IEEE P802.11
Wireless LANs

Tentative Minutes of the IEEE P802.11 Full Working Group

March 11-15, 2002

Hyatt Regency St Louis, St Louis, Missouri, USA

Opening Plenary: Monday, March 11

1.1. Introduction

1.1.1. Meeting called to order by Stuart Kerry and Bob Heile at 1:10PM. Agenda of 72nd session of 802.11 is in doc.: IEEE 11-02-116r5

1.1.2. Secretary – Tim Godfrey

1.1.3. Straw poll of new members in the group: 30

1.1.4. Straw poll of members without wireless connection – 5

1.2. Announcements

1.2.1. Review of Policies and rules (From document 00/278)

    1.2.1.1. Roll call is impractical = has been discontinued.

    1.2.1.2. Review of voting rights and process.

    1.2.1.3. Voting tokens will be handed out directly by Al Petrick.

1.2.2. Review of voting membership status:

    1.2.2.1. 802.11 now has 291 voters, 113 nearly voters; potential voters is 404 at this meeting. 303 aspirant. Total 578. Quorum by definition at plenary., but 202 would be needed.

1.2.3. Attendance Book

    1.2.3.1. New on-line system being introduced.

    1.2.3.2. The book will continue to be circulated until the new system is verified.

1.2.4. Document numbering system is moving to an electronic system at this meeting for 802.11.

1.2.5. Review of Patent Policy, individual membership, and anti-trust rules in document 00/278

1.2.6. Plaques and Certificates for work in 802.11b and 802.11d.

    1.2.6.1. Carl Andren, Editor and Chair of 802.11b-cor1.

    1.2.6.2. Victoria Poncini for 802.11b

    1.2.6.3. Ken Clements for 802.11d

    1.2.6.4. Arnoud Zwemmer, Johnny Zweig, Chris Zegelin, also received awards for 802.11d.

1.2.7. New Electronic Attendance Book and Document Number assignment system

    1.2.7.1. Thierry Walrant describes the new system he has implemented.

    1.2.7.2. New system is described in document 02-160

1.2.8. Wireless Network

1.2.9. IP Statements

1.2.9.1. The chair of 802.11 announces that an IP statement has been received from Intersil regarding 802.11i

1.2.9.2. The chair of 802.15 announces that an IP statement has been received from Sony

1.2.10. WG Elections

1.2.10.1. This is the year for WG and 802 officer elections.

1.2.10.2. Proposed slate of officers for the upcoming 2 year term:

1.2.10.2.1. Stuart Kerry, Chair, Al Petrick Vice Chair, Harry Worstell, Vice Chair, Tim Godfrey, Secretary

1.2.10.3. Nomination : Moved Carl Stephenson

1.2.10.4. Second TK Tan

1.2.10.5. Any other nominations?

1.2.10.5.1. Discussion –

1.2.10.5.1.1. When will the election take place? Friday Closing Plenary.

1.2.10.5.1.2. Is this the last opportunity for nominations? Yes, according to Paul's recommendation.

1.2.10.5.1.3. Nominations must be made now, to clarify.

1.2.10.5.1.4. Comment that most members were unaware of the nomination time frame requirement.

1.2.10.5.2. Request to move this business from the consent agenda to the regular agenda, since there are some questions.

1.2.10.5.2.1. The chair agrees.

1.2.10.6. Proposed slate for 802.16

1.2.10.6.1. Jim Allen, Ian Gifford, Pat Kinney Rick Alfin, Mick McInnnis

1.2.10.6.1.1. Nominated Carl Stepehenson, second Benno Ritter,

1.2.10.6.2. No further nominations

1.2.10.6.2.1. Move that nominations are closed (John Barr) accepted without objections.

1.2.11. Publicity Chair

1.2.11.1. Nominee from last meeting – Brian Matthews.

1.2.11.2. No other nominations

1.2.11.3. Postpone vote until Wednesday until Brian is present.

1.2.12. WG Graphic review

1.2.13. Liaisons

1.2.13.1. Liaisons are expected to present updates in the Friday Plenary meeting in order to keep their positions.

1.2.13.2. Discussion

1.2.13.2.1. Where do we discuss new liaisons? Will be discussed in the Wednesday Plenary

1.3. 802.11 Agenda

1.3.1. The chair reviews the agenda in document 02-116r5.

1.3.2. Any new old business

1.3.2.1. There is an 802 study group?

1.3.3. Any New business?

1.3.3.1. None

1.3.4. Move to adopt the agenda

1.3.4.1. Vic Hayes

1.3.4.2. Second Ivan Reede

1.3.4.3.   Adopted without objection

1.4. Matters arising from the minutes?

1.4.1. None

1.5. 802.15 Joint agenda (Today only)

1.5.1. Rick Alfin,

1.5.2. John

1.5.3. Passes by unanimous consent

1.5.4. Approval of 802.15 minutes (Rick, John) approved without objections.

1.6. Approval of 802.11 Minutes from Dallas January 2002

1.6.1. Moved by Vic Hayes

1.6.2. Seconded Bruce Kraemer

1.6.3. Approved by unanimous consent

1.7. Future Meetings

1.7.1. May – Sydney, AU

1.7.2. July – Vancouver, BC

1.7.3. September – Hyatt Monterey, CA

1.7.4. November, Koloa, Hawaii

1.7.5. January 2003 – Ft Lauderdale, FL

1.7.5.1.   Straw Poll – In favor of Ft Lauderdale: 117:0:5
1.7.5.2.   Any volunteers for alternate venues? No

1.7.6. May 2003 – Sophia Antipolis, FR

1.7.6.1.   Any volunteers for other venues? No
1.7.6.2.   Show of hands for interest in France: 95:8:6

1.8. Financial summary

1.8.1. Will be presented on Wednesday.

1.9. ExCom Activities

1.9.1. Bob Heile reports.

1.9.2. Closing ExCom meetings 1-5 at this and next meeting.

1.9.3. Discussed proposal for 2nd vice chair to SEC

1.9.4. Discussion of the TGg letter ballot

1.9.5. Discussion – WiFi and IEEE logo issue. Should the IEEE have an issue with WiFi, they should take the same position with Bluetooth

1.10. Nominations for officers

1.10.1.   Nominations for Chair – none

1.10.2.   Nominations for Vice Chair –

1.10.2.1.   Discussion
1.10.2.1.1.   Can we table this until Wednesday? To give anyone the chance to come forward.
1.10.2.1.2.   Was it announced in January? Candidates should be ready by this point. Everyone should know about this.

1.10.2.1.3.   It is not that they didn't know, but perhaps they didn't know it was required at the opening plenary.

1.10.2.1.4.   Would like to have the candidates explain why the candidates are going for election.

1.10.2.1.5.   Since there are concerns, it is probably worth waiting two days.

1.10.2.1.6.   Does anyone know of anyone who is even interested in being nominated? (no response)

1.10.2.1.7.   Everyone should know that the meetings start on Monday. There are no guarantees that particular business will take place on a certain day.

1.10.2.2.   Move to close Nominations –

1.10.2.2.1.   Moved Bob O'Hara

1.10.2.2.2.   Second Atul Garg

1.10.2.3.   Objection to Consideration

1.10.2.4.   Discussion

1.10.2.4.1.   What does it mean to close nominations when there is one candidate? That means there will be a vote coming up. There is still the opportunity to vote no.

1.10.2.4.2.   Motion to table this motion until Wednesday

1.10.2.5.   Objection to consideration is only valid for new main motion.

1.10.2.6.   The motion to table was not valid

1.10.2.7.   Motion to table the closing of nominations

1.10.2.7.1.   Jim Zyren

1.10.2.7.2.   Second Kowalski

1.10.2.7.3.   Vote 54:28:21

1.10.2.8.   Move to bring this motion back from the table

1.10.2.8.1.   Dave Bagby

1.10.2.8.2.   Eric

1.10.2.8.3.   Discussion

1.10.2.8.3.1.   Move to postpone until Wednesday.

1.10.2.8.3.1.1.   John Kowalski

1.10.2.8.4.   Discussion

1.10.2.8.4.1.   Agrees that we need to re-elect officers. Against the motion

1.10.2.8.5.   Vote: Fails 27:47:29

1.10.2.9.   Discussion

1.10.2.9.1.   Move to nominate Jim Zyren as parliamentarian

1.10.2.9.2.   Dave Bagby

1.10.2.9.3.   Second Ivan Reed

1.10.2.9.4.   Discussion

1.10.2.9.4.1.   Parliamentarian is not an elected post.

1.10.2.10.   Discussion –

1.10.2.10.1.   Even after we close nominations, can there be write in candidates? We have one slate under considerations.

1.11. *802.11 Subgroup Updates*

1.11.1.   TGe – John Fakatselis

     1.11.1.1.   Continuing to resolve comments

     1.11.1.2.   We will approach no voters and try to get consent of the resolution.

     1.11.1.3.   We will decide if we send out a new letter ballot.

     1.11.1.4.   Requests that no-voters give a prompt response of suggested resolutions.

1.11.2.   TGf – Dave Bagby

     1.11.2.1.   LB32 closed last night

     1.11.2.2.   Do not have the ballot results yet.

     1.11.2.3.   Outcome of LB will determine work this week.

1.11.3.   TGg – Matthew Shoemake

     1.11.3.1.   LB33 closed at noon today.

         1.11.3.1.1.   291 voters, received 230 valid ballots

         1.11.3.1.2.   86:104:40

         1.11.3.1.3.   45% yes 55% no

         1.11.3.1.4.   855 comments to resolve.

     1.11.3.2.   Will begin comment resolution with several groups working on specific areas.

     1.11.3.3.   Discussion

         1.11.3.3.1.   Why are so many companies advertising TGg products? This has been discussed in the CAC. The chair is working on a position on this. If people build to a draft before it is ratified, that is their own risk. The position will be published on the reflector

1.11.4.   TGh – Mika Kasslin

     1.11.4.1.   Continuing comment resolution

     1.11.4.2.   Will try to have a new LB at this meeting.

1.11.5.   TGi – Dave Halasz

     1.11.5.1.   Will try to get out a LB this week.

     1.11.5.2.   There are some objections to LB that we will try to resolve.

     1.11.5.3.   Will discuss issues 802.1x issues.

         1.11.5.3.1.   There is a possibility of meeting with 802.1aa (maintenance to 802.1x)

         1.11.5.3.2.   Preliminary agenda is for Tuesday evening.

1.11.6.   5GSG – TK Tan

     1.11.6.1.   There will be three session this week

     1.11.6.2.   Updates from ETSI BRAN

     1.11.6.3.   Major topics – call for participation on 802.11a high rate. 3G cellular and WLAN interworking. Collaboration with ETSI BRAN and MMAC.

     1.11.6.4.   New market requirements for Next Gen WLANs.

1.11.7.   Document Submission

     1.11.7.1.   Harry reviews submission and formatting rules for documents.

1.11.8.   802.11 Special Committee including TG Editors on State Machines

     1.11.8.1.   Duncan Kitchin

     1.11.8.2.   The current process requires State Machines being updated, as a set of changes to the SDL in the form of editors instructions on how to change the existing SDL.

     1.11.8.3.   This is impossible and impractical – we are looking for alternatives

1.11.8.4. One possibility is removing the SDL entirely and replacing them with smaller state machines where needed.

1.11.8.5. It has been suggested that actual implementers provide input on whether the SDL provided any useful input in implementing the standard.

1.11.8.6. A Special Task (Ad Hoc) is being formed to investigate how to proceed, and bring a recommendation back to the WG this week.

1.11.8.6.1. The TGe editor is not here, we will need a delegate – Adrian Stepehens.

1.11.8.7. This is an Ad Hoc Task. Duncan Kitchin will lead this effort and bring a recommendation to the Friday Plenary.

1.12. 802.15 Subgroup Updates

1.12.1. 802.15 TG1

1.12.1.1. Vote in RevCom coming up 7 approve, 1 against, 1 abstain.

1.12.2. 802.15 TG2

1.12.2.1. Will conduct two parallel letter ballots in .11 and .15. Both have to pass. Will use 802.15 automated tool for Letter Ballots.

1.12.2.2. LB at the end of next week.

1.12.3. 802.15 TG3 High Rate

1.12.3.1. In the middle of comment resolution

1.12.3.2. Last LB was 84% approval based on comment resolution. Less than 100 comments remain.

1.12.3.3. Security is the remaining issue for work this week.

1.12.4. 802.15 TG4

1.12.5. 3A – alternate 15.3 PHY Study Group

1.12.5.1. Working on 5 criteria, selection process

1.13. Joint Subgroups

1.13.1. Publicity – Al Petrick, Jim Meyer

1.13.1.1. IEEE staff on site will update on branding and publicity

1.13.1.2. Dennis Eaton will present an update on WECA

1.13.2. Regulatory Ad Hoc – Vic Hayes

1.13.2.1. Document RR 027r1

1.13.2.2. Letters to MII of China

1.13.2.3. Letters to US JRG 8A-9B

1.13.2.4. Liaison to ETSI-=BRAN with new DFS

1.13.2.5. Rules change – Regulatory will not be Standing Committee, but will be a TAG (Technical Advisory Group)

1.13.2.6. Objectives – proposals to rules changes, US WRC 03, Response to IC consultation.

1.13.2.7. Discussion

1.13.2.7.1. What about DARS proposals on limits below 2.4GHz band.

1.14. Old Business

1.14.1. Motion to reaffirm the TGg post actions after the Dallas Meeting as directed by SEC

1.14.1.1. John Kowalski

1.14.1.2. Jim Zyren

1.14.1.3. Discussion

1.14.1.3.1. This appeal was raised in SEC to get the procedure taken care. Does not want to have a member later protest on procedural matter. This is to cover our tracks. The procedure we followed was not in accordance with 802. There were several SEC members that think empowerment is a bad idea.

1.14.1.3.2. This should be a procedural motion. This does not have any impact on conformant implementations. However the SEC directed it to be technical.

1.14.1.3.3. Does this 75% apply to this particular vote? This affirmation? Therefore this does not affect any procedural matters

1.14.1.3.4. Jim Zyren : Reserves a point of order that this is technical motion.

1.14.1.3.5. Call the question – no objections

1.14.1.4. Motion ID 334

1.14.1.5. Vote: Passes 98:6:14

1.14.2. Announcement

1.14.2.1. Wireless Interface Group

1.14.2.1.1. Specification for RF to BBP MAC and PHY

1.14.2.1.2. Benno Ritter

1.14.2.1.3. Tonight

1.14.2.2. Tutorials tonight

1.14.2.2.1. High Speed Mobile Data

1.14.2.2.2. DSRC

1.14.3.

1.15. Recess at 3:05PM

2. Wednesday Plenary Session

2.1. Opening

2.1.1. The meeting is called to order at 10:35 by Stuart Kerry

2.2. Announcements

2.2.1. Agenda updates

    2.2.1.1. New business additions

    2.2.1.2. WG officers nominations

2.2.2. Attendance Books

    2.2.2.1. The paper books are running in parallel with the electronic system

    2.2.2.2. The electronic system in primary

    2.2.2.3. Overall we are pleased with the electronic system.

    2.2.2.4. The group thanks Thierry Walrant for writing the application.

    2.2.2.5. Any feedback or comments?

        2.2.2.5.1. At what point can you not sign in? What if you are late? Only during the meeting times.

        2.2.2.5.2. There is no option for a plenary session? 802.11 and 15 plenaries are included, but not 802 plenaries

        2.2.2.5.3. The chairs and vice chairs have administrator rights. See them if there is any problems?

        2.2.2.5.4. Is the book a valid backup if you miss? No.

2.2.3. Voting tokens

    2.2.3.1. Evan Green has the tokens if you need to pick them up

    2.2.3.2. It has been difficult to get the tokens. Eventually we will have electronic voting.

    2.2.3.3. Why can't we pick up token at registration? There is an extra cost for doing that.

2.2.4. New participants meeting at registration desk at 1:00PM

2.3. IP Statements

2.3.1. No more have been received

2.4. Modification to the agenda

2.4.1. Any old Business to add?

    2.4.1.1. There will be a motion to establish an RREG TAG

2.4.2. Any New Business to add?

    2.4.2.1. Request of the 802.11 WG coming out of a motion from the WNG committee. The motion is a request for liaison with CableLabs.

    2.4.2.2. Report from the Editors Special Committee is ready now. We will add it to the new business for this session.

    2.4.2.3. A motion to establish liaison to JEDEC JC-61 committee which is developing a standard MAC PHY interface

2.5. Approval of Agenda as modified (02-116r6)

2.5.1. Motion to approve the modified agenda

    2.5.1.1. Moved John Rosdahl

    2.5.1.2. Second Bruce

    2.5.1.3. Agenda accepted without objection

2.6. WG Operating Rules

2.6.1. Existing rules in document 00/331r2. Proposed changes are in document 00/331r3.

2.6.2. Includes all changes to rules from the Chairs Advisory Core.

2.6.3. Sections 1,2,3,6,7,8, 9 have been changed. New sections Section 4 and Section 5.

2.6.4. Document is on the server.

2.6.5. Will discuss the rules in the closing Plenary

2.6.6. Asks everyone to review the rules before then, and bring questions.

2.6.7. The official vote of adoption will be at the next meeting. It will come up at the start of the Sydney meeting, on Monday.

2.6.8. These rules are our bylaws. These rules are above Roberts rules, but SEC and 802 rules have precedence over our rules.

2.6.9. The chair intends to move this group into the next century. We need to move ahead.

2.7. 802 elections and nominations

2.7.1. The chair provides an overview of his thoughts on the election process:

IEEE 802.11
Working Group Officer Election Process

- This presentation details the procedures for the election of the IEEE 802.11 Working Group Officers (Chair and Vice Chair's) in March of each even-numbered year.
- The election shall be held at the Working Group Opening Plenary meeting.
  – "March 2002 Nominations currently differed to Wednesday Plenary"
- One of the Vice Chair's, as Acting Chair, shall introduce the candidates for Chair and request additional nominations. The candidates shall each be given a short time (nominally, two minutes) for a statement, typically to (1) summarize their qualifications; (2) state their commitment to participate and accept duties and responsibilities; (3) state their vision for the Working Group.
- The floor shall be opened for discussion (nominally for five minutes total). The Acting Chair should attempt to ensure an emphasis on positive, rather than negative, statements about candidates. However, negative statements about the past performance of incumbent candidates is acceptable.
  – **The Acting Chair should limit the duration of comments to allow broad participation. If only one candidate is nominated, the Vice Chair may choose to sharply limit the debate. The situation shall be repeated, with the Chair leading the process for the election of the Vice Chair.**

IEEE 802.11
Election Process (Cont'd)

- At the Opening Plenary or deferred time period, the Chair, Vice Chair's, and Secretary shall count the hand votes and notify the membership of the results.
- In order to be elected, any candidate must receive a simple majority (over 50%) of the votes cast in the election for the respective position.
- Should no candidate receive a majority in either election, a runoff election shall be held at the Working Group Closing Plenary meeting. The process shall be similar to the initial election, except that:
  – Write-in candidates and new nominations shall not be permitted.
  – In the runoff election, the nominated candidate having received the fewest votes in the previous election round shall not be an eligible candidate (in case a tie prevents this possibility, all the nominated candidates shall remain eligible).
  – Hand Votes shall be counted during the session. If the process is inconclusive, another runoff shall be held, as in the point above.
  – Should a runoff process not lead to the election of a Vice Chair, the election may be deferred to the next Working Group session, at the Chair's discretion. However, every effort should be made to conclude the election of the Chair.

2.7.2. The election should be held at the opening plenary unless deferred.

2.7.3. Runoff elections shall be used to close on the election process

2.7.4. Discussion.

    2.7.4.1. Do we need a motion to take the nomination from the table? There will be a time for that.

    2.7.4.2. Are we precluding new nominations during the process? The nominations were supposed to be closed on Monday according to SEC rules.

2.7.5. Motion – to take the motion to close nominations from the table

2.7.5.1.	John K
2.7.5.2.	Jim Zyren
2.7.5.3.	Vote: Passes 132:0:0

2.7.6. Motion on the floor: Move to close nominations

2.7.6.1.	Moved Bob O'Hara
2.7.6.2.	Second Atul Garg
2.7.6.3.	Motion ID 336
2.7.6.4.	Discussion

2.7.6.4.1.	The motion on the floor is to close nominations. We can discuss that motion or vote.
2.7.6.4.2.	The secretary reads the original motion that was tabled.
2.7.6.4.3.	Point of information – Who has been nominated so far?

2.7.6.4.3.1.	Stuart Kerry, Harry Worstell, Al Petrick, Tim Godfrey.

2.7.6.4.4.	The motion on the floor is out of order if there is anyone who wishes to make a nomination?
2.7.6.4.5.	The chair asks for any further nominations?

2.7.6.4.5.1.	There are not other nominations.
2.7.6.4.5.2.	The motion on the floor is in order.

2.7.6.5.	Vote on the motion: Passes 155:0:0

2.7.7. Discussion

- 2.7.7.1. We now have one slate of candidates.
- 2.7.7.2. Candidates to state qualifications, commitment to participate, and vision for the group.
- 2.7.7.3. The chair moves to Harry Worstell

2.7.8. Election of the Chair

- 2.7.8.1. Stuart Kerry makes a 2 minute statement: Qualifications of two years of experience in leading the group, and active in 802.11 since 1993, including sessions as Vice Chair. We have become the forefront of standards for wireless LANs. Committed to take this group forward for the next two years. We have made great improvements in the administrative process by moving to an electronic system. He can speak from authority on Roberts Rules and the SEC rules. There is still work to do, perhaps in the MAC. Has full commitment of Philips for the next two years of work. The CAC committee will help us resolve issues. The thought is to form a standing committee to deal with issues and rules during the meetings. To deal with resolutions and actions at the meetings from chairs, or protests on process. We have to realize that technology moves quickly, and this group needs to move quickly also. The committee is the WG chairs and Task Group Chairs. CAC is all of chairs, TG chairs, and vice chairs. Acting between sessions with two meetings.

2.7.9. Discussion of the nomination

- 2.7.9.1. We have made tremendous progress is a difficult environment. Asks for support of the candidates.
- 2.7.9.2. Affirm this idea to get this group working together and making progress.
- 2.7.9.3. This is a reasonable selection process. Reaffirms support for the officers.
- 2.7.9.4. As the chair of a TG, fully supports the nomination.

2.7.10. Election Process –

- 2.7.10.1. Is there any objection to a vote by acclamation?

2.7.10.2.   None

2.7.10.3.   Stuart Kerry is elected as the Chair by unanimous acclamation.

2.7.10.4.   The chair moves to Stuart Kerry

2.7.11.   Election of the Vice Chair

2.7.11.1.   Harry Worstell makes his statement: Has been involved for over 4 years, and as vice chair for 2 years. We have moved from 35 people to over 300 people. We have worked through our growing pains. Has letters of commitment from AT&T for continuing work.

2.7.11.2.   Is there any objection to a vote of acclamation

2.7.11.3.   None

2.7.11.4.   Harry Worstell is elected as the Vice Chair by unanimous acclamation

2.7.12.   Election of the Vice Chair

2.7.12.1.   Al Petrick makes his statement: Has enjoyed working with the chairs and the group. Looks forward to working more closely with the TG chairs. Has maintained the voter database and attendance records. Will now have more time to work with the TG chairs as we add automation. Has full support from Icefyre semiconductor

2.7.12.2.   Is there any discussion or objection from the floor? None

2.7.12.3.   Is there any objection to a vote of acclamation? None

2.7.12.4.   Al Petrick is elected by unanimous acclamation.

2.8.   New Business

2.8.1.   Establish Radio Regulatory as a TAG

2.8.1.1.   Vic Hayes (Document RR 02-038r0)

2.8.1.2.   Explanation of Technical Advisory Group – to provide assistance to Working Groups. Does not make standards, but advises and makes recommendations.

2.8.1.3.   Will prepare position papers and liaison statements.

2.8.1.4.   Will hold teleconferences

2.8.1.5.   The charter of the RR TAG is contained in the document.

2.8.1.6.   Motion: 1) To request IEEE 802 SEC to establish a regulatory TAG with the charter as depicted on slide 2 of document IEEE 802.11RR-02-040r1. 2) Appoint to individuals as official working group representatives to have voting rights in the TAG: Denis Kuahara and Stuart Kerry. 3) to grant attendance credit to WG members attending the RR TAG.

2.8.1.6.1.   Moved Vic Hayes

2.8.1.6.2.   Second Bob O'Hara

2.8.1.6.3.   Motion ID 337

2.8.1.7.   Discussion

2.8.1.7.1.   Doesn't a rules change require a plenary cycle? Yes, the rules change was started in November, and has been balloted. This is the output of that comment resolution process.

2.8.1.7.2.   The words "only authorized group" are a concern. Could the TAG authorize sub-groups if needed? The objective of the TAG is to coordinate all three wireless WGs. It is important to limit the communication channels.

2.8.1.7.3.   What exactly is meant by a radio regulatory matter? Is this TAG empowered to create recommended practices? What if the expertise is outside the group? Would the RP's be sponsor ballot-able? If an RP is needed, it has to go through the PAR process.

2.8.1.7.4. Would the 802.11 chair no longer be able to speak on these matters? The chair of 802.11 suggests that he be able to designate an alternate to represent 802.11 in the RR TAG.

2.8.1.7.5. In favor of forming this RR TAG. We need something at the 802 level.

2.8.1.7.6. In response to the limiting of external communications – if a communication is an 802 position, it is over the 802 chair. The RR TAG has priority over SEC in external communications.

2.8.1.7.7. Perhaps the way to correct this is to change the charter to say the RR TAG is the only official position of 802. That would still allow "unofficial" communication from other WGs or SEC.

2.8.1.8. Vote on the motion: passes 118:2:13

2.8.2. Announcements

2.8.2.1. The WNG will have important discussions this afternoon. A vote on high rate, and the 3G interworking SG

2.8.2.2. Other new business will be moved to Friday.

2.8.2.3. We are working on a reply comment to WECA position in RREG. Look for it on the server

2.9. Recess for Subgroups at 12:00

3. Closing Plenary

3.1. *Opening*

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

3.2. *Review of the Agenda*

3.2.1. Document 02/116r7 is up for approval today

   3.2.1.1. Revision 7 is displayed

   3.2.1.2. Fixed special order times for motions in old business. There are 13 minutes per item

   3.2.1.3. We have a 30 minute break. We would like to change to a 15 minute break.

   3.2.1.4. Blue items are deferred from Wednesday

      3.2.1.4.1. Study Group WNG

      3.2.1.4.2. Cable Labs WNG

      3.2.1.4.3. ETSI Bran letter

   3.2.1.5. 802.15.2 LB

   3.2.1.6. 802.16 Sponsor Ballot

   3.2.1.7. Any other items for the agenda?

      3.2.1.7.1. Propose moving report from the editors special committee to before the reports to task groups in New Business.

   3.2.1.8. Discussion on the request

      3.2.1.8.1. Did you want it before the motions or before the reports?

      3.2.1.8.2. Can we move it into the reports?

   3.2.1.9. No objection to moving it at the end of the reports.

3.2.2. Discussion on the attendance book

   3.2.2.1. The paper book will be a backup for this week

3.2.3. Back to the agenda

   3.2.3.1. Any old business? No

   3.2.3.2. Any new Business?

      3.2.3.2.1. There is a new motion for New Business: 802.11 Email Reflectors

   3.2.3.3. Any other new business? No

3.2.4. Any objection to the agenda as modified?

   3.2.4.1. None

3.3. *Announcements*

3.3.1. CAC should look at the CAC tab for teleconferences and related information.

3.3.2. No new IP statements have been received.

3.3.3. General feeling about electronic attendance? The group applauds.

   3.3.3.1. Thanks to Thierry Walrant for developing it.

   3.3.3.2. The other wired groups want to use this system also.

3.4. *Document List Update*

3.4.1. All documents have been updated on the servers.

3.4.2. Will be on the web site by Monday or Tuesday

3.5. Task Group and Study Group Reports

3.5.1. TGe – John Fakatselis

3.5.1.1. Continued resolution of comments and modification to the draft.

3.5.1.2. Addressed about 70% of the comments

3.5.1.3. Passed a motion to empower TGe to conduct business as defined in our objectives in Australia

3.5.1.4. We approved the continuation of teleconferences. There will be three groups. Schedules to be announced on the reflector.

3.5.1.5. Objectives

3.5.1.5.1. To continue with comment resolution

3.5.1.5.2. Approve text and update draft

3.5.1.5.3. Approve new draft

3.5.1.5.4. Initiate a new TGe letter ballot

3.5.1.6. The chair requests everyone to listen carefully to the objectives of each task group

3.5.2. TGf – Dave Bagby

3.5.2.1. Document 02/171r4

3.5.2.2. Have been reviewing comments for LB32

3.5.2.3. Note that TGf chair has new contact new information.

3.5.2.4. LB32 results. Passed 79.0%. 139:37:46. It is a valid return, with 20% abstain.

3.5.2.5. 60 members did not return ballot.

3.5.2.6. 60% of the technical comments have been resolved.

3.5.2.7. Two new motions will be brought to the WG regarding issues in the standard:

3.5.2.7.1. the MLME SAP regarding association and disassociation.

3.5.2.7.2. Extending reason codes in table 18 of 802.11 regarding old AP not verifying association.

3.5.2.8. TGf interim notice: TGf will hold an additional interim meeting in April in the SF Bay Area. Will be for LB32 comment resolutions and draft editing, and preparing a recirculation ballot.

3.5.2.8.1. The results of the meeting will be presented to this body to the whole group.

3.5.2.8.2. The recirculation ballot will be 40 days.

3.5.2.9. There will be a motion for the interim meeting, a motion to enable the ballot, and then the recirculation ballot.

3.5.2.10. Schedule – meeting April, Recirc May, Sponsor Ballot in May.

3.5.2.11. Output documents 184r11 resolutions, 163 minutes, 171r4 report.

802.11F
Meeting Report
March 2002

Goals for March

- LB 32 result review
- Probable actions:
  - Review / confirm ballot results
  - Review comments received
  - Resolve comments
  - Revise draft if necessary
    - Re-circulation ballot

March 2002 802.11 F Agenda

- Call to order
- Administration Stuff
- Agenda Adoption
  - Status / Goals for Mtg
  - Old / New Business
    - LB 32 result review
    - Actions from Ballot result

Agenda adoption

- Moved: to adopt agenda as proposed
  - Moved: Bob
  - Second: Moskowitz
  - Vote: unan

Admin Stuff

- Matters Arising from the January minutes?
  - none

- Approval of minutes from January
  - Moved: Bob O
  - 2$^{nd:}$ R Paine
  - Vote: unan

Reminder: TGf Chair contact info has changed…

- This week people were still using the 3Com email address for communication - please use the revised contact info for TGf matters:

  David Bagby

  Chairman P802.11 TGf

  Email: david.bagby@ieee.org

  Phone: (650) 637-7741

•TGf chair currently still available to discuss business opportunities…<grin>

Requirements for LB comments

- From IEEE companion:
  - From the IEEE Standards Companion:
  - Next, you must examine your negative ballots and their comments. Remember, a negative ballot must have comments attached. Those comments should explain any difficulties the balloter has with the current document and offer precise wording for changes that would turn their "no" vote into a "yes" vote. In many cases, the balloter may offer vague solutions or even no solution at all. At this point, the working group (or a subgroup established to resolve ballots) should examine the problem to see if they can resolve it on their own, or they may discuss the situation with the balloter and solicit more precise language. If none of this is successful, the ballot may be labeled non-responsive.

Comment requirements

  - From the IEEE Standards Board Operations Manual (section 5.4.3.1):
  - b) Do Not Approve (Negative With Comments). This vote shall be accompanied by one or more specific objections with proposed resolution in sufficient detail in a legible form so that the specific wording of the changes that will cause the negative voter to change his or her vote to "approve" can readily be determined. The Sponsor shall encourage the submission of comments with all negative ballots.

LB 32 result

(as of end of this week):

- Ballot result:
  - Passing: 79.0%
  - Yes: 139, no: 37, abstain: 46

  - Misc. other LB 32 info:
    - Valid vote: over 50% return (78.3%)
    - Abstain level ok: 20.2%
    - Members that did not vote: 63
    - Invalid votes from members: 5
      - These will not be dinged for not voting (just this once) due to special dispensation given By the 802.11 Chair.
    - Total Voters: 290

LB 32 comment status

- Approx 60% of technical comments resolved.

- Editorial comments to be reviewed/resolved by editor, any that appear to actually be technical will be referred back to TG.

Possible Comment Resolutions

- Adoption of comment:
  - Changes vote from No to Yes, causes re-circulation ballot.
- TG offers alternative to requested change:
  - If accepted by voter, official acceptance of alternative required.
- Comment declined:
  - Vote and comment stands as is.
- Comment invalidated (as non-responsive).
  - Comment "erased" result as if comment had not been submitted.

Submission   Slide 12   David Bagby

Motion re fixing MLME SAP

- Moved: to formally request IEEE P802.11 to correct the description of the MLME SAP with regard to association and reassociation so that it matches the behavior as described with the text of the standard.
- Moved: Bob O
- 2nd: Jon R
- Vote: unan
- Plenary vote:

Submission   Slide 13   David Bagby

Motion re extending reason codes in table 18 of P802.11

- Moved: To formally request IEEE P802.11 to add a reason code with the meaning of "Old AP did not verify previous association".
- Moved: Jon R
- 2nd: Bob O
- Vote: unan
- Plenary Vote:

TGf Interim mtg notice

- TGf will be holding a 2 day Interim TGf meeting either the week of April 22nd
    - (exact dates subject to mtg facility arrangements, time & place to be announced via reflector and web site)
- Location: SF Bay Area.
- The meeting agenda will be limited to the items:
    1. Completing LB 32 comment resolutions.
    2. Completing Draft 3.1 to reflect the comment resolutions
    3. Taking action necessary to issue the LB 32 resolved comment file and Draft 3.1 for an electronic re-circulation ballot.
        - Anticipating that several other ballots are likely to be issued from 802.11, the TGf re-circulation ballot will be longer (40 days) than the minimum 10 day period to ensure sufficient time for review.

TGf Interim Meeting Motion:

- Moved:
  1. TGf will make make the final LB32 Comment resolution document and the corresponding Draft revision (3.1) available to the membership via the 802.11 members only area of the web site after its April Meeting.
  2. The TGf chair is instructed to issue a 10 day electronic ballot (where non-response is taken as assent) asking the membership the following question:
     1. Shall TGf draft 3.1 be issued for WG re-circulation ballot?
  3. The TGf chair shall then start the re-circulation ballot depending on the outcome.
- Plenary vote:

Expected TGf schedule

- Interim mtg in April
  - Timing driven by 30 day notice requirements
- Recirc runs thru May mtg
- Sponsor ballot starts from July Plenary

Goals for May 2002

- TGf is not anticipating meeting formally during May
  - As the re-circ ballot will still be running...

- Members attending the meeting are encouraged to discuss the material out for ballot as part of responding to the ballot.

Summary:

- LP 32 processing not complete
  - Anticipate completion at Interim meeting.
- Output Docs:
  - 02/184R11: LB 32 comment responses as of end of March 2002 meeting (processing incomplete).
  - 02/163 TGf minutes
  - 02/171 This report

3.5.3. TGg – Matthew Shoemake

3.5.3.1.   Comments in 02/179r1

3.5.3.2.   Resolutions in 02/209r2. R3 will be issued within 2 weeks.

3.5.3.3.   Draft 2.5 will be issued 2 weeks before Sydney, containing resolutions

3.5.3.4.   Draft 3.0 will be generated at Sydney

3.5.3.5.   Motions from TGg to WG

        3.5.3.5.1.   Request pre-authorization to issue LB in the May 2002.

3.5.3.6.   Objectives for Sydney

        3.5.3.6.1.   Continue to resolve LB comments

        3.5.3.6.2.   Update Draft to 3.0

        3.5.3.6.3.   Issue a Letter Ballot

3.5.3.7.   Discussion

        3.5.3.7.1.   The draft 2.5 will be no later than 2 weeks before the meeting? Yes

        3.5.3.7.2.

TGg Report to IEEE 802.11 WG

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

Letter Ballot #33

- Received approximately 890 comments
  - 388 were editorial
  - Consolidated comments available in 02/179r1
- Worked on resolution of motions
  - See document 02/209
    - Current revision is 2
    - Revision 3 will be issued within two weeks of the end of the March 2002 session

State of the Draft

- Current version is Draft 2.1
- Draft 2.5 will be issued 2 weeks before the Sydney meeting
- Draft 2.5 will contain resolutions from the March 2002 session
- Draft 3.0 will be generated at the May 2002 session

Motions from TGg

- All motions passed during the March 2002 session were internal motions to 802.11g except one:

    Direct the chair of TGg to request preauthorization for a letter ballot to be issued on the 802.11g draft from the May 2002 session.
    Williams/Zyren 26/1/0

    TGg chair to introduce a motion to IEEE 802.11g when it is in order.

Objectives

- Continue resolution of LB #33 comments
- Update draft to version 3.0
- Issue letter ballot on draft 3.0 from the May 2002 (Sydney) session

3.5.4. **TGh – Mika Kasslin**

3.5.4.1.   Report is Document 173r0

3.5.4.2.   Joint meeting with RREG update on DFS, BRAN27

3.5.4.3.   Discussed TPC elements

3.5.4.4.   Discussed DFS elements, heard proposals

3.5.4.5.   Revised draft normative text was created 02/245r0

3.5.4.6.   reviewed draft, revised normative text to 245r2

3.5.4.7.   The new draft normative text was adopted unanimously, on the server on Thursday afternoon as 802.11h-D2.0

3.5.4.8.   Motion to initiate LB in closing plenary

March 2002   **doc.: IEEE 802.11-02/173r0**

TGh Final Report for the March 2002 Session

Mika Kasslin

TGh chair

March 2002   **doc.: IEEE 802.11-02/173r0**

TGh Agenda (02/203)

- 11 meeting slots reserved, finally used 9 of them
  - A joint meeting with R-Reg
  - Discussion on TPC elements
  - Discussion on DFS elements
  - Draft normative text review
- Meeting minutes in 02/165r0

Joint Mtg with R-Reg

Industry Canada presentations

- Canadian Proposals for the WRC-03 on 5GHz RLAN issues
- Simulation on Aggregate Interference from Wireless Access Systems including RLANs into EESS in the 5250-5350 MHz

Update on DFS Framework preparations

Update on BRAN#27 results

Submission   Slide 3   Mika Kasslin, Nokia

Discussion on TPC Elements

- Proposed draft normative text available early March (02/154r2)

- Presentation on transmit power indication in Beacon frames (02/210r0)
  – Draft normative text prepared based on the support in a straw poll

Submission   Slide 4   Mika Kasslin, Nokia

Discussion on DFS Elements

- D1.1 and two complete DFS draft normative text proposals

- Presentation about benefits of extended DFS reports, 02/228
- A proposal for DFS, 02/161
- A proposal about measurement/quiet request element, 02/215
- A proposal about fast channel switching, 02/216
- Presentation about benefits of RSSI measurement report

Discussion on DFS Elements

Straw polls results on the proposals:

Positive for quiet period offset

Positive for two IEs for measurement and quiet request

Negative for channel switch time indicated also in microseconds

As the result a revised draft normative text proposal was created, 02/245r0

Draft Normative Text Review

- New DFS proposals accepted unanimously in the revised draft normative text proposal, 02/245r2
  - optional CCA report
  - optional RSSI histogram report
  - MLME and PICS
  - "The Channel Switch Announcement frame may be sent in a BSS by the AP without performing backoff, after determining the WM to be idle for one PIFS period"
- As the result a new draft normative text proposal on the server at 4:20pm on Thursday, March 14th 2002

Draft D2.0

TGh adopted unanimously draft normative text given in 02/245r2 as 802.11h-D2.0

TGh directed unanimously the chair to prepare a motion for the closing plenary to conduct a working group letter ballot to forward the 802.11h-D2.0 to sponsor ballot.

March 2002 Objectives

- Review results of the BRAN#28 meeting related to the DFS framwork
- Process letter ballot comments

3.5.5. TGi – David Halasz
    3.5.5.1. TG decided to go to Letter Ballot
    3.5.5.2. Discussed 802.1X attack
    3.5.5.3. Conference call on May 6
    3.5.5.4. Objective for May
        3.5.5.4.1. Letter Ballot comment resolution

TGi Final Report for the March 2002 Session

March 15, 2002

TGi Final Report for the March 2002 Session

- Motions
  - Replace clause 8 with text in doc 02/178: Passed
  - AES w/CNTR mode & CBC-MAC. Failed
  - Go to letter ballot in Task Group.
- Discussion on 802.1X attack.
- Conf. Call on May 6th, 11-1 EST, dial in number will be provided later on the reflector. Purpose is to discuss letter ballot comments.

Slide 2   David Halasz, Cisco Systems, Inc.

Next meeting objective

- Letter ballot resolution

Slide 3   David Halasz, Cisco Systems, Inc.

3.5.6. WNG SC – TK Tan

3.5.6.1.   Closing report 02/263r0

    3.5.6.1.1.   Presentations on high rate, 3G WLAN, Letter of invitation from ETSI. Discussion on forming a SG

    3.5.6.1.2.   The group is not quite ready to form a SG.

    3.5.6.1.3.   Objectives for May meeting

        3.5.6.1.3.1.   Review updates from BRAN 28

        3.5.6.1.3.2.   Continue HDR discussion

        3.5.6.1.3.3.   WLAN integration with Mobile Nets

    3.5.6.1.4.   2 Motions for WG

March, 2002   **doc.: IEEE 802.11-02/263r0**

WNG SC Closing Report
IEEE 802.11, St Louis, MO
March 11-15

T. K. Tan,

Bruce Kraemer

WNG SC Agenda

- Tuesday
  - Updates (ETSI BRAN, MMAC, IAG)
  - Presentation/Discussion (HDR extension to 802.11a)
  - Call for participation for more submissions on HDR extension to 802.11a
- Wednesday
  - Presentation/Discussion (HDR extension to 802.11)
  - 3G-WLAN Interworking
  - Market requirements and usage scenarios
- Thursday
  - Joint regulatory meeting
  - Presentation – radio resource measurements
  - Motions discussion and decision

Submission   Slide 2   TK Tan, Bruce Kraemer

March Submissions

- 11-02-232r0-WNG-Extended Data Rate 802.11a.ppt
- 11-02-183r0-WNG Single Burst Contention Resolution.ppt
- 11-02-159r1-WNG-System_capacity_and_Cell_Radius_Comparison_with several_high_data_rate_WLANs.ppt
- 11-02-138r0-Throughput_Analysis_for_IEEE_802-11a_Higher Data Rates
- 11-02-149r0-WNG-Global_Area_Network_(GAN)_Concept.ppt
- 11-02-234r0-WNG BRAN27-5GHz Adhoc group report.ppt
- 11-02-182r0-WNG-Home_Networking_Requirements _& _Aspects.ppt
- 11-02-242r0-Co-operation_towards_WLAN_–_3G_&_Public_Interworking
- 11-02-180r0-WNG-On the use of multiple antennae for 802.11 .ppt
- 11-01-668r2-W-Multihop-Networking.ppt
- 11-02-252r0-WNG-Suggested_Criteria_for_High_Throughput_Extensions.ppt
- 11-02-240r0 WNG - UWB .ppt
- 11-02-238r0 WNG IAG Report.ppt

Submission   Slide 3   TK Tan, Bruce Kraemer

WNG SC Objectives – Sydney, Australia,

- Review updates from previous ETSI BRAN #28, 3G-WLAN interworking and IAG meetings
- Continue discussion on HDR extension to 802.11
- WLAN integration with Mobile networks
- Requirements for Next Generation WLANs and their implications on the standardization process
- 802.11 radio resource measurements
- Prepare for IEEE interim in July, ETSI BRAN & other interim meetings as needed

Submission   Slide 4   TK Tan, Bruce Kraemer

2 Motions

- Move that the WNG Standing Committee request the 802.11 WG to form a liaison with CableLabs for the purpose of coordinating the use of 802.11 WLANs in DOCSIS cable modem systems
  - WNG SC Passes: 64/0/4
- Move that the WNG Standing Committee requests the 802.11 WG to accept the invitation from ETSI BRAN and MMAC to participate in the "WLAN – 3G and other Public Access networks interworking" project
  - WNG SC Passes 59/0/14.

Submission   Slide 5   TK Tan, Bruce Kraemer

3.5.7. Publicity – Al Petrick

3.5.7.1. Report in 268r0

3.5.7.2. Nominated a new chair, Brian Matthews, approved by consent.

3.5.7.3. Update from IEEE staff on Branding

3.5.7.3.1. IEEE working on policy for branding and copyright.

3.5.7.4. Discussed press announcements. Created 269r0 regarding products claiming draft standard compliance

3.5.7.5. Teleconference with MARCOM staff. Roger Marks point of contact.

3.5.7.6. Will have quarterly analyst briefings for standards

3.5.7.7. Report from WECA – expanded charter for all regulatory issues in unlicensed bands.

3.5.7.8. Objectives for May 2002

3.5.7.8.1. Update with WECA

3.5.7.8.2. TG reporting procedure

3.5.7.8.3. Update conference calendar

3.5.7.8.4. Media Analyst list

3.5.7.8.5. Plan meeting for July meetings

3.5.7.9. Discussion

3.5.7.9.1. What is the letter regarding draft standards? It will be on the reflector, not the web site. The concern is with products claiming compliance with 802.11g draft standard. It is a warning to companies claiming such compliance.

3.5.7.9.2. Who's position does this document represent? The PC or the WG Chair? Who formulated this position?

3.5.7.9.3. The letter was brought to the CAC on Sunday. The WG sent it to the PC. The PC worked on it, and is forwarding it onto the WG. There was no vote in the PC.

3.5.7.9.4. If this is a WG position, we should adopt it with a motion. The history of this group, back to 802.11b, we have brought out product before final ratification.

3.5.7.9.5. The chair asks the membership to withdraw this to be discussed off-line. Any objection?

3.5.7.9.6. Doesn't believe the statement is just a reminder, not an official position.

3.5.7.9.7. This is not needed, since it is already IEEE policy to not claim compliance to drafts.

3.5.7.9.8. The chair will take advice from IEEE legal staff and get back to reflector

802.11/.15 Publicity Committee

Al Petrick 802.11

Jim Meyer 802.15

Meeting Objectives

- Nominate PC chair for 802.11
- Update from 802.11 staff on Branding
- WECA update report from Hong Kong meeting
- Generate TG reporting procedure for WG
- Update conference calendar
- Review Letter from the Chair on products build to draft standards

Accomplished for this session ▬

Submission   Slide 2   Al Petrick-IceFyre, Jim Meyer-TimeDomain

Accomplishments

- Publicity chair 802.11
    - Brian Mathews approved by consent
- Update from IEEE staff
    - Branding: IEEE working on policy and procedure for using IEEE trademarks and copyrights
        - Working to set up partnerships with industry groups i.e WECA
    - IEEE staff plans to setup website links for "Branding" and Copyright procedures

Submission   Slide 3   Al Petrick-IceFyre, Jim Meyer-TimeDomain

Accomplishments

- PC group discussed the issue of press announcements from companies claiming compliance for products built to draft standards. In particular IEEE 802.11g
  – Causing confusion in the market with Industry Analysts
  – Reviewed letter from the chair in response to companies claiming compliance to products built to "draft" unapproved standards.
    • doc.: IEEE 802.11-02/269r0
- Held teleconference call with IEEE MarCom staff on this issue relative to ALL working groups under IEEE 802
  – Appointed Roger Marks 802.16 chair to act as the point of contact between IEEE MarCom staff and IEEE 802
    • Funnel Press inquiries to respective WG Chairs
    • Generate email bulletin on highlights from WG interim and plenary closing reports
  – Planning to set up regular quarterly analyst briefings on standards developments

Submission   Slide 4   Al Petrick-IceFyre, Jim Meyer-TimeDomain

March 2002   IEEE doc: 11-02-268r0

WECA

- WECA has expanded the charter of its Regulatory Committee
  – Previous charter was protection of 5 GHz spectrum worldwide and WRC-2003
  – Will now address **all** regulatory issues associated with the unlicensed bands
  – Committee successfully submitted petition to FCC to expand UNII bands to encompass bands from 5.470 to 5.725 GHz
- Successful quarterly Members meeting in Hong Kong
  – Excellent turnout (>125 members)
  – Continued discussion on upcoming standards, the technology roadmap and branding – current focus is branding for Wi-Fi5
  – Technical committee initiated draft test plans for TKIP and 802.11e
- CeBIT tradeshow starts Thursday
  – First press conference was very successful with over 50 of top European press in attendance
- Next Member's meeting June 17 – 20, location TBD (North America)

Submission   Slide 5   Al Petrick-IceFyre, Jim Meyer-TimeDomain

Meeting Objectives for May 2002 Interim Session

- WECA update report
- Generate TG reporting procedure for WG chair
- Update conference calendar
- Generate and review media analyst list
- Coordinate timeline for teleconference briefings with analysts and IEEE MarCom staff for CY2002

Submission   Slide 6   Al Petrick-IceFyre, Jim Meyer-TimeDomain

3.6. *Report from special editors committee*

3.6.1. Duncan Kitchin

3.6.2. Document 277

3.6.3. The recommendation from the editors on State Machines..

    3.6.3.1. Currently updates to the SDL must be provided in the form of editing instructions. With multiple TG's making changes, this is a hopeless task.

    3.6.3.2. The proposed resolution is to delete the SDL from the annex. Each TG supplement will include the editing instruction to remove the SDL, and remove the statement of precedence.

    3.6.3.3. The TGs will provide state machines as a part of their work, as they see fit. The language of the state machines are up to the Task Groups.

3.6.4. Discussion

    3.6.4.1. None

3.7. *Liaison Reports*

3.7.1. The chair notes that reports are required. Liaisons will be removed if they do not report

3.8. *802 Radio Regulatory*

3.8.1. Vic Hayes: Document RR 02/048r1

    3.8.1.1. European regulations updated to allow 802.11a and 802.11g.

    3.8.1.2. Changed RREG into a TAG

    3.8.1.3. Revised communication channel qualification for regulatory matters.

    3.8.1.4. received report from WECA

    3.8.1.5. Charter for the RR TAG approved by 802.11 in document RR –02-040r3

    3.8.1.6. Reply comments in RR 043. Motion in RR 049

3.8.2. Objectives for May

    3.8.2.1. Review rules changes

3.8.3. Teleconferences have been scheduled

    3.8.3.1.

Closing report Radio Regulations to Radio Working Groups March 2002 meeting

Regulatory Ombudsman
(Vic Hayes)

http://ieee802.org/Regulatory/

\\venus1\RREG 2002_March

Submission   Slide 1   Vic Hayes, Agere Systems

Objectives for St Louis. MO

- **Seeking SEC approval of rules changes for SEC Standing Committee Radio Regulations and for Wireless PARs**
- **Work on PAR rules amendment**
- **To prepare and submit other position statements if needed**
  - **e.g. Spectrum requirement 5 GHz band**
  - **e.g. 2.45 GHz regulations in China**
  - **e.g. Supportive comments on WECA petition**
  - **e.g. Opposing comments on Sirius petition**
- **To hold joint meetings with TGh, TGg and SC WNG**

Submission   Slide 2   Vic Hayes, Agere Systems

European update, 2.4 GHz

- 300 328 is in the proces of revision
- The phrase
  - '...and other forms of spread spectrum modulation ....'
- May become
  - '...and other forms of wide band data modulation techniques ... '
  - new title of annex 3 of 70.03: Wide Band Data ...
- Minimum bitrate requirement is being removed to follow change in CEPT

European update, 5 GHz

- EN 301 489-17, Part 17: Specific conditions for 2.4 GHz Wideband Transmission systems and 5 GHz high performance RLAN equipment
- Scope was updated to encompass IEEE 802.11 devices

Standing Committee Radio Regulations

- Followed-up on the results of the SEC comment resolution meeting held Sunday
  - Rules change converted from a SEC Standing Committee to a Technical Advisory Group (TAG) doc.: RR-02/38
  - Prepared a motion and a charter for a Radio Regulatory TAG, doc.: RR-02/40
  - Confirmed Carl Stevenson as the Chair of the TAG or as the Regulatory Ombudsman
- Revising the communications channel qualification

PAR Rules change

- Followed-up on the results of the SEC comment resolution meeting held Sunday
  - Regulatory conformance for wired AND wireless PARs in clause 6.4 (Technical feasibility)
  - Wireless coexistence added to the clause 6.2 (Conformance), doc.: RR-01/29r2
  - New project management clause proposal to be considered, doc.: RR-02/42

5 GHz

- Received Liaison statement from ETSI-BRAN informing about the reciept of our liaison statement with DFS proposal (January 2002) and reporting work on further developments, doc.: RR-02/33
- Report for TGh and notes on BRAN#27
- Received a draft for DFS framework

5 GHz

- Received presentation from Industry Canada on proposal for 5 GHz in WRC-03 and simulation between Aggregate RLAN and EESS, doc.: RR-02/35 and 36
- Received a draft analysis for BWAS and RADAR, doc.: RR-02/39
- Reply Comment to support WECA petition for 5470-5725 MHz band under preparation, outline in doc.: RR-02/41

2.4 GHz

- Received a summary report of the WECA visit to MII, China, officials on March 8, doc.: RR-02/32
- No plan to act at this meeting pending ativity of WECA
- No time to work on ET Docket No. 01-278 to oppose the rigorous limitation of the spurious emission

Potential output documents

- Revised proposals to the Rules changes
  – Motion to establish TAG with Charter
- Reply Comments on WECA Petition RR-02/43
- Draft response to IC consultation RR-02/47
  – schedule tele-conference(s) to complete,
- Leave reply Comments on 01-278 to individual members

Objectives for Sydney

- **To review and action any rules change issues left from March 2002**
- **To prepare and submit position statements if needed**
  - **e.g. Spectrum issues 5 GHz band**
  - **e.g. 2.45 GHz**
  - **e.g. Opposing comments on Sirius petition**
- **To hold joint meetings with TGh, TGg and SC WNG**

Interim meetings

- Tele-conferences on Friday, March 29 and Friday April 19 to prepare/approve the response to the Consultation of Industry Canada (closing date: April 30, 2002)
  - Venue via the regs reflector (11 AM EST)
- At the 802.11/802.15 interim meeting in Sydney, May 13-17, 2002

3.9.   802 Coex – Jim Lansford
3.9.1.1.

IEEE 802 Wireless Coexistence

Jim Lansford
Jim.Lansford@mobilian.com
(405) 377-6170

Tim Blaney
Tim@commcepts.net
(530) 478-5606

History

- SG approved March 2001
  - Presentations at Plenary and Interims
  - Proposed organization developed at Portland plenary
    - Rules change for SC was recommended
    - September meeting was cancelled
  - Study group extension motion missed in Austin
- Meeting as BoF at Dallas interim and St. Louis plenary
  - LMSC rule change not desired – TAG preferred
- Attendance has consistently shown strong interest (40+ attendees at each BoF)

Where do we go from here?

- Feedback
  - Need a definition of "coexistence"
  - Need a Recommended Practice
    - Could also be a Guideline
    - Defines the way coexistence can be achieved

How do we get there?

- Renew study group? Or create a TAG now?
  - Develop coexistence definition
    - First cut done this week in BoF
  - Write a PAR for the TAG
    - Develops the Recommended Practice
    - Balloting within the TAG
    - Approval by SEC and WGs
    - Approval by IEEE SA

Motion

- Motion to continue the Coexistence Study Group until the July 2002 Plenary.
- Charter: SG shall develop a PAR for Coexistence TAG in 802 SEC.
  - Moved:
  - Seconded:
  - Vote:

3.10. Special Orders

3.10.1. TGe Motions

3.10.1.1.　To empower the task group to conduct business toward the objectives stated at the closing March plenary including initiating a Letter Ballot or Recirculation ballot, independent of quorum.

> 3.10.1.1.1.　Moved by John Fakatselis on behalf of TGe
> 3.10.1.1.2.　Motion ID 338

3.10.1.2.　Discussion

> 3.10.1.2.1.　Against the motion – suggests that we try to follow the procedure of a plenary. The document that will be the subject of the LB will be made available to the whole body for a short enabling LB.
> 3.10.1.2.2.　There are several things wrong with this motion – any document could be issued as a LB. The SEC has frowned on this action.
> 3.10.1.2.3.　In favor of the motion – we don't want to derail our progress. All we want to do is send out a letter ballot. It is not a blank check. LBs go to everyone. All this enables is a vote and reception of comments.
> 3.10.1.2.4.　The problem is that it is a choice of letter ballot or recirculation ballot. You cannot go to a recirculation ballot. You can only change votes in the first plenary after a LB
> 3.10.1.2.5.　In favor of this – it allows the groups to move forward. The 802 rules for notification have been made met for this interim. The meeting has been announced in a year in advance.
> 3.10.1.2.6.　Regarding the 10 day pre-qualification? What was the ruling of the 5 day ballot? The WG chair does note that the 5 day LB was against the rules.
> 3.10.1.2.7.　It doesn't matter what the advance notice is. Would prefer to not have a blank check. Against
> 3.10.1.2.8.　The comments and suggestions are welcome. Dislikes the sense of mistrust of the task groups intentions. No matter what we do, it is by the rules. Of 2.7.2
> 3.10.1.2.9.　The chair quotes 2.7.2 of the WG operating rules. The actions may be reaffirmed by a 40 day LB.
> 3.10.1.2.10.　There is no violation of our rules. Furthermore, we have no problem in plenaries
> 3.10.1.2.11.　Call the question (John/ Dave B)
>
> > 3.10.1.2.11.1.　Question called with No Objections
>
> 3.10.1.2.12.　Point of order – is this a procedural or technical under the rules?
>
> > 3.10.1.2.12.1.　Regarding complete and available.
> > 3.10.1.2.12.2.　The chair notes that this enables the group to conduct business towards the objectives as previously stated.
> > 3.10.1.2.12.3.　The chair cannot rule on the issue, this is an empowerment to make a decision at a future meeting.
> > 3.10.1.2.12.4.　Is the draft available for pre-viewing.?
> > 3.10.1.2.12.5.　The chair states that the draft is not under discussion. The meeting at Sydney will determine the draft.

3.10.1.3.　Vote on the motion: Passes 85:13:4

3.10.2. TGf Motions

3.10.2.1.   Motion: to formally request IEEE 802.11 to correct the description of the MLME SAP with regard to association and Reassociation so that it matches the behavior as described with the text of the standard

> 3.10.2.1.1.   Moved Bagby on behalf of TGf
> 3.10.2.1.2.   Discussion
>
>> 3.10.2.1.2.1.   What is the particular piece of information? The STA can accept or reject the requests. There is no opportunity to intervene between the request and response currently.
>> 3.10.2.1.2.2.   Point of information? Why doesn't the TG make the change? TGf is not chartered to change the standard.
>> 3.10.2.1.2.3.   Does the WG have the charter to make a change? The motion is requesting the WG (owner of the document) to deal with the issue. Not saying which TG actually does the work.
>> 3.10.2.1.2.4.   What form will this take? Will there be a supplemental standard? What is the process for implementing the change? We don't know at this point. We just want the WG to take a look at it. The chair has an action item to look into the process.
>> 3.10.2.1.2.5.   Technical or procedural? Procedural
>
> 3.10.2.1.3.   Vote on the motion: Passes 87:0:11

3.10.2.2.   Moved to formally request IEEE P802.11 to add a reason code with the meaning of "Old AP did not verify previous association"

> 3.10.2.2.1.   Moved Bagby on behalf of TGf
> 3.10.2.2.2.   Vote on the motion: Passes 82:3:9

3.10.2.3.   Call for orders of the day: fixed agenda (Matthew Shoemake)

3.10.2.4.   The last TGf motion is moved to the first of "old business"

3.10.3. TGg Motions

3.10.3.1.   Per sub clause 2.7.2 of the IEEE 802.11 working group operating rules, move to authorize an official letter ballot on the TGg draft at the May 2002 session. Issuance of the pre-authorized letter ballot shall be enabled by a simple majority vote of the task group at the May 2002 session.

> 3.10.3.1.1.   Shoemake on behalf of TGg
> 3.10.3.1.2.   Discussion
>
>> 3.10.3.1.2.1.   None
>
> 3.10.3.1.3.   No objection to calling the question
> 3.10.3.1.4.   Vote on the motion: Passes 85: 7: 12

3.10.4.   TGh Motions

3.10.4.1.   POI – given that we are ahead in time, moves to amend the agenda:

> 3.10.4.1.1.   The chair states that It is 9:41 – we are on schedule.

3.10.4.2.   Move to conduct a working group letter ballot to forward the 802.11h-D2.0 to sponsor ballot. Ballot is requested to complete before the start of the scheduled May 2002 interim meeting

> 3.10.4.2.1.   Moved Kasslin on behalf of TGh
> 3.10.4.2.2.   Question called by the chair without objection
> 3.10.4.2.3.   Vote on the motion: passes 96 : 0 : 10

3.10.5. TGi Motions

3.10.5.1. Move to conduct a WG letter ballot to forward 802.11i-D2 to sponsor ballot.

> 3.10.5.1.1. Moved Halasz on behalf of TGi
> 3.10.5.1.2. Discussion
>
> > 3.10.5.1.2.1. The chair asks if the draft satisfies the rules? Yes.
>
> 3.10.5.1.3. No objection to calling the question
> 3.10.5.1.4. Vote on the motion: Passes 100 : 3 : 6

3.10.5.2. Move per 802.11 WG rules clause 2.7.2, move to empower the 802.11i task group, to conduct business as per the 802.11i objective in the March 2002 closing plenary TGi report, adopt motions, initiate recirculation ballot by the working group, at the scheduled May 2002 interim, independent of a quorum

3.10.5.2.1. Moved Dave Halasz
3.10.5.2.2. Second Jesse Walker
3.10.5.2.3. Discussion

> 3.10.5.2.3.1. Does this preclude the need for a re-affirmation?
> 3.10.5.2.3.2. The chair re-reads 2.7.2 of the rules. This pre-authorization provides the empowerment.
> 3.10.5.2.3.3. The 75% will come from those that attend? Yes.
> 3.10.5.2.3.4. Call the question (Zorn/ Kitchin) no objection

3.10.5.2.4. Vote on the motion: Passes 85 : 10 : 13

3.10.6. TGf Motions

3.10.6.1. The chair asks if we can resume TGf motions. No Objections

3.10.6.2. Motion:

> 3.10.6.2.1. TGf will make the final LB32 Comment resolution document and the corresponding Draft revision (3.1) available to the membership via the 802.11 members only area of the web site after its April Meeting.
> 3.10.6.2.2. The TGf chair is instructed to issue a 10 day electronic ballot (where non-response is taken as assent) asking the membership the following question:
> 3.10.6.2.3. Shall TGf draft 3.1 be issued for WG re-circulation ballot?
> 3.10.6.2.4. The TGf chair shall then start the re-circulation ballot depending on the outcome.
> 3.10.6.2.5. Moved Bagby on behalf of TGf
> 3.10.6.2.6. Discussion
> 3.10.6.2.6.1. POI – are the comment resolutions in a document? The resolutions are not complete. The resolutions and draft will be provided in the first step, then enable the draft
> 3.10.6.2.6.2. In favor of the motion. Is there a precedent for the 10 day electronic ballot?
> 3.10.6.2.6.3. The chair notes that this is enabling a separate TGf interim meeting. The TGf chair says a 10 day LB is sufficient to allow membership to determine if a draft is ready for LB.
> 3.10.6.2.6.4. For the motion – It is in our guiding rules. This is a creative way to bypass the Australia meeting. Other TGs have tried to do that. What we are doing here is to empower an announced and scheduled interim to make key decisions and initiate a letter ballot. This motion could be used by other groups

as well. There will be very few people making decisions, but the LB is the final check of the whole group.

3.10.6.2.6.5. The TGf chair says you can hold an interim meeting any time with advance notice. We would get together sooner except for the 30 day notice rule. Disagrees that this is avoiding the May meeting.

3.10.6.2.6.6. Question about non-response taken as assent. Why is that? That is to reduce the response burden to the group. Amend the motion if you wish.

3.10.6.2.7. Motion to amend: replace the work "assent" with "abstain"

3.10.6.2.7.1. Moved Kitchin

3.10.6.2.7.2. Second John K

3.10.6.2.7.3. Call the question on the amendment (Don / Dave B)

3.10.6.2.7.4. Vote on calling the question: Passes 101 : 1 : 0

3.10.6.2.8. Vote on the motion to amend: Passes 89: 2: 8

3.10.6.3. Motion on the floor: Moved: 1 TGf will make the final LB32 comment resolution and the corresponding draft revision (3.1) available to the membership via the 802.11 members only area of the web site after its April meeting 2) the TGf chair is instructed to issue a 10 day electronic ballot asking the members the following question: Shall TGf draft 3.1 be issued for electronic WG recirculation ballot? 3) The TGf chair shall then start the re-circulation ballot depending on the outcome.

3.10.6.3.1. Discussion

3.10.6.3.1.1. Concern about the 10 day electronic ballot. The SEC said the electronic ballot by TGg was appealed and upheld by SEC. The TGf chair is willing to take the risk.

3.10.6.3.1.2. Call the question (John K, Jim Z) no objection

3.10.6.3.2. Vote on the motion: Passes 80: 1 : 8

3.10.7. WNG motions

3.10.7.1. Move that the 802.11 WG form a liaison with CableLabs for the purpose of coordinating the use of 802.11 WLANs in DOCSIS cable modems

3.10.7.1.1. Moved TK Tan on behalf of WNG

3.10.7.1.2. Discussion

3.10.7.1.2.1. Who is the proposed liaison?

3.10.7.1.2.2. Harry will consider doing the job? Also Richard Kennedy? Donald Eastlake also volunteers.

3.10.7.1.3. Any Objection to call the question? None

3.10.7.1.4. Vote on the motion: Passes 64 : 0 : 15

3.10.7.2. Move that the 802.11 WG accept the invitation from ETSI BRAN and MMAC to participate in the "WLAN – 3G and other Public Access Networks Interworking" project

3.10.7.2.1. Moved TK Tan on behalf of WNG

3.10.7.2.2. No Discussion

3.10.7.2.3. Question called with no objection

3.10.7.2.4. Vote on the motion: Passes 76 : 0 : 6

3.10.7.2.5. POI – could you describe what this involves? There were several presentations (listed in 02/263) on this subject. Regarding global standard for interworking between 802.11, MMAC, ETSI, with 3G networks. The idea is to eventually justify establishing a TG to incorporate amendments to 802.11. A

representative will attend ETSI interworking meetings are report back to 802.11.

3.10.8. Publicity Motions

3.10.8.1. Are there any other candidates for Publicity Chair?

3.10.8.2. The WG chair asks the body for affirmation of the new chair of the Publicity group, Brian Matthews.

3.10.8.3. Brian Matthews is affirmed as Publicity Chair.

3.10.9. Radio Regulatory motions

3.10.9.1. Motion to authorize the chair of 802.11 to support changes in the Charter of the Radio Regulatory TAG.

3.10.9.1.1. Moved Vic Hayes on behalf of RREG
3.10.9.1.2. The question called without objection
3.10.9.1.3. Vote on the motion: passes 62 : 0 : 14

3.10.10. 802 Coexistence motions

3.10.10.1. Motion to authorize the 802.11 chair to recommend continuance of the Coexistence Study Group until the July 2002 Plenary. Charter: SG shall develop a PAR for Coexistence TAG in 802 SEC

3.10.10.1.1. Moved Lansford
3.10.10.1.2. Second Ritter
3.10.10.1.3. Discussion

3.10.10.1.3.1. None

3.10.10.1.4. Call the question without objection
3.10.10.1.5. Vote on the motion: passes 77 : 1 : 11

3.11. New Business

3.11.1. TGe

3.11.1.1. No motions

3.11.2. TGf

3.11.2.1. No motions

3.11.3. TGg

3.11.3.1. No motions

3.11.4. TGh

3.11.4.1. No motions

3.11.5. TGi

3.11.5.1. No motions

3.11.6. WNG

3.11.6.1. There has been discussion on high rate SG formation. It was agreed to not move ahead at this time. WNG will continue to entertain proposals in Sydney.

3.11.7. Publicity

3.11.7.1. No motions

3.11.8. WG motions

3.11.8.1. No motions

3.11.9. Radio Regulatory

3.11.9.1. Comments to be filed at FCC today. Letter was on the server yesterday. Supporting WECA petition regarding WLANs in the 5GHz range and allocating more bandwidth.

3.11.9.2.   Moved: To request SEC approval to file the contents of RR-02-043r0 with the FCC in the prescribed process via the ECFS and to mail required service copies to other commenters

3.11.9.2.1.   Moved Vic Hayes on behalf of Radio Regulatory
3.11.9.2.2.   Second Denis Kuahara
3.11.9.2.3.   Discussion

3.11.9.2.3.1.   None

3.11.9.2.4.   Question called without objection
3.11.9.2.5.   Vote on the motion: Passes 74 : 0 : 12

3.11.10.   **802 Coexistence**

3.11.10.1.   No motions

3.11.11.   **802.15.2**

3.11.11.1.   Defer until Jim is in the room

3.11.12.   **802.16 Sponsor Ballot Request at SEC**

3.11.12.1.   The chair of 802.16 has combined the unlicensed and licensed specification in 802.16a. This implies coexistence issues.

3.11.12.2.   802.16 will request going to sponsor ballot with this standard. It has been announced on the reflector and in our opening Plenary on Monday

3.11.12.3.   The chair suggests that members who are interested in commenting become a member of the Sponsor Pool for 802.16

3.11.12.4.   Discussion

3.11.12.4.1.   This is on the SEC agenda. Does the WG chair wish for the body to provide guidance on how to vote in SEC

3.11.12.5.   Motion that the 802.11 WG direct its chair to vote to decline to forward 802.16a to sponsor ballot until 802.16a addresses coexistence in the unlicensed bands.

3.11.12.5.1.   Moved Bob O'Hara
3.11.12.5.2.   Second Vic Hayes
3.11.12.5.3.   Discussion

3.11.12.5.3.1.   In favor – when the PAR for 802.16 TG was proposed, this group voted against approving this PAR.

3.11.12.5.3.2.   It was the 802.16.1 document that turned into 802.16a

3.11.12.5.3.3.   802.16.2 addresses coexistence issues, and will encompass 802.16a.

3.11.12.5.3.4.   Is there a member of 802.16 here? What is the status of coexistence? Against this motion. There is a coexistence task group working on this. It has selected a DFS capability from 802.11h to facilitate coexistence. Urges responding in the sponsor ballot pool.

3.11.12.5.3.5.   In favor – we have heard presentations on 802.16 coexistence. They have not addressed coexistence with WLANs. They have worked on coex with 16 technologies.

3.11.12.5.3.6.   Concern – it is good that 802.16 addresses coex, but this could be the camels nose. We should not necessarily insist that the way they address it is approved by 802.11. We shouldn't set the precedent that WGs can veto each others work. We are not insisting that they address the issue in a manner acceptable to us.

3.11.12.5.3.7.   Coexistence is a two way street. We have not been involved in 802.16 coex groups. We also need to

think about coex with 802.16. this group is not familiar with the work they are doing.

3.11.12.5.3.8.　The chair will discuss this with the .16 chair.

3.11.12.5.3.9.　In favor – they should have assured us they were addressed beforehand.

3.11.12.5.3.10.　Against the motion – voting against this in sponsor ballot is the proper tool. Would not want to tie the chairman's hands unnecessarily.

3.11.12.5.3.11.　802.16a addresses only 5G. They are not interested in 2.4GHz band.

3.11.12.5.3.12.　Want to make sure we don't start setting precedents. There is no overarching coex requirement. Don't assume there is such a requirement.

3.11.12.5.4.　Call the question – without objection

3.11.12.5.5.　Vote on the motion: Passes 33 : 16 : 33

3.11.13. 802.15.2 Letter Ballot

3.11.13.1.　The coexistence group for 11 / 15 resided in 802.15, but jointly balloted in both 11 and 15. Draft is available as D05.

3.11.13.2.　Motion: Send IEEE 802.15.2 Draft version D05 to working group letter ballot for the purpose of seeking approval to forward the draft to Sponsor Ballot

3.11.13.2.1.　Moved Jim Lansford

3.11.13.2.2.　Second Adrian Stephens

3.11.13.2.3.　Discussion

3.11.13.2.3.1.　Would like to clarify the process. There are two LBs. What is the process for resolving comments? They will be rolled up. There will be two independent comment resolutions. A .11 team will help resolve. It must pass by 75% in both 11 and 15. Where do these comment resolutions take place? In what forum? Those who participate will attend 11 and 15 voting credit. The group is 802.15.2, but it is as if it is an 802.11 draft.

3.11.13.2.3.2.　Therefore, in order to go to SB it would require 75% from both 11 and 15? Yes.

3.11.13.2.3.3.　The WG chair notes that we started this some time ago, we have been represented in 802.15.2. We could have the SEC break any ties on the issue.

3.11.13.2.3.4.　Clarify – are we saying this is the only way we can have 11 coex statements? No, this is a recommended practice for coex for LANs and PANs.

3.11.13.2.3.5.　For the motion – have been involved for 9 months. This has been through a lot of review.

3.11.13.2.4.　Call the question – no objections

3.11.13.2.5.　Vote on the motion: passes 64 : 0 : 15

3.11.14. Liaison with Jedec JC61 committee

3.11.14.1.　Developing an interface between radio and baseband and MAC and PHY for wireless networks. Formed March 10, 2002

3.11.14.2.　Focusing on 802.11, 802.15, FWA, UWB.

3.11.14.3.　Presentation in Document 02/247r1

3.11.14.4.　Motion: to establish a liaison to JEDEC JC-61 committee to monitor and cooperate in implementation based standards activities for WLAN systems.

3.11.14.4.1.　Moved Benno Ritter

3.11.14.4.2.　Second Larry Arnett

3.11.14.4.3.	Discussion

	3.11.14.4.3.1.	Thinks the activity is a bad idea. Specifying such interfaces will cause huge problems. The interfaces are abstract. A physical form would become a constraint. JEDEC shouldn't be doing this work, it should be done here, but this body has considered it and decided to not do it.
	3.11.14.4.3.2.	We should not lend support.
	3.11.14.4.3.3.	There are 40 companies supporting this effort. It's not up to IEEE to not allow the work in JEDEC. The group wants to have input from the WG. Trying to create a mass market.
	3.11.14.4.3.4.	POI – some of the formative meetings were held under NDA. Will this be public? JEDEC is an open organization. You have to become a member of JEDEC. The group was started not under JEDEC. With JEDEC there is no NDA required.
	3.11.14.4.3.5.	POI – what is meant by cooperate in implementation? There is not a joint development of standards. What is wanted is a close interaction.
	3.11.14.4.3.6.	For the motion: The reason why this is needed is that the standards are ambiguous and hard to implement. This is just a transport mechanism.
	3.11.14.4.3.7.	Does this set any requirements for vendors making chips interoperable. It is undecided. Still working on whether JEDEC would certify interoperability
	3.11.14.4.3.8.	Against – not likely to result in a standard before the need no longer exists. We are already seeing higher integration. These interfaces have already been integrated inside a chip.
	3.11.14.4.3.9.	The reason why we want to standardize this is for modules in the FCC rules. They prescribe a complete PHY inside the same module to be able to pre-certify. Some functions might be put into SOC chips as well. Then a certified module would be needed.
	3.11.14.4.3.10.	If the intent is to build interfaces to match IEEE specs, what is the cycle time, and when would it occur? JEDEC would react to the industry standards. Intend to implement changes in IEEE standards in this interface.

3.11.14.4.4.	Call the question – no objections
3.11.14.4.5.	Vote on the motion: 25 : 22 : 26

3.11.14.5.   Benno to submit the liaison names to the WG chair. Benno Ritter is the only candidate.

3.11.14.6.   The chair references Item 2.3.9 rules regarding liaisons.

3.11.15.   CableLabs liaisons

3.11.15.1.   There are now four candidates for the position of liaison

3.11.16.   **802.11 Email Reflectors**

3.11.16.1.	That all 802.11 email reflectors be closed to allow submissions only from members of the reflector.

3.11.16.1.1.	Moved O'Hara
3.11.16.1.2.	Second Albert
3.11.16.1.3.	Discussion

	3.11.16.1.3.1.	In Favor – we have an increasing amount of spam. We need to close all the reflectors.

3.11.16.1.3.2. Undecided – why do we need a motion? The mover has asked for this action in the past. It has not been enacted. By passing this the vice chair will be directed to do so.

3.11.16.1.3.3. Against – concerned that it would disenfranchise members.

3.11.16.1.3.4. Against – would like the list closed, but it could impose a lot of work. The problem is with aliases.

3.11.16.1.3.5. For the motion – there are a lot of questions from people who don't know what's going on. This would save a lot of time.

3.11.16.1.4. The chair notes that we have over 700 members on the reflector. It is a difficult job. The IEEE is aware of the situation and working on it. There are also virus problems. The voters list is already closed. We are referring to the technical and announcements reflectors.

3.11.16.1.5. Discussion

3.11.16.1.5.1. What is the Vice Chairs position? There is a lot of work maintaining the reflector. There are a lot of incorrect email addresses submitted from new members. There are a lot of email address changes.

3.11.16.1.5.2. The vice chair is in favor of the motion. He has the job of implementing

3.11.16.1.6. The question called with no objections

3.11.16.1.7. Vote on the motion: Passes 47 : 6 : 9

3.11.16.2. The chair notes that the two remaining email reflectors will be closed next week, or as soon as possible. Members with aliases will have to provide a full email address ASAP.

3.11.16.2.1. The problem is not the alias, but the From Address. It must be the same as the subscriber.

3.11.16.2.2. The Vice Chair is directed by the chair to go ahead with this action, and cooperate with the IEEE representative. And cooperate with Greg Chesson.

3.12. Any other business?

3.12.1. CableLabs liaisons within WNG SC

3.12.1.1. We have four candidates Richard Kennedy, Harry Worstell, Donald Eastlake, and Lior Ophir.

3.12.1.2. Do we need to elect or appoint these liaisons?

3.12.1.3. The chair quotes from the Op Rules on liaisons. They shall be appointed by the WG or the WG chair. And confirmed by the WG members.

3.12.1.4. The chair proposes to do this as an action at the Plenary meeting at the Sydney Interim meeting .

3.12.1.5. No objection

3.13. Adjourn at 12:00

Attendance list for the meeting held at
Hyatt Regency - St Louis, St Louis, MO

Full name	status	att. %	phone	company	e_mail
Dr. Tomoko Adachi ()	voter	100	+81 44 549 2283	Toshiba Corporation	tomo.adachi@toshiba.co.jp
Mr. Vali Ali ()	nonvoter	100	(281) 514-7833	Compaq Computer Corporation	vali.ali@compaq.com
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
Dr. Dov Andelman ()	aspirant	100	+972 9 743 9701ext. 377	Envara	dova@hlan.com
Mr. Merwyn Andrade ()	nearly voter	100	+1 408 526 4628	Cisco Systems Inc.	mandrade@cisco.com
Mr. Carl F. Andren (Carl)	voter	100	+1 321 724 7535	Intersil Corporation	candren@intersil.com
Mr. Mitch Aramaki (Michimas)	aspirant	100	(408) 861-3921	Panasonic Technologies, Inc.	aramaki@research.panasonic.com
Mr. Larry Arnett ()	voter	100	+1 408 774 3179	Mitsubishi Electric & Electronics USA, Inc.	larry.arnett@edg.mea.com
Mr. Drayton Avera ()	aspirant	10	+1 404 876 7707	RF Solutions	davera@rf-solutions.com
Mr. David Bagby	voter	100	+1 408 326 3762	3Com Corporation	david_bagby@3com.com
Dr. Dennis J. Baker ()	nonvoter	100	202-767-1391	Naval Research Laboratory	baker@itd.nrl.navy.mil
Mr. Bala Balachander	aspirant	100	(650) 475 1978	Woodside Networks	bala@woodsidenet.com
Mr. Raja Banerjea ()	nearly voter	100	(732) 949-2102	Agere Systems	banerjea@agere.com
Mr. Simon Barber ()	voter	100	415 577 5523	Instant 802 Networks, Inc.	simon@instant802.com
Mr. Michael Barkway ()	nearly voter	100	+44 1223 421025	Tality	mib@tality.com
Mr. Michael I. Barkway ()	nonvoter	100	+44 1223 421025	Tality (UK) Ltd.,	mib@tality.com
Mr. Gil Bar-Noy ()	voter	100	+972 9 743 9701 ext 200	Envara	gilb@hlan.com
Mr. Charles R. Bartel	nearly voter	100	(412) 268-2665	Carnegie Mellon	crb@cmu.edu
Mr. Edul Batliwala ()	aspirant	100	617 551 7631	Compaq	edul.batliwala@compaq.co
Dr. Anuj Batra (Anuj)	voter	100	+1214 480 4220	Texas Instruments Incorporated	batra@ti.com
Mr. David A. Beberman ()	nonvoter	100	508 351 9492	Corporate Wave Net	cwn1@world.std.com
Mr. Glenn R. Beckett	nonvoter	100	916 785-4668	Hewlett-Packard	glenn_beckett@hp.com
Dr. Mathilde Benveniste ()	voter	100	+1 973-761-6105	AT&T Labs	benveniste@ieee.org
Mr. Adrian Bishop ()	nonvoter	100	321 626 0569	Tantivy communications	abishop@tantivy.com
Mr. Simon Black (Simon)	voter	100	+44 778 677453	Qosine Ltd.	simon.black@qosine.co.uk
Mr. Timothy Blaney ()	voter	100	+1 530 478 5606	Commcepts	tim@commcepts.net
Mr. Jan Boer (Jan)	voter	100	+31 30 609 7483	Agere Systems, Nederland	janboer@agere.com
Mr. Daniel R. Borges ()	nonvoter	100	678-924-6533	Agere Systems	dborges@agere.com
Mr. Pratik Bose ()	nonvoter	100	301 990 3450	Eka Systems	pratik.bose@ekasystems.com
Mr. Jim Brennan ()	nearly voter	100	208-773-2108	Mabuhay Networks, Inc	jim_brennan@mabuhaynetworks.com

Full name	status	att. %	phone	company	e_mail
Mr. Jean-Claude Brien	nonvoter	100	613-990-4698	Industry Canada	brien.jeanclaude@ic.gc.ca
Mr. Ronald Brockmann (Ronald)	voter	100	+31 30 229 6081	Intersil N.L. B.V.	rbrockma@intersil.com
Mr. Robert Brummer ()	voter	100	415 558 4709	Dolby Laboratories Inc	rdb@dolby.com
Mr. Kevin Burak ()	voter	100	+1 508 851 8238	Motorola	Kevin.Burak@Motorola.com
Dr. Alistair G. Buttar ()	voter	100	+41 22 7991 243	Motorola	alistair.buttar@motorola.co
Mr. Pete Cain ()	aspirant	100	+44 (0) 131 335 7214	Agilent Technologies UK Limited	peter_cain@agilent.com
Mr. Peter J. Cain ()	nonvoter	100	+44 131 335 7214	Agilent Technologies	Peter_Cain@agilent.com
Ms. Nancy Cam-Winget ()	voter	100	650-691-9891	CMC	nance@winget.net
Mr. Bill Carney ()	voter	100	+1 707 521 3069	Texas Instruments	bcarney@ti.com
Mr. Michael Carrafiello	voter	100	978 287 9282	Avaya	mcarrafiello@avaya.com
Mr. Pat Carson (Pat)	voter	100	+1 408 467 5218	TDK Corporation	pcarson@tdktca.com
Dr. James C. Chen ()	voter	100	+ 1 408-431-6644	Marvell Semiconductor, Inc.	jamesc@marvell.com
Mr. Yiming Chen ()	nearly voter	100	310 719 7532	Winbond Electronics	ymchen@windbond.com
Mr. Yi-Ming Chen ()	nonvoter	100	+1 323 293 3001	Winbond Electronics Corporation America	ymchen0@winbond.com
Dr. Greg Chesson ()	voter	100	+1 408 773 5258	Atheros Communications, Inc.	greg@atheros.com
Mr. Lieshu Chiang ()	nonvoter	100		Accton Co. LTD.	lieshuchiang@accton.com.tw
Mr. Alan Chickinsky ()	voter	100	+1 703 633 8300	TASC	achickinsky@tasc.com
Dr. Charles Chien ()	aspirant	100	(310) 581-1650 ext	G-Plus, Inc.	charlesc@g-plus.net
Dr. Aik Chindapol ()	voter	100	+1 858 521 3546	Siemens	aik.chindapol@icn.siemens.com
Dr. Leigh M. Chinitz ()	voter	100	(408) 731-2853	Proxim	lchinitz@proxim.com
Dr. Sunghyun Choi (Sunghyun)	voter	100	+1 914 945 6506	Philips Research	szc@philabs.research.philips.com
Mr. Woo-Yong Choi ()	nearly voter	100		ETRI	wychoi53@etri.re.kr
Mr. Ojas T. Choksi ()	nonvoter	100	972 991 4400	Glacier Networks	ochoksi@glacier-networks.com
Dr. John T. Coffey ()	voter	100	+1 707 284 2224	Texas Instruments	coffey@ti.com
Mr. Terry Cole ()	voter	100	512 602 2454	AMD	terry.cole@amd.com
Mr. Anthony Collins ()	nearly voter	100	(240) 631-1910 X 307	Aryya Communications	acollins@aryya.com
Mr. Craig Conkling (Craig)	voter	100	+1 408 474 5306	Philips Semiconductors, Inc.	craig.conkling@philips.com
Dr. Todor Cooklev ()	voter	100	+1 781 687 0682	Aware, Inc.	tcooklev@aware.com
Mr. Richard Cross ()	nonvoter	100	757 836 0009	NSA/NTIO	rhcross@ncr.jfcom.ic.gov
Mr. Glen Crowder ()	nonvoter	100	678-924-6532	Agere Systems	gcrowder@agere.com
Mr. Russell J. Cyr ()	voter	100	978-206 3424	Engim, Inc.	russell@engim.com
Mr. Barry Davis ()	voter	100	+1 858 385 4301	Intel	barry.r.davis@intel.com
Mr. Rolf De Vegt ()	voter	100	+1 650 780 5846	Woodside Networks	rolf@woodsidenet.com
Mr. Udi Delgoshen ()	nonvoter	100	972 9 89 8924100	Infineon Technologies	delgoshen@infineon.com
Mr. Michael Derby (R.)	voter	100	858 864 5930		mikederby22@yahoo.com
Dr. Georg Dickmann ()	voter	100	+41 1 802 33 49	BridgeCo	georg.dickmann@bridgeco.net
Mr. Wim Diepstraten (Wim)	voter	100	+31 30 609 7482	Agere Systems, Nederland	wdiepstraten@agere.com
Mr. Roger Durand ()	voter	100	+1 978 684 1186	Enterasys.	rdurand@enterasys.com

Full name	status	att. %	phone	company	e_mail
Mr. Donald E. Eastlake III ()	nearly voter	100	508-851-8280	Motorola Labs	Donald.Eastlake@motorola.com
Mr. Dennis Eaton ()	voter	100	+1 321 729 4178	Intersil Corporation	deaton@intersil.com
Mr. Jon Edney ()	voter	100	+44 1223 423 123	Qosine Ltd.	jon.edney@ntlworld.com
Mr. Paul C. Edwards ()	nonvoter	100	650 330 2335	Bergana Communications	pedwards@bergana.com
Mr. Jason L. Ellis ()	nonvoter	100	(858) 457-8749	General Atomics	jason.ellis@ga.com
Mr. Christoph Euscher ()	voter	100	+49 2871 91 2861	Siemens	christhoph.euscher@siemens.com
Dr. Lars Falk ()	voter	100	+46 40 10 51 33	Telia Research AB	lars.p.falk@telia.se
Mr. Charles S. Farlow ()	nonvoter	100	952 380 5881	California Amplifier	cfarlow@calamp.com
Mr. Chuck Farlow ()	nonvoter	100	952 380 5881	California Amplifier	farlow@calamp.com
Mr. Augustin J. Farrugia ()	voter	100	650 654 2935	Gemplus	augustin.farrugia@gemplus.com
Dr. Weishi Feng ()	voter	100	+1 408 222 1922	Marvell Semiconductor	weishifeng@yahoo.com
Mr. Niels T. Ferguson ()	voter	100	+31 20 463 09 77	MacFergus	niels@ferguson.net
Mr. Nestor Fesas ()	nonvoter	100	512 358 9000	Bandspeed	nfesas@bandspeed.com
Dr. Gerhard Fettweis ()	aspirant	100	+49 351 80800 30	Systemonic AG	gerhard.fettweis@systemonic.de
Mr. Jeff R. Foerster ()	nonvoter	100	503-264-6859	Intel Corporation	jeffrey.r.foerster@intel.co
Mr. Brian Forde ()	aspirant	100	+353-1-291 1000	Silicon & Software Systems	brian.forde@s3group.com
Mr. Michael Froning (Michael)	aspirant	100	+1 603 862 4105	University of New Hampshire	emf@iol.unh.edu
Mr. Kenji Fujisawa ()	voter	100	+81 3 5795 8507	Sony Corporation	fujisawa@sm.sony.co.jp
Mr. Marcus Gahler (Marcus)	voter	100	+1 425 603 0900 x117	NextComm, Inc	mgahler@nextcomm.com
Mr. James Gardner ()	voter	100	+1 650 780 5858	Woodside Networks	jamesgardner@woodsidenet.com
Mr. Atul Garg (Atul)	voter	100	+1 408 991 5755	Philips Semiconductors	atul.garg@philips.com
Dr. Vafa Ghazi ()	voter	100	+1 206 675 9918	Cadence Design Systems, Inc.	vafa@cadence.com
Dr. Monisha Ghosh ()	aspirant	100	+1 914 945 6415	Philips Research	monisha.ghosh@philips.co
Mr. Tim Godfrey (Tim)	voter	100	+1 913 706 3777	Intersil	tgodfrey@choicemicro.com
Mr. Wataru Gohda ()	nonvoter	100	360-834-8080	Sharp Labs	wgohda@sharplabs.com
Mr. Peter Goidas ()	nonvoter	100		Agere Systems	goidas@agere.com
Mr. Patrick S. Gonia ()	nonvoter	100	612-951-7631	Honeywell	patrick.gonia@honeywell.com
Dr. Alex Gorakhov ()	nonvoter	100	31 40 27 43455	Philips	alexei.gorokov
Mr. Rik Graulus ()	voter	100	(408) 436-3939	Resonext	rik.graulus@resonext.com
Mr. William H. Gray ()	nonvoter	100	650-857-4601	Hewlett Packard	william_gray@hp.com
Mr. Evan Green	voter	100	+1 503 264 8456	Intel Corporation	evan.r.green@intel.com
Mr. Larry Green ()	voter	100	805-879-1520	Communication Machinery Corporation	green@cmc.com
Mr. Patrick Green ()	voter	100	+1 408 749 4948	Advanced Micro Devices	patrick.green@amd.com
Mr. Srikanth Gummadi ()	voter	100	+1 707 284 2209	Texas Instruments	sgummadi@ti.com
Dr. Fred Haisch ()	voter	100	(678) 924-6600	Agere	haisch@agere.com
Dr. Steve D. Halford	voter	100	+1 321 729 5130	Intersil Corporation	shalford@intersil.com
Mr. Robert J Hall, P.E.	aspirant	100	(512) 372-5842	SBC	bhall@tri.sbc.com
Mr. Neil Hamady ()	voter	100	408 441 3359	Resonext	neil.hamady@resonext.co
Mr. Mark Hamilton ()	voter	100		3Com Corporation	mark_hamilton@3com.com

Full name	status	att. %	phone	company	e_mail
Dr. Christopher J. Hansen (Chris)	voter	100	+1 408 543 3378	BroadCom Corporation	chansen@broadcom.com
Mr. Yasuo Harada (Yasuo)	voter	100	+ 81 6 6900 9177	Matsushita Electric Industrial Co. Ltd.	yasuo@isl.mei.co.jp
Mr. Thomas Haslestad ()	nonvoter	100	47 37 04 52 84	Telenor	thomas.haslestad@telenor.com
Dr. Amer A. Hassan ()	voter	100	+1 425 705 9590	Microsoft	amerh@microsoft.com
Mr. Kevin Hayes ()	voter	100	408 773 5275	Atheros Communications, Inc.	kevin@atheros.com
Mr. Victor Hayes (Vic)	voter	100	+31 30 609 7528	Agere Systems, Nederland	vichayes@agere.com
Dr. Chris Heegard (Chris)	voter	100	+1 707 521 3062	Texas Instruments	heegard@ti.com
Dr. Dan Hilberman ()	nearly voter	100	+ 1 408 716 4253	CALY Networks	dan@calynet.com
Dr. Garth Hillman ()	voter	100	+1 512 602 7869	AMD	garth.hillman@amd.com
Mr. Christopher Hinsz ()	voter	100	+1 408 528 2452	Symbol Technologies Inc.	chinsz@sj.symbol.com
Mr. Jun Hirano ()	nearly voter	100	+81 468 40 5165	National/Panasonic	Jun.Hirano@yrp.mci.mei.co.jp
Mr. James Hobza ()	aspirant	100	(858) 453-8400 x353	WIDCOMM, Inc	jhobza@widcomm.com
Mr. Maarten Hoeben (Maarten)	voter	100	+31 30 229 6083	Intersil B.V.	maarten.hoeben@intersil.com
Mr. Michael Hoghooghi ()	voter	100	+1 (301) 444-8834	Motorola	emh002@email.mot.com
Mr. Satoru Hori ()	nonvoter	100	+81 468 59 3471	NTT	hori@ansl.ntt.co.jp
Mr. Russell Housley (Russ)	voter	100	703-435-1775	RSA Laboratories	rhousley@rsasecurity.com
Dr. Dave Hudak ()	voter	100	614 822 5275 ext.	Karlnet, Inc.	DHudak@Karlnet.com
Mr. John Hughes ()	voter	100	+1 408 528 2636	Symbol Technologies Inc.	jhughes@sj.symbol.com
Mr. David Hunter ()	voter	100	+1 805 687 2885	Time Factor	hunter@timefactor.com
Mr. Keith Huntington ()	aspirant	100	(508) 366-7800 ext. 107	Insyde Software, Inc.	ieee-kjh@wizardfish.com
Mr. David Hytha ()	voter	100	+1 858 404 6588	Silicon Wave	dhytha@siliconwave.com
Dr. Hiroshi Ide ()	voter	100	310 616 1434	Melco	ide@buffalotech.com
Mr. Yasuhiko Inoue ()	voter	100	+81 468 59 5097	NTT Corp	yinoue@ansl.ntt.co.jp
Mr. Katsumi Ishii (Kirk)	voter	100	+1 408 988 4515	JVC	kirk@jvclab.com
Mr. David P. Jablon ()	aspirant	100	+1 508 898 9024	Phoenix Technologies Ltd.	dpj@world.std.com
Dr. Raj Jain ()	nonvoter	100	408 956 8000 x309	Nayna	raj@nayna.com
Mr. Marc Jalfon ()	voter	100	+972 4 8655006	Intel Israel (74) Ltd.	marc.jalfon@intel.com
Mr. Hemaprabhu Jayanna ()	voter	100	(916) 356-7386	Intel Corporation	hemaprabhu.jayanna@intel.com
Dr. Jung Je Son ()	voter	100	82-31-779-6533	Samsung	jaggy@samsung.com
Dr. Ho-In Jeon ()	voter	100	82-31-750-5321	Kyung-Won University	hoinjeon@netsgo.com
Mr. Henric A. Johnson	nonvoter	100	46 708 250375	Blekinge Institute of Technology	hjo@bth.se
Ms. Sherry Johnson ()	voter	100	+ (630) 529-1029 x15/	Cybiko, Inc.	sherry_j@cybiko.com
Dr. VK Jones ()	voter	100	+1650.475.1915	Woodside Networks	vkjones@woodsidenet.com
Mr. Bobby Jose ()	voter	100	916 961 8977		bobby@ieee.org
Mr. Mark F. Kahn ()	aspirant	100	(925) 785-4909	Proteon Radio Networks	kahn@proteanradio.net
Mr. Daryl Kaiser ()	nonvoter	100	408 853 4513	Cisco Systems Inc.	darylk@cisco.com
Dr. Martin Kappes ()	nonvoter	100	908 696 5120	Avaya Inc.	mkappes@avaya.com
Dr. Jeyhan Karaoguz (Jeyhan)	voter	100	+1 949 585 6168	Broadcom Corporation	jeyhan@broadcom.com

Full name	status	att. %	phone	company	e_mail
Mr. Kevin Karcz (Kevin)	voter	100	+1 603 862 1008	University of New Hampshire	kjk@unh.edu
Dr. Murat Karsi ()	nonvoter	100	(760)-815-1642	Ellipsis Digital Systems	mkarsi@ellipsisdigital.com
Mr. Mika Kasslin (Mika)	voter	100	+358 7180 36294	Nokia Research Center	mika.kasslin@nokia.com
Mr. Kris Kelkar ()	nonvoter	100	805-419-8329	California Amplifier	kkelkar@calamp.com
Mr. Patrick Kelly ()	nearly voter	100	(512) 358-9000	Bandspeed	pkelly@bandspeed.com
Mr. Richard Kennedy	voter	100	+1 281 514 8695	Compaq Computer Corporation	rkennedy100@sbcglobal.ne
Mr. Stuart J. Kerry (Stuart)	voter	100	+1 408 474 7356		stuart.kerry@philips.com
Mr. Andrew K. Khieu ()	nonvoter	100	(916)785-4234	Hewlett Packard	andrew_khieu@hp.com
Mr. Poh Boon Kiat ()	nonvoter	100	065-7707043	Oki Techno Centre	pbkiat@okigrp.com.sg
Dr. Dongkyu Kim ()	aspirant	100	82-31-200-3655	Samsung Electronics	donq@samsung.com
Mr. Ziv Kimhi ()	aspirant	100	(415) 920-9214	Instant802 Networks, Inc.	ziv@instant802.com
Dr. Günter Kleindl ()	voter	100	43 51707 35738	Siemens	guenter.kleindl@siemens.at
Mr. Cees Klik ()	voter	100	+31 35 689 4106	Philips	Cees.Klik@philips.com
Mr. David Kline ()	nearly voter	100	(541) 715-7607	Hewlett-Packard Company	dave kline2@hp.com
Mr. Roger Knobbe ()	voter	100	+1 310 737 1661	Network Associates, Inc.	Roger_Knobbe@nai.com
Dr. John M. Kowalski (John)	voter	100	+1 360 817 7520	Sharp Laboratories of America	kowalskj@sharplabs.com
Mr. Bruce P. Kraemer (Bruce)	voter	100	+1 321 729 5683	Intersil Corporation	bkraemer@intersil.com
Dr. Thomas Kuehnel ()	voter	100	+1 650 693 2820	MicroSoft	kuehnel@ccrl.nj.nec.com
Dr. Masahiro Kuroda ()	nonvoter	100		Mitsubishi Electric	marsh@isl.melco.co.jp
Mr. Denis Kuwahara (Denis)	voter	100	+1 425 957 5366	Boeing	denis.kuwahara@boeing.com
Mr. Paul A. Lambert ()	nonvoter	100	650-475-2006	Woodside Networks	paul@woodsidenet.com
Mr. David S. Landeta (David)	voter	100	+1 407 729 5540	Intersil Corporation	dlandeta@intersil.com
Dr. Jim Lansford (Jim)	voter	75	+1 405 377 6170	Mobilian Corporation	jim.lansford@mobilian.com
Mr. Colin Lanzl ()	voter	100	781 687-0578	Aware, Inc.	clanzl@aware.com
Mr. Kim Laraqui ()	nonvoter	100	46 8 633 25 17	Spirea	kim@spirea.com
Mr. Jon LaRosa ()	voter	100	(603) 430-7710 x12	Meetinghouse Data Communications	jal@mtghouse.com
Mr. Peter Larsson ()	voter	100	+46 8 764 14 30	Ericsson Radio Systems AB	peter.larsson@era.ericsson.se
Mr. Dongjun Lee ()	nonvoter	100	781 687 0684	Aware, Inc.	dongjun@aware.com
Mr. Martin Lefkowitz ()	voter	100	707 284 2202	Texas Instruments	lefko@ti.com
Mr. Onno Letanche ()	voter	100	+31 30 6097 454	Agere Systems	oletanche@agere.com
Mr. Sheung Li ()	voter	100	+1 408 773 5295	Atheros Communications	sheung@atheros.com
Dr. Jie Liang ()	voter	100	(214) 480-4105	Texas Instruments Incorporated	jliang@ieee.org
Dr. Daniel B. Lieman ()	nonvoter	100	781-418-2518	NTRU Cryptosystems	dlieman@ntru.com
Mr. Huashih A. Lin ()	nonvoter	100	310-719-2530 x 2535	Winbond Electronics Corporation America	halin@winbond.com
Mr. Shawn Liu ()	voter	100	886-3-516-5106	IPC	shawnliu@inprocomm.com
Mr. Titus Lo ()	voter	100	+1 425 603 0900	NextComm, Inc	titus.lo@ieee.org
Mr. Peter Loc ()	voter	100	+1 408 222 1951	Marvell	ploc@marvell.com
Mr. Ralph Lombardo, Jr. ()	voter	100	+1 603 589 0376	Digital Networks	lombardo@dnpg.com
Mr. David Lucia ()	aspirant	100	(978) 443-1795	Azimuth Networks, Inc	david_lucia@azimuth.net

Full name	status	att. %	phone	company	e_mail
Mr. Luke Ludeman ()	nonvoter	100	303 583 5479	Spectralink	lludeman@spectralink.com
Dr. Yeong-Chang Maa	voter	100	+886-3-516-5106 ext. 201	IPC	ycmaa@inprocomm.com
Mr. Osamu Maeshima	nonvoter	100	81-492-78-7895	KDDI R&D Laboratories Inc.	maeshima@kddlabs.co.jp
Mr. Mahalingam Mani ()	voter	100	(408) 404-1330	Avaya Inc.	mmani@avaya.com
Mr. Shrikant Manivannan ()	nonvoter	100	91 80 550 2001	Wipro Technologies	shrikant.mani@wipro.com
Mr. Paul Mantilla ()	nonvoter	100	31 31 689 1468	PHILIPS	p.mantilla@philips.com
Mr. Ralph Mason ()	nonvoter	100	613-520-5757	Carleton University	rmason@doe.carleton.ca
Mr. Brian Mathews ()	voter	100	+1 321 259 0737	AbsoluteValue Systems	brian@linux-wlan.com
Mr. Conrad Maxwell ()	voter	100	+1 949 483 7819	Conexant Systems, Inc.	conrad.maxwell@conexant.com
Dr. Ron McCallister ()	voter	100	480 607 4831	Intersil Corporation	rmccalli@intersil.com
Mr. Justin McCann ()	aspirant	100	(614) 822-5275 ext. 105	Karlnet, Inc.	jmccann@karlnet.com
Mr. Kelly McClellan ()	voter	100	+1 949 428 4157	Valence	kpm@valencesemi.com
Mr. Gary McCoy ()	voter	100	+1 603 589 0381	Digital Networks	gamccoy@dnpg.com
Mr. Bill McIntosh ()	voter	100	813 288 7388 X117	Fortress Technologies	bmcintosh@fortresstech.com
Mr. Jorge Medina ()	voter	100	(407) 829-4440	Direct2Data Technologies	jorgem@d2d.com
Dr. Mehul Mehta ()	nonvoter	100	+44 1189 131 500	Synad Technologies Limited	mehul.mehta@synad.com
Mr. Pratik Mehta ()	voter	100	+1 512 723 6214	Dell Computer Corporation	Pratik_Mehta@Dell.com
Dr. Klaus Meyer ()	voter	100	+49 351 277 6063	AMD	klaus.meyer@amd.com
Mr. Yasuhiko Mizoguchi ()	nonvoter	100	81357955764	Sony Corpration	ymizo@sm.sony.co.jp
Mr. Fanny Mlinarsky ()	aspirant	100	(978) 443-1795	Azimuth	fanny_mlinarsky@azimuth.net
Mr. Rishi Mohindra ()	nonvoter	100	408-331 4146	Maxim Integrated Products	Rishi_Mohindra@maximhq.com
Mr. Leo Monteban ()	voter	100	+31 30 609 7526	Agere Systems, Nederland	monteban@agere.com
Mr. Tim Moore (Tim)	voter	100	+1 425 703 9861	Microsoft	timmoore@microsoft.com
Mr. Tony Morelli ()	nonvoter	100	321-729-5968	Intersil Corporation	tmorelli@intersil.com
Mr. Mike Moreton ()	aspirant	100	+44 (0) 118 9131 500	Synad Technologies Limited	mmoreton@synad.com
Mr. Robert Moskowitz (Bob)	voter	100	+1 248 968 9809	TruSecure Corporation	rgm@trusecure.com
Mr. Oliver Muelhens ()	nonvoter	100	+49 241 6003 541	Philips	oliver.muelhens@philips.com
Mr. Michael Mueller ()	nonvoter	100	49 811 600 97 26	Telelogic	michael.mueller@telelogic.de
Mr. Willem Mulder ()	voter	100	+31 30 609 7504	Agere Systems, Nederland	wmulder@agere.com
Dr. Peter Murphy ()	aspirant	100	(707) 521-3073	Texas Instruments	murphy@ti.com
Dr. Peter A. Murphy ()	nonvoter	100	707 521 3073	Texas Instruments	murphy@ti.com
Mr. Peter Murray	voter	100	+1 908 232 9054		pmurray99@comcast.net
Mr. Andrew Myles ()	voter	100	+61 2 84461010	Cisco Systems	andrew.myles@cisco.com
Dr. Kevin Negus ()	voter	100	(408) 731-2778	Proxim	kevin@proxim.com
Mr. David B. Nelson ()	aspirant	100	(978) 684-1330	Enterasys Networks, Inc	dnelson@enterasys.com
Dr. Chiu Ngo ()	voter	100	+1 914 945-6475	Philips Research	chiu.ngo@philips.com
Mr. Paul Nikolich	nonvoter	45	+1 781 684 8487	Broadband Access Systems	p.nikolich@ieee.org
Mr. Gunnar Nitsche ()	voter	100	+49 351 808 0054	Systemonic AG	Gunnar.Nitsche@systemonic.de
Mr. Puthiya Nizar ()	nonvoter	100	916-356-9049	Intel Corporation	puthiya.k.nizar@intel.com

Full name	status	att. %	phone	company	e_mail
Mr. Erwin R. Noble (Erwin)	voter	100	+1 408 617 4768	Philips Components	erwin.noble@philips.com
Mr. Tzvetan D. Novkov (Tzvetan)	voter	100	+1 847 635 3247	Toko America Inc.	tnovkov@tokoam.com
Mr. Ivan Oakes ()	voter	100	+44 1223 421025	Tality	ifo@tality.com
Mr. Hideaki Odadgiri ()	nonvoter	100	81 43 296 2211	Oki Electric Industry Co	odagiri634@oki.com
Mr. Bob O'Hara (Bob)	voter	100	+1 (408) 986-9596	Informed Technology Inc.	bob@bstormnetworks.com
Mr. Yoshihiro Ohtani ()	voter	100	81-743-65-4529	Sharp Corporation	ohtani@slab.tnr.sharp.co.jp
Dr. Kim J. Olsiewski ()	aspirant	100	(760) 804-2416	Denso International America,	kim olszewski@densolabs.com
Mr. Lior Ophir ()	aspirant	100	(972) 9 970-6542	Texas Instruments	lior.ophir@ti.com
Mr. Dirk Ostermiller (Dirk)	voter	100	+1 801 617 2511	MicroLinear	dirko@xmission.com
Mr. Richard H. Paine (Richard)	voter	100	+1 425 865 4921	The Boeing Company	richard.h.paine@boeing.co
Mr. Subra Parameswaran (Subra)	nearly voter	100	+1 408 721 8216	Bergana Communications	tps@bergana.com
Mr. John B. Pardee ()	nonvoter	100	414-364-6688	innov8rs LLC	Jack.Pardee@innov8rs.biz
Mr. Jonghun Park ()	nonvoter	100	82-31-280-9534	SAMSUNG ELECTRONICS	jonghun@samsung.com
Mr. Gregory Parks (Greg)	voter	100	+1 916 939 9400 X3211	Sharewave Inc.	greg.parks@sharewave.co
Mr. Gavin Parnaby ()	voter	100	(858) 677-9967	National Semiconductor Corporation	Gavin.Parnaby@nsc.com
Mr. Vijay M. Patel ()	nonvoter	100	301 444 8821	Motorola, Inc.	QVP003@email.sps.mot.com
Mr. Dave Patton ()	nonvoter	100	360-212-2546	Hewlett-Packard	dp@vcd.hp.com
Mr. Tan Pek-Yew ()	voter	100	+65 381 5470	Panasonic Singapore Laboratories	pytan@psl.com.sg
Mr. Al Petrick (Al)	voter	100	+1 321-235-3423	IceFyre Semiconductor	apetrick@icefyre.com
Dr. Henry Ptasinski ()	voter	100	(408) 543-3316	Broadcom Corporation	henryp@broadcom.com
Mr. Murali Ramadoss	voter	100	+1 916 356 4028	Intel Corporation	murali.ramadoss@intel.com
Mr. Noman Rangwala ()	voter	100	+1 415 661 1794	Analog Devices	noman.rangwala@analog.com
Mr. Murli M Rao ()	nonvoter	100	(732) 949 5806	Agere Systems	mmrao@agere.com
Mr. Ivan Reede (Ivan)	voter	100	+1 514 620 8522	AmeriSys Inc.	i_reede@amerisys.com
Mr. Einan Regev ()	nonvoter	100	972-49594122	Wavion	einan@wavion.com
Dr. Stanley A. Reible (Stan)	voter	100	+1 978 589 9864	Oak Wireless	reible@compuserve.com
Mr. Danny Rettig ()	voter	100	+972 4 865 5579	Intel	dany.rettig@intel.com
Mr. Edward Reuss ()	voter	100	(831) 458-7483	Plantronics, Inc.	ed.reuss@plantronics.com
Mr. David Richkas ()	voter	100	+1 858 385 4129	Intel	dave.richkas@intel.com
Mr. Maximilian Riegel (Max)	voter	100	+49 89 722 49557	Siemans	maximilian.riegel@icn.siemens.de
Mr. John Rinderknecht ()	nonvoter	100	512 358 9000	Bandspeed	jrinderknecht@bandspeed.com
Mr. Carlos A. Rios (Carlos)	voter	100	+1 408 202 0294	RiosTek	carlos@riostek.com
Mr. Benno Ritter ()	voter	100	+1 408 474 5116	Philips Semiconductors	Benno.Ritter@philips.com
Mr. Walt Roehr ()	nonvoter	100	703-435-1787	Telecommunication Networks Consulting	w.c.roehr@ieee.org
Mr. Kent G. Rollins (Kent)	voter	100	+1 407 829-4440	Direct2Data Technologies	kentr@d2d.com
Dr. Stefan Rommer ()	voter	100	+46 31 344 60 33	Ericsson Mobile Data Design AB	Stefan.Rommer@erv.ericsson.se

Full name	status	att. %	phone	company	e_mail
Mr. Jon Rosdahl ()	voter	100	+1 801 617 2508	MicroLinear	jrosdahl@ieee.org
Mr. Pejman Roshan ()	aspirant	100	(949) 823-1464	Cisco Systems, Inc.	pejman@cisco.com
Mr. Reinhard Ruckriem ()	nonvoter	100	49 89 234 8 3701	Infineon Technologies	reinhard.rueckriem@infineon.com
Mr. Gunnar Rydnell (Gunnar)	voter	100	+46 31 344 63 20	Ericsson Mobile Data Design AB	gunnar.rydnell@erv.ericsson.se
Dr. Michael J. Sabin ()	aspirant	100	408 736 6589	Woodside Networks	mike.sabin@worldnet.att.ne
Mr. Antonio E. Salloum Salazar ()	nonvoter	100	+31 40 27 22631	Philips	antonio.salloum@philips.com
Mr. John H. Santhoff ()	nonvoter	100	858-587-9001	Pulse-Link Inc.	jsanthoff@pulse-link.net
Dr. Hans G. Schantz ()	nonvoter	100	(256) 922-9229	Time Domain Corporation	hans.schantz@timedomain.com
Mr. Edward Schell ()	voter	100	(609) 520-0071	Hitachi America, Ltd.	edward.schell@dmsl.hitachi.com
Mr. Sid Schrum (Sid)	voter	100	+1 919 463 1043	Texas Instruments	sschrum@ti.com
Dr. Erik Schylander ()	voter	100	+31 40 27 35585	Philips	erik.schylander@philips.co
Mr. Michael Seals ()	voter	100	+1 321 724 7172	Intersil Corporation	mseals@intersil.com
Mr. Joe Sensendorf ()	voter	100	408 974 1476	Apple Computer Inc.	joes@apple.com
Mr. Rick Shaw ()	voter	100	+1 801 617 2560	Micro Linear	shaw.rick@microlinear.com
Mr. Yangmin Shen ()	aspirant	100	(309) 692-8712	Symbol Technologies Inc.	sheny@sj.symbol.com
Mr. Matthew Sherman (Matthew)	voter	100	+1 973 236 6925	AT&T Labs	mjsherman@att.com
Mr. Shusaku Shimada	aspirant	100	81-55-243-0332	Yokogawa Electric Corporation	Shuusaku_Shimada@yokogawa.co.jp
Dr. Matthew B. Shoemake (Matthew)	voter	100	+1 214 480 2344	Texas Instruments Incorporated	shoemake@ti.com
Dr. William Shvodian (Bill)	voter	100	+1 703 269 3047	XtremeSpectrum	bshvodian@xtremespectrum.com
Dr. Aman Singla ()	voter	100	+1 408 773 5272	Atheros Communications	aman@atheros.com
Dr. David Skellern (David)	voter	100	+61 2 8446 1004	Cisco Systems	skellern@cisco.com
Mr. Donald I. Sloan (Don)	voter	100	+1 330 664 7917	Cisco Systems, Inc.	dons@cisco.com
Mr. Kevin Smart ()	voter	100	+1 801 617 2507	MicroLinear	keltypack@networld.com
Mr. Dave Smith ()	voter	100	916 785 2639	Hewlett-Packard	dave_smith4@hp.com
Mr. H. Keith Smith ()	voter	100	760 710 3051	Ellipsis Digital Systems	hksmith@ieee.org
Mr. Paul A. Snopko ()	nonvoter	100	847-941-8419	Zenith Electronics Corporation	paul.snopko@zenith.com
Dr. Pyeong-Jung Song ()	nonvoter	100		ETRI	pjsong@etri.re.kr
Mr. Wei-Jei Song ()	aspirant	100	949 435 0604	3DSP	wsong@3dsp.com
Dr. Amjad Soomro ()	voter	100	+1 914 945 6319	Philips Research	amjad.soomro@philips.com
Mr. Gary Spiess (Gary)	voter	100	+1 319 369 3580	Intermec Technologies Corp.	gary.spiess@intermec.com
Ms. Dorothy V. Stanley ()	voter	100	+1 630 979 1572	Agere Systems	dstanley@agere.com
Mr. William Kenneth Steck ()	nonvoter	100	1 972 238 2313	Cambridge Silicon Radio	ken.steck@csr.com
Dr. Adrian Stephens ()	voter	100	+44 771 276 3448	Mobilian Corporation	adrian.stephens@mobilian.com
Mr. Spencer Stephens	voter	100	805.777.7911 x124	Strix Systems	cto@strixsystems.com
Mr. William M. Stevens (Bill)	aspirant	100	(425) 883-2088 x145	Radioframetm Etworksn	bill@radioframenetworks.com
Mr. Carl R. Stevenson	voter	100	610-712-3217	Agere Systems	carlstevenson@agere.com

Full name	status	att. %	phone	company	e_mail
Mr. Warren E. Strand	nonvoter	100	503-466-7740	Credence Systems Corportation	warren_strand@credence.com
Mr. Thomas W. Studwell ()	nonvoter	100	919-254-7574	IBM Corporation	studwell@us.ibm.com
Mr. Michael Su ()	voter	100	510-687-3474	Via Technologies	MichaelSu@viatech.com
Mr. Barani Subbiah ()	voter	100	(408) 326-6738	3COM Corporation	barani_subbiah@3com.com
Mr. Masahiro Takagi ()	aspirant	100		Toshiba Corporation	takagi@csl.rdc.toshiba.co.j
Mr. Minoru Takemoto ()	voter	100	81-743-65-4529	Sharp Corporation	takemoto@slab.tnr.sharp.co.jp
Dr. Takuma Tanimoto ()	nearly voter	100	+1 408 433 1990	Hitachi Semiconductor (America) Inc.	takuma.tanimoto@hsa.hitachi.com
Mr. H.C. Taylor ()	nonvoter	100	44 20 20 8666	BT Group Plc	
Mr. Roger Teague ()	nearly voter	100	+44 (0) 118 9131 500	Synad Technologies Limited	roger.teague@synad.com
Dr. John Terry (John)	voter	100	+1 972 894 5742	Nokia Research Center	john.terry@nokia.com
Mr. Yossi Texerman ()	voter	100	+972 9 743 0161 ext 309	Envara	yossit@hlan.com
Mr. Kevin Thomaszios	nonvoter	100	408 433 5200 x571	Micro Linear	thomazios.kevin@microlinear.com
Mr. Peter Thornycroft ()	aspirant	100	(408) 527-7361	Cisco Systems Inc.	pthornyc@cisco.com
Mr. Jerry A. Thrasher (Jerry)	voter	100	+1 859 825 4056	Lexmark International, Inc	thrasher@lexmark.com
Dr. James D. Tomcik ()	voter	100	858 658 3231	QualComm	jtomcik@qualcomm.com
Mr. Walt Trzaskus ()	voter	100	407 829 4440	Direct2Data Technologies	trzaskus@d2d.com
Mr. Allen Tsai ()	voter	100	+886-3-516-5106	InProComm, Inc.	Allen Tsai allen@inprocomm.com
Mr. Tom Tsoulogiannis (Tom)	voter	100	+1 416 754 8007	Neesus Datacom Inc.	tomt@neesus.com
Dr. Mike Tzamaloukas	voter	100	650 4751273	Skymoon	mtzamaloukas@skymoonventures.com
Mr. Marcos Tzannes ()	nonvoter	100	925 962 1301	Aware	marcos@aware.com
Mr. Niels Van Erven ()	voter	100	+1 858 674 8533	3Com	niels_vanerven@3com.co
Dr. Richard van Nee ()	voter	100	+31 30 276 3575	Woodside Networks	vannee@woodsidenet.com
Mr. Patrick Vandenameele ()	aspirant	100	+32 16 38 72 72	Resonext	patrick.vandenameele@resonext.com
Dr. Dmitri Varsanofiev	voter	100	+1 617 812 0542	Resonext	dmitri@varsanofiev.com
Mr. Jagannatha L. Venkatesha ()	nonvoter	100	678-924-6534	Agere Systems	jagannath@agere.com
Ms. Nanci Vogtli ()	nonvoter	100	858 674 8186	Pulse Engineering	nancivogtli@pulseeng.com
Mr. John Vollbrecht ()	voter	100	(734) 821-1205	Interlink Networks	jrv@interlinknetworks.com
Dr. Dennis Volpano ()	voter	100	+1 (408) 360-4900	Cranite Systems	volpano@cranitesystems.n
Dr. Toan X. Vu ()	voter	100	(949) 639-8084	Symbol Technologies, Inc.	toanv@symbol.com
Mr. Brian C. Wadell ()	nonvoter	100	781 942 9283	Azimuth Networks	bcwadell@guidedwave.com
Mr. Tim Wakeley (Tim)	voter	100	+1 916 785 1619	Hewlett Packard	tim_wakeley@hp.com
Dr. Jesse R. Walker (Jesse)	voter	100	+1 503 712 1849	Intel Corporation	jesse.walker@intel.com
Mr. Thierry Walrant ()	voter	100	+1 408 617 4676	Philips Consumer Electronics	thierry.walrant@philips.com
Dr. Fujio Watanabe ()	voter	100	+358 7180 37348	DoCoMo Communications Laboratories	fwatanabe@ieee.org
Dr. Mati Wax ()	nonvoter	100	972-4-9097301	Wavion	mati@wavion.com
Mr. Lim Wei Lih ()	voter	100	3815493	Panasonic Singapore Laboratories	wllim@psl.com.sg

Full name	status	att. %	phone	company	e_mail
Dr. Mathew Welborn ()	voter	100	+1 703 269 3052	XtremeSpectrum	mwelborn@xtremespectrum.com
Mr. Michael W. Wellman ()	nonvoter	100	(571) 203-8319	Agere Systems, Inc.	mwellman@agere.com
Mr. Menzo Wentink (Menzo)	voter	100	+31 30 225 97 52	Intersil B.V.	mwentink@intersil.com
Dr. David A. Wheeler ()	nonvoter	100	+44 1189131545	Synad Technologies Limited	david.wheeler@synad.com
Mr. Doug Whiting ()	nearly voter	100	760-827-4502	Hifn	dwhiting@hifn.com
Dr. Douglas L. Whiting ()	nonvoter	100	(760) 827-4502	Hifn	dwhiting@hifn.com
Mr. Peter K. Williams	voter	100	(617) 663-5710	Granum Partners LLC	PETER.WILLIAMS@GRANUM.COM
Mr. Peter King Williams ()	nonvoter	100	617 663 5710	Granum Partners LLC	peter.williams@granum.co
Dr. Richard G.C. Williams ()	voter	100	(858) 530-3760	Texas Instruments Incorporated	richard@ti.com
Mr. Steven D. Williams (Steven)	voter	100	+1 503 264 2043	Intel Corporation	steven.d.williams@intel.co
Mr. Christopher Wingert ()	aspirant	100	(858) 658-4428	Qualcomm	cwingert@qualcomm.com
Mr. Harry Worstell (Harry)	voter	100	+1 973 236 6915	AT&T Labs	hworstell@att.com
Dr. Charles R. Wright	voter	100	(978) 684-1361	Enterasys Networks, Inc	cwright@enterasys.com
Mr. Shyhtsun WU (Felix)	aspirant	100	(530) 754-7070	University of California	wu@cs.ucdavis.edu
Dr. Yang Xiao ()	voter	100	(801) 617-2518	MicroLinear	yangxiao@ieee.org
Dr. Shugong Xu ()	voter	100	(360) 834-8672	Sharp Laboratories of America	sxu@sharplabs.com
Mr. Jung Yee ()	voter	100	+1 613 234 2046	IceFyre Semiconductor Inc.	jyee@icefyre.com
Mr. Kit Yong ()	voter	100	+1 281-290-9922 x202	Lincom	kity@lincom.com
Mr. Kit C. Yong ()	nearly voter	100	(281) 298-9922 x102		kity@lincom.com
Mr. Albert Young (Albert)	voter	100	408-725-8070 x 31	Ralink Technology Inc.,	ayoung@ralinktech.com
Mr. Heejung Yu ()	nearly voter	100		ETRI	heejung@etri.re.kr
Mr. Patrick Yu ()	voter	100	(408) 452-4905	Acer Laboratories Inc., USA	patrick_yu@ieee.org
Mr. Nakache Yves-paul ()	aspirant	100		Merl	nakachey@merl.com
Mr. Glen Zorn ()	voter	100	+1 425 471 4861	Cisco Systems	gwz@cisco.com
Mr. Robert J. Zuccherato ()	nonvoter	100	613-270-2598	Entrust	robert.zuccherato@entrust.com
Mr. Arnoud Zwemmer ()	voter	100	+31 30 229 60 84	Intersil Corporation	arnoud.zwemmer@intersil.com
Mr. Jim Zyren (Jim)	voter	100	+1 321 729 4177	Intersil Corporation	jzyren@intersil.com

IEEE P802.11
Wireless LANs

Minutes of 802.11 Task Group E
MAC Enhancements - QoS

Hyatt Regency, St Louis, Missouri, USA

Date: March 11 – 15, 2002

Author: Tim Godfrey
Intersil
Phone: 913-706-3777
Fax: 913-664-2545
e-Mail: tgodfrey@intersil.com

1. Monday Afternoon

1.1. Call to order

1.1.1. Meeting called to order at 3:30PM by John Fakatselis

1.1.2. Secretary Tim Godfrey

1.2. Objectives for this week

1.2.1. Work towards draft changes that will convert no-votes and lead us closer to the 75% Draft approval requirement

1.3. Agenda

1.3.1. Presentation of agenda from document 116r2.

1.3.2. Discussion on agenda

1.3.2.1. Is there time for Ad Hoc? Yes, they will meet when we recess from formal sessions into ad hoc. They are not shown on the agenda.

1.3.2.2. How do we intend to review what the ad hoc groups have done so far?

1.3.3. Scheduled Task Group discussion

1.3.3.1. Tuesday at 10:30AM.

1.3.3.2. Wednesday at 3:30PM

1.3.3.3. Thursday at 10:30

1.3.3.4. The agenda is modified to include these fixed times.

1.3.4. Adoption of agenda

1.3.4.1. Approved without objection

1.4. Approval of Minutes

1.4.1. Approval of the minutes of the November Meeting

1.4.1.1. Approved without objection

1.4.2. Approval of the minutes of the January meeting

1.4.2.1. Approved without objection

1.5. Straw Poll

1.5.1. How many new members? Just a few

1.6. Process

1.6.1. Continue operating as ad-hoc groups addressing the comments.

1.6.2. Accept resolutions at incremental TG meetings

1.6.3. Next Steps – one of three likely:

1.6.3.1. Continue addressing remaining comments at next meeting

1.6.3.2. Send out a draft for new letter ballot

1.6.3.3. Seek vote reversal, and send ballot for recirculation

1.6.4. Guidelines for ad-hoc groups

1.6.4.1. Resolve comments, and confirm acceptance by commenters.

1.6.4.1.1. Address easy comments first

1.6.4.1.2. Obtain feedback

1.6.4.1.3. Present resolutions to TG group for formal acceptance of changes to the draft.

1.6.5. Discussion

1.6.5.1. Should we have reports from Ad Hoc Groups before we break? Yes

1.6.5.2. Are there any Ad Hoc groups that are close to closure? AP mobility has addressed all comments. FEC is also done.

1.6.5.3. Question on vote reversals – there were changes accepted after the last ballot. How can we reverse votes if the draft is now different? The idea is that the changes are what cause the voter to reverse – it is based on the known changes since the last draft.

1.6.6. Call for papers

1.6.6.1. New papers on the subject of FEC (related to Letter Ballot comments) are brought for presentation.

1.6.6.2. There is also a paper on EDCF (handled in the HCF group).

1.6.6.3. Mathilde

1.6.6.4. Sunghyun

1.6.6.5. *The IP mobility ad hoc has a paper 02-166r6 which is their output.*

1.6.7. **Discussion**

1.6.7.1. *The Ad Hoc groups get to decide how to use or present the papers. The papers should first be discussed in the appropriate Ad Hoc group.*

1.7. Overall Status of comment resolution

1.7.1. **There are 465 comments that are unassigned.**

1.7.2. **There were lots of duplicates: duplicates were considered resolved if one was resolved. 246 duplicates were eliminated**

1.7.3. **The chair notes that comments that do not have a specific suggestion can be resolved by rejecting them. But be sure to contact the commenter to let them know why the comment is ignored, and give them a chance to provide a constructive resolution.**

1.7.4. **01/084r6 is the update of status.**

1.8. Reports from Ad Hoc groups

1.8.1. **AP Mobility – Adrian**

1.8.1.1. *Work was done to refine the document from the last meeting. A new document was prepared that will be presented.*

1.8.2. **FEC – Sunghyun / John K**

1.8.2.1. *About 50 comments were resolved. There are still a few controversial issues. The big issue was the relationships among the places FEC is represented. Capability bit*

1.8.3. **Frame Formats – Matthew Sherman**

1.8.3.1. *Still a lot of work to do – calls for people to help.*

1.8.4. **Burst Ack – (Srini not here) Shugong**

1.8.4.1. *Srini has prepared a slide. Document 02/175r3*

1.8.4.2. *Capability bit element has been introduced. Use of management frames to send out burst ack.*

1.8.4.3. *24 comments still open*

1.8.4.4.

1.8.5. **HCF – (leaders not present) Mathilde volunteers**

1.8.5.1. *Some progress has been made, but no documents have been distributed. We need to get the written documents.*

1.8.5.2. *Some discussion of OBSS with respect to backoff rules.*

1.8.5.3. *A new access category was added – One EDCF station may have up to 8 priorities, but have less access categories.*

1.8.5.4.   *CWMIN is per access category.*

1.8.5.5.   *The 9th access category will be used for HC channel access.*

1.8.5.6.   *More flexible fragmentation will be allowed. Arbitrary size for each fragment will be supported to better match TXOPs.*

1.8.5.7.   *The editor is planning to re-organize chapter 9 to make it easier to understand. Especially the NAV rules.*

1.9. Papers

1.9.1.   **The chair notes that papers must be directly addressing outstanding comments.**

1.9.1.1.   *Straw poll – do we want to have any papers presented now? Of the ones that are ready?*

1.9.2.   **Paper - Improvements for EDCF (Menzo Wentink)**

1.9.2.1.   *Document 02-214r0*

1.9.2.2.   *CW space is limited*

1.9.2.3.   *Proposes a new mapping of CW and CFB limits for different user priorities.*

1.9.2.4.   *Discussion –*

     1.9.2.4.1.   *Are the QoS parameters proposed to be static? Yes*

     1.9.2.4.2.   *How do these simulations compare to EDCF simulations that have already been done?*

     1.9.2.4.3.   *Like the idea of defaults, but also a central control of parameters is needed.*

     1.9.2.4.4.   *As the draft stands, we do have transmission at DIFS. Legacy stations transmit at DIFS+1.*

     1.9.2.4.5.   *What about a time sensitive application with long packets? Long CFBs can cause jitter.*

     1.9.2.4.6.   *If you remove the AIFS and only differentiate with CWmin, you increase the contention. Opening the window size is needed to relieve contention.*

     1.9.2.4.7.   *CWmax – it is a good idea to use, but it causes overhead. To be effective it has to be appropriate for the traffic load. It would have to change continually and signaling would add overhead.*

     1.9.2.4.8.   *In allowing these multiple frame exchanges, wouldn't there be a problem managing parameterized QoS via the HC? Worried it would impact the HC's ability. This does not impact the HC. These are only transmitting 3mS intervals. Does not use the PIFS interval. There is no conflict with the HC.*

     1.9.2.4.9.   *It does use the HC techniques, without an HC.*

     1.9.2.4.10.   *Thinks the HC could improve performance in some times.*

     1.9.2.4.11.   *The jitter of the HC could go up to 3mS, the max EDCF burst length.*

1.9.3. **Paper – Simplifying the MAC FEC implementation and related issues (Jie Liang)**

1.9.3.1. *Document 02-207r0*

1.9.3.2. *Describes option for use of header bits for controlling FEC decoding in the MAC.*

1.9.3.3. *Issues with certain packets that incorrectly appear coded even if they are not.*

1.9.3.4. *Proposes changing PLCP header bits to indicate FEC.*

1.9.3.5. *Discussion*

1.9.3.5.1. *After decoding of a non-encoded frame, it should be possible to determine if the frame is "bad" based on looking at addresses or consistency of other fields.*

1.10. Recess

1.10.1. **Recess at 5:45PM.**

2. Tuesday Morning

2.1. Opening

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

2.2. Procedure

2.2.1. **This morning will continue the Ad Hoc. We will reconvene at 10:30.**

2.2.2. **Ad Hoc Groups are going to bring resolution motions to the TG in packages.**

2.2.3. **We will vote on entire packages of resolutions to speed the process.**

2.2.4. **Comments that are not resolved to the satisfaction of the commenter will be addressed individually.**

2.3. Reports from Ad Hoc Sub Groups

2.3.1. **Introduction**

2.3.1.1. *What progress has been made?*

2.3.1.2. *Have no-voters been contacted with respect to the proposed resolutions*

2.3.2. **AP Mobility – Adrian Stephens**

2.3.2.1. *Have completed a detailed pass through the document that will be recommended as a resolution.*

2.3.2.2. *Will verify that all issues are closed.*

2.3.2.3. *No Voters have been contacted, and some responses received.*

2.3.3. **HCF – Mathilde**

2.3.3.1. *No progress yet. The reports from teleconferences were not received until this morning.*

2.3.3.2. *Some discussion on difficult issues made last night.*

2.3.3.3. *Still needs to communicate to no-voters on resolutions*

2.3.4. **FEC – John K**

2.3.4.1. *The text is essentially complete.*

2.3.4.2. *TI would like to add a bit in the QoS control field.*

2.3.4.3. *Other explanatory text in the frame format section is still needed.*

2.3.4.4. *Some comments were resolved by the frame formats group – FEC group needs help understanding them.*

2.3.4.5. *Emailing text of resolutions to no-voters will start today.*

2.3.4.6. *How many no-voters are there? About 10.*

2.3.4.7. *Discussion*

2.3.4.7.1. *Will there be time for paper presentation? First lets get the updates out.*

2.3.5. **Burst Ack – Shugong**

2.3.5.1. *We have some resolutions for comments ready to send to no-voters this morning.*

2.3.6. **Frame Formats – Matthew**

2.3.6.1. *What about previous resolutions. We will sort by name and send the whole file to all commenters.*

2.3.6.2. *Any resolutions made at this meeting will be sent out individually.*

2.3.6.3. *The group is suffering because we don't have critical mass to make major decisions.*

2.3.7. **Other – Keith Amman**

2.3.7.1. *In the same situation – not enough people.*

2.3.7.2. *Also need to update the input from Michael and integrate it.*

2.4. Recess for ad-hoc groups at 8:30AM

2.5. Opening of TG session

2.5.1. **Called to order at 10:36AM by John Fakatselis**

2.6. Comment Resolution

2.6.1. **Process**

2.6.1.1. *We have not received comments back from no-voters yet.*

2.6.1.2.   *We will allow no-voters to re-open consideration if we approve resolutions that they don't agree with.*

2.6.1.3.   *Is there any objection to granting reconsideration of any comment we approve, and then receive feedback of objection from the commenter? This is in effect a change to the rules on reconsideration.*

2.6.1.3.1.   *No Objections*

2.7. Presentations of comment resolutions

2.7.1.1.   *The chair moves to Duncan Kitchin*

2.7.2.   AP Mobility group – Adrian Stephens

2.7.2.1.   *Comment resolutions are described in document <02-066r8>.*

2.7.2.2.   *Notes on resolutions*

2.7.2.2.1.   *Comment 3 – No provisions for HCF*

2.7.2.2.1.1.   Resolved

2.7.2.2.2.   *Comment 6 – Limited QoS in IBSS*

2.7.2.2.2.1.   Resolved

2.7.2.2.3.   *Seven comments were accepted and 5 were rejected. Waiting for responses.*

2.7.2.2.4.   *Added support for 802.11h channel management.*

2.7.2.2.5.   *Ranking is determined by considering the QAPCS control field as a 16 bit unsigned integer.*

2.7.2.3.   *Motions will be brought forward later (when meeting the 4 hour rule)*

2.7.2.4.   *Discussion*

2.7.2.4.1.   *Is there any way to signal that the mobile AP will not support intra-bss bridging (side streaming)*

2.7.3.   Other resolutions – Keith Amman

2.7.3.1.   *Document 02-084r7, merged letter ballot comments*

2.7.3.2.   *Notes on resolutions*

2.7.3.2.1.   *The group eliminated duplicate comments, and pick off low hanging fruit.*

2.7.3.2.2.   *Lots of comments were on the annexes. They were recognized and accepted them. They need to be resolved and dealt with. SDL is a problem area. We have a special committee working on a resolution.*

2.7.3.2.3.   *Side Traffic 02/016 was adopted to deal with side traffic.*

2.7.3.2.4.   *Comment asking for resolution of hidden node problem was rejected as out of scope of the PAR*

2.7.3.3.   *There are no specific motions at this time.*

2.7.4.   HCF – Mathilde

2.7.4.1.   *Reviewing of teleconference output*

2.7.4.2.   *Looking for specific resolutions*

2.7.4.3.   *No motions at this point.*

2.7.5.   FEC – John Kowalski

2.7.5.1.   *Document 02-115r5*

2.7.5.2.   *Notes on comments*

2.7.5.2.1.   *Based on input from the paper presented yesterday, to guard against the error packet condition, signaling was added to the QoS control field and the frame control field. (as approved previously)*

2.7.5.2.2.   *Informative notes are added to explain TSPEC bits.*

2.7.5.2.3.   *Explanatory text was added to explain the RS code.*

2.7.5.2.4.   *More explanatory text on the FCS was added*

2.7.5.2.5.   *informative note was added on the decoding procedure.*

2.7.5.2.6.   *FEC frame format was made non-WEP centric.*

2.7.6.   Burst Ack – Shugong

2.7.6.1.   *Document 02-135r4*

2.7.6.2.   *This document contains the normative text that will be brought up in a motion later this week.*

2.7.6.3.   *The comments have been resolved.*

2.7.6.4.   *There are still outstanding issues on the last page.*

2.7.6.5.   *There is a connection setup mechanism for Burst Ack. There is another mechanism for TSPEC, and for FEC. There should be a generic mechanism for connection setup, handling all of these. We shouldn't have separate mechanisms.*

2.7.6.6.   *Discussion*

2.7.6.6.1.   *This does provide a connection mechanism, but there is no relation to TSPEC. We should move forward with this.*

2.7.6.6.2.   *What are the timeouts related to? One is the retry limit.*

2.7.7.   Frame Formats – Matthew Sherman

2.7.7.1.   *Document 126r3 – minutes from ad-hoc teleconference.*

2.7.7.2.   *Notes on comments*

2.7.7.2.1.   *There were few common issues that could be grouped.*

2.7.7.2.2.   *All comments resolved prior to this meeting will be circulated to commenters*

2.7.7.2.3.   *Many of the comments were mis-assigned. After reassignment, there were 300 comments left.*

2.7.7.2.4.   *About 135 comments were processed.*

2.7.7.3.   *No motions at this time.*

2.8. Next Actions

2.8.1. Discussion

2.8.1.1. *Are any new presentations accepted? No, only items applicable to comment resolution.*

2.8.1.2. *Is Michael available? Yes.*

2.8.1.3. *Ad Hoc leaders will stay here to coordinate activities for the rest of the day.*

2.8.2. SDL Ad Hoc

2.8.2.1. *Duncan asks for participation. Keith Amman will join.*

2.9. Recess for Ad Hoc groups at 11:50AM

3. Wednesday AM

3.1. Opening

3.1.1. The meeting is called to order at 8:05 by John Fakatselis

3.2. Process

3.2.1. Ad Hoc Groups will continue until the 3:30 session

3.2.2. We need to determine what our strategy for the Interim meeting will be.

3.2.2.1. *We need to assess our progress by the number of comments resolved by 3:30.*

3.2.2.2. *We need to have any normative text for motions on the server now to be introduced at 3:30.*

3.3. Updates from Ad Hoc Groups

3.3.1. AP Mobility

3.3.1.1. *No Report – already complete*

3.3.1.2. *Results in document 02-206*

3.3.2. Frame Formats

3.3.2.1. *Resolutions for 4 comments yesterday*

3.3.2.2. *Will distribute comments to other ad-hoc groups.*

3.3.3. FEC

3.3.3.1. *Some responses to query have been received*

3.3.3.2. *Text needs to be added to frame formats*

3.3.3.3. *Some comments are contradictory – commenters need to work out amongst themselves*

3.3.3.4. *An additional draft of resolutions will be on the server today with motions.*

3.3.4. Burst ACK

3.3.4.1. *Solved the last remaining comments – all comments completed*

3.3.4.2. *Retry limit is still an open issue*

3.3.4.3. *Text will be on server this morning*

3.3.5. HCF

3.3.5.1. *Not much new progress*

3.3.5.2. *Normative text for EDCF in document 02-241r0 is on the server. Replaces queues with access categories. Also mapping from user priority to queue.*

3.3.5.3. *This will address 20 comments.*

3.3.5.4. *We will have one or two motions this afternoon regarding CFBs in an EDCF TXOP.*

3.3.5.5. *21 comments are resolved.*

3.3.5.6. *Were responses sent by email? Will do this morning.*

3.3.6. Other

3.3.6.1. *Resolutions were sent out last night, some bounced and were re-sent this morning*

3.4. Planning

3.4.1.　Straw poll – who is going to be at Australia? Most people, including the key contributors

3.4.2.　Next action – we will continue in the Ad Hocs until 3:30.

3.4.3.　Objective- we want to resolve as many comments as possible. Handle the easy ones first.

3.5. Recess for Ad Hoc groups at 8:30AM

4. Wednesday Afternoon

4.1. Opening

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

4.1.2.　This is the time for motions. Motions must address comment resolutions to be in order.

4.1.3.　We are going to start with Ad Hoc groups, and give them the opportunity for motions. Then individuals may make motions to address blocks of comments.

4.1.4.　We ask that movers indicate how many comments the motions addresses in their opening statement.

4.2. Planned Motions

4.2.1.　 AP Mobility: 2 motions

4.2.2.　FEC: 3 motions

4.2.3.　HCF : 2 Motions

4.2.4.　other : none

4.2.5.　Burst Ack : none

4.2.6.　Discussion

4.2.6.1.　What is the deadline for motions to go into a new draft? The TG has been scheduled for 10:30 tomorrow and again at 6:30. Everything has to be on the server tonight for the 10:30am. Everything by 2:30 tomorrow can be considered at 6:30.

4.2.6.2.　Matt Sherman would like to review resolutions with the group. Request 10 minutes of agenda time.

4.3. HCF (document 02/255)

4.3.1.　Motion

4.3.1.1.　Move to Instruct the editor to adopt the normative text in 02-241r0.

4.3.1.1.1.　Moved Sunghyun

4.3.1.1.2.　Discussion

4.3.1.1.2.1. There is 02-084r7 that contains the comment resolutions.

4.3.1.1.2.2. The current draft has up to 8 queues. Is this a change of how EDCF works? Believes it is a purely editorial change.

4.3.1.1.2.3. Does this effect other uses of priority in the draft? We defined what is meant by higher priority access category. Access Category becomes synonymous and Queue. Some people didn't like to see the term queue in the description. There is now only one kind of priority - user priority.

4.3.1.1.3. Second Menzo

4.3.1.1.4. Any objection to adopting the motion?

4.3.1.1.4.1. Adopted by unanimous consent.

4.3.2. EDCF TXOP bursting

4.3.2.1. Allow a multiple MSDU or MMPDU transmission during an EDCF TXOP within the limit of dot11CPCFBlimit[UP].

4.3.2.2. Motion: to instruct the editor to adopt the normative text in document 02-185r0.

4.3.2.2.1. Moved Sunghyun

4.3.2.2.2. Discussion

4.3.2.2.2.1. Is this allowing multiple MSDUs from the same access category? The same access category or higher.

4.3.2.2.2.2.

4.3.2.2.3. Second Maarten

4.3.2.2.4. Any objection to the motion? Yes

4.3.2.2.5. Discussion

4.3.2.2.5.1. This may preclude implementations of the HCF that perform uniformly. Against.

4.3.2.2.5.2. It brings the EDCF and HC mechanisms closer together. The HC is in control of this limit

4.3.2.2.5.3. The HCF already has a problem with the way EDCF is working, so there isn't an additional problem. For the motion

4.3.2.2.5.4. Against the motion. We debated this at the last meeting. The concern is that this will increase the complexity of EDCF. HCF is the right way to do robust QoS.

4.3.2.2.5.5. How many Comments of no-voters would be addressed by this? Three. How many would change their vote to No if we adopt this? Straw Poll

4.3.2.2.5.5.1. Of those who voted no, does this address a comment? 4

4.3.2.2.5.5.2. Of those who voted yes, does this create a new No vote? 4

4.3.2.2.5.6.   In favor of the motion. This has the virtue of being simple to implement. The HC can override it. So there is no downside.

4.3.2.2.5.7.   Against the motion because it introduces significant change. We need to study the impact. In a high rate network, it could introduce jitter.

4.3.2.2.5.8.   In favor – it does not introduce additional complexity. It is similar to fragment bursting. The Global TXOP limit is in the beacon already. The only change is that the TXOP is per access category.

4.3.2.2.5.9.   Is the MIB parameter a duration or number of MSDUs? A duration. If the duration is zero it should be interpreted as one frame exchange.

4.3.2.2.5.10.   In favor – there are concerns about latency and jitter. This reduces the number of contentions, and thus latency and jitter.

4.3.2.2.5.11.   The issue is latency and jitter as experienced by the HCF. For applications that require Parameterized QoS, they will have to be used by the HCF because there are no specified admission control mechanism.

4.3.2.2.5.12.   Call the question (Ron / Menzo)

4.3.2.2.5.12.1.   Vote on calling the question: fails 18:13:3

4.3.2.2.6.   Discussion

4.3.2.2.6.1.   What EAP mechanisms exist to control the HC access? There is no explicit text. We have the global TXOP limit. There is no direct way to distribute the new MIB variable. If the global TXOP limit is 0, then

4.3.2.2.6.2.   Is it a MIB variable or part of the QoS Parameter Set Element? Only a MIB variable. It is not in the parameter set.

4.3.2.2.6.3.   If we introduce this mechanism, fairness will be much worse.

4.3.2.2.6.4.   This would actually add fairness, since more bandwidth can be assigned in a TXOP. At higher bit rates the overhead of EDCF grows. This mechanism is needed to gain efficiency at higher bit rates.

4.3.2.2.6.5.   call the question (Maarten / Steve W)

4.3.2.2.6.5.1.   Any objection? Yes

4.3.2.2.6.5.2.   Vote on calling the question: Passes 28: 1: 3

4.3.2.2.7.   Vote on the main motion: Passes 25: 8 : 6

4.4. FEC

4.4.1. Document 078r2 addresses most of the FEC comments

4.4.2. Document 115r8.

4.4.2.1. *Motion to incorporate the updated text relating to the FEC in section 7.3.2.15 in D2.0a into the draft*

    4.4.2.1.1. *Moved John / Adrian*

    4.4.2.1.2. *Accepted by unanimous consent*

4.4.2.2. *Motion to incorporate the text in draft 115r8 into the updated draft.*

    4.4.2.2.1. *Moved John Kt*

    4.4.2.2.2. *Discussion*

        4.4.2.2.2.1. *It adds bits in the QoS Control Field.*

        4.4.2.2.2.2. *Wouldn't those changes be in other sections than 7.5? Yes, 7.5 refers back to those.*

        4.4.2.2.2.3. *It incorporates specifying decoding order.*

        4.4.2.2.2.4. *How many no-vote comments does it address? About 6. Any risk of new no-votes? Minimal*

    4.4.2.2.3. *Seconded Sid Schrum*

    4.4.2.2.4. *Motion accepted by unanimous consent.*

4.4.3. Additional Scrambling in the FEC

4.4.3.1. *Presentation of "A Precoder for limiting scrambler error propagation". Document 02/221r0*

4.4.3.2. *Chris Heegard*

4.4.3.3. *Overview*

    4.4.3.3.1. *It is useful to change the scrambling to change the Peak to Average ratio of the OFDM signal on a retry. Change the phase of a periodic sequence.*

    4.4.3.3.2. *The receiver needs to know the state – that state is transmitted across the channel. If an error occurs, the whole frame is lost.*

    4.4.3.3.3. *Proposed solution, after RS encoder, precode with 1/g(D) filter. An inverse filter at the receiver undoes the effect of the filter at the receiver.*

    4.4.3.3.4.

4.4.3.4. *Motion to instruct the editor to include the text from 02/115r7 into the draft.*

    4.4.3.4.1. *Moved Heegard*

4.4.3.5. *Discussion*

    4.4.3.5.1. *The MAC header is scrambled? Yes – it implies that multicast packets cannot use the FEC if there are legacy devices in the BSS.*

    4.4.3.5.2. *Legacy stations will see the protocol version which is scrambled as some random value, and throw them out. So all packets are corrupted for legacy stations.*

4.4.3.5.3.   *This is effectively creating a new protocol – it goes beyond the PAR. Cannot vote in favor of this.*

4.4.3.5.4.   *How does a receiving station know that this mode is in effect for a given packet? There are two bits that indicate the FEC encoding. But they are scrambled? They are both set to one after the scrambling.*

4.4.3.6.   *The mover withdraws the motion.*

4.5. AP Mobility

4.5.1. Status

4.5.1.1.   *Four no votes have been resolved.*

4.5.1.2.   *Proposed values for default values of traffic categories*

4.5.1.2.1.   *Default values are per PHY? The aCWmin and aCWmax are coming from the PHY. The rest of the values come from the MAC.*

4.5.1.3.

4.5.2. Motions from Document 066

4.5.2.1.   *Move to instruct the editor to edit the TGe draft, reversing the editing instructions in 11-02-066r3 and following the editing instructions in 11-02-066r9.*

4.5.2.1.1.   *Moved Adrian Stephens*

4.5.2.1.2.   *Discussion*

4.5.2.1.2.1.   Is the traffic category table relevant to this motion? No.

4.5.2.1.2.2.   Suggest waiting until tomorrow. Have the traffic parameter class simulations been run for other PHYs? That is not relevant to this motion.

4.5.2.1.2.3.   Summary of motion: AP Mobility is an option to elect an access point. What is new to this motion? What has changed in this motion? Was presented yesterday.

4.5.2.1.3.   *Second David Hunter*

4.5.2.1.4.   *Vote on the motion: Motion passes with unanimous consent.*

4.5.3. Motions from Document 236

4.5.3.1.   *Move to instruct the editor to edit the TGe draft following the editing instruction in document 02/236r0, with the exception of the instructions for Annex D..*

4.5.3.1.1.   *Moved Adrian Stephens*

4.5.3.1.2.   *Discussion*

4.5.3.1.2.1.   This defines QIBSS operation. Provides a table for Annex D, providing default parameters as a function of traffic class.

4.5.3.1.2.2.   Finds it hard to believe that these parameters are optimum for all PHYs. Should they be here? Should we make the motion here?

4.5.3.1.3.   *Second Mathilde*

4.5.3.1.4.   *Discussion*

4.5.3.1.4.1.   *The concept of QoS in an IBSS is not a big deal – doesn't provide a benefit.*

4.5.3.1.4.2.   *In favor – there is benefit in the presence of interfering networks. Ad Hoc is valuable.*

4.5.3.1.5.   *Vote on the motion: Passes 28 : 1 : 6*

4.6. Burst Ack

4.6.1.   **Recommendations in document 02-135r6**

4.6.1.1.   *There will be a motion tomorrow.*

4.6.1.2.   *Changes that were made today*

4.6.1.2.1.   *Add transmit buffer size*

4.6.1.2.2.   *clarify the receiver buffer operation*

4.6.1.2.3.   *clarify the lifetime of burstackreq*

4.6.1.2.4.   *Add sent count in the burst ack request*

4.6.1.2.5.   *Rename Re-ordering buffer size.*

4.7. Frame Formats

4.7.1.   **Recommendations will be put on the server tonight. No document number yet.**

4.7.2.   **Changes that have been made**

4.7.2.1.   *TXOP ranges do not accommodate slow PHY rates. Suggested change of units.*

4.7.2.2.   *QoS parameter set available as an option in Probe Response.*

4.7.2.3.   *Beacon interval*

4.7.2.4.   *Make the error statistics element "reserved for future use". OBSS not in standard.*

4.7.2.4.1.   *Objection to that: there is useful information to be derived related to handoff issues. Wants to take offline.*

4.8. Recess until 8:00AM

5. Thursday Morning 1

5.1. Opening

5.1.1.   **The meeting is called to order by John Fakatselis at 8:05AM**

5.2. Reports from Ad Hoc Groups

5.2.1.   **FEC**

5.2.1.1.   *The group is done, except for the pending the motion from the scrambler.*

5.3. Report of overall progress

5.3.1. Merged Letter Ballot Comments 02-084r8

5.3.1.1. *Includes every comment resolution received as of yesterday*

5.3.1.2. *Still 277 unassigned comments*

5.3.1.3. *846 comments have been resolved.*

5.3.1.4. *We still have 510 unresolved technical comments*

5.3.1.5. *Frame formats – some of these comments don't belong in this group. Now that other groups are near completion, it is easier to resolve frame format issues.*

5.3.2. Discussion

5.3.2.1. *When will we have individual motions? At 10:30AM.*

5.4. Schedule

5.4.1. We reconvene at 10:30, and make motions at that time.

5.5. Recess for Ad Hoc Groups at 8:30AM

6. Thursday Morning 2

6.1. Opening

6.1.1. Call to order at 10:30AM by John Fakatselis

6.2. Process for the session

6.2.1. Motions need to be tied to specific comment resolutions.

6.2.2. Call for motions to be made in this session.

6.2.2.1. *AP Mobility – no motions, one this afternoon*

6.2.2.2. *Frame Formats – no motions, one this afternoon*

6.2.2.3. *HCF –*

6.2.2.4. *Burst Ack – no motions*

6.2.2.5. *Other – no motions*

6.2.3. Discussion

6.2.3.1. *Additional emails have been sent out with provisional resolutions. Waiting for feedback*

6.2.3.2. *Anyone with comments from Simon Black: there is an updated email address.*

6.2.4. There are no motions from the Ad Hoc Groups.

6.3. Comment Resolutions

6.3.1. Discussion

6.3.1.1. *Can we approve comment resolutions in the document 084? Can we make a formal motion to adopt*

them? We are still waiting for commenter agreement to the proposed resolutions.

6.3.1.2. *What about the resolutions from prior to this meeting? Are there any that can be approved? They were sent out with instructions for commenters to respond directly to the Ad Hoc leaders? If we don't have any responses, we should adopt them.*

6.3.1.3. *There are a block of comments regarding the SDL. We are waiting for the response from the special task group (Duncan Kitchin)*

6.3.2. Any motions from individuals?

6.3.2.1. *None*

6.4. Recess for Ad Hoc Groups at 10:45AM

7. Thursday Evening

7.1. Opening

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

7.2. Process overview

7.2.1. We have the following items on the agenda

7.2.1.1. *Review of the draft – This is a fixed time agenda item. Since we don't have a draft to review, we will move to making motions.*

7.2.1.2. *Does anyone object to that plan? No.*

7.2.2. Scheduling of motions

7.2.2.1. *Ad Hoc Groups will report, and then introduce motions.*

7.2.2.2. *the R9 comment resolution document will be handled in the "Other" ad-hoc group.*

7.2.2.3. *How many individual motions are there? 3*

7.2.2.4. *The chair moves to Duncan Kitchin*

7.2.2.5. *We will continue modifying the draft until 9:00PM and then move to administrative matters.*

7.3. Motions from Ad Hoc groups

7.3.1. FEC Ad Hoc – John Kowalski

7.3.1.1. *Motion to make the QoS Control Field consistent with the FEC Text that was approved yesterday.*

7.3.1.1.1. *Motion: Instruct the editor to modify the text and table in 7.1.3.5 to be consistent with the definition of FEC bits mentioned in section 7.5 (as in the previously approved 115r8)*

7.3.1.1.1.1. *Moved John Kowalski*

7.3.1.1.1.2. Second Otani-san

7.3.1.1.2. *Discussion*

7.3.1.1.2.1. It's not clear what this is doing? In short, the draft puts a bit in the QoS control field back in. There are now two bits.

7.3.1.1.2.2. What's the point of 2 bits? To preclude the occurrence of a false decode of FEC frames.

7.3.1.1.3. *Vote – the motion is accepted by unanimous consent.*

7.3.2. AP Mobility – Adrian Stephens

7.3.2.1. *Table of default parameter values resulting from discussion – going into Annex D. These are now all based on PHY-specific parameters aCWmin and aCWmax, to provide a reasonable set of values to provide differentiation in an IBSS. Document 02-236r2*

7.3.2.1.1. *Move to instruct the editor to edit the TGe draft following the editing instructions in 11-02-236r2 relating to Annex D.*

7.3.2.1.1.1. Moved Adrian Stephens

7.3.2.1.1.2. Second Maarten

7.3.2.1.2. *Discussion*

7.3.2.1.2.1. Like the motion and support it, but there are errors in the normative text. (editorial). For example the [TC] should be [UP].

7.3.2.1.2.2. Why were no values provided for [UP} 3, 6, and 7? Those values are reserved for later use. They are spare.

7.3.2.1.2.3. Would the be defined later? Yes if there is a need for it. Did not want to over specify.

7.3.2.1.2.4. Can we put "reserved" on those lines?

7.3.2.1.3. *Motion to amend: adding "additionally, inserting the word "reserved" for all parameters relating to unused TCs."*

7.3.2.1.3.1. Moved Keith

7.3.2.1.3.2. Second Adrian

7.3.2.1.3.3. Vote: Motion to amend passes with unanimous consent

7.3.2.1.4. *Motion as amended: Move to instruct the editor to edit the TGe draft following the editing instructions in 11-02-236r2 relating to Annex D, additionally inserting the word "reserved" for all parameters relating to unused TCs.*

7.3.2.1.5. *Discussion*

7.3.2.1.5.1. Where do these labels come from? From 802.1. The assumption is that the MAC classifier above the MAC will know what type of application.

7.3.2.1.6. *Motion to amend: add "and replacing MaxCFBlength with dot11CPCFBlimit.*

7.3.2.1.6.1. Moved Sunghyun

7.3.2.1.6.2. Second Adrian

7.3.2.1.6.3. Vote: motion passes with unanimous consent.

7.3.2.1.7. Motion as amended: Move to instruct the editor to edit the TGe draft following the editing instructions in 11-02-236r2 relating to Annex D, additionally inserting the word "reserved" for all parameters relating to unused TCs and replacing MaxCFBlength with dot11CPCFBlimit.

7.3.2.1.8. Discussion

7.3.2.1.8.1. How were the numbers derived? Through simulation.

7.3.2.1.9. Motion to amend: add "and further, replacing the value of dot11CPCFBlimit for TC=5 with 0.5"

7.3.2.1.9.1. Moved Keith

7.3.2.1.9.2. Second Adrian

7.3.2.1.9.3. Vote: Motion passes with unanimous consent.

7.3.2.1.10. Motion as amended: Move to instruct the editor to edit the TGe draft following the editing instructions in 11-02-236r2 relating to Annex D, additionally inserting the word "reserved" for all parameters relating to unused TCs and replacing MaxCFBlength with dot11CPCFBlimit, and further, replacing the value of dot11CPCFBlimit for TC=5 with 0.5"

7.3.2.1.10.1. Vote: the motion passes with unanimous consent.

7.3.3. Burst Ack – Shugong

7.3.3.1. Define a Burst Ack Response

7.3.3.2. Motion: Instruct the editor to incorporate the text in the document 02/135r7 into the draft

7.3.3.2.1. Moved Duncan

7.3.3.2.2. Second John K

7.3.3.2.3. Vote: the motion is adopted by unanimous consent

7.3.4. Frame Formats – Matt Sherman

7.3.4.1. Resolutions of comment 1145 and 1146.

7.3.4.2. Motion: instruct the TGe editor to incorporate the resolutions for the first two lines from the table in 02/257r0 into the draft

7.3.4.2.1. Moved Matt Sherman

7.3.4.2.2. Second John

7.3.4.2.3. Vote: Motion accepted by unanimous consent

7.3.5. "Other" – Keith Amman

7.3.5.1. Motion: replace contents of Annex C, except the title, with the note "This annex has been removed and the content is not relevant to this standard", and delete all references to Annex C contained in clause 9 and annex A.

7.3.5.1.1.1.   Moved Keith A

7.3.5.1.1.2.   Second Greg

7.3.5.1.2.   *Discussion*

7.3.5.1.2.1.   This is following the direction of the Editors Special Committee and has been accepted by TGh.

7.3.5.1.2.2.   What will be used to replace the SDL? This doesn't prevent putting in other state machines at another time.

7.3.5.1.2.3.   Which editing instructions of the multiple TGs have precedence? If the technical effect is the same, it is an editorial matter to resolve it.

7.3.5.1.2.4.   This is based on looking forward and assuming that the requirements for SDL be removed? There was never a requirement. The SDL was a response to a no-vote in the original standard sponsor ballot. The special committee will provide statements from implementers to the effect that the SDL was not useful.

7.3.5.1.2.5.   Do we know who that no-voter was? Yes. Is that person still in the sponsor ballot pool? We don't know. It is prudent to be prepared for the same comment.

7.3.5.1.2.6.   There is no requirement to replace Annex C with another state machine? No.

7.3.5.1.2.7.   Each group will define a sub-set of the state machines? Yes, that is the intention, to decouple the state machines of the different task groups.

7.3.5.1.2.8.   Does it matter if different groups use different languages? No, each group will use the best language for their work. However, the editors should maintain coordination.

7.3.5.1.2.9.   Call the question (Adrian / Mac) Called with no objection

7.3.5.1.3.   *Vote: Passes 40 : 0 : 2*

7.3.5.2.   *Motion: Move to adopt the resolutions marked as resolved in document 02-084r9, except for resolutions marked "duplicate" that reference unresolved comments, and those in conflict with the motions adopted and recorded in the meeting minutes of TGe between January 1, 2002, and March 15, 2002. If there are contradictions within the document, the editor is instructed to take no action on the conflicting resolutions, and report it back to the group.*

7.3.5.2.1.   *Moved Keith Amman*

7.3.5.2.2.   *Discussion*

7.3.5.2.2.1.   There may be motions in the document 084r9 that are in conflict with themselves.

7.3.5.2.3.   *Second John K*

7.3.5.2.4. *Discussion*

7.3.5.2.4.1. There are two comment resolutions that are a problem

7.3.5.2.4.2. 1847. Needed correction in value range of AIFS was declined – needs to be accepted.

7.3.5.2.4.3. This comment remains as an outstanding no-vote. It will be corrected later. It stays on the list and will be resolved.

7.3.5.2.4.4. Problem with comment 1128. The resolution was unacceptable to the commenter. It is wrong. Needs to be excluded

7.3.5.2.5. *Motion to amend: add "excluding comment 1128" after "document 084-r9".*

7.3.5.2.5.1. Moved Matt Sherman

7.3.5.2.5.2. Second John K

7.3.5.2.5.3. Vote : passes by unanimous consent

7.3.5.3. *Motion on the floor: Move to adopt the resolutions marked as resolved in document 02-084r9 excluding comment 1128, except for resolutions marked "duplicate" that reference unresolved comments, and those in conflict with the motions adopted and recorded in the meeting minutes of TGe between January 1, 2002, and March 15, 2002. If there are contradictions within the document, the editor is instructed to take no action on the conflicting resolutions, and report it back to the group.*

7.3.5.3.1. *Motion to amend: add comments 1514 and 1528 to the exclusion.*

7.3.5.3.1.1. Moved Sid S

7.3.5.3.1.2. Second John K

7.3.5.3.1.3. Vote: the motion to amend passes without objection

7.3.5.4. *Motion on the floor: Move to adopt the resolutions marked as resolved in document 02-084r9 excluding comment 1128, 1514, and 1527, except for resolutions marked "duplicate" that reference unresolved comments, and those in conflict with the motions adopted and recorded in the meeting minutes of TGe between January 1, 2002, and March 15, 2002. If there are contradictions within the document, the editor is instructed to take no action on the conflicting resolutions, and report it back to the group.*

7.3.5.4.1. *Call the question (John K) No Objection*

7.3.5.4.2. *Vote on the motion: passes 38 : 0 : 1*

7.4. *Motions from Individuals*

7.4.1. **Document 02/223r1**

7.4.1.1. *"CC/RR Performance" Sunghyun Choi*

7.4.1.2. *Overview*

7.4.1.2.1.   *Document 157 compared CC/RR and straight PCF (polling all the stations) Not a good comparison*

7.4.1.2.2.   *New scenarios were used for simulation.*

  7.4.1.2.2.1.   Standing Poll – legacy PCF

  7.4.1.2.2.2.   CC/RR, with parameters from 01/571r0. polled in CFP

  7.4.1.2.2.3.   Using CFP for voice stations only downlink using CP

  7.4.1.2.2.4.   Downlink during CFP uplink during CP

7.4.1.2.3.   *Simulation does not have TXOP or CFB.*

7.4.1.2.4.   *Results – standing poll, lowest throughput.*

7.4.1.2.5.   *Polling on downlink was superior to CC/RR*

7.4.1.2.6.   *CC/RR has lowest delay.*

7.4.1.2.7.   *CC/RR has more jitter than polling. Polling has constant, but higher delay.*

7.4.1.2.8.   *Believes parameterized QoS will not need CC/RR*

7.4.1.2.9.   *This simulation was not done with an HCF.*

7.4.1.2.10.   *Believes that CC/RR is not justified.*

7.4.1.3. *Straw Poll*

7.4.1.3.1.   *Would you like to remove CC/RR? Yes 33 ; No 15, abstain 3*

7.4.1.4. *Discussion*

7.4.1.4.1.   *Would provide mathematics showing probability function. Something more substantial than a simulation. Wants a standard set of "use cases" to reference simulations against.*

7.4.1.4.2.   *Requests the group to think about this for the next two months.*

7.4.1.4.3.   *Will not move to remove the CC/RR and CCI mechanism from the draft at this meeting.*

7.4.1.4.4.   *Need to take this discussion off line between the meeting.*

7.4.2. **Document 01/599r3**

7.4.2.1. *Method for HCF channel access and OBSS mitigation : Mathilde B*

7.4.2.1.1.   *want CFPs and CAPs to have priority access over EDCF.*

7.4.2.1.2.   *We don't want to allow HC from squeezing EDCF out.*

7.4.2.1.3.   *Propose Cyclic Prioritized Multiple Access, CPMA*

7.4.2.2. *Motion – deferred until next meeting*

7.5. *Administrative matters*

7.5.1.1. *The chair moves to John Fakatselis*

7.5.2. **Next Meeting**

7.5.2.1. *Options – we could have another letter ballot, continue resolving comments, have an additional interim meeting, change votes to have a recirculation ballot*

7.5.2.2. *Who thinks that we should:*

7.5.2.2.1. *Don't go to letter ballot now, continue Comment Resolution next time?*

7.5.2.2.1.1. Yes: We cannot go for letter ballot. We still have contentious issues.

7.5.2.2.2. *Go to Letter Ballot now?*

7.5.2.2.2.1. Yes: The problem we have is to get people committed to giving feedback. A draft brings us a lot of feedback.

7.5.2.2.2.2. No: the editorial effort needed to make a draft is greater than the time before the next meeting.

7.5.2.2.2.3. Discussion

7.5.2.2.2.3.1. Can we even go to a letter ballot? The new rules provide a provision, but might be challenged.

7.5.2.2.2.3.2. Some aspects of the draft may not be considered complete and ready for ballot. Is that a relevant objection?

7.5.2.2.2.4. Straw Poll: How many people think we should attempt to go to letter ballot at the end of the meeting? Yes 5, 20 No, 2 abstain.

7.5.2.2.3. *Is there any objection to not initiate another letter ballot? No Objection*

7.5.2.3. *Therefore, next time we will continue resolving comments.*

7.5.2.4. *There was a suggestion to have another interim before the May meeting.*

7.5.2.4.1. *The soonest would be Mid April under the rules.*

7.5.2.5. *Discussion*

7.5.2.5.1. *We did make a lot more progress this week – in support*

7.5.2.5.2. *Against – we did make a lot of progress in teleconferences.*

7.5.2.5.3. *Face to Face meetings are effective. Otherwise people are doing other things. Against teleconferences.*

7.5.2.5.4. *Teleconferences have the problem with Asia and Europe participants. There is no suitable time.*

7.5.2.6. *Straw Poll – Who is in favor of an interim before the interim: For 5 ; Against 13 ; Abstain 3*

7.5.2.6.1. *Based on that, is there any objection to not have an interim before the interim*

7.5.2.6.1.1. No Objections

7.5.3. **Ad Hoc Teleconferences**

7.5.3.1. *Is it worth having the Ad Hoc Teleconferences?*

7.5.3.2.   *Discussion*

    7.5.3.2.1.   *A lot of good work was done – although attendance was light. A lot could be accomplished. We should not give up on the idea.*

7.5.3.3.   *Any objection to continue with teleconferences?*

    7.5.3.3.1.   *Discussion*

        7.5.3.3.1.1.   We need to repartition the work.

        7.5.3.3.1.2.   There is no need for FEC, but there is a need for work on TSPECs and connection negotiation in general.

        7.5.3.3.1.3.   The reduction of number of teleconferences will help with participation of the remaining.

7.5.3.4.   *We are going to continue the teleconferences.*

7.5.3.5.   *Motion – to have a series of interim teleconferences between now and May*

    7.5.3.5.1.   *Moved Matthew*

    7.5.3.5.2.   *Second Steve*

    7.5.3.5.3.   *Vote – passes with unanimous consent*

7.5.4.   **Interim Empowerment**

7.5.4.1.   *To empower the task group to conduct business toward the objectives stated at the closing March plenary including initiating a Letter Ballot or Recirculation ballot, independent of quorum.*

    7.5.4.1.1.   *Moved John Fakatselis*

    7.5.4.1.2.   *Second John K*

    7.5.4.1.3.   *Vote: Motion passes by unanimous consent*

7.6. Meeting is adjourned at 9:30PM

IEEE P802.11
Wireless LANs
Title

Date: March 14, 2002

Author: Jon Rosdahl
Micro Linear
11734 South Election Road, Suite 200 Draper, Utah 84020
Phone: 801-617-2508
Fax: 801-617-2501
e-Mail: jrosdahl@ieee.org

Abstract

Minutes for TGf From the St. Louis.

Thanks goes to Sherry Johnson for helping with taking minutes while the Secretary was out of the room.

Meeting Called to order 8:05am Tuesday March 12, 2002 by David Bagby Chair of TGf.

Minutes from Jan 2002 mtg approved:
   Approval of minutes from Jan 2002:
      Moved: Bob O, 2nd: Richard Paine
      Unanimous

New contact Info for David Bagby chair of TGf was given:.
      The revised contact information is:
      Email: david.bagby@ieee.org
      Office Phone: (650) 637-7741

Goals for March:
      LB 32 Result Review
      Review and confirm ballot results
      Review and respond to comments
      Prepare new Letter Ballot or Recirculation Ballot

Moved to Adopt Agenda as proposed
      Moved: Bob O, 2nd Robert M.
      Unanimous

Sherry J. volunteered to fill for Jon R. Tues Afternoon, and Wed Late Afternoon session.

Review Requirements for LB Comments:
      From IEEE companion: Review requirements for comment with No Vote.
      Some comments have been marked invalid, and these choices have been reviewed with .11 Chair.
      To ensure fairness, we will review the comments "blind" to allow the group to ensure the correct choice.

      Invalidated Comment A:
         Comment: This clause defines a set of new mechanisms for securing….
         Change: -- Peer review by 11i group
         Disposition: This comment is considered by the TGf group to be a non-responsive Comment….
      By comparing the requirements against this comment.
         There is not a specific objection, no specific change specified.

      No objection to invalidating

      Invalidated Comment B:
         Comment: What does invocation of the primitive failed mean: it seems like some criteria needs…
         Change: Blank
         Disposition: This is not a valid comment to support a "NO" vote. No votes must be supp……
            No votes must be accompanied with a Technical reason for the NO vote. Either this
            commenter needs to produce a technical comment, or change his vote to yes.

      Invalidated Comment C:
         Comment: The only permitted status codes are Success…
         Change: Take one of two courses: (1) define a Pending Status code….
         Disposition: This is not a valid comment to support a NO vote…
      Discussion:
         maybe treat this as technical comment for processing, but this does not change the vote and ballot
         as submitted.

      Invalidated Comment D:
         Comment: The security measures discussed in Section 5 of the current ballot have ……
         Change: More technical discussion between 11f and 11i is required…
         Disposition: Same as B

      Invalidated Comment E:
         Comment: The technical approach outlined in section 5
         Change: …..

Disposition Same as B.

Invalidated Comment F:

Comment: Page 1, line 32 talks about "Conformant APs." What is a conformant AP?

Change: …

Disposition:

Invalidated Comment G

Comment: I like the descirtion….

Change: <Blank>

Disposition:

This is not a valid comment to support a "NO" vote. No Votes must be supported by valid technical comments. As the reviewer only provided the editorial comments, the vote must either be changed to "yes with comments" or be declared invalid.

Voters may change their vote from No to Yes with comment. IF only one comment that was submitted with a No vote was then determined invalidated, then their vote is then deemed invalid, and not given credit for voting on LB.

Wednesday, we will give a report on our progress, but the detail will not be described to the finest detail. A question was asked to see just how close the vote is, and the chair declined to state until we determined the outcome of our discussion on the invalidated comments.

Motion: I move to affirm the chairs choice of invalidating the afore mentioned Comment A - G.
Moved: Jon Rosdahl, 2nd: Richard Paine
Vote: Unanimous

Invalid Vote impacts:

The prior invalid comments were the small set of LB 32 Results:

YES: 134   NO: 42 Abstain: 46 Invalid: 5 not Voting: 68 Total Voters: 290

LB valid > 50%, Abstain level OK < 33%, ballot Passed with 76.134 %

Going forward: The group is to prepare a recirculation ballot. The recirculation ballot is sent and only comment on the changes to the new draft, or the comment resolution of the original ballot.

A Document number was requested from Harry W., who was in the room at the time, for the letter ballot comments doc.

A moment of celebration was had as applause was for the passing of LB33.

Doc Color Coding,

Pink/magenta rows: invalid comments

Orange voter name: Potentially non-responsive comment

Contact voter, give 2 working days to meet ballot requirements.

Must respond by 9:30 this week.

Yellow: Technical comments that are part of No Vote.

The formal number for comments Doc is 184.
The group then paused to review the submitted comments.
Just prior to break time, the chair presented a letter to send to the voters that had issues with their comments.
Review of letter was done, and then approved to send to those commenters marked in orange in the comment file.

Break 10:03 am.

Mtg Reconvened 10:31

A Get-Well Card was circulated to the group for Peter Ecclesine who was injured in a motorcycle accident a couple of weeks ago, and is still recovering from his injuries. The TGf group expresses their concern and extends their wish to his speedy recovery.

Started to proceed with comment Dispositions:

Comment 7:

     Discussion:

          Clarification of the NAS-Port information that is being suggested.

          Longer discussion included other possible comments that talk about similar issues, and then the discussion followed a discussion of the use of AIDs and the state of the Authentication that is being tracked. If doing this doesn't cause a problem, then why not accept and try to establish a convergent response?

     Resolution:

          It is believed that the commenter misunderstands the purpose of this particular RADIUS access request. The AID is only incidental in that it happens to be part of an event (a STA's reassociation) that triggers the need for the new AP to authenticate the old AP and establish a security association with that old AP. The reault of this access request may be cached by the new AP, so that subsequent reassociations from STA's arriving from the same OLD AP (And having different AIDs) need not generate a new RADIUS access request. Text has been added to this section to make this point clearer.

     Unanimous acceptance.

Comment 33 and 34:

     Discussion:

          Review the table in question to identify what should be in the ID col. Values of Elements ID are defined on Page 24, or rather the fact that the element IDs are defined in this recommended practice, so Table 3 started out with element ID 1 and then Table 6 is also has some element IDs that are the same, and some that are new. IDs were assigned as appropriately.

     Resolution:

          ID numbers have been assigned and entered in the table. Comment Accepted.

Comments 35, 36, 37:

     Discussion:

          Editorial comments of his NO vote do not have to be handled, but to provide a complete response to resolve the commenter NO vote, we will address these three Editorial comments by the editor. The chair suggested sending an Email notifying the commenter that we have accepted all the technical comments, and the editorial comments are to be handled by Editor.

Text for Comment 7 resolution was provided by Justin McCann, and added to the working draft.

The meeting seemed to be stalled while some editing was done online.

     Return to discussion of 36 and 37, the reference list .

AI: The correct Reference for comment 37 will be found by Robert W.

Comment # 320: Section 6.4:

     The comment required looking up the minutes from July 2001. The minutes from July

          "5. Vendor specific use of the context blob (row 451, 448, 452)
          Discussion: The context blob will contain information elements.
          Proposed resolution: Tim Moore proposed that 11F define one information element (IE) where the first three bytes (octets) of the information field are a vendor organizationally unique identifier (OUI). This information element can be ignored at will. No compliant implementations of this RP will depend on the use of this information element.
          Motion: to adopt the proposed resolution:
          o Moved: Tim Moore
          o Second: Victoria Poncini
          o Vote: 8 for, 1 against, 1 abstain"

Discussion continued that there is no way we can create the informational element as TGf is a Recommended Practice and is not a change/enhancement to the spec itself. This issues needs more thought, and thus will need to wait to continue discussion after lunch.
Break for lunch 12:00

Tuesday Afternoon Session Called to Order 1:17pm

Dave switches to file 'comments sorted by clause' and requests that we start at the top. (Dave still waiting for consultation with Stuart on items open at end of last session – to be discussed when answers are provided).

Comment 112
>	Discussion:
>>		Not a technical comment – should be reclassified but makes no difference to ballot count – not part of his no-vote. Comment will be reclassified as editorial and requested change is declined.

Comment 113
>	Discussion:
>>		This comment is declined. The target environment specified by the commenter is not the target environment for this recommended practice.

Comment 16
>	Discussion:
>>		This comment is considered by the TGf group to be a non-responsive comment. The broad undefined change requested is not specific enough to determine what would satisfy the commenter and so does not meet the requirement of being sufficiently detailed to support a technical 'no' vote.

Comment 30
>	Declared invalid – no comment / no change

Comment 41
>	Discussion:
>>		Comment accepted. References to 'registration service' are deleted.

Comment 140
>	Discussion:
>>		There are many different ways to implement an AP and this is one of them. The Document clearly states that the figure depicts an example of typical AP architecture with which the IAPP does operate. The draft does not need to describe every alternative to the architecture of an AP in order to describe how the IAPP operates. The comment is declined.

Comment 141
>	Discussion:
>>		Chair suggests that this is an invalid comment. This comment is considered by TGf group to be a non-responsive comment. No change is requested. Therefore the comment is not specific enough to determine what would satisfy the commenter and so does not meet the requirement of being sufficiently detailed to support a technical 'no' vote.

Comment 142
>	Discussion:
>>		Accepted. The draft currently explains how layer 2 topology updates are provided in clauses 4, 5, and 6.

Comment 160
>	Discussion:
>>		The Document clearly states that the figure depicts an example of typical AP architecture with which the IAPP does operate. The draft does not need to describe every alternative to the architecture of an AP in order to describe how the IAPP operates. The comment is declined.

Comment 161
>		Accepted. The draft currently explains how layer 2 topology updates are provided in clauses 4, 5, and 6.
>		Comment 188

Comment 188
>		Accept. TCP is added to the description in clause 1.3

Comment 214
>	Discussion:
>>		The comment is accepted. The security mechanism in the draft does provide the ability to confirm that all messages between APs are legitimate (sent by a registered and authenticated AP).

Comment 300

    Discussion:

        The comment is reclassified as editorial. Neither the comment, nor the requested change, alter the behaviour or function of the IAPP. The comment is further declined. The figure is meant to show an example AP architecture for the purpose of describing the operation of the IAPP and its relation to the other standard protocols used with the IAPP. The figure is not meant to be a definitive description of all APs.

Comment 321

    Discussion:

        The comment is reclassified as editorial. Neither the comment, nor the requested change, alters the behaviour or function of the IAPP. The comment is further declined. The figure is meant to show an example AP architecture for the purpose of describing the operation of the IAPP and its relation to the other standard protocols used with the IAPP. The figure is not meant to be a definitive description of all APs.

Comment 413

    Discussion:

        Copy of previous comment. The Document clearly states that the figure depicts an example of typical AP architecture with which the IAPP does operate. The draft does not need to describe every alternative to the architecture of an AP in order to describe how the IAPP operates. The comment is declined.

Comment 414

    Discussion:

        This comment is considered by the TGf group to be a non-responsive comment. The broad undefined change requested is not specific enough to determine what would satisfy the commenter and so does not meet the requirement of being sufficiently detailed to support a technical 'no' vote.

Comment 415

    Discussion:

        Accepted. The draft currently explains how layer 2 topology updates are provided in clauses 4, 5, and 6.

Comment 452

        Accepted. TCP/IP has been added to the description.

Comment 457

    Discussion:

        Accepted. The text implying that the registration is an explicit event has been deleted.

Because of determination for resolution for comment 456, comment 41 is being re-thought. Decision made to remove references to 'registration service' in document. Comment 41 now references this change (in the comments document as well as above).

Backtracking…….

Answers from Stuart for questions posed in Tuesday AM session:

1) Re T/E vs. Y/N - all comments marked by voter as part of No vote must be accepted to auto change vote from No to Yes – independent of E/T marking of the vote.
2) Re: July Element ID comment – TGf can not do, but TGf can bring proposal to Plenary for .11 to vote on. If .11 adopts, then some .11 MAC TG will get it done (tbd as to exactly which one, how and when)
3) Wed. TGf mtg will be in GRAND B – this is a room change.

Further discussion on decision for 2) - We have 2 approaches:

1. Context Block
   - .11 MAC elements
2. Context Block
   - Vendor spec
     o Vendor stuff
   - QOS Stuff
     o QoS GUNK
   - Security Stuff
     o Security Gunk

What are the pros and cons of the two above approaches – problem is that they both have the same name. Question is why reinvent what is already in .11.

Break for Afternoon Cookies: 2:51pm.

Meeting reconvened at 2:35
Meeting next door was too loud, and a messenger was sent to turn down the volume.

Discussion on the need for informational Element.
There was a comment that there are element type descriptions defined in RADIUS and in IEEE 802.11 pick one rather than identify a new set of values for the Ideas. It was pointed out that the elements that are needed are not defined in all cases in either place, and having a local decision point to assign the value is thought to be a good thing.

If we use the RADIUS type service, then we need to drop any and all packets that have any element that you don't know what to do with. RADIUS services require all packets to have all elements understood and abort otherwise.

A strawman proposal was presented as Table 9 that is a compilation of Table 3 and 6.
A check to identify that the RADIUS element were not already identified in the table 9 list.

…..missed comment.
We don't know what AAA elements will need until they state what they need. You don't know all of them, but you may know a good list of those you do know.

2 issues, Where is the text for the motion from July, and 2, where is the space that the id's come from.

Comment #320 Accepted, and added text (see Table 9).
Call for objection, none so unanimous.

Comment 162, 368, 372: Remove IPSEC from IAPP.
        Discussion: are the comments valid…. Yes
                Are we willing to remove IPSEC …. No
                IF we were to remove it, then we would need something to replace it with, but we would still have a home grown key management scheme, that is not provided as an option. Therefore, if no one has a better solution, then we must either sign up for more work to eval the options and provide replacement. No one seemed willing to provide the work. Who ever needs the security for the 3rd party handoff, should find IPSEC is sufficient.
……..Missed comment.
2 different issues here, IPSEC is at a layer below what we are doing, and that the comments are valid, but does it matter if an IAPP connection is hijacked? What is the threat that I am trying to prevent?
Beside session hijacking, we should be precluding spoofing and DOS attacks. The IAPP frame needs to be authenticated in a pair wise method. And the Threat model needs to be described.

Why bother in the first place?   If a Rogue AP is given a chance to have an STA attach and provide all the information of a STA. Then it captures information/state that it shouldn't.

I can take the state away from you, and keep you from working, and I don't even have to unencrypt any blocks etc. You have a theft of connection. Can this be done with a CMS object? Robert says yes he believes so. If you have a general purpose computer to act as the AP then you could do this, but then you are at risk for a TCP attack.

The comment requests removing the IPSEC, and there is no real option of replacement. We have a reason for using IPSEC, and thus we should be able to tell the reason. Note that excel spreadsheet has a limit on the size of the response, and so we should try to summarize what we have been talking about this.

Disposition for 162, 368, 372:

> We will add a threat model to the draft to explain the reasons for using IPsec. It is the opinion of the task group that the bilateral security association of IPsec is sufficient to secure the IAPP communications between APs, which is all that IAPP is attempting to accomplish. The commenter statement that IAPP involves a 3-Party handoff of authorization is not supported by the content of the draft. If some other standard is planning to make use of the facilities provided by IAPP to perform such a 3-party handoff, it is the responsibility of that other standard to ensure that the handoff is performed securely.

No objections to accepting: thus unanimous to accepting it.

Comment:189: This has been corrected, A definition of AAA was added to the definition list.

Comment 108: Define new term for Entity.
Discussion: There seemed to be an issue of how the commenter came to have an issue.

Disposition: The term is defined in the sentence cited by the commenter. The IAPP entity is that which provides services to an AP through the IAPP SAP. No Change required to satisfy this comment.
No objection, Unanimous approval.

Comment 212: Need to define details of Context Block….
Discussion:

> It is the job of the other groups to describe their need and use of the context block, it has been described in previous meetings several times. The context block should be passed into the IAPP service, and then it is passed on and transported to the other side, and IAPP is not concerned with the internal details of the context block. A question of an example of IAPP usage in regards to Context Block. The IAPP doesn't look at the Context Block, it doesn't care what is in it, and doesn't know about it other than it is a bucket of data.

Disposition:

> The context block is defined precisely in clause 6.4. The draft clearly states which standards information is contained in a context block. IT is those standards that specify the use of the context block in IAPP. To date, no standard has yet made such a specification. Comment is Declined.

No Objection, Unanimous approval.

Comment 322: Timing Constraints
> Discussion: They are defined where needed, but are not where not.

> Disposition:
>> Timing constraints are described where they are felt to be required. Where they are not described, it is felt that timing constraints are not required. Comment declined.
> No objection, Unanimous.

Comment 85:
> Discussion: Until the 802.11 chair obtains such port numbers, the number will be a TBD
> Disposition: Comment Accepted, port definitions were split.
> No objection, Unanimous.

Comment 163, 210 and 373:
> Discussion:
>> Unsure what NB stands for in comment. The issue of what secrets are defined where. Are the use of the secrets are described in clause 5, and thus a reference is added. If you are not using all 5 aspects of the word protecting, then you should not call it protecting. Strictly speaking. So if we

change the words protecting to "providing confidentiality and integrity and authentication". The concern was that the word protecting implies more than we are using it for in this context.
The shared Secret is used to provide confidentiality of hidden attributes, and integrity and authentication for the communication between the RADIUS server and the AP.
The BSSID Secret is used to provide confidentiality of hidden attributes, and integrity and authentication for the communication between the RADIUS server and the AP.

Disposition: Accepted, text was added as described in the discussion.
No objection, Unanimous.

Comment 190:

Disposition, Accepted the port will be standardized when the Chair gets it for us.

Comment 211, 374: Naming schemes of Keys.

Discussion:

Both secrets are bound. The shared secret is bound to the IP address. The BSSID secret is bound to the BSSID. The key usage is compatible with this naming scheme. The option offered by the commenter to ignore the comment is accepted.

No objection, Unanimous.

Comment 246, 336:

Discuss:

If there can be more one BSSID per RADIUS client, and 2) can there be an entity in the RADIUS Server that needs this Secret to be unique.

Disposition:

It is possible that there may be more than one BSSID supported by a single RADIUS client. This would require different secrets for each BSSID. Comment declined.

Comment 375,447:

Discussion:

The idea is to have the AP get given an ESSID to ensure that it joins the correct DS. The RADIUS server will be giving the correct DS. How does the AP register to the DS? This is a manual process done at set-up, and is part of the process to get an ESS started.
The RADIUS server is necessary as a part of the network to make the IAPP work, but it is not a component of the DS. The addition of 802.1X, we implicitly indicate the DS that is being used.
The ESSID is specified in the 802.11 MIB. The DS is specified there. IT is not specified in the IAPP, and is not specified by the RADIUS server, but the RADIUS server does limit the APs joining to the DS, or rather is limiting the ones that are authenticated to the ESS. The way the AP specifies the DS that this AP is a part of is specified in the MIB, and doesn't need to be in the RADIUS request.
How does the ESS ID get into the AP? How is the information provided to IAPP about the ESS ID? Does the RADIUS server need to know? Some say yes, the VLAN gets the request to allow some AP to join the specified ESS ID. If you have two AP's in the same box, …wait, lets not get into strange configurations, and lets try to focus on the straight forward choices. More discussion on possible places and contexts that we may need to have the ESS ID for.

Disposition:

The ESS that the AP joins is defined in the 802.11 MIB. There has not been a requirement identified for the IAPP to use this information. Comment declined.
No objection, Unanimous.

Comment 413:

Disposition:

A description of what might happen in an AP if the IAPP is already running when an "IAPP-Initiate.request is received is entirely dependent on individual implements and thus not part of the recommended practice. Comment Declined.

No objection, Unanimous.

Comment 164, 183, 376

Discussion:

It not the intention of 802.11f to document on proper coding of internal security models.

Disposition:

It is not eh intention of TGf to instruct implementers on the proper coding of internally coded modules Comment Declined.

No objection, Unanimous.

As we were at 5:25, so we decided to break until 7:00 pm

Meeting convened by Bob O at 7:05pm as Dave was detained by Room Service delays

Comment 184, 377: IAPP-Initiate.request

    Discussion:

        DS is not just the wired backbone. The DS may be connected by a wireless link, but it is just the communication system that exists between the APs. Question on Concept of the DS. If the DS is only one AP, then what does the IAPP initiate request need to do in that case? Does the AP know that it is the only one in the DS? Does it care? The DS is not valid prior to having the first AP connect to the DS. For some access points, the DS is a wireless interface, but that is immaterial to the creation of the DS. Is it possible for a single interface to act as a STA and a AP. An AP is a layer 2 device with at least 1 interface. Is there a way to say There is a live DS? There is always a DS, but the commenter is asking to ensure that there is another device on the DS prior to having the request operate. It may be impossible to prove that there is another device, and this is due to the problem of

    Disposition:

        By definition of an AP in 802.11-1999, that an AP is a device that provides distribution system services, there is always a DS present when an AP is present. IT is unreasonable to ask that the AP verify that there must be some other device present in the DS, when there are perfectly valid ESSs that comprises a single AP. The comment and its requested change are declined.

    No objection, Unanimous consent.

Comment 313:

    Disposition:

        It is impossible to determine what comment the commenter intends, as he did not follow the ballot instructions.

    No objection, Unanimous.

Comment 114: MAC address usage

    Discussion:

        The usage of the MAC address may be used differently is the comment. We need to identify the uses and ensure that the usage is consistent. A search for MAC addresses was done to ensure that we knew what the usages are. The only place that the DSM IP address is used is in 4.10.2, and in all other places, we do make a distinction. In 4.11

    Disposition:

        The intended usage of AP Address as the SDM IP address is correct in this clause and will be changed to be identical in4.11. this makes the usage of this term consistent in the draft. The usage of the DSM IP address selected because it is a higher layer address for the AP and is what is required to be provided to the lower layers (TCP/IP or UDP/IP) for correct addressing. In this primitive, the IP address is obtained from the incoming Move-Notify packet sent by the AP at which the STA has reassociated. Comment Accepted.

    No objection, Unanimous.

Comment 165, :

    Disposition:

        TGf is not responsible for protecting the context of the Context Block, other than to ensure it confidentiality, integrity, and authenticity when it is exchanged between APs and using the IAPP. If some further protection of the content of this Context Block is required by some other standard that uses it to transport information between APs, that additional protection must be provided in the coding of the Context Block content, itself.

    No objection, Unanimous.

Comment 247:

    Discussion:

        After looking at the text, the sentence requested seemed to be the same as what was there, but we could make it clearer by making a minor change to the sentence. Add "obtained from the IP header" of to the sentence. We believe that the sentence is correct as is, but look at modifying was explored.

    Disposition:

        We believe that the draft text already states what the commenter requests. The commenter is solicited to provide additional information. Comment Accepted. No Change made.

    No objection, Unanimous.

Comment 248:

    Discussion:

        If you have two IDs, then you will have two security authentications.   There was not an agreement. What is the limit on IP addresses to the AP? If you have multiple IPs in an AP, then it is the implementers responsibility to keep them straight. Is the security association between the DSM addresses or between the BSS IDs. If the AP has one IP address per DSM, then we seem to be ok, but what if we have more? This is not a standard example, and thus would be the job of the implementer to do the multiplexing and worry about keeping this straight. More esoteric examples of complex devices that could be built without regard to standards was then discussed. The security association is between bound to the DSM (IP) address not any other address.

        If you have two different IP addresses, then you would have two IP segments, and because the AP has only one DSM interface as a logical entity, then if I do have an extra IP in the physical box, then I have to deal with the extra complexity. If we send the BSSID of the new AP to the Old AP, then the Security Authentication would be set-up and usable. With out the New AP BSSID, then we would not be able to set-up the bi-directional link.   It was agreed to add a new BSSID to the IAPP-MOVE.indication. and IAPP-MOVE.Confirm. There was a concern of the use of AP in the sentences that were being added. If an AP Physical device has multiple BSSIDs then the usage of the AP seemed make this ambiguous. But because we are looking at the standard simple model of one WM and one DSM address per AP, and then it is the logical thing in the big thing.

    Disposition:

        Accepted:

    No objection, Unanimous.

Comment 378 :

    Disposition:

        TGf is not responsible for protecting the context of the Context Block, other than to ensure it confidentiality, integrity, and authenticity when it is exchanged between APs and using the IAPP. If some further protection of the content of this Context Block is required by some other standard (i.e. 802.11i) that uses it to transport information between APs, that additional protection must be provided in the coding of the Context Block content, itself.

    No objection, Unanimous.

Comment 379:

    Disposition:

        The RADIUS server will not grant access-accept to another AP from a different ESS, thus preventing the establishment of a SA over which the information can be exchanged.

    No objection, Unanimous.

Comment 380:

    Discussion:

        Only the context block is secure, but then you can not gain access to the context block in the IAPP. So if the security is optional, can you see into this block? If the network is trusted enough to leave in the open, then it is not

    Disposition:

        The IAPP packets are secured by the IAPP security model. The Content of the packet can then be trusted. If the security model is not implemented, then the underlying physical network must be trusted enough that the attacks addressed by the security model are not present. Therefore, the content of the packets can, again, be trusted. The purpose of the sequence number is to associate notify and response packets. It is believed the sequence number is adequate to this task.

        Comment not accepted.

    No objection, Unanimous.

Comment 42:

    Discussion:

        Missed some comments, but we did look to add the word primitive to clarify

    Disposition:

        The commenter is confused between the use of service primitives, which are used in 4.10.4 and the packets and frames that may be generated by the invocation of those service primitives. The text in 4.10.4 is correct. However, the work "primitive" is inserted to clarify the meaning of the sentence. Comment not accepted

    No objection, Unanimous.

Comment: 249
        Discussion:
                What would the reasons be for sending the Deny message. No matter the action, the old AP needs
                to determine what the response should be. If the only two values allowed is Successful or
                Stale_move. So now that we need have identified a reason, what is the codes that should be
                added. Deny may be a better to a FAILURE code. Would it be better to have both types? We
                discussed more scenarios to why there would be more codes needed. We looked at some other
                choices for status codes. MOVE_DENIED should be used to indicate that the AP receiving the
                IAPP-MOVE.indication either is not able to verify a previous association by the indicated station or
                has some other reason to deny the reassociation at the AP that sent the IAPP_Move-notify packet.

        Disposition:
                Resolved by adding the above text.
        No objection, Unanimous.

Comment 166, 381:
        Disposition:
                Invalid comment.
        No objection, Unanimous.

Comment 43, 86, 285:
        Discussion:
                See change in 4.11.2

        Disposition:
                Accepted.
        No objection, Unanimous.

Discussion to add Response code from 4.11.2 and add to 4.9.2 also to make the draft whole again.
        No objection, Unanimous.

Comment 302: 4.2.2
        Disposition: Accepted: see updated text in 4.2.2.
        No objection, Unanimous.

Comment 115: 4.2.4
        Disposition: Accepted See updated text in 4.2.4.
        No objection, Unanimous.

Comment 116: 4.3.3
        Disposition: Accepted. See updated text in 4.3.3. Commenter is commended for providing text as requested.
        No objection, Unanimous.

Comment 303: 4.3.3
        Discussion:
                It may be that 115 or 116 comments resolve this better than the other 302 comments.
        Disposition:
                A description of the……see comment 302.
        No objection, Unanimous.

Comment 416: 4.3.4
        Disposition: Invalid comment.
        No objection, Unanimous.

Time to think about our next step. We have a paper from IETF that we could have presented. We then had a
discussion on whether the paper was agreed on the agenda. It was not pointed out that a paper was to be presented
at the time the Agenda was voted on.
We have time from 8 am to the start of Social on Wed. other than when we are at the Plenary.

Comment 258: 4.4.2
        Discussion:
                There may have been a set of status return codes, and that the status for request and confirm
                should be the same. We had previously determined that that if you tell the IAPP to terminate, that
                you have only successful as a possible response. If different status code is returned, what would it
                be and why would it be indicating. If the IAPP has no visibility into the other layers, then there is
                nothing that would prevent the IAPP from closing down and returning a successful status.

Disposition:

The IAPP has no visibility into the parts of the AP that manage the actions that are recommend to take place prior to invocation of the TERMINATE.request. Thus, it has no basis on which to return any status other than SUCCESSFUL. Comment Declined.

No objection, Unanimous.

Comment: 288, 417:

Disposition:

Comment Declined. The primitive does do something useful, it indicates that the operation of the IAPP has successfully terminated.

No objection, Unanimous.

Comment 259: 4.4.4

Disposition:

It is not the purpose of the recommended practise to identify every possible action that may occur when the practice is not implemented as recommended. Comment Declined.

No objection, Unanimous.

Comment 167, 289, 382: 4.5

Discussion:

Why do we have to tell another access point that a STA has associated? The commenter is the one posing the question. The first purpose is to cause the forwarding table to update. The update process will occur anyway when the Station eventually sends a packet later. This is a means to update faster the forwarding tables. The 2nd purpose is to account for the STA's that haven't implemented the ReAssociation as specified. Or a Restarted system that needs a cleanup on the old APs. Text added to 4.5.1 "to allow those APs to clean up behind the stations that do not properly reassociate when moving from one AP to another:" Also another sentence was added "This updates the layer 2 internetworking devices before a transmission from the associating station, which might occur some arbitrary time after the association."

Disposition: Comment Declined. Text clarifying the rationale for this function has been added to the draft.

No objection, Unanimous.

Mtg recessed 9:29 pm.

Meeting Reconvened 8:07 am Wednesday.

Comments 314,191, 260, 323, 324: Sequence numbers

Discussion:

We have talked about the Sequence numbers and we have what we have. Use the disposition for all comments that it applies to.

Disposition:

Resolved – Please see Nov. 2001 TGf minutes for motions that resolved Sequence number comments. This has been reconsidered at several meetings and in resolution to many similar comments. Comment declined. (In some cases we point out that this is a recommended practice not a normative standard)

No objection, Unanimous.

Comment 44:4.5.3

Discussion:

He is correct that the clause 10 of 802.11 does describe the MAC interface as he does, but it is wrong. The text clearly says that the MLME interface with the MAC at that level, and there is nothing permitted in that interface that would allow the external management interface to allow the indication has occurred or is in process. The MAC MLME diagram/description in clause 10 doesn't match the text in the MAC description. The interface for these things to happen haven't been included or corrected. The internal interface is the point of discrepancy, and thus is not an interoperability issue and thus can be left as an implementation detail. There is no way to know when the Associate Request frame originally arrives, only after the processing of the event is over.

Disposition:

There is no interface that will allow the information cited by the commenter, the reception of an Associate Request frame, to be accessed. The MLME interface description in the 802.11-1999 is wrong in how it describes the interaction between the MLME and the external SME with respect to the association and reassociation. The text of the standard describes the opportunity for the SME to decide whether to accept an association and provide status and reason codes to be used to indicate acceptance and rejection of associations. The MLME interface does not provide the

proper indications and responses to implement what is described in the text of the standard. A Formal request has been made from TGf to 802.11 working group to correct the description of the MLME SAP to match the behaviour described in the text. This will result in the MLME SAP matching what is required of it by TGf.
No objection, Unanimous.

Now that we have this disposition, we need to have a motion to actually send the request.
Motion:
> Moved to formally request IEEE P802.11 to correct the description of the MLME SAP with regard to association and reassociation so that it matches the behaviour as described with the text of the standard.
> Move: Bob O, 2nd Jon R.   Vote: No objection, Unanimous.

Comment 117:4.5.3
> Discussion change to local AP
> Disposition:
>> Text has been modified to indicate that the action is taken only when the indication is produced by the local AP. Comment Accepted.
> No objection, Unanimous.

Comment 118:4.5.4
> Discussion:
>> An Ethernet link doesn't have a forwarding table. We think that his complaint is that it says "any Layer 2" devices is the contention point. It is really absurd, as there is not forwarding tables in Ethernet nics. So it is a real nit, and the removal of "any", or rather place any in front forwarding tables, then we change the word the also. The word bridges was exchange for layer 2 devices also.
> Disposition:
>> Comment Accepted. Text modified.

Comment 261: 4.5.4
> Discussion:
>> This is similar to what is happening for all layer 2 traffic that is sent on an non guaranteed media. The cache is learning process, and the missed packet will have others that will come along after the dropped case. There is only one letter difference in networking and notworking. If his comment is to the mechanism, then the update cannot be guaranteed. The point to point frame will propagate through the tree until the point that allows me to drop down to the dest. However, the broadcast frame should have more penetration to the spanning tree. Simple case, one downlink port, and one uplink port, as soon as the station gets the packet, the packet will update the table when the device attempts to contact a device off the switch. A better description of the switch case is then discussed. An example with 3 switches was then explained. The point at which the broadcast frame is sent and received, the tables are for certain updated.
> Disposition:
>> Comment Declined. If a layer 2 update frame is lost, the same result will be obtained when the STA for which the update frame was sent begins its own transmissions, sends a broadcast frame, or ARP caches and forwarding table entries time out. TGf does not believe that the Layer 2 Update frame mechanism needs to be made more reliable than currently described.
> No objection, Unanimous.

Comment 168: 4.6
> Discussion:
>> Why do you need the Add confirm if you don't need the Add notify. Review what we did for a similar comment earlier. Some folks come from a different perspective, and are expecting a different style of standard, and if they are not reading the doc carefully miss the point.
> Disposition:
>> No, this function cannot be a part of the AS. IT is a necessary part of the IAPP to confirm that the actions of the IAPP add has occurred.
> No objection, Unanimous.

Comment 383: 4.6
> Disposition: resolved with similar comment from comment 168.
> No objection, Unanimous.

Comment 119: 4.6
    Discussion:
        Reviewed the text, and determined that the comment is valid. Text modified to reflect the needed
        change. Effect of receipt changed to describe both failure and successful status values.
    Disposition:
        Comment Accepted in part. Text has been clarified as to the behaviour when the status is
        FAILURE and TIMEOUT. No recommendation is made to how to handle the STA's association
        when the status is not SUCCESSFUL.
    No objection, Unanimous.

Comment 46:
    Discussion:
        The MLME response is needed to make the SAP for association complete, but it is not there now.
        We have the indication when it is done, but there isn't a handshake across the interface yet, and is
        the part that needs to be fixed by the 802.11 WG. If we get some status other than a
        SUCCESSFUL, could we send the STA a packet to indicate the failure mode? No, it is only part of
        the services, and there should be an Add response. If the Add notify packet is sent, the old AP
        may say it has a more recent request, and then instead of a response sequence, it sends its own
        Add notify sequence. The right thing to do if the MLME interface was correct. Is the status would
        be indicated in the process. If on a Timeout, a retransmit should be done, and on the fail it should
        try some other reaction. When the Status -=FAIL, the STA's association should be denied or the
        STA disassociated. Leaving the timeout out, we haven't determined the proper action in that case.
        If we say that the TIMEOUT case causes the retry, and the FAIL causes the rejection of the
        Association. Timeout should be allowed a second chance, and a FAIL should be sufficient to reject
        the association. Should a TIMEOUT happen multiple times, then we should treat the status as a
        failure.
    Disposition:
        Comment accepted in part. The text has been clarified as to the behaviour when the ….see doc
        184 for full text.
    No objection, Unanimous.

Comment 169, 384: 4.7 ADD.notify
    Discussion:
        This is generated by the add packet.
    Disposition:
        No it is a necessary part of the IAPP to act on the receipt of the ADD-notify packet. See figure 2.
        Comment Declined.
    No objection, Unanimous.

Comment 315:
    Disposition: "Above" is meaningless. This comment is not conformant with the balloting instructions.
    No objection, Unanimous.

Comment 119: 4.7.2
    Discussion:
        Text added to end of sentence. "as received by the local IAPP entity in the ADD-notify packet."
    Disposition:
        Comment Accepted. Text modified.
    No objection, Unanimous.

Comment 305: 4.7.2
    Discussion:
        The packet has the source address already there,.
    Disposition:
        Address declined. The address of the sender is in the source IP address field. The sender can
        determine if it receives its own broadcast from that address.
    No objection, Unanimous.

Comment response just received by E-Mail from Dave Richkas, he had only 2 comments.
"In order to resolve these comments, I recommend that the specific change to the draft is the deletion of the
subclause 4.6 for the first comment; and the deletion of the sub clause 4.7 for the second comment. There is a
choice that TGf has to make: abandon the design goal of enforcing at most one association per station, or else define
an algorithm that can span multiple subnets within the same ESS. The Algorithm specified does not accomplish.
How you do this is up to you."

The question is whether the comment is valid or not. The decision was that they are now valid comments.
Comment 290 is now valid, and the resolution is the same as 383 because Dave R. cut and pasted from there.
Comment 291 is now valid, and the resolution is the same as 384 because Dave R. cut and pasted from there.

A discussion continued on various topics, but no real sense of communication taking place with the group.
10 minutes till time for break. Try to do 3 more comments in 4.7.4.
discussion continued on the needs for the IAPP-ADD on the same sub-net, but there are issues if there are multiple sub-nets, and we need to not be a panacea for all. We are not looking to make everything perfect, and as such we are looking to make things as good as possible, and then let it go at that.

Recess and will start after lunch at 1 o'clock on comment 47.
Recessed at 9:56 am.

Meeting Convened at 1:23 pm Wednesday

LB Vote Status Update:
     AS of LB Close (w./Chair rulings ratified by TGf);
          Yes: 134, no: 42, abstain: 46, invalid: 5
          Invalid Votes: (No -> Invalid)
     Invalidated votes reversed due to further examination of Editorial vs Tech to support No votes rules:
          Bard (#10, 11)
               #10 valid open comment
               #11 invalid comment (no change requested)
          Somayazulu (#318, 319)
               #318 invalid comment (no issue, no change requested)
               #319 Valid open comment
Ballot result Then:
     YES: 134, no: 44, abstain: 46
     Passes 75.3%

Motion to restore the votes as stated:
No Objection, Unanimous

          Votes Changed from No-> Yes due to LB comment resolution
               Stanely (#320)
               Chickinsky (#33-37)
               Kitchen (#210-211)
               Wiliams (#447)
           Ballot then:
               Yes: 138, No: 40, abstain: 46
               Passes 77.5%

Comment #319:
     Disposition:
          Comment accepted, The word "conformant" deleted.
     No objection, Unanimous
     This is the last comment for Somayazulu, and thus his vote will be added to the No-> yes list.

Comment #10, 434:
     Discussion:
          We do not believe that we will be able to satisfy his comment. Doing ether of the suggested actions are not the correct thing to do.
     Disposition:
          Comment Declined, there is no time at which the INITIATE.confirm primitive would issue the PENDING status which the commenter requests. The INITIATE.confirm is issued by the IAPP only when the operation associated with the invocation of the corresponding INITIIATE.request has completed. It can be thought of as an asynchronous "up-call" from the IAPP.
     No objection, Unanimous

Comment #435, 11:
          Changes to the Disposition of these comments is required to accommodate the fact that we didn't need to editorialise the disposition. The comments are invalid as they do not suggest plan to resolve.
     Disposition:
          Comment is invalid This is not a valid comment to support a "NO" vote. No votes must be supported by valid technical comments.
     No objection, Unanimous

Comment # 47: 4.7.4
>Discussion:
>>In the PDF line 10-11, the objection. 4.5.1, the ADD request states that it does something different from what the commenter is stating. If we delete the last line, and allow the definition of what the ADD does. It is defined in 4.5.1
>Disposition:
>>Comment Accepted. The descriptive text for the IAPP-ADD.request has been removed.
>No objection, Unanimous

Comment 120: 4.7.4
>Discussion:
>>The need for the paragraph in question was discussed. The need to have it was pointed out. It was there to advise those who have problems with existing implementations. Decided that the benefits for having the paragraph were greater than not having it.
>Disposition: Comment accepted. Text Modified as suggested.

Comment 262: 4.7.4
>Disposition:
>>Comment declined. The task group feels that a warning to implementaters of 802.11 STAs is important, in the light of certain broken implementation that reset the sequence number improperly. This warning was included due to resolution of previous letter ballot comments.
>No objection, Unanimous

Comment 48: 4.7.4
>Discussion:
>>A restatement of the comment was made, and a few interpretations given. Look for place that the Add Modify does not add attach scenarios to the Recommended Practice. We may want to add protection to the Add.nodtfy, and a paper to that effect will be presented later. A Global key is needed to ….The ADD.notify does not provide anymore risk than any other item. Subclause 5.5 is the location. See the last paragraph of subclause. Therefore the response to his comment on lack of security of ADD.notify, the work group needs to determine if the statement in 5.5 is sufficient.   A Global Key would be necessary to protect all the ADD.notify messages. Wrapping the ADD.notify in an ESP format and then using the current key or previous key to get the Global key that would wrap the Add.Notify. This would protect the exchange and prevent an attack . It may be worth protecting the exchange. If we skip the Security of the ADD.notify comments until the paper is ready tomorrow.

Comment 316:
>Disposition:
>>Comment declined.
>No objection, Unanimous

Comment 97, 385:
>Disposition:
>>Comment Accepted. No changes were requested.
>No objection, Unanimous

Comment 170: 4.8.1
>Discussion:
>>Explanation of how authentication is done was given. What are the possible states that need protection? Side conversation about security and whether the 802.11 Authentication process is valid or not. The secretary was requested to note that he seemed cranky.
>Disposition:
>>Comment declined. The IAPP is not involved in STA authentication. In the current architecture of 802.11-1999, authentication must occur before association. The IAPP works in this architecture. If authentication occurs later in some other architecture, an implementation can delay invocation of this service primitive.
>No objection, Unanimous

Comment 171:
>Disposition:
>>We have no solution for TGI getting their act together either. Therefore, we are not waiting for them. Comment accepted. No Change was required.
>No objection, Unanimous

Comment 98, 386: 4.8.2
      Discussion:
            The comment was restated, and then we looked at the point that RADIUS must track the APs. The SSID is not required in the external packet. See 5.3.1 paragraph to see definitions that are there. We have specified the Called-Station-ID already, and that along with the items in the table should be sufficient. The Username is the Old BSSID, and the Called-Station-ID is the New BSSID. The question is how to get the RADIUS server know the old one to compare to it. A new RADIUS Server attribute will need to be used to hold the SSID.   Look at 5.3.3 (page 20 line 3). The RADIUS Server will validate the old BSSID is a valid member of the ESS.
      Disposition:
            The IP address of the destination AP is obtained from the RADIUS server and is therefore registered with the same ESS. The RADIUS server makes this check. See 5.3.3. There is no need to include the SSID in the Packet itself. Comment Accepted. No change requested.
      No objection, Unanimous

Comment 103:
      Discussion:
            Line 37 page 12, relook at the paragraph in question. The context tells where the MAC address is obtained from. Where the MAC address is obtained is clearly specified.
      Disposition:
            Comment Accepted. The precise value of the "MAC address of the AP" is defined in the sentence following the one cited by the commenter. It is the value obtained from the current AP address field of the Reassociate.Request frame sent by the reassociating STA.
      No objection, Unanimous

Comment 192: 4.8.2
      Disposition:
            Comment accepted. No change requested. The answer to the question is "YES". The Context block is provided as a general means to transport information of any sort between APs when a STA reassociates.
      No objection, Unanimous

Dave had some E-Mailed responses that need to be rolled into the response doc. Bob to give Dave the file to roll the changes in and will pick up after the break.
Recessed 2:51.

Meeting reconvened at 3:30pm Wednesday

New Rev. 6 of ballot comment file is out in TGf folder. However, it is sorted incorrectly and rather than having everyone try to do it themselves, Dave sorted correctly and put a Rev. 6a out in the folder.

Dave received an e-mail during the break where someone changed their No vote with comments to a Yes vote with comments.

Comment 386:
      Disposition:
            The IP address of the destination AP is obtained from the RADIUS server and is therefore registered with the same ESS. The RADIUS server makes this check. See 5.3.3. There is no need to include the SSID in the Packet itself. Comment Accepted. No change requested.

Comment 387:
      Disposition:
            TGf is not responsible for protecting the context of the Context Block, other than to ensure it confidentiality, integrity, and authenticity when it is exchanged between APs and using the IAPP. If some further protection of the content of this Context Block is required by some other standard that uses it to transport information between APs, that additional protection must be provided in the coding of the Context Block content, itself.
            No objection, Unanimous

Comment 49: 4.8.3
      Disposition:
            There is no interface that will allow the information cited by the commenter, the reception of an Associate Request frame, to be accessed. The MLME interface description in the 802.11-1999 is wrong in how it describes the interaction between the MLME and the external SME with respect to

the association and reassociation. The text of the standard describes the opportunity for the SME to decide whether to accept an association and provide status and reason codes to be used to indicate acceptance and rejection of associations. The MLME interface does not provide the proper indications and responses to implement what is described in the text of the standard. A Formal request has been made from TGf to 802.11 working group to correct the description of the MLME SAP to match the behaviour described in the text. This will result in the MLME SAP matching what is required of it by TGf.
No objection, Unanimous.

Comment 121: 4.8.3
    Disposition:
        Comment accepted
        No objection, Unanimous

Comment 104: 4.8.4
    Disposition:
        Comment accepted. Text clarified.
        No objection, Unanimous

Comment 172: 4.8.4
    Discussion:
        This is saying 'here's a description of the interface that makes the protocol work". It's an abstract service interface. Not a protocol, but a definition.
    Disposition:
        Comment declined. This is an abstract interface description. As such, operations occur in zero time and have no opportunity to fail. If the description says that something will happen as a result of the invocation of a service primitive, that something will happen.
        No objection, Unanimous

Comment 250: 4.8.4
    Discussion:
        Comment to move the layer 2 update to 4.9.4 accepted. But more detail may have to be spent on this in 4.9.4.
    Disposition:
        Comment accepted.
        No objection, Unanimous

Comment 306: 4.8.4
    Disposition:
        Comment declined. There is no requirement that every AP on a subnet needs to know the location of every mobile STA in the ESS.
        No objection, Unanimous

Comment 325: 4.8.4
    Disposition:
        Comment accepted. The issuance of the Layer 2 Update frame has been moved to occur after the MOVE.response packet is received with Status=SUCCESSUL.
        No objection, Unanimous

Comment 388: 4.8.4
    Discussion:
        We could put in a 'not operating' status code into the text.
    Disposition:
        Comment accepted. A NOT_OPERATING status value has been added to the IAPP.MOVE.confirm primitive, with appropriate description.
        No objection, Unanimous

Comment 317:
    Disposition:
         "Above" is meaningless. This comment is not conformant with the balloting instructions.
        No objection, Unanimous.

Justin McCann has put a file out on TGf with some proposed comment resolutions for 5.3. Dave recommends jumping ahead to get these done.

Comment 231
    Disposition:

Comment declined. Existing RADIUS servers will require a plug-in to support IAPP security block functionality.
No objection, Unanimous

Comment 232:
    Disposition:
        Comment is declined. This is a RADIUS specific set-up issue, and not an issue with IAPP per se, and therefore is outside of the scope of TGf.
        No objection, Unanimous

Comment 233:
    Disposition:
        Comment accepted. But the suggested change is denied. The New AP and old AP can store the old/new BSSID IP Address and security association(s), obviating the need for RADIUS requests for every roam requests. Text to that effect has been added. TGf is providing context transfer, not fast handoff services.
        No objection, Unanimous

Comment 346:
    Disposition
        Comment declined. TGf is making a recommended practice. An RP has little value if it recommends multiple practices.
        No objection, Unanimous

Comment 59:
    Discussion:
        Some discussion on what the text should read in order to clarify the proposed comment/change.
    Disposition:
        Comment accepted. (Need to clarify text)

Dave proposed adjourning for the evening and we will pick up on Thursday AM and discuss the text needed to clarify Comment 59.

Meeting adjourned at 5:00pm

Meeting reconvened at 8:13 am Thursday.

Dave placed r8 of the comment file out on the temp folder for us to use.

Motion re Invalid Votes:
        Move: TGf requests that the 802.11 Chair grant a one time dispensation to the voters who provided only invalid comments for LB32. The invalidation of these comments has the effect of invalidating the entire vote. TGf thinks that while the votes were invalid under 802 rules, the individuals did respond to the LB and should be given credit for having voted in LB32.
No mover For the motion.

A T-Shirt was provided by TGf Chair to the 802.11 exec to wear to the Closing Plenary that says "Never underestimate the stupidity of people in large groups."

Comment 59 text was not available at this time. Move on to next comment.

Comment 144 was looked at but because the commenter requested that the comment be later in the day was deferred.

Comment 329:
    Discussion:
        We reviewed the comment and looked at the targeted text. The answer is the implementers option. Justin had some proposed text changes. The word optional was replaced with "at the new AP's discretion" and some text to the end of the paragraph. Another change was looked at moving the Must establish for the A part and a May establish for the B part.
    Disposition
        Comment Accepted Text has been added to address the comment.
        No objection, Unanimous

Comment 1: 5.3.2
    Discussion:

Just has some recommended text for the comment disposition. Some comments were made that the suggested action is needed but for other reasons. The need to have the OLD AP info is needed for other reasons.

Justin's proposed disposition: "Comment and suggested change are denied. This is not necessary, since the New AP will be able to decrypt message from the Old AP only if (1) the RADIUS server determines that the New AP is a valid member of the Old AP's ESS (protected by the New AP is a valid member of the Old AP's ESS (protected by the New AP's RADIUS shared secret and also the New AP's User-Password), and also (2) the Radius Server returns an New-BSSID-Security-Block encrypted in a form which the New AP can understand (i.e. encrypted with the New AP's User-password, which must be configured into the New AP.

Robert had a 4.10.2 comment resolution (248), that had triggered a thought that the BSSID and IP are needed.

Disposition:
Comment Accepted: BSSID and AP IP address were added as a result of processing 248.
No objection, Unanimous

Comment 50: 4.9.2
Discussion:
Typically the move.confirm is not sent until the new AP receives an Access reject or an Access accept. Then a Move notify goes to the old AP and a move notify comes back and the move confirm would need the status as requested. In 4.9.2, FAIL was added as a possible value for the status field. Fail indicates that a RADIUS Access-Reject was received in response to the RADIUS Access-Request sent to the RADIUS server to look up the IP address of the Old AP.
Disposition:
Comment Accepted. Text modified as suggested.
No objection, Unanimous

Comment 307: 4.9.2
Disposition:
Comment declined. On page 48 of 8802-11-1999 in clause 7.l2.3.6 the content of the Reassociation Request frame is described. The third item in Table 9 is "Current AP Address".
No objection, Unanimous

Comment 51: 4.9.4
Discussion:
Given the way that the MLME is described, the reassociation indication is an indication from the MAC management entity that the reassociation has been done. There is no way to intervene in the middle. The comment for the Association #49 is also applicable here.
Disposition:
See Disposition for #49.
No objection, Unanimous

Comment 52: 4.9.4
Discussion:
We don't have the interface to do what is requested see #49.
Disposition:
See Disposition for #49.
No objection, Unanimous

Comment 87: 4.9.2
Discussion:
A review of the current reason codes was done. We would need TGe to add the reason code for us as we are a RP not an Addendum.

Proposed Disposition:
Comment Accepted. A Reason Code will be added with the meaning "Old AP did not verify previous association." TGf will ask the 802.11 working group to add this the the 802.11 standard.

Motion:
TGf requests the WG to add a reason code with the meaning of "Old AP did not verify previous association" be added to the 802.11 standard. (see 7.3.1.7: Table 18-Reason codes.)
Moved: Jon Rosdahl

Discussion continues:
The motion was not 2nd and a conversation for the reason for requesting a new code and the ramifications of getting a new reason code. There would need a new addendum to get the reason

code. There is no PAR to actually do this, and there is no way to ensure when it would be added to the standard, or by which group.

Text to be added to 4.9.4 was added to the end of the paragraph " with a Reason Code of 1, meaning "Unspecified Reason". Future revisions of the IEEE Std. 802.11 may define a new Reason Code that means "Old AP did not verify previous association." Should this Reason Code be defined, it should be used in preference to Reason Code 1."

When the new AP sends the move.notify to the old AP and the old AP says that it doesn't know about the STA, and the old AP tells the New AP that it should start the association from scratch. Suppose you have a choice of APs to associate to. If you are Reassociating vs associating, you may make a different choice.   Are there certain cases that the Old AP knows that the STA is gone, and so would respond incorrectly? No, the STA doesn't tell the Old AP.

Disposition:
Comment Accepted. A Reason Code of 1 is recommended to be used until a new Reason Code is defined by 802.11 WG. TGf will ask the 802.11 working group to add a Reson Code with the meaning "Old AP did not verify previous association." to the the 802.11 standard.
No objection, Unanimous

Motion:

Moved that TG f Asks that 802.11 WG make a Reason Code that has a meaning "Old AP did not verify previous association." to the the 802.11 standard.
Moved Jon R. 2nd Bob O.
Unanimous, Motion passes.

Comment 99: 4.9.4
Discussion:
The point that the Recommend Practise of the preferred way of doing something. We need to choice one way of doing something. Extending the length of time of STA can attack the AP. Discussion of the reasons for the STA needing more time. The savings of a association process may not be valid argument to the need to make the requested change. If a STA is dropping out of communication with a set of APs, then the need to have the STA do an association process is probably the right thing to do. If the Old AP doesn't respond, then we disassociate the STA and force the STA to Associate to the new AP. We only have control of telling the AP when to start forwarding frames to the STA. So in the 2 cases where an AP doesn't talk f, or the AP has died, the need to force the STA to Associate is justified. There are two opinions, one that we need to allow the Notify to be sent instead of doing a Disassociation. So the question is are there strong evidence to support one stance or the other. Is the Reassociation really of value if the communication is lost between the APs? If we make this optimisation, then we have the problem of what if the TIMEOUT reason is not just that we have new STA from an AP that we can not communicate with. There was an opinion that the 802.11 working group should make that change, but that f didn't want to change the f state machine. If the reassociate fails, then treat as an associate. This is the statement that TGf should not be defining, but using the 802.11 definition. IF the Reassociation fails, then the standard defines what the action should be. By the time the IAPP gets the indication of the roaming STA is wanting to Reassociate, it is too late, as it has already associated, and then it is after the fact that we are telling the MLME to disassociate the STA.
Disposition:
Comment declined. An implementor may choose to have the APME ignore the recommendation of the Recommended Practice to disassociate the station when the status returned is TIMEOUT and instead turn around and issue an IAPP-ADD.request for the station. This will cause the behaviour desired by the commenter.
No objection, Unanimous

Comment 173, 389: 4.9.4
Discussion:
Are there states that are not define? There might be, but the need for a state machine has been requested, but none provided to the group. The 802.11 WG seems to be moving away from State machines, and are out of vogue this week. See Editors adhoc committee. We need to be aware of the changes to the protocol, but we need to be careful not to encourage submissions at this point, but rather solutions to specific issues. We don't want a submission to replace the whole draft. The recirculation ballot has to have all the comments recirculated as well as the draft. The encouragement "If the commenter believes otherwise, his effort to create such a state machine would be greatly appreciated." Was left out of the official Disposition:

Disposition:
Comment declined. The task group does not believe that a state machine is required.

No objection, Unanimous

Comment:390
    Disposition:
        Comment declined. An AP is always a part of a DS.
    No objection, Unanimous

Comment 418:
    Discussion:
        We already added a result
    Disposition:
        Comment accepted.
    No objection, Unanimous

Break Time: Recess 9:58 am.

Reconvened 10:33 am Thursday by Bob O. David B. was away no Chair business.

Comment 127: 5
    Discussion: The suggested change doesn't match here comment made. We may want to decline because
we have done this type of comment, but only the last sentence applies here.
    Disposition:
        Comment declined. TGf is used to support context transfer between APs upon reassociation of a
        STA. It is unclear exactly what the commenter would like removed from the recommended
        practice.

Comment 105: 5
    Discussion: reviewed the text referenced.
    Disposition:
        Comment Accepted. Sentence deleted.
    No objection, Unanimous

Comment 213:
    Discussion:
        Same issue as previous comments and is related to the sequence number discussions and
        motions.
    Disposition:
        Comment declined. There is no mechanism with which to ensure that the various timestamps are
        synchronized in all AP's in the ESS.
    No objection, Unanimous

Comment 326:
    Disposition:
        Comment declined, but the sentence referred to was removed.
    No objection, Unanimous

Comment 371:
    Disposition:
        Comment Accepted. The section has been reviewed.
    No objection, Unanimous

Comment 312:
    Discussion:
        This comment did get an update from the original posting of the comment via E-Mail, and said that
        we should remove the RADIUS. See Comment
    Disposition:
        Comment declined. The New AP and Old AP can store the old/new BSSID, IP address and
        security association(s), obviating the need for RADIUS requests for every roam requests. Text to
        that effect has been added. TGf is providing context transfer, not fast handoff services. The
        context transfer service of 802.11f is designed specifically to support the forwarding of QoS context
        for a roaming STA.
    No objection, Unanimous

Comment 391: 5.1
    Discussion:
        We may want to wait for some missing members to return to the room before we discuss this
        comment.

Comment 53: 5.1.1
      Discussion:
            A review of cited text was made, and text added "and the Sequence number from the Associate Request sent by the STA" and " And is determined to be older than the association indicated by the ADD-Notify packet". In 4.7.4 we speak of the sequence number, and needed to add it in 5.1.1. Some more discussion about the specific words to add or not.
      Disposition:
            Comment Accepted.   Text Clarified.

Comment 54: 5.1.1
      Discussion:
            This section is a subset of 5.1, and 5.1.2 is also, and there are some ambiguities in how it is described in the two section. We need to be careful on how we deal with the differences from the service primitives and the packets themselves. If we look at 4.5, we say we are sending out the Layer 2 Update frame and the Add notifiy packet. So we should change the 5.1 section to be consistent, and add "invoking the IAPP-ADD.request after the APME receives an MLME-Associate.indication," and adding "invoking the IAPP-MOVE.request after the APME receives an MLME-REASSOCIATE.indication. The title to 5.1.1 is then changed to be :Actions triggered by the IAPP-ADD.request:" and the explicit names used instead of the generic functions in the subsequent paragraph. And the same set of changes needs to be applied to 5.1.2. This corrects the imprecise wording that was there previously. The title of 5.1.2 changes to "Actions triggered by an IAPP-Move.request." We noted at this point that the last sentence of 5.1.2 first paragraph was definitely wrong, and was removed.
      Disposition:
            Comment Accepted. Text modified to use IAPP service primitives rather than MAC management frames as the Triggers.
      No objection, Unanimous

Comment 88:5.1.1
      Discussion:
            We have modified the text already and should resolve his issue.
      Disposition:
            Comment Accepted. Text Modified to clarify removal of older association.
      No objection, Unanimous

Comment 89: 5.1.1
      Discussion:
            We have described the tables as being in Layer 2 devices.
      Disposition:
            Comment accepted. Text Modified.
      No objection, Unanimous
Comment 143:
      Discussion:
            This topic was discussed at length last Nov. and also last July. Reviewed text sent by Darwin E. We know why the use of only one packet without the correct IP packet is a problem, but can the IP packet be used to do both functions? If we allow the L2 update frame only, then we are missing the Sequence number and thus both packets are needed to accomplish the full functions.
      Disposition:
            Comment declined. Sending only the L2 update frame does not accomplish the same function as sending both the L2 Update frame and IAPP ADD-notify packet. The ADD-notify packet includes the sequence number information from the STA's association. This information is missing from the L2 Update Frame and prevents the older/newer determination from being made by APs receiving only that frame.
      No objection, Unanimous

Comment 253:
      Skip this comment for now.

Comment 308: 5.1.1
      Disposition:
            Comment declined. The sentence has been modified as a result of processing other comments.
Comment 391: 5.1
      Discussion:
            We have seen other groups that are using 2-way methods,…..
      AI: Robert M to get with Commenter and discuss the issue and try to provide resolution.

Comment 253:
> Discussion:
>> There are 2 ways to adjust this. When does the AP go to the RADIUS except….Wait this is a new time to go to the RADIUS server to get the correct secret, global key. Then use this at the ADD-notify exchange. Robert is working on the proposed text, and will bring it to the group. I can use a transform, but you must authenticate with the server. It is possible to have the update via the update. But if ADD.Notify only goes to the subnet, then we need to allow for a way to get to all of them, by using multicast as an option. This can be done by having a registered multicast number. This could be a problem as the 802.11 Chair hasn't gotten the port numbers yet. It seemed that we are discussing a much larger issue. The multicast security for a group is to have a group key that uses multicast. There are comments that request that the Add-notify should be protected. So Robert is willing to provide the text to resolve this. We don't have a count of the comments, but we know that the number is larger than 2. The question is do we want to really protect this? If so, we need to have a group security association maintained by the RADIUS service to protect the Add-notify (within an ESP wrapper). The reason for this is to prevent DOS attacks.   So if we have an Attack, it may come from either side wired or wireless. Add-notify are broadcast packets and these can be sent to the AP and it will intern pass it on to entire broadcast domain. A discussion of what TGi is now looking at the state machine of how to get authenticated and associated. In the security community, we need to follow the Hippocratic oath " Do No Harm". So that is why Robert is presenting his proposal in this way.
> Disposition:
>> Comment Accepted. Text to be provided by the commenter.
> No objection, Unanimous

Comment 392:
> Disposition:
>> Comment Declined. The AS is neither capable of obsoleting the old state in APs nor capable of updating the layer 2 devices to point in the correct direction to deliver frames to the mobile station. In addition, the potentially large delays through what may be several layers of AS will not be capable of supporting context transfer in the time required for the application that are anticipated.
> No objection, Unanimous

Comment 55: 5.1.2
> Discussion:
>> The figure Is being corrected. The corrected diagram sent to editor. By John V.
> Disposition:
>> Comment Accepted. The figure is updated to reflect the actions when a STA reassociates.
> No objection, Unanimous

R10 of the comment file was placed in the Temp area.
Recess for Lunch 11:55am

Reconvene: 1:12 pm

Review the Proposed Report that Dave has to give the WG. Doc # 02-171
> Discussed possible times for interim mtg to complete the comment resolutions
> Mtg to be the week of April 22nd.
> Look at having the Recirc ballot for possibly 40 days.
> We have very few folks planning on attending the May Interim Mtg.
> Therefore no formal mtg will be held in May. The Recirc ballot would still be open at that time.
> If we start the Letter ballot after the April 22, the letter ballot closes first of June/End of May,
> And then we can hopefully send our draft to sponsor ballot.

Motion:

Move that the proposed report be used, e.g. Doc 171r4.
> Move: Robert M.2nd John V.
> No objection, Unanimous

Return to processing the comments today, and then finalize the comments at the Interim.
The interim location is hopefully in the Bay area.
Jon read an afternoon Dr. Seuss poem of Computer saga at the request of the group:

Dr. Seuss Explains Why Computers Sometimes Crash (Read this to yourself aloud - it's GREAT!)

If a packet hits a pocket on a socket on a port,
and the bus is interrupted at a very last resort,

and the access of the memory makes your floppy disk abort,
then the socket packet pocket has an error to report.

If your cursor finds a menu item followed by a dash,
and the double-clicking icon puts your window in the trash,
and your data is corrupted cause the index doesn't hash,
then your situation's hopeless and your system's gonna crash!!

If the label on the cable on the table at your house
says the network is connected to the button on your mouse,
but your packets want to tunnel to another protocol,
that's repeatedly rejected by the printer! down the hall,
and your screen is all distorted by the side effects of gauss,
so your icons in the window are as wavy as a souse;
then you may as well reboot and go out with a bang, '
cuz sure as I'm a poet, the sucker's gonna hang!

When the copy of your floppy's getting sloppy in the disk,
and the macro code instructions cause unnecessary risk,
then you'll have to flash the memory and you'll want to RAM your ROM.

Quickly turn off the computer and be sure to tell your Mom!

Now we get back to the processing of comments:
Comment 56, 57:
        Discussion: see 312 for disposition. As it will be the same.
        Disposition: Comment Accepted. The new AP and old AP … see #312.
No objection, Unanimous

Comment 58:
        Disposition:
                Comment accepted. Text modified to reflect use of IAPP primitives to cause protocol operations.
No objection, Unanimous

Comment 230:
        Discussion:
                If we have a Move-Notify that is retried in TCP after the station has moved on, but it is a condition
                that should be detected.
        Disposition:
                Comment declined. TCP was chosen for exactly its retransmission behaviour, in order to provide a
                reliable transport for the MOVE-notify (and MOVE-response) message. This edge condition can be
                dealt with using the sequence number to resolve the most recent reassociation.
        No objection, Unanimous

Comment 263:
        Discussion:
                As we are only specify the protocol it occurs in real time (0).
        Disposition:
                Comment Accepted. TGf is providing context transfer, not fast handoff services.
        No objection, Unanimous

Comment 309: 5.1.2
        Discussion:
                Checked text referenced, and sure enough there was a hang over issue, and the STA references
                were removed and the correct AP references added.
        Disposition:
                Comment Accepted. Text modified to clarify.
        No objection, Unanimous

Comment 327: 5.1.2
        Disposition:
                Comment declined. The answers to all the commenter's questions are implementation dependant
                and have no impact on the correct operation of the IAPP.
        No objection, Unanimous

Comment 328: 5.1.2
        Discussion:

It is the employer's decision to implement the security, but the deplorer needs to provide the facilities. This question is left open, and will be addressed when Robert M. paper comes in.

AI: Robert M. to provide a paper that addresses this issue.

Comment 393: 5.1.2
> Discussion:
>> We have indicated that the context block is protected by the basic protection. TGi is not the only user of this block, and other users may be glad that it is protected. We may need to change the text to say that this is needed to protect the Context block.
> Disposition:
>> Comment declined. Since the context block is opaque to IAPP and the threats to it are unknown, the protocol takes the conservative approach and allows protection of the information.
> No objection, Unanimous

Comment 419: 5.1.2
> Disposition:
>> Comment Accepted. The sentence has been removed.
> No objection, Unanimous

Comment 420: 5.1.2
> Disposition:
>> Comment Accepted.
> No objection, Unanimous

Comment 458: 5.1.2
> Discussion:
>> This sentence is true for mapping the IP address…, but for doing the security transform, additional information needs to be added. If we send a call check with a BSSID, you will not necessarily get an IP in the call return. Table 3 tells all the element ids that are needed to pass the security stuff, but you don't need all this info for address resolution. There is more info than needed for the Address resolution, and having too much info is not a good thing. So the standard RADIUS server that supports the call-check service should work.
> Disposition:
>> Comment accepted. Text added to clarify.
> No objection, Unanimous

Comment 459: 5.1.2
> Discussion:
>> How does the new AP know that the old AP is authentic? If the Old AP is in the RADIUS database and can process the request….see disposition. Robert said that for a fee he would prepare a white paper on this topic.
> Disposition:
>> The new AP knows the old AP is authentic if the old AP is in the RADIUS database and the server can process the access-request. It is a key distribution mechanism with the trust relationship being implicit between only two entities. The trust relationships between all other entities is explicit. The security model is a variant of the Needham-Schroeder authentication method. The text is believed to be sufficient to explain the operation of the protocol (see 5.2.2). Comment declined.
> No objection, Unanimous

Comment 460:
> Discussion: "Can you say HTTP on a busy Server?"
> Disposition:
>> Comment declined: The lifetime of the TCP connection is not material to the operation of the IAPP. This can be left to be an implementor's choice.
> No objection, Unanimous

Comment 18:
> Discussion:
>> 1. it is an RP, and so it is not a requirement.
>> 2. a Registration service is needed.
>> 3. the STA cannot talk to old AP thus need to roam.
> Disposition:
>> The assumption that a STA can always talk to its old AP is unwarranted. The main reason that a client roams to a new AP is that it can no longer communicate with its old AP. Comment declined.

No objection, Unanimous

Comment 174:
Discussion:
The point of enlarging the key size is reasonable in light of other things in the world, but 256 bits split half for confidentiality and authentication should be enough. These fields are variable length, and the key strength is specified by f, but is the implementers responsibilities. If we look at page 21 line 6, if we used SHA1, then the size to be used could be 160. The size of the keys should not be increased beyond 160. Increasing beyond the 160 limit, the usefulness of the bits may be limited. For SHA1, secrets beyond 160 in size are hashed to 160.
Disposition:
Comment accepted. The BSSID secret is extended to 160 Bits.
No objection, Unanimous

Comment 193:
Disposition:
The security framework of TGf is independent of that for TGi. Clarification is not required. Comment declined.
No objection, Unanimous

Comment 254: left open awaiting Robert M. Paper.

Comment 286:
Disposition:
DHCP does not provide registration of IP addresses. It also does not provide any security. The need to provide security in IAPP as evidenced by the many comments received on that topic, is critical to the acceptance of IAPP by the working group. Comment Declined.
No objection, Unanimous

Comment 394:
Disposition:
Please refer to IEEE Std 802.11-1999 where you will find that an ESS is defined to be the set of BSSs connected by a common DS.
No objection, Unanimous

Recommendation: Please review 184r11 prior to the next interim meeting and prepare text for resolution prior to the meeting. Please bring the suggested text to the meeting.
A copy of the comment file and the working copy of the new proposed draft was distributed to the task group attendees.
The final status of voters has been sent to the 802.11 exec, and the confirmation of the votes will be done during the recirculation Ballot process.
The meeting was adjourned at 1:51pm

IEEE P802.11
Wireless LANs
March 2002 Plenary TGg Meeting Minutes

Date: March 11-15, 2002

Author: Kevin Smart
Micro Linear Corporation
11734 S Election Rd. Suite 200
Draper, UT 84020

Phone: +1-801-617-2507
Fax: +1-707-276-2836
e-Mail: keltypack@networld.com

Abstract

Meeting minutes from Task Group "g" meetings at the St. Louis, MO, IEEE 802 plenary.

Chair: Matthew Shoemake
Vice-Chair: John Terry

2002-03-11 3:40 PM
The meeting was called to order.
The chair asked for a volunteer to act as secretary of TGg.
Kevin Smart volunteered as the secretary for this meeting.

The chair was leading the discussion.

Document 02/179 has the comments from LB33.

LB33 closed today at 12:00 CST.

LB33 had one invalid ballot by Klaus Meyer. He did not include the Excel spreadsheet in his e-mail. He will get his comments to the chair

LB33 vote: 86/104/40 (plus 1 invalid). Ballot failed.

We currently have 865 comments to resolve. 200-300 comments are editorial. We need to resolve the comments so we can go out to another letter ballot. Matthew would like to resolve all of the comments. He would like to break the TGg body into some ad hoc groups, with each group trying to resolve 100-200 comments. He would like to resolve the comments in 1–1½ days using this divide and conquer approach. The group would present the issue and the potential resolution to the body. That should help us to resolve the comments quickly. Hopefully, presentations are tied to the comments.

It is possible that the ad hoc group will not reach consensus, so that will need to be brought to the body.

The chair would like to get some volunteers to consolidate the comments and divide them for the groups.

Agenda (document 02/139r0) needs to be approved. The chair went through the proposed agenda as shown in document 02/139r0 and asked for someone to make a motion to adopt the agenda.

Motion: Move to adopt the agenda as shown in 02/139r0
        Carl Andren moves
        Pratik Mehta seconds

No discussion.
Vote:32/0/1
Agenda is approved.

Call for documents that need to be submitted:
Doc. 02/131 Andren-MIBs and PICs
Doc. 02/132 Andren-CCA
Doc. 02/181r0 Choi-Control Period
Doc. 02/xxx Karaoguz-IBSS Legacy Coexistence
Doc 02/150 X-802.11g NAV propogation
Doc 02/157 Frame sequence validations
Doc 02/xxx Batra-Proposal for a 4 channel option to increase capacity in the 2.4GHz ISM band

Document 02/209 "Letter Ballot 33 Comment Resolution" has been added to help the ad hoc groups.

We need to group the comments to resolve several comments simultaneously. Doc 02/209 will help show the comment resolutions.

The chair would like to break into 5 groups. First group would be for the editorial comments, headed by Carl Andren. Suggested groups: editorial, mandatory, spectral, MAC, options. Carl Andren (Editorial), Terry Cole (MAC), Steve Halford, Sean Coffey, and John Terry.

Terry Cole had a question about 02/179r1 and the corrected ballot. The ad hoc leaders will work from 02/179r1 and split the comments from the new comments file.

Kevin Smart asked the chair to clarify the meaning of these ad hoc groups and the voting that may take place.

The chair's response:
An ad hoc group is really a "special committee." The special committee has a job to do, when the work is done they bring back the answer to the TGg body, and then the committee is dissolved. Special committees will be dissolved once their work is done. Voting in these special committees should be done through straw polls and consensus. Any vote in these special committees will not matter much because it will have to be addressed by the TGg body.

2002-03-11 4:21 PM
The group recessed until 7:00 PM, with the special committee leaders staying behind to split the comments amongst the special committees.

2002-03-11 7:03 PM
The meeting was called to order.

Carl Andren will take the Editorial comments.
Steve Halford will take Clause 19 except for 19.5 and 19.6
Sean Coffey will take Clause 19.5 and 19.6
John Terry will take the general comments
Terry Cole will take non-clause 19 and annexes

2002-03-11 7:07 PM
The group split into the special committees

The chair was requested to display the groups on the main screen to help the individuals split into the proper special committees. Displayed.

2002-03-12 1:01 PM
The chair reminded the group that we were split up into five special committees to try to resolve the comments. Most groups are currently 25% complete in the review of the comments. We split up into the five special committees.

2002-03-12 3:38 PM
The chair reminded the group of the special committees and sent us back to the groups after the coffee break.

2002-03-12 7:09 PM
The chair called the group to order and told the group to get the comments resolved. At 1:00 PM, the special committees will present the comment resolutions to the TGg body. The status will be reported to the 802.11 WG tomorrow morning.

2002-03-13 1:09 PM
The chair called the TGg meeting order. We just completed Agenda Item 7. We are moving to agenda item 8. The results from the special committees are in 02/209r2. The order will be John Terry, Steve Halford, Sean Coffey, Terry Cole, and Carl Andren. Most of the editorial comments will be handled by the editor without the need for a vote from the TGg body. The editorial comments will be in a later revision of the document.

John Terry (General Comments):

Most of the comments are repeated. The first comment took about 1:20 to resolve. The group worked on a resolution to Adrian Stephens' comment. They recommended changing the SIGNAL field in the CCK-OFDM to a rate that was not in the basic rate set. Status: recommended change was accepted. Ron Brockman will give the recommended value to the editor.

Next comment was that CCK and PBCC have a different timing requirement from OFDM. Recommendation: no change to the draft. Recommendation was accepted by the group.

To see the details of the discussion, the recommended changes, and the resolution see 02/209 (latest revision). The meeting minutes will not record each comment that is resolved, but will deal with motions and discussion on the motions that are brought to the floor.

When document 02/209 says "Approved by TG" it means that it the task group approved the resolution by unanimous consent.

In order to resolve some comments, 02/131 will be presented.

Terry Cole wanted to inform the group that he has additions to the MIBs. These are simple additions, so they can be added later.

Carl Andren is presenting 02/131r0 "Annex D"
The document may need to be changed based on the references. The document has been on the IEEE website since February 2002.

Comments on the MIBs: HRP vs. ERP. We need to be consistent (choose ERP). PBCC22 should be ERP-PBCC. These were accepted by the editor.

The MIBs from 02/131 as revised were to be included in the draft by unanimous consent.

The special committee wants a straw poll to determine whether one or both optional portions should be included.

Advice from the chair: members should remember the past when taking the straw poll. The groups have spent many months trying to get the draft at the current state.

People are interested in a straw poll.

Two separate straw polls:

1. Who is in favor in eliminating CCK-OFDM from the draft?
   This is straw poll, so all present can vote
   Result: remove CCK-OFDM: 14+17=31   keep CCK-OFDM: 6+14=20
2. Who is interested in removing PBCC from the draft?
   Result: remove PBCC: 17+11=28   keep PBCC: 14+5=19

Jan Boer: Request for a straw poll to remove both options:

Chris Heegard: Neither poll met 75%, so we shouldn't waste our time.

Bill Carney: Are motions allowed? The chair indicated that motions are in order at this point of the agenda.

POI: Richard Williams: When PBCC is used, does that mean only PBCC-22 and -33 or does it include Clause 18? The chair said that it was only PBCC-22 and -33.

Straw polls:

Who would like to see both PBCC and CCK-OFDM removed from the draft?
Remove Both: 20+14=34

Who would like to see both PBCC and CCK-OFDM remain in the draft?
Keep Both: 3+12+2=17

Note: the second question is **not** the negation of the first. Also the second set of straw polls is not part of the first set of straw polls.

Terry Cole: We have reached a good compromise, so we should continue to move forward with the draft.

Status: We conducted the straw polls, but there was not the necessary 75% to remove the options. The body has shown support in the past for including the options.

Terry Cole: This will be referred to many times during the comment resolutions. Please consider put the straw poll results in the resolution document.
- The request was captured in the document.

Question: Can we do a straw poll by company? The chair said "No, that would not be in order."

Terry Cole: Consider adding text for recommended practices in editorial section.
- Recommendation: The editor will make some possible editorial changes for recommended practices
- The editor says that Annex E should be this text in question.

The chair would like to review Annex E. There was no objection, so the review will happen.

Dick Allen: Annex E talks about stations connected to the AP, but not ones that are not associated. There may need to be some additional commentary.

Richard Williams: I am confused by clause 17 as well as legacy devices.
The editor will replace "legacy devices" with "clause 18 devices" The editor admitted that "clause 17" should be "clause 15".

Terry Cole: There should be another paragraph to this annex. "In the case of a non-mixed network …." He will work with the editor. Second, he would like to take this text, but there is document 02/150 that should be considered later.

Srikanth: Shouldn't we modify it before voting?
- that is probably a good idea, but not all of the additions are ready

Should we adopt this text? This is delayed. The status is that we are currently working on Annex E.

Richard Williams: I believe there is wide interest in this.
- Terry and Carl will be working on these changes at the break

Discussion of Dave Bagby's comment: Request straw poll on whether TGg should be shut down.

There was no objection to the straw poll on whether TGg should continue to exist.

Dick Allen: Suggestion: Dave Bagby's comment addresses several issues. First the need for optional modes (already addressed) and second MAC issues relating to the 802.11b standard.

Vice-chair: Suggested a special committee.

Ron Backmann: The claims by Dave Bagby are incorrect, so we can refute them.

Marty Lefkowitz: Disagrees. Scalability is an issue.

Vice-chair: Ron Backmann, Marty Lefkowitz, and Dick Allen should create a special committee to discuss and address this comment. There was no objection.

Chris Heegard: This person likely will not change his mind, so we should focus on the other comments.

Chair: We need to have a good, genuine response. We need to have a good statement that goes along with our response.

Eric Schylander (et al)'s comment regarding the RTS/CTS recommendation. We should vote on his suggestion in document 02/181r0.

Jan Boer: Does Eric have any contribution to this group for this idea?
Chair: Yes, document 02/181.

We should postpone the vote until after the presentation of document 02/181, which should happen after the break. The chair will try to get them to present after the break.

2002-03-13 2:56 PM
Recessed for break.

2002-03-13 3:49 PM
The chair called the meeting back to order a little late. The work from the special committee was displayed and read. This text will be included in 02/209 once accepted by the body. The chair is trying to get this accepted by unanimous consent.

Richard Williams: I am happy with that as a response, but perhaps we should see some of the comments embodied in the text, but do not limit it to CTS/RTS.

Dick Allen: CTS/RTS is not the only mitigation method that can be used, so that needs to be made clear in the response (and especially if it were to go into the draft). There are other MAC layer mechanisms.

Richard Williams: I have a fundamental opposition to putting anything into the standard that might present us from getting smarter.

Document 02/181 is another example.

Chair: Where should the text go?

Richard Williams: I am not sure where it should go, so leave it up to Carl Andren.

This response was accepted by unanimous consent.

Comment 19:

Terry Cole: This problem of referencing clause 17 or 18 may be wrong because it is only referencing OFDM.

These comments are deemed editorial and needs to be changed by the editor. The resolution was adopted by unanimous consent.

Question to Terry and Marty about the status of Annex E. Response: They are considering adding a paragraph, but it won't conflict with what is there. They should wait until it is complete until they present.

Marty: There are a lot of issues regarding backward compatibility that needs to be addressed. Some of these might not be simply informative. (For example the MAC comments.)

Comment 23 (General) was moved to the MAC group by unanimous consent.

Comment 24: referred to the MAC group – this was regarding the state machine changes

Comment 25: Recommend 25MHz spacing between adjacent BSSs to limit interference between legacy 11b systems and 11g systems. Steve Halford: This is not a valid comment because people use 25 MHz spacing for 11b systems in the 2.4GHz band. This will be listed as a recommended practice by the body. It is recommended to use the same channel spacing as the current 11b standard (25 MHz). Asked if it could be agreed by unanimous consent. Failed.

Richard Williams: There is a paper coming up that will address this issue. They will be disappointed that it was agreed upon by unanimous consent.

Chair recommends putting this resolution on hold until later.

Comment 26: Concern about CTS/RTS for shorter packets. This will possibly be addressed S. Choi

S. Choi (Doc 02/181): 802.11g Contention Period presentation. For details see 02/181r1 and look through the presentation.

Question:
Ron Backman: This is a simple mechanism. Concern is that if we add this to the draft the QoS attendees may vote no.
- This shouldn't hurt .11b stations. .11e stations will have HCF, so this shouldn't confuse the group.

Ron Backmann: Won't we get a lot of comments demanding more information?
- The current draft only has a short statement on RTS/CTS, so we would also need to expand Annex E

Question: Interface between the PHY and MAC. Currently the MAC doesn't care about the received rate, but now it will have to keep track of the PHY rate. This is getting messy. Second, slide 14, what happens if a probe is received. This may cause some problems. There may be other places where it is broken. It is dangerous to accept this as is. RTS/CTS may be a little that way.

Albert: Comment on the elegant solution. Question T_extra has two ways of being calculated. The two are the extremes, perhaps we should use the average.
Reply: conservative T_extra works nearly as well as the ideal T_extra, so the conservative 5ms is good enough in the simulation.

Gary: Observation: First the existing 11b STAs are supposed to be CF aware, but many are not. Second, what happens when you have several STAs that are in sleep mode and they wake up?
- First point is agreed. Many are not aware of CF, but there are many that are CF aware (since it is a mandatory part of the standard
- Second, sees no problem. Overlapping APs may be a bigger problem. Gary: Many power saving STAs don't see beacons. Marty: Disagrees that STAs would see the beacons. The system was designed to allow for sleeping STAs to not need to listen for beacons. S. Choi: Such aggressive power savings STAs probably won't cause a problem because of lack of traffic. Examples are Palm computers and bar code scanners.

Terry Cole: Question- Devices receive beacon then receive the NAV then they wait for their timer to expire. It is not allowed to use RTS/CTS and the CFP. Terry has concern about turning an error condition into a normal condition by allowing for RTS/CTS in the CFP by splitting it into .11g CP and CFP.

Jan Boer: This idea is appealing, but how do handle these MAC changes. Response: talk with the MAC people and have them look for problems. Please check for problems.
Chair: Options: straw poll, nothing, motion, or wait until later.

S. Choi: A straw poll would be good.

Straw Poll: 02/181r1 slide 22
Is it okay to add the following sentence: "For the Extended Rate PHY, control frames of subtypes CF-END and CF-END+CF-ACK may be transmitted at one of the Extended Rate PHY (ERP) mandatory rates irrespective of the BSS basic rate set"

There was an objection, so we waited to take the straw poll until the body had time to think through the presentation.

2002-03-13 5:35 PM
Recessed for the day

2002-03-14 8:13 AM
The chair called the meeting to order. He commented that we should be accelerating the rate that we are addressing the comments. Other special committee leaders say that what we are addressing are redundant with some of their comments, so there is more indication that things will accelerated.

S. Choi is not here to continue with the 02/181 document discussion. The chair will look for him and try to bring S. Choi in after the break.

Comments 20-22 are all related. It is our belief that Annex E should address this issue. Terry Cole and Carl Andren will report.

Terry Cole: The special committee unanimously agrees to add one more paragraph to Annex E. There is some support to adding some new MIB elements, but it was not unanimous. Carl will show the new paragraph in Annex E, but the MIB elements have not been included as of yet.

Carl Andren gives the presentation of Annex E. The proposed text was read. This is a work in progress.

Chair: Do you intend to add additional text?

Carl: Yes, we are considering it.

Terry: We should adopt it in Annex E because there are so many comments that need to be addressed by Annex E.

Chair: Let's adopt Annex E and put in draft 2.1r1.

Anuj Batra: question about the text relating to "more fragments"

Carl: We are trying to put in some protection for multiple fragments.

02/131r1 will include the proposed text of Annex E. Carl is working on draft 3.0, so this will be a separate document. This is an informative section, so changes to this section are simpler.

This new paragraph was adopted by unanimous consent.

Comment 12 was also addressed by Annex E, which was adopted by unanimous consent. The body is accepting the comment resolution by unanimous consent.

Comments 23-24 are also addressed by Annex E. This was accepted by unanimous conset.

Comment 25 (concerned about 25 MHz spacing). This was put on hold until Anuj Batra has given his proposal. Anuj will give that presentation.

Futher discussion: S. Halford pointed out that Anuj is going to talk about having four channels separated by 20 MHz.

Richard Williams: The comment talks about 25MHz spacing, but that doesn't seem to be the case.

Anuj Batra is giving the presentation (Doc. 02/220r0). They are trying to increase the usage of 2.4GHz band to allow for better spectrum usage.

In order to meet the requirements, they had to back off an extra dB for single carrier. And 10.5 dB from the P1dB compression point.

Todor Cooklev: Channel 0 is centered at 2407 MHz, so there may be some problems on the lower end.

Steve Halford: All that is really being asked for is the addition of channel 0, so this may be a good idea.

Anuj would like a straw poll.

Motion would be to add an optional channel 0 centered at channel 0.

Straw poll: Like to see the motion now, wait until there is further study, neither.
     Now: 20+6=26
     Further study: 13+2=15
     Neither: 0

Richard Williams: He would like to know of those who would like to do further study, what kind of study should be done and who should do it.

Jim Zyren: This would possibly cause a PAR problem

Chair: Our PAR had some functional requirements and one of the requirements said that we needed to keep the same channelization scheme. This is not changing the channelization, so it is likely to be okay.

Terry Cole: Will this cause any new radio regulatory issues?

Chair: He believes that it isn't causing any RR issues

Jim Zyren: He also believes there won't be any problems.

Discussion of what what further study is desired:

Jim Zyren: Other people should look at the back-off requirements.

Comments: ETSI looks like the out-of-band needs to be below -30 dBm.

Richard: As we look into the backoff, it is really only an issue of the outer channels. This gives to good inner channels, so it should be easier to build a system.

Kevin Smart: This looks like it would mandate pulse shaping, so it may complicate the draft.

Anuj: There is nothing mandated, so it shouldn't change anything.

Don: What channels are being suggested? -- We are proposing the use of 0, 4, 8, and 12. The original was 1, 6, and 11. The frequencies wouldn't change.

Bill Carney: Point of information or parliamentary inquiry: Can we make a motion and they postpone until Sydney? That would work okay.

Jim Zyren: We could do that, but perhaps we should start a study group to study this issue and have a report in Sydney.

Motion:
Move to form special committee to discuss 4 channel proposal in document 02/220r0. Direct special committee to report on their findings at the May 2002 session. Special committee conference calls are authorized. Leader of special committee shall be Anuj Batra.

Motioner: Bill Carney
Second: Steve Halford

No discussion,

Vote results: 38/0/0

Motion carries unanimously.

Anuj: Please give a list a questions that will need be answered to Anuj Batra.

Carl Andren: Clause 18.4.6.2 in the standard gives the 25 MHz channel spacing.

Comment 25, 28 resolution is on hold until after the special committee returns. This was accepted by unanimous consent.

Comment 27: Draft requires state machine changes. Deferred to Terry Cole's group by unanimous consent.

Richard Williams: Is there something in the draft that is causing this confusion?

John Terry: Request of the editor to look at the channel spacing in case there is something in the draft that is confusing.

Comment 29: Similar to comments 20-22. Taken care of in Annex E. Resolution accepted.

Chair: reminds the group to sign into Pluto for the attendance

Some members are having difficulty signing in.

Chair: TGg and TGe should have a joint 2 hours session in Sydney. This will help address comment 15

This was accepted by unanimous consent.

Comment 30: Resolution proposed by the special committee was adopted by unanimous consent.

Comment 31, 33: Repeats of comments 15-18.

Comment 32: Make 54 Mbps mandatory: Straw poll was recommended.

Chair: Make 36, 48, and 54 mandatory.

Bill Carney: The basis for the comment is that the market is being told 54 Mbps, so we should make it mandatory.

Jim Zyren: Would like discussion. Understands the concern about the market expectation. Last night we decided to keep the optional modes, one of which is limited to 33 Mbps. This change might give momentum to the elimination of the other options. He believes that there should be continuity between .11g and .11a.

Bill Carney: I withdraw my comment.

Comment 34: Repeat of 23-24, 27

Comment 35: Repeat of 25, 28.

Comment 36: Repeat

Annex C review by Carl Andren: Preliminary. Only looks like there is one necessary change.

Terry Cole: We should wait until we hear from D. Kitchin on Friday.

Adopting Annex C as presented by unanimous consent, but we are waiting for results from the special committee. No objections.

Comment 38: Changed to editorial comment. Reference straw polls for the removal of options in the resolution. Objection by Kevin Smart. This is a technical comment because the optional PBCC mode has several problems as currently documented. This should be deferred to the resolution to the special committee for 19.5 and 19.6. Proposed resolution is accepted by unanimous consent.

Comment 40. Appears to be addressed by Annex E, but Terry Cole says that Annex E may not fully address the comment. We should defer this resolution until the MAC resolutions and possibly the joint meeting in Sydney.

Comment 41: Frequency reuse issues. Recommended to refer to Annex E for resolution. Approved by unanimous consent.

Comment 43: Concern that this is not a compatible PHY. The only way to work well is through recommended practices. Recommeneded solution is that the recommended practice should be sufficient. Soliciting the body for further comments.

Terry Cole: This comment came up 12 or more time in the MAC special committee. They recommended revalidating the body's feeling by straw polls.

Suggesting a straw poll on whether RTS/CTS usage should be mandatory.

Comment: We did straw polls in the last meeting about whether this should be mandatory, so what's the point?

Steve Halford: This was debated last time, and there was a straw poll. We shouldn't do another straw poll with limited numbers of people here.

2002-03-14 9:58 AM
Recessed for Break

2002-03-14 10:34 AM
Called the meeting to order. The chair looked for the straw poll in the January 2002 meeting, but he could find no pollin the minutes.

Therefore, we are having a straw poll:

Who would like to see the usage of the non-ERP (Legacy) bits as mandatory in the draft.

S. Choi: If the body makes this mandatory, it will affect S. Choi's proposal.

Chair: Who is willing to make this mandatory.

Point of Information: My understanding is that this is not mandatory.

Chair: That is true. If the AP suggests using RTS/CTS the STA is not required to follow along. The chair is trying to take the straw poll to resolve the comment.

Jim Zyren: point of clarification. Do we have to use RTS/CTS for each packet or during mixed-mode do we have to use RTS/CTS.

Jeyhan: secretary missed the question

Ron Brackmann: If we were to change the document to *shall* then that would not mandate RTS/CTS because the text gives "or other mechanisms." Chair: True. Ron: That doesn't preclude the use of other methods.

Comment: It is one thing to debate the issue, but we are debating the words in the draft. That raises a red flag. We should come up with some unambiguous text.

John Kowalski: The word "protection mechanism" is not really clear

S. Choi: Originally objected because he was concerned that RTS/CTS would be the only method.

Jeyhan: Protection mechanism is recommended. If we make it mandatory, then we need to be concerned about what the mechanism is. I am against making it mandatory.

Ron Brackmann: I agree that we can't make something mandatory that is not defined. We need to come up with the wording, but my understanding is that we can't send out an OFDM frame unless the NAV has some protection mechanism.

Terry Cole: Doc. 02/150 considers a number of editorial changes to this section. Regardless of the straw poll, my document will still be valid. 02/150 proposes 7.3.2.9 changes to make the section more clear.

John Kowalski: Would it be prudent to make a motion to mandate the use of legacy protection mechanisms.

Chair: Motions are in order at this time.

Pause while Dunkin works on the wording of the motion.

Comment 45: Deferred to special committee on MAC issues.

Duncan Kitchan:

Motion:

Instruct the editor to change the word "may" to "shall" in the third sentence of subclause 7.3.2.9 and add the sentence "Such a protection mechanism shall ensure that the station does not transmit an OFDM frame unless the NAV of legacy stations in the BSS has been set." Change all instances of the word "recommended" to "required" and "recommends" to "requires" in that subclause.

Moved: Duncan Kitchin
Seconded: Ron Brackmann

Terry Cole: 02/150 discusses this issue, so perhaps we should hear this.

John Kowalski: I strongly support this.

Comment: I object to the "OFDM frame" terminology because this is a MAC change.

Chair: This only concerns the mandatory OFDM modes of .11g. Per

K. Smart: OFDM preamble may cause some grief for .11a. – Response: there wont be any .11b devices in .11a space.

C. Andren: This is awkward.

Chair: The spirit of the motion doesn't change, and the editor would be empowered to make it more clear.

We are changing the word "an OFDM frame" to "a frame with an OFDM preamble" by unanimous consent.

Motion:

Instruct the editor to change the word "may" to "shall" in the third sentence of subclause 7.3.2.9 and add the sentence "Such a protection mechanism shall ensure that the station does not transmit a frame with an OFDM preamble unless the NAV of legacy stations in the BSS has been set." Change all instances of the word "recommended" to "required" and "recommends" to "requires" in that subclause.

Question: If we require a protection mechanism, we should define that mechanism. – True. The motion was carefully worded to allow for that – I don't feel comfortable leaving the protection mechanism open.

The interpretation

Question is called by unanimous consent.

Vote on amended motion: 44/5/7

Richard Williams: Requests clarification. I see don't see the word "may" in the third second sentence.

The second is "See Figure XX"

Richard is okay with the clarification.

The resolution to comment 43 is taken care of by this motion by unanimous consent.

Comment 44: Same as 15-18

Comment 46-48: repeats

Comment 49: We adopted Annex C and D to resolve this comment. Resolved by unanimous consent.

Comment 50-53: repeat

Comment 54:

Jeyhan's presentation: Doc. 02/235r0 IBSS Legacy Coexistence.

Carl Andren: Where do you want this in the document? Does it go in the PLME section?

Terry Cole: It appears your motivation is to successfully use BSS. It looks like it could help with multiple BSSs from some of the other comments.

Due to the previous changes, Jeyhan will generate a 02/235r1 that will modify the text and then make a motion to have the editor include it in the draft. He will present in the afternoon.

Comment 56: UWB systems may cause interference.

Steve Halford: The comment seems to be irrevelant

Dick Allen: ED has a threshold and UWB is likely to be below that threshold. 802.15 will be addressing this issue through a coexistence issue. We also don't talk about microwave ovens, etc.

Jim Lansford: UWB is mostly limited to above 3GHz, so this may be a non-issue.

Jim Zyren: The UWB spec is primarily for above 3.1GHz in the 2.4GHz band the power is likely to be less than -50dBm.

Terry Cole: We should record our conclusion as "Based on available information, we expect no co-existence problem with UWB."

Jim Zyren: After looking at the spec, the UWB PSD mask is -51 dBm/MHz in the 2.4GHz band, so it is a non-issue.

Carl Andren: ED has been in the standard a long time, but most people use CS because of the microwave oven issue.

Dick Allen: 802.11b standard ED threshold for minimum sensitivity is -76 dBm, so there may still be a problem.

Carl Andren: ED threshold is only for CCA and it is normally ignored

Dick withdraws his comment

This resolution was adopted by unanimous consent.

2002-03-14 11:56 AM
Recessed for the break

2002-03-14 1:08 PM
Chair called the meeting to order. This is a joint meeting with the Radio Regulatory group.

Vic Hayes (RR Chair): Presented Doc 802.RR-02/027r2.

Europe update: they may change 300 328 to allow for OFDM by expressly allowing "other forms of wide band data modulation techniques" This should allow for 802.11g devices. One potential problem is that the minimum bitrate may be removed, allowing for other types of devices. Europe 5GHz will allow for high-performance RLAN devices (802.11a should fit in this category). RR TAG discussion RR-02/040. Working on radio informal document bran-frwk-0312.doc.

Dick Allen: Saw comments on the radar. Can we ever satisfy the radar people? -- We have hired a radar consultant who is going to be doing some simulations and will be running several test. He will try to run the proposed DFS to see if the radar people are happy.

Terry Cole: Since we are getting ready to start this new TAG, what do you think will happen in the future? Will we remain having joint meetings? – Vic is unsure.

Tim Wakeley: April 30 is the open comment period? – Comment period closes on the 28th. Vic is unsure how to file the comments.

Vic: Other documents to look at are RR-02/045, RR-02/046 (response to Industry Canada). Regarding WECA petition the comments close on April 28th. The reply period closes March 15th, this week.

TGg Chair: Vic is retiring from 802. Congratulations.

Vic started 802 in 1988. 802.3 in 1990. Vic presided over 802.11 until 2000. Thanks. Big applause.

2002-03-14 1:35 PM
TGg only meeting.

Jeyhan has modified the text of his document. The new document is 02/235r1. Changed a few things to be consistent with the other changes that happened earlier.

Carl Andren: Change 802.11b to NonERP. Done

Terry Cole: Concerned about the final paragraph. He feels that a previous motion should take care of that. He is concerned about the potential of making Annex E normative rather informative. – Changes were made to make him happy

Richard Williams: What are the feelings of the MAC experts? – we have not presented in the MAC group
Richard: Concerned about the votes from the MAC experts.

Ron Brackmann: How many no votes related to IBSS? -- Chair does not know, but there were at least 4 from people who work at Broadcom.

Terry Cole: First there are about 8-10 comments regarding IBSS. Second our PAR doesn't prohibit MAC changes and there is not just a body of MAC experts. Supports

Chris Heegard: Not against this, but wants more time.

Ron Brackmann: Where would the text be added? -- up to the editor. This is intended to be normative text.

Straw poll:

How many people would like more time to consider the text before making a motion to adopt.

More time: 18
Motion now: 4

Straw poll:
More time to review it by themselves.
Terry and Ron would like some more information from Jeyhan.

Terry Cole: He would like some analysis from the MAC experts especially to see how it works with multiple IBSSs, but would support a motion now.

Ron Brackmann: Want to have some simulation data to see how it would affect the network.

Jeyhan will put 02/235r2 on the server.

54 is put on hold by unanimous consent.

Comment 57: How does the modem change from CCK to OFDM and back?

Carl Andren: Is a PHY issue?

Chair: The question is confusing. Does anyone know what the comment means?

Jung: Wants more information. Is the decision made on a per-packet basis? – YES – Is it feasible? – YES
The explanation seems to satisfy the commentor. Comment resolved by unanimous consent.

Comment 58: duplicate

Sean Coffey: Believes that comment 58 is inaccurate because the options offer higher throughput options than the mandatory OFDM mode.

Comment 59: duplicate

Comment 60: Changed to editorial to have the editor review the references.

Comment 61-63: duplicates

Comment 64: Scrambler fix. There was a paper in TGe. The commentor would like to see the fix transferred to TGe. Would like to wait until next meeting to fully resolve.

Carl Andren: Believes that the comment is incorrect. He believes that a self-synchronizing scrambler is a problem. The concern is that the scrambler initial state can easily have an error.

Richard Williams: Would be worried to be proposing something that was flawed.

Carl: Put forth a paper about the flaw. Shows an initial seed with an initial pattern can cause a self-synchronizing failure. The initial state issue is different than his paper.

Terry: Will look into this problem. We should look into a well-known polynomial. Supports deferring this resolution to the Sydney meeting.

Deferred by unanimous consent.

Comment 65: Believed to be related to RTS/CTS, so we are considering it a duplicate of 23-24, 27. Refer the commentor to 7.3.9.2 for the resolution. Approved by unanimous consent.

Comment 66: Wireless coexistence. We adopted a coexistence statement in the last meeting

Sean Coffey: Coexistence for 802.11 networks is not sufficient for the commentor. He asks for coexistence statements with other 802 networks. I'm not sure we need to fully support these other devices.

Steve Halford: This comment comes up in the general clause 19 comments. They would like to add the statement that we will coexist with other approved 802 devices. It is difficult to cross-reference other work that is not complete. 802.15.2 is addressing the coexistence issues.

Jeyhan: 801.15.3's letter ballot has passed. They want to know what will happen with these devices are put together.

Terry Cole: Would like to add some statement that there will be some best practices document for coexistence. Observation: we would be going into virgin territory if we were to be talking about throughput with dissimilar devices.

Sean Coffey: It is good that 802.15.2 is looking at the recommended practices, but TGg members cannot be working in both groups. We should take the comment in the order that Bob Heile has listed it.

Jeyhan: Wants to clarify Sean's comments. 802.15.2's charter is not all of 802, but primarily 802.15, so they won't bring coexistence statements for all of 802.

Chair: It is true that we cannot keep up with all of the groups. Added that 802.15.2 will likely document the best practices for 802.11b, which will be applicable to 802.11g.

Jeyhan: How many no votes are based on this?

Chair: Will talk with Bob Heile to find out what he is looking for.

Jeyhan: 802.15.3 had a statement about coexistence. The 802.11g coexistence statement is not satisfactory to 802.15. In 802.15.3, they had many similar comments, so we should look into the statements they made to resolve this type of comment.

Comment 67: duplicate of 30. Resolved by unanimous consent.

Comment 68-69: duplicate of 23-24, 27.

Comment 70: not a complete draft

Sean Coffey: The rules stated that in order to go to letter ballot the draft has to be complete with no open technical issues. How do we avoid this issue in the future?

Chair: These rules are currently being debated. The rules may be changed in Sydney since we are looking at modifications to the rules.

Sean: We need to make a statement in this group saying that the document is complete with no open technical issues.

Terry: Other groups claim that their documents are complete when they go to letter ballot. By sending it to letter ballot, they are making a statement that the documents are complete.

Comment 70 will be resolved by working on the other comments and stating that TGg will continue to make progress on providing compete drafts. Adopted by unanimous consent.

Comment 71: Clarified the meaning, so the text will be revised: "The phase of the OFDM pilot tones shall be 45 degrees less than the phase of the last Barker symbol."

Editor: What is meant is that the phase of the constellation will rotate by 45 degrees, which is easiest to see on the pilot tones.

Second try on modifying the text:
"The phase of the OFDM symbol (as referenced by the pilot tones) shall be 45 degrees less than the phase of the last Barker symbol."

Steve Halford: This was intended to capture the phase coherency between CCK and OFDM.

Steve Halford will assist the editor in making the text more clear

Comments 73-74: are covered by other corrections

2002-03-14 2:56 PM
Recess

2002-03-14 3:35 PM
The chair called the meeting to order.

The next special committee is clause 19, headed by Steve Halford.

Would like to discuss new business so we can work at Sydney.

Exit this plenary with a draft 2.5. Prepare to have draft 3.0 in Sydney so we can have a letter ballot. Chair wants to issue an r3 of 02/209 that talks about all of the resolved issues for Sydney. 3. we need to preauthorize a letter ballot for Sydney.

Motion:
Direct editor to produce draft 2.5 based on resolution of editorial comments and General comments in document 02/209r2 and provide chair with draft for distribution at least two weeks prior to May 2002 session.

Direct chair to identify comments in document 02/209r2 that were resolved in the March 2002 session, appropriately annotate these comments, and issue a new revision of document 02/209 no more than two weeks after the March 2002 session.

Moved: Steve Halford
Seconded: John Terry
Vote: 27/0/0

Motion:

Direct the chair of TGg to request preauthorization for a letter ballot to be issued on the 802.11g draft from the May 2002 session.

Moved: Richard Williams
Seconded: Jim Zyren
Vote: 26/1/0

Question: Bob O'Hara is warning about preauthorization.

Our working group rules supercede Robert's rules and we can preauthorize them.

Kevin Smart: I don't believe in signing a blank check.

Chair: It is not a blank check, it is a means of soliciting comments and progressing the work.

Terry Cole: What about the papers that have been submitted? If we can't present them, do we have to resubmit to present them in Sydney?

Chair: Terry is the only one who hasn't had the opportunity to present the paper.

Richard Williams: What about Carl Andren's CCA paper?

Chair: That is correct. Before getting into the clause 19 comments, we could do the presentations.

Terry Cole: I could present, but they are more related to the MAC issues, so this isn't the best time. I could briefly present 02/150.

Carl Andren: Doc. 02/132 – CCA (19.4.5) presentation

Energy detect has been in the standard, but it is not generally used due to Bluetooth, microwave ovens, etc.

Questions: Richard Williams: The intent is to make the CCA in 11g mode the same as 11b mode. – No the CCA will also have to capture 11g mode as well.

Richard: Is there a probability associated with this?

Editor: True, I didn't give any probabilities, but I did give a minimum sensitivity number. We could consider a probability parameter.

Richard: I believe that a probability is a desirable thing to do.

Steve Halford is nodding in agreement.

Editor: We could put a probability of 90, 95%, or something. Nobody is really checking this. Let's not get too carried away with super-detailed specification.

Richard: I would be in favour of putting in a number of 90%. It is pretty relaxed.

Chair: Is anyone concerned about putting in such a specification.

Editor: I can put that into draft 2.5. We will have to consider if that only applies to OFDM or if it also applies to legacy. Basically we can just copy over the a specification.

Richard: I am primarily concerned with the OFDM mode and not the legacy mode.

Editor: Instruction would be to have the editor wrap in the appropriate part of the 11a standard? YES

Concern with the 3.65 ms timer. Perhaps that should be smaller for the higher data rates for improved efficiency.

Concern about the maximum 1500 byte packet. Perhaps the number should be 2.4 ms.

Motion:

Move to adopt the CCA specification in Doc 02/132 and incorporate the CCA probability of error requirement from 802.11a. In mode 4, change the CCA timer value to 1.3 ms and remove the informative rate reference.

Moved: Carl Andren
Seconded: Steve Halford
Vote: 23/0/2

Terry Cole will present 02/150:
802.11g NAV Propagation

Second Paper: 02/157 presented by Terry Cole

Carl Andren: I thought that we put into the draft that some of the sequences may be illegal. – I don't think I did any of those, but I will look at it.

Ron Brackmann: You talked about a CCK data frame followed by an OFDM ACK. That doesn't make any sense. – There is a funny case where a CCK-11 data packet is followed by an OFDM-6 ACK. – Ron disagrees that the draft allows for that

We should look into excluding OFDM ACKs for CCK data frames. We may have to mandate this in the comment resolutions at the Sydney meeting.

Submissions are completed.

Steve Halford is leading the discussion of Clause 19 comment resolution.

Comment 2 (counted by rows in the Excel spreadsheet): Coexistence. Handled this with Bob Heile's comment (General comment 66).

Comment 3: OFDM G-only mode…

Terry Cole: How do we want to describe how a G only BSS can be done?

Ron Brackmann: It can be done in the support element and the basic rate sets.

Terry: Recommendation to exclude things that are impossible from the draft. This is the source of many comments.

The editor was directed to make the appropriate change. This was done by unanimous consent.

Comment 4: Accepted as directed by the special committee.

Comment 5: CCA issues. The CCA issues were addressed in 02/132 and added to the draft.

Terry Cole: We are not relying on the CCA of legacy devices and are procedures are defined in Annex E for handling this case. (with help from Carl Andren)

Richard Williams: It is not entirely true that one system is priviledged. This can be achieved by some of the methods seen in other presentations.

Comment 6: Changed to editorial and direct the editor to fix. Done by unanimous consent.

Comment 7: Reference 02/220 to show why the comment is inaccurate. The FCC specifications can be met with a sufficiently good PA and it is required by 19.4.3.8.1. Resolution adopted by unanimous consent.

Comment 8: See 02/209 for resolution. Accepted by unanimous consent.

Comment 9: See 02/209 for resolution. Accepted by unanimous consent.

Comment 10: Comment resolved. See 02/209. Accepted by unanimous consent.

Comment 11: Comment resolved. See 02/209. Accepted by unanimous consent.

Comment 12: Comment deferred. See 02/209. Accepted by unanimous consent.

Chris Heegard: TGe is looking at this issue, but we need to defer until after the joint TGg/TGe meeting in Sydney.

Comment 13: Comment resolved. See 02/209. Accepted by unanimous consent.

Comment 14: Comment resolved. See 02/209. Accepted by unanimous consent.

Comment 15: Comment resolved. See 02/209. Accepted by unanimous consent.

Minutes were not accepted earlier.

Motion: Move to adopt our minutes from the Dallas interim meeting (Doc. 02/026r0).
Moved: Srikanth Gumati
Seconded: Anuj Batra.
Adopted by unanimous consent.

2002-03-14 5:29 PM
Adjourned for the week.

IEEE P802.11
Wireless LANs
TGh minutes, March Plenary meeting, St. Louis, MO

March 15, 2002

Evan Green
Intel
2111 NE 25th Ave, Hillsboro, OR
Phone: (503) 264-8456
Fax:
e-Mail: evan.r.green@intel.com

Meeting called to order 3:20pm March 11, 2002

Evening session skipped by unanimous consent.

Meeting called to order 8am Mar 12, 2002

Agenda 02/203 approved by unanimous consent

Andrew Myles 02/142r1 Review of TPC draft text. Members were requested to review this document and be prepared to discuss requested changes on Thursday during the draft text review.

Peter Larsson 02/210 Some additional TPC aspects to consider

Discussion: Issue discuss with definition of estimated interference on slide 8. Observation that this proposal is most useful in PCF mode since in DCF mode tight power control may produce hidden nodes. Further observation that even if this scheme could not be used to control power due to hidden station concerns that it could be used to increase the data rate and thus save power and air time.

Straw poll 1. Which alternative would you prefer if this scheme were adopted: Alt 1 = 7. Alt 2 = 5. Alt 3 = 0

Straw poll 2. Shall we put this in the current draft? Yes = 4, No = 0, Abs = 12. Peter will work with editors to update draft text.

Chris Hansen 02/228 Benefits of extended DFS reports
Discussion: One view is that we should only address the minimum regulatory requirements. The other common view is that we should detect other BSSs to avoid switching to channels that are already in use.

Simon Black 02/161 A Proposal for DFS
Discussion: Regarding channel report table on slide 10. Should stations report only that they have detected a primary user (as in this proposal) or send measurements to the AP and let it decide? On slide 11, it was discussed that this is not technically needed although a potentially nice feature. Issue with slide 12 regarding management only frame period: should we use a default MIB value for this? Concern over the implementation of quiet periods (slide 7) may collide with efforts in Tge.

Amjad Soomro 02/215 measurement/quite request element for DFS
Discussion: In which frames is this element allowed to be sent in? Would be part of generic action frame. Issue with IBSS that this would have to be broadcast hence not reliable and may not be heard by all stations. A point was made that is why 02/161 proposes to use beacons to send this info because in an IBSS beacon transmission is shared among stations. Issue with slide 7, how would a measurement be conducted without asking for a quiet period? Concern about combining the quiet request with the measurement request. The quiet request is meant for all stations

yet the measurement requests are likely targeted to specific stations. Question: is the AP responsible for DFS or are all stations responsible (opinions both ways).

Amjad Soomro 02/216 Fast Channel switching
Discussion: Concern was expressed about the 'fast' mode regarding the difficulty of implementing the microsecond timing given that the existing channel switch mechanism supports a switch-now option. The counter concern is the issue of stations who may not hear a single channel switch announcement.

Straw Polls conducted by Mika Kasslin (results in document 02/205)

Straw Poll 1: Do you want to want a quiet period offset as called for in 02/215?
Y: 8
N: 11
A: 11

Straw Poll 2: Number of information elements for measurement and quiet request.
1 as in 02/215: 8
2 as in 02/161: 13
A: 12

Straw Poll 3: Need for channel switch time indicated a specific number of microseconds.
Y: 8
N: 19
A: 8

Straw Poll 4: Quiet period offset as indicated in 02/215. Same as poll 1 except after much discussion.
Y: 24
N: 6
A: 8

Straw Poll 5: DFS Measurement Reports

Option 1: 2   The functionality of the D1.1 measurement set with all the reports mandatory (D1.0)
Option 2: 0   The functionality of the D1.1 measurement set with all but the 'Basic Report' optional
Option 3: 14   The functionality of the 'basic report' only (02/161r0)
Option 4: 13   None of the above/no preference/other

Motion: To empower the TGh editors to prepare a new revision of the draft for review by the group based on the proposals for DFS described in 02/154r0 and 02/161r0 together with a quiet period offset based on 02/215.

Moved: Simon Black
Seconded: Evan Green

Friendly amendment to the motion by Amjad: Approved by mover and seconder.

Updated Motion: To empower the TGh editor to prepare a new revision of the draft for review by the group based on the proposals for DFS described in 02/154r0 and 02/161r0 together with a **measurement/**quiet period offset based on 02/215.

Call the question: David Skelrn
Seconded: Charles Wright
Noted: Amjad objected to the call.

Vote on the call:
Y: 23
N: 7
A: 2

Vote on the updated motion.
Y: 17
N: 14
A: 0
Motion fails (technical).

David Skelrn: A verbal update on ETSI conference call today on the DFS framework. Radar 'H' appears to be most sensitive to interference and requires a –58dBm threshold. They hope to have a complete draft Tue morning. Aiming for 98% probability of detection. 10 second scan required before first using a channel. In service testing will also be required.

Meeting recessed. Meeting called to order 8am Wed morning.

An updated proposed draft was prepared last night by the editors.
New number for draft is 02/245 'Potential Draft TGh text'. Members are asked to read this document and contact the editors with any editorial changes. The intent is for the group to review this document on Thursday and then consider voting to promote it to a proposed draft normative text.

Recess 35 minutes

Amjad Soomro, discussion on DFS measurements in quiet periods.
The group opinion differs around whether stations are to autonomously look for RADAR signals vs. the AP requesting measurements and thus taking responsibility for RADAR detection. More specifically should the measurement request have the ability to specify offset?

Straw Poll: Should we include and add for capability to restrict measurements to quiet periods (could be in repetitive periods)? STA to implement mandatory.
Y: 11
N: 14
A: 14

Based on this result the editors were instructed not to include this feature at this time.

Recess for the day. Meeting called to order 1pm Thu.

Andrew Myles, Short introduction to 02/245r1 submission of potential draft text.

Peter Larsson, 02/210r0a Proposal to add TPC report element in beacon.

Motion: Empower the editor(s) to amend, a (required) information element in the beacon, containing a transmit power indication, in the next revision of the TGh draft text.

Moved: Peter Larsson
Seconded: Chris Hanson

Friendly amendment: Empower the editor(s) to amend, a (required) information element in the beacon **and probe response**, containing a transmit power indication, in the next revision of the TGh draft text.

Vote results:
Y: 20
N: 0
A: 1

Vic Hayes, an update on the DFS framework. News from ETSI BRAN. The document title for EN 301 489-17 Part 17 has been changed to *High Performance RLAN equipment*. Yea!

Amjad Soomro, 02/266r0 Proposed Modifications in TGh Draft proposal. Also 02/256r0 Management Frame Channel Access Latency in TGh.

Chris Hanson, verbal presentation a case for including the RSSI histogram.

Straw Poll: RSSRI Report as in TGh D1.1 but as a new element?

1. RSSRI Report Mandatory - 3
2. RSSRI Report Optional   - 23
3. No RSSRI report   - 5

Andrew has added this feature (optional) to his proposal 02/245

Andrew Myles, review of changes now in 02/245r2 changes discussed and informally agreed during this session. Notes to editor: Editor to clarify 02/245 section 7.3.2.14, make it clear that power level measurements are on the same channel. Change RSSRI to RSSI and add its definition in the definition section. Editor to remove SDL as discussed. Add definition to the definition section to define DFS owner. Note that PICS mandatory TPC report Beacon is reflected.

Motion (technical): To adopt 02/245r2 as 802.11h-D2.0

Moved: Evan Green
Seconded: Andrew Myles

Y: 24
N: 0
A: 0

Motion (technical): Instruct the chair to bring an appropriately worded motion in the WG plenary asking the WG to conduct a WG letter ballot on 802.11hD2.0

Moved: Evan Green
Seconded: Andrew Myles

Y: 22
N: 0
A: 0

Minutes of Dallas 02/070r1 meeting approved by unanimous consent.

Meeting adjourned.

IEEE P802.11
Wireless LANs

802.11i Notes

Date: March 11, 2002

Authors: **Dorothy Stanley**
                                    Agere Systems
                 2000 North Naperville Rd, Naperville, IL 60566
                        Phone: +1 630-979-1572
                    E-mail: dstanley@agere.com

Jon Edney

Nokia

E-mail: jon.edney@qosine.co.uk

Abstract

This document contains the notes from the March 11-15 Plenary Session

1.0 Review of TGI Preliminary Agenda – Chair
Chair's Status
Monday:Editorial & Technical presentations and motions to take us to letter ballot
Tuesday: AES Presentation and motions 8 AM fixed start time
Discussion and motions for letter ballot
Attack du Jour discussion
Thursday – Prepare for next meeting

Q: Does attack du jour mean 802.1X –
A:Yes
Q: When do you plan to have a discussion with .1X
A: Can't have it tonight. Chair will invite T. Jeffries Tuesday night
Q: Concern that they are not taking our needs into account

Q: Concern – when to have discussions on AES section edits?
Try to go to letter ballot on Wednesday. Still have Friday to work towards if we can't make Wednesday.
Q: Is there time to discuss presentation on alternate authentication technologies?
Monday or Tuesday? Thursday doesn't work. Discussion should happen before letter ballot.
Chair: Need text beforehand if want to include it in the letter ballot. Is it realistic?
Would propose to move to Thursday. Let's see when we list out all the presentations.

Chair: Any objections to the agenda
No objections. Agenda adopted.

2.0 Monday Afternoon: First Agenda Item

Chair: List of submissions:
178 – Jesse (1)
222 – Alan (2)
151 – Tim Moore Changes to Information Elements (3)
145 – Bob Moscowitz – Proxy Pre-Authorized Roaming; Plan for Thursday(b)
202 – Carlos Rios – Alternate RSN Proposal – Today. (4)
204 – Descriptive text of 202
Submission – Bill Mcintosh – Cascading – Thursday ©
140 – Chesson, et al – Thursday(d)
201 – Marty Lefkowitz – Context Leasing – Thursday (e)
Submission – Stefan – Public Access Wireless LANs (a)
Submission – Arbaugh – Tuesday

144- Dorothy/Onno
1 – Russ – Update to CCM
256 - Rogaway

Chair: Can this wait until Thursday?
A: Want to have discussion early, but don't have text.
A: Need to agree on text
A: Can put it off until Thursday.
Chair: Can put it off until Thursday, will make statement about the fact that
This version of the draft won't affect this.
A: Need to go to letter ballot, expected to go to letter ballot by the industry
Chair: Agree
A: IBSS case, there will be holes. This argument applies to that also.

Discussion and agreement on the order of the presentation.

Main Presentation – Jesse Document 178

Jesse: Folks should get the document and read it. There are a few sections of normative changes. Many editorial changes.
Q: Where do I get the text if I can't get it off Neptune.
A: Flash cards.

Since the Dallas meeting, large adhoc group meeting to draft changes to section 8.
Had interim meeting in Santa Barbara. Worked through TKIP and keying. This document is an attempt to make clear what is in clause 8.

List of clauses which make normative changes. Will need to vote on these together or separately.:

> TKIP State
> TKIP MIB Attributes
> Key Hierarchy
> Master Key Derivation
> Rekeying hierarchy
> Packet sequence counter exhaustion
> Coordination of key updates
> MAC function
> Temporal key processing Rules
> PRF
> EAPOL-KEY description

TKIP State. This is new. The WEP state in inadequate to discuss the algorithms which are needed. We created new MIB variables which are more related to TKIP. Receive and transmit addresses. There is a key mapping table. Created all the state variables to map to the default key entries. Boolean flags for enable transmit and enable receive – used for re-keying.

Discussion on any of the changes?
Q: Is the array two dimensions? One dimensional?
A: Don't know. When we write the MIB, will determine this.
Comment: Still need to align the structures between TKIP, AES and WEP.

Comment: Countermeasures need additional specification.

TKIP MIB Attributes, clause 8.3.1.2.4.5
Mirror WEP decision tree. In Santa Barbara, we looked at the section for WEP, and decided it wasn't appropriate for TKIP. Need to go through it.

Starting with 8.3.2.3.3, key & key derivation is discussed. This is all new text. Text in 1.8 was adopted in Dallas as informative. Do we want to adopt this new text as normative or informative? If we think we are going to make huge changes, then keep it as informative. Changes in terminology – pair-wise and group keys.
Master key gets distributed. From this master key, various other keys are derived. Transient key gets chopped up into pieces. There is a key hierarchy for both group and master keys. Use a pseudo-random function to manufacture keys from the master keys. Difference from last time: now generate only keying material that is needed.

8.3.2.3.4 – How you get the MSK in a variety of cases – RADIUS, pre-shared static key, another AP if moving between APs.
Q: Another case to be recognized – no RADIUS server

Q: Have we pulled together the requirements for EAP methods?
A: Not really. Need to do this.

Discussion: Do we have different assumptions about what the authentication method would provide.
1. Unique key every time.
2. AS and STA agree on key in secure way, immune from eavesdropping and man-in-the-middle attacks.

8.3.2.3.4.2 – How to generate the group key.

8.3.2.3.5 – Re-keying hierarchy
Can Niels take a look at this? Check that it is consistent with what Niels had recommended.
Want 256 bit keys, since need to achieve 128 bit.

8.3.2.3.5.2 – Pairwise transient keys
Comment – there is a glossary at the end of the document for people to refer to.

8.3.2.3.6 – Packet Sequence counter
May change this.

8.3.2.3.7 – Re-keying Specification, including coordination of key updates.

Also added definitions of the variables in the state machines.
Also provided examples of scenarios. Many cases described.

8.3.2.3.8 MAC functions – includes discussion of MIB variables needed. Need to link to TKIP/AES requirements. Don't overload the WEP variables.

8.3.2.3.10 PRF – New PRF from Niels, to address his concerns.

8.3.2.3.11 – New Key Descriptor – Need to coordinate with Tony Jeffries. Either .1aa gives us a number and we define it, or we give this text to .1aa.

Q: Is a new EAPOLKey descriptor needed?
A: Yes.

Q: Where are the MIB variables implemented?
A: These are MAC variables, no impact to the authentication server.

Comment: Discuss now, and have vote on it later this evening.

Q: Should we update this prior to the voting?
A: Sure, suggest the changes now, if minor editorial changes, can make comments during letter ballot process too.

Q: Need to look at the payload?

.1X messages are encrypted when there is a key present. If you have a packet, and no keys, send in the clear. Still looking.

Q: How do I get the document that this is changing? IEEE is in the business of selling the standards. Copyright violation to distribute to non-voters, or nearly voters.
A: Previous documents is on the private area of the website.
A: Submission is available, and on the public website.

Q: Is text in 1.8 still valid?
A: This document will replace section 8 of 1.8. Needed to clarify and re-organize the previous text.

Q: Can Tim incorporate 802.11 formatted state machines?
A: Jesse has the power to change re-formatted but not re-defined.

Q: Will editor's comments remain in the draft?
A: Plan to leave them in.
Q: If they stay in, likely to get no with comment rather than "yes"
A: Still need to resolve the comments.

Second Presentation Monday Afternoon– Alan Chikinsky –
Comments on Draft 1.8 Editing Changes
Comments: Took out terms like "low-cost", tried to simplify, removed RSN in some places,
Issue: must be backwards compatible. Need to clearly differentiate rationale and requirements. How to implement a pre-99 system? Need to specify WEP too.

Q: How to proceed?
A: If these are editorial changes, work with Jesse offline.
Comment: People should read through the comments.
Q: Are these comments against 1.8 or Jesse's draft?
A: These comments are against 178, not 222. On Neptune submissions.

Q: Can you say that all of these comments are editorial?
A: Believe they are all editorial. Intent is to make editorial changes only.

Chair: Any objection to breaking early for dinner?
Meeting adjourned until 6:30.

3.0 Monday Evening
Jessie Walker is recognized to present motion.

Motion by Jessie Walker:

I move to instruct the editor to replace the text of clause 8 in draft 1.8 with the text of doc 11-02/178r0

Seconded Ono Letanche
Comment: Making the motion to reflect the intent of all the people who have worked on this.

Comments: Talk against the motion. He has presentation to provide "massive" reconstruction. He feels it is premature to adopt the text at this time.

Q: Clarify status of text intended.
A: Intends it to be normative text

Cmt: Advise against making normative because there is more changes to come and this will slow down changes in the future

Q: Is current clause 8 normative?
A: Yes except for the keying stuff

Chair: In the past we have made things informational as a method to get stuff in but advise against this in this case. It should be normative.

Comment : In the interests of multi-vendor interoperability clause 8 must be normative

Vote :
Motion passes 26 : 1 : 2

Presentation by Tim Moore

Information element changes to Tgi : 02/151r0

This was done because there was ambiguity in the way information elements were described in previous draft.

Idea to collapse all the information elements into a single "RSN" element
New idea to advertise how many keys are supported by the device

Currently no way to specify cipher / authentication suites – therefore change to MLME-Start to add this information in primitive.

Propose to add the text in 02/151r0 into the draft.

Questions:
Q: Is document on server?
A: Yes it is in pre-meeting directory

Q: What does it mean "number of keys" is that number of stations?
A: No this is number of keys supported on that station
Cmt: but if you are RSN station [isn't this implied]
A: no it does not current say that you have to support pair keys. Station and AP must put this information into the beacon.
Q: Don't understand why this matters at the station side – only matters at the AP
A: Advertises how many keys it supports not how many keys it has.
Cmt: but station is setting up keys based on instructions from AP
A: But how does AP know what to do. AP doesn't know whether station supports pairwise keys or not.
Cmt: But AP could tell station how to use its available keys.
Cmt: But station should not attempt to associate to AP if it doesn't believe it can support the keys of the AP
A: But AP could change it mode of operation when it discovers station only has group keys. But then it needs to know whether station supports it
Cmt: Only solution is to make it so the station can map its keys to pairwise on demand but we decided that this was not acceptable.
Cmt: Problem is that some station might not be able to support both pair-wise and group keys
A: but 802.11 mandates use of four keys
Cmt: All stations and APs support four keys. These can always be specified to be either pair-wise or group keys
A: But this is not true for IBSS case. Then you have the advertise number of keys
Cmt: Would like it to be clear that stations do not need to advertise this in the ESS case
A: This works is assumption is that stations that do not support pairwise keys simply map these to group keys
A: Do we ever want to support multiple group keys on AP. In this case it doesn't know whether the station could support this. Taking away the ability of the station to advertise takes away the ability to expand in the future
Cmt: Well then we shouldn't have to use it until we need to.
Cmt: AP can just specify the key ID to use. Station doesn't care whether it is key-map or default.
A: This means you make the key ownership much more complicated. We would have to double the number of states in the state machine
Cmt: We are just taking advantage of the fact that we know there are four default keys
A: Yes but you are assuming an ESS
Cmt: OK but if you are accounting for IBSS – this needs to be figured out before committing to this.
Cmt: How can you do the mapping to n keys?
A: this is done internal. Externally you still use the key-id bits but in IBSS case this could be mapped to large key table by indexing through MAC address
Cmt: Small percentage of stations don't support two pairwise keys
A: So should we bring a motion to not support stations that support group keys only
Cmt: No you need to allow people to support group keys only
A: If you can support either case how does the station know what to do

A: Ok Question is AP can support pairwise and group keys. If a station comes up that can support only group keys is it allowed to join? This is the key question.
Q: We agreed in AP case it doesn't really matter
Q: If AP is supporting stations and they are all supporting pairwise then broadcast go out with group key. Then if station only supports group keys would they go on the broadcast keys or would there be separate group key for unicasts?
Q: Since there is so much debate is it worth bringing the motion?
Cmt: Maybe modify the motion to include everything except the number of keys

Motion: **To incorporate document 11-02-151r0-I- "Information element changes to Tgi draft 1.8.doc" into the Tgi draft except making the unicast suite count and the authentication suite count two octets in size and deleting the dpair and apair items from the information element.**

Moved by Tim Moore
Seconded: Dorothy Stanley

Motion Passes 24 : 0 : 6

Presentation by Carlos Rios

"A Comprehensive, Simplified Alternative RSN Proposal" 11-02-202r0-1

Believe there are substantial problems in existing proposal
This proposal is much simpler and solves all problems

Currently group is intending to put out draft and "punt" to rest of the group. Believes that group will throw it back. Believes that it will never work.

"pseudo text" for new proposal is available and could be made into new draft this week.

RSN should be extended to cover IBSS and Simple infrastructure networks

Q: on Slide 8: where is the liveness?
A: In the Nonces
Q: Where are the Nonces?
A: Well they're not shown on the slide but they're in the text

Summary:
This consists of retooling the stuff we have
However this is a big change
If there is any interest please read the text
Think it is a valid maybe compelling alternative
If people like it maybe it could go to letter ballot

Q: Could adversary spoof the AP by issuing beacons?

A: This is really a DoS attack because you don't know the master key
Cmt: but this means you break traffic when reassociating
A: Yes but in a wireless system you are reassociating all the time
Cmt: Don't know any stations that can associate in 1 ms
A: No reason why it can't
Cmt: Associations are not acked so get overwritten by other packets
A: But you get disassociated all the time
Cmt: disagree. Current APs take a long time to set up state
Q: If you have extended IV why need to disassocate at all
A: But your disassociate every ten minutes now
Cmt: No station don't currently diassacoiate now that's not true
Cmt: But if you disassociate from AP AP drops packets
Cmt: currently disassoc means AP drops entire state. You are assuming AP keeps state after disassoc – this is a 802.11 state machine change
A: This is implementation issue
Cmt: no it is not – it is 802.11 issue
Cmt: Disassoc. will cause session breaks. You can't guarantee that you can get back right away
A: Well if you are exhausting IV you have a lot of data going on anyway (??)
Cmt: What reasons for disassoc other than IV exhaustion
A: Also roaming
Cmt: You are moving the group master key to everybody
A: Yes. Transmitted in encrypted form
Cmt: What if I've left the company. I can still access because my master key is still valid
A: no mstr key is derived from nonce
Cmt: OK so how do you revoke station who has master key?
A: example : you associate and you get your pairwise key.
Cmt: But my company never closes down its network
A: Ok then you get a new key every time (??)
Q: Now do you get your initial credential?
A: Read the book about how to do back end authentication (??)
Q: But if you change the group key you have to make all the stations reassociate
A: Yes but dealing with disgruntled employee is not job of 802.11i
Cmt: This proposal does not prohibit 802.1x from being used on top

No motion presented at this time.

Tomorrow 8am discussion on AES.
Any objection to recess?
No objection meeting is recessed

4.0 Tuesday Morning

Chair: There is not enough time to incorporate the text from yesterday in time for vote on going to ballot today. This vote can be taken on Thursday for presentation to Friday's plenary.

Floor open to discussion. Niels Fergussen presenting verbal comments
He has published an attack on OCB. He observes that Phil Rogaway is aware of this attack already. At current data rate this attack is not so significant but in future this might become a problem if very large data rates come in.
Q: You seems to be overstating the impact of this attack because it is attack on authentication not encryption and require huge amounts of data
A: In my opinion breaking the authentication is worse than breaking the encryption and we have to think about the future. Will Tgi last for 30 years? There were similar arguments when DES was invented but now there is a problem
Q: Would you characterize the paper as showing a bound to OCB or is it an attack on OCB
A: Depends on definition of attack. The attack is right at the security bound of the proof so we know it is no more secure than the proof. Main issue whether the size of data required for attack is relevant (i.e. it is so big)
Q: But maybe this is just showing that there is always a bound to any solution
A: Yes but I think we can do better
Q: This could also be fixed by the re-key approach but at slower rate than TKIP
A: Yes if you re-key problem is solved but re-key is big problem
Q: So one way to protect would be to put upper bound on data transferred
A: yes
Cmt: We don't want to run into another WEP. So which route can we take to minimize risk. Can we expect surprises at lower amounts of data.
A: Attack is already at security bound so this doesn't contradict the previous security claims of OCB
Q: Have there ever been any ciphers that have lasted 30 years?
A: Can't think of any useful ones. DES is "pretty dead" Public crypto study has not been around for 30 years so not fair comparison.

Presentation by Phil Rogaway

"Some Comments on OCB and CCM" 02/156ar0

Talk mirrors a paper that was distributed recently called : "some comments on WHF mode" WHF is now called CCM.

When OCB first picked up by Tgi it was very new. Since then OCB has done well and there is a lot of follow on work. Purpose of presentation is to defend method against recent comments but more than that the purpose is to allow opportunity for group to ask questions.

Rogaway said that most of the technical objections that have been raised are not valid. He covers reasons for this in presentation. One valid issue is authentication of plaintext along with cipher text.
Main objection seems to be related to patent related concerns.

All the mode have a degradation of security when you get a large enough sample of data.

Slide 5:
Q: Can you explain how you got these numbers?
A: Let's go over it off line

He believes that privacy is more important than authentication because authentication doesn't matter after session ends but privacy issue continues as a problem if data is recorded.

He thinks technical objections are spurious and that it is all about patents.
Doesn't understand this. There are 53 companies that have filed patent disclosure in 802.11 so why is there such a concern over OCB?

None of the IPR owners is trying to may it difficult to arrange licensing so why the concern? His interest is to get OCB widely used. It is not in interest of IPR holders to make this difficult now.

License is not charges to semiconductor vendor but collected from manufacture of products using the chips. Rogaway will place detailed IP standard on his web site.

Q: Is there a worry that this will be found to break later. Is this possible?
A: Not from crypto standpoint. Can't speak for how it is applied in the standard.

Q: So if I am a silicon vendor and I sell to product guy in Taiwan and they sell to European OEM who pays license
A: Possibly no one because I only have a US patent

Q: In the last meeting we were told the IPR owners would get joint position. Is that done?
A: Negotiations in progress but no announcement today

Q: what about open source software
A: I would make it freely available for this if not for profit
Q: What about IBM do they agree
A: don't know
Q: what about open source for profit?
A: not sure what that means – I'm not a lawyer
Cmt: Our concern is not you – it is the parade of lawyers than might follow
Q: would you consider relinquishing your patent to IEEE?
A: I would if this were somehow necessary but I don't think it would solve the whole problem

Presentation continues from slide 8

Concern that approach is to glue together two we'll known modes and assume that result is equally robust. However, he doesn't believe this is valid conclusion. CCM is actually

more complicated than it seems. The idea of pre-pending the length is something that appears to be a valid way to do CBC-MAC but it to some extent it is unknown. There is no proof in the literature.

Other issue is the sharing of the key in CCM. All the methods known for gluing encryption and authentication then using two keys is important. It is known that in many methods a common key breaks the security. It doesn't mean this is a problem in all cases. However, this needs to be proved in this case.

There is a claim that CCM is more secure than OCB. He is not aware of any analysis that can support this claim. Some of the statements don't make an sense – maybe these are unintentional statements.

Cmt: these statements were claims not results of proof.

Uncomfortable about the process by which CCM came about. Generally, cryptographic techniques which come out of standards groups are problematic.

End of presentation

There are questions from the audience challenging statements made by Rogawau with regard to problem with MIC then Crypt vs Crypt then MIC. There is disagreement between members of audience about the validity of the published analysis in this area.

Q: Sounds to me like we have 20 years of experience of auth and encryption. In you presentation you say OCB doesn't have advantage over separate auth and encrypt.
A: I believe that OCB is as good as separate Auth and Crypt. 802.11 probably doesn't have a problem doing separate auth and crypt because speeds are relatively low.
Cmt: Initially CCM was drafted with two keys but switched to one key towards the end because we believes to be secure

Q: Does Niels attack give help in defining when to re-key
A: Not really – it is such a high bound anyway. If you want to be really conservative go with separate auth and crypt.

Presentation by Russ Howley

"AES Encryption & Authentication Using CTR Mode & CBC-MAC" 02/001ar1

Further presentation presenting further improvements and results of proof work for the method

Document has been reorganized to better serve purposes of cryptographic community and standards community.

Change to the way encryption is performed on the payload / MIC combination.

Proof is in progress. Not completed yet but there is a proof outline with all steps understood. This will be presented to crypto conference. Looks like it will have the same

security bounds as OCB but proof will be less complicated than OCB (claimed by Howley)

Authors have explicitly released IP rights to public domain. Not aware of any other work prior to this that would have claims.

End of presentation

Cmt: If this was a used car and I was given it for free I would ask "what's wrong with it"
A: Not totally free – no patent fee but harder to implement
Q: is there a difference in the overhead and packet size compared to OCB
A: No they are the same
Q: Will method when the keys are derived from the same key material will last 30 years?
A: Yes believe this. There is a proof that it is OK to use same key
Q: Is there a chance that IP-SEC will use CCM?
A: Can't say precisely but we are advocating this. IP-SEC clearly want combined auth/crypt method. IETF is hostile to patents much more than IEEE so we are hopeful that CCM might get adopted. If it common between IP-SEC and 802.11 this could have cost advantage
Q: Putting the length up front is a problem for streaming environments where you haven't got all the data yet.
A: Yes but this is not really a problem for 802.11 or IP-SEC
Q: Is the length value at the front necessary
A: Basically yes but depends on how you do things. Certainly needed in current approach.
Q: Could you comment of the implementation issues in silicon. How does it compare to OCB?
A: The first order for complexity is about the same. CCM is probably fewer gates but not very significant
Cmt: If you are trying to do counter mode at line speed you need two blocks compared to OCB but each block is smaller so it all comes out pretty equal.
Q: How many gates required
A: Depends on many factors. On the order of 10 – 20k gates
Q: Transmitter address is included but there is a question whether it should be TA or RA included
A: No the MIC is calculated over the whole header but mutable fields set to zero
Cmt: Note headers are variable length
Q: Is MIC per fragment or per frame
A: It is done at MPDU
Q: What are advantages over separate auth/crypt approach
A: We believe this is as good and separate approach and so the reduced key management seems like an advantage. If group is risk adverse then no problem to go to separate approach
Q: Do you think that two separate keys is safer?
A: No I think there is no improvement by using separate keys

End of questions
Meeting recesses at 9:55

5.0 Tuesday Afternoon

Presentation by Onno Letanche

Proposed Ti D1.9 Clause 8 AES-CTR CBC-MAC (CCM) text : 02/144r1

Presentation of text changes showing AES-MIC structure

Presentation of diagram to show authentication method

Presentation of encryption / decryption structure

Slide "Packet number format"
Cmt: There is not enough IV bits shown in slide – need one more byte
Cmt: Concerned that the header is not word aligned
Q: Is the text intended to be a mandatory mode
A: Yes that is intent

Floor opened, Dorothy Stanley recognized – wants to bring motion.

Motion: I move that the editor be instructed to replace the existing text in clause 8.3.1.3
with document 02/144r1 as normative text after appropriate modification to include 4
bytes IV instead of 3 byte IV

Seconded : Niels Ferguson

Q: Is the clause number correct
A: Yes this is correct for the latest version of the draft
Cmt: Speak against. Have not heard clear technical reasons to abandon current approach.
Change without technical reason is bad for group and 802.11 – would look arbitrary.
Also proposed algorithm is new. This is problem for security. Virtually no one has done
paid analysis of OCB but who has done it for this method either? Recent "attack" on
OCB is really a property of OCB and is useful data point.
Cmt: Paid analysis: employees have been used to do proof and this has been paid. Recent
report says that proof is done in almost all areas except use of single key. Could use two
keys to relieve concern
Cmt: Against motion: We are proposing to replace something with technology which
seems to be still evolving which might cause further delays.
Cmt: Newness issue: OCB needs to be extended to cover plaintext protection – this will
make it even newer. Note that the cryptographers in the group is recommending this
approach so why is group not accepting this recommendation?
Cmt: Speak against: Surprised that this change is proposed after being in for ten month.
Don't see strong reason for change. OCB has had more external review than CCM mode.

Reason decision is hard is because these are similar approaches but this is also reason not to change

Cmt: Can we have straw poll for a delay for more discussion.

Cmt: Every time we come to the meeting we have to vote on this. Let get on with vote now.

Straw poll: I support delaying the vote until later in the week
Result: 21:57:10

Duncan Kitchen calls the question
Second : Mathew Shumake

Objection to calling the question is noted
Vote on calling the question:
Result: Pass 46:23:12 question is called

Restated Motion: I move that the editor be instructed to replace the existing text in clause 8.3.1.3 with document 02/144r1 as normative text after appropriate modification to include 4 bytes IV instead of 3 byte IV

Result of vote for main motion: Fails 43:34:8

Cmt: If we use two key CCM this is a very well tested and tried approach. We cannot rely of proofs by themselves for either method. In this context where there is no compelling reason to use OCB can't see any good outcome considering that there are multiple patent claimants

Cmt: Motion is not what I expected. The argument seems to have been around patent issue. Several people felt that OCB patent issue under control. It was appropriate to adopt CCM as unencumbered but maybe it would have passed if CCM was added without deleting OCB.

Cmt: Amazed this morning to see how fluid the patent issue is because the situation seemed to change with every question. Position is not clear and that is surprising.

Point of order: Is this discussion in violation of IEEE policy on patent issues?
Chair determines that discussion is acceptable after reviewing guidelines

Cmt: Motion was introduced based on this morning's meeting. This boiled down to a simple statement: "both are likely to meet needs technically". The differentiator then comes down to IPR encumberment. CCM is unencumbered as far as known. If CCM is adopted we as an industry don't need to worry about the unknown future liability whatever that might be.

Dorothy Stanley to make motion:
"I move that the editor be instructed to insert document 02/144r1 as normative text into the existing text in clause 8.3.1.3 after modification to include 4 bytes IV instead of 3

byte IV and with appropriate editorial adjustments to make OCB optional and CCM mandatory."

Seconded: Russ Housley

Move to divide the motion: Chris Heegard
I move to divide the motion into two motions as follows:
   1) I move that the editor be instructed to insert document 02/144r1 as normative text into the existing text in clause 8.3.1.3 after modification to include 4 bytes IV instead of 3 byte IV and with appropriate editorial adjustments to make CCM mandatory
   2) I move to instruct the editor to make appropriate editorial adjustments to make OCB optional."

Motion is withdrawn
Return to main motion

Request to rule the motion out of order because it is technically similar to previous motion except with an addition. This would result in a draft with substantially the same content as the previous motion.
Chair: rules against the request
Cmt: Request to reconsider because second motion is a modification of the intent of the first motion which was rejected.
Cmt: If original motion passed then you could have motion to add OCB as optional
Cmt: Chances that IETF would adopt CCM is quite low and they seem to want to use ccb-Mac in more traditional form. So caution group that two key approach might be better or more consistent with IETF
Cmt: Request for a straw poll to table until Thursday
Cmt: If we table to Thursday we won't get draft out to ballot

Straw poll: I support delaying the vote until later in the week

Result: 22:57:11

Cmt: I really think we should listen to the cryptographers. This group has bad record of defining crypto.
Question is called by Chris Heegard
Seconded : Shawn Coffui

No objection to call the question, the question is called:

Restated motion : "I move that the editor be instructed to insert document 02/144r1 as normative text into the existing text in clause 8.3.1.3 after modification to include 4 bytes IV instead of 3 byte IV and with appropriate editorial adjustments to make OCB optional and CCM mandatory."

Result : Fails 45:36:1

Next agenda item : Discussion and motions for letter ballot

Chair : Do we have a sense that draft is ready for a letter ballot:
Editor : I believe that with a few more hours work document is in a state suitable for letter ballot
Chair : We would need a motion to instruct the editor to prepare text for draft 2. After draft 2 is ready we need four hours prior to motion to go to ballot. If that passed motion goes to plenary
Motion by Alan Chickinski:

"I move to instruct the editor to prepare draft 2.0 based on current text (D1.9) plus changes adopted during current meeting"

Seconded: Merwyn Andrade

Result : Pass 54:1:2

Recess until 6:30.

6.0 Tuesday Evening March 12, 2002

Meeting called to order 6:50

Chair: Agenda is "Attack du Jour", 802.1X attack
Russ has presentation on TKIP

11:00 AM Ballroom D meeting of 802.1aa, however it conflicts with 802.11 plenary

Bill Arbaugh, Arunesh Mishra, "A view of Tgi from 20,000 feet"
Didn't issue press release, submitted to Usenix conference. Paper was
On the website. "Googled" by a reporter, he called WECA, uncertain response, then
He called B. Arbaugh. Attacks were against TLS.
Paper is at www.cs.umd.edu/~waa/1x.pdf .

Systemic problems in EAP state machines
2 Problems – Synchronization of state machines - .11,.1X,EAP
Message Authenticity – 802.11 frames, EAP.

How to improve ? Understand the state machines (UMCP)
     -Formally define current state machines
      -    Analysis by hand and machine

Porivde message authenticity – data frames via MIC
Management frames via auth information element or other mechanism
EAP TBD.

Q: Do you have the results of the analysis?
A: No, not done yet. A lot not documented.
Q: How can you authenticate the messages before you've authenticated the user?
A: Hard problem, looking at it.
Can authenticate the exchange at the end. Working with IETF
Q: Timeframe for completion of state machines?
A: By the end of the summer.
Q: What is the best way to compare these machines?
A: Results fed into IETF EAP BOF
Q: Which versions are you analyzing?
A: .1X- minor edits will be required. EAP is stable, .11 just starting the analysis

Systemic Problem – The problems being addresses by Tgi are too complex for a task
group of this size. Crypto: TKIP, AES, Initial key agreement, re-keying, secure roaming.

Recommendations:
- TGI focus solely on TKIP and AES solutions
- -Increase the size of the IV for TKIP and eliminate the need for rekeying
- Define key requirements for IETF
- Transfer initial key agreement mechanism to the IETF EAP BOF/WG
- -Establishes keys as part of the EAP process
- - This binds the network layer identity (EAP identity) and the link layer
  identity (MAC address)

Q: What does "key requirements for IETF" mean?
A: Can augment EAP methods.
Q: Can't increase IV size.
A: Wait for Russ's presentation
Q: Is secure roaming within our scope? Do you have recommendations?
A: Looking at this in UMD test lab.
Q: Should we start a new PAR for this?
A: Focus on crypto first.
Q: One of concerns is that we've created something more complex than IKE.
It failed in the market, we need to simplify.
A: Agreed.
Q: Crypto is no good without keys. If key work is done in IETF, have dependencies.
A: Yes, if work to extend IV space works, simplify the problem. Just left with initial key
agreement. Believe doing this at the upper layers is more secure. Some from this meeting
will attend EAP BOF next week.

Q: IEEE has a broad scope. Still need to deal with home, small systems, with pre-shared
keys. We could address this in IEEE, & others in IETF.

Q: Still need to address 3 way handshake.
Q: In act of moving EAP method discussions to IETF, have moved responsibility. Requirements document needs to be sent. Done already document 40.
Comment: IETF may not be willing to catch the ball on this.
Q: A lot of valid work for this group to do. Have to understand what we need to make this work.
Comment: Agree with moving to EAP layer. But need to give a clear message to the public. Need to be clear on what we need. Many RFCs, etc.
Comment: There exists an agenda for next week. Look at the agenda to see if there is anything on it that we need. There has been discussion of a draft charter, doesn't address what we need. Bernard has sent out a request for one page/5 minute summaries of EAP methods. Need more time. EAP needs to be fixed. Charter must address our needs in a timely fashion, otherwise, we don't need to support it.

Chair: Any discussion?
No Discussion

Move on to Russ's presentation

TKIP With 48-bit Ivs

Desire to reduce re-keying. Therefore need to increase the IV size.
Key management is hard. Cannot be eliminated, can increase the lifespan of each key.
Still need key management to establish keys at the beginning.
Concept – TK, TA, IV – 32 bits become input to phase 1
Frame format – need a location in the frame for an additional 4 IV octets – the 32 bits.
Should use the same solution for TKIP and AES.

Recommendation – adopt longer IV size.
Q: Where to put the new fields?
A: Many options, support legacy hardware
Q: Still need to deal with re-association. Expensive.
Keep group key re-keying, dispense with pairwise re-keying.

Comment: Need to reduce complexity. Tradeoff is an additional 4 octets per packet.
Q: Associate, come back, carry on from where you are. Maintain IV counts for each AP.
A: Or establish a new pairwise key. Also are
Q: Put IV in the beacon?
A: Says upper part has to be the same. Might be implicit ways to, but easy to get wrong and complex.
Comment: Agree, simpler to just send the bits.
Comment: No motions now, want to minimize additional workload on Jesse.

Q: Are there action items that we need to follow-up with .1aa.
Chair: Can't attend
Comment: Jesse will attend, need direction

Q: Do we have a decision to make on Bill's suggestion to push work to IETF?
A: You can make a motion. But want to go to letter ballot. Can make changes after letter ballot. We have added more and more work for ourselves. Need to step back and make coherent.

Q: Given that we have a can full of worms. We may have straightened them out, haven't removed them yet.
A: We needed to straighten them out before we can see what we have.

Chair: Need a laundry list of things to talk about in .1aa
    (1) Label in .1X state machine missing. Inconsistencies in state machines.
    (2) Re-keying EAPOL-key message – discussion. Need to agree among ourselves first, and specify our requirements.
    (3) Comment: Look first at Bill's analysis, and decide what to do first.
    (4) 802.1 changes might be media specific. 802.1X may want to maintain media independence. Is there more than one media that uses 802.1X?

Comment: 802.15.3 has the same problem. Is using 802.1X, but current .1X doesn't meet their needs.

Chair: Any more discussion?
No Discussion
Recessed until 8:00 AM Thursday.

7.0 Thursday Morning

Motion provided ahead of time by Jesse Walker, 7:50AM Thursday:

Instruct the Tgi Chair, while wearing the t-shirt presented on March 14th, to move, in the 802.11 WG meeting on behalf of Tgi to conduct a WG letter ballot to forward 802.11i-D2 to sponsor ballot.

Meeting called to order 8:10 AM Thursday

Chair: Last work item was to instruct editor to prpare D2.0. Give floor to Jesse
Q: If have another paper to present, will there be time?
A: Yes, after existing presentations

Cmt: Draft 2.0 is on the server, was put there yesterday.

First, note that there was an editorial error. In the TKIP mixing function test vectors. He updated the Phase 2, but not the test vectors. Need go back to Rev3 of doc 150.

Dave, TGI has a gift for the chair. Chair presented the gift, a t-shirt with the phrase

"Never underestimate the power of stupid people in large groups".
Chair: Thank you. Chairs and vice chairs also received similar shirts.

Jesse Walker: Motion

Instruct the Tgi Chair, while wearing the t-shirt presented on March 14th, to move, in the 802.11 WG meeting on behalf of Tgi to conduct a WG letter ballot to forward 802.11i-D2 to sponsor ballot.

Seconded: Alan Chickinsky

Discussion:

Cmt: Is there time to make a presentation prior?
Chair: No, has been seconded. But you can make a motion to table.

Motion to table this motion by Carlos Rios.
Second: Roger Knobe

Cmt: The motion to table is debatable. Can include the discussion there.
Chair: Motion to table is undebatable.
Vote: 2:25:14 Motion fails.

Cmt: would like to say a few things.
Chair: Welcome discussion

Cmt: Speak against the motion. A bit premature. Making a mistake. Setting ourselves up for negative comments from 802.11, fo going to LB before we're ready.

CMT: Speak for the motion. Draft does some things I like, some things I don't. Best consensus a t the moment. Industry expects a statement that we are making progress. This does it.

Cmt: Speak for the motion. Contents are complicated. But can serve to move simpler comments ahead and speed up the process.

Cmt: Echo same sentiments. Doesn't represent all work. Important to benchmark current state. Expect LB to fail.

Vote: 40:1:1 Motion passes.

Chair: Next step: He will make this motion at the WG meeting. Raised a question on state diagrams. This may or may not become an issue on Friday. Help answer this

CMT: Do have state diagrams in the draft. Areg and Tim have worked diligently to create new state diagrams to more clearly and completely describe the operaition. Not done, but

here is real documentation for how these things work. Have a plan for completing the state diagrams.

Cmt: State machines come up in the WG meetings. Issue & rules should be revised by .11 as a whole. Can Tgi be self sufficient here. Should we work on acceptable descritptions.

Chair: On Monday there was agreement to have editors work on this
Cmt: Editors agree that each of the task groups must provide state machines in the best methodology for their group. 2 problems: SDL a dead language. Also, idea of a single .11 state machine doesn't make any sense. All tg's making changes to this. Would be a nightmare to have a way to integrate these independent pieces in an annex in one place, and still correlate in the text. Tgi will do our own state machines, put in text. Editors will assume this is the way to proceed until told otherwise.

Chair: With the original .11 spec, went to UNH, testbed. Never used the state diagrams. Always referred to the text. Their usefulness was not needed at that time. Wisdom of creating these just for a checkbox is questionable.

Chair: Review presentations

258 Halasz, Anann Pre-Authentication w/802.1X
250 - Stephen Roemer – Public Access
145 -Bob M. 145 Proxy re-Auth Roaming
Bill M Cascading

140R1 – Secure Roaming – Greg
201 – Context Leasing – Maryt
152 – Tim Moore
141 – Jon Edney
243R0 – Bernard – 802.11 IP

Chair: Have a presentation Pre-authentication in 802.1X, co-authored by Keith Amman. Any objection if I go first?

No objection.

Any preference for Tim? No.

Chair: Steph

151: Requirements for MICs – alternatives to Michael.

Presentation 250r0, Issues in Public Spaces

Access Scenario: Require WLAN access to be as secure as access in 3G network. Security association is between the mobile mode and the secure server.

Security endpoints – could tamper with AP, wired link not secure. WSN/FA is in a secure place.

Public access is an important WLAN scenario
Security in public scenarios should be important to Tgi
How can Tgi secure traffic in the AP and the connecting cable.
Move the security endpoint into the wired network.

Should be possible to signal the AP not to perform data asuthentication, a node in the wireless network will check integrity
Optionally, do authentication and encryption in the wired network.

Consequences – higher security in public access scenarios
Transparent for RSN capable mobile nodes
Little point in using OCB, separate MIC preferred
Simpler/legacy APs without RSN could be used
Have to solve signaling between the AP and network node, fragmentation

Q: Which portions are need that we are not addressing? Authenticaiton?
A:

Cmt: Users will use application level security
A: Charging and billing probably the most serious

Cmt: Stated goal is to provide Wired equivalen privacyt. In this scario, you allow tapping of the wire.

CMT: Raise interesting questions, a lot of companies and standards organizations are working on "glue-ware" to bridge the 3G networks to WLAN side. Protocol converters, or control points. Many ways to get at it. Question for us, we should look at this as an embedding problem. What we work on cannot solve the problems of the larger scope. What is the proper level to characterize the interfaces of what we're working on? Request that others provide input on the external control points needed for integrating within WLANs
Resp: Perhaps management only is needed.

Cmt: One of early thinkings was that people would use VPN anyway. But some customers do care. Real concern comes from the operators, concerned that someone could attack one of their subscribers. Same problem exists for wired. Where does this need to be solved? 802.1, rather than 802.11?

Cmt: In a public space, public behind the AP, want to run a VPN. But no billing. 802.1X will provide context for billing.

Cmt: Can you compare physical security of 3G systems with WLAN. People can track & monitor 3G systems too. Wireless phone and WLANs have the same issues.

Cmt: Have the security all the way to the secure server.

Cmt: Need tools to hadle

Cmt: Scope of this wg is wireless, not wired. AP to server should be addressed at a higher layer

Cmt: Possible to make changes at link later to support this.

Cmt: Different subnets – layer 2 tunnelling protocols can be used to solve this

Cmt: Not a .11 MAC problem, perhaps 802.1

Cmt: Object to splitting encryption and authentication

Cmt: Something to consider, need to think about which aspects need to be solved, break up into components

Cmt: Is it possible to specify which are the 802.11 MAC issues? Include 3G authenticaiton credentials in the WLAN environment. Is there a way to eliminate use of the SIM card?

Cmt: Authentication can be done without SIM, still need to protect data.

Cmt: Does the solution to the billing problem include non-repudiation in addition to authentication?

CMT: What does non-repudiation mean in layer 2?

Cmt – Partition authenticaiton of end user and payload data

Cmt: Primary concern is protection of payload data from end to end

Cmt: My presentation deals with the same topic. Can I go next?

Chair: Would you mind – Have Keith here

Cmt: Feedback.

Cmt – Interesting, but this isn't the right forum. A lot of vendors are looking at solutions to this. Have a standard way of doing this.

Next Presentation: Halasz, Amman – Pre-Authentication with 802.1X

Chair: I'm not going to make any motions, don't need to give up the chair

Roaming comes up again and again. Review 802.11b state machine diagram. Class 1 frames include data frames. Data frames with FC control bits To DA and From DA are allowed. IEEE 802.1X packets from the supplicant go to the authenticator, not the DS.

Supplicant can be associated and then perform multiple 802.1X authentictaitons to different APs. Supplicant can do a "make before break"

Requires no changes to 802.1X ot 802.11. Helps to simplify, simplify, simplify, (a la Carlos) without introducing new concepts.

Cmt: primary reason – needed an event to begin the process. EAPOL-Start is there to activate. Why this is after association today. No intrinsic objection to this.

CMT; Takes the burden of roaming from the AP to the supplicant

Cmt: Were in the state machine would you put the authentication?

Cmt: Phone could associate, do 802.1X, talk. Cound do .1X with a second AP.

Cmt: How long could you remain pre-authenticated with an AP forever. People have to implement a timeout mechanism, or wait for association request. Brings closer to original 802.11 state machine.

Cmt: New AP runs out of resource, because everyone is doing this. How does the station know this has happened. STA would not be able to associate.

Cmt: Had a problem with WEP

Cmt: Not everyone has to do this – sta could go through all way and part way.

Cmt: This has been an ongoing concern for me. Have been talking about this on and off. Began to develop this concept. Want to move one step forward.

Cmt: A good move towards simplification. 802.1X is a port based mechanism. Before the association there is no port. No Association ID.What about having the keys on a number of APs, is this deemed to be secure. Is it ok to have a set of keys set up and distributed. How would these keys be revoked.

Cmt: Power save might be an issue.

Cmt: A lot of views that "can't do this" Really asking for no change, rather than a small change. A realization that this can be done.

Cmt: Onlt took this so far. Still questions. After association, may need to prove that you are the right person.

Cmt:Like it a lot. Greg's presentation will make use of this. Also advocate putting keys in separate. WE HAVE A THEME SONG!!

Cmt: Need changes to the supplicant to support this – maintain multiple key structures in the supplicant, can you clarify.

Cmt: Yes.

Cmt: Pre-authenticate using existing 802.1X frames. Could use data frames. Advantage is that formal state of the STA is clearer. Also don't have media dependence.

Cmt: Had been reviewing Greg's presentation. Could solve the problem without changing the higher layers. Need the ability to pre-authentication.

Cmt: One approach gives the advantage to the AP, one to the STA.

Cmt: Nice to simplify. Need to keep the scaling in mind – want to deploy large scale voice over WLAN approaches.

Cmt: Confuse contect transfer with roaming. On ports. A port is not created via association. It is created via a cryptographic relationship.

Cmt: In conversations with .1X, secure virtual port is the logical port.

Cmt: A good sign that multiple people are thinking along the same lines. Note R1 is very different from R1. Like the idea of using data channels. Initially had the cellphone model in mind – chats with 3 base stations, then switches over. Mobile station may not be able to talk to multiple at a time. Need to solve this too. How to pre-authenticate when you can't talk to multiple APs.

Cmt: Overall complexity of the keying is an issue. Then you need to deal with roaming, then need to deal with IBSS. That's the direction we need to follow. There is more than one way to pre-authenticate.

Cmt: Had several motivations for proposing this. Is the current draft complete? Issue will be raised. Can use this approach to address the completeness concern.

Cmt : Interaction with TGf. This is a way to avoid context transfer.

Cmt: Didn't want someone to say that you can't send data packets prior to association.
Cmt: In this scenario, derive multiple MSKs – will add complexity to the client.
Cmt: Add some complexity, but balance that with overall simplicity.
Cmt: A decision that the client can make – Implementation decision, not a standards decision.
Cmt: For post association, have a state machine for re-association. Is re-authentication post association?
Cmt: We only took the idea so far. No motions will be made now. If it's worthwhile pursueing
Cmt: Most implementations will have to handle multiple associations. Current problem with .1X – no keys, send it anyway. After association, send only if you have keys.
Cmt: Need to authenticate management frames. Potenially have the keying material to do this.

Chair: any more comments?
No more comments.

Chair: Bill Mcintosh's presentation is next

226 - Cascading – AN Enhancement to IEEE 802.11i
Allow a security connection to pass through an AP to a security server.
Q: What do you mean by security connection?
A: Entire security protocol

Need total link layer protection
Security devices should be physically secure
Simplifies flat network

Still have vulnerabilities – rogue AP on the net.
Run the security connection through the AP to a secure server. Potential integration into routers/switches.

Need a passthrough function in the AP.
Q: Key management to server, or everything to server?
A: Everything

Intermediate driver on client devices
Q: Need to relay 802.1X info
A: Yes

Q: Security server is an AP with a remote antenna.
Q: Like a tunnel endpoint?
A: Yes. Want to be able to do this without additional software on the clients
Q: Want vendor interoperability?
A: Yes

Q: Split the AP in half. Multiple APs serves by the security server. Is this a significant architectural change?
A: Need to talk, not sure.

Q: 802.10b does what you want to do.

Asking for the hooks to support this. Put the AP in a mode which allows passthrough.
Q: Applicability to the home market. Don't want another server.
A: Like to consolidate security when they have a lot of APs.
Q: Rogue AP. Could use 802.1X & put a supplicant on the AP.
A: Would need 802.1X switch or hub to be configured to support this.
Q: This is not a security problem. Nothing changes except that you have split the brains from the antenna. Interface between two halves of the AP
A: To make it work from a standard NIC card. AP has work to do.
Q: Split AP has work to do.

10:00 Recess for break.

10:30 Restart presentation
Chair is delegated to Jessie Walker

Presentation by Bob Moskowitz
"Proxied Pre-authorized Roaming" 02/230

Basic idea is method by which stations can be notified of nearby APs and can pre-authenticate via wired connection to other APs
Q: Doesn't this require IP support – I thought 802.11 did not mandate IP support is DS
A: Well yes this would only work in IP based DS
Q: Nearest neighbor discovery should be pushed to the station. I will be more accurate than trying to have the AP do it.
A: I want to give the station as much knowledge of structure as possible so be good to use both AP given info as well as learned info. Also you must have IP address of the AP you want to roam to and this can't be learned from wireless side.
Q: Have you considered case where AP is mobile? Neighbors of AP can change?
A: This creates all sorts of problems but is this practical scenario? What's the likelihood that they would be on same SSID?
Cmt: This is also a useful test to detect rouge APs

End of presentation

Dave Halasz returns to chair

Presentation by Greg Chesson
"Secure Roaming …. And more" 02/140r1

Q: Two slides previously said there was pair-wise keys but slide seems to show multi-party exchange to connect to AP

A: The AP connection phase occurs after the pairwise keys are established

Q: But the establishment of original PW keys required authentication and now we have to authenticate again?!

A: No the previous exchanges validated the parties this is validating the AP to the Sta {more discussion on this point but too detailed to capture – moved to offline discussion}

Presenter: Last slide does not show the fact that there are two ways to pre-authenticate at AP. This can be done as shown or indirectly via the AS.

Q: What is difference between this an current proposal?

A: The main difference is that all transactions are two party.

A: 802.1x still takes place in the same way but we are distribution a different key in a different way and the way it is done allows us to knock out complexity and re-use the same method whenever a key is needed

Cmt: You can't assume that all APs are working through the same AS. There is a problem with the relationship between the AS and the AP

Cmt: There are other reason why you need AP-AP communications other that using for authentication

A: Yes IAPP could be simplified

Cmt: No I disagree

A: Related to multiple Ass. We think that we can embed the architecture in multiple AS environment

Cmt: AS represents an infrastructure of AS not a single one

Cmt: You cannot have a central coordinator in IBSS

A: Example: you want to join ad-hoc "Foo" you get your keys from "Foo". This is not like 802.1x case.

A: In practical example one person is responsible for setting up the keys. If they leave you have to restart the session

Cmt: but this doesn't work in hidden node case.

A: Yes but there is no known way to do a distributed AS in reality so it is necessary for one to take in this responsibility. If they go you have to restart.

A: Actually is AS goes away it still works but new person cannot join until restart

Cmt: OK so this is a key limitation on IBSS but if group accepts this needs to be clear

A: Yes we need to spell it out really clearly

Cmt: In IBSS case you need to have pre-shared keys (and actually all cases). In IBSS case you better be able to confirm the identity of the AS before you use it. So if you need that whay go through all this Kerberos like stuff. Just use the pre-shared key!

A: Agree

Cmt: Furthermore you need pre-shared keys between AS and all the APs. I don't understand what the purpose of needham-schroder in this case. Seems like the need for pre-shared keys makes its use pointless. This seems even more complex.

A: Well complexity is subjective

Cmt: So what is the purpose? One think I can think of is that roaming is easier if you have a ticket.

A: Agreed
A: You said if you use IBSS you need pre-shared key but there might be other ways like PKI. The authentication method allows other architectures to be employed other than just pre-shared keys.
A: On complexity side I disagree that counting messages is a good measure. We think this proposal is much simpler than current approach.
Cmt: But this doesn't reduce the complexity of the key hierarchy
A: But we use the same approach every time. It's not the number of keys but the number of key methods that gives complexity
Cmt: you said you are still using 802.1x
A: No that is only one choice in our approach
Cmt: But you said that it works with existing 802.1x approach
A: Yes it does but the method is generic enough to use other approaches
New Comt: This has an advantage that it moves the authentication back before the association
A: No the approach is independent of this issue
Cmt: Well I understood that Auth would occur before assoc
A: Yes I suppose we can assume that
Cmt: Well I think that is helpful for implementation (paraphrase)
Cmt: I don't see anywhere where it says that authentication comes before association
Cmt: Yes but I see an advantage to doing authentication first
A: Well yes we think that is implied by the slides although not explicit
Cmt: IBSS idea of having a single AS is compatible with Tge AP mobility
A: Yes I agree but they don't have to be tied together.

Recess until 13:30

1:40, Marty Lefkowitz, Context Block Leasing – Document 201r0

I'm an implementer with a sleep deficit at this point.
Context block leasing is a mechanism for facilitating fast hand-off. The STA pushes the security information to the new AP before association.
Incremental step over tgi key

Relies on TGf
Uses the security of the current association as well as AP-AP RBD security.
No new protocol requirements on the STA during scan
May be situations sm/medium business – no RADIUS server. Just need an AP which is enabled with this. Will work with associate or re-associate.
Station may use security policy of new AP candidate in roaminging decision.
Associate
Pair-wise transient key generated
Generate another pair-wise key for transfer is generated
Should be related to the scanning algorithm – send to another AP
APs verify credentials, then transfer context block.
Does not remove need for new AP to pull security context from old AP.

Implementation overview

Q: If the APs don't overlap, this doesn't work, right?
A: Right.
Q: Seem to have a lot of messages, what's the gain?
A: While the messages are being exchanged, can be sending data to the old AP
Q: What is the advantage over just authenticate/Dave's presentation.
A: Just send probe request/response & then pre-authenticate.
Q: Can talk to new AP, either via old AP, or over the air.
A: Secure roaming solution has incorporated part of this. This concept can be used anywhere.
Q: Get new GDK, slide 5.
A: When you hand off and transmit data, amount of time when you are authenticated and not associated is minimized.
Q: In current document, need to wait until queue is empty before
A: He is getting keys in advance.
A: Believe this can be done in less than 40ms. Need a few more management messages to deal with the context lease. Can be management or data messagesNeed more security in TGf, perhaps new messages. Need to discuss pre-shared key case
Q: Criteria for granting the context lease.
A: Any reason can be used by the AP to deny. Might be resources.
Q: How predictable is it that the AP deny the request?
A: Manufacturer dependent.

Next Presentation: Tim Moore – Document 152r1
Integrity check for disassociate/Associate/Re-associate messages
Did edits this morning, based on Dave's talk.

The problem: disassociate etc messages not integrity checking
Either integrity check, or
Ignore disassociate when in 802.1X authenticated state

Can current hardware encrypt/MIC these messages.
Sending – no problem. Receiving side needs to recognize the message – new SNAP header
Cmt: Like the idea Issue will be – application of crypto. Do crypto in software.
Can't easily simply add a MIC. Current hardware won't support it, most likely. Associate/diss messages can be encapsulated.
Cmt: If there is a policy to support TKIP and AES stations. Which would you use?
A: Currently use one multi-cast suite, TKIP. Would have to use this cipher.
Q: There were scenarios which used re-associate to re-synch crypto status. Won't be able to do this.
A: You're right. AP will have to be careful how long it keeps the state. Need to continue
Cmt: Station would need heuristic to get the station back in synch.
CMT: when get a message you expect to be encrypted, but it isn't, you send dis-associate.
Q: What does the AP do when it loses its keys?

Cmt; Don't need a data frame. Can encrypt the portion of the management frame.
A: SO idea can be implements, apart from other problem.
Q: This addresses DOS attacks.
A: Yes, but there are more problems around associate. Pre-authenticate. Someone takes over your session. Result is DOS.
Q: Concerned that we haven't done the layering. Pick the layer, if need to encrypt something lower, then you've picked the wrong layer
A: Yes.
Cmt: It's either above or below the line, then you can design.
Cmt: Need to name and manage the entities here.
Cmt: Level 2 messages affect thigs elsewhere, how do you secure this.
Need clear usage guidelines on usage for wch side
Q: can you add something to the packet, an integrity check. Make the packet longer.
Q: Deadlock situation – someone logs on, gets the keys, logs off, can't log back on, since don't have they keys. If you had dynamic MAC addresses, this would solve the problem.

With changes to 802.1X, EAP-Logoff is authenticated. Require to send EAP-Logoff when dis-associate.

Jon Edney – Document 141r0 MAC Address Hijacking Problem

Last time, gave a related talk on motivation: Public space applications. People Watching for MAC addresses. Could keep a database of where certain MAC addresses roam.
Related paper 261.

This paper discusses an attack we identified while discussing temporary MAC addresses.

Attack: First and second user both have legitimate credentials. Second is the attacker. Both use same MAC address. Second guy can intercept traffic from the first.
Cmt: Same attack exists with IP address
Cmt: Only on shared hub?
A: With a bridged or switched hub, will change where traffic is being sent.
Cmt: There will be thrashing – first one sends traffic again, the. Traffic switched back.
Cmt: ARP can deliver the IP address. Need to authenticate ARP to address this issue.
Cmt: In wired network, can do the same thing. If you are in the hotspot, 802.1X used only for authentication. Would run VPN for security. The same attack.
Cmt: In public space, easier to attack the wired side. Need to be concerned about the wired link also.
Cmt: Yes, if run a VPN, this becomes a DOS attack. If don't run VPN, don't expect protection from this attack.
Cmt: Agree. Some of these problems occur across multiple technologies. When sending and receiving sensitive data, need to use a VPN. Don't know that we can solve this problem.
Cmt: Do you assume that the second guy will have the same key

A: No, assume different keys. On the unencrypted wired side can see data. Attempt to get the unencrypted data sent to the AP sent to him via his connection.
Q: Can service provider use MAC address correlation. MAC address bound at AAA server.
A: Yes, can do this, there are problems.
Q: IEEE meeting has all characteristics of a hotspot. Who has been accessing their company e-mail without a VPN? No one.
A: We understand the attack, the vulnerability is real.
Cmt: Relying on 802.1X only for public space is not enough. Address in best practices.
A: Authenticate the disassociate messages, bind this to the MAC addresses.

Next presentation: Bernard

Until he comes back – waiting for Bernard.

Chair: Last time, we discuss reviewing the proposal with 5 crypto experts, or take the publicly available info and make it available. Clause 8 is publicly available. This is sufficient, to use with crypto experts. Is this sufficient.
Q: Is working plan to keep the working draft in a document?
A: Yes. Have to watch that you don't go too far – can't put it all in.
Another group pasted the entire draft into the
Cmt: Point groups to the RSA website for TKIP info
Chair: RSA reflector. Initial feedback – need to send to IEEE reflector, then complaints. Guidance now, working towards a submission – use RSA reflector. If you have a submission, e-mail Harry, and he'll put it on the website.
Cmt: Agree. When need feedback on a "half-baked idea", need feedback from people you're working with.

Bernard- Introducing a presentation on the behalf on James Kempf – Doc 243
802.11 and IP.

Presentation discusses work done for IETF Seamoby
Measurements on length of time used for re-association.
Need to use correct terms.

Handover Loss Analysis
Application Tolerance for Loss
Requirement for 40ms fast handoff – total connectivity loss for voice
Roaming – get on and have connectivity
Cmt: VOIP uses specialized hardware,
A: Loss of re-association request is typically a problem.
Cmt: Today's devices don't support QOS. Requirements on products deployed were different that the more stringent requirements coming today.
A: Current characteristics of 802.11 cause some of these problems.
A: Need to be careful on the problem definition – which one are we trying to solve.
Asking the security solution to generate negative ms delay.

Cmt: Why do you believe that this is related to loss of re-association
A: More work needs to be done to understand this.
Cmt: Reflects early work. Send out msg, nothing happens, send again.
Cmt: Send out request, ACK, then time for response, dead-time is in the AP/OS, not on the wireless link. In future, see re-association storms.
Cmt: More of the delay could be found in the scanning process, prior to going to another AP.
A: True, but not included in these results.

Again, need a clear problem statement, and an expectation of what you're trying to get out of it. 2-300ms is achievable. Need to define criteria.

Chair: IETF is meeting next week. Bernard and John Volbrecht are the chairs. Dave, several others. One of the reasons it's getting started is because of our needs.
Cmt: We need tomake sure that if there is a working group charter, that it reflects what we need the group to do.

Chair: Assuming we go to letter ballot, do we want to have an interim meeting.
Bob Moscowitz volunteered to host in Herndon VA.
Would be nice to get a head start on letter ballot comments.
Cmt: Yes.

No more presentations.
Do we need to meet again today?

Any other volunteers: Donald Eastlake.
Q: What would be the agenda?
A: Comment organization.

Recess until 3:30. Discuss an interim.

Meeting called to order at 3:40.

Chair: Wanted to get a-hold of Stuart to see when it would make sense to have an interim meeting. Look at the calendar. Concern that the letter ballot will end right before the Sydney meeting.

Q: When would the earliest day to start.
Chair: Say the 22nd. This would mean May 1 for the letter ballot to end. Have one week before Sydney.

Q: How long will it take to have the results?
A: Many of the results come in late.

Chair: Have a conference call May 6, give an indication of where we are, organize comments.

11:00 Eastern/10Central/8Pacific/5pmNL 2 hours.
Q: What is the plan for the Sydney meeting?
A: Go through comment resolution.
Q: Will there be a quorum?
A: Making a motion to make sure we have one.

Q: How will you organize and divide up the work?
A: By section and number of comments.

Q: Shouldn't we work on suggestions, proposals, longer IV, so we can address the issues first, and avoid dealing with many of the problems ahead of time.
Chair: People are free to do this.
Q: Last time, spent 2 meetings organizing comments. Vote changes in ahead of time, before comment resolution. Do presentations and motions first, before comment resolution.
Cmt: When the agenda is set in Sydney, if work would solve the comments, organize the agenda to do work first, then address comments.
Chair: If people have suggestions for the agenda, send them to me. Agenda is not set until the morning of the meeting.

Chair: Sounds like an excellent suggestion. Will organize the agenda that way.

Cmt: Had identified a work item to identify specific requirements on the methods. Not tied to our drafts. What is the timeframe for this.
Chair: Comment was made, after he saw the letter, he was satisfied.
Cmt: Thought the comment was that we needed to follow up with more details.
Chair: Yes, this was before he realized that a letter had been sent.
Cmt: Wednesday, March 20 3:30-5:30 in Minneapolis.
Chair: Encourage people to attend. Dave will attend, many others also. In our interest to make sure that our needs are addresses. Does this anser the question?
Cmt: No. Maybe wait until after the charter is established. Input from the letter is not specific enough to write documents.
Cmt: Methods will be discussed at the BOF.
Cmt: Does there need to be a requirements document?
Cmt:L For what?
Cmt: For the work that the group will be doing.
Cmt: If you feel compelled to write such a thing, please do.

Chair: Any objection to adjourning?
Cmt: Yes, I want to stay.

No Objection.

Dave will be presenting the motion, wearing the t-shirt.
Meeting Adjourned.

IEEE P802.11
Wireless LANs

Minutes of Wireless LAN Next Generation Standing Committee Meetings

Date: March 11-15, 2002

Author: Garth Hillman
Advanced Micro Devices
5204 East Ben White Blvd, Austin, TX 78741
Phone: (512) 602-7869
Fax: (512) 602-2700
e-Mail: garth.hillman@amd.com

Abstract

Minutes of the Wireless LAN Next Generation Standing Committee meetings held during the IEEE 802.11/15 Interim meeting in St. Louis from March 11 through 15, 2002.

Executive Summary:

1. Judging from the attendance the interest was very high.
2. The primary topic discussed was "should a motion to form a Study Group to define a PAR and 6 Criteria for a High Rate OFDM extension be generated for presentation to the Working Group and, if so, how should the motion be worded?" The related discussion revealed that the issue was complex having many variables such as – scope, timing, priority, coordination. As a result the discussion was tabled until the Sydney meeting.
3. Erik Schylander gave an update (234r0) from the ETSI-BRAN 27 meeting and Amer Hassan gave an update (238r0) of the Jan 29 IAG meeting.
4. A number (14) of presentations were made in the following categories:
   a. MAC Scalability Issues – docs 215r0, 138r0, and 183r0
   b. Rate/Range Extension Techniques – docs 231/2, 180r0, and 01-668r3
   c. Criteria for Extension – docs 252r0, 253r0, 182r0 and 149r0
   d. WLAN-3G&Public Inter-working – 242r0
   e. Radio Resource Management – docs 270r0 and 211r0
   f. Ultra-Wideband – 240r0
5. Radio Regulatory update was presented by Carl Stevenson– doc RR-02-048r0

6. Two motions passed unanimously:
    a. The WNG SC request the 802.11 WG to form a liaison with Cable Labs for the purpose of coordinating the use of 802.11 WLANs in DOCSIS cable modem systems. (64,0,4)
    b. The WNG SC requests the 802.11 WG to accept the invitation from ETSI-BRAN and MMAC to participate in the 'WLAN-3G and other Public Access Networks' inter-working project. (59,0,14)

The following names were on the sign-up sheet (138).

Name	Affiliation	Email Address
*Tomoko Adachi	Toshiba	Tomo.adachi@toshiba.co.jp
*Larry Arnett	Mitsubishi	Larry.Arnett@edg.mea.com
*Anuj Batra	Texas Instruments	batra@ti.com
*Rashmi Bajaj	France Telecom R&D	Rashmi.bajaj@rd.francetelecom.com
*Raja Banerjea	Agere Systems	banerjea@agere.com
*Gil Bar-noy	Envara	glib@envara.com
*Chuck Bartel	CMU	cnb@cmu.edu
*David Beberman	Corporate Wave Net	Cwn1@world.std.com
*Mathilde Benveniste	AT&T	Benveniste.m@att.net
*Tim Blaney	Commcepts	Tim@commcepts.net
*Kevin Burak	Motorola	Kevin.burak@motorola.com
*Alistair Buttar	Motorola	Alistair.buttar@motorola.com
*Bill Carney	Texas Instruments	bcarney@ti.com
*Pat Carson	TDK	pcarson@tdktca.com
*Mike Carrafiello	Avaya	mcarrafiello@avaya.com
*Lieshu Chiang	Action Tech Inc.	lieshuchiang@action.com.tw
*Charles Chien	G-Plus	charlesc@g-plus.net
*George Chrisikos	Prominent Communications	gchrisikos@prominentcomm.com
*Aik Chindapol	Siemens	Aik.chindapol@icm.siemens.com
*Sean Coffey	Texas Instruments	coffey@ti.com
*Todor Cooklev	Aware	tcooklev@aware.com
*Russel Cyr	Engim	Russell@engim.com
*Barry Davis	Intel	Barry.r.davis@intel.com
*Eryk Dutkieniicz	Motorola	Eryk.dutkieniicz@motorola.com
*Paul Edwards	Bergana	pedwards@bergana.com
*Niels van Erven	3Com	Niels_vanerven@3com.com
*Christoph Euscher	Siemens	Christoph.euscher@siemens.com
*Lars Falk	Telia	Lars.p.falk@telia.se
*Chuck Farlow	California Amplifier	cfarlow@calamp.com
*Nestor Fesas	Bandspeed	nfesas@bandspeed.com

*Gerhard Fettweis	Systemonic	Gerhard.fettweis@systemonic.com
*Kenji Fujisawa	Sony	fujisawa@sm.sony.co.jp
*James Gardner	Woodside Networks	jamesgardner@woodsidenet.com
*Amitava Ghosh	Motorola	Qao004@email.mot.com
*Monisha Ghosh	Philips Research	Monisha.ghosh@philips.com
*Wataru Gohda	Sharp Labs	wgohda@sharplabs.com
*Alexei Gorokwov	Philips Research	gorokwov@philips.com
*William Gray	Hewlett Packard	William_gray@hp.com
*Patrick Green	AMD	Patrick.green@amd.com
*Joerg Habetha	Philips	Joerg.habetha@philips.com
*Neil Hamady	Resonext Communications	Neil.hamady@resonext.com
*Yasuo Harada	Matsushita Electric/ Panasonic	yasuo@isl.mei.co.jp
*Thomas Haslestad	Telenor	Thomas.haslestad@telenor.com
*Amer Hassan	Microsoft	amerh@microsoft.com
*Chris Heegard	Texas Instruments	Heegard@ti.com
*Bent Hessen-Schmidt	SiGe	bhs@sige.com
*Garth Hillman	AMD	Garth.Hillman@amd.com
*Jon Hirano	Matsushita Communication	Jon.hirano@yrp.mci.mei.co.jp
*Michael Hoghooghi	Motorola, Inc	Emh002@email.mot.com
*S?t?ru Hori	NTT	hori@ansl.ntt.co.jp
*David Hudak	Karlnet Inc	dhudak@karlnet.com
*David Hunter	Time Factor	hunter@timefactor.com
*Keith Huntington	Insyde Software Inc	Ieee-kjh@wizardfish.com
*David Hytha	Silicon Wave	dhytha@siliconwave.com
*Hiroshi Ide	Buffalo/Melco	ide@buffalotech.com
*Yasuhiko Inoue	NTT	yinoue@ansl.ntt.co.jp
*Ho-In Jeon	Kyung-Won University	hoinjeon@netsgo.com
*Marc Jal Fon	Intel	Marc.jalfon@intel.com
*Mark Kahn	Protean Radio Networks	kahn@proteanradio.net
*Martin Kappes	Avaya	mkappes@avaya.com
*Jeyhan Karadguz	Broadcom	yeyhan@broadcom.com
*Kris Kelkar	California Amplifier	kkelkar@calcomp.com
*Pat Kelly	Bandspeed	pkelly@bandspeed.com
*David Kline	HP	Dave.kline2@hp.com
*Dong Kyu Kim	Samsung Electronics	dong@samsung.com
*Gunter Kleindl	Siemens	Guenter.kleindl@siemens.at
*VK Jones	Woodside Networks	vkjones@woodsidenet.com
*Bruce Kraemer	Intersil	bkraemer@intersil.com
*Thomas Kuehnel	Microsoft	tkuehnel@microsoft.com
*Colin Lanzl	Aware	clanzl@aware.com
*Peter Larsson	Ericsson	Peter.larsson@era.ericsson.se

*Dongjun Lee	Aware Inc	dongjun@aware.com
*Sheung Li	Atheros	sheung@atheros.com
*Wei Lih Lim	Panasonic	wllim@psl.com.sg
*Titus Lo	NextComm Inc	tlo@nextcomm.com
*Ralph Lombardo	Digital Networks	Lombardo@dnpg.com
*Robert Love	Motorola	GAZ178@email.mot.com
*Osimu Maeshima	Kaaz Labs	maeshima@kddlabs.co.jp
*Pratik Mehta	Dell	Pratik_mehta@dell.com
*Kelly McClellan	Valence	kpm@valencesemi.com
*Gary McCoy	Digital Networks	gamccoy@dnpg.com
*Michael Mueller	Telelogic	Michael.Mueller@telelogic.de
*Yasuhiko Mizoguchi	Sony	ymizo@sm.sony.co.jp
*Oliver Muelhens	Philips	Oliver.muelhens@philips.com
*Peter Murphy	Texas Instruments	Murphy@ti.com
*Richard van Nee	Woodside Networks	vannee@woodsidenet.com
*Kevin Negus	Proxim	Kevin@proxim.com
*Chiu Ngo	Philips Research	Chiu.ngo@philips.com
*Puthiya Nizar	Intel	Puthiya.k.nizar@intel.com
*Erwin Noble	Philips	Erwin.noble@philips.com
*Hideaki Odagiri	Oki Electric	Odagiri634@oki.com
*Kim J. Olszewski	Denso International America	Kim.olszewski@densolabs.com
*Dirk Ostermiller	Micro Linear	dirko@xmission.com
*Richard Paine	Boeing	Richard.h.paine@boeing.com
*Subra Parameswaran	Bergana	rps@bergana.com
*Vijay Patel	Motorola	QVP003@email.sps.mot.com
*Murali Ramadoss	Intel	Murali.ramadoss@intel.com
*Einan Regev	Wavion	einan@wavion.com
*Ed Reuss	Plantronics	Ed.reuss@plantronics.com
*John Rinderknecht	Bandspeed	jrinderknecht@bandspeed.com
*Max Riegel	Siemens	Maximilian.riegel@icn.siemens.de
*Stefan Rommer	Ericsson	Stefan.rommer@erv.ericsson.se
*Jon Rosdahl	Micro Linear	jrosdahl@ieee.org
*Gunnar Rydnell	Ericsson	Gunnar.rydnell@erv.ericsson.se
*Carl Scarpa	Hitachi	cgs@dmsl.hitachi.com
*Edward Schell	Hitachi America	Edward@dmsl.hitachi.com
*Erik Schylander	Philips	Erik.schylander@philips.com
*Bill Seed	Aryya	bseed@aryya.com
*Rick Shaw	Micro Linear	Shaw.rick@microlinear.com
*Shusaku Shimada	Yokogawa Electric Company	shusaku@ieee.org
*Hasse Sinivaara	Nokia	Hasse.sinivaara@nokia.com
*Paul Snopko	Zenith Electronics Corp	Paul.snapko@zenith.com

*Jung Je Son	Samsung Electronics	jaggy@samsung.com
*Thomas Studwell	IBM	studwell@us.ibm.com
*Barani Subbiah	3Com	Barani.subbiah@3com.com
*Masahiro Takagi	Toshiba	takagi@csl.rdc.toshiba.co.jp
*Pek Yew Tan	Panasonic	pytan@psl.com.sg
*Teik-Kheong (TK) Tan	Consultant	tantk@pacific.net.sg
*Takuma Tanimoto	Hitachi	takuma@tanimo.com
*Jerry Thrasher	Lexmark	thrasher@lexmark.com
*Kevin Thomazios	Micro Linear	kevint@microlinear.com
*Jim Tomak	Qualcomm	jtomak@qualcomm.com
*Allen Tsai	Inprocomm	allen@inprocomm.com
*Mike Tzamalovkaj	Skyroom	Mike.tzamalovkaj@ieee.org
*Marcos Tzannes	Aware	marcos@aware.com
*Patrick Vandenameele	Resonext Communication	Patrick.vandenameele@resonext.com
*Rolf de Vegt	Woodside	rolf@woodsidenet.com
*Tim Wakeley	HP	Tim_wakeley@hp.com
*Fujio Watanabe	DoCoMo	fwatanabe@ieee.org
*Mati Wax	Wavion	mati@wavion.com
*Christopher Wingert	Qualcomm	cwingert@qualcomm.com
*Peter de Wit	TDK Systems	Peter_de_wit_TDK@compuserve.com
*Harry Worstell	AT&T	hworstell@research.att.com
*Yang Xiao	Micro Linear	yangXiao@ieee.org
*Shugong Xu	Sharp Labs	sxu@sharplabs.com
*Heejung Yu	ETRI	heejung@etri.re.kr
*Albert Young	3Com	Albert.young@3com.com
*Chris Zegelin	Symbol	chrisz@sj.symbol.com

Tuesday March 12, 1:00-3:00 PM

Today's Proposed Agenda:

1. Agendas for week
   a. Tuesday Agenda
      i. Logistics
      ii. Updates - BRAN, IAG
      iii. Approve minutes from Dallas meeting
      iv. HR .11a Presentations
      v. Motions

      vi. Richard Kennedy
- b. Wednesday Agenda
  - i. .11a HR
  - ii. WWAN/WLAN
  - iii. Next Gen Requirements
- c. Thursday Agenda
  - i. Joint Reg meeting
  - ii. Radio Resource Measurement
  - iii. Next Gen Requirements

2. Updates
   - a. Amer Hassan, Microsoft (doc 02-238r0) - IAG – Jan. 29, 2002
     - i. Goals/achievements
     - ii. Where do we go from here
       1. drop 5 GHz form the name
       2. Marketing requirements
       3. Set up Partnership Project
     - iii. Overview of Presentations made
   - b. Erik Schylander, Philips (doc. 02-234r0) – ETSI-BRAN – Feb. 12-15, 2002
     - i. ETSI formed an ad hoc group since ETSI does not recognize SCs
     - ii. Similarities of 802.15.3 MAC and HL2 MAC
     - iii. Conclusions
       1. Ad hoc group will be continued 'for the time being'
       2. Standards are becoming less global not more global
       3. 802.15.3
          - a. new arch
          - b. new PHY
          - c. Universal MAC

3. Unanimously approved minutes of Dallas meeting (doc. 100r0-02).
4. Presentation #1 Jon Rosdahl, Micro Linear – Throughput Analysis of 802.11 MAC – doc.138r0
   - a. Only 2 nodes
   - b. Same overhead as 802.11 standard
   - c. 1500 Byte payload
   - d. 54 Mbps - gives – 30.4 Mbps throughput (58% efficient)
   - e. 200 mbps – gives – 5x Mbps throughput (24% efficient)
   - f. Conclusion – at higher rates payback for reduced overhead accelerates therefore we need to consider addressing MAC
5. Presentation #2 Tudor Cooklev, Aware – Extended Data Rate .11a (doc. 231/232)

a. Bit Loading used in OFDM in general although .11a uses an equal number of bits per carrier
b. Aspects of bit loading
    i. Feedback from receiver to transmitter required and feedback must be faster than changes in the channel
    ii. Trellis coded modulation req'd; it will out perform Convolutional coding especially at high data rates
    iii. Simulation results assumed largest constellation is 10 bits (1024 points per quadrant); note that if uncoded .11a will yield a raw rate of 120 mbps. [10 bits per sub-carrier x 48 sub-carriers per frame / 4 usec per frame = 120 Mbps]
    iv. Comparison between .11a and .11a with bit loading and TCM (as used in ADSL standard). Note that TCM must be used with bit loading.
    v. Summary
        1. no pre-set max
        2. Optimal for multi-path
        3. Mature technology
        4. Requires small standardization effort
6. Presentation #3 Monisha Ghosh, Philips Research – Use of Multiple Antennas (doc. 02-180r0)
    a. Next Gen goals – raw bps, robustness, throughput, backward compatibility?
    b. Exploit channel diversity – frequency (bit interleaved coded modulation), space (antennas)
    c. Simulation with antennas 5 cm apart
    d. In two antenna system would require a second receiver
    e. HR Options
        i. Larger constellations
        ii. Turbo-coding
        iii. Double BW
        iv. Multiple Antennas (increase robustness and/or data rate)
    f. 2x2 Configurations
        i. 1 TX/2 RX
        ii. 2TX/1RX orthogonal space time encoding
        iii. 2TX/2RX space coded
        iv. 2TX/2RX MIMO system
    g. Simplest would be to add an extra antenna at receiver
7. Presentation #4 Richard Kennedy, Independent Consultant (no document) – DOCSIS liaison
8. Motion – Move that the WNG Standing Committee request the 802.11 WG to form a liaison with CableLabs for the purpose of coordinating use of 802.11 WLANs in DOCSIS cable modem systems. Passed (64,0,4)
9. Motion to be proposed at tomorrows Plenary – Move that the WNG Standing Committee request the 802.11 WG to form a Study Group to investigate a high rate (>= 100 Mbps) extension to the 5 GHz 802.11a PHY and associated MAC parameters with the intent to create a PAR and 6 Criteria to justify formation of a new task group. Additionally , the 802.11a high rate

extension will be evaluated, in part, on its suitability as a rate extension to 802.11g in the 2.4 GHz. – was not voted on due to a call for "orders of the day".
10. Meeting was adjourned.

Wednesday March 13, 3:30-5:30 PM

1. Presentation #5 Beberman, Corporate Wave Net, (doc 183r0) – Single Burst Contention
   a. OFDM
   b. Collision detect vs. collision avoidance
   c. Problem: Collision time = length of longest frame which has collided
   d. Essentially a fast version of RTS/CTS
   e. Hadamard set without all 0's and al1 1's; 13 vectors of 4 bits randomly selected from the Hadamard set generates the 52 bits needed for an OFDM frame
   f. 6 basis vectors to Hadamard set
   g. Detection is "OR" operation
   h. If OR results in more than half of bits =1's a collision has occurred
   i. Channel arbiter(CA) = separate device from the AP whose sole purpose is to send the CTS code quickly after receiving the error free RTS code. The CA is not connected to anything in the network
   j. Based on magnitude of Carriers so no coherent detection required.
2. Presentation #6 Sean Coffey, TI (doc. 252r0) – Suggested Criteria for High Rate Extensions to 802.11
   a. Lessons can be learned from TGg
   b. Tentative .11g solution creates a potential problem in that 'a' & 'b' are no longer decoupled although the MAC is common
   c. Spectral Efficiency vs. Rate
   d. Look to increase rate per channel
   e. Consider throughput vs. rate and range
      i. (54/34 @ 25 range normalized)
      ii. Longer data packets (packet aggregation) are more efficient
      iii. Each ACK takes 24 us; header = 20 us; do we have to ACK every packet?
      iv. Be careful; e.g., larger constellations may require longer preambles
      v. Backwards compatibility comes with baggage but is essential 'in some form'
      vi. SG should be empowered to recommend appropriate changes at every layer and not be constrained to MAC or PHY.
3. Presentation #7 Thomas Haslestad, Telenor Norway (doc.242r0) – Cooperation towards WLAN-3G&Public Inter-working (IW)
   a. Provide a unified solution for 3GPP, IETF, Global IW

b. Scope and Purpose of Standardization within 3GIWG
c. Generic Authentication Transport Layer (RLZ message scheme)
d. W2 interface exists between AP and network

4. Presentation #8 Pratik Mehta, DELL, (doc. 253r0) – Next Generation WLAN Requirements
   a. Single Global Solution
   b. Suitable for all Applications
   c. Scalable
   d. Ad Hoc Connectivity
   e. Low to High BW Devices
   f. Interoperability
   g. Coexistence
   h. Roaming
   i. Manageability – power, diagnostics, configurability
   j. RF Sense
   k. QoS
   l. Security
   m. Marketability – in door/out door,
   n. Performance – throughput, range, robustness

5. Presentation #9 Bruce Kraemer, Intersil, (doc. 237r0) - Motion to form High Rate Extension Study Group
   a. Introduction
   b. Goal of any Study Group is to form Task Group
   c. Task Group will draft text for an amendment to 802.11 and present that to the Working Group
   d. Options for Motion
      i. 5 GHz band PHY only
      ii. 5 GHz band PHY only however criteria would consider implications to .11g and separate PARs written
      iii. Extensions to both .11a and .11g PHYs with one PAR.
   e. Monday's motion was based essentially on option 2.
   f. Cannot limit PAR and 6 Criteria to PHY, it must include the MAC

6. Discussion
   a. Bary Davis, Intel – do nothing, could derail TGg
   b. Tim Wakeley, HP - focus on throughput
   c. Pratik Mehta, Dell – too many SGs and too fast
   d. Jim Zyren, Intersil – option #3, dual band; need to start now
   e. Christoph Euscher, Seimens – new MAC
   f. Sean Coffey, TI – cannot limit to just PHY
   g. Jon Rosdahl, Micro Linear – stay focused so something is accomplished (#1 option)

h. Kevin Negus, Proxim – industry will move forward with or without IEEE, 5 GHz band offers much more potential BW
7. To be continued Thursday evening.

Thursday March 14, 6:30-9:30 PM

1. Carl Stevenson – Regulatory Update (doc. RR 02-048r0)
   a. Rules changes for SEC SC Reg Regulations and Wireless PARs; SEC SC -> SEC TAG
   b. Work on PAR rules amendment
      i. Add Regulatory conformance for wired and wireless to clause 6.4
      ii. Add Wireless coexistence to clause 6.2
      iii. New project management clause
   c. 2.45 regulations in China
   d. Support comments on WECA petition
   e. Opposing comments on Sirius petition
   f. Joint meetings with TGg, TGe and WNG
   g. European Update on 2.4 GHz
   h. European Update 5 GHz; movement away from HL centricity but require DFS and TPC
      i. Liaison response from ETSI-BRAN
      ii. Communication from industry Canada
      iii. Communication from Canadian satellite community
   i. Objectives for Sydney
      i. 2.4 GHz Update
      ii. 5 GHz Update
      iii. Joint meetings with TGg, TGh, WNG
      iv. 802.11 and 802.15 coexistence
2. Presentation #10; Harry Worstell – Radio Resource Measurement Update (doc. 11-02-270r0)
   a. 2 Conference calls (10-12 participants)
      i. Next call March 27 – 1 EST
   b. Enterprise (2 presentations of 3 rec'd)
   c. Hot Spots (1 presentation due)
   d. Home-Cable (1 presentation due)
   e. Auto Configuration (by Mathilde tonight)
   f. Next Steps – keep as ad hoc for now
3. Presentation #11; Mathilde Benveniste, ATT – (doc. 11-02-211r0)
   a. The problem

  i. Contiguous coverage
  ii. Limited number of channels
  iii. Maintain PnP nature -> make self configurable
 b. Multi-BSS WLAN system set up similar to cell system
  i. AP ~= Base Station
 c. Old Planning approach
  i. Map Studies
  ii. Field Strengths
  iii. Coverage Estimations
  iv. Manual Neighbour Lists
  v. Channel Assignment
 d. New Planning Approach
  i. Adaptive Learning
  ii. Self Characterization
  iii. Optimised RF Planning
 e. Sample Application
  i. Self-configurable Indoor Wireless Prototype
 f. MACA/MAHO Functions (Mobile Assisted Channel Assignment/Mobile Assisted ??)
 g. Channel Assignment
  i. Analogous to 4 color map problem
 h. Challenges
  i. Insufficient Channels for 3 D coverage
  ii. Ad Hoc
  iii. Allocate Channel Time among co-channels
  iv. No (at this time) coordination between APs
 i. Conclusion
  i. If we can put the hooks into MAC and PHY a auto-configurable system can be built
  ii. DFS and TPC will likely not be enough
4. Presentation #12; Christian Euscher, Siemens - Home Networking Req't Aspects of Next Generation Wireless (doc. 11-02-182r0)
 a. Home Environment Requirements
  i. Application Data Rates have wide range (xKbps <-> yMbps) and tend to cluster
  ii. Low Cost
  iii. Services – include Voice and Video
  iv. Scalability
  v. Coexistence

      vi. QoS
      vii. Zero Configuration
      viii. Roaming between heterogeneous networks (Home and Cellular)
      ix. Roaming within Home
      x. Security
- b. Design Suggestions
  - i. PHY – OFDM
  - ii. Antenna techniques – TX, TX, MIMO
- c. Next Steps
  - i. PHY – OFDM
  - ii. MAC – new concept
  - iii. Network Layer – integrate with IETF

5. Presentation #13; Dr. Jun Hirano, Panasonic – Global Area Networks (doc. 11-02-149r0)
   a. WWAN/WLAN/WPAN integration = GAP
   b. Home Req'ts
   c. Enterprise Req'ts
   d. Public Hot Spots Req'ts
   e. Public Car Req'ts including GPS
   f. Public Train (many users moving simultaneously)
   g. Public City Center Req'ts
   h. Public (easy pass) Req'ts (automatic ticketing, admission)
   i. PAN Req'ts
   j. Spectrum Question

6. Presentation #14;Hori, NTT - System Capacity and Cell Radius Comparison (doc. 11-02-215r0)
   a. Four High Rate Extension Modulation Candidates
   b. System Parameter Comparison
   c. Cell Radius Calculation
      i. Assumed 30dBm TX Power with no antenna gain
   d. Required Carrier to Noise Ratio (CNR)
   e. Required Carrier to Interference Ration (CIR)
   f. Radius Comparison
   g. Conclusion – CNR and CIR must be improved significantly to get higher rates

7. Presentation #15; TK Tan, Consultant – WWAN/WLAN IW Motion Discussion (doc. 11-02-263r0)
   a. Showed Formal Letter of Invitation from ETSI-Bran and MMAC
   b. Proposed Working Model

    c. Motion – move that the WNG Standing Committee requests the 802.11 WG to accept the invitation from ETSI BRAN and MMAC to participate in the "WLAN-3G and other Public Access networks inter-working project". Passed (59,0,14)

8. Presentation # 16; Bruce Kraemer, Intersil – High Rate Extension Motion Discussion (doc. 11-02-237r3)
    a. Major SG Issues Outlined
    b. Straw Poll Process to determine divergence of opinion
        i. PHY Scope
            1. 5 GHz only (27)
            2. 5 GHz only but 2.4 (g) friendly consideration (22)
            3. Explicitly both (26)
            4. Abstain (13)
        ii. MAC Scope and Coordination
            1. Importance of High Throughput? (84,0, 0)
            2. Can one SG address both MAC and PHY topics? (92,8,2)
            3. Perceived procedural problem (40 legal, 0 illegal, 31 abstain)
        iii. Timing
            1. Proceed with SG request in March (22)
            2. Proceed with SG request in July (30)
            3. Later (7)
            4. Abstain (27)
        iv. Priority
            1. Is HR the highest priority (45)
            2. Is other (7) {e.g., globalization, 3GPP-IW, Multi-hoping, UWB, ….)
            3. Abstain (33)
        v. Coordination with other Standards Body
            1. Coordinate HR with ETSI-BRAN and MMAC – (70)
            2. Don't Coordinate HR with ETSI-BRAN and MMAC – (5)
            3. Abstain – 13
    c. Due to the divergence of opinions demonstrated by the answers to the questions posed it will be very difficult to compose a motion which will receive support at tomorrows closing plenary therefore the group voted to discontinue discussing HR at this meeting and continue discussion in Sydney – (65, 0, 17)

9. Presentation #17;Oliver Mulhens, Philips; Multi-hop QoS Controlled WLANs (doc. 11-01-668r3)
    a. Need
    b. Preface
    c. Benefits
        i. Coverage

      ii. Existing 802.11 QoS
- d. Problem 1 – limited coverage area
  - i. Solution – forwarding nodes
- e. Problem 2 – Interconnection of QBSSs
  - i. Solution = cluster bridges
- f. Properties of Clustered Wireless Networks
- g. Clustering in 802.11
  - i. Coverage extension
  - ii. Wireless interconnection of BSSs using a control channel and a data channel
- h. Work Items
  - i. Dynamic clustering
  - ii. Interconnection of cluster
  - iii. Routing
- i. Conclusions
- j. Next Steps – join forces.

10. Presentation #17; Richard Paine, Boeing; WLAN Next Generation UWB (doc. 11-02-240r0)
- a. Next Generation Technology Trends
- b. New 5 Year Technologies
- c. Boeing Wireless Roadmap
- d. Events Since Dallas
- e. Proposal – form an ad hoc team that conducts conference calls to track developments in UWB with the goal of eventually pushing UWB to SG status. Straw poll results (13,20,25)