeping us updated of their intentions.*

8.2.1.3. *Our meeting here is not held hostage to this outside group. Thus we ask if there is any other business or actions for this body at this time.*

8.3. Discussion

8.3.1.1. *Urges members here to help this move forward. Members are not bound to wait for an outside group. Members could respond to comments of the previous letter ballot. We cannot say this group has made progress this week.*

8.3.1.2. *We do have presentations, but don't want to make them until the private group has reported. Our presentation may not be relevant depending on the results.*

8.3.1.3. *The chair notes that there is no requirement for certain people to be in the room to have a session. Reminds everyone that there are 400 members overall, but a small percentage are actively participating. At this moment we have a formal session. We are empowered to make decisions.*

- 8.3.1.4. *Would like to hear the presentation now. We are not seeing any other ideas. This room could vote something in.*
- 8.3.1.5. *The member with the final draft isn't here now, and the presenter is in the private meeting.*
- 8.3.1.6. *The modified drafts had certain features in common – removal of burst ACK, FEC and side channel optional. Perhaps we could discuss those items now?*
 - 8.3.1.6.1. *None*
- 8.3.1.7. *Would it be in order to make motions to remove FEC?*
- 8.3.1.8. *The chair notes that technical motions are scheduled for 3:30.*
- 8.3.1.9. *Could we make the motion and postpone to a certain time?*
- 8.3.1.10. *The draft is still the one from the last letter ballot.*
- 8.3.1.11. *The chair would have the motion, discuss it, and postpone the vote. We want to make it informal –*

8.4. Straw Polls

- 8.4.1.1. *Who favors removing FEC from the draft?*
 - 8.4.1.1.1. *35 : 0 : 1*
- 8.4.1.2. *Who favors removing mobile AP from the draft?*
 - 8.4.1.2.1. *37 : 1 : 2*

8.4.2. Discussion

- 8.4.2.1. *Would anyone have a problem to limit debate and call the question if this comes up? That requires a formal motion, but it looks like it would pass.*
- 8.4.2.2. *The chair moves to Jon Rosdahl*
- 8.4.2.3. *The most contentions issues is whether HCF is optional or mandatory at the AP.*
- 8.4.2.4. *Clarify the issue: The mandatory option means that the AP must product the proper grammar to effect a message exchange sequence over the air to attempt to set up a polled service. It does not say the AP must grant a poll.*

8.5. Straw Polls

- 8.5.1.1. *Based on that, who would like to see mandatory polling at the AP in the draft?*
 - 8.5.1.1.1. *23 : 6 : 6*
- 8.5.1.2. *That would have passed with 75% if it were a technical motion.*

8.5.2. Discussion

- 8.5.2.1. *The chair moves to John Fakatselis.*
- 8.5.2.2. *Statement that people should prepare in advance and not make everyone wait here.*

- 8.5.2.3. *Features have to be tested and understood by applications. There are many types of applications – but at this point in time applications are data-driven. Later there will be AV and voice applications. Would like to see proof that AV requires polling. There are IETF activities that allow streaming over unreliable networks without isochronous services.*
- 8.5.2.4. *PC platforms should be agnostic to underlying media. Existing parameters for media flows are not being used currently because nobody understands them.*
- 8.5.2.5. *Feels that prioritized QoS is enough for RFC video and data exchanges.*
- 8.5.2.6. *AV Polling is the most efficient way to control the channel. Polling will give more guarantee to the service. There was a straw poll – mandatory HC 33, optional 11.*
- 8.5.2.7. *Agrees that working over many media requires consistent methods, and priorities are a good way to do that. Agrees that polling is a little more efficient, but that efficiency is not needed in most cases.*
- 8.5.2.8. *Applications are in development have to make assumptions about underlying networks. Will have to deal with legacy 802.11 equipment and support it also.*
- 8.5.2.9. *Polling vs. not polling – it depends on the timing of the devices? Video is async, but VoIP is a mixed situation. The PSTN is synchronized. Can co-located APs be synchronized so they don't interfere on the same channel? The reasonable way to synchronize them is at the PSTN gateway. Believes there is a large opportunity in telephony. The efficiencies of polling are enormous in this particular case.*
- 8.5.2.10. *It is vitally important to cut things out of the draft to simplify it. We don't want to force everyone to write software for functions that nobody will ever use.*
- 8.5.2.11. *Personally against complexity. Have tried to boil down polling to the simplest possible implementation needed to support the broadest applications: VoIP and AV. If it is implemented, it will be deployed in millions of homes. A small difference in efficiency adds up to huge returns. We don't expect to use all the fields in the draft – but not sure we can get them out of the draft.*
- 8.5.2.12. *We are only saying the AP must recognize a certain set of frame exchange sequences. We will not use all the fields. There is a way to make a simple polling sequence. This meets the needs of the AV and infrastructure people.*
- 8.5.2.13. *Packet loss rates – 802.11b has a .5% to .1% packet loss rate. Retrying packets is essential for AV requirements with 10e-6 requirements.*
- 8.5.2.14. *There is less chance for dropped packets with a polled mechanism because there is no contention. Over a*

large number of users and scenarios, the performance differences and probabilities add up.

- 8.5.2.15. *To get the error rate to the required level, retrying up to 3 times is needed.*
- 8.5.2.16. *Polling is not that difficult to implement. It is running and deployed. If there is a mandatory AP polling, then there is a minimum level of scheduling required. If the scheduling used only the 802.1d tags, that could be compliant. We want to provide a minimal approach, without prohibiting more complex implementations.*
- 8.5.2.17. *Not sure a minimal response to a traffic spec is very useful compared to no response at all. Doesn't think we can force the market to go a certain direction.*
- 8.5.2.18. *There was another presentation about the reserved element ID for 802.15.2? Where is the document?*
 - 8.5.2.18.1. *It is on the 802.15 server, but appears to be corrupt.*

8.6. Presentation of proposal

8.6.1. Discussion

- 8.6.1.1. *The paper will be brought to the group for a motion at 3:30.*
- 8.6.1.2. *We still have open issues that we will straw poll and discuss now.*

8.6.2. TGe Consensus proposal (document 02/524r3)

- 8.6.2.1. *Believes we have resolved the majority of the issues that have been impeding progress.*
- 8.6.2.2. *consensus on EDCF improvements, HCF Polling, power save extensions*
- 8.6.2.3. *Improved EDCF features: Based on WME. Clarify and simplify. 4 queues at STA and AP. Sequence numbers,*
- 8.6.2.4. *Automatic power save delivery is new feature. Allows wake up after N-beacons without PSpoll.*
- 8.6.2.5. *HCF Polling. Unified TSPEC, schedule element, normative scheduler behavior.*
- 8.6.2.6. *power save extension – similar to CF-pollable. STA and AP negotiate wake-up period multiple of beacons. AP delivers MSDUs to STA without PSpoll using More bit to signify when it's done.*
- 8.6.2.7. *Discussion on power save extension*
 - 8.6.2.7.1. *This may need to be thought out more – the station doesn't get a confirmation that the exchange was correct when coming out of power save.*
 - 8.6.2.7.2. *How does this power save mechanism interact with at TSPEC schedule?*
 - 8.6.2.7.3. *It's completely independent.*
- 8.6.2.8. *Normative text in 524r1-temp in To-Doc-keeper*

- 8.6.2.9. *Most people agree that side-channel communications is important. But security has not been dealt with. We can't incorporate it until that is resolved.*
- 8.6.2.10. *The MAC SAP is still open. Are there 3 or 4 bits? How does it support both prioritized and parameterized..*
- 8.6.2.11. *Most contentious issue is whether HCF polling is mandatory or optional at the AP.*
- 8.6.2.12. *There is still an open issue with the AIFS definition. There were some changes in the WME text from previous TGe drafts.*

8.6.3. Discussion

- 8.6.3.1. *The side channel protocol under discussion is the proposal from the last meeting (direct side link protocol), not from the last LB draft. (WARP)*

8.7. Straw Poll

8.7.1. Discussion

- 8.7.1.1. *The previous straw poll was done before seeing the consensus proposal. Would like to*

8.7.2. HCF support in the AP?

- 8.7.2.1. *Mandatory: 49*
- 8.7.2.2. *Optional: 12*
- 8.7.2.3. *Abstain: 4*

8.7.3. Discussion

- 8.7.3.1. *Would like to make it optional – we would like to make implementation fast and simple. We will support the TSPEC later. Not saying that polling is a bad thing.*
- 8.7.3.2. *Many of those that voting for mandatory are concerned that if it is not mandatory, it will not be implemented. Applications need to count on having it implemented.*
- 8.7.3.3. *The question of compliance should be separated from the standard itself. WECA could implement a phased compliance testing. That might address the objection. We can define exactly what this means, and resolve the TSPEC issues.*
- 8.7.3.4. *We need to have HCF at the AP. Without that assurance, client vendors will not develop applications at the client.*
- 8.7.3.5. *We have now normative behavior for the scheduler, but not normative behavior for TSPEC admission. A compliant device could refuse all TSPEC requests, and never generate polls. Would prefer to have normative behavior that requires generation of polls if we want polling mandatory.*

- 8.7.3.6. *It is strange to specify something as mandatory when there is no normative behavior.*
- 8.7.3.7. *It should be possible to allow stations to figure out what the AP capabilities are.*
- 8.7.3.8. *People are confusing the straw poll with the draft. The straw poll shows that the group wants mandatory polling at the AP. We acknowledge there are open issues.*
- 8.7.3.9. *Today we have WLAN without QoS, and they may continue to be sold without 802.11e. All of 802.11e is optional, so all AP vendors will not have to implement it.*
- 8.7.3.10. *The enterprise VoIP market requires as many phones as possible with low latency. This is why HCF polling is required.*

8.7.4. Recess for break at 10:00AM

8.8. Opening

- 8.8.1. **The meeting is called to order at 10:30AM by John Fakatselis**

8.9. Discussion on proposal presentation

- 8.9.1.1. *Believes whether HC is mandatory or optional at the AP is irrelevant, since the AP could just reject requests for polling. Believes that making it mandatory would just increase No votes on the draft.*

8.10. Presentation continued

- 8.10.1.1. *Open Issues: MAC SAP definition to support both prioritized and parameterized traffic, etc.*
- 8.10.1.2. *Next steps – how do we proceed? How long do we need to clean up text before the next LB?*

8.10.2. Discussion on next steps

- 8.10.2.1. *Impressed with the progress that's been made. Supports the overall architecture. We should not try to send out an LB since the text is not yet ready. We don't want the burden of too many comments. We need to get a draft published for careful review, and be ready to have a very complete draft at Kauai.*
- 8.10.2.2. *Has the WG chair given any opinions on our options for moving forward?*
- 8.10.2.3. *Since the normative text has been submitted, we can decide if it is ready. Concerned about how much time we have for the editorial work before submitting to LB.*
- 8.10.2.4. *There are very major changes to the draft that are a concern. We only have 4 hours to look at the new draft, which isn't enough.*

- 8.10.2.5. *Notes that failing a LB costs two meetings. We should be very sure it will pass before we send it out.*
- 8.10.2.6. *There are 56 days between meetings. It takes 15 days to get the document ready, 15 days to ask for a LB, and 40 days for a LB. It wouldn't close before the November meeting any way. It might be better to work the 56 days to polish the draft. We want to put in the state diagrams and the PICS proforma included.*
- 8.10.2.7. *Favors getting the LB out sooner. Getting input from all 400 members is critical, since TGe is a smaller subsection of the body.*
- 8.10.2.8. *We can just approve the draft in this group. Not necessarily go to LB.*
- 8.10.2.9. *The chair notes that we still have a fixed agenda item for technical motions at 3:30 today.*
- 8.10.2.10. *Question for the chair – what is the relation of the outstanding comments to the new draft? Have we resolved those comments?*
- 8.10.2.11. *It is the tradition of the group to address the comments. We have spent 2 meetings addressing comments, and we have a document that contains the resolution. Formally resolving all comments is only required for a recirculation ballot. The group deemed that resolving comments one by one was not addressing the contentious issues. Thus, the new approach of the consensus proposal and draft modification has been taken, which addresses the comments globally.*
- 8.10.2.12. *The chair asks for further guidance on comment resolution*
- 8.10.3. Discussion on comment resolution process**
- 8.10.3.1. *We have spent 6 months on improving the draft. After a letter ballot we have about 10 people participating in teleconferences that are resolving comments. We have made sweeping changes, so many comments become irrelevant. We need to move on and get a new consensus.*
- 8.10.3.2. *We have spent time resolving comments on issues that are still in the draft. Is it allowable for this new draft to reverse a previous resolution.*
- 8.10.3.3. *It requires 75% vote to introduce or remove something from the existing draft. In a given week, we cannot reverse a decision without the formal reconsideration process.*
- 8.10.3.4. *Decisions from previous meetings can be changed by a 75%.*
- 8.10.3.5. *Since there is no motion on the floor, would like to terminate debate.*

- 8.10.3.6. *The chairs opinion is that the discussion is relevant. We are discussing the necessary period and process to review and modify the draft text.*
- 8.10.3.7. *The chair want to be sure there are any other topics or presentations that anyone might want to bring forward? Are there any papers to be presented now?*
- 8.10.3.7.1. *None*
- 8.10.3.8. *Objection to have a discussion without a motion.*
- 8.10.3.9. *The chair notes that it is not necessary to have a motion on the floor to have a discussion.*
- 8.10.3.10. *The purpose is to get perspectives. The next step will be a motion now that we have determined the groups opinions.*

8.10.4. **Straw Poll**

- 8.10.4.1. *Do you think it would be wise to issue a letter ballot before the Kauai, Hawaii meeting?*
- 8.10.4.1.1. *Yes : 14*
- 8.10.4.1.2. *No : 39*
- 8.10.4.1.3. *Abstain : 10*

8.10.5. **Discussion**

- 8.10.5.1. *Suggest that we recess until 3:30 so we can give the normative text the attention it deserves.*

8.10.6. **Straw Poll**

- 8.10.6.1. *Will you accept in principle the normative text for the TGe consensus proposal as the TGe working draft going forward.*
- 8.10.6.1.1. *Yes : 48*
- 8.10.6.1.2. *No : 3*
- 8.10.6.1.3. *Don't know yet (will by 3:30) : 14*
- 8.10.6.1.4. *Abstain (won't know by 3:30) : 1*

8.10.7. **Motion**

- 8.10.7.1. *Motion to modify the agenda to include a special order to vote on whether to send the draft to a WG letter ballot.*
- 8.10.7.1.1. *Duncan K*
- 8.10.7.1.2. *Matt S*
- 8.10.7.2. *Discussion*
- 8.10.7.2.1. *We already have special orders for this topic. The session starts at 7:30PM. The chair rules this out of order.*
- 8.10.7.3. *Motion to modify the previously adopted motion to adopt the agenda, in order to remove the special order to vote on whether to send the draft to WG letter ballot.*
- 8.10.7.3.1. *Duncan K*
- 8.10.7.3.2. *Matt S*

8.10.7.4. Discussion

- 8.10.7.4.1. *Given that we have not adopted a draft, is this in order?*
- 8.10.7.4.2. *Yes, this is a procedural motion regarding the agenda.*
- 8.10.7.4.3. *Against the motion – we are going to vote on this matter sooner or later. Don't understand the intent.*
- 8.10.7.4.4. *Would like to prevent wasting time.*
- 8.10.7.4.5. *Call the question (john K / Matthew) No Objection*

8.10.7.5. *Vote on the motion: Passes 44 : 9 : 11*

8.10.8. Discussion

- 8.10.8.1. *We removed a special order, but we have not voted on whether or not we send it to letter ballot. We could still vote to send it to letter ballot.*
- 8.10.8.2. *The chair notes that if there is a motion to go to letter ballot he would rule it out of order. He feels that was the intention of the group in the previous motion. Discuss off-line if there is a difference of opinion.*

8.11. Presentation of Papers**8.11.1. DLP – Direct Link Protocol**

- 8.11.1.1. *Carlos Rios, et al*
- 8.11.1.2. *document 02/465r2*
- 8.11.1.3. *Overview*
 - 8.11.1.3.1. *Based on proposal from Vancouver, adding ideas from security coming from TGi.*
 - 8.11.1.3.2. *This is a successor to WARP, WiSP, and DSRC presented in Vancouver.*
 - 8.11.1.3.3. *Allows direct IBSS-like communication while associated to an AP, conserving bandwidth at the AP.*
 - 8.11.1.3.4. *The AP remains the gatekeeper and enforces policies regarding DLP.*
 - 8.11.1.3.5. *New Action frames – DLP Request / response pair.*
 - 8.11.1.3.6. *Proposed normative text in 02/438r4*
- 8.11.1.4. *Q&A*
 - 8.11.1.4.1. *Q: The AP is a gatekeeper? What keeps the side channel from being formed if the AP says no?*
 - 8.11.1.4.2. *A: If there really is a policy against DLP, it would have to be disabled at the station.*
 - 8.11.1.4.3. *Q: What happens if the AP is not happy with some elements of the request?*
 - 8.11.1.4.4. *A: The AP can reject the request, but won't modify it.*
 - 8.11.1.4.5. *Q: Security is a moot issue. Anybody can set up an IBSS. The command / response pair require coordination between TGe and TGi?*

- 8.11.1.4.6. A: *The only common thing is the RSN information element.*
- 8.11.1.4.7. Q: *What initiates the first frame of this exchange?*
- 8.11.1.4.8. A: *It's up to the implementer. It could be automatic? It's outside the scope of the standard.*
- 8.11.1.4.9. Q: *has this been presented to TGi?*
- 8.11.1.4.10. A: *No that's the next step.*
- 8.11.1.4.11. Q: *After a period of no activity, the whole procedure must be restarted?*
- 8.11.1.4.12. A: *Yes, it times out. It's different than the current draft.*
- 8.11.1.4.13. Q: *when the motion is made, it should be for the differences between r2 and r3, since r2 is already in the draft.*
- 8.11.1.4.14. A: *noted.*
- 8.11.1.4.15. Comment – *there is an MLME request to initiate from outside, but there is also the ability for the MAC to initiate internally.*
- 8.11.1.4.16. Comment: *there is already a 4 way authentication in TGi.*
- 8.11.1.4.17. *This is not for authentication. It expects authentication to be done before the parties start talking.*

8.12. Closing comments

- 8.12.1.1. *The chair request members to notify him at the break if there are any plans to bring controversial motions.*
- 8.12.1.2. *Would like to hear of any objections that might be brought up regarding any procedural issues.*
- 8.12.1.3. *If there are motions to forward, please write them in advance and have them ready to present.*
- 8.12.1.4. *We had a suggestion to recess until 3:30?*
- 8.12.2. **Is there any objection to recess until 3:30?**
- 8.12.2.1. *No objection*
- 8.12.3. **At 12:00, Recess until 3:30PM**

9. Thursday Afternoon

9.1. Opening

- 9.1.1. **The meeting is called to order at 3:30PM by John Fakatselis**
- 9.1.2. **This is a special order agenda item for technical motions regarding the new draft**
- 9.1.2.1. *We are going to vote on motions that specify normative text on the draft.*
- 9.1.2.2. *At the 7:30PM session, we are going to review and approve the new draft.*

9.2. Discussion of process

- 9.2.1.1. *The chair reviews the process for this session*
- 9.2.1.2. *This is a special order fixed time agenda time.*
- 9.2.1.3. *We are going to entertain motions on normative text to be incorporated into the TGe draft.*
- 9.2.1.4. *At 7:30, the editor will walk us through the changes to the draft that incorporates those changes, and we will vote to approve the draft.*
- 9.2.1.5. *Those who are bringing motions are asked to bring the exact wording ready to display on their computers.*
- 9.2.1.6. *Are there any more requests or questions?*
 - 9.2.1.6.1. *None*

9.3. Motions

9.3.1. Consensus proposal

- 9.3.1.1. *Motion : instruct the editor to adopt the normative text in document 02/604r1 (“11-02-604-r1-E-Normative-Text-For-Tge-Consensus-Proposal.doc”), with the substitution of subclauses 9.10.3, 9.10.4, and 9.10.5 by subclauses 3.4.3, 3.4.4, and 3.4.5 in document 02/592r0, into the next TGe draft*
- 9.3.1.2. *Moved Rolf Deveg*
- 9.3.1.3. *Seconded John Kowalski*
- 9.3.1.4. *Discussion*
 - 9.3.1.4.1. *The change of substitution is due to the change of how AIFS is used.*
 - 9.3.1.4.2. *In document 02/099 there is a diagram on slide 3 explaining the difference between the AIFS in the proposed draft and the previous drafts. The key difference is if the station defers during a countdown. When it re-starts the countdown, it is a different (lower count). It is exactly the same as legacy DIFS. Prefers this. Also MSDU lifetime was eliminated. It is most important to keep this group in consensus. Supports the motion.*
- 9.3.1.5. *Motion to divide the motion into four motions to be considered separately: 1) Deleted features 2) DLP 3)EDCF 4) HCF plus TSPEC 4) Explicit identification of the clauses. (Explicit identification of the clauses is available)*
 - 9.3.1.5.1. *Moved Peter J*
 - 9.3.1.5.2. *Second David Hunter*
 - 9.3.1.5.3. *Point of information: Is this non-debatable?*
Yes.
 - 9.3.1.5.4. *Vote on the motion: Fails 15 : 114 : 3*
- 9.3.1.6. *Discussion on the main motion*
 - 9.3.1.6.1. *Would like to point out that we’ve spent 2 years on comment. We have some minor points of conflict. We have a brand new draft that is radically different than what*

we had. We have had only 4 hours to review. Concerned that there may be more that is wrong or objectionable. They would then vote no on the ballot. Wanted to see the motion divided.

9.3.1.6.2. *Strongly in favor of the motion. All the representatives have worked hard to craft this. It is very important to accept this as a baseline.*

9.3.1.6.3. *Regarding the claim that it is a radical change. In favor of the motion for that reason.*

9.3.1.6.4. *Call the question (Duncan / John K)*

9.3.1.6.4.1. *Vote on calling the question: Passes
127 : 2 : 7*

9.3.1.7. *Vote on the main motion:*

9.3.1.7.1. *The vote is taken again due to a members objection.*

9.3.1.7.2. *Passes 129 : 5 : 4*

9.3.2. Any other motions?

9.3.2.1. *There are no other motions regarding the draft.*

9.3.2.2. *Is there anything else that anyone wants to discuss regarding the agenda item?*

9.3.2.2.1. *Thanks for everyone's help in coming to a compromise.*

9.3.2.2.2. *The chair recognizes Duncan Kitchin who stepped down from Vice Chair for his contributions during this week.*

9.3.3. Announcement from the WG chair

9.3.3.1. *The Stuart J. Kerry compliments John Fakatselis for his work in leading the group forward and the excellent progress this week.*

9.3.4. Motion to recess until 7:00PM

9.3.4.1. *John K*

9.3.4.2. *Duncan*

9.3.4.3. *No objections*

9.3.5. At 4:10PM, the meeting is recessed until 7:00PM

10. Thursday Evening Session

10.1. Opening

10.1.1. The meeting is called to order at 7:00PM by John Fakatselis

10.2. Review of this session's Special Orders Agenda

10.2.1. Any old business

10.2.2. Any new business

10.2.3. at 7:30PM, present and vote on the draft

10.3. Old Business

10.3.1. None

10.4. New Business

10.4.1. What do we do between meetings?

10.4.1.1. *As a way of moving forward, the past two months have been successful. Lets continue the same way.*

10.4.1.2. *We should address the letter ballot comments so they will not ask if they have been resolved. Between meetings, could we have an ad-hoc group to look at them? We should try in earnest to address the no-votes, so they will not vote no again.*

10.4.1.3. *The chair suggests a motion would be appropriate. The editor should update existing resolutions based on our current approved direction.*

10.4.1.4. *Have all the comments been distributed to the whole group? We need to have the database distributed to everybody. The Excel file was truncated.*

10.4.1.5. *The original Access file does not have the resolutions.*

10.4.1.6. *A different position on the comments – we have a lot of work to do on the draft. We are not obligated to resolve all comments on a failed LB. We believe we have addressed the intent of the commenters. We should ask commenters to notify us if they still have a problem with the new draft.*

10.4.1.7. *The chair agrees that there is nothing in the rules that says we have to address all comments on the failed ballot. On the other hand, we have received complaints from members who feel insulted if we ask them to review a ballot, and do not process their comments. We need to be sensitive to their concerns.*

10.4.1.8. *Srini has enough to do without processing comments. We should divide it up and help him out.*

- 10.4.1.9. *Would like the editor to ask for the assistance the group can offer.*
- 10.4.1.10. *The comments are old at this point. Maybe we could ask people to withdraw their comments if they no longer care. That would reduce the work.*
- 10.4.1.11. *The question is what are we going to do, and how are we going to do it?*
- 10.4.1.12. *Today we had more people than ever vote to adopt changes to the draft. It was a fair cross section of the companies represented in the group. Suggest that everyone who voted today would agree to withdraw their comments. We need to find out who is perturbed about their comments, and address them only.*
- 10.4.1.13. *Many comments are no longer relevant since many things have been taken out of the draft. It would be quick to remove those comments, and that would remove more than half.*

10.4.2. Motions

- 10.4.2.1. *Instruct the chair to send an email to the reflector identifying the state of TGe and the draft, and identifying that comments will not be specifically addressed except at the request of the commenter.. The chair is also instructed to note the situation in the next plenary*
- 10.4.2.2. *Moved Matt S*
- 10.4.2.3. *Keith*
 - 10.4.2.3.1. *Move to postpone consideration until after special orders*
 - 10.4.2.3.1.1. *Peter*
 - 10.4.2.3.1.2. *Keith*
 - 10.4.2.3.1.3. *Vote : passes without objection*

10.5. Special Orders Item

10.5.1. Draft Presentation

- 10.5.1.1. *Access Categories – previously there were 8, now there are only 4*
- 10.5.1.2. *Removed AP mobility*
- 10.5.1.3. *Removed FEC*
- 10.5.1.4. *DLP is new in clause 5.9*
- 10.5.1.5. *Priority mapping changes in table 0.1. User priority to access category.*
- 10.5.1.6. *Cleaned up Duration/ ID definitions.*
- 10.5.1.7. *The CC and RR frames are gone.*
- 10.5.1.8. *New element for automatic power save delivery*
- 10.5.1.9. *QoS Parameter set has been cleaned up.*

- 10.5.1.10. *EDCF does not rely on 9.2. It is a new clause 9.10. We used the WME description for EDCF and put it in a new clause.*
- 10.5.1.11. *The HCF section is moved to 9.11*
- 10.5.1.12. *Distributed Admission Control procedure is described.*
- 10.5.1.13. *New primitives added for DLP. The DLP message flow figure needs to be moved to clause 11.*
- 10.5.1.14. *Added the description for power save delivery in clause 11.*
- 10.5.1.15. *Description of autonomous TSPEC generation in the MAC is added.*
- 10.5.1.16. *An update of the MIB has been done. Two new MIBs are added.*
- 10.5.1.17. *Annex H (FEC) was removed.*
- 10.5.1.18. *Informative annex on building a TCLAS and how to use TSPEC was added.*

10.5.2. Discussion

- 10.5.2.1. *TCLASS is still there? Yes, it is an opaque object for the application to use as needed. The MAC does not interpret them.*
- 10.5.2.2. *In the TSPEC, there is an item of the “surplus bandwidth allowance factor”. How does the implementer know what it needs to be?*
- 10.5.2.3. *That number is there because the channel is error prone. To have reliable communication, more bandwidth is needed to allow for retries. It is the excess of bandwidth on the air compared to the bandwidth at the MAC SAP.*
- 10.5.2.4. *So a different number is needed based on the number of retries? The number is “learnable” by the MAC.*
- 10.5.2.5. *We will revisit this before letter ballot in case more clarification is needed.*
- 10.5.2.6. *Is there room to think about implications of 802.11i? We have been talking to the 802.11i group. As far as we know, this is compatible with their architecture.*
- 10.5.2.7. *What is the random data field?*
- 10.5.2.8. *It is used to test the channel to determine what the error rate is. We may need to clarify this.*

10.5.3. Motion

- 10.5.3.1. *Instruct the editor to create draft 3.3 by incorporating the changes to the draft as decided by the technical motions passed during the “special orders” agenda items of the September 2002 TGe sessions. In addition, the changes voted through these motions supersede any previously adopted technical motions that might be in conflict.*
 - 10.5.3.1.1. *Moved Peter J*
 - 10.5.3.1.2. *Second Sid S*

- 10.5.3.2. *Discussion*
- 10.5.3.2.1. *Do we need to instruct the editor to continue to refine? That is already his charter. We will review 3.3 at the next session.*
- 10.5.3.2.2. *The draft presented tonight was not 3.3, but a "preliminary version".*
- 10.5.3.2.3. *This is a technical motion because of the ability to supersede any previous technical motions.*
- 10.5.3.2.4. *Will the document that results from this process be a complete draft standard? It will be a draft as defined in our rules. It has to be an amendment to the existing standard, which specifies changes to the base standard.*
- 10.5.3.2.5. *The editor states that the document will indicate changes to the base standard. It will not carry changes from previous TGe drafts.*
- 10.5.3.3. *Vote on the motion: Passes 48 : 0 : 1*

10.6. Postponed Motion

10.6.1. Motion on the table

- 10.6.1.1. *Instruct the chair to send an email to the reflector identifying the state of TGe and the draft, and identifying that comments will not be specifically addressed, except at the request of the commenter. The chair is also instructed to note the situation in the next plenary session.*
- 10.6.1.2. *Moved Matt S*
- 10.6.1.3. *Keith*
- 10.6.1.4. *Motion to table this motion*
- 10.6.1.4.1. *Moved Duncan K*
- 10.6.1.4.2. *No second*
- 10.6.1.5. *Discussion*
- 10.6.1.5.1. *In support of this to avoid spending time on explicit comment resolutions. We want to respect those who commented, but allow the opportunity for those who believe comments still need to be resolved.*
- 10.6.1.5.2. *Would like it to be clear that failure to respond does not indicate assent to the draft.*
- 10.6.1.5.3. *The chair should also thank the commenter for their effort in making the comments*
- 10.6.1.5.4. *Call the question (John / Amjad S)*
- 10.6.1.5.4.1. *Vote on calling the question: Passes 17 : 5 : 6*
- 10.6.1.6. *Vote on the main motion: Passes 23 : 2 : 7*
- 10.6.1.7. *Motion to reconsider*
- 10.6.1.8. *What is the new information that we need to reconsider – by stating that comments will not be specifically addressed implies we ignored the comments.*
- 10.6.1.9. *Motion to reconsider is out of order – there is no new information.*

10.6.2. Discussion

- 10.6.2.1. *This will result in a storm of protest. We have an issue with people saying we send out too many letter ballots.*
- 10.6.2.2. *The chair asked the group to carefully craft a message that will be suitable and clear enough.*
 - 10.6.2.2.1. *The chair suggests a short recess to draft the proper text.*
 - 10.6.2.2.2. *Who will draft the text?*

10.6.3. Recess for 10 minutes

- 10.6.3.1. *No objection*

10.6.4. Continued Discussion

- 10.6.4.1. *Motion requesting the chair to send the following email to the reflector:*

To the 802.11 Community,

About 4 months ago, TGe conducted a letter ballot on Draft 3.0. The letter ballot failed. The task group has been diligently working on addressing the comments received. Because of significant changes to the working draft, many of the comments have been overtaken by circumstance. The task group believes the current draft addresses many (if not most) of the comments. As a consequence, and also because there is no formal obligation under 802/802.11 rules to individually respond to comments on a failed letter ballot, the task group proposes that Draft 3.3 speak for itself. However, if anyone wishes an individual response to their comments, we are pleased to provide one. If so desired, please contact the editor, Srinikandala (srini@sharplabs.com), and responses will be provided. Please understand that if you do not request an individual response to a comment, this does not imply assent to the current draft; you are free to comment in the forthcoming letter ballot. Sincerely,

John Fakatselis
Chair, TGe

- 10.6.4.1.1. *Moved Matt S*
- 10.6.4.1.2. *Second Peter*
- 10.6.4.2. *Discussion*
 - 10.6.4.2.1. *There are still many comments that are still pertinent to the draft. The draft has not changed that significantly. We should delay this until we are sure this is the case.*
- 10.6.4.3. *Motion to amend: add "on November 11th" after "requesting the chair to send the following email to the reflector:"*
 - 10.6.4.3.1. *Moved Duncan*
 - 10.6.4.3.2. *Second Srinikandala*
 - 10.6.4.3.3. *Discussion*

- 10.6.4.3.4. *The original comment was better. An open date is better. Leave it to the chair's discretion. This could impede the ability to send out a letter ballot.*
- 10.6.4.3.5. *Nov 11th is the Monday of the next meeting. We can reconsider it on Monday if things have changed between now and then.*
- 10.6.4.3.6. *There is nothing in this letter that says we will not address comments. We are free to address them as we wish.*
- 10.6.4.3.7. *We don't want Srini to have to deal with comments from random people. Support this motion.*
- 10.6.4.3.8. *This motion does absolve us of the responsibility of almost all comments. The whole point is to relieve the group of unnecessary busy work. Srini is under no obligation to respond. He only forwards the information to the TG.*
- 10.6.4.3.9. *This has nothing to do with whether we address comments. It could result in provoking the working group.*
- 10.6.4.3.10. *Call the question (Duncan / Peter)*
- 10.6.4.3.10.1. *vote on calling the question: Passes 17 : 0 : 4*
- 10.6.4.4. *Vote on the motion to amend: Passes 11 : 8 : 5*
- 10.6.4.5. *Motion on the floor:*
- 10.6.4.6. *Motion requesting the chair to send the following email to the reflector on November 11th:*

To the 802.11 Community,

About 4 months ago, TGe conducted a letter ballot on Draft 3.0. The letter ballot failed. The task group has been diligently working on addressing the comments received. Because of significant changes to the working draft, many of the comments have been overtaken by circumstance. The task group believes the current draft addresses many (if not most) of the comments. As a consequence, and also because there is no formal obligation under 802/802.11 rules to individually respond to comments on a failed letter ballot, the task group proposes that Draft 3.3 speak for itself. However, if anyone wishes an individual response to their comments, we are pleased to provide one. If so desired, please contact the editor, Srini Kandala (srini@sharplabs.com), and responses will be provided. Please understand that if you do not request an individual response to a comment, this does not imply assent to the current draft; you are free to comment in the forthcoming letter ballot.

Sincerely,

John Fakatselis
Chair, TGe

10.6.5. **Motion to adjourn**

- 10.6.5.1. *John / Peter*
- 10.6.5.2. *Vote: Passes 9 : 5 : 1*

10.6.6. Adjourn at 9:00PM

10.6.6.1. The chair informally notes that he is obligated to act according to the motion that was passed.

**IEEE P802.11
Wireless LANs**

Title

Date: Month Day, Year

Author: Jon Rosdahl
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Abstract

IEEE 802.11 Interim Session minutes for TGf meeting in September 2002.

1. Meeting called to order at 1:00pm
2. Welcome from Dave Bagby.
3. Agenda
 - a. Called to order
 - b. Adopt agenda
 - c. Look at last set of minutes
 - d. Process all received comments
 - e. Look at new business
 - f. Adjourn
4. Motion to adopt agenda: Moved: Butch A. 2nd Jon R. Vote: unanimous
5. Matters from the minutes from July's minutes
 - a. Moved to accept the minutes from July, Moved: Bob M. 2nd Butch A.
 - b. Vote: unanimous
6. Process all comments received.
 - a. NO Comments received as the Letter Ballot hasn't been started yet.
7. Propose to change the goals for Sept. and replace the word with Nov. and proceed.
 - a. Another option would be to try to hold an interim mtg in late Oct., but then we would almost be there by Nov.
 - b. StrawPoll: How many would be at the Nov mtg about 10 said they would be there.
 - c. Discussion on values of having or not having an extra Interim Mtg.
8. Call for New Business
 - a. 1 point of information, 802.11i, a presentation on Client Radius Kickstart will be made.
 - b. No new Business was presented.
9. Adjourn at 1:15 pm. Moved by Butch A.

**IEEE P802.11
Wireless LANs**

September 2002 Monterey Interim TGg Meeting Minutes

Date: September 9-13, 2002

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Abstract

The TGg meetings were primarily focused on addressing the comments of letter ballot #41. The ballot passed with approximately an 80% positive vote, but there were enough technical comments that we decided to address them and issue a new draft. The comments were resolved in 11-02-535rX, with the final revision 11-02-535r14. All technical comments were addressed, but there was not sufficient time to complete the draft, so the editor was instructed to issue a draft (draft 4.0) within two weeks of the closing of this interim session. Following the release of the document, we have requested a 15 day letter ballot to request a 15 day recirculation ballot for completion before the Kauai plenary.

Minutes

The outline numbers are based on the approved agenda that was in Doc. 11-02-536r1.

September 9, 2002

- 0. 802.11g Session Called to Order at 10:34 AM
 - 0.1. Review the tentative agenda in document 11-02-536r0
- 1. Review the chair status update in 11-02-538r0
 - 1.1.1. 5-6 new people were attending this meeting
 - 1.1.2. LB 41 preliminary results: 184-45-30 or YES votes: 80.35%
 - 1.1.2.1. Results in 11-02-522r0
 - 1.1.2.2. Comments in 11-02-534r0
 - 1.1.2.3. Comment resolution will be in 11-02-535. It looks like there are about 451 unique comments, with 217 editorial and 234 technical
 - 1.1.3. Goals
 - 1.1.3.1. Complete letter ballot comments
 - 1.1.3.2. Issue recirculation ballot
 - 1.1.3.3. Joint meeting with 802.18
 - 1.1.4. Approach
 - 1.1.4.1. Split into 5 groups to resolve the comments
 - 1.1.4.1.1. Editorial
 - 1.1.4.1.2. General
 - 1.1.4.1.3. Clause 19
 - 1.1.4.1.4. Clause 19.5 and 19.6
 - 1.1.4.1.5. Non-clause 19 and appendices
 - 1.1.4.2. Review an updated draft
 - 1.1.4.3. Issue a recirculation ballot

- 1.2. Review of recirculation ballot rules
 - 1.2.1. We can only comment on changes between drafts
2. Review IEEE 802 and 802.11 Policies and Rules
 - 2.1.1. No copyrights
 - 2.1.2. Turn off mobile phones
 - 2.1.3. Use official templates
3. Approve or modify agenda
 - 3.1. Review the proposed agenda
 - 3.2. Move to adopt the agenda as proposed in 11-02-536r0
 - 3.2.1. Moved: Dick Allen
 - 3.2.2. Seconded: Bob Costas
 - 3.2.3. No discussion
 - 3.2.4. Vote: 26-0-0 – The agenda is approved
4. Review and approve the minutes from the Vancouver minutes in Document 11-02-448r0
 - 4.1. Move to adopt the minutes from the Vancouver meeting in 11-02-448r0.
 - 4.1.1. Moved: Dick Allen
 - 4.1.2. Second: Bob Costas
 - 4.1.3. No discussion
 - 4.1.4. Adopted by unanimous consent
5. Review letter ballot 41 results
 - 5.1. No discussion
6. Identification of leads for the special committees
 - 6.1. No opposition
 - 6.2. Leads adopted as proposed by unanimous consent
 - 6.2.1. Editorial – Carl Andren
 - 6.2.2. General – John Terry
 - 6.2.3. Clause 19 – Steve Halford
 - 6.2.4. Clause 19.5 and 19.6 – Sean Coffey
 - 6.2.5. Non-clause 19 and appendices – Terry Cole
 - 6.3. Recess from main group until the technical groups have completed their work
 - 6.3.1. We will come back into a full session of TGg when the SCs are completed with their work

Recessed at 10:57 AM to Special Committees

2002-09-10: Reconvened at 1:07 PM

7. Comment Resolution and Adoption based on recommendation from special committees and submissions related to LB#41 comments
 - 7.1. Status (suggested resolutions in 11-02-535r1)
 - 7.1.1. General and Clause 19.5 and 19.6 joined
 - 7.1.2. Clause 19 will be in r2
 - 7.1.3. Editorial – about half are in r1
 - 7.1.4. Non-clause 19 and appendices – did not finish last night, recommendations will be in a later revision
 - 7.2. Current Draft is 3.1
 - 7.3. General and Clause 19.5 and 19.6 comment resolution

Editorial note: The main text of the resolutions is found in 11-02-535rX, where X is the latest revision of the document. Comment numbers mean the row number in the Excel spreadsheet and the Tab is determined by the section of comment resolution.

- 7.3.1. General Tab:
 - 7.3.1.1. Comment 2 – regarding slot times
 - 7.3.1.1.1. Don: The proposed solution is not real clear.
 - 7.3.1.1.2. John T: It is allowing the APs to switch to short slot time if it is long slot time.
 - 7.3.1.1.3. Albert: Gives a suggestion to help clarify the resolution.
 - 7.3.1.1.4. The resolution was adopted by unanimous consent (UC).
 - 7.3.1.2. Comment 3 – regarding normative behaviour for a STA using a protection mechanism
 - 7.3.1.2.1. The recommend resolution was to refer to the *Informative Annex E*

- 7.3.1.2.2. There was a question about whether this would satisfy the commentor
- 7.3.1.2.3. There is also a *normative* statement in 7.3.1.9 that the commentor is being pointed to also the commentor is pointed to a submission from Menzo et. al. 11-02-065r1.
- 7.3.1.2.4. The resolution was unanimously adopted by a vote of: 24-0-2
- 7.3.1.3. Comment 4 – how an non-ERP can join an ERP IBSS
 - 7.3.1.3.1. The proposed resolution was adopted by UC
- 7.3.1.4. Comment 5
 - 7.3.1.4.1. Reclassified as editorial
 - 7.3.1.4.2. Done by UC
- 7.3.1.5. Comment 6
 - 7.3.1.5.1. Reclassified as editorial
 - 7.3.1.5.2. Done by UC
- 7.3.2. Comment 7 – Dynamic rate fallback
 - 7.3.2.1. There was a vote to see if there was support for developing a dynamic rate fallback algorithm. Vote: 1 (for)-22 (against)-2 (abstain). There was no support to develop such an algorithm.
 - 7.3.2.2. The algorithm is left up to the implementor
 - 7.3.2.3. Done by UC
- 7.3.3. Comment 8 – Move parts of Annex E to normative text
 - 7.3.3.1. The SC didn't believe that anything needed to be done, so they rejected the comment
 - 7.3.3.2. Chair: If Annex E is normative, then future implementations will have less leeway when developing "protection mechanisms"
 - 7.3.3.3. Rejected by UC
- 7.3.4. Comment 9 – removal of CCK-OFDM
 - 7.3.4.1. Objection to the proposed resolution by Kevin Smart
 - 7.3.4.1.1. Kevin: I want a vote to determine the level of support that is included in the resolution document
 - 7.3.4.2. Sean Coffey: How many times do we have to revisit this issue?
 - 7.3.4.3. Chair: Every ballot.
 - 7.3.4.4. Sean: I'm not objecting to the vote, but we need to have a way to say no. We want
 - 7.3.4.5. Mark Webster: Didn't we have a vote in St. Louis? Is that not documented?
 - 7.3.4.6. Chair: Yes, in 11-02-209r13
 - 7.3.4.7. Secretary: It did not make the 11-02-209r13 comment resolution document, but it is in the St. Louis minutes in document 11-02-164r0.
 - 7.3.4.8. Motion:
 - 7.3.4.8.1. Move to remove section 19.6 on CCK-OFDM
 - 7.3.4.8.2. Moved: Kevin Smart
 - 7.3.4.8.3. Seconded: Carl Andren
 - 7.3.4.8.4. Debate:
 - 7.3.4.8.4.1. Steve Halford: This keeps coming up. There is value in having these options in the draft. They are in there for a purpose. These are extensions with value.
 - 7.3.4.8.4.2. Jim Zyren: The options were included for technical reasons, but we should all understand the process of where we are. To do that now puts the project at risk. These are optional parts, we risk taking a big step backward if we were to remove these options.
 - 7.3.4.8.5. Vote: 3-30-8 motion fails
 - 7.3.4.9. After adding the voting results to the resolution was adopted by UC.
- 7.3.5. Comment 10 – removal of PBCC
 - 7.3.5.1. Motion: Move to remove section 19.5 on PBCC
 - 7.3.5.2. Moved: Kevin Smart
 - 7.3.5.3. Seconded: Carl Andren
 - 7.3.5.4. Discussion:
 - 7.3.5.4.1. Kevin Smart: Wants a vote for the record to show strong support for our resolution.
 - 7.3.5.4.2. Jim Zyren: Echos comments from before
 - 7.3.5.5. Vote: 1-28-9 motion fails
 - 7.3.5.6. Resolution was adopted by unanimous consent.
- 7.3.6. Comment 11 – Too many rates
 - 7.3.6.1. Resolution adopted by unanimous consent
- 7.3.7. Comment 12 – Change CCK-OFDM to DSSS-OFDM

- 7.3.7.1. Jim Zyren: The name came from a TI presentation and it stuck. There is no value in changing it.
- 7.3.7.2. Sean: The grammar is poor.
- 7.3.7.3. Chair: We will fix it later
- 7.3.7.4. Adopted by UC
- 7.3.8. Comment 13 – DS is sometimes used for DSSS
 - 7.3.8.1. Forwarded to the editor
 - 7.3.8.2. Done by UC
- 7.3.9. Comment 14
 - 7.3.9.1. Refer to comment 10
 - 7.3.9.2. Done by UC
- 7.3.10. Comment 15
 - 7.3.10.1. Reject based on comments 9 and 10
 - 7.3.10.2. Done by UC
- 7.3.11. Comment 16
 - 7.3.11.1. Referred to MAC group
- 7.3.12. Comment 17 – use “optional” too many times
 - 7.3.12.1. Moved to editor
 - 7.3.12.2. Done by UC
- 7.3.13. Comment 18
 - 7.3.13.1. Refer to 11-02-209r12, where this issue was discussed
 - 7.3.13.2. Done by UC
- 7.3.14. Comment 19
 - 7.3.14.1. Moved to MAC group

Recessed for break at 3:03 PM. New document is 11-02-535r3.

- 7.4. Clause 19 Tab
 - 7.4.1. Comment 2-6
 - 7.4.1.1. Resolutions adopted by UC
 - 7.4.2. Comment 7
 - 7.4.2.1. Move to remove the ERP-OFDM mandatory mode
 - 7.4.2.2. Moved: Matthew Shoemake
 - 7.4.2.3. Seconded: Carl Andren
 - 7.4.2.4. Vote: 0-27-1 motion to remove ERP-OFDM failed
 - 7.4.3. Comment 8
 - 7.4.3.1. Straw poll:
 - 7.4.3.1.1. 1. Short preamble optional
 - 7.4.3.1.2. 2. Short preamble mandatory
 - 7.4.3.1.3. Vote: 2 (1)-19 (2), most people want the short preamble mandatory.
 - 7.4.3.2. Comment rejected by UC
 - 7.4.4. Comment 9
 - 7.4.4.1. Moved to Editorial
 - 7.4.5. Comment 10
 - 7.4.5.1. Refer to General Tab comments 9 & 10,
 - 7.4.5.2. Rejected by UC.
 - 7.4.6. Comment 11
 - 7.4.6.1. Rejection statement adopted by UC
 - 7.4.7. Comment 12
 - 7.4.7.1. Moved to editorial
 - 7.4.8. Comments 13-15 are moved to editorial comments
 - 7.4.9. Comment 16
 - 7.4.9.1. Adopted same resolution to Comment 8
 - 7.4.9.2. Done by UC
 - 7.4.10. Comments 17-19
 - 7.4.10.1. Moved to editorial comments
 - 7.4.11. Comment 20
 - 7.4.11.1. Rejected by UC
 - 7.4.12. Comment 21

- 7.4.12.1. Adopted by UC
- 7.4.13. Comment 22
 - 7.4.13.1. Adopted by UC
- 7.4.14. Comment 23
 - 7.4.14.1. There are mistakes in earlier parts of 802.11, but we don't want to fix it.
 - 7.4.14.2. Terry Cole: If there are problems, please refer them to me.
 - 7.4.14.3. Referred to WG editor function by UC
- 7.4.15. Comments 24-26
 - 7.4.15.1. Christopher Hinsz: Perhaps the title should be changed.
 - 7.4.15.2. Richard Williams: What type of change would you suggest?
 - 7.4.15.3. Carl Andren: Change the title to "Maximum Signal Level Capability"
 - 7.4.15.4. Christopher Hinsz will be satisfied by the resolution
 - 7.4.15.5. Resolution adopted by UC
- 7.4.16. Comment 27
 - 7.4.16.1. Rejected by UC
- 7.4.17. Comment 28
 - 7.4.17.1. Rejected by UC
- 7.4.18. Comment 29
 - 7.4.18.1. Moved to editorial
- 7.4.19. Comment 30
 - 7.4.19.1. Editorial comment, but we don't feel that there is a reason to change the text
 - 7.4.19.2. Rejected by UC
- 7.4.20. Comment 31
 - 7.4.20.1. Adopted by UC
- 7.4.21. Comment 32-33
 - 7.4.21.1. Rejected by UC
- 7.4.22. Comment 34
 - 7.4.22.1. Deemed an editorial comment
 - 7.4.22.2. Carl: Want to change 18.3.3 rather than this section
 - 7.4.22.3. Richard: We might have a problem with changing 18.3.3. We might get a comment about 18.3.3 if we were to change that.
 - 7.4.22.4. Dick: I am worried about generating more no votes. Most of the current NO votes will not change.
 - 7.4.22.5. Taken off-line
- 7.4.23. Comment 35-36
 - 7.4.23.1. Editor: We could add a table to put all of these things in
 - 7.4.23.2. Terry: This should be moved to the MAC group
 - 7.4.23.3. Moved
- 7.4.24. Comment 37
 - 7.4.24.1. Adopted the same resolution as Comment 23 by UC
- 7.4.25. Comment 38
 - 7.4.25.1. This is rejected because it would cause more NO votes. Done by UC.
- 7.4.26. Comment 39
 - 7.4.26.1. Editorial change
- 7.4.27. Comment 40
 - 7.4.27.1. Commentor wants to add Adjacent Channel requirements
 - 7.4.27.2. Comment rejected by UC
- 7.4.28. Comment 41
 - 7.4.28.1. Believe that the current masks are adequate
 - 7.4.28.2. Comment rejected by UC
- 7.4.29. Comment 42
 - 7.4.29.1. Changed to editorial
- 7.4.30. Comment 43
 - 7.4.30.1. Rejected by UC
- 7.4.31. Comment 44
 - 7.4.31.1. See comment 42
 - 7.4.31.2. Done by UC
- 7.4.32. Comment 45
 - 7.4.32.1. Similar to 43. Rejected by UC

- 7.4.33. Comment 46-47
 - 7.4.33.1. Changed to editorial (47 is a repeat of 12)
 - 7.4.33.2. Done by UC
- 7.4.34. Comment 48
 - 7.4.34.1. Moved to MAC SC
- 7.4.35. Comment 49
 - 7.4.35.1. Moved to editorial
 - 7.4.35.2. Editor didn't think it was necessary, so he will not change it.
 - 7.4.35.3. Editor rejected it.
- 7.4.36. Comment 50
 - 7.4.36.1. Text should be removed. Done by UC.
- 7.4.37. Comment 51
 - 7.4.37.1. Rishi: I feel it should be the average power over the short or long sequence.
 - 7.4.37.2. Jan: This also applies to CCK, so 16us would also be applied to Barker preambles
 - 7.4.37.3. Richard: 16 us is okay, but where do we measure?
 - 7.4.37.4. Rishi: I guess at the antenna connector
 - 7.4.37.5. Richard: Time-domain average? No specified technique?
 - 7.4.37.6. We agreed on time-domain average over 16 us. Power is at the antenna connector.
 - 7.4.37.7. Solution adopted by unanimous consent
- 7.4.38. Comment 52
 - 7.4.38.1. Rejected by UC
- 7.4.39. Comment 53
 - 7.4.39.1. The text was explained.
 - 7.4.39.2. Carl: Perhaps we should take out mode 4.

We will recess for dinner. Until 7:00.

We were locked out of our room.

Session was called to order at 7:22 PM.

- 7.4.39.3. Jan Boer: Mode 4 doesn't make a lot of sense, but is best to leave as-is.
- 7.4.39.4. Jan: If we change it, we may get more comments.
- 7.4.39.5. Chair: Let's revisit this later.
- 7.4.39.6. Carl: If you modify this to include some sort of energy detect with the timer, it will make more sense.
- 7.4.39.7. Chair: Jan, please look this over and give a suggestion.
- 7.4.40. Comment 54
 - 7.4.40.1. Comment converted to editorial and accepted by UC
- 7.4.41. Comment 55-60
 - 7.4.41.1. Editor: Some of the commentors got a little confused, but the text is clear and consistent.
 - 7.4.41.2. Terry Cole: I think that people will claim those need to be MIB parameters.
 - 7.4.41.3. Chair: Perhaps we should put this off until we have had more time to think about it.
 - 7.4.41.4. Steve Halford: My main concern of the existing CCA has a -82dBm number, but .11b has a more graduated scale based on Tx level. Since we are lowering the sensitivity setting, we may want to be careful. Want others to think about this too. Possibly introduce another variable that switches on the type.
 - 7.4.41.5. Richard: If we do that to try to avoid the NO votes it is going to get ugly. We are going for the lowest common denominator. The cleanest way to to go for the highest common denominator.
 - 7.4.41.6. Steve: If I were to do this now, I would have a single -76dBm for b and -82dBm for a.
 - 7.4.41.7. Mark Webster: I like Steve's idea. I was wondering if anyone understands the logic of why there are three levels? Why would you spec your receiver based on your transmitter?
 - 7.4.41.8. Dick Allen: The idea is that the more power you use, you will step on more stations, so you need to be more sensitive to mitigate the potential interference.
 - 7.4.41.9. Mark: Receiver sensitivity is a key spec and a key differentiator in the marketplace. We should have a single value regardless of the transmit power.
 - 7.4.41.10. Richard: We probably ought to split it out based on 802.11a and 802.11b waveforms.
 - 7.4.41.11. Jan: Perhaps we should take out energy detect only. We should take out CCA mode 1 and mode 4. If it is in, it doesn't really bother me because mode 5 is there.
 - 7.4.41.12. We should put this off until tomorrow.

*Update the draft and start to work on 11-02-535r4.
Recess for five minutes to get the new document on the server.
Session called back to order.*

- 7.5. Non-clause 19 Tab
 - 7.5.1. Comment 2
 - 7.5.1.1. Essentially the same as General Comment 3, so they should refer to Annex E.
 - 7.5.1.2. This was rejected by UC
 - 7.5.2. Comment 3
 - 7.5.2.1. There is a definition of a protection mechanism, but it may need some editorial change.
 - 7.5.2.2. Suggest that the definition be modified slightly.
 - 7.5.2.3. Adopted by UC
 - 7.5.3. Comment 4
 - 7.5.3.1. Resolution to Comment 3 addresses this comment
 - 7.5.3.2. Adopted by UC
 - 7.5.4. Comment 5
 - 7.5.4.1. Directed the editor to make the change from DSS to DSSS
 - 7.5.4.2. Adopted by UC
 - 7.5.5. Comment 6
 - 7.5.5.1. Delete the sentence in 7.1.3.4 as suggested by the editor.
 - 7.5.5.2. Adopted by UC.
 - 7.5.6. Comment 7
 - 7.5.6.1. Editorial comment
 - 7.5.6.2. Accepted by UC
 - 7.5.7. Comment 8
 - 7.5.7.1. The group recommends leaving this as-is, but making a note about interoperability.
 - 7.5.7.2. Abandoned for the evening
 - 7.5.8. Comment 9
 - 7.5.8.1. The SC didn't believe that this needed to be
 - 7.5.8.2. Editor: We should put in something to say how often STAs should check the capability bit.
 - 7.5.8.3. The proposed resolution was adopted by UC
 - 7.5.9. Comment 10
 - 7.5.9.1. Comment is rejected by UC
 - 7.5.10. Comment 11
 - 7.5.10.1. No recommended change, so the comment was rejected by UC.
 - 7.5.11. Comment 12
 - 7.5.11.1. Comment rejected by UC
 - 7.5.12. Comment 13
 - 7.5.12.1. Editorial comment, but we are awaiting assignment from ANA
 - 7.5.12.2. Comment accepted by UC
 - 7.5.13. Comment 14
 - 7.5.13.1. Very similar to comment 12
 - 7.5.13.2. Comment rejected by UC
 - 7.5.14. Comment 15
 - 7.5.14.1. Same as 13
 - 7.5.14.2. Comment accepted by UC
 - 7.5.15. Comment 16
 - 7.5.15.1. Comment accepted and resolved by UC
 - 7.5.16. Comment 17
 - 7.5.16.1. Comment accepted by UC
 - 7.5.17. Comment 18
 - 7.5.17.1. Comment rejected by UC
 - 7.5.18. Comment 19
 - 7.5.18.1. Postponed
 - 7.5.19. Comment 20
 - 7.5.19.1. Comment 8 is similar
 - 7.5.20. Comment 68
 - 7.5.20.1. Comment accepted by UC

- 7.5.21. Comment 69
 - 7.5.21.1. Comment accepted by UC
- 7.5.22. Comment 70
 - 7.5.22.1. For CCK-OFDM we should add a single PICS line that says we support the same thing as ERP-OFDM.
 - 7.5.22.2. Taken off-line
- 7.5.23. Comment 71
 - 7.5.23.1. Comment rejected by UC

Meeting recessed for the evening at 9:22 PM.

September 11, 2002

Meeting called to order at 8:06 AM

We discussed the plan going forward. We are trying to group together like comments to help accelerate the schedule to get a recirculation ballot out.

- 7.5.24. Comment 8
 - 7.5.24.1. After more consideration, the proposed resolution was adopted by UC
- 7.5.25. Comment 19
 - 7.5.25.1. Straw poll: Should we make shot slot time optional or mandatory
 - 7.5.25.2. (mandatory) 6 – (optional) 14
 - 7.5.25.3. Straw poll: Should we keep short slot time support in the draft?
 - 7.5.25.4. (remove) 2 – (keep) 10
 - 7.5.25.5. The comment was rejected base on these straw polls by UC
- 7.5.26. Comment 20
 - 7.5.26.1. Dick: Shouldn't we consider adding something to an Annex that will help resolve this comment.
 - 7.5.26.2. Terry: If we want to add something to Annex E, we could resolve it.
 - 7.5.26.3. Terry: One method is described in Annex E.
 - 7.5.26.4. Resolution adopted by UC
- 7.5.27. Comment 21
 - 7.5.27.1. The proposed resolution was adopted by UC
- 7.5.28. Comment 22
 - 7.5.28.1. Resolved by the editor and the ANA.
 - 7.5.28.2. Adopted by UC
- 7.5.29. Comment 23
 - 7.5.29.1. The proposed resolution was adopted by UC
- 7.5.30. Comment 24
 - 7.5.30.1. The proposed resolution was adopted and the comment was rejected by UC
- 7.5.31. Comment 25
 - 7.5.31.1. The proposed resolution was adopted by UC
- 7.5.32. Comment 26
 - 7.5.32.1. Terry: We didn't see a method of doing short slot times in an IBSS, but we didn't want to preclude a clever implementation that can do short slot times. Therefore, we didn't want to make it normative.
 - 7.5.32.2. There will be a presentation on this topic, so we will hold off until the presentation.
- 7.5.33. Comment 27
 - 7.5.33.1. The proposed resolution was adopted and the comment was rejected by UC
- 7.5.34. Comment 28
 - 7.5.34.1. Comment accepted and the editor was directed to add the appropriate text.
 - 7.5.34.2. This was done by UC
- 7.5.35. Comment 29
 - 7.5.35.1. Duplicate of General Comment X
- 7.5.36. Comment 30
 - 7.5.36.1. Comment resolved by UC
- 7.5.37. Comment 31
 - 7.5.37.1. Comment resolved by UC

- 7.5.38. Comment 32
 - 7.5.38.1. Comment changed to editorial and resolved by UC
- 7.5.39. Comment 33
 - 7.5.39.1. Comment rejected by work done in General Comment 3. Done by UC
- 7.5.40. Comment 34
 - 7.5.40.1. The comment was accepted and the editor was directed to make the appropriate change.
 - 7.5.40.2. Comment resolved by UC.
- 7.5.41. Comment 24
 - 7.5.41.1. Sean Coffey: We need to look at this comment again. If I remember the original discussions, the intent of the body was to not disallow association based on slot time support alone.
 - 7.5.41.2. Terry: Our comment resolution was based on the text, which allows the possibility of disallowing association.
 - 7.5.41.3. Some text was suggested to clarify this.
 - 7.5.41.4. Steve H: It seems that someone may want to set up a network that REQUIRES the short slot time.
 - 7.5.41.5. Sean: That is a very natural thing, but we are trying to guarantee the ability to associate.
 - 7.5.41.6. Terry: The text is actually silent on the association request. The discussion was clear, but the text in the motion is not.
 - 7.5.41.7. Sean: There is a further ambiguity, if there is an overlapping BSS you must switch to a 20 us slot time. There are many situations that we need to be aware of. The first thing is to unresolved comment 24.
 - 7.5.41.8. Comment 24 is now unresolved by UC
 - 7.5.41.9. Matt: What happens in a recirc ballot if we drop below 75%?
 - 7.5.41.10. Chair: We can do another recirc if we can prove that we believe that we will be back over 75% based on the comment resolution.
 - 7.5.41.11. Sean: We should put this off until later.
 - 7.5.41.12. Steve H: If the outcome of this hinges on the inclusion of the short slot time, can we revisit that?
 - 7.5.41.13. Chair: We will have to look at how to do that procedurally.
- 7.5.42. Comment 35
 - 7.5.42.1. Commentor may want to make a presentation, so we will postpone this resolution.
- 7.5.43. Comment 36
 - 7.5.43.1. The commentor felt that the CTS/RTS/NAV had changed base on this. Based on that, we believe that a statement needs to be put into the normative text.
 - 7.5.43.2. The group said that we are not changing the rules.
 - 7.5.43.3. The comment was countered by the suggestion of the SC.
 - 7.5.43.4. The resolution was adopted by UC
- 7.5.44. Comment 37
 - 7.5.44.1. The bits are MAC specific, so they need to be transmitted through MAC communication.
 - 7.5.44.2. The comment was rejected by UC.
- 7.5.45. Comment 38
 - 7.5.45.1. The suggestion was adopted and the length was changed back to 1 with a note saying that the length is important, so it needs to be checked.
 - 7.5.45.2. The resolution was adopted by UC
- 7.5.46. Comment 39
 - 7.5.46.1. The comment was rejected by UC
- 7.5.47. Comment 40
 - 7.5.47.1. Resolved by UC
- 7.5.48. Comment 41
 - 7.5.48.1. Resolved by UC
- 7.5.49. Comment 42
 - 7.5.49.1. Comment put on hold
- 7.5.50. Comment 43
 - 7.5.50.1. The comment was rejected and resolved by UC
- 7.5.51. Comment 44
 - 7.5.51.1. The comment was rejected and resolved by UC
- 7.5.52. Comment 45
 - 7.5.52.1. The comment was countered and resolved by UC

- 7.5.53. Comment 46
 - 7.5.53.1. Request to have Terry speak with Menzo to determine if the paper should be presented.
- 7.5.54. Comment 47
 - 7.5.54.1. The comment was put on hold
- 7.5.55. Comment 48
 - 7.5.55.1. Terry: We found the text definitive, but perhaps it was not clear. The SC all agreed with the resolution.
 - 7.5.55.2. Adopted by UC

Meeting recessed at 10:03 AM until 1:00 PM.

Meeting called to order at 1:29 PM

- 7.5.56. Comment 49
 - 7.5.56.1. The proposed resolution was adopted by UC
- 7.5.57. Comment 50
 - 7.5.57.1. The comment was rejected since there was no proposed solution. Done by UC
- 7.5.58. Comment 51
 - 7.5.58.1. Comment was rejected and the resolution was adopted by UC
- 7.5.59. Comment 52
 - 7.5.59.1. Terry thought that there was a problem with the proposed solution.
 - 7.5.59.2. We looked into it and corrected the resolution.
 - 7.5.59.3. The resolution was adopted by UC
- 7.5.60. Comment 53
 - 7.5.60.1. Withdrawn by commentor
- 7.5.61. Comment 54
 - 7.5.61.1. Bob O'Hara: The question is in the term *modulation*. It seems to be an overloaded term that is not clear.
 - 7.5.61.2. The comment referenced the wrong paragraph, and we decided that we should replace "type of modulation" with "PHY option."
 - 7.5.61.3. The resolution was adopted by UC
- 7.5.62. Comment 55
 - 7.5.62.1. Editor: Where would the proposed text be added?
 - 7.5.62.2. Terry: This is requesting a comment in the normative section.
 - 7.5.62.3. Proposed resolution was adopted by UC
- 7.5.63. Comment 56
 - 7.5.63.1. Proposed resolution was adopted by UC
- 7.5.64. Comment 57
 - 7.5.64.1. Proposed resolution was adopted by UC
- 7.5.65. Comment 58
 - 7.5.65.1. No change recommended
 - 7.5.65.2. Don: The highest mandatory OFDM rate is 24 Mbps.
 - 7.5.65.3. Terry: It appears that if we receive a packet at 54 Mbps, we will ACK at 24 Mbps. I believe that was intentional.
 - 7.5.65.4. Resolution adopted by UC
- 7.5.66. Comment 59
 - 7.5.66.1. The proposed resolution touches the base document, which is beyond the scope of our current PAR
 - 7.5.66.2. Comment rejected by UC
- 7.5.67. Comment 60
 - 7.5.67.1. Commentor's suggestion was accepted and resolved by UC
- 7.5.68. Comment 61
 - 7.5.68.1. Comment adopted by UC
- 7.5.69. Comment 62
 - 7.5.69.1. Comment accepted and adopted by UC
- 7.5.70. Comment 63
 - 7.5.70.1. Comment is rejected, but forwarded to the working group editor function
 - 7.5.70.2. Adopted by UC
- 7.5.71. Comment 64

- 7.5.71.1. Recommendation was adopted and the comment was resolved by UC.
- 7.5.72. Comment 65
 - 7.5.72.1. Other pieces have been clarified, so we believe this meets the commentors requirements.
 - 7.5.72.2. Resolved by UC
- 7.5.73. Comment 66
 - 7.5.73.1. Comment put on hold

Presentation by Matt Fischer regarding Comment 42. Document 11-02-XXXr0 (document number is unavailable due to the problems with the server pluto) entitled "Dynamic BSS Condition"

Questions:

Carl Andren: It looks like you have eliminated the domino effect, but...

Matt: I didn't put the slide on aging, so the aging information will allow to stop transmitting the directive.

Marcus: I don't see that the aging will stop the problem.

Carl: The domino effect still happens. Where ever the boundary is, there is an unfair advantage.

Marty: I think the whole chain is suffering if there is frequency reuse involved. What happens if you scan?

If you are looking to assess the medium and you hear 'g'? Do you transmit 'g' or what do you use.

Terry: Under what conditions does the propagation really go all the way down the chain?

Matt: If the APs are not talking, then it won't propagate.

Matt: If a STA in a fringe, the STA can attempt to reassociate.

Steve: How is this maintaining fairness? It seems to be passing the buck of fairness. I am not sure how this is solving the problem. It seems to be limiting the domino effect.

Matt: I'm not sure that this is passing the buck, but it is limiting the effect of propagation.

Steve: I really like the aging.

Jeff: I agree with all, but the limited propagation part. It seems less bad to be surrounded by long. It seems to worsen the effect for the BSSs on the fringe.

Terry: This leaves us with at reasonable size region around the long guy. Isn't that how it is already?

Matt: It depends on how you deploy APs.

Terry: I think we have that major drawback already.

Marty: Are you messing up roaming algorithms?

Straw polls:

Would you like to see dynamic and static bits moved into their own information element?

Yes: 15 No: 4

Are you worried about a domino effect in general?

Yes: 15 No: 10

Are you worried about ERP BSSs can be locked into long slot times without a recovery mechanism?

Yes: 16 No: 4

Meeting recessed at 3:06 PM until tomorrow morning at 8:00 AM

September 12, 2002

Meeting called to order at 8:17 AM

Discussion by the chair on our potential progress. We may or may not be able to get the recirculation ballot out of this meeting.

Looking at the Agenda in 11-02-536r0.

Unfixing the time for for Agenda Item 12. Change Agenda Item 12 from a special order to a general order. Done by unanimous consent.

Working with 11-02-535r10.

7.5.74. Comment 24

7.5.74.1. We wordsmithed our response because the text is silent on the issue

7.5.74.2. Sean: Let's move on

7.5.74.3. Don Sloan: Let's not move on. I want to hear what we are doing.

- 7.5.74.4. Some more wordsmithing was done, but Sean suggested going back to the original response.
- 7.5.74.5. The old response was readopted by UC.
- 7.5.75. Comment 67
 - 7.5.75.1. Deferred
- 7.5.76. Comment 72
 - 7.5.76.1. The comment was accepted and adopted by UC
- 7.5.77. Comment 70
 - 7.5.77.1. The wording was worked on and accepted by UC.
- 7.5.78. Comment 73
 - 7.5.78.1. We have directed the editor to check each *shall* to make sure there is a PICS entry associated with it.
 - 7.5.78.2. Terry will help Carl complete this activity.
 - 7.5.78.3. Adopted by UC
- 7.5.79. Comment 74
 - 7.5.79.1. Straw poll: Should we delete our changes to Annex C (leaving Annex C and SDL unchanged from base document)?
 - 7.5.79.1.1. 1 (Yes-Annex C is full of SDL as it is now)
 - 7.5.79.1.2. 12 (No-Annex C is empty)
 - 7.5.79.2. Comment is rejected.
 - 7.5.79.3. Adopted by UC
- 7.5.80. Comment 75-77
 - 7.5.80.1. See resolution of Comment 74, comments are rejected.
 - 7.5.80.2. Adopted by UC
- 7.5.81. Comment 78
 - 7.5.81.1. Comment was accepted and a new MIB object was added.
 - 7.5.81.2. Adopted by UC
- 7.5.82. Comment 79-80
 - 7.5.82.1. Similar to 78
 - 7.5.82.2. Adopted by UC
- 7.5.83. Comment 81
 - 7.5.83.1. The text was shown.
 - 7.5.83.2. The comment was accepted and turned over to the editor.
 - 7.5.83.3. Adopted by UC
- 7.5.84. Comment 82
 - 7.5.84.1. Withdrawn by commentor
- 7.5.85. Comment 83
 - 7.5.85.1. The proposed two new MIB variables were adopted by UC
- 7.5.86. Comment 84, 85, and 87
 - 7.5.86.1. Grouped together with 78, by UC
 - 7.5.86.2. Adopted by UC
- 7.5.87. Comment 86
 - 7.5.87.1. Solution adopted by UC
- 7.5.88. Comment 88
 - 7.5.88.1. Deferred
- 7.5.89. Comment 89
 - 7.5.89.1. Proposed resolution adopted by UC
- 7.5.90. Comment 90, 92, 93
 - 7.5.90.1. Rejected base on General Tab Comment 3.
 - 7.5.90.2. Done by UC
- 7.5.91. Comment 91
 - 7.5.91.1. Comment accepted and the sentence was deleted.
 - 7.5.91.2. Done by UC
- 7.5.92. Comment 94, 96-98
 - 7.5.92.1. Grouped by UC
 - 7.5.92.2. Comment accepted and resolved in Resolution of Comment 91.
 - 7.5.92.3. Done by UC
- 7.5.93. Comment 95
 - 7.5.93.1. Comment deferred

- 7.5.94. Comment 99
 - 7.5.94.1. See Comment 19, comment was rejected by UC
- 7.5.95. Comment 100
 - 7.5.95.1. Straw Poll: Should 20 us slot be normative in an IBSS?
 - 7.5.95.2. (Yes) 0 – (No) 16
 - 7.5.95.3. Comment declined by UC
- 7.5.96. Comment 102
 - 7.5.96.1. Similar as 91 (countered by 91 resolution)
 - 7.5.96.2. Resolved by UC

Recessed for Break at 10:00 AM

Meeting called back to order at 10:36 AM

Update about potential TGg interim meeting. This is impossible because it would need to be announced at a plenary.

We could give Carl a little more time by doing some letter ballots after he has some time. There are other possibilities, but we need to finish the comments this week.

Comments are being resolved in 11-02-535r11

- 7.5.97. Comment 101
 - 7.5.97.1. There may be a motion regarding this comment, so we are putting this resolution on hold until later.
 - 7.5.97.2. After careful consideration, Matt Fischer will not be making a motion.
 - 7.5.97.3. Sean Coffey and Matt Fischer may be posting a paper on the reflector if further comments are received.
 - 7.5.97.4. Matt: There is a potential of introducing problems, so we should leave it as is.
 - 7.5.97.5. Sean: The default is to leave it as-is because I don't feel it is broken.
 - 7.5.97.6. Deferred.
- 7.5.98. Comment 103
 - 7.5.98.1. Referred to General 3
 - 7.5.98.2. Resolved by UC
- 7.5.99. Comment 104
 - 7.5.99.1. This will be take offline with the commentor
- 7.5.100. Comment 105
 - 7.5.100.1. Comment rejected and resolved by UC
- 7.5.101. Comment 106
 - 7.5.101.1. Comment was accepted
 - 7.5.101.2. Resolved by UC
- 7.5.102. Comment 107
 - 7.5.102.1. Same resolution from 105. Done by UC
- 7.5.103. Comment 108
 - 7.5.103.1. Comment rejected and sent to the working group editor function. Done by UC
- 7.5.104. Comment 109
 - 7.5.104.1. Referred to General 3 and rejected
 - 7.5.104.2. Resolved by UC
- 7.5.105. Comment 110
 - 7.5.105.1. It looks like there will be some acceptance of the solution, but will be taken offline
 - 7.5.105.2. Ken Clemments: Anything that gives priority of one station over others is inherently a QoS issue and not appropriate for this group.
 - 7.5.105.3. Deferred until later
- 7.5.106. Comment 111
 - 7.5.106.1. The comment was rejected and resolved by UC
 - 7.5.106.2.
- 7.6. Revisiting Clause 19 (Steve Halford)
 - 7.6.1. Comment 34
 - 7.6.1.1. The editor will create a table like Table 101 and put in the OFDM section that applies specifically applies to ERP radios, so there should be no conflict.

- 7.6.1.2. Resolution adopted by UC
- 7.6.2. Comment 53
 - 7.6.2.1. Carl: We should remove CCA mode 4 with the timeout option
 - 7.6.2.2. Marcus: If we remove CCA mode 4, we need to make sure that the numbering is consistent
 - 7.6.2.3. Terry: The way the MIBs work, the numbering doesn't really matter. It is nice, but not mandatory.
 - 7.6.2.4. Carl: The carrier sense and energy sense was mode 5 in 11b, so we should keep the number 5
 - 7.6.2.5. Steve: Is there a problem with deleting it?
 - 7.6.2.6. Carl: No
 - 7.6.2.7. Srikanth: It was my understanding that 11-02-589 was going to address this comment.
 - 7.6.2.8. Steve: That issue was going to come up next, so I wrote that up in 11-02-589
 - 7.6.2.9. Chair: Let's look at 11-02-589 and then look at eliminating CCA mode 4
 - 7.6.2.10. Steve: lets look at CCA because that is a separate issue that 11-02-589.
 - 7.6.2.11. Straw poll: In favour of removing CCA mode 4 from the TGg draft?
 - 7.6.2.11.1. Discussion:
 - 7.6.2.11.1.1. Jan: It doesn't hurt to have it, but no one is doing CS only. It is a historical mode that has no use.
 - 7.6.2.11.1.2. Carl: The 1.3ms was there because the header was at 2Mbps. The 1.3ms came from the 5.5Mbps mode. We should take it out because
 - 7.6.2.11.1.3. Dick: Do we cause more NO votes by taking it out?
 - 7.6.2.11.1.4. Mark: There was an equivalent mode in DSSS before there was 11b. This was for the case of 0dB SNR situations. In 11g, do we need to protect 1Mbps DSSS signals? If so, we should change this section. I am in favour of removing this.
 - 7.6.2.11.1.5. Mark: If a radio does not have a good ED capability, they could do CCA mode 4, otherwise they cannot be used. I may have flip-flopped.
 - 7.6.2.11.1.6. Jan: If we allow CCA mode 4, you need a timer and we have to set it to a value. In some situations it may cause more problems than necessary.
 - 7.6.2.11.2. Vote:
 - 7.6.2.11.2.1. Yes: 21
 - 7.6.2.11.2.2. No: 3
 - 7.6.2.12. Jan: Is anyone aware of any NO votes that would be generated by this removal?
 - 7.6.2.13. No one knows of any NO votes that this would generate.
 - 7.6.2.14. CCA mode 4 is removed from the draft by UC
 - 7.6.2.15. The comment was resolved by UC
- 7.6.3. Document 11-02-589r0, presented by Steve Halford
 - 7.6.3.1. There will need to be some modifications based on the previous resolution
 - 7.6.3.2. Jan: PHY slot boundary is not really defined in the standard. Change to "slot boundary on the medium"
 - 7.6.3.3. Straw Poll:
 - 7.6.3.3.1. Adopt proposal that:
 - 7.6.3.3.1.1. 1. Common ED threshold level for DSSS and OFDM modulations (still a function of TX power)
 - 7.6.3.3.1.2. 2. ED threshold set as a function of modulation (-76 dBm for DSSS and -82 dBm for OFDM)
 - 7.6.3.3.1.3. 3. No change
 - 7.6.3.3.1.4. 4. Some other change
 - 7.6.3.3.1.5. People can vote for more than one
 - 7.6.3.3.1.6. Vote: (1) 28 – (2) 16 – (3) 2 – (4) 3
 - 7.6.3.3.2. Carl: I would propose #1 without Tx Power
 - 7.6.3.3.3. Chair: Lets add another option and vote again (since it was a non-exclusive vote)
 - 7.6.3.3.3.1. 5. Common ED threshold level for DSSS and OFDM modulations at -76 dBm (not a function of TX power)
 - 7.6.3.3.3.2. (5) 29 votes

Meeting recessed at 12:00 PM for lunch

Meeting called to order at 1:18 PM

7.6.3.3.4. Reviewed the straw poll result

7.6.3.3.5. No one said this would be a great issue and would not likely generate a NO vote.

- 7.6.3.3.6. Straw Poll
 - 7.6.3.3.6.1. Adopt a proposal that:
 - 7.6.3.3.6.2. 1. Common ED threshold level for DSSS and OFDM modulations (still a function of TX power)
 - 7.6.3.3.6.3. 2. Common ED threshold level for DSSS and OFDM modulations at -76 dBm (not a function of TX power)
 - 7.6.3.3.6.4. Mutually exclusive vote
 - 7.6.3.3.6.5. (1) 5 – (2) 22
- 7.6.3.3.7. Document 11-02-589r1 was shown with the modifications for the CCA time.
- 7.6.3.4. The text in 11-02-589r1 was adopted by UC
- 7.6.4. Comment 55
 - 7.6.4.1. The text in 11-02-589r1 was approved and this was agreed that it adequately addressed the comment.
 - 7.6.4.2. Resolved by UC
- 7.6.5. Comments 56-60
 - 7.6.5.1. Resolution of Comment 55 for 56-60 is adopted by UC
 - 7.6.5.2. These comments were resolved by UC

We are now working with 11-02-535r12

- 7.7. Clause 19.5 & 19.6 Tab
 - 7.7.1. Comment 12 and 14
 - 7.7.1.1. Accepted and resolved by UC
 - 7.7.2. Comment 15
 - 7.7.2.1. Resolution adopted by UC
 - 7.7.3. Comment 17
 - 7.7.3.1. Resolution adopted by UC
- 7.8. Editorial
 - 7.8.1. Comment 3
 - 7.8.2. Comment 10
 - 7.8.2.1. Question of *network* vs. *BSS*. What is more appropriate?
 - 7.8.2.2. We agreed to go with BSS
 - 7.8.3. Comment 30
 - 7.8.3.1. Comment is withdrawn
 - 7.8.4. Comment 57
 - 7.8.4.1. Added Modulation Type to the RXVECTOR
 - 7.8.5. Comment 71
 - 7.8.5.1. Question about the Japan regulatory rules?
 - 7.8.5.2. These are recommendations, but we don't want to have untruths
 - 7.8.5.3. This is an editorial issue and we will correct if this is not true.
 - 7.8.5.4. This was done by UC
 - 7.8.6. Comments 102-103
 - 7.8.6.1. Editor prefers not to change this
 - 7.8.6.2. Commentor said it would be okay to leave the same
 - 7.8.7. The use of the word *subclause* is discouraged by the IEEE.
 - 7.8.7.1. Adrian: Made the comment based on the style guide from the IEEE-SA
 - 7.8.7.2. Terry: This will be rolled up in a consistent manner by the IEEE-SA staff
 - 7.8.8. Comment 198
 - 7.8.8.1. Bit names.
 - 7.8.8.2. Terry: Bit names are okay, but we should avoid using a name that might be misinterpreted
- 7.9. Question related to short and long preambles by Uri.
 - 7.9.1. Uri: If there is a legacy STA, it cannot support short preamble, so it needs the use of a protection mechanism.
 - 7.9.2. Steve: You don't need to use protection mechanisms.
 - 7.9.3. Carl: If there is a legacy STA that doesn't use short preamble, then the BSS will switch to long preamble.
 - 7.9.4. Uri: It is not a reason to reject association?
 - 7.9.5. The group consensus is that the AP can reject association for any reason.
- 7.10. Non-Clause 19 comments

- 7.10.1. Comment 26
 - 7.10.1.1. Comment is declined by UC
- 7.10.2. Comment 29
 - 7.10.2.1. Comment was resolved by Clause 19 Tab Comment 11.
 - 7.10.2.2. Comment rejected.
- 7.10.3. Comment 35
 - 7.10.3.1. Proposed resolution is adopted by UC
 - 7.10.3.2. Comment rejected
- 7.10.4. Comment 42
 - 7.10.4.1. The proposed resolution was adopted by UC
- 7.10.5. Comment 46
 - 7.10.5.1. Straw poll:
 - 7.10.5.1.1. Should "CTS to Self" protection mechanism be added to DCF as part of the 802.11g draft?
 - 7.10.5.1.2. Discussion
 - 7.10.5.1.2.1. Steve: It looks like it is in the TGe draft.
 - 7.10.5.1.2.2. Jan: It increases the probability of NO votes.
 - 7.10.5.1.2.3. Marcus: If it is useful, then we should added
 - 7.10.5.1.2.4. Albert: The duration can be set for milliseconds, so the protection mechanism can be for a long period.
 - 7.10.5.1.2.5. Adrian: The idea of CTS to self is for hidden nodes, we shouldn't play with the duration field in this group.
 - 7.10.5.1.3. Yes: 23 – No: 2

Meeting recessed at 3:00 PM for the break.

Meeting called back to order at 3:52 PM

- 7.10.5.1.4. Comment put on hold
- 7.10.6. Comment 47
 - 7.10.6.1. Proposed resolution was adopted and the comment was declined by UC
- 7.10.7. Comment 67
 - 7.10.7.1. See clause 19 comment 40. The comment was rejected.
 - 7.10.7.2. Adopted by UC
- 7.10.8. Comment 88
 - 7.10.8.1. Proposed resolution was adopted by UC
- 7.10.9. Comment 95
 - 7.10.9.1. Comment is declined based on the resolution and by UC
- 7.10.10. Comment 101
 - 7.10.10.1. Proposed resolution was adopted by UC.
- 7.10.11. Comment 104
 - 7.10.11.1. Proposed resolution was adopted by UC.
- 7.10.12. Comment 110
 - 7.10.12.1. Comment was rejected and resolution was adopted by UC.
- 7.10.13. Comment 66
 - 7.10.13.1. Matt Fischer: There are a couple of potential solutions. One solution is to have the PHY return a set of parameters, but it will take a bit of text on the MAC side. An alternative is to withdraw the comment.
 - 7.10.13.2. Terry: At the moment, I am not sure the option is complete.
 - 7.10.13.3. The authors have offered to withdraw this.
 - 7.10.13.4. The comment was withdrawn.
- 7.11. Clause 19
 - 7.11.1. Comment 35-36
 - 7.11.1.1. The group decided that it is correct as it is and we don't want to change it.
 - 7.11.1.2. The distinction is intentional.
 - 7.11.1.3. See non-Clause 19 row 47
 - 7.11.1.4. Comment countered by UC
- 7.12. Non-Clause 19
 - 7.12.1. CTS to self discussion Document 11-02-332r0 was presented by Menzo
 - 7.12.1.1. This is a replacement for RTS/CTS

7.12.2. Motion:

7.12.2.1. Move to adopt the CTS only mechanism specified in document 11-02-332r0 into the 802.11g draft.

7.12.2.1.1. Marcus: Does this really make sense from the AP point of view.

7.12.2.1.2. Menzo: If you have hidden nodes, then RTS/CTS would be better. If I were an AP, I would use this. In most case this is better.

7.12.2.2. Moved: Menzo Wentink

7.12.2.3. Seconded: Jan Boer

7.12.2.4. Vote: 22-0-0

7.12.3. This resolved Comment 46 by UC.

There was a pause to let the editor work on a few final changes to show to the group.

We had a brief discussion about the plan going forward. We are likely to have a 15 day letter ballot two weeks after the meeting to give the editor a little more time to polish the draft. That way, we will be able to go to sponsor ballot in Hawaii.

8. Presentation of Draft

8.1. Abandoned

9. Motions and Submissions related to Draft

9.1. Motion

9.1.1. Move to direct the TGg editor to produce draft 4.0 of the IEEE 802.11g draft based on the approved comment resolutions in document 11-02-535r14 within two weeks of the close of the September 2002 interim session.

9.1.2. Moved: Jan Boer

9.1.3. Seconded: Kevin Smart

9.1.4. Discussion

9.1.4.1. none

9.1.5. Vote 23-0-0

9.2. Motion

9.2.1. Move to request that the IEEE 802.11 Working Group issue a 15 day letter ballot two weeks after the close of the September 2002 Interim session. The letter ballot shall include a motion to issue a 15 day recirculation ballot on the IEEE 802.11g draft 4.0.

9.2.2. Moved: Kevin Smart

9.2.3. Seconded: Hinsz

9.2.4. Vote: 25-0-0

10. Presentation of Draft

10.1. Abandoned

11. Joint Meeting with 802.18

11.1. Did not happen

12. Motions related to forwarding Draft

12.1. Abandoned

13. New Business

13.1. none

14. Unfinished Business

14.1. none

Adjourn at 5:31 PM

**IEEE P802.11
Wireless LANs**

TGh minutes, September Interum meeting, Monterey, CA

September 12, 2002

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Joint RR session opened by Mika/Carl 3:30pm Monday

Status update by Mika Kasslin, 02/541r0 Tentative LB42 results

September 2002

doc.: IEEE 802.11-02/541r0

Tentative LB42 Results

Yes: 208

No: 24

Approval ratio: 89.7%

Abstain: 38

241 new comments

Submission

Slide 2

Mika Kasslin, Nokia

Review of 802 operating rules and IP disclosures by Mika Kasslin

Motion (Procedural) to accept agenda in document 02/540r0

Moved: Peter Ecclsine
Seconded: Chris Hansen
Passed with no objections

Motion (Procedural) to accept minutes of July meeting in document 02/435r0

Moved: Andrew Myles
Seconded: Bruce Kramer

Passed with no objections

LB42 comments presentation 02/541r0 by Mika Kasslin

Plan for the week is to have breakout sessions.

Group leaders:

- Generic Group: Al Garret
- Management req/resp: Chris Hansen
- DFS: David Skelrn (after Tue AM)
- MLME SAP: Simon Black

Interim reports from adhoc groups were given Tue at 1pm.

Straw poll: Should we deny association to stations without spectrum management capability? (section 11.5 line 1236)

Keep as is (AP may allow): 13

Deny association: 5

TGh Wednesday Sept 11 8am-10am session

Start with prezo by Loir Ophir on 'Forward Compatibility Hooks for 802.11h'. 11-02-XXXr0a-H-Forward_Compatibility_Hooks_for_802_11h in Working Group area

Concerns on channel numbers and bits in Basic Report

Andrew Myles – could define another report with 16 bits

Peter Ecclesine – an octet in 802.11d means 200 5MHz channels can be numbered in an octet. The Japan 4.9 band is an example of the next standard picking it up.

Gunther Kleindl – forward hooks only if it does not delay the standard

Mika Kasslin – our action frames also address the future. Is concerned that changes to draft lead to comments about why the changes were made.

Loir Ophir – this issue does respond to some commenters

Simon Black – has sympathy with this but asks “why can't the future standard address this issue?”

Second prezo

Would add an octet of band field to several messages

Issue with country element

Vijay Patil – fear that forward-looking has to work across groups, e, i, etc. and this group is not alone in the implementation

Straw poll “Would you like to see simple forward compatibility hooks inserted in the 802.11h draft to support future extensions for other regulatory domains, other frequency bands, other purposes?”

Yes: 2

No: 10

Don't care: 0

Maybe: 1

Yes, provided that we do not hold up our progress: 3

Continue review of tentative resolutions to LB42 comments

Mika Kasslin presented 498r2 comments from LB36

David Skellern presented DFS comment resolutions

David Skellern proposed to change 11.5, 11.6 introductory text to make consistent with agreements reached this week. Accepted with no objections.

Straw poll by Chris Hansen:

How many people would like to keep the +/3dB differential tolerance in section 7.3.2.12

For: 7

Against: keeping +/- 3dB tolerance: 4

Thursday session 9/12

Motion (technical) to approve document 02/515r6 as comment resolutions for LB 42

Moved: Chris Hansen

Seconded: Andrew Myles

Yes: 15

No: 0

Abs: 1

Motion (technical)

1. TGh will make TGh draft revision 2.2 corresponding to the LB42 comment resolutions (02/515r6) available to the membership via the 802.11 members only area of the web site by October 2002.
2. The TGh chair is instructed to issue a 15 day electronic ballot (where non-response is taken as assent) asking the membership the following question: *Shall TGh draft 2.2 be issued for WG re-circulation ballot?*
3. The TGh chair shall then start the re-circulation ballot depending on the outcome.

Moved: Andrew Myles

Seconded: Chris Hansen

Yes: 19

No: 0

Abs: 0

Meeting adjourned with no objections (with applause however).

**IEEE P802.11
Wireless LANs**

**TGi Monterey Interim Meeting Minutes
September 2002**

Date: September 9-13, 2002

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Abstract

Minutes of the 802.11 Task Group I (security) meetings held during the 802.11 WLAN Working Group Interim Session in Monterey, CA from September 9th – 13th.

Monday**Call to Order & Agreement on Agenda**

Meeting called to order on Monday, September 9, 2002 3:35pm by Chair Dave Halasz.

Chair: Discussion on the Agenda – needs to be approved

Proposed Agenda:

- Chair's Status
- Ad hoc in San Jose
- Review IP Policy
- Fixed meeting times.
 - TGe discussion Tues 10:30am
 - WIG discussion thurs 1pm
- Comment resolution of LB35 (draft 2 of TGi)
 - Request submission presentation
 - Comment resolution
 - Review LB35 comments
 - Comment resolution
 - General submissions
- Prepare for next meeting

Chair: We could add for Wednesday or Thursday to decide to go to LB. We may be able to do it.

Comment: How much time is needed before Friday?

Chair: Editor's text must be available 4 hours to TG to vote on going to LB on Thursday night.

Chair: In Vancouver we said we wanted to do a line-by-line review. We have not done that yet. Motions may come out of that.

Chair: If we do not go to LB this meeting, we will need to decide if we want another ad hoc before Hawaii.

Chair: Do we want to add a time for a LB vote to the agenda?

No response.

Comment: Are there times in the agenda for presentations?

Chair: Yes

Chair: Any objections to adding a general submissions to the end?

No

Chair: Are there further comments on the agenda?

None. Agenda adopted.

IEEE Patent Policy – doc 00/278

Chair reviewed IEEE patent policy per Stuart Kerry's request.

Chair: Are there any questions?

None.

Submissions for comment resolution

Dave Halasz 02/521 Ad Hoc discussion suggested motions.

Tim Moore – 2 motions for draft

Tim Moore 02/298r4 – update to 298

Tim Moore 02/499 – IBSS

Tim Moore 02/545 – Password to PMK Mapping

Paul Lambert 02/xxx OCB MSDU Vs. MPDU - Wednesday

Paul Lambert 02/xxx CCMP MIC Processing - Wednesday

Paul Lambert 02/xxx New test vectors for CCMP - Wednesday

Dorothy Stanley 02/542 CCMP replay and state text. – Tuesday evening

Dorothy Stanley/Arnoud Zwemmer 02/xxx RSN MIB – Tuesday evening

Pej R. 02/xxx Frame exchange

Clint Chaplin 02/477 – PRF

Frank Ciotti – 02/xxx – RSN IE MIB objects – Thursday

Chair: Is there further comment resolution submissions?

None

General submissions:

Tim Moore 02/547 – Validate Deauthentication & Disassociate messages.

Robert Moskowitz 02/516r0 – RADIUS client kick-start.

Chair: Any others?

None.

Jesse: Where in the agenda are we going to have architecture discussion?

Chair: With TGe.

Chair: Any submissions for TGe discussion?

None.

Chair: What are we going to do during the TGe joint meeting? We don't have an agenda. If there is nothing to drive it, it is a waste of time.

Paul Lambert is willing to work with somebody on discussion topics.

Chair: I suggest a group of us meet at 8:00am Tuesday to create an agenda for the 10:30am joint meeting.

Dorothy: There are several open comments that deal with TGe and TGi interaction. At the ad hoc we said we should base TGi on the 1999 spec. Side channel, etc. are not in our charter.

Chair: I'm all for that, but we should have a submission.

Dorothy: One way to do that is to go back to the closed comments.

Jesse: TGe is making decisions that affects our architecture, and vice-versa. We need a way to solve this.

Comment: Procedural question. This meeting room is scheduled for both TGe & TGi. It will not be large enough.

Chair: New schedule (R5). TGf adjourned for the week. Now TGe has meeting at the same time at the joint meeting. I will talk to John F. (TGe chair).

Comment: TGe will have the large room upstairs all day tomorrow.

Chair: We will meet up there then at 10:30am for the joint meeting.

Chair: Suggest we meet at 8am tomorrow at the coffee service to discuss TGe agenda items.

Submissions for comment resolution

Dave Halasz – doc 02/521 - Suggested Motions From August 2002 TGi Ad-Hoc Meeting

Motion by Jesse Walker:

Remove the following text from clause 5.7.7:

“When 802.1X authentication was used between two RSN-capable STAs, Deauthentication frames are not permitted at the MAC level.”

Second: Nancy Cam-Winget

Discussion:

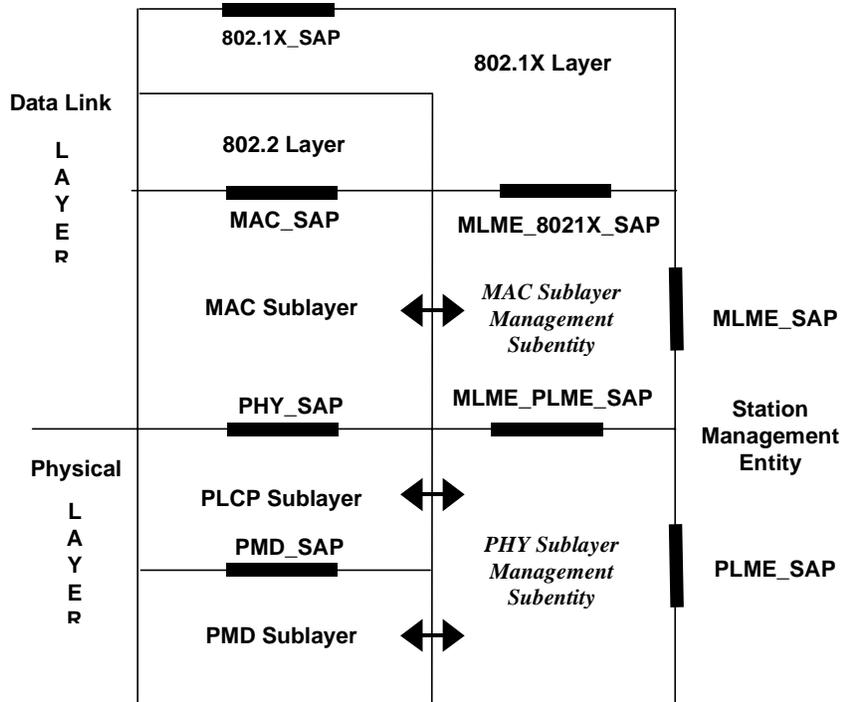
None.

Vote: 26-0-3 Passes

Motion by Butch Anton:

Replace the figure in clause 5.8 with the following figure,

Second: Dorothy Stanley



Discussion:
None.

Vote: 22-2-4 Passes

Motion by Jon Edney:

Replace the following text from clause 5.9.3,

“Since the Supplicant/Authentication Server authentication is carried over the Authenticator/Authentication Server secure channel, the Authentication Server can guarantee that the Authenticator it is communicating with is the same Authenticator that the Supplicant is communicating with.”

With the following text,

“The Supplicant/Authentication Server authentication is carried over the Authenticator/Authentication Server channel. The security of the Authenticator to Authentication Server communication is outside the scope of TGi.”

Second: Albert Young

Discussion:
None

Vote: 22-1-2 Passes

Motion by Dorothy Stanley:

Remove the following text from clause 5.9.2 (first paragraph, last two sentences):

“The association exists only for a period of time sufficient for authentication to take place. Should authentication not be completed within that time, the station noticing the delay will disassociate its peer.”

Second: Jesse Walker

Discussion:

Dorothy: This text is in the clause describing use of 802.11 within 802.1x. It's not accurate.

Comment: Its not true that the association lasts for a short period of time.

Vote: 23-1.2 Passes

Motion by Jesse Walker:

Replace the following text from clause 7.3.2.17,

5. “A STA supports TKIP.”

With the following text,

5. “A STA supports CCMP.”

Second: Nancy Cam-Winget

Discussion:

Comment: Please explain.

Jesse: Document 02/298 states that the default is TKIP. That is not true – AES is default.

Vote: 25-1-2 Passes

Motion by Tim Moore:

At the following text from clause 7.3.2.17,

“The cipher suite selector 00:00:00:0 “None” is only valid as the unicast cipher suite. An AP may specify the selector 00:00:00:0 “None” for a pairwise key cipher suite if it supports none of the pairwise cipher suites proposed by the STA. An AP shall not specify the selector 00:00:00:0 “None” as the group key cipher suite selector.”

Add the following text,

“The group key cipher suite selector in the Associate Request and the Re-associate Request shall match the value the STA received in the Probe Response or the Beacon.”

Second: Dorothy Stanley

Discussion:

None.

Vote: 24-0-2 Passes

The following discussion resulted from the motion on how to derive a GTK for WEP per doc 02/521r0:

Comment: I don't remember the PRF 192. Draft 2.0 has 192. The latest 02/298 replaced it with 256 because the key counter was changed.

Chair: So the 192 should be removed?

Comment: I thought WEP was deprecated. By adding 104 bit support here, we are extending the draft to support WEP.

Jesse: We're not advocating its use.

Chair: Does that mean we need to add the use of 104 bit WEP to the text?

Comment: What was the agreement on 104 bit WEP?

Chair: It is straightforward to add 104 bit support.

Comment: Is this multicast mapping necessary for WEP?

Chair: That is a good argument for it.

Chair: I will change the motion from PRF192 to PRF104 and make a version R1 of the draft for the motion.

Jesse: I suggest we re-work this text off-line and then submit. If we do it now we may get it wrong.

Chair: Agree. Any objection?

None.

Action: work on new text for motion.

Motion by Albert Young:

Remove clause 8.8 from the draft.

Second: Tim Moore

Discussion:

Comment: Since I wasn't at the ad hoc meeting, could you explain the rational?

Chair: How do we introduce text relating to another TG's draft. Shouldn't this be up to TGe to resolve? This will be part of the discussion for tomorrow's joint meeting. There are two ways to solve it – shared key & 802.1x ad hoc.

Jesse: we cannot get past SB if we make a reference to unadopted standards (e.g. TGe). We decided to remove all text related to TGe and make motions out of them. Whoever gets to SB last will adopt these motions.

Comment: We are depending on text from another TG. If that text changes, our draft is then wrong.

Vote: 24-0-3 Passes

Motion to remove the RSN bit from the draft since it is redundant with RSNE.

Motion:

Remove the RSN bit from the TG_i draft.

Second: None – motion postponed.

Discussion:

Comment: Currently the text defines the difference between RSN & TSN as a TSN has IE but not RSN bit. How would you differentiate?

Tim: If the multicast cipher suite is WEP, then TSN.

Comment: So an RSN cannot use WEP?

Tim: Correct.

Dorothy: Do we want to have more discussion on this? It is a bit confusing.

Chair: We may want to make a motion after further discussion.

Tim: This affects other text in the draft. We need more work.

Comment: The use of the privacy bit is along these lines.

Chair: I suggest we form an ad hoc group to draft a motion on this.

Chair: Action - Delay motion until later this session.

Motion:

At the end of clause 5.2.2.2, add the following,

- The Robust Security Network does not provides a number of security features. These features notably include:
- Protection of management and control packets
 - Guarantee of packet delivery

The lack of protection of management and control packets can lead to Denial Of Service attacks. Since packet delivery is not guaranteed, care must be taken to ensure Supplicant and Authenticator state agreement and to prevent replay attacks.

Second: none – motion postponed.

Discussion:

Comment: 802.11 does not guarantee packet delivery, why would it be assumed that an RSN would?

Comment: Suggest rewording.

Comment: Who is the intended audience of this message?

Chair: If a packet cannot be delivered, AP will disassociate STA. This is a note to implementer.

Comment: It would be better to put it a positive way.

Comment: This adds clarity on mgt & control frame processing.

Comment: This doesn't say that.

Comment: When people read this, they will think, why didn't TG_i do this?

Comment: We could say that the cost of adding the protection was too high.

Comment: Let's take it off line and revise it.

Chair: Action - Delay to later in the week.

Discussion #1

[Clarify the usage of the Privacy bit, in the capability information field 7.3.1.4, when RSN is in use.]

Introduction:

From 7.3.1.4,

APs set the Privacy subfield to 1 within transmitted Beacon, Probe Response, Association Response and Reassociation Response Management frames if WEP encryption is required for all Data Type frames exchanged within the BSS. If WEP encryption is not required, the Privacy subfield is set to 0.

STAs within an Independent BSS set the Privacy subfield to 1 in transmitted Beacon or Probe Response Management frames if WEP encryption is required for for all Data Type frames exchanged within the IBSS. If WEP encryption is not required the Privacy subfield is set to 0.

From 5.1.1.4

A **Robust Security Network** (RSN) depends upon IEEE 802.1X to deliver its authentication and key management services. All stations and access points in an RSN contain an 802.1X Port entity that handles many of these services. This document defines how an RSN utilizes IEEE 802.1X to access these services.

A **Transition Security Network** (TSN) is an RSN that also supports unmodified pre-RSN equipment. A TSN is defined only to facilitate migration to an RSN. A TSN is insecure, since the pre-RSN equipment can compromise the larger network.

With RSN & TSN, 802.1X packets are Data packets that may not be encrypted.

Discussion #2

Action: Remove the following comment from clause 8.7. To be replaced with either a motion or an explanation why the text is correct.

[Editor's note: The pseudo-code below is not correct. It does not take the MIC into account.]

Discussion #3

Action: create a PICS Proforma.

Chair: Tim and I discussed. We may have some information that may act as the basis for this.

Discussion #4

Action: A motion is needed to in September to add submission 02/477r1 to the draft as an informative appendix.

Chair: This is the PRF. Clint will make a presentation later on.

Discussion #5

Action: A motion is needed to add a MIB object for the Preshared Key.

Chair: Dorothy, Arnoud & Frank working on this.

Discussion #6

Action: Based on comment 312, a motion is needed to add an informative annex to the draft describing the entire message flow starting from establishing the AS/Authenticator key, Associating to the BSS, authentication, unicast key distribution (4-way handshake), group key distribution, data transfer, (rekey?), and Disassociation.

Chair: We are well on our way to handling this.

Discussion #7

Action: Remove following comment from clause 5.9.3

[Editor's note. Using the Group key to send unicast packets is inconsistent with the rest of the document. The remainder of the document does not permit group keys to be used to send unicast packets. This needs to be clarified.]

Comment: Why was this requirement in there?

Comment: For AP's that could not support Key Mapping.

Comment: Who cannot do this?

Comment: I thought somebody stated that they could not.

Discussion #8

Action: Add an agenda item (either to this meeting or in Monterey) to discuss the use of group keys for unicast transmissions. In the past we have said yes. Also, we need to discuss the downgrade of an RSN to a TSN if a non-RSN capable station joins the BSS.

Discussion #9

Action: Possible motion to remove changes to clause 6.2.1.2.2. Discussion required.

<end of motions and discussion items from doc 02/521r0>

Chair: We have 20 minutes until dinner break. Tim, is there enough time for your two motions?

Tim: We can try.

Motion by Tim Moore:

The ordering of the IEs in the management packets incorrect

Motion to change the order number as follows:

- change 7 in 7.3.2.1 (Beacon) to 14
- change to 5 in 7.2.3.4 (Assoc req)
- change to 6 in 7.2.3.6 (Re-assoc req)
- change to n+1 in 7.2.3.9 (Probe res)

Second: Jesse Walker

Discussion:

Comment: Duncan suggested that everything after 11d, was to put things in the order of their IE number. Changes the written policy.

Tim: Do we have an official policy yet?

Comment: I haven't seen text yet from Duncan.

Chair: If Tim's motion goes through, it is harmless.

Tim: If Duncan's policy is correct, it superseded this.

Jesse: Suggest we talk to Duncan first.

Comment: Assignment is independent of IE order?

yes.

Comment: I don't see any harm in going forward with this. It brings current text up to date.

Vote: 23-0-4 Passes

Motion by Tim Moore:

With the change of TKIP IV to 48bits do not need some sections in the draft for IV thresholds

Motion to remove the following sections and MIB variables

- 10.3.11.3 mlme-setkeys.indication
- MIB variables
 - WEPKeyMappingIVMax
 - WEPKeyMappingThreshold
 - WEPDefaultKeyIVMax
 - WEPDefaultKeyThreshold

Second: Arnoud Zwemmer.

Discussion:

Chair: Are these needed for the initial draft standard?

Tim: Needed for TKIP to rekey.

Chair: We added these?

Tim: Yes.

Comment: Don't we need an indication for 4-way handshake?

Tim: No. We don't do 4-way handshake because of IV.

Comment: Not applicable to re-key per se.

Tim: MIB currently indicates re-key. We would have to redefine it.

Comment: Is there another object that indicates that the keys have been set?

Tim: Why would the upper layer need to know?

Comment: Some upper layer may want to know.

Tim: Would require redefinition.

Vote: 29-0-1 Passes

Chair: Any objection to recessing until 7:00pm?

None.

In recess at 5:24pm

Resume 7:10pm

Chair: Reminder to meet at 10:30am tomorrow for the joint TGe/TGi meeting at the TGe room. At 8:00am we will meet to prepare at the coffee service upstairs..

Comment: Where is the latest draft on the server?

Chair: Jesse would be the best person to ask, but he's not here right now.

Presentation – Tim Moore – doc 02/298r4 – Suggested changes to RSN.

- Result of a group of people trying to implement. They have 4-way handshake, TKP & Michael working.
- Doug & Jesse found an issue with the Group key and sequence counter. Now passing sequence counter in EAPOL-Key message.
- Michael tx/rx fix
- Clarify use of multicast cipher in assoc request.
- Some fixed in the authenticator state machine.
- Bit/octet convention issue. 298 referred to 802.11 for one field, but not for others. All EAPOL msgs now use 802.1x convention
- Change EAPOL-Key MIC to HMAC-MD5 for AES case.

Comment: Wouldn't the length be known before hand?

Tim: Not if it was hacked.

Comment: Why does MD5 help?

Tim: With CBC-MAC, pkt could be changed to be out of order and couldn't detect.

Motion by Tim Moore:

Motion to incorporate changes in 02/298r4 into TGi draft

Second: Donald Eastlake

Discussion:

Comment: What are the miscellaneous changes?

Tim: They are in the doc.

Motion by Paul Lambert:

Motion to postpone to until the 1:00 pm session on Tuesday.

Second: by Alan Chickinsky

<No discussion on procedural motion>

Vote: 13-1-6 Passes

Presentation - Tim Moore – doc 02/499r1

Tim: Support "ad hoc" nature of IBSS. Every station has an authenticator and supplicant. Use the 4-way handshake to distribute the group key. Similar counter measures as used for ESS case.

Comment: Why would the first message cause them to bootstrap?

Tim: The rule is you get a new key if you cannot decrypt broadcast.

Comment: How do you changed the fixed keys? How do you detect?

Tim: The 4-way handshake fails.

Comment: But it won't work until you change all the stations?

Tim: Right.

Comment: If a rogue STA changes it key, does it force all stations to change?

Comment: No, they are manual keys. The handshake will fail, that is all

Comment: A bootstrap will force a cascade of 4-way handshakes.

Tim: Yes.

Comment: Also, won't this invoke countermeasures?

Tim: No, the MIC won't fail.

Comment: This doesn't seem to scale well.

Tim: Yes, the startup will be tough.

Comment: Each STA must maintain a table of all keys for other STAs it is communicating with. This may be an issue.

Tim: Yes.

Comment: Problem with startup. In IBSS you can't join, may drain resources. You can't tell from the broadcast if the msg came from a network you want to join or not.

Tim: True.

Comment: In IBSS, I don't think there is a need for pairwise keys.

Tim: You need the pairwise key for distributing the group key at the very least.

Chair: Does anyone have a concern with ad hoc scalability?

Comment: Ad hoc will not scale well be design.

Comment: All the STAs would not coalesce to a common broadcast key?

Tim: No

Comment: How is it done with the limited number of key indexes?

Tim: Wait to the next slide.

Tim: Cipher negotiation

AKMP and multicast must be the same

Unicast negotiation is in the 4-way handshake

Tim: We need to determine if pairwise keys are useful in this environment.

Comment: You're not trying to protect from other members of the network.

Tim: Someone can determine the keys based on the nonce.

Tim: We changed the rules – two key mappings keys for each STA. One for pairwise and one for broadcast.

Comment: How different are the key lookup rules?

Tim: For ESS it is the same. Same also for unicast ad hoc. For broadcast ad hoc, use a different lookup table.

Tim: Shall I hold the motion to include this doc into the draft until 1:00pm tomorrow?

Consensus is yes.

Comment: How much of this is above the MAC.

Tim: The biggest part is in 802.1x and the Authenticator.

Chair: How many people have created a Supplicant at this point?

Tim: Two that I know of.

Comment: You're basically making every terminal into an AP?

Comment: Yes.

Comment: Why not just do that?

Comment: How is that simpler?

Chair: How this is got started is that some people wanted ad hoc being centrally controlled. Others said it should be de-centralized.

Comment: TGe has a proposal that does this that they are about to throw it out.

Tim: An IBSS STA will have a different broadcast key for every STA it receives from.

Comment: Which is different than the AP model.

Chair: Any other comments on 02/499?

None.

Jesse: The latest draft in on server in ToDockkeeper.

Presentation – Tim Moore, Doug Whiting, Jesse Walker – doc 02/545r0 - Mapping Password to PSK

Standardize a method to generate a 256 bit PSK from an ASCII password.

PSK = PBKDF2(password, ssid, ssidlen, 4096, 256)

Jesse: Only do this if you have to. Security is bad.

Tim: Use hard to guess passwords. Also change SSID from default.

Jesse: I would suggest that every AP ship with a different SSID.

Comment: This forces the administrator to set them to a common value in order to roam.

<Slide with crypto-functions>

Comment: Why so big (4096)

Doug: Increases the number of effective bits by that amount.

Comment: How long does this take?

Tim: 17ms on my machine.

Comment: There is a Unicode problem here with UTF8. Results will be different based on code page used.

Comment: Will a 1 byte SSID cause a problem with this?

Tim: This will work, but won't be very good.

Doug: Doc says don't use this in the corporate environment. Suggested for home use.

Comment: Apple had a concept of pass phrase. Is this the same?

Chair: I don't believe they ran it through a function.

Tim: How much time to people want to review the draft?

Chair: If we postpone a motion, will anybody look at it?

Jesse: Do you want it incorporated as normative?

Comment: It could be normative for optional.

Tim: Either we make it normative or WECA does.

Jesse: We could put it in an informative annex.

Motion by Russ Housley

Motion to incorporate document 02/545r0 as an informative annex.

Second: Jesse Walker

Discussion:

Comment: Request to change document to use passphrase instead of password.

Motion to amend by Donald Eastlake.

Change motion to be:

Motion to incorporate document 02/545r0 as an informative annex with password replaced by passphrase.

Second: Paul Lambert.

Discussion:

Comment: We have not properly defined "passphrase". Does the editor know this definition?

Jesse: I have seen it before.

Comment: Call the question

Chair: Any objection?

None

Vote on motion to amend: 22-1-2 Passes

New main motion:

Motion to incorporate document 02/545r0 as an informative annex with password replaced by passphrase.

Any discussion on new main motion?

None

Vote on new main motion: 24-0-1 Passes

Presentation: Clint Chaplin, Tim Moore, Doug Whiting – doc 02/477 – Proposal for Informative Schemes for Generating Randomness

Clint:

We wanted to come up with something that stations could do at boot-up for a good source of randomness.

There are both hardware and software solutions defined.

If you have several sources of randomness, use them all.

Comment: For software solution, inputs are external. Attacker can see this.

Clint: Attacker can't synch to the clock in your receiver.

Comment: But the difference is always SIFS time which is 10us. Can't this be measured?

Clint: It is not the ACK we're looking at, it is the response of the 4-way handshake.

Comment: Have you tried it?

Clint: No

Doug: If you don't know where randomness is in your system, hire a consultant to help you find it.

Clint: This is informative.

Comment: It seems to be a general problem. It seems odd to put in this document.

Clint: This is in response to LB comment.

Comment: RFC1750 is similar without hardware.

Comment: Is it appropriate? It will generate a bunch of new comments.

Comment: Have you considered ARPing any servers configured on the AP.

Clint: Not all APs have servers configured. If have they do, use it.

Jesse: Something like this is very important because the implementers are not in this room. They do not understand where to get good a source of randomness.

Comment: The number one source of crypto problems we see is poor selection of randomness.

Motion by Jesse Walker:

Move that the editor incorporate into the draft document 02-477 as an informational appendix.

Second: Dorothy Stanley

Motion to amend by Donald Eastlake;

Move that the editor incorporate into the draft document 02-477 as an informational appendix and site RFC1750.

Second: Tim Moore.

Any objection?

None

Any Discussion?

Comment: Against the amendment. The RFC is not as definitive.

Comment: The RFC has a lot detail. I think it should be in there.

Comment: The RFC talks about a good source of entropy.

Comment: I suggest adding a reference to the RFC with descriptive text around it.

Jon Edney: Call the question.

Vote on amendment: 20-1-4 Passes

New main motion

Move that the editor incorporate into the draft document 02-477 as an informational appendix and site RFC1750.

Discussion:

Against: More text to maintain and people to vote against. Simply reference the RFC.

For: What Clint's text provides is not in the RFC.

Vote: 14-3-7 Passes

Chair: There are no further motions prepared for today.

Comment: We could address the issues raised earlier today for ad hoc groups.

Chair: Sounds good.

Motion by Tim Moore:

Remove the following text from clause 8.5.1.3:

“If this is not possible it shall be initialized to the first PMK the Group key master receives (since there is no need to send broadcast traffic unless there is at least one station associated), but the following rules shall then be applied:

1. The GMK should be updated periodically from another current PMK.
2. The GMK shall be changed when the AP deletes the association state for the station whose PMK is being used as the GMK.”

Discussion:

None

Vote: 17-0-4 Passes

Chair: Any objection to recess until tomorrow’s 10:30 session?

None

Recessed at 9:15pm

Tuesday

10:30am Session - Joint TGe/TGi meeting

Dave Halasz (TGi Chair) to chair the joint session

Dave: A joint TGe/TGi meeting was requested. Issues have come up in TGi. TGi cannot reference a draft, only a standard. Also, if the architectural model changes in another group whose draft we reference, it affects the work we have done.

Submission: Russ Housley - doc 02/566 – Discussion Points for Joint TGe and TGi.

Russ: The intent is stimulate discussion.

Procedural issues:

- TGi draft cannot reference TGe draft, and vice versa
- TGi draft contains references to TGe items.
- Make submission to address interactions in subsequent PAR.

Comment: Wouldn’t it be better simply to duplicate text in both groups?

Russ: This would require a lot of coordination on the part of both editors.

Comment: Would’t this simply combine the two groups again?

Comment: No, only the overlap in both.

Comment: There is a security issue with simply pulling pieces out of TGi and putting them into TGe.

Dave: Ongoing maintenance and coordination would be required if doing this. Why not just do this now?

Russ: Confusing for implementer. TGi text would describe how TGe bits were set, for example.

Russ: The CCMP layering allows multiple transmit queues. One replay counter per queue. One sequence counter per interface. Changes to this architecture would have far reaching affects on TGi.

Comment: This slide shows the transmit architecture. It would be nice to see diagram for the receive side.

Technical Issues identified by TGi:

- Are there any MAC header fields TGe is introducing that need to be integrity checked?
- How do we protect side channels communications?
- TGi assumes 'No ACK' will not be in TGe.
- Burst ACK changes the architectural layering.

Comment: Can you elaborate on the No ACK issue?

Mike Morton: There is an issue with replay protection. If a frame arrives outside the window, it gets discarded. With No ACK there is a possibility that a large number of frames could be missed, resulting in a large jump in replay numbers.

Comment: Wouldn't there be the same problem with broadcast and multicast?

Russ: With broadcast and multicast traffic, you have to keep track of the replay counter per transmitter.

Comment: The No ACK issue is the same as the Burst ACK issue.

Russ: Yes.

Comment: What I'm hearing from TGi is "Don't do Side Channel, Burst ACK, No ACK because it the security is too difficult". But what if I really want it?

Dave: What we want to point out is that what is going to be needed is a maintenance PAR. If we plan now, that PAR will be easier. We want to ensure that when it comes time to create the maintenance PAR, that it won't be impossible to bring TGe and TGi together. Otherwise, it could be a huge project.

Comment: It appears the architectural model addresses the issue of fragmentation with respect to TXOPs.

Russ: Correct. The model assumes the fragment is already protected.

Comment: Why does it have to be that way? What are we protecting?

Russ: It is a trade-off between doing crypto ahead, or variably on the way to antenna.

Comment: But if done like currently in OCB, it would be easier.

Russ: We will be having a discussion on MSDU Vs MPDU later in TGi.

Comment: CCMP has two processes – multiplexing and CCMP processing. Why not assign the replay counter on exit of queue instead of entrance?

Russ: It would cause security to be in two places. It is easier to put it all in one place. The processing is the same.

Comment: We need to agree on an architecture that works with vendor's hardware. There are three architecture options.

Russ: Other components can be decomposed and moved. It appears only the replay counter needs to remain here to get the same bits on the air.

Dave: Is there any objections or comments to creating a maintenance PAR?

Comment: How long do you think it will take to complete the maintenance PAR?

Dave: If we make the architectural models agree, the work should be minimal. It is in our interest to do this.

Comment: What if one group finishes its work far ahead. And then the later group incorporates the changes needed?

Dave: If the later group makes changes such that the models don't agree, it will make the maintenance PAR very difficult.

Dave: I haven't talked to Stuart Kerry or John Fakatselis yet, but I see no other way to do this given the procedural issue.

Comment: Given the reality that one group will finish far ahead of the other, TGe won't address any security issues. Likewise TGi will remove all TGe related topics from its draft.

Comment: Clarification - is the procedural rule an IEEE rule or 802.11? In other WGs, we have referenced drafts.

Dave: One group could put another group in perpetual limbo if changes are made to references. TGi doesn't want to limit the work of TGe.

Comment: Isn't there already references to Traffic Classes in the TGi draft?

Dave: We were discussing that these need to be removed to move forward.

Comment: We already have the concept of queues in 802.11 (contention Vs. contention free).

Comment: Shouldn't you plan for the worse?

Dave: That is not very practical.

Comment: The TGi device needs to allow for any device that allows reorder. We need to plan for the existing standard.

Dave: But we can't plan for things that are changing.

Comment: If TGi and TGe can't plan for things that are changing, how can the maintenance PAR?

Dave: Because they will be finished.

Comment: If TGe doesn't consider security, and TGi doesn't consider QoS, you will have two different devices. I'd rather combine them now.

Dave: We should be plan to make the maintenance PAR as easy as possible.

Comment: In IETF it is common practice to reference other drafts. When one group finishes, it becomes frozen.

Comment: These are amendments to standards, not standards. If you say TGi is based on TGe amendments, then TGi can't finish until TGe is finished.

Dave: We want to make sure no group is waiting on another.

Comment: We should make a list of the technical issues between the two groups. I suggest forming an ad hoc group to do this.

Dave: This was the point of the submission by Russ.

Comment: Have we started a group to address the maintenance PAR?

Dave: If this proposal is acceptable to TGe, then we will look into forming the PAR and group. I'm not sure if we can officially start a maintenance PAR on an unfinished PAR. However, there is nothing to prevent us from doing work.

Comment: The main thing I see missing in the list is Side Channel support.

Dave: Side Channel is similar to IBSS. We are addressing IBSS in TGi. Did that answer you question?

Comment: Not really

Comment: How are you supposed to vote on TGe or TGi if there are holes? How can we assume the holes will be fixed in the maintenance PAR?

Dave: Vote on items specific to that draft. What is the alternative?

Comment: The alternative would be that both groups finish at the same time. One may become inactive for some time.

Dave: The whole purpose of splitting the PAR was so that we didn't have to do that.

Comment: We could just lock-step the two groups – basically re-join the two groups. But I advocate what Dave is suggesting.

Comment: It would be foolhardy to hold up TGi for TGe.

Comment: For something like side channel, you need to include the whole protocol in both drafts.

Comment: No, only Clause 7 items. We only care about the bits.

Dave: Is there any further discussion?

None.

Recess for lunch

Resume 1:06

<Announcement from Harry Worstell: Pluto up and running. Please login for attendance>

Return to motion postponed during Monday's session until 1:00pm today:

Motion by Tim Moore:

Motion to incorporate changed in 02/298r4 into TGi draft

Second: Donald Eastlake

Discussion continued:

Comment: Clarification – mandatory or optional?

Tim: This is not the IBSS document.

Chair: Any other discussion?

None.

Vote: 19-0-2 Passes

Motion by Tim Moore

Motion to incorporate document 02/499r2 into TGi draft as an optional to implement feature.

Second: Jon Edney

Discussion:

Tim: To fix an issue with 2 IBSS's on the same channel, there is one change I added to r2 last night. Before responding to 4-way handshake, check the BSSID to make sure it is in your BSS.

Comment: For unicast and multicast?

Tim: Yes.

Comment: I suggest we make IBSS optional.

Chair: So you would like IBSS in an RSN as optional?

Comment: Yes

Comment: If it were optional, then the alternative is PSK everywhere.

Tim: Yes

Comment: Why should the IBSS communication be less secure than ESS?

Comment: If optional, the user does not have a choice. The vendor makes the choice.

Comment: Why won't simple PSK work?

Jesse: People won't use it or configure it incorrectly.

Tim: zone issue is that the replay counter needs to be persistent across reboots, etc. Otherwise, once you break the bottom key, you break them all.

Comment: We should explain the requirements that Tim is addressing.

Jesse: You are going to have to remember every key you ever used.

Comment: There is structure here, but it is necessary for security.

Jesse: We need the type of structure Tim is proposing. The reason we can get away with this in the ESS case is because we assume the security is just there.

Comment: The broadcast key lookup breaks current implementations. Makes this next generation. If this is next generation, then what is RSN? Is RSN meant to run on existing hardware?

No

Comment: What is TKIP then?

Chair: TKIP is for existing hardware.

Comment: Against - Horribly complicated.

Comment: If we adopt, there would be no backwards-compatible IBSS security solution.

Comment: Against - Complex, no backwards compatibility, additional key mapping logic required.

Chair: We do this on AP's now.

Comment: For - No more complex than existing ESS proposal with exception of key mapping group keys. What people are saying is that they want security and simplicity, but we've pointed out that is not attainable.

Comment: Are you introducing extra complexity to handle the PSK case? In the PSK, everyone has to type in their PSK. In public key environment, you don't need that. More processing required, but people don't have to do as much.

Comment: Do we have a LB comment stating that we have to solve the IBSS case?

Chair: Yes. This is the 2nd largest group of comments.

Chair: Tried solving via a distributed model to match the nature of ad hoc. Allow it to be extensible via EAP.

Comment: Would the key id base be unused at all times?

Tim: The way it is currently specified, yes.

Comment: Instead of using Key ID bits, you have to check if the frame is multicast/unicast.

Comment: Where is Microsoft on this? The developers said it solves the problems, but it's difficult to implement.

Chair: If the supplicant is in the OS, the vendor doesn't need to implement it in firmware.

Comment: I'm concerned about the complexity of implementing this on a headless device. Unable to configure.

Comment: There is no requirement that it be turned on. Could be booted w/security off then configured.

Comment: It is no more complicated than configuring the PSK with WEP today.

Comment: You should be more concerned with someone coming along and configuring the embedded device via the input device.

Comment: How do you configure the keys without a keyboard?

Chair: Out of the scope of this TG.

Tim: It sounds like you need MIB variables.

Comment: A good example is how to use a printer in an IBSS.

Comment: So is the requirement that the device be configured, and that ad hoc is a conduit?

Chair: I don't see how the PSK case is more complicated. There has been some work on making the UI easier (e.g., Passphrase presentation). I'm not sure what the concern is.

Comment: This point argues that this should be optional.

Comment: How many keys mapping keys are suggested?

Tim: At the moment, we are leaving it at the ten minimum using the same key mapping table. Should we increase it?

Comment: I think it should be made implementation specific.

Tim: With a minimum value.

Comment: I would like to see IBSS security be mandatory, with an option to turn it off, rather than optional to implement.

Comment: I was meaning optional to implement. What is the point to making it mandatory if it cannot be configured?

Chair: When we say mandatory, we mean mandatory to implement, not enable.

Comment: Ask Jesse to elaborate on PSK comment.

Jesse: The property on PSK needs credentials. Each device needs an input device to do this.

Comment: Depending on what the architecture is underneath, it could be a solution for certain environments.

Comment: Ad hoc networks always start with 2. Then there is an agreement via the 4-way handshake.

Tim: Who owns the key and changes it, and how to send it out? Stations are hidden.

Comment: There are replication problems.

Tim: We don't know how to recover. Need a larger Key ID to avoid wrapping.

Jesse: In the IBSS case, you must enroll. Either PSK or define protocol. The enrollment problem is not a data-link issue. In conflict with PAR.

Chair: We're providing tools so that someone can define it. Like a RADIUS solution.

Jesse: I think all we can do based on our PAR is to provide the tools.

Comment: We've been more than willing to address the enrollment problem in an ESS by using 802.1X

Jesse: I disagree. Somebody else outside the scope that our spec issues. In IBSS case we cant make that presupposition.

Comment: Using public keys there are many ways to solve the enrollment problem.

Chair: I thought you said we had to specify the credentials for IBSS?

Jesse: No, that there has to be a way for credentials to enter the system.

Chair: I thought you said that for IBSS, we had to state how credentials are entered into the system?

Jesse: Then I assert that we're done. We know how to authenticate using 802.1x. We have the 4-way handshake.

Chair: I disagree. You do have a problem with establishing broadcast keys and pairwise keys.

Tim: There is nothing in 02/499 that says you have to use PSK.

Tim: There is a separate problem of how to get credentials in an IBSS.

Straw Poll

RSN MAC IBSS should be mandatory to implement in TG1.

Result: 24-18-2

Comment: Before we vote on Tim's motion, I would like to see Russ' public key presentation first.

Motion to postpone by Henry Ptasinski

Motion to postpone until 8:30pm today

Second: Nancy Cam-Winget

Discussion:

None

Vote: 22-1-13 Passes

Motion by Nancy Cam-Winget

Motion to modify agenda to present submission 02/561 at 7:30pm tonight.

Second: Dorothy Stanley

Discussion:

None

Vote: 32-0-1 Passes

Submission: Dorothy Stanley – doc 02/542 – Draft CCM Replay and State Text

- The section numbers in this document may have changed.
- Defines MIB variables for information needed for each CCMP session.
- Reference to QoS & TC's because no official decision yet to remove from draft. Will be taken out later if vote passes.
- Rules to detect if attacker is attempting a replay attack.

Discussion:

Comment: Did you clarify all of the endian issues? It may need to be changed later. This describes where the first 16 bits go.

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

None.

Recessed at 2:45pm

Resume: 3:32pm

Chair: I encourage you to read 02/499 before this evening's vote.

Presentation: Nancy Cam-Winget – doc 02/551 – TGi Frame Exchanges

Nancy: Informational walk-through. Not a submission, but could be added as an informational annex.

Comment: All messages up to deriving Pairwise Keys were in the clear?

Nancy: Yes.

Comment: Is there a timer defined for the 4-way handshake?

Tim: Yes, but no way to configure at the moment.

Nancy: This will be a MIB variable.

Comment: At what point is it suitable for the AP to generate the GMK?

Tim: Once at bootup. And then occasionally after that.

Nanct: You may want to change the GTK because there is no way to replay protect it.

Comment: Why is it not suitable to use something from the Authentication Server to derive the GMK?

Tim: It is not a good idea to re-use keys for a purpose other than they were designed.

Tim: Latest 02/298 changes the Group Key Hierarchy slide. The Authenticator now uses the 1st 64 bits for Michael key. The Supplicant uses 2nd 64 bits.

Tim: All EAPOL messages from the end of the 4-way handshake are encrypted.

Comment: If you receive an unencrypted packet at this point, what do you do?

Tim: Disassociate STA

Comment: So a spoofed packet could cause a disassociate?

Tim: The AP drops unencrypted packets it receives. The AP will disassociate any STA upon receiving an encrypted packet from that STA that it cannot decrypt.

Chair: This would be useful as an appendix.

Nancy: I don't have text for a submission. If people find it useful, we can add text as an appendix

Comment: I have seen similar diagrams in 02/298. What are the differences?

Tim: This is walking through from start to finish.

Straw Poll:

Include the RSN Frame Exchange in document 02/551 as an information annex to the TGi draft.

Discussion:

Comment: I'm concerned that we are adding too many annexes to the draft. Should this be embedded as informative text in draft?

Nancy: This was to help everybody understand the steps to go through.

Tim: This puts all the frame exchanges in place.

Comment: Can it be put in clause 5?

Nancy: Since clause 5 is mostly informative, how about we put it in there?

Comment: But clause 5 is before clause 8. It may be confusing.

Comment: Clause 5 is like a road map. This is what to expect even if you don't understand it all yet.

Nancy: should I put more work on this to make it into a submission?

Amended Straw Poll:

Include the RSN Frame Exchange in document 02/551 into Clause 5 of the TGi draft.

Result: 51-1-2

Submission: Arnoud Zwemmer – doc 02/570r0 – Security MIB Extensions

Arnoud:

Defines objects for:

RSN implemented

RSN enabled

Comment: When true, both RSN and non-RSN allowed?

Arnoud: Yes, description text will indicate this.

Arnoud: The existing PrivacyInvoked MIB variable is used to determine when to set the Privacy bit, so that functionality cannot be changed. The description will be modified.

Chair: For initial authentication, both Privacy & RSN bits are set, but the frames are unencrypted.

Dorothy: We just have to let them go based on their 802.1x Ethertype.

Comment: Is the rekeying object required for both the Supplicant and Authenticator?

Arnoud: No, only for Authenticator.

Comment: I think it would important to point this out in the description

Arnoud: Agree

Comment: On unicast ciphers, do I enable all that I support?

Arnoud: Yes.

Comment: We need another MIB variable that states MIC failures.

Arnoud: Do we need a counter for the number of MIC failures within 60 seconds?

Tim: Yes.

Comment: How do you distinguish different versions of TKIP (e.g. SSN and RSN)

Arnoud: That would be in a vendor MIB. This is RSN only.

Comment: I suggest that pairWiseKeys be made an integer instead of a truthValue, since some vendors support more than 1.

Arnoud: Agree.

Comment: Is there a need to add a rekeyNow MIB variable for the Group keys instead of waiting for one of the counters to expire?

Perhaps.

Motions for this submission will be made in this evening's session to allow the document to be on the server for the required time.

Note: Russ has posted doc 02/561 to server for this evening's presentation.

Chair: Is there any objection to recessing until 7:00pm?

None.

Recessed at 4:55

Resume: 705pm

Motion by Dorothy Stanley:

Instruct the editor to make the modifications indicated in 02/570r1.

Second: Arnoud Zwemmer

Discussion:

None.

Vote: 20-0-1 Passes

Motion by Dorothy Stanley:

Instruct the editor to add text from 02/542 into sections 8.3.4.3 and 8.3.4.4 or appropriately renumbered sections.

Second: Jesse Walker

Discussion:

None

Vote: 21-0-0 Passes

Chair: We have 20 minutes before Russ' presentation. I'd like to use this time to talk about pre-authentication. It might be useful to have a capability bit that indicates if the AP supports pre-authentication. Perhaps we could add this in the RSNE.

Comment: Given that you may need more than 1 bit, why not have your own IE

Chair: It would not be protected.

Tim: It would have to be added to the 4-way handshake.

Jesse: Currently we don't have a way to signal this. Seems like a good idea.

Tim: We should add a word to the IE for this.

Comment: Would this be used only in beacons and probe responses?

Tim: At some point in the future, it may be useful to know if the STA supports pre-auth.

Chair: There seems to be no objection. We need to work on a proposal.

Jesse: Another IE perhaps - it would be useful to know if network is public or private for enrollment.

Submission – Russ Housley – doc 02/561ar0 – Using the Certified RSA Public Key to Establish a Pairwise Encryption Key.

Russ:

This is something that was started from the Side Channel teleconferences.

- Each STA has a public key and MAC address in a certificate.
- Computationally intensive – may prohibit legacy hardware.
- Private key facilitates enrollment
- Vendor installs RSA Key and certificate (signed by vendor and root) in every device.
- If you lose device, you've also lost MAC address. So binding is still together. No revocation issue.
- Two stations can establish a key without any third parties.
- STA must protect private key

Comment: It doesn't give the peers the right to authorize.

Comment: So there is a third entity that provides trust for MAC address?

Russ: Right.

Comment: For home, with AP and client, how do I ensure I do not assoc to my neighbor's AP?

Comment: There will be some UI that lists the MAC addresses. The user finds the MAC address from a label on the bottom of the device and selects the right one.

Comment: That is how SSH works.

Comment: Would Diffie-Hellman be better than RSA?

Russ: No, this is tuned to be faster.

Comment: Does the public certificate for the CA need to be on the device?

Russ: Yes

Comment: Does TLS do more?

Russ: It does a little more and a little less.

Chair: We decided to postpone Tim's submission, thinking it would be better to hear this first. Gets into mechanics of key distribution. It seems like this could be made into some type of EAP method, but not an alternative to Tim's submission.

Tim: I do n 4-way handshakes, you do n of these. You still haven't distributed the group keys.

Comment: Is this an IBSS proposal or authentication?

Russ: A proposal to establish a key between any two stations.

Comment: If it's just for IBSS, not enough resources.

Comment: Similar to effort to authenticate management frames in original 1991 proposal. The MAC address can be changed.

Russ: The binding is to the burned in MAC address only.

Russ: This is parallel to the scheme used in cable modems by CableLabs. We should use their scheme for encoding the MAC address instead of reinventing one.

Comment: If a STA uses one MAC for two interfaces...

Russ: Then only one key.

Comment: People are doing this for embedded devices.

Jesse: When the STA enters a new domain, you could use a one-click process. We must solve this or government will regulate.

Tim: Not practical in enterprise. Can't track 50,000 MAC addresses.

Russ: You don't need to.

Comment: Didn't we say we did not want to use public key – too many resources.

Russ: It is too much for legacy devices only.

Comment: Are there other public key algorithms that would work better? (elliptic curve, DH)

Russ: Yes, but no patent issues here.

Comment: Not significantly different. Xircom thinks they have patents on everything

Comment: Cost is high, but computation is infrequent.

Comment: How many certificates in chain?

Russ: Two

Comment: x.509 certificates?

Russ: That's what I propose.

Comment: How many bytes per certificate?

Russ: About 2 Kbytes.

Comment: Is this simpler than the current solution?

Russ: This is not complete. Let me finish to make sure it is an apple to apple comparison.

Russ: This solves RADIUS server emulation on each client required for Tim's solution.

Chair: The impression I was getting from people is the complexity of the n-way, but that still has to be done here.

Comment: The real advantage here is for use in headless devices.

Russ: Right.

Comment: How is this different than installing x.509 certificate on device, and using TLS.

Comment: Right, but how did the certificate get there?

Comment: What encapsulation method is used for transfer of PDUs?

Russ: I haven't thought of it.

Russ: perhaps Tim and I could get together and see if there is a hybrid model between the two proposals.

Tim: Agree.

Chair: We don't want to get carried away and go out of scope.

Comment: What you're talking about is between the NAS and AS. This is between NAS and STA.

Chair: The motion said we are not going to talk about EAP types.

Comment: Suggest using certificates on top of 4-way handshake, replacing 4-way with this? If the suggestion is to replace the 4-way handshake with this, that can take a long time.

Comment: If using TLS, you reduce the number of frame exchanges using this scheme.

Comment: Still need to access a backend server to authorize the user.

Comment: You only know device, not user. Authorization is a separate process.

Comment: Can be used for ad hoc, ESS, and Side Channel. How would this co-exist with TTLS? Is your tunnel secure enough to transfer the user's credentials?

Comment: You still haven't authenticated the user, only the device.

Russ: We're not sure if that is part of our charter.

Comment: The customer pays to use the server, regardless of device.

Russ: The user would have to enroll with its MAC address.

Comment: This proposal came out of the side channel discussion. This was the only solution that scaled well for side channel. PSK scheme did not. This is something else in our toolkit that could solve other problems. Moves administration to vendors.

Comment: Are you saying this should be the solution instead of Tim's proposal?

Comment: No, this is simply key management.

Comment: I don't have a problem using this for Side Channel or IBSS. But for ESS, this will change too much.

Russ: Are we willing to build a certificate into the NIC for AES class devices?

Comment: It sounds like this is not necessarily a replacement for Tim's proposal, but complementary.

Comment: If we are pushing authentication up, why are we doing this at the MAC layer?

Russ: So we should all use IPSEC and go home?

Comment: We're going to need a large secure database of MAC addresses.

Russ: No.

Comment: Do you know of any cases of where something like this is deployed?

Russ: Yes.

Tim: We have 40,000 wireless users using certificates at Microsoft.

Comment: Attrib certificates?

Tim: No

Comment: How long is the chaining block?

Tim: Two.

Comment: Is this going to be pursued?

Chair: We could pursue it after Tim's motion at 8:30pm.

Motion to incorporate document 02/499r2 into TGi draft as an optional to implement feature.

Second: Jon Edney

Discussion:

Jesse: For – I like what Russ has done, however Tim’s proposal is a necessary step to make what we have today work.

Comment: Against - if it’s not what we are going to end up with, then why put it in?

Tim: What complexity?

Comment: Key mapping aspect of multiple broadcast keys.

Tim: Everything else has been done before.

Comment: For – scaling not any worse than IBSS.

Comment: What size did you assume an IBSS might be when writing?

Tim: 20-25 is the largest ad hoc I’ve seen. But there would be a limit in text.

Comment: If you want to have 25 nodes, you’ve got to have that many keys.

Comment: A good model for IBSS is home use.

Comment: This is the only IBSS proposal. If we reject it we have nothing and cannot go to LB.

Comment: If we vote it in, would Microsoft implement it?

Tim: We are still writing supplicant code. When done, this will be straightforward to do.

Vote: 23-2-7 Passes

Comment: Is it on the agenda to further define what a TSN is?

Chair: No, but people may introduce more motions.

Chair: Any objections to recessing until tomorrow at 3:30pm?

None.

Recessed at 8:45

Wednesday

3:30pm Session

Review Agenda.

- LB comment processing tomorrow.
- Paul Lambert has 3 submissions.
- Dave Halasz has submission 02/590 on RSN Capability Field

Submission – Paul Lambert – doc 02/553r1 - CCMP MIC Processing

Paul:

Invariant Fields –

- CCMP processing once per MPDU
- Retransmissions don’t require re-processing.

There are three fields that can vary on retransmit – Power Management, More Data, QoS-TXOP/Queue Length, FEC, ACK Policy

Comment: How can 'More Data' be different on re-transmit?

Comment: It indicates the state of the queue. The state can change at time of re-transmit.

Comment: True in TGe. True also for 1999 spec?

Comment: How can power management change on retransmit?

Paul: There is a remote chance it could change.

Comment: In the same frame exchange sequence, the power management bit should stay the same.

Paul: But it represents the state of the system, not the MPDU.

Motion by Paul Lambert:

The CCMP integrity processing in the current TGi draft shall be modified to mask to zero the 'Pwr Mgt', 'More Data' and 'QC bits 4 to 15' for purposes of the CBC integrity calculation.

Second: Ali Raissinia

Discussion:

Comment: What you've identified is correct. How do we future-proof ourselves?

Paul: Good question. I don't see many fields changing in MAC header. There are few threats on remaining bits not protected.

Vote: 26-0-0 Passes

Submission – Paul Lambert – doc 02/362r6 – Proposed test Vectors for IEEE 802.11 TGi

Significant changes in latest revision:

- Added AES CCMP processing
- Eighth test vector

Motion by Paul Lambert:

Motion to incorporate document 02/362r6 into the TGi draft.

Second: Butch Anton

Discussion:

Comment: Informative or normative?

Chair: Up to editor

Chair: Motion to amend?

Comment: What was the intent?

Paul: It ought to be normative. Not much good as informative.

Comment: Leads to question on inconsistency.

Straw Poll

Test vectors should be normative text.

Discussion:

Comment: Test vectors let implementer know if implemented correctly. If made normative, imperative to fix.

Comment: This is redundant with the text. Should be informative.

Result: 21-18-7

Comment: Is there precedence in other 802.11 specs?

Comment: No

Motion to amend:

Motion to incorporate document 02/362r6 into the TGi draft as informative text.

Second: Luke Ludeman

Discussion:

Vote: 30-0-2 Passes

New main motion:

Motion to incorporate document 02/362r6 into the TGi draft as informative text.

Discussion:

Comment: If errors or changes required, what is vote required to add?

Chair: 50% - informative

Comment: I would like to review more closely

Comment: Clarify – one additional vector?

Paul: An 8th added. Bits set to 1 so that muting can be discovered.

Paul: Ask editor to add clarifying text that all fields are big-endian.

Comment: I would like to see the endian text added before the test vectors. Vectors may be wrong.

Chair: You could make a motion to postpone.

Comment: I would like to make the motion to postpone

Motion by Henry Ptasinski

Motion to postpone Test Vector motion (doc 02/362r6) until Thursday 3:30pm

Second: Dorothy Stanley

Discussion:

Paul: We should put vectors in now. Changes could be put in later.

Vote: 11-13-12 Fails (procedural)

Back to new main motion by Paul Lambert:

Motion to incorporate document 02/362r6 into the TGi draft as informative text.

Second: Butch Anton

Discussion:

None

Vote: 27-1-9 Passes

Submission: David Halasz – doc 02/590 – RSN Capabilities Field

Dave:

- Provides a migration strategy for TSN and RSN
- Added RSN Capabilities field (2 octets) to RSN IE

Comment: Only for TSN? Or RSN also

Chair: May be used for other features.

Comment: Mandatory or optional field?

Chair: Optional.

Motion by Dorothy Stanley

Motion to incorporate doc 02/590r0 into TGi draft as normative text.

Second: Greg Chesson

Discussion:

None.

Vote: 31-0-0 Passes

Motion by Tim Moore:

Motion to add following text to the TGi draft RSN Capability Information field as normative text:

“Add Pairwise field as B1 to the RSN Capability Information field

STAs set the Pairwise key subfield to 1 within the RSN Capability field if the STA supports Pairwise keys using Group key rather than using key mapping keys.”

Second: Albert Young

Discussion:

Tim: This bit only needs to be set on the RSN STA so it knows how to handle the mix.

Tim: If this bit is set, the AP has to do more work.

Vote: 26-0-4 Passes

Motion by Paul Lambert

Move to instruct the editor to clarify the text in the draft that specifies the transmission order of the replay counter for TKIP to use little-endian for the IV transmission order. And clarify the text for CCM to use big-endian transmission order for the PN field. Further instruct the editor to incorporate corrected test vectors when they become available.

Second: Ali Raissinia

Discussion:

Comment: Against - current order for TKIP is little-endian, and CCM is big-endian. CCM is big-endian because of NIST – strong precedent to leave that way. I would like to amend motion.

Comment: The CCM test vectors are numbers, not encapsulation methods. Not true that it makes a change in logic. Translation is always necessary for IP fields. Format internally doesn't matter.

Comment: Endian order is independent of transmission order. If different, while data is being received, you don't know the endian order until the key search is complete.

Chair: You're saying at receive time you don't know if the frame is TKIP or CCM?

Comment: After key lookup, while receiving the IV, you may not have completed the key search so you don't know what order to use to start decrypting.

Comment: For hardware solutions, this is important.

Comment: The address information in the packet is everything you need. Order doesn't matter.

Comment: It is true the address gives the information you need, but no guarantee you have finished the key lookup by the time you need the IV.

Comment: I can't find any info in draft that says CCM is big-endian

Comment: Key search and address lookup are the same. In the TKIP and CCM encapsulation diagram, bytes are labeled 2, 3, 4, 5. In all other places, IV0 represents little-endian. If we choose big-endian, we should probably update these diagrams to start from 5 on the left.

Comment: The diagram is wrong, not IV but PN.

Comment: Against amending motion. I would like to see IVs handled in consistent way. Not intent of authors.

Paul: The intent of the authors was big-endian.

Comment: Agree – but unaware of precedence Greg mentioned.

Comment: I have diagrams to clear up the ambiguity.

Comment: Call the question

Chair: Any objection?

None

Vote: 6-25-1 Fails

Motion by Greg Chesson

Move to instruct the editor to clarify the text in the draft that specifies the transmission order of the replay counter for both TKIP and CCM so that they both use little-endian transmission order. Further instruct the editor to incorporate corrected test vectors when they become available.

Second: Al Potter

POI: Clarify should be modify?

Greg: Intent was 75% vote

Discussion:

None

Vote: 29-6-1 Passes

Presentation: Bob Moskowitz – doc 02/516r0 - RADIUS Client Kickstart

Bob:

- Scalability/deployment issue with manually configured IP addresses and secret on Authenticator and RADIUS server
- Suggest using DH to place a Master Secret on both devices.
- Work belongs in IETF. No RADIUS workgroup.
- Trying to get onto 802.1x agenda.

Discussion:

None

Chair: Are there any motions or discussion?

None.

Chair: Is there any objection to recessing until tomorrow at 8:00am?

None

Recessed at 5:11pm.

Thursday

8:00 AM Session

Agenda for today:

- LB35 Comment Resolution
- A few submissions
- Towards the end of today's session, we need to decide if we want to have another ad hoc, or an actual Interim, which would allow us to make motions.

Submission: Tim Moore – doc 547r1 – Validating Disassociate and Deauthenticate Messages

Tim:

- Anybody can send these to messages and disconnect anybody from the network.
- STA or AP can delete state (remove keys) synchronously.
- Use a new message format when keys are available.

Comment: Was the idea to perform 4-way handshake, and then disconnect on completion?

Tim: No. If spoofed, 4-way will complete without error to genuine STA. If genuine STA sent Disassociate, AP will attempt 4-way with STA, which will timeout (because STA is disassociated), and AP will disassociate STA.

Comment: In Bernard's pre-authentication presentation, he said you always pre-authenticate. You are allowed to use that for management frames. But I thought our decision was to not use that approach?

Tim: We decided not to use signed management messages, which is why I came up with this approach.

Comment: To avoid using timeout approach, why not complete the 4-way and then disassociate?

Tim: The AP has to remember state, but should work. Should make things a little quicker.

Jesse: If we take this approach, we end up disabling at the MAC level messages once we have keys.

Tim: Yes.

Comment: We could define a new protected message. Would be less ambiguous.

Tim: True

Comment: If the AP sends data to STA, and the STA is not associated, STA will send a Deauthenticate message to AP. The AP has keys so it will initiate a 4-way handshake, which will timeout. What stops AP from sending data?

Comment: I did see one attack that made all STAs Associate to a rogue AP. This was Open Authentication. Pointed to a method of local denial of service.

Tim: A rogue AP will not have shared secret or access to a RADIUS server.

Jesse: I think the correct way to correct the problem is at the MAC layer, but will never get past political issues. This method seems to be the only option.

Tim: We're making deleting the keys difficult, and it doesn't modify the MAC.

Comment: We need to make sure this doesn't move the problem somewhere else.

Straw Poll

The problem with unauthenticated Disassociate and Deauthenticate Messages as per Document 02/547r1 is a problem that TGi needs to address.

Discussion:

Comment: Stopping only one type of DoS. Can force 4-way handshake.

Comment: What is the impact if not solved? Attacker can send Disassociate.

Comment: I am concerned about the DoS argument. We've been increasing features to launch DoS attacks – more fragile. Not a valid reason to oppose. If we find a way to close this one, things will be less fragile.

Comment: I disagree that people would do this to disable security.

Comment: There was much publicity in the Arbaugh paper. Attacker could assume session of valid user.

Comment: We are replacing a big DoS attack with a small one.

Comment: We did not pursue Bernard's pre-authentication suggestion. If we really want to fix all the holes, the underlying structure needs to change.

Comment: I would like to find out what the straw poll result would be.

Comment: I'm not convinced that we're closing a significant hole in the dike.

Comment: This is the easiest DoS attack to address.

Tim: This is the easiest one. Is it worth doing?

Comment: If the DoS attack can be an enabler for another type of attack, then it is a bigger issue. We ought to try to close this if we can.

Comment: If it doesn't delay the schedule for LB, then we should do this.

Chair: We can't address this after LB if we're changing underlying structure.

Comment: We're just picking the low hanging fruit.

Comment: We have security against jamming, piggyback, MIM attacks.

Chair: It's not fair to characterize this as a DoS attack. You can slow down traffic. If passing through your STA, it can monitor modification results.

Comment: The sequence that someone uses here, is that in issue?

Result: 16-18-11

Letter Ballot Processing:

Many comments processed in Sydney, and at the San Jose Ad Hoc. Most NO votes were related to AES, IBSS or the editor's comments.

Comment 687:

Jesse: We discussed this in San Jose. We said we would simply change to a Word comment.

Jesse: The original text was inconsistent with the technical portion of the text.

Motion by Jon Edney:

Move that the editor be instructed to modify clause 5.4.3 of TGi draft 2.0 to incorporate the text "An RSN does not directly provide either service; instead, it uses 802.1X to provide access control and key distribution, and confidentiality is provided as a side-effect of key distribution." at the end and indicate that the existing last paragraph refers to legacy systems.

Second: Jesse Walker

Discussion'

Comment: What about the changes that are recommended in 2.3?

Jesse: Those have been in there since draft 1. There are two types of instruction: one to IEEE editors, others to remind us of work to do.

Comment: Does the editor's note indicate the changes that are already in the draft?

Jesse: If you leave the original 1999 text, it doesn't describe what we have, nor do the previous changes.

Comment: The text we have here is accurate, but not sufficient.

Chair: Are you suggesting we keep what we have and then add additional text?

Comment: Yes.

Vote: 23-0-4 Passes

Action: Closed – Addressed by above motion.

Comment 736

Action: Closed - Addressed by doc 02/570

Comment 206

Comment: Based on Tim's straw poll, on this topic, it sounded like we were not going to address this.

Tim: If choose to drop frames, something has to happen.

Chair: Deciding when to allow Disassociate messages based on state is complex.

Action: Closed - currently no consensus in the group to pursue suggested remedy.

Comment: What happened to all the motions we said we prepared in San Jose?

Chair: Motions were made earlier to address many of those.

Jesse: TGe, TGg, TGh, have passed motions that the SDL applies only to legacy systems. The normative text is the definition. I will talk to TGe to find their text.

Recess at 10:00am

Resume: 10:35am

Comment 1002:

Action: Closed - WECA is planning on performing a security review.

Comment 1011:

Comment: In clause 8 there is text that defines this.

Comment: This is editorial – no motion necessary.

Action: Closed – Editor to take definition of RSN from clause 8 and place it in clause 3.

Comment 2207:

Jesse: This comment is a result of an earlier version of 02/298

Action: Closed – Agree – Motion to incorporate updated 02/298 to address this.

Comment 2208:

Comment: WEP is still supported. If we change name we need to change WEP reference to this bit.

Comment: Yes.

Comment: Good idea. Confusing as is.

Jesse: I would suggest “Protected Bit” rather than encrypted since we are doing more.

Motion by Jesse Walker

Move to instruct the editor to change the name of bit 14 in the Frame Control Field from ‘WEP’ to ‘Protected Frame’ and update associated references throughout the draft.

Second: Albert Young

Discussion:

None

Vote: 19-0-1 Passes

Action: Closed – Addressed by motion to rename WEP bit to Protected Frame bit.

Comment 1043:

Comment: I suggest replacing the PRF192() with simply stating that a 192 bit random number is needed. How to obtain a good random number is now in an informative annex.

Comment: We should say calling RAND() is not good enough.

Motion by Jesse Walker

Move to instruct editor to replace text in clause 8.3.2.3.5.1 with:

“All stations contain a global Key Counter which is 256 bits in size. It should be initialized at system boot up time to a fresh cryptographic quality random number. Refer to annex on random number generation.”

Second: Russ Housley

Vote: 25-0-0 Passes

Action: Closed – Addressed by motion to above.

Comment 1472:

Comment: Based on this morning’s Straw Poll, the consensus was that we do not to protect management frames.

Action: Rejected

Comment 2214:

Comment: This clause is no longer accurate.

Action: Leave open - The text for 5.4.3.2 needs to be replaced to reflect the current architecture and a subsequent Motion. Frank Ciotti has volunteered to draft the text.

Comment 2253:

Comment: None of this work has been done.

Chair: Do we need a volunteer? We can’t wordsmith right now.

Jesse: We need a volunteer to draft text.

Action: Leave open – need a volunteer to draft new text for clause 8.3.2.3.8.1

Comment 646:

Action: Leave open – Dave Halasz and Tim Moore volunteered to update PICS.

Comment 1328:

Action: closed – addressed in 02/298.

Comment 1329:

Action: closed – addressed in 02/298.

Comment 1333:

Action: closed – addressed with 02/499 and 02/298.

Comment 2264:

Comment: How is this a TGi issue?

Comment: Could drop security association. The capability is there – the STA can leave the BSS for duration of Listen Interval.

Comment: There is a paragraph in the TGi draft that states a STA cannot be part of an ESS and IBSS at the same time.

Comment: We should remove it.

Comment: I'm not sure about that – the IBSS security is unknown.

Comment: The 1999 spec only states that a STA shall not maintain two simultaneous associations to AP's, but it can be member of two IBSSs.

Comment: The related text should be removed from 5.4.2.2

Motion by Gary Spiess

Move to instruct editor to remove the following text from clause 5.4.2.2

“The rules for association within a BSS prevent a STA from being associated with an IBSS and a BSS simultaneously.”

Second: Dorothy Stanley

Vote: 25-0-3 Passes

Action: Closed – Out of scope of TGi. Also, above motion was passed to remove related text in 5.4.2.2.

Comment 2265:

Action: Closed - Motion passed above to remove related text in 5.4.2.2.

Comment 1120:

Jesse: We would have to not affect how WEP is processed. Legacy decision tree – don't do anything about it.

Action: Closed – Legacy issue which we are not addressing.

Comment 2289:

Action: Closed - Probe Request no longer has capability information

Comment 2180

Comment: If a coherent definition of TSN exists, this comment no longer applies.

Chair: We clarified TSN yesterday. So you're okay with closing comment?

Comment: Yes.

Action: Closed

Comment 2310:

Action: Closed – resolved by adding a 802.1X_SAP

Comment 2312:

Action: Closed – resolved by adding a 802.1X_SAP

Comment 1820:

Comment: The first part of the comment is editorial.

Chair: For the second part, we said we would define the Privacy Bit use in the San Jose ad hoc.

Action: Leave open – need volunteer to clarify text for use of Privacy Bit in an RSN.

Recess for lunch at 11:59am

Resume: 1:19pm

Presentation: TK Tan – doc 02/xxx – WIG WLAN Interworking Group

- Joint effort between 802.11/ETSI BRAN and HiSWAN
- Key area of focus for WIG is interface between WLAN and WWAN
- Need assistance from TGi on security model
- 3GPP selected.

Comment: Do you have time to describe the 3GPP architecture in more detail?

TK: Not in this presentation – I can point you to the right people.

Comment: Is it much different than Bluetooth, etc?

TK: I'm not an expert, but I would say yes.

The next WIG meeting is next year in Tokyo

Comment: WIG has a requirement that the WLAN security cannot affect the WWAN security. The reverse is also true.

Comment: A key for one network cannot be used in another.

Comment: In the BRAN doc, it talks about extending 1x to use EAPOH. What had to change?

Comment: EAPOH is a protocol to transport EAP over HyperLAN.

Comment: Is there a document available that describes this?

Comment: Yes, a number of them. I'll give them to you when I find them.

Return to LB Comment Processing

Dorothy: There are a number for which we added a comment, but they are not closed.

Chair: At some point we need to discuss if we are ready for LB.

Chair: Some people said they would like to make motions. Now would be a good time to do that.

Motion by Jesse Walker

Instruct the editor to insert the following editing instruction at the beginning of Annex Comment: "Delete the text of this annex."

Second: Russ Housley

Discussion:

Jesse: Annex C is the SDL. The tools required to maintain this are no longer available. This is similar to what the other task groups are doing.

Vote: 25-0-1 Passes

Motion by Tim Moore

Motion to incorporate the following into the RSN configuration MIB

dot11RSNConfigGroupMasterRekeyTime OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The time in seconds after which the RSN group master key must be changed. The timer shall start at the moment the group master key was set.

A group key refresh will occur on a group master key change.

The fine granularity (seconds) also enables the network Administrator to 'immediately' refresh the group master key."

DEFVAL { 7*86400 } -- once per week

::= { dot11RSNConfigEntry 12 }

dot11RSNConfigGroupUpdateTimeOut OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

UNITS "milli-seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The time in milli-seconds after which the RSN group update handshake will be retried. The timer shall start at the moment the group update message is sent."

DEFVAL { 100 } --
 ::= { dot11RSNConfigEntry 13 }

dot11RSNConfigGroupUpdateCount OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The number of times the RSN Group update will be retried."
DEFVAL { 3 } --
 ::= { dot11RSNConfigEntry 14 }

dot11RSNConfigPairwiseUpdateTimeOut OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
UNITS "milli-seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The time in milli-seconds after which the RSN 4-way handshake
 will be retried. The timer shall start at the moment a 4-way message
 is sent."
DEFVAL { 100 } --
 ::= { dot11RSNConfigEntry 15 }

dot11RSNConfigPairwiseUpdateCount OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The number of times the RSN 4-way handshake will be retried."
DEFVAL { 3 } --
 ::= { dot11RSNConfigEntry 16 }

Second: Don Eastlake

Discussion:

None.

Vote: 22-0-6 Passes

Chair: If we plan to go to LB, we need to prepare a motion. It needs to be available on the server 4 hours ahead of time.

Comment: I don't think we're ready. We want to do a line-by-line review. We should wait until next session.

Comment: We should be ready once Jesse has included the voted in text.

Chair: We have action items to do yet.

Comment: We still have 75 LB comments not processed

Jesse: If we went to LB now, there are enough open issues that we would fail. Would delay another LB for another 2 or 3 meetings.

Chair: We learned from LB35 that we want to minimize the number of comments. We need to take measures to ensure that we can go to LB at the next meeting. We can make a motion to pre-authorize some work. The announcement must be at least 30 days prior to the meeting. Any changes made in ad hoc meeting would be put to 15 day LB, to make a new draft available for the November meeting.

Comment: What would be the LB length after the November meeting?

Chair: We may not finish all the changes by November/

Comment: What is the advantage to doing this vs. what we did in San Jose?

Chair: We would not have to take two days voting in the motions that resulted from the ad hoc.

Comment: What would be the output of the 15-day LB?

Chair: A document that we would say "We want this to be our new draft".

Comment: So there are no comments back?

Chair: Correct.

Jesse: If we pre-authorize ourselves to produce a new draft, must we do so?

Chair: If we are pre-authorize, it doesn't mean we have to do it. We need 75% to get approval for an ad hoc. In the ad hoc we need 75%. The LB needs 75%.

Comment: If we get through all LB comments, all remaining comments should be editorial. If we get through another 75 today, we can go to the next round.

Jesse: I think there is a good 2 weeks of work to incorporate the changes I have into the draft.

Chair: Therefore we can't go to LB this session.

Comment: We cannot vote to go to LB until we have a draft. And it needs to be on the server 4 hours before we can vote on it.

Chair: Does anybody want to make a motion to prepare the draft for LB?

None.

Comment: Is there a plan for the comment resolution?

Chair: We can pick that up today. There is growing consensus for another meeting before the November meeting. Yes.

Jesse: I think it is important to get the pre-authorization, even if we don't need it. It may be necessary if many changes are found.

Comment: One of the LB comments is to have a PICS.

Chair: Tim and I have starting working on this. If it is not available before November, will discuss it during the November meeting.

Comment: A PICS is not a few minute review.

Straw Poll:

TGi to have a meeting, prior to the November Plenary, with the intent of authorizing a 15 day LB to update the draft.

Discussion:

Comment: What if we can't go to LB because of time constraints?

Chair: Then we vote on the motions in the November meeting.

Comment: What is the advantage to doing the 15day LB rather than simply waiting until Hawaii?

Jesse: I could do the editing ahead of time instead in Hawaii.

Comment: I have not heard of a 15 day LB.

Chair: I talked to Stuart about it.

Comment: It seems the LB needs to go only to TG_i voters. That's who would be voting on the motions in the TG.

Comment: A LB to the entire WG may have less of a chance of getting voted in.

Comment: Disagree. More time to look at suggested changes.

Chair: This happened in the meeting here. Motions were postponed.

Comment: If the LB fails, does it prevent us from updating the draft?

Jesse: No

Comment: Will this generate more comments?

Chair: No – this would be a yes/no only vote.

Comment: The 15-day LB may not be granted do to what is happening in the executive committee currently. They are saying 30 day only.

Comment: There is a lot to be said for having the author have enough time to resolve obvious errors. True issues may be lost.

Result: 42-0-3

Straw Poll

Desired location of the October TG_i meeting.

(may vote for many)

Virginia: 22

Boulder: 12

Redmond: 10

Motion by Paul Lambert:

The CCMP integrity processing in the current TG_i draft shall be modified to mask bits b4 b5 and b6 of the FC SubType field.

Second: Greg Chesson

Discussion:

Comment: Why would the No Data bit change?

Paul: Good question. My next motion will be to never protect a data frame when the No Data bit is set.

Motion to amend by Henry Ptasinski:

The CCMP integrity processing for data frames in the current TG_i draft shall be modified to mask bits b4 b5 and b6 of the FC SubType field.

Second: Dorothy Stanley

Discussion:

None

Vote: 27-1-5 Passes

New main Motion by Paul Lambert:

The CCMP integrity processing for data frames in the current TGi draft shall be modified to mask bits b4 b5 and b6 of the FC SubType field.

Second: Greg Chesson

Discussion:

None

Vote: 26-0-7 Passes

Recess at 3:00 until 3:30pm.

Resume 3:30pm

Chair: Due to scheduled TGe vote at 3:30, any objection to recessing until 4:00pm?

None.

Recessed until 4:00pm.

Resume 4:04pm

Chair: Not all people are back from TGe vote yet. Resume processing LB comments.

Chair: If a comment is in the 'Closed', 'U' or 'W' state, we will ignore it.

Comment 312:

Comment: WECA is hiring a consultant to address this.

Action: Rejected – Outside scope of TGi. We are adding message flow as an appendix.

Chair: The following four comment numbers are still open:

2214, 2253, 646 and 1820

Motion by Paul Lambert:

The TGi protection of Data frames shall only apply to data frames that contain data of length ≥ 1 . Data frames shall not be protected when bit b6 of the Subtype is set. The FC 'Protected Frame' bit (FC bit 14) shall not be set when bit b6 (no data) of the Subtype is set. The draft shall be updated to reflect these limitations in subtype protection.

Second: Jesse Walker

Discussion:

For data frames of type NULL-Data?

Paul: No – there are 8 ways of sending zero length data frames. The field is overloaded.

Comment: What about WEP encrypted zero length data frames?

Paul: They won't be passed up.

Vote: 21-0-3 Passes

Motion by Arnoud Zwemmer

To accurately reflect the extensibility of cipher suites and authentication suites as identified in section 7.2.3.17, change the syntax of the objects in the MIB pertaining to cipher/authentication suites from INTEGER { wep(1), tkip(2), wrap(3), ccmp(4) } to OCTET STRING (SIZE(4)), with the DESCRIPTION clause noting that the first three octets shall form an OUI and the fourth octet a cipher/authentication suite within that OUI space, with the DESCRIPTION clause also listing the suites defined by IEEE 802.11i. For example, for the unicast cipher suite objects, 00:00:00:1 is WEP, 00:00:00:2 is TKIP, 00:00:00:3 is WRAP, 00:00:00:4 is CCMP.

Second: Tim Moore

Discussion:

None.

Vote: 16-0-4 Passes**Presentation: David Johnston - doc 02/593r1 – Clarified CCM Diagrams**

Discussion:

Comment: You have the endian-ness wrong in the nonce. Based on yesterday's vote.

Comment: In the text we incorporated yesterday, it shows step by step processing of how the fields are used.

Jesse: I would gladly welcome this as long as you and Paul agree on how to correct the document.

Comment: I found some errors with a quick review. But the pictures are a big improvement.

Chair: Paul and DJ should work together to fix errors and draft a motion to incorporate into draft.

Chair handed over to Dorothy Stanley while Dave looks for Stuart Kerry to draft the text for the October TGi meeting motion.

Motion by Paul Lambert:

Replace all references in the TG_i draft to the 8 octet 'PN' field that contains PN, KeyID and ExtIV in the CCMP processing with either 'RSN Header' or the abbreviation 'RH'

Second: Greg Chesson

Vote: 22-0-1 Passes

Chair: Any objection to a 10 minute recess until Dave returns?

None.

In recess for 10 minutes at 4:52pm

Resume (Dave as chair)

Chair: I talked to Stuart, and there is currently some debate about electronic LBs. The suggestion is to avoid the risk, have the meeting. If there are changes, vote on them as the first agenda item of the November meeting.

Comment: What is the risk? I heard TG_g is doing this.

Chair: TG_g is going for re-circulation. Different situation.

Chair: The amount of time we would save is not that significant. Is it worth the risk of being caught in battle of validity electronic ballots? Any arguments could put us past the time frame needed for LB.

Chair: We need to make the motions along the lines of "instruct the editor to..." Have exact clause numbers and exact text.

Chair: Do we need another straw poll?

No

Chair: I do not plan on making the motion for the 15 day letter ballot.

Comment: So, we have the meeting in Virginia. Any motions we draft in the Virginia meeting have to be exact. And then make the actual motions in Hawaii?

Yes.

Comment: It would be helpful if the draft were available for review ahead of time.

Chair: Harry can place it in a private area on the server.

Jesse: Should we have a tutorial for the rest of the membership on what we put in the draft, and why?

Chair: Lofty goal. We have a lot of things to follow-up on. We still have to review the draft.

Jesse: I was talking about for Hawaii.

Chair: Sounds like a good idea if we are planning on going to LB.

Comment: I spoke to Stuart. TG_g and TG_? are doing the same thing. There are 56 days between now and the next meeting.

Jesse: The alternative we came up with should be essentially the same thing. We vote first thing in Hawaii.

Chair: The motion to be presented to the WG tomorrow will be for a TG_i meeting on October 15th, 16th and 17th in Virginia from 9:00am to 5:00pm.

Chair: Any further business?

None.

Chair: Any objections to adjourning for the week?

None.

Adjourned at 5:19pm.

**IEEE P802.11
Wireless LANs**

Minutes of Wireless LAN Next Generation Standing Committee Meetings

Date: September 9-13, 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 Monterey from Sept 09 through 13, 2002.

Executive Summary:

1. IEEE802.11 officially joined MMAC and ETSI-BRAN in the WIG
 - a. Agreement was reached on Scope, Organization, Operating Procedures, Time Line, Work Plan (doc. 11-02/557r0)
 - b. Architecture of WLAN-WWAN Interface was presented (doc. 11-02/557r0)
 - c. Liaison Statements announcing the formation of WIG were prepared (doc. 11-02/071,72,73,75,76,78,79,80)
 - d. Next major work item will be review and agreement on release 1 on the Interface Specification
2. Ad-Hoc Multiple Antenna Channel Modelling Group formation (outside of IEEE) was announced (doc.11-02/574r0)
3. Move to have the Working Group confirm PAR (802.11-02/564r0) and Criteria (802.11-02/565r0) to extend 802.11, 802.11a and 802.11d, as necessary, to include the Japanese 4.9GHz-5GHz bands; And to forward them for approval at the November 2002 IEEE 802 Plenary was passed.

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Attendance – 92

Monday Sept 9, 10:30-12:00 noon (Joint WIG/WNG Meeting)

:

1. TK Tan Presented the week's agenda (doc. 11-02/557r0r0)
 - a. Proposed Agenda for the week
 - i. Monday 10:30-12 noon
 1. Review Vancouver Meeting
 2. Approve Vancouver Meeting Minutes
 3. Review results of 1st WIG meeting held 9-8-02
 - ii. Monday (9-9) 1:00 – 3:00 PM
 1. Joint ETSI-BRAN/MMAC/IEEE meeting on WIG
 2. Discussion of 5GHz bands in Japan
 - iii. Wednesday (9-11) 3:30-5:30 PM
 1. Radio-Reg Update
 2. UWB Channel Model Review
 3. Multi-hop Update
 4. Long Term WLAN Requirements
 5. Next Meeting Goals
 - b. WNG-SC Objectives
 - i. Host WIG 1st meeting
 - ii. Vote on new '5GHz Channels in Japan' PAR and 5 Criteria
 - iii. Announce Multiple Antenna Channel Modelling Ad Hoc group formation
2. Agenda was accepted without objections
3. Vancouver WNG minutes were reviewed by Garth and accepted without comment

4. Yesterday's WIG meeting was briefly reviewed by Garth Hillman (AMD)
5. Steven McCann (Siemens Roke Manor) recapped his presentation (doc. 11-02-557r0) from yesterday:
 - a. ETSI-BRAN Scope
 - i. ETSI BRAN 3G IW
 1. Generic WLAN
 2. ETSI/MMAC
 3. All external interfaces for WLAN
 - b. Coupling
 - i. Loose – avoids core network
 1. Control Plane Only
 2. AAA
 3. Architecture
 - a. AAAL (local) and Inter-working Unit (IWU) in WLAN
 - b. Service Provider Network functions
 - c. Interface between WLAN and Service Provider Network is W2, the definition of which is one of the goals of WIG and includes in the first phase:
 - i. Policy
 - ii. Authorization
 - iii. Accounting
 - iv. Authentication
 - d. IEEE and HiperLAN/2 Authentication hierarchy reviewed and shown to be similar:
 - i. TGi = EAP Method (exchange identities)-EAP-Radius-IETF Transport
 - ii. H2 = EAP Method (exchange identities)-EAP-Diameter-IETF Transport
 4. Scope
 - a. Release 1
 - i. Basic (i.e., time based) billing
 - b. Release 2
 - i. Service based billing
 - ii. QoS
 - iii. Mobility Management Functions
 5. EAPOH (EAP over HiperLAN)=EAPOL therefore let's form a generic IW Standard
 - ii. Tight – too network specific
 - iii. Hybrid – not efficient
6. Thomas Haslestad (Telenor) (doc. 11-02-557r0) recapped his presentation from yesterday
 - a. Draft WIG Scope

- i. To be an integral part of the production of a generically applicable inter-working standard for WWAN and other public networks. The standards is to be applicable for IEEE 802.11 family, MMAC HISWAN family and ETSI Hiperlan/2*
 - ii. To be the point of resolution for ETSI, IEEE and MMAC on issues related to inter-working with WWAN and other public networks.*
 - iii. To be the single point of contact for the above-mentioned WLAN standards on questions related to inter-working with WWAN and other public networks.*
- b. Function – point of contact and resolution
- c. Rules and Procedures - consensus
- d. Meeting Schedule – 3 meetings per year, one each at IEEE, ETSI, MMAC
- e. Chairmanship – owned by the hosting committee until the start of the following meeting
- f. Internal Interfaces – access to email exploder and consolidated list of documents (~106 to date)
 - i. BRANsupport@etsi.fr
- g. External Interfaces – WIG cannot approve liaison statements thus
 - i. Chairman calls for consensus on email exploder
- h. Work Plans - phased
 - i. Release 1
 - ii. Release 2
- i. Next Steps
 - i. Agreement on WIG method and work plan
 - ii. Consider R1 from MMAC/ETSI as the baseline for release 1
 - iii. IEEE to comment
 - iv. Iterate among ETSI, IEEE and MMAC
 - v. Consensus on Release 1
 - vi. Proposal for Release 2 Baseline
 - vii. Consensus on Release 2
- j. WIG #1 is happening at this meeting
- k. WIG#2 needs planning
- l. Discussion of Issues from yesterday
 - i. 3GPP relationship/contacts have been established; 3GPP has formed three committees
 - 1. SA1 (System Architecture) – levels of coupling
 - 2. SA2 – roaming, IW
 - 3. SA3 – Security; just started
 - a. ETSI and MMAC have been formally asked to comment and would like to add IEEE
 - ii. 3GPP Nested Scenarios
 - a. #1=Common Billing and Customer Care

- b. #2=3GPP system based access control and Charging = proposed Release 1
- c. #3=access to 3GPP system based services
- d. #4=service continuity
- e. #5=seamless services
- f. #6=access to 3GPP CS (circuit switched?) services
- iii. Architecture comparison
 - 1. There are functions which exists today between the 3GPP architecture and the WLAN architecture which need defining; the definition of these functions will be the focus of the discussions between WIG and 3GPP
- iv. How does IEEE802.11 act on WIG?

Monday Sept 9, 1:00-3:00 PM (Joint WIG/WNG Meeting)

1. Presentation - (doc. 11-02/574r0)Venko Erceg, Zyray Wireless
Request for participation in - Ad-Hoc Multiple Antenna Channel Modelling Group; verceg@zyraywireless.com
 - a. 11 participants currently; want to add more
 - b. Objective – extend 802.11 channel models to include MIMO systems
2. WIG continued by Thomas and TK
 - a. How does IEEE802.11 act on WIG?
 - i. WIG will continue
 - ii. Does IEEE wish to participate?
 - b. The committee was asked to affirm participation of IEEE802.11 in WIG as follows:
 - i. Scope was presented again for comment; none received; considered adopted**
 - ii. Rules of Operation were presented again for comment; none received; considered adopted**
 - iii. Proposed F2F Meeting Format was adopted without comment** – 3 meetings a year, one each at MMAC, IEEE, ETSI
 1. Next meeting at MMAC in Jan/Feb 2003 time frame
 - iv. Document Exchange was presented again for comment; none received; considered adopted**
 - v. Internal Interface (exploder) was presented again for comment; none received; considered adopted**
 - vi. External Interface (done separately in each org since WIG does not have the mandate to approve liaison statements or standards) was presented again for comment; none received; considered adopted**
 - vii. Phased Approach was presented again for comment; none received; considered adopted**
 - viii. Work Plan – use R1 (first inputs from ETSI and MMAC) as baseline - was presented again for comment; none received; considered adopted**
 - ix. Timeline Objectives were presented (see below) again for comment; none received; considered adopted**

1. WIG#1 happening
2. BRAN#30; Oct 1-4 – R1 baseline tabled
3. From Oct 18 through Dec. 10 – IEEE comment and iteration period
4. Feb. 2003 WIG#2 – consensus for release 1
5. Ask for approval of R1 at each the earliest plenary for each organization
6. Develop timeline for R2

Comment - 3GPP is working on their system release 6 and system release 6 included some of WIG release 2 (e.g., IMS (IP Multimedia Subsystem) support) therefore WIG may be behind in some areas.

Response – yes WIG needs to catch up on some issues whereas WIG is ahead in others.

x. IEEE802.11 has officially joined WIG

- xi. Liaison Statements – Preparation work will start tomorrow; Oak Tree rooms 2,3

3. Peter Ecclesine (doc. 02/533r0) – Preparation of PAR and 5 Criterion for including Japan’s new 4.9 & 5GHz bands

(http://www.soumu.go.jp/s_news/2002/pdf/020611_3_02.pdf) in the IEEE802.11 standard:

- a. Application envisioned by Japan for new bands - WLL
- b. IBSS is PROHIBITED in these two new bands
- c. Issues Summary
 - i. Can OFDM PHY satisfy the new Regulations
 - ii. Determine channel IDs for 4.9 and 5.0 bands
 - iii. How to handle the Japanese 4 ms carrier sense rule
 - iv. How to handle rules prohibiting IBSS
- d. Peter’s j5par.doc is an initial draft of the PAR and Peter reviewed:
 - i. Scope
 - ii. Purpose
- e. Peter’s j5crit.doc is an initial draft of the 5 Criteria and Peter noted issues in US and Japan:
 - i. 4.9 for US homeland security
 - ii. 4.9 for Japan
- f. Ad Hoc meeting this evening at 7 PM in Oak Tree
- g. Peter presented the motion he would like to see WNG pass on Wednesday as:

Move to have the Working Group confirm 802.11-02/xxxr0 PAR and 802.11-02/xyr0 Five Criteria to extend 802.11, 802.11a and 802.11d, as necessary, to the Japanese 4.9GHz-5GHz bands,
And to forward them for approval at the November 2002 IEEE 802 Plenary

- h. Meeting was adjourned

Monday Sept 9, 7:00 PM WNG Ad Hoc

1. A draft PAR (11-02/564r0) and 5 Criteria (11-02/565r0) for 4.9 and 5.0 bands in Japan was completed. Note that the PAR was made broad enough to include changes as necessary to the 5.15-5.25 bands to meet the Japanese requirements.

Tuesday Sept 10, 1:00-3:00 PM

1. Liaison statements were prepared (doc 11-02/581r0) in the WIG meeting. [see minutes of WIG meeting and doc.11-02/606r0]

Wednesday Sept 11, 3:30 – 5:30 PM

1. Meeting called to order with 36 attendees
2. TK reviewed the agenda for the afternoon
3. Garth Hillman resigned as secretary.
4. Amer Hassan announced IAG will hold a meeting on Friday afternoon from 1-4:30 in Windjammer
5. Joint Radio Regulatory Meeting Carl Stevenson
 - a. Carl Stevenson reviewed status as reported in 802.18-02/027r0
 - b. Request from the floor regarding knowledge of any new unlicensed bands that FCC could make available for WLAN.
Carl indicated none were being considered at this time
6. TK reviewed WIG activities this week (as recorded in document 11-02-560r1 slides 3 & 4). A question arose about how to get further information via the WIG reflector and it was stated that there were email addresses for that purpose contained in document 11-02-560r1.
7. Preparation of PAR and 5 criteria for 11a amendment to address Japanese bands.
 - a. Peter Ecclesine reviewed contents of the PAR (11-02-564r0) and 5 criteria (11-02-565r0) as well as the translation of the Japanese rule change (11-02-533r1). Some discussion and editorial changes were proposed.
 - b. Motion to approve the documents and present to 802.11 plenary
Moved by Peter Ecclesine
Seconded by Amer Hassan
Vote : passed (14,0,0)
8. Standing Committee was adjourned for the week.

**IEEE P802.11
Wireless LANs**

Minutes of High Throughput Study Group Meetings

Date: September 11,13, 2002

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Abstract

Minutes of the High Throughput Study Group meetings held during the IEEE 802.11/15 Interim meeting in Monterey from Sept 09 through 13, 2002.

Executive Summary:

1. Inaugural meeting of the High Throughput Study Group was held on Wednesday 9-11-02, 3:30 to 5:30 PM; attendance was excellent (>100) indicating high interest
2. Garth Hillman was affirmed as secretary.
3. Straw polls indicated that the scope should include:
 - a. Enhancements to both existing and planned 802.11 extensions
 - b. Throughput improvement expected should be quantified
4. Scope statement – ‘To define standardized modifications to the 802.11 MAC and PHY layers that achieve a minimum increase of at least xxx in throughput as measured at the MAC data SAP’ - was developed for the PAR
5. Purpose statement developed – ‘To improve the 802.11 wireless LAN user experience by providing significantly higher throughput for current applications and to enable new applications and market segments’ - was developed for the PAR
6. Jon’s meeting Doc. is 11-02/532r0

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Total – 165 inclusive of both meetings

Wednesday Sept 11, 3:30-5:30 Inaugural Meeting

:

1. Jon Rosdahl strawman (doc. 11-02- 532r0) agenda for the week was:
 - Meeting Call to Order
 - Elect/Confirm Secretary
 - REVIEW IEEE/802 & 802.11 POLICIES and RULES
 - APPROVE/MODIFY AGENDA
 - Set/Review Objectives
 - Discuss/Revise PAR and 5 Criteria
 - Develop a plan for future SG work
2. Meeting was called to order by Jon at 3:35
3. Opening Remarks by Jon on participation expectations
4. Garth Hillman was affirmed as secretary
5. Jon reviewed the rules and noted that as a SG non-voting members are allowed to vote
6. Agenda was proposed by Jon
 - a. Motion to adopt agenda – Adrian Stephens
 - b. Second – Bobby Jose
 - c. Passed unanimously
7. Jon's comments
 - a. Chairman and Secretary are here to facilitate progress towards generating a PAR and Criteria
 - b. Want solutions not just technology when technical presentations are made
 - c. Noted our ONLY two tasks as a study group are to generate a PAR and a Criteria document
 - d. Strawman Title - Enhancements for Higher Effective Throughput
 - e. Strawman Completion date – July 2004 based on an aggressive but POSSIBLE timeline which Jon reviewed
 - f. Enhancement (Evolution) or Next Generation (Revolution)?
8. Comments:
 - a. What is scope; need discussion
9. Jon presented two scope statements which he had received over the past week
10. Why are we here – customers get half of what they pay for; they pay for 11 mbps but get 5.5 mbps
11. Discussion on this SG activity from the floor:

- a. Agnostic to changes to MAC or PHY layers
 - b. Q - Evolution or revolution? A – do evolutionary enhancements now, new standard in another TG
 - c. High Throughput versus Higher data rates but would include higher data rates per se
 - d. Enhancements that can be achieved in 18 months
 - e. Keep options open to include things that might not be immediate; i.e. revolutionary
 - f. Try not to be too abstract in scope statement; don't get too broad
 - g. Scope – closely coupled MAC and PHY to get optimal solution
 - h. Higher Data Rate is subset of Higher Throughput
 - i. Quantitative SCOPE not qualitative
 - j. Backward compatibility (a?, b/g?) requirement needs to be reflected
 - k. Coupling of MAC/PHY needs to be a major part of this activity
 - l. Enhancing existing MAC and PHY layers OK but which layers?
 - m. Does not have to apply to 2.4 AND 5 GHz; example – FEC at 5 GHz only
 - n. On the other hand Burst ACK – would be good for ALL PHYs
 - o. Scope – don't be too narrow just to avoid conflicting with existing and developing standards
 - p. Why is existing performance is what it is; we need to clearly understand this before making new proposals; i.e., define the problem
 - q. Timing – make it worth our while; don't think too small just to get done quickly
 - r. Coupling – MAC and PHY are viewed as decoupled today; should they be?
 - s. Define “Throughput” then we can define what we want to achieve
 - t. Backward compatibility should not limit us and is not mandatory; i.e., revolutionary
 - u. Upper layer stack coupling to MAC is just as important as MAC/PHY coupling
 - v. RRM is discovering that the traditional layer 1 and 2 (MAC/PHY) scope of 802.11 is limiting
 - w. Higher layer protocols (e.g., TCP) can have a significant effect on system throughput
12. How to capture these ideas and use them? What will be our process?
 13. Jon listed the Criteria as they exist today
 14. Jon – “If we answer why we are here we will be led to a purpose statement”
 15. Jon – “If we answer what we hope to accomplish we will be led to a scope statement”
 16. Jon – proposed a strawman scope
 17. Discussion specifically on scope
 - a. Does everyone understand “Throughput” – (majority, 0, <10)
 - b. What is meant by and not meant by the proposed scope statement
 - c. What is history of proposed scope statement
 - d. Higher throughput and data rate for OFDM modulations only?
 - e. Straw Poll – Should enhancement of 802.11b throughput be included? (34 for,23 against,27 abstain) -> (34,23,27)
 - f. Straw Poll – Should enhancement of 802.11a throughput be included? (96,0,4)

- g. Straw Poll – Should enhancement of 802.11g throughput be included? (72,8,14)
 - h. Throughput – data rate as measured at the MAC data SAP (versus the air interface bit rate)? Or Air Interface Rate minus overhead introduced by the MAC (actual header and trailer bits AND back-off idle periods)? Or Air Interface Rate minus overhead introduced by the MAC (actual header and trailer bits AND back-off idle periods AND Management frames such as Beacons)? OR ????
 - i. Adrian Stephens proposed a new scope statement – “To define standardized modifications to the (existing?) .11 MAC and OFDM PHY layers that achieve an increase in throughput measured at the MAC data SAP”
 - j. Straw poll - Should we consider only existing 802.11 standards (i.e., excluding .11g and .11e) as the baseline from which this group operates? (6,62,10)
 - k. Straw Poll – replace strawman scope with Adrian’s but with (existing?) removed – “To define standardized modifications to the .11 MAC and OFDM PHY layers that achieve an increase in throughput measured at the MAC data SAP” (67,8,25)
 - l. Straw Poll – Should we quantify minimum increase in throughput at SAP interface? (55,29,15)
 - m. What are the conditions under which we would measure this throughput – e.g., without sacrificing range etc.
 - n. Definition of throughput again?
 - o. Straw Poll – remove OFDM from Adrian’s scope statement passed (66, 25, 6)
 - p. **New scope statement** - To define standardized modifications to the .11 MAC and PHY layers that achieve a minimum increase of at least xxx in throughput as measured at the MAC data SAP
 - q. Don’t get too broad
18. Recessed until 7 PM Thursday evening

Existing queue – Jim, Terry

Thursday 9-12-02 7:00 – 9:30 PM

1. Meeting was called to order by Jon at 7:15 PM
2. Jon recalled that our broad goal is to answer What and Why
3. Agenda for the evening - Discuss and revise the PAR and Criteria and establish a process for going forward
4. Jon reviewed current scope statement developed in first meeting
5. Jon reviewed the Criteria we will need to meet
6. Timing – PAR must be delivered 30 days before Plenary session; this will make July 2004 strawman target difficult to achieve
7. Answer What and Why before establishing a timeline was requested by membership
8. Answer Why first and then What was requested by membership
9. Discussion of why (Purpose):
 - a. What usage scenarios are we trying to address
 - b. Good Technology with a Balance of Wow and Value

- c. Market spaces
 - i. Home (multimedia distribution)
 - ii. Hot Spot deployment (range, # users)
 - iii. Corporate LAN Deployment improvement
 - d. Higher data rates for Corp, > 200 mbps
 - e. Unified MAC+PHY, end-to-end solution
 - f. Scalable solutions which can take advantage of faster PHYs
 - g. High speed applications
 - i. Video
 - ii. Photo
 - iii. File distribution
 - h. High speed delivery of advanced services to Handheld devices
 - i. Increase the market size via standardized leading edge “wow” solutions
 - j. Improved spectrum efficiency
 - k. Extended range
 - l. Provide Value to the end user
 - m. Understand the user’s experiences
 - n. Keep bounds on range vs. rate trade-offs
 - o. Transition technology for current standards to the next generation
10. Comments:
- a. Extended range conflicts with extended throughput
 - b. Enhance Range x Throughput product for WLAN applications (versus WPANs)
 - c. Spectrum efficiency improvement implies lower power, higher range
 - d. Are we going to try to address everything
 - e. Each of three areas have different infrastructures; how do we deal with this
 - f. Will it be the wired infrastructure that drives us to wireless – natural evolution
 - g. Evolutionary (shorter time frame) or revolutionary (longer time frame); don’t let timeline drive us down one path or the other
 - h. Answer – how much weight do you want timeline to have in the time vs. resources equation
 - i. Question to be answered at some point - What do you think the right combination of enhancements to MAC/PHY that allow for a fast track completion?
 - j. We don’t want to miss Moore’s law and by not acting proprietary solutions will emerge which will dilute volume production
 - k. Let’s be realistic, this will take three years realistically and therefore we need to set the bar high to get the most bang for our buck
 - l. Wireless multimedia in the home.

11. Purpose Summary (Why)

- a. Make our current system better
- b. bits/sec/Hz/user – move these attributes to area 16 (other items) on PAR (majority)
- c. Higher Throughput to improve the End-User experience in Market Spaces including but not limited to (65,1,1):
 1. Wireless LANs in the Home
 2. Hot Spot Deployment
 3. Corporate LAN Deployment
- d. We must include timeline because it is part of the PAR
- e. Adrian's strawman – To improve the 802.11 wireless LAN user experience by providing significantly higher throughput for applications including but not limited to those in the Home, Hot-spots and Enterprise Markets. (65,0,8)
- f. **Replace Adrian's statement as follows** - To improve the 802.11 wireless LAN user experience by providing significantly higher throughput for current applications and to enable new applications and market segments. (39,26,3)

12. Area 16 Other Details

- a. bits/sec/Hz/user

13. Meeting was adjourned at 9:35 PM

Note: (xx,yy,zz) are the results of straw polls where xx=for, yy=against, and zz=abstain.

**IEEE P802.11
Wireless LANs**

RRM Minutes for the September 2002 Session

Date: September 13, 2002

Author: Harry Worstell
AT&T
Simon Barber
Instant802 Networks
Richard Paine
Boeing

Monday, September 9, 2002
10:00AM

The meeting was called to order
Chair presented update since Vancouver meeting in July 2002.
There were 21 people present at the beginning of the meeting

Agenda

Item		Monday, September 9, 2002, 10:00 am		
1	*	Meeting Called to Order	Paine	0
2	*	REVIEW IEEE/802 & 802.11 POLICIES and RULES	Paine	5
3	MI	APPROVE OR MODIFY AGENDA	Paine/All	10
4	DT	Set/Review Meeting Objectives	Paine/All	10
5	DT	Presentations on RRM Requirements and Issues	Paine/All	45
6	DT	Discuss/Revise Draft RRM Requirements and Issues Document	Paine/All	15
7	MI	Recess for the day		0
Item		Tuesday, September 10, 2002, 8:00 am		
1	*	Meeting Called to Order	Paine	0
2	ii	Intro, Agenda, and Summary	Paine	10
3	DT	RRM Issues and Vision (Big Picture Issues)	Kwak	30
4	DT	Timming and Scheduling	Metha	30
5	DT	Pictorial View of RRM	Skellern	30
6	DT	PAR Check	Paine	10
7	DT	5 Criteria Check	Paine	10
8	DT	Recess	Paine	0
Item		Thursday, September 12, 2002, 8:00 am		
1	*	Meeting Called to Order	Paine	0
2	*	Intro, Agenda, and Summary	Paine	10
3	DT	Control, Where Art Thou?		20
4	DT	Control	Barber	30
5	DT	PAR Check	Paine	10
6	DT	5 Criteria Check	Paine	10
7	DT	Final PAR and 5 Criteria Vote	ALL	20
8	DT	Recess	Paine	0
Item		Thursday, September 12, 2002, 7:00 pm		
1	*	Meeting Called to Order	Paine	0
2	*	Intro, Agenda, and Summary	Paine	10
3	DT	PAR Check	Paine	30

4	DT	5 Criteria Check	Paine	30
5	DT	Final PAR and 5 Criteria Vote	All	30
6	DT	Motions for Closing Plenary	All	30
7	DT	Meeting Adjourned	Paine	0

Presentations:

02/531r0 Richard Paine.....RRM Plenary Opening Report
 02/597r0 Richard Paine.....RRM Plenary Wednesday Report
 02/608r0 Richard Paine.....RRM Plenary Closing Report
 02/337r8 Richard Paine.....PAR
 02/340r7 Richard Paine.....5 Criteria
 02/508r4 Richard Paine.....Requirements and Issues
 02/603r0 Daryl Kaiser.....Normative text for the RRM Scope of the PAR
 02/601r0 Simon Barber.....Control
 02/528r0 Lars Falk.....RRM and WLAN-WWAN handovers
 02/557r1 Joe Kwak.....Big Picture Issues
 02/527r0 Mehul Mehta.....Radio Resource Measurements : Timing and Scheduling Considerations
 02/602r0 Edgar/Paine.....Control, Where art Thou
 02/510r0 Simon Barber/J Kim...Proprietary MIBs
 02/618r0 Bobby Jose..... RRM Requirements Discussion on CCA
 02/568r0 David Skellern.....RRM Architectural Framework

This will require an extra session from the extra TGf sessions.

The Chair covered the IEEE IP Policy

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

a)

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

b)

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

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

The group covered changes to the PAR for revision 4 (doc 337r4). The Chair presented the PAR and 5 Criteria drafts. The discussion covered the ability to take the PAR and 5 Criteria to vote on Friday. There was supposition that on Friday we might not be able to take a vote because of the “control” issue. There was a request to have a “control discussion” before the vote on Friday. 802.11f is not going to be meeting this week because of a delay in the Sponsor Ballot in the IEEE office. Therefore, their meeting times were available and the Chair obtained a meeting time at 8am on Thursday to talk about the control issue.

The projected date of submission for sponsor ballot has changed to July 2003, This is a very aggressive schedule

There was a wording change in scope that added "across multiple 802.11 vendors".

It was suggested that there may be additional changes to the PAR after some of the presentations.

The Chair presented a timetable that was added to the revision 4 of the PAR

Further edits "Issue call for proposals for Study Group" to correctly read "Task Group"

It was suggested that we need 60 days after call for proposals before TG meeting –

There is no room in the aggressive schedule for this.

Also indicated that many people are working to wrap up other TGs, and will join RRM when these activities are done. We should not be too aggressive to allow these people to attend.

It was suggested that we should seek input from TG Chair since he is the only person to attempt to make an aggressive schedule for a TG recently - he has experience with what is a reasonable time period to keep calls open etc.

The Chair edited dates to reflect changing the Draft submission to RevCom to May 2004. -

1st draft out in May 2003.

A suggestion to consult with the TG Chair - if he thinks the more aggressive timetable might work for this then we can change back - hopefully this group won't fall into the problems G had.

5 Criteria

The Chair indicated that the 6th criteria might be quite important for us - co-existence.

E.G. in Microsoft's experience in an area where there are a lot of WLAN cards just the probe requests can cause a problem -

we might want to make changes for co-existence with other 802.11 WLANs

The Group added the word "installation" before "cost" in the second sentence of 5 criteria document (consideration of installation cost). Also added was the words "and may cost less".

Lars Falk presented the document 02/528r0 - "RRM and WLAN-WWAN handovers"

He raised all the issues around it and the discussion was on what measurement parameters were required for handoff. The presentation will be included in the requirements and issues document

There was a discussion about the need for STA and AP tables for the terminals as well as the Access Points. Most terminal applications do not have SNMP and are not SNMP-enabled. XP already has some APIs (WLAN) including NDIS. There was a recommendation to create an API. Clients could use the information. However, clause 10 of the standard specifies what has to be shown as the MIB. If there is not an API, then there should be a logical interface and a set of primitives. Figure 11, in the standard shows the interfaces and the management entities of both the PHY and the MAC. Some of the best issues are around choosing which network would give you the best data rate. We want to be careful not to specify things so they have to be implemented everywhere where this is not necessary.

Straw Poll

"How many people want us to have an extra session (taking over on one of the TGf sessions) for the discussion of control"

17 yes

0 no

0 abstain

Straw Poll

"Would you vote yes on present PAR and 5 criteria?"

12 yes

1 no

9 abstain

Question: if a study group supports a PAR and a higher group rejects it what happens?

It comes back to study group for another try.

Richard presented document 02/508r4 - "Requirements and Issues"

- a list of all the problem statements brought up in the group.

Meeting was recessed at 12:00.

Tuesday, September 10, 2002
8:00 am

Item		Tuesday, September 10, 2002, 8:00 am		
1	*	Meeting Called to Order	Paine	0
2	ii	Intro, Agenda, and Summary	Paine	10
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5	DT	Pictorial View of RRM	Skellern	30
6	DT	PAR Check	Paine	10
7	DT	5 Criteria Check	Paine	10
8	DT	Recess	Paine	0

The Chair called the meeting to Order and reviewed the progress in Monday session.

David Skellern presented document 02/568r0 "RRM Architectural Framework"

overview

- o Shows the 802.11 architectural framework in which RRM will reside
- o Identifies some RRM models consistent with that framework

some addressed in TGh

- o The 802.11 standard place MIBs in the MLME and PLME and specifies access from SME via the MLME SAP and PLME SAP using generic GET/SET primitives [see Figure 63 of ISO/IEC 8802-11:1999(E)]
- o TGh handles measurement and control using MLME primitives

Conclusions:

- o The 802.11 architecture recognizes certain constraints and mechanisms.
- o Development of 802.11 RRM extensions are likely to proceed most quickly and smoothly if existing layer models and mechanisms can be used to deliver the desired functionality

Joe Kwak presented 02/577r0 "RRM Study Group: Big Picture Issues"

- Multiple radio technologies (multimode chip sets)
- Connectivity between 3G systems, 3GPP, 802.15, 802.16 and IEEE802.11

Mehul Mehta presented 02/527r0 "Radio Resource Measurements: Timing and Scheduling Considerations"

- Initiate discussion on
 - o Signalling issues concerning Radio Resource Measurement (RRM)
 - o Possible formats and types
 - o Confidence in measurements
 - o Systems Issues
- Conclusion:
 - o Requirements for RRM...
 - Types of radio link attributes needed
 - Accuracy, Confidence, Validity
 - List the different RRM and organise them
 - Occasionally, Intermittently, Regularly, Frequently
 - ...will depend on entities that will use RRM
 - Target deployment type
 - o Public WLAN access, Enterprise, Home, SOHO, others
 - Complexity and 'Sophistication' of the incumbent policies
 - ...and would also help structure the measurements
 - Database type 'key' access
 - Interface with minimal complexity
- Discussion:
 - o frame type requirements how do we know the apps?
 - o Just introducing issues
 - o look at information available before we incorporate more frames
 - o wish list and should be in requirements doc

The Chair discussed the PAR and a vote this week.

Meeting Recessed 10:00 am

Thursday, September 12, 2002
8:00 am

Item		Thursday, September 12, 2002, 8:00 am		
1	*	Meeting Called to Order	Paine	0
2	*	Intro, Agenda, and Summary	Paine	10
3	DT	Control, Where Art Thou?		20
4	DT	Control	Barber	30
5	DT	PAR Check	Paine	10
6	DT	5 Criteria Check	Paine	10
7	DT	Final PAR and 5 Criteria Vote	ALL	20
8	DT	Recess	Paine	0

Chair went over agenda

There were 56 attendees at the beginning of this session.

Simon Barber presented a paper on control 02/601r0

- o How much change?
- o Balance possible features against the need for the group to complete it's work in a reasonable amount of time
- o Don't want to make work complex for implementers
- o Want to make sure we do enough work to be useful
- o Conclusion:
 - o Adding new messages to TGh protocol, specifying extra measurements to be taken by the client and reported to the AP
 - o Adding new messages to TGh protocol, allowing MAC/PHY parameters to be set on the client by the AP
 - o Adding new messages to TGh protocol, allowing MAC/PHY operation to be directed
 - o Other modifications to the MAC protocol operation

Darwin Edgar/Richard Paine presented a paper 02/602r0 on "Wherefore art thou, control"

Factors to consider

- o Scaling
- o IP Address/Subnet Mask
- o \$/Mbps
- o Data Rate
- o Throughput

Most mac and phy can be gotten from mid

Look at THh MLME model for collecting data (MLEGET and PLMEGET)

Enumeration mechanism could be made easier by using ANA management

Using existing MID is a time consuming process and this might be quicker for within the STA not across the air

Certain types of control are useful some are not (would be hard to make the philosophical change to the std Left side of diagram is MLME right side is SME)

Primary factor is scalability

Adding some degree of control is good but not as far as Simons presentation

Comment: Should look at each PHY and make decisions based on what they have available

Comment: Should the AP have the ability to change channels as normative behavior 2. Environment of dot11 comes from a single BSS which is not what evolving Growth and Demand for 802.11 will require more than just reuse of channels---must look to the future not just now and dot 11 must have the capability to address these issues

Straw poll for what degrees of control should be in the PAR

Specifying measurements to be taken by the client and reported to the AP should be with in the scope of the PAR.

Yes 42 No 0 Abstain 1

Specifying a mechanism to allow an access point to set parameters that effect the normal operation of the MAC and PHY on the client should be within the scope of the PAR

Yes 13 No 11 Abstain 17

PAR document discussions

comment: must specify what will be changed—scope is not specific enough to limit what will be done.

Meeting recessed until evening session.

Thursday, September 12, 2002
7:00 pm

Item		Thursday, September 12, 2002, 7:00 pm		
1	*	Meeting Called to Order	Paine	0
2	*	Intro, Agenda, and Summary	Paine	10
3	DT	PAR Check	Paine	30
4	DT	5 Criteria Check	Paine	30
5	DT	Final PAR and 5 Criteria Vote	All	30
6	DT	Motions for Closing Plenary	All	30
7	DT	Meeting Adjourned	Paine	0

There were 26 attendees at the beginning of the evening session.
Text was offered for the scope of the PAR:

Scope:

This project will enhance the 802.11 Media Access Control Standard, the 802.11a High Speed Physical Layer Extension in the 5GHz band and the 802.11b Higher-speed Physical Layer Extension in the 2.4 GHz band supplemental standards, other 802.11 PHY approval supplemental standards and 802.11d Specification for Operation in Additional Regulatory Domains. These enhancements will provide mechanism to higher layers for radio and network measurements requests and reports. Refer to Section 16 for additional explanation.

Purpose: (10)

To define measurements and develop mechanisms to provide 802.11 wireless measurement information for higher layers and new applications.

The 802.11 Vice Chair suggested adding only a small amount of control to this PAR then start a second study group for control at a later date (6 months), then let them run staggered at the 802.11 sessions so participants can attend both. This way if control gets bogged down at least the measurement part can moved forward.

Comment: monitoring will be a problem with the TGe group. TGh may well be complete very soon - due to European law relaxing the requirement for DFS.

The Chair set the objective for this session to be only the PAR and 5 criteria

Question: we should include corrigendum and amendment 'd'.

Editing PAR

Suggested text:

"To enhance the 802.11 Media Access Control Standard, the 802.11a High Speed Physical Layer in the 5 Ghz band and the 802.11b Higher Speed Physical layer extension in the 2.4Ghz band supplemental standards, other 802.11 PHY approved supplemental standards, and the 802.11d Specification for operation in additional regulatory domains to provide radio and network measurement reports across multiple vendors and to provide a measurement service to higher layers. Refer to section 16 for additional explanation."

Comment: remove 'multiple vendor'

"To enhance the 802.11 Media Access Control standard, the 802.11a High Speed Physical Layer in the 5 Ghz band and the 802.11b Higher Speed Physical Layer Extension in the 2.4Ghz band supplemental standards, other 802.11 PHY approved supplemental standards, and the 802.11d Specification for operation in additional regulatory domains to provide radio and network measurement requests and reports and to provide a measurement service to higher layers. Refer to section 16 for additional explanation.
add 'requests and reports'

"To enhance the 802.11 Media Access Control standard, the 802.11a High Speed Physical Layer in the 5 Ghz band and the 802.11b Higher Speed Physical Layer Extension in the 2.4Ghz band supplemental standards, other 802.11 PHY approved supplemental standards, and the 802.11d Specification for operation in additional regulatory domains to provide radio and network measurement requests and reports and to provide a measurement service to higher layers. Refer to section 16 for additional explanation.

A discussion on the requirement to add an absolute measure of RSSI to the PHY specs continued. It was suggested that the chip manufacturers already do this in the chips, so there is little cost in adding this to the spec.

- merge the to-provide clauses

"To enhance the 802.11 Media Access Control standard, the 802.11a High Speed Physical Layer in the 5 Ghz band and the 802.11b Higher Speed Physical Layer Extension in the 2.4Ghz band supplemental standards, other 802.11 PHY approved supplemental standards, and the 802.11d Specification for operation in additional regulatory domains to provide a measurement mechanism to higher layers that includes radio and network measurement requests and reports. Refer to section 16 for additional explanation.

Grammar changes

"To enhance the 802.11 Media Access Control standard, the 802.11a High Speed Physical Layer in the 5 Ghz band and the 802.11b Higher Speed Physical Layer Extension in the 2.4Ghz band supplemental standards, other 802.11 PHY approved supplemental standards, and the 802.11d Specification for operation in additional regulatory domains. The enhancements will provide measurement mechanisms to higher layers that includes radio and network measurement requests and reports. Refer to section 16 for additional explanation.

Grammar - drop requests and reports:

"This project will enhance the 802.11 Media Access Control standard, the 802.11a High Speed Physical Layer in the 5 Ghz band and the 802.11b Higher Speed Physical Layer Extension in the 2.4Ghz band supplemental standards, other 802.11 PHY approved supplemental standards, and the 802.11d Specification for operation in additional regulatory domains. These enhancements will provide mechanisms to higher layers for radio and network measurements. Refer to section 16 for additional explanation.

This completes the PAR.

Editing Purpose of Project

Some participants don't like 'monitoring' - due to possible QoS issues

change monitoring to 'for higher layers'
further editing

ok - done, on to editing section 16

deleting unnecessary duplication of text

deleting sentences that don't make sense.

Editing reasons - new text.

Some participants have concern over the aggressive timetable.

We may get less time in future meetings
changes to timetable - ending in July 2004

- ready to vote on PAR

Steve Pope moves to vote on the PAR
Walter Johnson seconds

Motion - Move to adopt 11-02-337r8 as the draft PAR for the Radio Resource Measurement Study Group and submit it to the 802.11 Working Group.

Yes 24 No 0 Abstain 1

Editing the 5 Criteria

Second sentence in Balanced costs is not complete?

Editing

Comment: - data measurement is limiting - drop the data.

Dropped

Comment: - editings - measurement ->plural

Suggested text for One unique solution:

The PAR will define only one set of radio measurement extension to 802.11 and there is no other radio measurement activity in 802.11.

editing - Easy for document reader...

Comment: - replace SNMP/MIB with measurement

editing - Reasonable cost for performance

- text was irrelevant

The measuring and reporting of radio resource measurements can be done with a very small incremental cost of total system resources.

editing - Consideration of installation cost.

Vote on 5 criteria

Motion:

Move to adopt 11-02-340r7 as the draft 5 criteria for the Radio Resource Measurement Study Group and submit it to the 802.11 Working Group.

Moved: Simon Barber

Seconded: Marty Lefkowitz

For 13 Against 0 Abstain 0

Motion

Move to have the Radio Resource Measurement Study Group move that the 802.11 Working Group forward to the 802 Exec for approval 11-02-337r8 PAR and 11-02-340r& Five Criteria to enhance the 802.11 network measurement and reporting

Moved : Tim Olson

Seconded : Marty Lefkowitz

For : 12 Against: 0 Abstain: 0

The Chair proposed that the presentations we didn't have time for will take place on the teleconferences.

Bob Miller moves to adjourn.

The meeting adjourned at 9:31 pm