7th Joint 802 Wireless Opening Plenary: Monday, May 10, 2004

1.1. Introduction

1.1.1. Meeting called to order by Stuart J. Kerry at 8:00AM

1.1.2. The agenda of the 85th session of 802.11 is in doc: IEEE 11-04-275r4. This session is including 802.11, 802.15, 802.18 RREG TAG, 802.19 Coexistence TAG, 802.20 MBWA, and 802.21.

1.1.3. In the future we will rotate the order of groups presenting first in the joint meeting. We are also considering other ways to make the joint meeting more effective and a better use of time.

1.1.4. Count of new participants at this meeting: 38. There are 401 people in the room.

1.1.5. Secretary – Tim Godfrey

1.1.6. Officers and Chairs of 802.11:

<table>
<thead>
<tr>
<th>Stuart J. Kerry</th>
<th>Al Patrick</th>
<th>Harry R. Worstell</th>
<th>Tim Godfrey</th>
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<th>David Halasz</th>
<th>Sheung Li</th>
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<tr>
<td>MAC Enhancements - QoS</td>
<td>TGe Chair</td>
<td>TGI Chair</td>
<td>TGj Chair</td>
</tr>
<tr>
<td>Assigned Numbers Authority (ANA) Load</td>
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1.2. Policies and procedures

1.2.1. Current policies and procedures are in 00/331r7. A revised version (r8) will be placed on the server

1.2.2. Al Petrick reviews the policies and procedures contained in document 04/424r1

1.2.2.1. Review of officer duties

1.2.2.2. Review of voting tokens – 802.15 through 802.20 will continue to use paper tokens. 802.11 is using printed voting status on their registration badges. We are continuing this from the March meeting. There were only 16 discrepancies. If anyone else has a question about voting status, see Al Petrick or Harry Worstell.

1.2.2.3. Hierarchy of policies and procedures.

1.2.2.4. Review of registration and media recording rules.

1.2.2.5. Review of attendance list and recording procedures, and rules for statements to the press.

1.2.2.6. Review of attendance procedures, and rules for voting rights (earning and maintaining). More details in document 04/422r1

1.2.2.7. Review of membership and anti-trust rules.

1.2.2.8. Review of IEEE-SA Standards Board Bylaws on Patents in Standards. This information was last updated in February 2004.

1.2.2.9. The following text was read in its entirety to the membership by Al Petrick:

March 2004

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

6. Patents

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

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

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

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

Approved by IEEE-SA Standards Board –, March 2003, Feb 2004
Inappropriate Topics for IEEE WG Meetings

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

If you have questions, contact the IEEE Patent Committee Administrator at patcom@ieee.org

Approved by IEEE-SA Standards Board – December 2002

1.2.2.10. The rules and status of copyright are reviewed.
1.2.2.11. IEEE Bylaws were amended in November 2003 by the IEEE SA bylaws. IEEE Bylaw 1300-4(4)
  1.2.2.11.1. Abstentions are no longer counted toward the total number of votes needed to approve or disapprove.
  1.2.2.11.2. Email ballots must receive approval from a majority of voting members of the working group.
  1.2.2.11.3. These changes are reflected in the Policies and Procedures.
1.2.2.12. Discussion
  1.2.2.12.1. Does that mean that we no longer need to record abstentions.
  1.2.2.12.2. The 802.11 WG chair says the we still have to record abstentions.

1.3. **IP Statements (Letters of Assurance)**
  1.3.1. Stuart J Kerry calls for any letters of assurance. None.

1.4. **Announcements**
  1.4.1. On site information for the schedule is on the back of your badge.
  1.4.2. The chair notes that members should be aware of watching their belongings.
  1.4.3. Hotel security will take projectors at the end of the day
  1.4.4. Lunches will be served in the Garden room every day.
  1.4.5. The social event will be at Speedzone on Wednesday evening.
1.5. **Approval of the Agenda**
1.5.1. The agenda is approved with Unanimous consent.

1.6. **Approval of the Minutes**
1.6.1. There are no matters from the March Minutes
1.6.2. The minutes are approved with Unanimous consent

1.7. **Key Activities**
1.7.1. **Server and Network**
  1.7.1.1. Al Petrick reviews the new participants presentation 04/422r1.
  1.7.1.2. The procedures for signing in to the server attendance web site are reviewed
  1.7.1.3. The procedures for requesting document numbers and submitting documents are reviewed.
  1.7.1.4. The wireless network is reviewed. Members are cautioned to insure their virus protection, security patches, and firewall software is functional and up to date.
  1.7.1.5. 802.15 will be conducting random paper attendance this week.
  1.7.1.6. New Members must request voting status before they will be granted. This is per LMSC procedures, and will be updated into the WG policies and procedures.

1.8. **Review of Interim Meetings**
1.8.2. January 16th 2005, Hyatt Monterey, Monterey CA.
1.8.3. May 15th. 2005, Sydney Australia (considering the Wentworth and the Hilton)
1.8.4. September 18th 2005, Boston, Park Plaza Hotel.

1.9. **Financials**
1.9.1. Bob Heile presents the financial status.
1.9.2. Starting in July, our Treasurer’s Al Petrick and John Barr will give reports. This is the first session under the 802.11/15 treasury. There are no previous reports.
1.9.3. We have closed out previous accounts and audits and submitted to IEEE for final review. The current back balance is $60495.
1.9.4. About $35000 has already been allocated for known expenses.
1.9.5. The objective is to be able to cover the penalties incurred if a meeting were cancelled.

1.10. **Review of 802 ExCom**
1.10.1. There are a number of new Study Groups that have gone through the continuous process
1.10.2. 802.11r, 802.11s and 802.11ma-rev have been approved to go to Standards Board by NesCom. They will be reviewed on Thursday of this week. The groups will continue as Study Groups

1.11. **802.11 Working Group**
1.11.1. Voters Summary
1.11.1.1. Al Petrick reviews document 04/511r0
1.11.1.2. We now have 548 voters, 125 nearly voters,
1.11.1.3. At the next meeting, those nearly voters will have to request voting
   rights before rights are granted.
1.11.1.4. We have 673 potential voters,
1.11.1.5. There are 485 aspirants.
1.11.1.6. Discussion
   1.11.1.6.1. Since we abide by 802 procedures, we don’t have to
   wait until they are incorporated in our procedures. The rule for
   requesting has been in the 802 rules for a while.
   1.11.1.6.2. The 802.11 WG chair states that the rule was brought to
   our attention at the last meeting. We are abiding by it as of now.

1.11.2. Changes to the 802.11 agenda
1.11.2.1. The agenda r4 will be posted to the server after this session. TGe
   and WNG have swapped
1.11.2.2. The 802.11 agenda is approved with Unanimous consent.

1.11.3. 802.11 Minutes from Orlando
1.11.3.1. The 802.11 minutes from Orlando are approved with Unanimous
   consent.

1.11.4. WG Policies and Procedures
1.11.4.1. Current P&P is 00/331r7, on the web site and server.
1.11.4.2. At the last meeting document 04/421 indicated policy changes. The
   new P&P is document 04/510r0, which will be voted on in July. (A new
   document number has been issued for the 2004 year.
1.11.4.3. The current document is incorrect, but will be corrected.

1.11.5. Review of 802.11 officers
1.11.5.1. Stuart J. Kerry reviews the officers roles

1.11.6. Documentation
1.11.6.1. No update

1.11.7. Task Group Reports
1.11.7.1. TGe – John Fakatselis. A sponsor ballot was conducted. The group
   will work to resolve comments that have been received.
   1.11.7.1.1. We are still waiting for the ballot results from IEEE.
1.11.7.2. TGi – Dave Halasz. The 3rd recirc of SB closed May 8th. There are 6
   outstanding comments. We are in Procedure 10. We expect an
   affirmation on Wednesday and sending to RevCom for June meeting.
1.11.7.3. TGj – Sheung Li – LB68 closed and an ad-hoc group resolved all
   comments. New draft is 802.11J D1.5. Currently in Procedure 10 going
   to Sponsor Ballot.
1.11.7.4. TGk – Richard Paine. – Document 04.512 contains the presentation.
   Will complete comments on draft review comments. Still working on
   security of measurement frames, and handoff. Expect to complete
   comment res on D0.14, and work towards a Letter Ballot.
1.11.7.5. TGm – Bob O’Hara: There are no interpretation requests. Will work
   on content for 802.11 revision. There will be a submission on vendor-
   specific information.
1.11.7.6. TGn – Bruce Kraemer. Working on approval of requirements and
   criteria. Preceding CFP. Document 429 contains plan for week.
1.11.7.7. WNG – TK Tan. Will have a briefing from WAVE and presentations
   on AP architecture.

1.11.7.9. Mesh Network SG – Donald Eastlake – doc 04/508 has agenda plans. Main objective is to use case specification, and architecture definition. Will discuss process towards initial draft.

1.11.7.10. WAVE SG – Lee Armstrong. There were issues on the PAR at the last meeting. This meeting will address those issues and develop a revised PAR to present to plenary on Friday.

1.11.7.10.1. The WG Chair notes he as received letters from BNJ Consulting, Intertrans Corp, Mark IV, Nissan, Raytheon, Sirit, Transcore, Volkswagen of America, Daimler Benz, and Ford, in support of the WAVE SG activities.

1.11.7.11. WEIN SG – Steve McCann – Agenda is doc 0472. First meeting on Thursday. Has early version of PAR and 5C will be editing and discussing. Will cover issues like network discovery, 3GPP requirements, and access routers and handoff.

1.11.7.12. WNM SG – Harry Worstell – First meeting. Will elect secretary, review rules, etc. Will accept any presentations. Goal will be to create PAR and 5C documents. Looking for external network entities to manage wireless networks in a standard manner.

1.11.7.13. WPP SG – Charles Wright. Wireless Performance Prediction. Have held teleconferences. Have a draft PAR document on server for discussion. Hope to present PAR and 5C on Friday.

1.11.7.14. Ad Hoc Committee on IETF CAPWAP – Dorothy Stanley. Will prepare comments on IETF CAPWAP document. Have held teleconferences. Document 456r3 and 473R1 are on the server and will be discussed this evening in the meeting session. Will finalize response and bring to plenary on Wednesday.

1.11.7.14.1. The intention is to bring a motion to the WG on Wednesday, but it is also on the agenda for Friday.

1.11.7.15. WG Editor – Terry Cole has been delayed. The editors meeting is still happening tomorrow at 7:00AM.

1.12. 802.15 Working Group – Bob Heile

1.12.1. Voter Status

1.12.1.1. 231 voting members, 58 nearly voters, 150 aspirant

1.12.2. Policies and procedures

1.12.2.1. Will have a meeting tomorrow. No significant changes are expected.

1.12.3. Task Group Reports

1.12.3.1. 802.15.1a – Bluetooth specification review of BT 1.2 into new version of 802.15.1. 2nd recirculation ballot, under procedure 10. Unfortunately there is a new No voter with comments against the draft. Will resolve comments and go to recirc next week.

1.12.3.2. 802.15.3a – alternate PHY for 802.15.3. In the process of confirmation, will hear presentations and continue the process.

1.12.3.3. 802.15.3b – amendments to 802.15.3 MAC. First meeting as TG. Will confirm officers, take submissions, proposals. Final submissions in July. Actively interested in information from CE companies on MAC improvements.

1.12.3.4. 802.15.3C – MM wave SG. First meetings this week. Have 6 time slots. Will generate MMwave base.

1.12.3.5. 802.15.4a – alternate PHY for 15.4 supporting precision location and low power operation. Will continue documents for selection criteria.

1.12.3.6. 802.15.4b – enhancements to 15.4. Will approve officers and hear proposals/
May 2004

1.12.3.7. 802.15.5 – mesh networking for .15 MACs in peer-to-peer. Will affirm officers, hear presentations, and issue CFA and technical requirements.

1.12.4. Publicity – Brian Matthews. Will receive industry group updates and have discussion on external communication issues.

1.13. **802.18 – Carl Stephenson**

1.13.2. Will prepare regulatory document for filing with FCC
1.13.3. Will address FCC enquiry on broadband access, Canada issue on 5GHz, FCC NPRM on 3,6GHz band. FCC NPRM on unlicensed use of TV spectrum.
1.13.5. Working on PAR and 5C for SG1. Regarding a standard on how to make use of unused spectrum – Incumbent profile detection concept.

1.14. **802.19 – Steve Shellhammer**

1.14.2. Will revise proposed P&P to submit to ExCom next meeting.
1.14.3. Purpose is to change LMSC rules to address coexistence during standards development process.
1.14.4. Will have presentations on methodologies.
1.14.5. Will have joint meeting with 802.11 WPP SG.

1.15. **Announcements**

1.15.1. Stuart Kerry notes that members are responsible for their own attendance on the server. Discrepancies should be addressed immediately. Don’t come back at the end of the week, or later.
1.15.2. Stuart Kerry notes that there has been discussion of documentation access across all working groups. All wireless Working Groups have agreed to provide access to all other groups’ document areas. We will have access to all 802 working groups except 802.3

1.16. **802.20 – Jerry Upton**

1.16.1. Using a local server of Neptune. Will meet in Pacific room. There will be a sign-in book.
1.16.2. Have requests for reciprocal rights for attendance between 802.20 and 802.21 since there is a lot of common activity.
1.16.3. The focus of the meeting will be working on requirements, eval criteria and models, channel models, and review of work plan schedule. Will close on Thursday at 5:30

1.17. **802.21 – Ajay R**

1.17.1. This is the second session of 802.21. It is a new group working on media independent handover services, dealing with both wireless, cellular, and wired.
1.17.2. Will meet in Terrace C/D.
1.17.3. Will work on requirements and usage scenarios.
1.17.4. There is a lot of liaison work within 802 and external standards development organizations.
1.17.5. On the server: name Handover, IP is 10.0.1.21

1.18. Closing items
1.18.1. 802.11 members interested in the 802.18 RLAN group should meet Al Petrick after this session.

1.19. The joint session is adjourned at 9:30AM

2. Wednesday Plenary, May 12, 2004

2.1. Opening
2.1.1. The meeting is called to order at 10:30AM by Stuart J. Kerry.
2.1.2. Following the agenda in 04/275r5.
2.1.3. Review of the agenda items
2.1.4. Additions to Old Business
  2.1.4.1. Dorothy Stanley has an additional motion for EAP requirements. There will be 2 motions.

2.2. Announcements
2.2.1. The WAVE study group has completed objectives for this session, issuing a new PAR and 5C to be reviewed. The PAR and 5C have been approved within WAVE and is on the server. It will be voted on in the plenary on Friday.
2.2.2. Attendance – we will not back-fill for missed sessions anymore. It is the members responsibility to sign in. The 75% requirement is there to make up for any missing slots. Also, the evening sessions now count for one rather than two sessions.
2.2.3. Al Petrick is setting up an Ad Hoc meeting in Terrace F. It is a 5GHz meeting to craft a letter for the 802.11 position on interference tolerance for ITU. At 1:30pm.
2.2.4. A letter is being sent to the membership of 802.11. The SEC ExCom has made a rule change a while ago, that states that new members are required to notify the chair that they want to be a member and gain voting right. Nearly voters must send an email to the WG chair to gain voting rights at the next plenary meeting. This has been in effect, but we have not followed it to this point. We are going to ask all members to send this letter back to the chairs, so we can be sure everybody really wants to be a member and we didn’t miss anybody. From now on, the letter will be required before voting rights will be granted.
2.2.5. Q&A
  2.2.5.1. How do we determine when we became a member? Just send in the letter – it doesn’t matter. This is just to verify the voting pool of 802.11, and prevent challenges to the WG regarding proper membership.
2.2.5.2. If you don’t reply to the letter, you will be taken off the 802.11 membership. There is a cutoff date of June 30, 2004.

2.2.6. The social is tonight – busses start at 6:00pm.

2.3. **Letters of Assurance**

2.3.1. The chair calls for any new letters of assurance

2.3.1.1. None

2.3.2. We cannot send a letter regarding mesh networking until the Task Group is approved by the Standards Board.

2.4. **Approval of the Agenda**

2.4.1. The agenda is approved by Unanimous consent

2.5. **Liaison Reports**

2.5.1. 802.11 to 802.1

2.5.1.1. No report. Dave Halasz formally requests that this liaison is removed.

2.5.2. 802.11 to 802.15.3a

2.5.2.1. No report. First call – Atul Garg

2.5.3. 802.11 to 802.18

2.5.3.1. Denis Kuahara.

2.5.3.2. Report in document 18-04-0016

2.5.3.3. The group considered 6 dockets this week. 3.6Ghz FCC action, Reply comment period for Broadband over Powerline. Reviewed comments on interference temperature action from FCC.

2.5.3.4. RR Tag Study Group has been working on spectrum re-use in the TV band. A PAR and 5C were approved for WG formation in the July Plenary. Title is “Wireless Regional Area Working Group”. The “WRAN” group will be available to 802.11 during the July meeting for comments.

2.5.4. 802.11 to WiFi Alliance

2.5.4.1. Bill Carney

2.5.4.2. Report in document 04/555r0

2.5.4.3. Over 1200 certified WiFi products.

2.5.4.4. QoS certification plan of record – WiFi alliance will invoke certification for WME in September 2004. The complete 802.11e amendment will be certified once it is ratified. QoS will always be optional.

2.5.4.5. WPA2 will certify the full 802.11i amendment. Based on June approval, certification will begin in September. WPA2 will coexist with WPA. WPA2 will be optional for 18 months for PC devices.

2.5.4.6. Branding – There is a new logo design, showing the PHY that is supported. Goes into effect this week.

2.5.4.7. Bill Carney becomes WFA chair, Paul Meche, Vice Chair.

2.5.4.8. Meetings – June Warsaw, September Taipei, December Orland, 1Q04 Dublin.

2.5.5. 802.11 to JEDEC JC61

2.5.5.1. Tim Wakeley

2.5.5.2. Report in document 04/652r0

2.5.5.3. JC61 BB-RF interface standard is published and free for download.

2.5.5.4. The interoperability and compatibility recommended practice document work is beginning.

2.5.6. 802.11 to IETF
2.5.6.5. CAPWAP – there are two requests from the group: additional AP functional description, and request for review of CAPWAP taxonomy.

Response in 04/473r3 will be brought as a motion for approval.

2.5.7. **802.11 to MMAC**

2.5.7.1. Inoue-san

2.5.7.2. Report in document 04/596r0

2.5.7.3. Committees are HiSWAN, and Wireless Home Link Committee, and wireless 1394

2.5.7.4. T71 Ad Hoc is working on standardization of 5GHz band. Same scope as 802.11J

2.5.7.5. MMAC will reorganize to have two working groups for WLAN. One for 802.11 and one for HiSWAN. And a SIG for future WLAN systems. Will also have SIGs for UWB and Wireless 1394

2.6. **Old Business**

2.6.1. Report from 802.19 – Tom Seip

2.6.1.1. Document 802.19 – 19-04-0017

2.6.1.2. Proposing change to LMAC Policies and Procedures for coexistence. A Coexistence Assurance document will be produced. The document describes system resiliency. The process only applies to MACPHY standards, not higher layers.

2.6.1.3. The 802.19 TAG will establish and maintain a set of methodologies, and assist WG in coexistence analysis.

2.6.1.4. 802.19 would evaluate the validity of the analysis.

2.6.1.5. 802.19 would approve PARs and Draft. A 6th criteria would be added to the PAR.

2.6.1.6. The 6th criteria will determine if a Coexistence Assurance document is required at the end of the standards process.

2.6.1.7. Discussion

2.6.1.7.1. This could apply to a WG or TAG.

2.6.1.7.2. When will this form be available? This is currently a proposed change. It will take time for ExCom to implement this rules change. 802.19 plans to grandfather all existing PARs, and PARs in the process of being approved.

2.6.1.7.3. How would the evaluation of validity actually happen? 802.19 will ensure the methodology was applied correctly and reported accurately.

2.6.1.7.4. There would be a vote in 802.19 to confirm or not confirm? Yes.

2.6.1.7.5. We have agreements between 802.11 and 802.19. We will be represented in 802.19 during that process. The WG chair assures the group that he will be present.

2.6.1.7.6. Would individuals need to get voting rights in 802.19? Not necessarily, since 802.11 and other WGs will be represented.

2.6.1.7.7. 802.19 is not passing judgment on coexistence, but only how well the methodology was applied.
2.6.1.7.8. Will 802.19 provide any “commentary” to ExCom on a particular standard? Will they evaluate “merit”. Yes.

2.6.1.8. Straw Poll: Affirm that the direction taken by 802.19 for enabling coexistence assurance in Wireless 802 is acceptable

| 2.6.1.8.1. | Vote: For 74, 16 against |

2.6.2. Report on Bonneville team

2.6.2.1. Deferred until Friday

2.6.3. CAC secretary tiger team- Harry Worstell.

2.6.3.1. We have completed a document that is under review. It will be formatted into a pamphlet and print out for the CAC members to review tomorrow.

2.6.3.2. Once the CAC approves, we will distribute to the secretaries of the WG.

2.6.3.3. The purpose is to help increase uniformity, and assure we include the key required elements in all TG and SG minutes.

2.6.3.4. Discussion

2.6.3.4.1. Could this be available on Friday? If everybody likes it, yes. If there are changes, then maybe. We want to be sure the CAC has reviewed it.

2.6.3.4.2. The WG chair reminds the secretaries that TG and SG minutes are due next week on Monday.

2.6.3.4.3. What if there is other input? That is OK. It is a living document. We will offer it to other secretaries to review as well.

2.6.3.4.4. It will be reviewed by secretaries before publication.

2.6.3.4.5. Is this a modification to previous guidelines. Harry purchased a guideline from a parliamentary organization, and gleaned it out.

2.6.3.4.6. This will not become part of our Policies and Procedures. We want to accommodate everyone styles.

2.6.3.4.7. 

2.6.4. Ballot Results review – Harry Worstell

2.6.4.1. The WG is considering to post the full voting results of letter ballots for the group. This would indicate everyone’s votes by name. Normally we just post the totals.

2.6.4.2. We want to get the opinion of the membership. There is not a privacy issue, since no-voters must submit comments anyway.

2.6.4.3. There would be no contact details – just the voters name and their vote. This is a public forum and public records.

2.6.4.4. Discussion

2.6.4.4.1. This is useful to know who to contact when we need to close a ballot. Expects this would be the members-only area. Would like to restrict access to the members of the specific ballot pool, rather than the general web password that is widely known.

2.6.4.4.2. Not an advocate of making this totally open. Wants to keep people from tracking this information with company affiliations.

2.6.4.4.3. Stuart Kerry states that membership is individual, and company affiliations are not published.

2.6.4.4.4. Then why does 802wireless world collecting affiliation? The WG chair has to insure there is no positions of block voting. A given company cannot be more than 15% of the membership.

2.6.4.4.5. This would be posted once after closing, and not continually updated.

Minutes page 11 Tim Godfrey, Conexant
2.6.4.4.6. In favor – this lets members verify that their vote was correctly recorded. There can be no complaints at a later time.

2.6.4.4.7. We need to consider the password since our password is shared among many groups.

2.6.4.4.8. Stuart Kerry states that the web password will be changed by this Saturday.

2.6.4.4.9. Stuart notes that there are 1800 on the reflector, and about 1400 in the database. There are over 500 voters.

2.6.4.5. Straw Poll: Is the posting of ballot results agreeable to the membership?

2.6.4.5.1. The Straw Poll includes everyone in attendance

2.6.4.5.2. Vote: 128 Yes, 3 No.

2.6.4.6. Straw Poll: Should this information be public or private?

2.6.4.6.1. Vote: 94 Private, 20 Public

2.6.4.7. We will post ballot information in the private area for future ballots.

2.6.5. TGi closing report and Motion

2.6.5.1. Stuart Kerry announces the results of the latest sponsor ballot on 802.11i Draft 10:

2.6.5.1.1. Ballot Results 163 elig. 133, 3 against, 8 abstain.

2.6.5.1.2. There was 97% affirm, 86% return. 5% abstain.

2.6.5.1.3. Opened on 4/23, closed on 5/8

2.6.5.2. Dave Halasz presents the TGi closing report

2.6.5.2.1. Draft 10 received 2 comments. 04/526 contains the resolutions. (both comments were rejected)

2.6.5.2.2. There are 3 No voters, and 5 outstanding No comments.

2.6.5.3. Motion: Having completely followed LMSC procedure 10, and believing that comments responses in 11-04/526R1 and the draft mentioned below demonstrate that the IEEE-SA rules for sponsor ballot have reached an orderly endpoint, Request IEEE 802.11i draft 10.0 be placed on the next available RevCom agenda.

2.6.5.3.1. Motion ID 488

2.6.5.3.2. Moved Dave Halasz on behalf of 802.11i

2.6.5.3.3. Vote on the motion: 116 : 1 : 1

2.6.5.4. The WG chair congratulates Dave Halasz and the members of 802.11i

2.6.6. Motions from CAPWAP

2.6.6.1. Move to request Stuart J. Kerry, Chair of IEEE 802.11 to send the letter in 04/473r3 to Bert Wijnen, Operations and Management Area Director and the CAPWAP Co-Chairs, as the IEEE 802.11 Working Group’s Response to the IETF WG request for comments on draft-ietf-capwap-arch-02.

2.6.6.1.1. Moved Dorothy Stanley

2.6.6.1.2. Second Carl Stephenson

2.6.6.1.3. Vote on the motion: The motion is approved by Unanimous consent.

2.6.6.2. Dorothy announces that the work of the Ad Hoc is now completed.

2.6.6.3. Move to request Stuart J. Kerry, Chair of IEEE 802.11 to send the letter in 04/160r5 to Harald Alvastrand IETF Chair, with copies to the IAB and the IESG, Requesting publication of the “EAP Method Requirements for Wireless LANs” as an IETF Informational RFC, or at their discretion, as an IETF Best Current Practice.

2.6.6.3.1. Moved Dorothy Stanley
2.6.7.  WG Editors Report
2.6.7.1.  Terry Cole – report in document 04/005r4
2.6.7.2.  We will be publishing 802.11i with the deadline of 30 days after approval by RevCom.
2.6.7.3.  Internationalization – ISO/IEC version of 802.11-1999 2003 version is in process of approval. Ballot has closed, waiting on ISO summary. Not expecting any comments or further work.
2.6.7.4.  802.11g and 802.11h have not started the ISO/IEC process yet.
2.6.7.5.  Stuart Kerry notes that we go through the ISO/IEC process since we are an international organization. Now that IEEE is fully on par with other standards body, we will start using pointer documents to our documents, rather than re-publication.
2.6.7.6.  The WG chair and thanks Robin Tasker at IEEE for her efforts.

2.6.8.  802.11 to 802.21 Liaison report
2.6.8.1.  Ajay Rajkumar
2.6.8.2.  802.21 document 21-04-0021
2.6.8.3.  802.21 was started in March 2004, working on media independent handover. Specifically inter-802, and 802 with cellular technologies.
2.6.8.4.  Inter ESS handover may also be handled.
2.6.8.5.  The overlap means there will be interfacing with other 802 groups. This is the first introduction to 802.11 for that purpose.
2.6.8.6.  Discussion
2.6.8.6.1.  Liaisons are fine for reports, but work will need to happen in key task groups. Especially those that have direct overlap with 802.21 activities.
2.6.8.6.2.  The Wireless Network Management group is one. In addition TGk, Fast Roaming, TGn, and WIEN should be included. Joint meetings with these groups would be appropriate.
2.6.8.6.3.  Also we may want task group level joint meetings.
2.6.8.6.4.  This is a call for interest.
2.6.8.6.5.  The 802.11 TG chairs will discuss with Ajay and determine what the proper level of interaction that is needed.
2.6.8.6.6.  802.21 will be with us in Portland and also in Berlin for September.

2.6.9.  AP Functional Descriptions– TK Tan
2.6.9.1.  Report in document 04/604r0
2.6.9.2.  WNG had four presentations of AP functional descriptions.
2.6.9.3.  We are trying to describe the AP architecture per the current standard, and to allow for innovation.
2.6.9.4.  Looking to address industry trends such as the wireless network view, and the possible distributed or centralized architectures.
2.6.9.5.  The current standard does not provide clear specification of interoperability within the ESS.
2.6.9.6.  Create a formal description of an AP, tying in 802.1X, CAPWAP, Mesh, 802.21, etc.
2.6.9.7.  Planning to form a new Study Group to address this effort.
2.6.9.8.  WNG SC took a straw poll, the result was 26 : 1 : 9
2.6.9.9.  Straw Poll: Do you support the formation of a Study Group to work on better AP functional descriptions.
2.6.9.9.1.  Discussion:
Would this produce a PAR for a recommended practice? The SG would decide.

Vote: 110 for, 7 against, 23 abstain.

Announcements

7:00AM tomorrow CAC meeting Terrace F
Social event tonight – Count requested: 125 people are going.
The agenda has been changed for Thursday. If you are going to TGJ, select TGm. If you want TGe use WNG. If you want WNG use TGe.
Charles Wright announces the WPP has PAR and 5C on the server.
613r0 and 585r3
Tomorrows WNG will have a motion for the new SG.

Recess

The meeting is recessed at 12:33PM

Closing Plenary, Friday, May 14, 2004

Opening

The meeting is called to order at 8:05AM by Stuart J. Kerry.
Following the approved agenda in 04/275r5
There are no changes in r5
Review of the agenda for this meeting.
The next agenda will 04/592, available 30 days before the next meeting.
Any changes to the agenda?
Al Petrick will report on the RREG Ad-Hoc
The agenda is approved by Unanimous consent.
There are 190 people in the room.

Announcements

CAC members are reminded to note dates. May 17th for TG and SG minutes. Agendas are due by May 25th. First conf call June 7th and July 5th. There will not be an extraordinary meeting in Portland. Meeting matters will be discussed on CAC conf call number 2
Remember to reply to the email letter to confirm your voting before June 30th.

Letters of Assurance

Stuart Kerry calls for new LOA from the body.
None
Stuart Kerry will send a letter to TI referring to the Patent identification by Tom Seip regarding Mesh Networking, now that

New Task Groups

As of yesterday TGr is Fast Roaming Task Group, and TGS is Mesh Networking Task Group.
802.11m-revA was also approved

Documentation Update
3.5.1. Documentation for 2003 will be moved to the grouper.ieee.org server. Revisions will have to be sent to Harry, since they can't be uploaded there.

3.6. **Task Group Reports**

3.6.1. **TGe**

3.6.1.1. Sponsor Ballot Report on Draft 8. Stuart Kerry Reports the ballot is at 69% return, 85% yes, 15 negatives as of a few minutes. The current sponsor ballot closing date is the 20th of May, or when it reaches 75% return ratio.

3.6.1.2. John Fakatselis presents the TGe report in document 04/640r0.

3.6.1.3. First recirculation of Sponsor Ballot. 320 comments were received so far. 150 have been resolved so far.

3.6.1.4. Objective for July- complete comment resolution, issue draft for recirculation.

3.6.1.5. Stuart notes that the minutes of TGe will be reviewed to insure the proper process is being followed.

3.6.2. **TGj**

3.6.2.1. Closing report was given on Wednesday

3.6.3. **TGj**

3.6.3.1. Sheung Li presents the report in document 04/641.

3.6.3.2. This meeting focused on reviewing the sponsor ballot process.

3.6.3.3. TGj will move to conduct an ad-hoc meeting to resolve comments on sponsor ballot

3.6.3.4. The date will be determined based on the date the sponsor ballot is started.

3.6.3.5. The Sponsor Pool for 802.11J closes today.

3.6.4. **TGk**

3.6.4.1. Richard Paine presents the report in 04/647

3.6.4.2. Meeting objectives were to complete review of draft 014. address security and handoff.

3.6.4.3. Technical comments have been almost completed

3.6.4.4. Two security proposals were given. Neither passed.

3.6.4.5. A team is working on handoff.

3.6.4.6. Security is the remaining issue. There are three approaches.

3.6.4.7. Work will continue in July. LB will be considered there.

3.6.4.8. Teleconferences will continue.

3.6.4.9. Discussion

3.6.4.9.1. Is the site report team informal or official? Informal. Request that the team output be taken back onto the IEEE reflector.

3.6.4.9.2. There are two teams. Wants to be able to keep track of every official part of TGk, and have the communication on the reflector. Can't control the non-TGk team.

3.6.4.9.3. Stuart Kerry reminds the membership that all TGk business should be public and conducted on the reflector.

3.6.5. **TGm**

3.6.5.1. Bob O'Hara presents report in 04/523r0

3.6.5.2. TGm will continue to respond to interpretation requests.

3.6.5.3. There was one submission proposing to add text to define vendor specific element into the standard.

3.6.5.4. This was adopted, and will be incorporated into a draft.
3.6.5.5. Also passed a motion to create a new 802.11 draft, merging the current 802.11 standard with 802.11g and 802.11h, plus and TGm changes.
3.6.5.6. There are 75 work items remaining.
3.6.5.7. Will address "Wildcard SSID"
3.6.5.8. Objectives for July – adopt new draft for 802.11rev, and interpretation requests.
3.6.5.9. Discussion
3.6.5.9.1. What happens when new amendments are approved like 802.11i and 802.11e? The PAR for TGm says new amendments approved through November 13th 2004 will be rolled into the revision draft.
3.6.5.9.2. There is a problem with document 619r3

3.6.6. Announcements
3.6.6.1. Stuart Kerry reminds the Chairs that they must send room size and attendance requests by the end of the day.

3.6.7. TGn
3.6.7.1. Report in document 04/532 by Bruce Kraemer
3.6.7.2. Plans were to complete FRCC and usage models.
3.6.7.3. Firmed up presentations date and CFP schedule.
3.6.7.4. There were 9 technical presentations.
3.6.7.5. FRCC was disbanded since work was complete. Thanks to those that participated, and Adrian Stephens for chairing the effort.
3.6.7.6. There will be a Call For Proposals on Monday May 17th on the web site and reflector.
3.6.7.7. Timeline of key events was established. Presentations will start in September in Berlin.
3.6.7.8. In July, TGn will prepare for presentations and reviewing status of CFP, reviewing timeline.
3.6.7.9. Will form liaison with 802.19 and 802.21.
3.6.7.10. Discussion
3.6.7.10.1. Why would TGn liaison with 802.21? Stuart Kerry states that many groups will form Liaisons. Liaison is a general term.

3.6.8. Publicity
3.6.8.1. Brian Matthews presents 04/591
3.6.8.2. Had update from WiMedia Alliance
3.6.8.3. Had update from WiFi Alliance
3.6.8.4. Reviewed recent press enquiries and coverage.
3.6.8.6. We will have a release on the two new task groups.
3.6.8.7. Bonneville update – Document 04/646 is a report on CAC team working to improve the 802.11 standards process and efficiency. Most recent discussion was on modifying the 4-hour rule.
3.6.8.7.1. Stuart Kerry notes that Brian should contact Andrew Myles regarding his presentation in March.

3.6.9. WNG
3.6.9.1. TK Tan presents report in document 04/509
3.6.9.2. Discussed AP functional behaviors and descriptions
3.6.9.3. Motion to recommend to ExCom to form SG on AP
3.6.9.4. Presentations on Wireless on TV bands, and spectrum etiquette.

3.6.10. TGr – Fast Roaming
3.6.10.1. Clint Chaplin presents 04/648
3.6.10.2. Received reports from ad-hoc groups, and other presentations. There will be cross-pollination between TGr and WIEN. Working on precise definition of ESS jointly.

3.6.10.3. Created scope, requirements, and timeline documents.

3.6.10.4. Goals for July – finish scope and requirements, call for normative text.

3.6.10.5. Will conduct 3 teleconferences, at different times for different regions.

3.6.10.6. Will select officers in July. Call for technical editor.

3.6.10.7. The FR SG has been concluded. Clint Chaplin is released from duties of chair of FR SG.

3.6.11. TGs – Mesh

3.6.11.1. Donald Eastlake presents document 04/649

3.6.11.2. Received presentations on defining ESS and Mesh concepts.

3.6.11.3. Formed ad-hoc subgroups on use cases, QoS, and Routing.

3.6.11.4. Will hold teleconferences.

3.6.11.5. Will establish joint sessions with related groups such as TGr.

3.6.11.6. There will be elections for secretary and editor in July.

3.6.11.7. Discussion

3.6.11.7.1. The presentation is not properly formatted.

3.6.12. WIEN SG

3.6.12.1. Report in Document 04/633r0. Steve McCann

3.6.12.2. Received presentations – outlining issues that the group will cover.

3.6.12.3. Two categories of issues. 802.11 air interface, and other issues that are network to network (which may not be in scope).

3.6.12.4. Worked on PAR and 5C.

3.6.12.5. Discussed relationship with 3GPP organization and liaison opportunities.

3.6.12.6. Formed list of 802.11 air interface issues that need to be address. Request for presentations to address these issues.


3.6.12.8. Discussion

3.6.12.8.1. Stuart Kerry notes that 3GPP liaison is raising concern with other 802 Working groups. Steve McCann will consult with other WG chairs.

3.6.13. WNM SG

3.6.13.1. Harry Worstell presents 04/644

3.6.13.2. Wireless Network Management – extending work of TGk, allowing higher layers to manage the wireless network.

3.6.13.3. Looking for Secretary for ongoing work.

3.6.13.4. Discussed needs, requirements, and scope, and started considering PAR and 5C.

3.6.14. WPP

3.6.14.1. Charles Wright presents document 04/525r1

3.6.14.2. Worked on PAR and 5C document, which was approved in the SG.

3.6.14.3. Held joint meetings with TGk and 802.19.

3.6.14.4. Will resolve comments on PAR and 5C in July.

3.6.15. WAVE SG

3.6.15.1. Lee Armstrong presents document 04/650r1

3.6.15.2. The WAVE SG resolved comments and issues on PAR and 5C.
3.6.15.3. Discussed issues of stand-alone standard vs amendment to 802.11
3.6.15.4. Revised PAR and 5C was generated and approved.
3.6.15.5. Goals for July – prepare basis for first draft amendment.
3.6.15.6. Letters in support of WAVE were received from a number of companies.
3.6.15.7. PAR and 5C were accepted by vote of 22:1:3
3.6.15.8. Discussion

3.6.15.8.1. What was the decision of amendment vs standard? It will be an amendment.

**3.7. Standing Orders – Motions**

**3.7.1. TGj Motions**

<table>
<thead>
<tr>
<th>Motion</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7.1.1.</td>
<td>Motion to authorize ad hoc meeting to resolve sponsor ballot comments to enable issue of sponsor ballot recirculation under Procedure 10</td>
</tr>
<tr>
<td>3.7.1.1.1.</td>
<td>Moved Sheung Li on behalf of TGj</td>
</tr>
<tr>
<td>3.7.1.1.2.</td>
<td>Motion ID 490</td>
</tr>
<tr>
<td>3.7.1.1.3.</td>
<td>Vote: passes 86 : 0 : 1</td>
</tr>
</tbody>
</table>

**3.7.2. WNG Motions**

<table>
<thead>
<tr>
<th>Motion</th>
<th>Details</th>
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<tbody>
<tr>
<td>3.7.2.1.</td>
<td>Move that the WNG SC recommends that the IEEE 802.11 WG form a study group to determine how to formally describe the Access Point functions and behaviors (ref 11-04/604r0), with the intent to create a PAR and five criteria to form a new Task Group.</td>
</tr>
<tr>
<td>3.7.2.1.1.</td>
<td>Moved TK Tan on behalf of WNG</td>
</tr>
<tr>
<td>3.7.2.1.2.</td>
<td>Motion ID 491</td>
</tr>
<tr>
<td>3.7.2.1.3.</td>
<td>Vote: motion passes with Unanimous consent</td>
</tr>
</tbody>
</table>

**3.7.3. WAVE Motions**

<table>
<thead>
<tr>
<th>Motion</th>
<th>Details</th>
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<tbody>
<tr>
<td>3.7.3.1.</td>
<td>Move to have the Working Group approve the PAR defined in 11-03-0943r7, and the 5 Criteria response from 11-03-0967-r5 and to forward them to the IEEE 802 ExCom and subsequently NesCom for approval.</td>
</tr>
<tr>
<td>3.7.3.1.1.</td>
<td>Moved Lee Armstrong on behalf of WAVE SG</td>
</tr>
<tr>
<td>3.7.3.1.2.</td>
<td>Motion ID 491</td>
</tr>
<tr>
<td>3.7.3.1.3.</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discussion</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7.3.1.3.1.</td>
<td>There have been arguments for and against making WAVE SG an amendment or standalone. Still feels that it should be stand-alone because the documentation update process is cumbersome. Opposed to the motion.</td>
</tr>
<tr>
<td>3.7.3.1.3.2.</td>
<td>Believes it should be a standalone document due to document management issues.</td>
</tr>
<tr>
<td>3.7.3.1.3.3.</td>
<td>Against motion – thought work was interesting, but usage is different than 802.11 intent.</td>
</tr>
<tr>
<td>3.7.3.1.3.4.</td>
<td>For the motion – this has been voted on in the SG and debated. Those involved in the SG feel this work should be an amendment.</td>
</tr>
<tr>
<td>3.7.3.1.3.5.</td>
<td>The WG chair asks for the SG vote on this PAR. The vote was 22 : 1 : 3. Much time was spent debating this.</td>
</tr>
<tr>
<td>3.7.3.1.3.6.</td>
<td>In favor. Working with 7 auto makers that want this to be in the mainstream of 802.11. The SG has gone through a detailed analysis and consideration. The amendment has a minimum impact, and is consistent with other work such as 802.11j</td>
</tr>
</tbody>
</table>
3.7.3.1.3.7. In favor – the auto makers are interested in this for safety, and also interested in the general capability of WiFi in the car. Wants one single technology. Wants an amendment.

3.7.3.1.3.8. If this results in small changes to the MAC then no objection. Can't tell at this stage. Wants an explanation of what changes are expected.

3.7.3.1.3.9. In favor of this motion. Not persuaded by arguments against this on the grounds that this breaks the document. The argument pre-supposes the output and what will be approved. This group has ongoing influence and control. If it breaks the standard, it will not be approved by this group. 802.3 has been amending their standard for over 20 years. They have developed mechanisms to deal with major changes.

3.7.3.1.3.10. In favor – one of the concerns is how does this affect other 802.11 products. The nature is that this is very specific targeting a specific frequency band. This will not affect operations in any other unlicensed band. It is better that this is an amendment.

3.7.3.1.3.11. Lee Armstrong answers regarding changes and impact of the amendment. There is minimal impact and will not break the standard or existing implementations.

3.7.3.1.3.12. For the motion. The devices that use this technology can also be used in 802.11 mode. This means there should be a close coupling. The maintenance of the standard is up to this body.

3.7.3.1.3.13. Question – have heard that there is a proposal already written. What is the document number? There is no formal document. There is an existing ASTM standard. We started to prepare an 802.11p draft, but there is work to be done, since it duplicates what is in 802.11J. It is not on the server.

3.7.3.1.3.14. The 802.1 documents have frequently used stand-alone documents. They tend to be standards that are above the LLC. Things that are below the LLC tend to be amendments.

3.7.3.1.3.15. The advantage of being an amendment is that it can expand the market for other types of technologies that are developed in 802.11. A base standard cannot grow and expand as easily. In favor.

3.7.3.1.3.16. In favor of the motion – call the question

| 3.7.3.1.3.16.1. | Bruce K / Colin L |
| 3.7.3.1.3.16.2. | Vote: passes 78 : 0 : 0 |

3.7.3.1.4. Vote on the main motion: passes 60 : 11 : 19 (83%)

3.7.3.2. Move to have the Working Group initiate a 15 day letter ballot to reaffirm the WG decision regarding the WAVE PAR and 5 Criteria.

| 3.7.3.2.1. | Moved Lee Armstrong on behalf of WAVE SG |
| 3.7.3.2.2. | Motion ID 492 |
| 3.7.3.2.3. | Discussion |

3.7.3.2.3.1. Against this – why do we have to do it again? The WG chair answers that this is an interim session. We don't know if we have a quorum. We have problems at ExCom. They require a quorum. This LB gets the entire WG involved. This is a re-affirmation to include members that are not here.
3.7.3.2.3.2. Suggest it would be better to have a vote in July to affirm this PAR and 5C on the ExCom Docket.

3.7.3.2.3.3. Stuart Kerry states that he has consulted with ExCom, and the rules say that the item would have to be removed from the EXcom agenda if it were not confirmed by the full WG with Quorum. It has to be on the Agenda by Sunday night in July.

3.7.3.2.4. Vote: Motion passes 77 : 0 : 6
3.7.3.2.5. The ballot will start next Wednesday.

3.7.4. WPP Motions
3.7.4.1. Request that this PAR & 5 Criteria contained in 11-04/613r2 & 11-04/585r5 be posted to the ExCom agenda for WG 802 preview and ExCom approval (and subsequent submission to NesCom).

3.7.4.1.1. Moved Charles Wright on behalf of WPP
3.7.4.1.2. Motion ID 493
3.7.4.1.3. Discussion
3.7.4.1.3.1. Will there be a motion to have a LB to affirm? Yes
3.7.4.1.4. Vote: motion passes 67 : 2 : 17

3.7.4.2. Move to have the WG chair initiate a 15 day letter ballot to reaffirm the WG decision regarding the WPP PAR and 5 Criteria.

3.7.4.2.1. Moved Charles Wright on behalf of WPP
3.7.4.2.2. Motion ID 494
3.7.4.2.3. Vote: motion passes 73 : 0 : 8

3.7.5. Report of 5GHz Regulatory Ad-Hoc
3.7.5.1. Report in doc 04/636r0
3.7.5.2. Reviewed ITU documents on RLAN protection, and input from WiFi Alliance on DFS.
3.7.5.3. Determined general interference requirements.
3.7.5.4. Developed two user scenarios, home and enterprise.
3.7.5.5. Reviewed rate degradation model.
3.7.5.6. Will finalize document to present at September ITU meeting.
3.7.5.7. Q&A
3.7.5.7.1. none

3.7.6. WG Motions
3.7.6.1. Move to authorize teleconferences to be held by 5GHz Ad-Hoc SC no more than once every week starting no earlier than June 1, 2004, and until two weeks after the Portland July 2004 802 plenary.

3.7.6.1.1. Moved Al Petrick
3.7.6.1.2. Second Carl Stephenson
3.7.6.1.3. Motion passes with Unanimous consent
3.7.6.2. Move to empower all Task Groups and Study Groups to conduct weekly teleconferences to progress through the IEEE standard process until two weeks after the Portland 802 plenary meeting. Exact dates and time to be announced by each group 10 days prior to the calls.

3.7.6.2.1. Moved Harry Worstell
3.7.6.2.2. Second Clint Chaplin
3.7.6.2.3. Discussion
3.7.6.2.3.1. How many hours per week would this add up to? If all groups held teleconferences, it could be 12-14
hours. However most people are interested in a subset of groups.

3.7.6.2.3.2 Stuart Kerry notes that all pertinent information should be posted to the reflector.

3.7.6.2.4 Vote; Motion approved by Unanimous consent

3.7.7 802.18 RR TAG motions

3.7.7.1 To approve document 18-04-0020-00-0000_04-37_BPL_Rep_Cmts.doc authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the EC for the required 5 day pre-filing review, and file the document in a timely fashion with the FCC.

3.7.7.1.1 Moved Carl Stephenson on behalf of 802.18
3.7.7.1.2 Second Colin Lanzl
3.7.7.1.3 Vote: Motion is approved by Unanimous consent

3.7.7.2 To approve document 18-04-0022-00-0000_3GHz_NPRM_Cmts.doc authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the EC for the required 5 day pre-filing review, and file the document in a timely fashion with the FCC.

3.7.7.2.1 Moved Carl Stephenson on behalf of 802.18
3.7.7.2.2 Second Richard Kennedy
3.7.7.2.3 Discussion
3.7.7.2.3.1 Were there any recommendations about directional antennas? It was recommended that a maximum power and a minimum antenna gain. Would allow co-location of many full-BW links.

3.7.7.2.4 Vote: Motion is approved by Unanimous consent

3.7.7.3 To approve document 18-04-0024-00-0000_Wireless_broadband_comments.doc authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the EC for the required 5 day pre-filing review, and file the document in a timely fashion with the FCC.

3.7.7.3.1 Moved Carl Stephenson on behalf of 802.18
3.7.7.3.2 Second Bruce Kraemer
3.7.7.3.3 Vote: Motion is approved by Unanimous consent

3.7.7.4 To approve document 18-04-0025-00-0000_cognitive-radio-rep-cmtes.doc authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the EC for the required 5 day pre-filing review, and file the document in a timely fashion with the FCC.

3.7.7.4.1 Moved Carl Stephenson on behalf of 802.18
3.7.7.4.2 Second Denis Kuahara
3.7.7.4.3 Vote: Motion is approved by Unanimous consent

3.7.7.5 To approve document 18-04-0023-00-0000_Industry_Canada_Cmts.doc authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the EC for the required 5 day pre-filing review, and file the document in a timely fashion with Industry Canada.

3.7.7.5.1 Moved Carl Stephenson on behalf of 802.18
3.7.7.5.2 Second Denis Kuahara
3.7.7.5.3 Vote: Motion is approved by Unanimous consent

3.7.8 802.19 COEX TAG update

3.7.8.1 Reviewed comments on proposed changes to approval process for coexistence.

3.7.8.2 Document 19-04-0010r4
3.7.8.3. Issued 15 day electronic ballot to send document to ballot.
3.7.8.4. Had discussion of coexistence in licensed bands, and methodology.

3.8. New Business
3.8.1. None

3.9. Announcements
3.9.1. Al Petrick requests members interested in the 5GHz Ad Hoc to send him an email.
3.9.2. Stuart Kerry reviews procedures for managing reflector subscription on the web site.
3.9.3. Discussion on the opinion of the group on scheduling meetings concurrently with 802 Tutorials during plenary meetings. For example tutorials on WAVE were presented, but 802.11 was not able to attend, and later the information had to be repeated.
3.9.3.1. Stuart Kerry asks for members opinions if we should reserve Monday and Tuesday evenings for 802 tutorials, and not hold 802.11 meetings.
3.9.3.2. Feels that we have a lot of work to do. It is already difficult to accomplish our work. Doesn't want to give up the time.
3.9.3.3. Would like to see the tutorials, but feels we need to continue our work.
3.9.3.4. From the perspective of 802.18, we have to finish by end of Thursday. To take those slots away would be painful.
3.9.3.5. Appreciates the difficulty of missing the tutorials, but suggest considering tutorials on a case by case manner, and recess for specific tutorials that are of WG interest.
3.9.3.6. Without tutorials it is difficult to know what is going on in other groups. It is hard to plan ahead. Suggests dealing with the schedules once the tutorials are announced.
3.9.3.7. We should not give up primary meeting time for tutorials. Maybe the tutorials could be moved to Sunday or Friday afternoon?
3.9.3.8. Stuart will pass that on to the Executive Committee.
3.9.3.9. Request for reasoning behind having tutorials? Stuart states that tutorials are sponsored by any chair of WG or TAG on any subject. Looking for interest and comments across the whole of 802. There is an unwritten rule that WGs should not use evenings for meeting time.
3.9.3.10. 802 also has an opening plenary session for an update of the rest of the 802 working groups.
3.9.3.11. Straw Poll: Would the group be willing to leave Monday and Tuesday evening time slots open for Tutorials at plenary meetings?

| 3.9.3.11.1. | Vote: 26 Yes, 39 No |

3.10. Next Meeting
3.10.1. July 11-16th in Portland, Oregon.

3.11. Adjourn
3.11.1. The meeting is adjourned at 10:30AM.
3.11.2. Congratulations to TGi for their approval and conclusion.
Attendance List Not Yet Available
1. Monday 11:30 pm Morning Session, May 10, 2004

1.1. Opening

1.1.1. Call to order
1.1.1.1. John Fakatselis (JohnF) called the meeting to order
1.1.1.2. Meeting begun at 11:34 am.

1.2. Agenda

1.2.1. Review of the agenda
1.2.1.1. JohnF showed the tentative meeting agenda, 11-04-0275-04-0000
1.2.1.2. 11-04-0275-04-0000-802-11-wg-tentative-agenda-may-2004.xls, on the screen and reviewed the proposed agenda:
1.2.1.2.1. Potentially we will be working on comments. We will likely be occupied discussing comments until the last session.
1.2.1.2.2. We have decided to change the Thursday meeting time from 8-am – 3:30 from 10:30-6pm

1.2.2. Approval of the agenda
1.2.2.1. JohnF: Is there any discussion on the agenda?
1.2.2.2. JohnF: I ask the voting members, are there any objections to approving this new version of the agenda?
1.2.2.3. JohnF: I see no objections, so the agenda is approved.
1.3. Comment Resolution Discussion

1.3.1. **Ballot Status**

1.3.1.1. JohnF: Stuart has agreed to extend the letter ballot for 10 days due to lack of response (only 61% responses, well less than 75%). We shall nevertheless continue to work on the comments. We cannot go for re-circulation because the current ballot has not yet closed.

1.3.1.2. Stuart: I remind those who have already voted that their votes can be changed until the ballot closes.

1.3.1.3. JohnF: Thank you, Stuart. We will address comments as they come in.

1.4. Reviews of voting rules and process

1.4.1. **Rules and Process**

1.4.1.1. JohnF: How many have participated in TGe before, show of hands? None, so no need to go over rules. However, for new members, you can ask a voting member to act on your behalf. You can still participate in discussions.

1.4.1.2. Stuart: Is everyone aware of the patent policy?

1.4.1.3. JohnF: Is everyone aware? No exceptions noted.

1.4.1.4. JohnF: Our next meeting is July 14 in Portland, so we can again ask for re-circulation

1.4.1.5. Stuart: …or the advanced process.

1.4.2. **Acceptance of Last Minutes**

1.4.2.1. Any discussion on last minutes? (11-04-0478-00-000e)

1.4.2.2. Any objection to accepting them? Seeing no objection, meeting minutes approved.

1.4.3. **Papers and Other Business**

1.4.3.1. Would anyone like to present papers?

1.4.3.2. Srin says two, Floyd may have two, Mathilde might have 1.

1.4.3.3. JohnF: None of the papers is ready as of this session? No exceptions noted.

1.4.3.4. JohnF: Some of you might have heard that CEC is re-evaluating 4 hour rule, however TGe process remains the same. Be careful to introduce any material with enough time to meet the 4 hour rule.

1.4.3.5. Mathilde: Does the four hour rule apply to normative text changes?

1.4.3.6. JohnF: Yes, however, if there are no changes to text previously submitted, it obviously meets the requirements of the 4-hour rule.

1.4.3.7. JohnF: Any other questions? We need all papers by 10:30am Tuesday for presentation.

1.4.3.8. JohnF: We may be slow getting comment resolution started because Srin and I have been slow getting the comments. We must keep track of pending, resolved, etc. I ask Srin at this point, what comments have been received so far?

1.4.3.9. Srin: 200-250 comments so far. Now not sure what split is, probably about 200 technical as a guess.

1.4.3.10. JohnF: When will we be ready for resolution process?

1.4.3.11. Srin: 1:30 should be OK.

1.4.3.12. JohnF: Since we need to proceed, I would like to “divide and conquer”, as in past sessions. The most efficient way will be for Srin to help select groups. Each group leader will work with the group, then report back to Srin in preparation for approvals. I would like to open this for discussion.
discussion? Any objection to follow the process as described? Seeing no objection, accepted.

1.4.3.13. Floyd: In the past, some comments have been disputed, what then?
1.4.3.14. JohnF: I will help resolve these in the larger group. Are there any people other than Srini on sponsor ballot? Three hands noted. I encourage you to gather comments from all who wish to contribute. We want successful closure, so please represent all inputs.
1.4.3.15. JohnF: Is there anyone who would like to comment on the Agenda for the balance of the week? If not, I will ask the members to approve recess until 1:30 pm.
1.4.3.16. Stuart: [Clarification of voting policy] As soon as 75% reached, ballot will be closed. If 75% is still not reached the process will be continued up to 40 days. Encourage voting members to vote to speed closing.
1.4.3.17. Srini: Comments will be ready after lunch.

1.5. Closing

1.5.1. Recess

1.5.1.1. JohnF: Please show up at 1:30 pm so we have enough people to work in the comment groups.
1.5.1.2. Any objection to recess? Hearing none, we are in recess until 1:30 pm.

2. Monday 1:30 pm Afternoon Session May 10, 2004

2.1. Opening

2.1.1. Call to order

2.1.1.1. JohnF called the meeting to order at 1:32 pm.

2.2. Comment Resolution Discussion

2.2.1. Editor’s Comments

2.2.1.1. Srini: Document 546r0 will go on server soon. ~ 300 comments
2.2.1.2. John: We will wait until the document is posted and go from there. [waits]
2.2.1.3. Srini: Have looked at document, four logical categories, so will start with 4 groups: Power Save (11.2 and subclasses), EDCA (9.1 and 9.1.1 and subclauses, HCCA (9.9.2), and Others.
2.2.1.4. Srini shows document 546r0 on projected screen, makes proposals.
2.2.1.5. Power: (Floyd), EDCA (open), HCCA (BobM), Others (Srini)
2.2.1.6. JohnF: Going to leave EDCA open for now, even though Srini has volunteered to lead this group as well. Incremental documents are acceptable. If group consensus cannot be reached, will raise to larger group. We will have three groups active. John points out areas of room where groups will work. At beginning of next session at 4:00 pm will ask leaders of groups to report on progress and when slot for discussion is expected to be used. Any questions? Any objection to proceed?
2.3. Closing

2.3.1. Recess
2.3.1.1. Hearing none, recessing the group until 4:00 to allow the ad-hoc groups to proceed with resolutions.

2.4. Opening

2.4.1. Call to Order
2.4.1.1. JohnF: The meeting is called to order
2.4.1.2. Reconvene at 4:06 pm

2.4.2. Update on Comment Resolution Progress
2.4.2.1. Floyd: (representing Power Save) 56 total, 8 addressed, accepted 3, declined 2, 3 recommended for action in larger group.
2.4.2.2. BobM: (representing HCCA group) 21 total comments editorial and technical, 13 addressed with resolutions, continuing to work balance
2.4.2.3. Srinidhi: (representing “Other” group) 100+ comments. 26 comments total, includes both editorial and technical.

2.5. Closing

2.5.1. Recess
2.5.1.1. JohnF: Is there any objection to recessing until 7:30 pm session? Seeing none, we are recessed until 7:30 pm.
2.5.1.2. Recessed at 4:11 pm

3. Monday 7:30 pm Evening Session May 10, 2004

3.1. Opening

3.1.1. Call to Order
3.1.1.1. JohnF: Called meeting to order
3.1.1.2. Meeting reconvened at 7:34 pm.

3.2. Resolution Progress Discussion
3.2.1.1. JohnF: May I have updates on resolution progress?
3.2.1.2. Srinidhi: The Power Save Group has resolved 46 comments
3.2.1.3. BobM: The HCCA group has resolved all but three of the 21 comments.
3.2.1.4. JohnF: Then I propose that the ad-hoc groups continue with the resolution process. For those presenting papers, it would be helpful to have them ready for tomorrow morning, and make sure 4 hour rule is preserved.
3.2.1.5. Mathilde: What is the vote return currently?
3.2.1.6. JohnF: About 61% as of this afternoon.
3.2.1.7. Srinidhi: What happens if we can close ballot and resolve comments by Thursday, can we go for new ballot?
3.2.1.8. JohnF: Yes
3.3. Closing

3.3.1. Recess

3.3.1.1. JohnF: Is there any objection to calling a recess? Seeing none, the group is recessed until 8:00 tomorrow morning.

3.3.1.2. The group recessed at 8:40 pm

4. Tuesday 8:00 am Morning Session May 11, 2004

4.1. Opening

4.1.1. Call to Order

4.1.1.1. JohnF: Called meeting to order

4.1.1.2. Meeting reconvened at 8:06 am

4.2. Process

4.2.1.1. JohnF: Are there any papers to present today?

4.2.1.2. Mathilde: Paper available

4.2.1.3. Srini: Still determining if paper will be presented.

4.3. Ad-hoc Group Progress Report

4.3.1.1. Floyd: Power Saving group addressed 11, accepted 4 comments, declined 2, marked 3 controversial (need larger group discussion), 2 others require additional info from commenter. Working on compromise power-save proposal, so much time spent on this.

4.3.1.2. JohnF: I hope we are not designing anything?

4.3.1.3. Floyd: Not a complete re-design, but should be acceptable to majority and should not produce negative comments. There were a total of 56 total comments.

4.3.1.4. JohnF: Are the changes being conducted to minimize no votes?

4.3.1.5. Mathilde: The changes should not provoke a bad reaction.

4.3.1.6. JohnF: I ask the group to judge the changes carefully. Too many radical changes would make the sponsor ballot unrepresentative of new view. Just a word of caution. When will you be ready to produce a document for review, and when will you present to the group?

4.3.1.7. Mathilde: The presentation I will be making in the next session will outline the changes discussed yesterday in the collaboration

4.3.1.8. JohnF: My question to you is when do you expect to be done?

4.3.1.9. Floyd: I expect to have one document and will give to Srini.

4.3.1.10. Srini: I have been looking at the “other” group. with 46 comments resolved to date. Have been getting inputs from other ad-hoc groups. Incorporating into 546r1 (now on server). Total comments was 74 Total number counting all comments is 320.

4.3.1.11. JohnF: Do you think we should try to approve the 74 at the 1:30 session?

4.3.1.12. Srini: Yes, via 541r1

4.3.1.13. JohnF: I am asking the members to review this document before 1:30 session. We will identify any comments of concern and remove these, and approve the balance. Please forward any exceptions to John or Srini.

4.3.1.14. BobM: The HCCA comments total 22. 21 have been resolved and are listed in 570r0 which was placed on the server, and these have already been incorporated in Srini’s document.
4.4. Closing

4.4.1. Recess

JohnF: If no objection, we shall recess until 10:30 to allow the ad-hoc groups to continue their work. Seeing no objections, the meeting is recessed until 10:30 am.

4.5. Opening

4.5.1. Call to Order

JohnF: We call the meeting to order.

Meeting resumed at 10:31 am

4.6. Process

4.6.1. Discussion

JohnF: I have a request to present a paper from Mathilde.

Mathilde: The paper is not yet available, and the co-contributors are still working on it.

JohnF: There is no reason to rush. Give us a final copy. Anyone else with a paper? Is Menzo here? No. We are still hoping to complete the ballot, still 14 voters short as of 9:00am this morning. Stuart and I are individually urging voters to cast their votes. At 1:30 we shall attempt to approve resolutions, so try to be here to. Please review the document. I will try to pass a block comments which are not disputed in 546r1. I will ask the group to approve blocks.

4.7. Closing

4.7.1. Recess

If there is no objection I shall recess until 1:30pm. Hearing none, we are recessed.

Recess at 10:35 am

5. Tuesday 1:30 pm Afternoon Session May 11, 2004

5.1. Open

5.1.1. Call to Order

JohnF: The meeting will come to order.

Meeting called to order 1:32 pm

5.2. Process

JohnF: We would like to hear Mathilde’s paper, then Srini will present the proposed comment resolutions provided by the ad-hoc groups.
5.3. Presentations

5.3.1.1. Mathilde: doc.:IEEE 802.11-04/584r0 Some Power Save changes in the 802.11e Draft. Still in draft form, still being worked on. Incorporate all changes into single framework. Preserve ability of unscheduled ADSD for all traffic, and to have information and control over the amount of buffered traffic received per service period.

5.3.1.2. Andrew Estrada: This addresses a number of comments?

5.3.1.3. Mathilde: Yes. No more questions? Thanks.

5.3.1.4. JohnF: This paper does not appear to be on the server. Please put on the server so that members can read it.

5.4. Comment Resolution

5.4.1.1. JohnF: At this point would like to ask Srini to take the floor. I shall ask for a motion to pass the resolutions. If anyone wants to lodge an exception or suggest an alternate resolution, let's remove these from the list. What remains will be moved as a block. Document IEEE 802.11-04/546r1.

5.5. Closing

5.5.1. Recess

5.5.1.1. JohnF: I am going to take a recess for 15 minutes so that people can review the document. Is there any objection to recess for 15 min? Seeing no objection, we are in recess for 15 minutes.

5.5.1.2. Recessed at 2:06 pm

5.6. Opening

5.6.1. Call to Order

5.6.1.1. JohnF: The group is called to order.

5.6.1.2. Group reconvened at 2:21pm

5.7. Process

5.7.1. Discussion

5.7.1.1. JohnF: I would like to ask if anyone would like to discuss any items individually? None observed. Then we shall proceed with the first resolutions of the week.

5.7.1.2. JohnF: Srini, please present your document.

5.7.1.3. Srini: Here is my motion:

5.7.1.4. "Move to accept the resolutions for the comments for which resolutions have been written in 04/546r1 with the exception of comments Adachi/6, Takagi/3, Myles/44, Kandala/24 and Hansen/8."

5.7.1.5. Moved by Srini/Mark Bilstad

5.7.1.6. JohnF: We have a formal motion on the floor. Discussion?

5.7.1.7. Otani: Adachi 6 may be 8

5.7.1.8. Srini: He is correct, it should have been 8.

5.7.1.9. JohnF: Do you want to move to amend?

5.7.1.10. Srini: I move to amend my motion to change from Adachi/6 to Adachi/8.

5.7.1.11. JohnF: Mathilde do you want to ask something?

5.7.1.12. Mathilde: No.

5.7.1.14. Second for motion to amend by Mathilde
5.7.1.15. JohnF: Hearing no discussion, any objection to pass motion to amend? None noted. Motion to amend passes.
5.7.1.16. JohnF: Any discussion on main motion? Hearing none, any objection to accepting the main motion? Hearing no objection the motion passes unanimously.
5.7.1.17. Bob, does the one you mentioned need discussion?
5.7.1.18. BobM: That one (Hansen/8) has been pulled out, recommend discussion later.
5.7.1.19. Andrew Estrada: I do not understand resolution of Moreton 202, line 209.
5.7.1.20. Srini: Let me look at it. I can explain. Mike is saying round it down, we are saying round it up.
5.7.1.21. Andrew Estrada: Was the resolution declined?
5.7.1.22. Srini: It is an alternate solution, but we declined the comment.
5.7.1.23. JohnF: Given the question that I went through, the way to produce the most productive time, I suggest we break into ad-hoc groups again. Our next meeting is 10:30 on Thursday, suggest groups of people work on solutions and bring to ad-hoc groups for action Thursday. I prefer to submit documents individually to meet 4 hour rule, then pass through ad-hoc group. Then if I have approval of ad-hoc, then the overall task group will give it a last shot for approval. I encourage individuals and groups to work tomorrow. We do not have 75% to close the letter ballot, but we can still make good use of the time. We can still work productively.
5.7.1.24. Andrew Estrada: What happens if we do not get required returns?
5.7.1.25. JohnF: We will extend until we do. We don’t have an assessment of what we might have to deal with at this time.

5.8. Closing

5.8.1. Recess
5.8.1.1. JohnF: Are there any objections to recess until Thursday May 15th at 10:30am? Seeing none, we are recessed until Thursday
5.8.1.2. Meeting recessed at 2:40 pm
5.8.1.3. Minutes concluded until Thursday meeting.

6. 10:30 am Thursday Morning Session May 13, 2004

6.1. Opening

6.1.1. Call to Order
6.1.1.1. JohnF: The meeting is called to order
6.1.1.2. Meeting is reconvened at 10:39am

6.2. Process

6.2.1. Meeting Schedule
6.2.1.1. JohnF: It has come to my attention that the printed schedules may incorrectly show the meeting time of TGe for Thursday. It is my opinion that we should move on with the officially-adopted agenda. If you know anyone who needs to be here who is not, notify them so that they can attend.
6.2.1.2. JohnF: I wish to continue with this session beginning at 10:30 if there is no objection. Seeing none, I shall continue with the session.
6.2.2. **Comment Resolution Status**

6.2.2.1. JohnF: We have been adhering to a policy of ad-hoc group addressing of ballot comments to recommend resolutions. Srini, have we received any inputs?

6.2.2.2. Srini: There was some ad-hoc activity on Tuesday evening, as well as Wednesday. On Wednesday Matthew Fisher and Menzo Wentink worked to complete some issues. All resolutions are in 546r2.

6.2.2.3. JohnF: Is Menzo here? No. How many comments remain?

6.2.2.4. Srini: About 50 remain, many in power saving ad-hoc group.

6.2.2.5. JohnF: Why so many?

6.2.2.6. Srini: Power saving group has potential solutions, but has not written them up yet.

6.2.2.7. Stuart: [Interrupts meeting] We are looking for the ballot representative for SONY. Is he in the room? No. If anyone knows where he may be found, please contact either myself or John. Also be advised that the ballot extension closes on May 20th.

6.2.2.8. Mark Bilstad: I which to announce that document 11-04-0623-00-000e contains suggested resolutions based on 11-04-0620-00-000e.

6.2.2.9. Mathilde: These are pretty solid, everyone should read them, some changes might still be needed.

6.2.2.10. JohnF: I prefer not to make any changes to 11-04-0620-00-000e

6.2.2.11. Mark: 623r0 contains comments group has not seen these yet. In resolving these we tried to be as conservative as possible.

6.2.2.12. Mathilde can we remove comments without waiting four hours?

6.2.2.13. JohnF: Yes, changes are subject to the four hour rule. If the paper addresses say 50 comments, then we can edit the comments. If these comments are outside the scope of the paper, the changes are subject to four hour rule. By the end of the day I shall seek approval of these.

6.2.2.14. Srini: Since the “i” draft is issuing, we will have to make sure that TGe is compliant with “i”. Another document is on multi-cast 11-04-0625-00-000e, 11-04-0569-00-000e is normative text, both meet four hour rule. I hope to present these.

6.2.2.15. JohnF: Given where we are, I suggest moving forward as follows: So far all of the work [since Tuesday] was done unofficially. I would like to recess for the ad-hoc groups to formally endorse the comment resolutions addressed Wednesday. I want the power save group to draft resolutions on those comments they agree on. I ask Srini to look at “miscellaneous” comments joining others to resolve any remaining comments. After lunch, for everything that has met 4 hour rule, I would like to begin approving things and see how far we can take it by 6:00 tonight. Is this plan understood? Any suggestions to operate a different way? Hearing none, we shall proceed this way.

6.2.2.16. Srini: 11-04-0627-00-000e contains all the current resolutions that will be offered for group approval.

6.2.2.17. JohnF: Floyd, you were out of the room (recaps power save comment resolution need). After lunch we shall act on everything that meets 4 hour rule. By 3:30 we should be able to handle most items. We may run as late as 5:30

6.2.2.18. We shall recess into ad-hoc groups now. Any objections? Any questions?

6.2.2.19. Mathilde: What is the latest time a motion can be made?

6.2.2.20. JohnF: We have fixed agenda items, and must complete them before the end of the session at 6:00. I can take motions as late as 5:30 for changes on the draft. We must officially approve the draft changes before we adjourn.

6.2.2.21. Mathilde: contains a list of comments that some believe can be addressed by normative text changes. Please review this text. If you feel your comments are addressed, please send e-mail to me. If you feel your comment is not addressed please also send me e-mail. (says e-mail address)
6.3. Closing

6.3.1. Recess

6.3.1.1. JohnF: Anything else before recess? No. Then I shall ask does anyone object to a recess until after lunch? Hearing none, we are recessed.

6.3.1.2. Recess at 11:01am.

7. Thursday 1:30pm Afternoon Session May 14, 2004

7.1. Opening

7.1.1. Call to Order

7.1.1.1. JohnF: The meeting is called to order

7.1.1.2. Meeting is reconvened at 1:35 pm

7.2. Process

7.2.1. Comment Resolution

7.2.1.1. JohnF: We want to perform comment resolution, subject to 4 hour rule. Srini, could you take the floor?

7.2.1.2. Srini: I have one exclusion and one change, and 1 paper to present (about 5 minutes). I will make a motion based on this paper.

7.2.1.3. JohnF: Go ahead with the paper.

7.2.1.4. Srini: Document 11-04-0625-00-000e Using QoSLocalMulticast at the QAP. On the server since Monday. Discusses addition of multicast capability APs. This contribution addresses two ballot comments. Normative text has been provided. 11-04-0569-00-000e shows the proposed changes to the draft.

7.2.1.5. BobM: Is the bandwidth used visible to scheduler, and is the access approved by the admittance function?

7.2.1.6. Srini: Yes.

7.2.1.7. Srini: Motion:

7.2.1.8. "Move to incorporate changes in 04/569r0 into the next version of the TGe draft"

7.2.1.9. Moved by Srini, Seconded by John Kowalski

7.2.1.10. JohnF: Is there any objection to accepting this motion? Yes. One objection.

7.2.1.11. JohnF: I call for a vote. Voting tokens, please

7.2.1.12. The motion passes for 5, against 1, abstain 8

7.2.1.13. Tom Seip: Did this motion cover any comments?

7.2.1.14. Srini: Yes I would like to outline several new comments shown in 546r2.

7.2.1.15. JohnF: Has this been available for the 4 hour period?

7.2.1.16. Srini: Yes, but may be deserving of review. I could bring back later...

7.2.1.17. JohnF: No, I will suggest a short recess to allow review..

7.2.1.18. Mathilde: I have put r1 of 04/0620 containing text changes on proposal for power save on the server. I will ask for a motion on this material later.

7.2.1.19. JohnF: Please review the material slated for voting. Are their any comments or questions?

7.2.1.20. Andrew Estrada: Some cells are marked with olive green on just some cells, so what is the meaning?

7.2.1.21. Srini: Please ignore these notations.
7.3. Closing

7.3.1. Recess

7.3.1.1. JohnF: Is there any objection to recess? Hearing none, we are recessed until 2:10 pm
7.3.1.2. Recessed at 2:00 pm

7.4. Opening

7.4.1. Call to Order

7.4.1.1. JohnF: I call the meeting to order
7.4.1.2. Reconvene at 2:11 pm

7.5. Process

7.5.1. Comment Resolution

7.5.1.1. JohnF: I would like the group to look at 546r2, which has met the 4 hour rule and represents the ad-hoc’s work. Would anyone like to pull aside any comments for case by case treatment?
7.5.1.2. TomSeip: You have already accepted several resolutions that I have submitted, and I would like to address reconsideration. When can I do that?
7.5.1.3. JohnF: The only ones under consideration now are colored in green. Srini, please state the motion to indicate that.
7.5.1.4. Srini: Comments previously accepted are in white.
7.5.1.5. JohnF: Would anyone like to have a comment pulled aside for individual action?
7.5.1.6. Tom: Back to my previous question. I didn’t get an answer… So mine would be out of order at this time?
7.5.1.7. JohnF: Yes.
7.5.1.8. Srini: I wish to move:
7.5.1.9. "Move to accept the resolutions for the comments for which resolutions have been written in 04/546r2 and highlighted in green with the exception of comments 1, 23, and 141.
7.5.1.10. Moved by Srini
7.5.1.11. JohnF: Are there any suggested changes?. No. May I have a second? Second by Mathilde. I have a formal motion on the floor. Any discussion?
7.5.1.12. MarkB: Are these comments viewed as controversial?
7.5.1.13. Srini: These were approved by the ad hoc group.
7.5.1.14. JohnF: I would like to call the question. Can we accept the motion as shown?
7.5.1.15. Objection
7.5.1.16. Very well, we will take a formal vote. Voting tokens please.
7.5.1.17. JohnF: The motion passes unanimously, 5 for, 0 against, 3 abstain
7.5.1.18. JohnF: How many resolutions remain? Are there any other resolutions to be voted on now? If not give us an indication of when we will be ready to vote on remaining ones.
7.5.1.19. Floyd: Our group’s were uploaded at 1:00 pm, so not till 5:00
7.5.1.20. JohnF: Is this the only set of resolutions your group has?
7.5.1.21. Floyd: Yes
7.5.1.22. JohnF: Does anyone else want to forward a resolution?
7.5.1.23. Tom Seip: When would it be an appropriate time for reconsideration?
7.5.1.24. Mathilde: Before the motion is made I would like to present just before the close.
7.5.1.25. JohnF: Just to be careful time-wise, how long to present the paper?
7.5.1.26. Mathilde: No more than 10 minutes.
7.5.1.27. JohnF: I am scheduling resolution motions for about 5:00; I will schedule your paper about 3:30. I would like to entertain any reconsiderations. Reconsideration takes 2/3 to approve and mover must be one of those who originally passed the resolution. However since unanimous, anyone can petition for reconsideration.
7.5.1.28. JohnK: However person had to be present?
7.5.1.29. Srini: Didn’t have to be present?
7.5.1.30. JohnF: Whoever asks for reconsideration must bring new information for reconsideration, so individual must have information that was not available at time of voting. I would ask someone to move on your behalf. Tom you have the floor.
7.5.1.31. Tom Seip: I have concerns about two of my comment resolutions. Most of my comments were resolved well. These two were denied in a way that was not in my view appropriate: Seip/7, and Seip/11 Specifics had to do with removal of a number which had been in a table, but was replaced by “n”. I provided a candidate number, and I was in on original table insertion into 802.11. Max MSDU in a convenient place is necessary. My calculations were said to be wrong, however some number should be provided. The 2nd one: Seip/11: Requested clarification on response to 11, but dissatisfied, what I was told is not shown in text of response. Should add additional text to be responsive.
7.5.1.32. JohnF: I am in favor of allowing motions to reconsider so as to convince voters that the process works. Tom has generously given his time and presence Is there any objection to reconsider? No. There is a motion to reconsider, may I have a second? Mathilde. I am not sure if this is debatable.
7.5.1.33. Srini: The motion is non-debatable.
7.5.1.34. JohnF: The motion has been moved and seconded. Any objections? None. We will therefore reconsider the comments. Tom, can you offer alternative resolutions?
7.5.1.35. Tom: Yes, I will provide them as fast as possible.
7.5.1.36. JohnF: We will try to reach a compromise that will satisfy you and the group
7.5.1.37. Tom: Thank you.
7.5.1.38. JohnF: Is there anything else?
7.5.1.39. Srini: Would like to bring some comments to the floor.
7.5.1.40. JohnF: I would like to have specific resolutions, not something that needs debate. I would like to start editing toward an acceptable solution. It’s appropriate based on our agenda to do that. Which comments?
7.5.1.41. Srini: Comment 185. Srini recommends accept comment.
7.5.1.42. JohnF: May I have informal discussion?
7.5.1.43. Mark: I was the person who worked on this first, but now understand the complexity, and believe TGf may be more appropriate to consider.
7.5.1.44. JohnF: Any other discussion, based on what Srini has proposed? No.
7.5.1.45. Does anyone object to following the informal discussion? No.
7.5.1.46. Srini: I wish to move:
7.5.1.47. "Move to accept the comment 186"
7.5.1.48. Moved Srini/Thomas
7.5.1.49. JohnF: Is there any objection to accept the resolution? Hearing none, the motion passes.
7.5.1.50. Srini: Other comments touch the subject, and will be coupled to this acceptance.
7.5.1.51. JohnF: Does anyone want to bring a resolution to the floor, or anything not yet disclosed to me that will be ready?
7.5.1.52. Mark: Is he going to use this resolution to provide a basis for others? Yes.
7.5.1.53. JohnF: I will ask for another recess. I ask Tom to develop a resolution. I will start with Mathilde, then after 5:00 some time we will consider the resolutions
given in Floyd’s paper. First during recess, examine the documents and pull out any items that you would like to take out of the resolutions.

7.5.1.54. Floyd: The document is available as 623r1
7.5.1.55. JohnF: If there are any individual concerns, pull them aside
7.5.1.56. Mathilde: All the motions will be made on doc 620r1 posted at 1:00. so motions will be coupled to this time.

7.6. Closing

7.6.1. Recess
7.6.1.1. JohnF: Any questions? I would like to recess until the next session at 3:30 pm. Are there any objections? No. Hearing no objections, we are in recess until 3:30 pm.
7.6.1.2. Recess at 2:43 pm

8. Thursday 4:00 pm Afternoon Session May 14, 2004

8.1. Opening

8.1.1. Call to Order
8.1.1.1. JohnF: I call the meeting to order
8.1.1.2. Reconvene at 4:03 pm

8.2. Process

8.2.1. Schedule Review
8.2.1.1. JohnF: We will consider Tom Seip’s two resolutions, and then have Mathilde’s paper.

8.2.2. Process
8.2.2.1. JohnF: Since Tom and Srini are going to work on the resolutions by e-mail, we should have a motion to postpone, to allow the process to complete. Srini, can you so move?
8.2.2.2. Andrew Estrada: I too have a motion to reconsider (the one passed just before recess, upon which I abstained).
8.2.2.3. JohnF: Noted, we will take them in turn.
8.2.2.4. Srini: I wish to move:
8.2.2.5. “Move to postpone the resolution to comments 281 and 285 to the next meeting”
8.2.2.6. Moved by Srini.
8.2.2.7. JohnF: I suggest that we instead say just “table” What has to happen is that somebody will have to take it from the table. We cannot go for another recirculation ballot unless this is addressed, so it is inherently “tracked”. The process is incomplete. The motion to reconsider is incomplete, so we have to table.
8.2.2.8. Moved by Srini. Floyd seconds.
8.2.2.9. “Move to table the resolution to comments 281 and 285”
8.2.2.10. Do I hear any objections to passing this motion? Hearing none, the motion passes unanimously.
8.2.2.11. The procedure we will do is to allow an explanation of why we would want to reconsider any others. I will ask that someone so move who was here at the time of the vote. A vote of 2/3 will be required.
Andrew: I would like to reconsider number 8. The commenter asked that the second case be implemented. The comment was declined as a purpose existed for setting TXOP=0. However, there is an ambiguity for the second case. The rules say a "nominal" size MPDU. Without descriptor the two cases say the same thing.

JohnF: Therefore we will entertain the motion to consider comment #8

Andrew: I wish to move:

"Motion to reconsider comment #8"

Seconded by Srinivasa

JohnF: The motion is not debatable. I ask is there any objection to accepting the motion? Hearing none, the motion passes unanimously. We now consider the comment in the main motion, entertaining an alternate resolution.

Srinivasa: (recommends inserting the words "nominal sized" MPDU).

Mathilde: What is nominal sized?

Andrew: (changed with Srinivasa help to) "transmission of one MPDU of nominal frame size"

Andrew: I wish to move:

"Move to accept the alternate resolution as shown below:

7.1.4 Duration/ID field in Data and Management frames

- Within all data type frames containing QoS CF-Poll, the Duration/ID value is set to
  - one SIFS duration plus the TXOP limit if the TXOP Limit is non-zero
  - time required for the transmission of one MPDU of nominal MSDU size and the associated ACK frame plus two SIFS"

Moved by John, seconded by Srinivasa.

JohnF: I ask, is there any objection to passing this motion? Seeing none, the motion is passed unanimously. I would now like to attempt to pass as a block other resolutions which Srinivasa may have prepared.

Srinivasa: I wish to make a motion based on 04/627r0.

Steve: I would like to mark some exceptions.

JohnF: Although this will produce some changes in the document, I rule that the changes are editorial, suspending the 4 hour rule. Please note the motion as referring to 04/627r1 and upload to server.

Srinivasa: I wish to move:

"Move to accept the resolutions as written in 04/627r1 for the comments for which resolutions have been written in 04/627r1 with the exception of comments 270, 271, and 274."

JohnF: (Time 4:30pm) At 4:30 we are under special orders for ballot business. I rule that it is within the spirit of the items we are already working on, so I suggest we keep working. Before I do so, I would like to hear any objections. Hearing none, we shall continue until 6:00 pm

The motion moved previously by Srinivasa is seconded by JohnK.

JohnF: Is there any discussion on the motion? Hearing none, I call the question. Is there any objection to accepting the motion as shown? Hearing none, the motion passes unanimously. Mathilde you have 10 minutes.

Mathilde: I wish to present "Some Power-save changes in 802.11e Draft", shown as 04/584r0. (Actually document is r1, a typo) I would like to go over the proposal to simplify the existing method for power save in the draft. [Provides Presentation]. We made a few changes last night, and 04/584r1 has been on the server since 1:00 pm

JohnK: I have some concerns. Shows a ballot comment submitted under clause 11 power management. I have concerns it may break WSM, and schedule may be inadmissible in the first place.
Mathilde: It is easy for an AP to provide an APSD schedule.

Thomas Kuehnel: I like that APSD is taken care of, but I am concerned about "side effects". This is a late change, which might be achieved by waiting to the next meeting to allow closer examination.

Mathilde: What is the difficulty? A lot of companies worked on this. If you have specific questions, I'd like to understand them

Thomas: One thing I don't understand is the effect it will have on the counter values that are now transmitted uplink and downlink. It seems at this point that it could have unexpected effects.

Steve: Since we are getting close to the end, we must be sure. It would be good to take some time to make sure things work.

JohnF: Mathilde, make your closing statement. We closed about 50 comments with this? Floyd, How many have you closed?

Floyd: 39 closed

JohnF: Mathilde make your closing statement.

Mathilde: For those of you who have implemented 8.0 you don't have to do much more other than in a field that is set to zero, you put a non-zero value: the only additional complexity.

Floyd: 620r1 and 623r1 are on the server. This addresses 39 comments, so people should take some time to read it to see if they agree with comments.

Mathilde: 620r0 has been on server for an even longer time, so r1 builds on r0.

Floyd: I can do r0 now, and r1 later. But r0 does not reference 623r1.

JohnF: Everything has been on server for 4 hours?

Floyd: No.

Mathilde: The reference is only normative text changes, not the resolutions.

Floyd: 623r1 is a word document

JohnF: ...So everything in 620r1 is traceable to 620r0. I rule that everything here is OK with respect to the four hour rule. I will give full benefit to the membership to review. I will recess to allow members to examine the information. That will give us a half hour to go from there, to see how we can proceed with resolutions. I have a suggestion not to take this time. Does someone want to move to recess?

Moved by Srini, Floyd seconded.

JohnF: I don't think this is debatable. No discussion. Do I hear any objections to recess? Yes. OK, so voters please use your tokens to vote for the motion to recess for 20 minutes. The motion passes 8 for, 2 against, 3 abstain.

JohnF: Therefore we are recessed for 20 minutes. I would like you to review the document just put on the server to see which you want to accept and which you want to pull out.

8.3. Closing

8.3.1. Recess

8.3.1.1. JohnF: We are in recess for 20 minutes.

8.3.1.2. Recess at 5:15 pm

8.4. Opening

8.4.1. Call to Order

8.4.1.1. JohnF: I call the meeting to order

8.4.1.2. Reconvene at 5:35 pm
8.4.2. Comment Resolution

8.4.2.1. JohnF: I show you the draft motion (on-screen). Mathilde, this motion is perfectly in order, but I suggest you provide a document with the individual resolutions. If you don’t do this, all 39 resolutions may be lost if the motion fails. I shall not be able to entertain any further motions. I suggest you consult with Floyd on this.

8.4.2.2. Floyd: I would like to change the motion.

8.4.2.3. JohnF: (note bene) For attendance mark WNG as “e” is not available.

8.4.2.4. Floyd: I wish to move:

8.4.2.5. “Move to accept the resolution as written in 04623r1 for the comments for which resolutions have been written in 04/623r1 with the exception of comments x, y, and z…

8.4.2.6. Steve: which exclusions?

8.4.2.7. JohnK: I would like to exclude Benveniste/4, Benveniste/5, Beneveniste/6 and Benveniste/7,

8.4.2.8. Mathilde: I feel these should be included.

8.4.2.9. JohnF: If every commenter was allowed to keep their own comments in, then the process would not work.

8.4.2.10. Mathilde: I take exception to removing my comments.

8.4.2.11. JohnF: Is there any objection to the motion shown on the screen? One objection noted. I will ask for a vote. Is the motion on the floor in order as stated?

8.4.2.12. JohnK: Point of order

8.4.2.13. Mathilde: The comments excluded are my comments. I am one of the several people who drafted the resolutions.

8.4.2.14. JohnK I would state that if this text is adopted with resolution of these comments it would change my vote, so I think it is valid to exclude them. We could bring to the floor and discuss all over again.

8.4.2.15. JohnF: I have the right to rule whether the motion is out of order. We've heard John's counter-argument. As far as he is concerned the motion is not out of order. I would like to see a vote. Voters with tokens please. The vote passes 15 for, 2 against, 4 abstain, therefore the motion is in order.

8.4.2.16. Srini: point of order, we have more exclusions.

8.4.2.17. JohnF: Sorry, you may continue.

8.4.2.18. Srini: I would like to exclude Benveniste/8,9,10, Amann/7,11, Barr/4,7,8,9, Ecklund/2,3,4,5,6,7,8…

8.4.2.19. JohnF: It is not reasonable to exclude the whole document. Do you intend to exclude the whole document?

8.4.2.20. Srini: Yes.

8.4.2.21. John: You have the right to continue because the motion is in order.

8.4.2.22. Floyd adds exception numbers to the motion.

8.4.2.23. “Move to accept the resolution as written in 04623r1 for the comments for which resolutions have been written in 04/623r1 with the exception of comments Benveniste 4,5,6,7,8,9,10, Amann/7,11, Barr/4. Kandala/22”

8.4.2.24. Srini: But all resolutions reference the same document.

8.4.2.25. JohnF: There are only three minutes to go.

8.4.2.26. Steve: If resolutions conflict with one another how is this handled?

8.4.2.27. JohnF: It shouldn’t—we have to make sure this doesn’t happen.

8.4.2.28. Mathilde: I want to call the question. Tom seconds.

8.4.2.29. JohnF: Any objections to calling the question? Two objections noted. Therefore we shall vote. Members, please use your voting tokens. 2/3 vote is required. Motion fails 7 favor, 7 against, 3 abstaining.

8.4.2.30. Orders of the day.
8.4.2.31.  JohnF: We have reached our agenda time. We shall continue the motion in the next session.

8.5.  Closing

8.5.1.  Adjourn

8.5.1.1.  JohnF: Is there any objection to adjourn? None heard. Therefore we are adjourned

8.5.1.2.  Adjourn 6:01 pm

9.  ----------------------END OF MINUTES---------------------------
Minutes of the 802.11 Task Group I meetings held during the 802.11 WLAN Working Group Interim Session in Garden Grove, California from May 10th – 14th, 2004.
Call to Order & Agreement on Agenda
Meeting called to order on Tuesday, May 11, 2004 at 8:06 am.
Chair: Dave Halasz
Secretary: Frank Ciotti

Agenda discussion - Proposed Agenda:
- Approve Agenda
- Approve Meeting minutes from Chicago & Orlando
- Review IP policy & Letters received
- Chair’s status
  - Sponsor Ballot results
- SB resolution
- Other submissions
  - OUI tutorial
  - 04/160 EAP Method Requirements
  - 04/497 Stanford attack on 4-way handshake

Chair: Any Objection to approving the agenda?
None
Agenda Approved

Meeting minutes approval
Chair: Any objection to approving the Meeting Minutes from Chicago 04/469 And Orlando 04/414?
None

Minutes Approved

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

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

Chair: Does anybody have a patent they wish to disclose?
No.

Chair’s Status
We issued a Sponsor Ballot recirculation on April 23rd which closed on May 8th. We received two comments on the SB.
We used procedure 10 to approve getting on the RevCom agenda. We are not on the agenda yet. I would like to make a motion during this session to be placed on the RevCom agenda.

The RevCom meeting is June 23. If all goes well, they will forward it on to the standards body to be ratified. The standards body meets on June 24.

SB Comments
Chair: We have to forward all of our unresolved comments to RevCom. There is one comment from Dave Bagby that has not been resolved and will be forwarded

Chair: Any objection to rejecting the comment giving the reason from the previous re-circulation?
None

Chair: The second comment is from Keith Amann. This is the same as one of Dave Bagby’s comments. The comment is regarding inclusion of text on the export of encryption. We are not lawyers, however Keith felt that a developer may want to be aware of this.

Chair: Any objection to rejecting the comment giving the reason that it is beyond the scope of TGi?
None

OUI Tutorial
Chair: Originally we had used the OUI of 00:00:00 for 802.11i specific values, but that turned out to be owned by Xerox. Since then 802.11 has obtained its own OUI, however the IEEE is requesting a tutorial on its use. Do I have volunteers to work with me on this?
Jesse, Nancy, Frank
Chair: Meet at 1:30 in Grand D room.

Submission: Dorothy Stanley – doc 04/160r4 – EAP Method Requirements
The document was received by the IETF and went through last call. This revision reflects the comments received from that last call.

Comment: You are not making any security claims because it is a recommendation.
Comment: Why should the IETF care about this as it is a requirements doc for IEEE, not IETF?
Dorothy: 802.11i states that there are requirements for WLANs that are unique to that environment, but the EAP methods are (informally) approved in the IETF. It is a tool that the IETF can use to approve EAP methods.
Comment: If I’m writing 802.11 security code, I’m going to read the TGi draft. I’m not going to know that I should look elsewhere for the EAP methods. This document should be included in the TGi draft.
Comment: This document was specifically requested by the IESG. That is the reason we originally drafted this document.
Comment: When an EAP method has several options, how does one claim compliance? Do all the parameters need to be specified?
Comment: Yes.
Comment: The goal is to make clear the conditions of when an EAP method will and will not conform.
Dorothy will make a motion to approve the draft as the IETF liaison at the Closing Plenary on Friday.

Submission: Jesse Walker – doc 04/497 – 1 Message Attack on the 4-Way Handshake

Jesse: An attack on the 4-Way Handshake has been claimed by Stanford University. The attack is based on the fact that the first message is sent unprotected. A Denial of Service attack can be launched. The suggested solution is for the receiver to maintain a queue similar to handling the TCP SYN flood attack. Another suggestion is to include a MIC in the first msg, however this won’t work with the PSK case. Tim also spoke to the professor at Stanford.

Tim: If the supplicant uses a new SNonce after a successful 4-way handshake (receipt of valid msg 3), then there are no additional memory requirements on the Authenticator to handle this attack. Also, worst case, this prevents a client from getting access the network, and there are many ways to perform this type of attack.

Comment: Is there an issue if the SNonce simply being incremented?

Jesse: The security people for a long time have said that the SNonce should be selected randomly and not incremented.

<br />

<Recess for 5 minutes to draft a straw poll>

Comment: How will these guidelines be published?

Chair: They will be available in the minutes.

Jesse: This allows the client to know the attack is taking place. This is a trade-off of processing Vs. memory resource. This allows less memory to be used.

Straw Poll by Jesse Walker

TGи should suggest the following implementation guidelines as protection against the 4-Way Handshake Denial of Service attack as described in submission 04/497:

- The Supplicant, on receiving a message 1, takes the ANonce from message 1, calculates the TPTK using the current SNonce and sends message 2.
- The Supplicant, on receiving a message 3, takes the ANonce from the message 3, calculates the TPTK using the current SNonce, verifies the MIC and, if correct, updates the PTK and updates the current SNonce with a new random number.
- The Supplicant does not store any information from message 1 between message 1 and message 3.

Result: 23-0-4

Comment: Do we need to inform the maintenance committee of this Straw Poll or the generation of the SNonce?

Chair: A document can be drafted and provided to the maintenance committee.

Comment: We should probably wait until after the RevCom mtg.

Chair: I would like to recess to work on the OUI tutorial for the 802 RAC and to work on the motion for the Wednesday Mid-session plenary.

Chair: Any objection to recessing until 7:30pm?

None
Resume 7:30

Submission: Dave Halasz – doc 04/588 - Tutorial – Using OUI’s to Identify Cipher and AKM Suites

Motion

Having completely followed LMSC procedure 10, and believing that comments responses in 11-04/526R1 and the draft mentioned below demonstrate that the IEEE-SA rules for sponsor ballot have reached an orderly endpoint, request IEEE 802.11i draft 10.0 be placed on the next available RevCom agenda.

Movers:

Clint Chaplin/Mike Moreton

Discussion:

None

Vote: 21-0-0 Passes

Chair: I will bring the motion before the WG in the Mid-session plenary.

Chair: Any further business?

None

Any objection to adjourning?

None

Adjourned at 7:58pm
Thursday, May 13, 8:00AM session

Peter Ecclesine appointed Secretary for the Interim Session
Agenda Moved Sheung Li, Seconded Peter Ecclesine   adopted unanimously
Review IEEE/802 & 802.11 Policies and Rules
Review Japanese Standards Activities
Review IEEE Activities on Balloting Process
Review Recirculation Ballot Results  04-466r1 has LB68 ballot comments
Request Working Group Actions as Necessary
Motion for Empowerment:
Whereas TGj expects to close a Sponsor Ballot long before the July Plenary,
Whereas an empowerment motion was passed in March for TGj to operate as required to progress the ballot process,
including creating drafts for recirculation balloting and handling other business as necessary up to the July Plenary
Move to authorize an ad hoc meeting to resolve Sponsor Ballot comments and create new drafts for recirculation
under Procedure 10, giving 30 days notice to the Working Group prior to the ad hoc meeting

Move  Jon Rosdahl, second Inoue-san
Approve 8  disapprove 0  Abstain 0

Adjourn the session
IEEE P802.11
Wireless LANs

Minutes for the TGk May 2004 Session

Date:

May 10, 2004

Author:

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1. Chair calls the conference to order at 4:00 PM
2. Attendance
3. Review IEEE 802 & 802.11 Policies and Rules
   a. Patent Policy – none seen
   b. Inappropriate Topics
   c. Documentation
   d. Voting
   e. Roberts Rules
4. Objectives for Meeting 04-505r2
   a. Complete D0.14 Review
   b. Measurement Security Inputs
   c. Site Report to Support Handoff
   d. Letter Ballot Vote
5. Technical Presentation Review
   a. Black – Comment Resolution
   b. Kwak – (4) - Periodic Measurements
   c. Qi
   d. Walker
   e. Aboba
6. Move to accept modified agenda
   a. Comment – All of the measurement requests have identical analysis of not requiring confidentiality.
   b. Question – How could do a denial of service attack on “Load Report”? Answer – if you use a “Load Report” to convince clients to migrate to another access point.
8. Technical Presentation - Limiting Degrees of Freedom for Measurement Requests – 11-04/519r0 - Edney
   b. Comment – It will be good to have the use-case scenarios.
   a. Action frames that are sent prior to 4-way handshake can’t be protected.
   b. Goal is to reuse 11i the way it is.
   c. We would have to introduce a management replay counter.
   d. Intend to bring proposal later in the week.
   e. Comment – 11h did not want to protect action frames.
   f. Question – Is the security header in this proposition, the 11i header. Answer – TKIP protects source, destination, and priority. Need different set of rules for muting management bits.
   g. Comment – This defines action categories that can decide if it is protection capable. If a station is not capable then it does not get these action frames.
   h. Comment – This proposal treats action frames as a new form of data frames with a new replay space.
10. Technical Presentation – Use of EAPOL-Key messages – Tim More – 11-04/534r0
    a. 11i defines how and when keys material is available for protection & encryption.
b. 11i EAPOL-Key frame is extendable

c. Secure channel exists between STA and AP as soon as PTK is available

d. Do not need a new encryption mechanism for 802.11k.

e. Question – does it work for broadcast? Answer – send an unprotected frame with the data protected.

f. Question – Are the 2 proposals heard today new security mechanisms outside 802.11i? Answer - 802.11i explicitly describes how it applies to data frames and nothing else. These proposals are new applications of existing encryption mechanisms.

g. Question – Is there precedence for this? Answer – yes.

h. Comment – Wouldn’t this be a candidate for denial of service. Answer – if keys are in place, somebody would have to know your key. If a malicious attacker was in same broadcast group, then they would have your key.

i. Comment – we must assume that 11i is in the baseline text.

j. Comment – in the action frame there is a dialogue token.


a. Problem Statement - The primary purpose of the Site Report is to provide measurements to the STA prior to scanning, which enable the STA to optimize aspects of roaming:
   - Scanning
   - Pre-authentication
   - Others

b. The information is only a hint; you will always need something else prior to roaming.

c. Station may choose to ignore part or all of site report.

d. Must be robust against misleading information.

e. Bad hints
   - STA headed north, AP provided info on APs to south
   - AP provide information on 802.11a APs, STA only supports 802.11b

f. Scanning low priority APs can be very valuable.

g. Information needed early (pre-authentication and optimized scanning)

h. Question – Is the thrust of the presentation that you should be weary of the site report. Answer – Yes, and you need information early.

i. Question – Are there things missing in the site report? Answer – RSN IE Match and reach-ability. For a powerful STA, they can gather all information required from scanning and utilizing cache.

12. Chair - we should get a straw poll on three security mechanisms.

13. Meeting recess until 7:30 PM tonight.
1. Chair calls meeting to order at 7:32 PM
2. Motion to amend agenda to go into comment resolution until more people return from dinner. Motion passes unopposed.
3. Clause 11.7.2 – Black
   a. Problem - "How does the need to return to the serving channel for a particular length of time between measurements relate to periodic measurements? This could result in no periodic measurements being able to be made.”
   b. Remedy – Clarify
   c. Comment – Should we put this comment aside.
   d. Resolution – Open - Assign to task group.
4. Assigning team leaders to D0.14 comment categories
   a. MLME – Black
   b. Periodic Measurements – Kwak
   c. Beacon Reports -.
   d. Busy Time Histogram
   e. Dot11CurrentChannel used for Serving Channel – Johnson
   f. Remove TPC – Kwak
   g. Consistent power –RCPI (suspend until after duplicate review)
   h. Definitions
   i. Security
   j. MIB & PICs
   k. General Description Text
   l. Start Times
   m. ANA
   n. Miscellaneous
   o. Agarwal Comments
5. Technical Presentation Simplified 11k Security – 11-04/552r0 - Kwak
   a. Require TKIP MIC in all action frames – transmitting STA computers/encrypts/appends TKIP MIC to allow receiving STA to authentication both message and sender before acting on contents of received frame. TKIP MIC is modified for use with group key(s) for broadcast/multicast frames.
   b. User frame-based encryption as option for all action frames. Add new security bit. Frames which carry useful information for STAs not yet associated should not be encrypted, e.g. Beacons, Probe Responses, Site Report, new System Information, etc.
   c. The transmitter of the action frame decides when to encrypt.
   d. The receiver of the action frame uses TKIP MIC to decide whether to respond or take any action.
   e. Benefits
      ▪ Avoids discussion/disagreements concerning mandatory data encryption.
      ▪ Do not need to impose encryption on operators or users.
      ▪ Relies on integrity of existing security protocols.
      ▪ Relatively easy to draft text. The procedures section describes intended use of data encryption but includes no requirement “shall”.
   f. Comment – if these action frames were data frames; we would not have to do anything at all. It would also be forward-able on the DS. Make all TGk action frames data frames.
g. Comment – The cryptography does not work with this proposal. If you reuse a key in a different way then you’re exposed to attacks.

h. Comment – The entire data packet has to be encrypted as defined in TKIP.

i. Comment – The data has value and because it has value it should be protected.

j. Comment – 802.11i already contains an Encrypted/Clear bit.

k. Straw Polls related to protecting action frames
   (Walker/Qi 264r4)
   Should TGk utilize the TGi mechanism for protecting action frames?

Yes: 9 No: 9 Abstain: 8

   (Tim Moore 534r0)
   Should TGk utilize the EAPOL/Ether type mechanism for protecting action frames?

Yes: 13 No: 2 Abstain: 9

   (Joe Kwak 552r0)
   Should TGk require a security header and TKIP MIC on all 11k action frames?

Yes: 3 No: 17 Abstain: 3

   (Joe Kwak 552r0)
   Should the TGk security header contain an Encrypted/Clear bit to permit optional encryption of frame body for all 11k action frames?

Yes: 1 No: 17 Abstain: 7

6. Straw Poll
   (Joe Kwak)
   Should unsecured requests reports be sent by the same data mechanism as secure requests reports [rather than action frames]?

a. Comment – Jess Walker speaks against the straw poll.

b. Comment - we did define this in the primitives between SME and MIB.

c. Comment – we should be very careful on forwarding these packets.

d. Comment – we could have 2 mechanisms (1) unprotected or the current action frame format and (2) protected would utilize the data frame tunneling mechanism.

e. Comment – Two mechanisms require a great deal of normative text.

f. Comment – Having tow delivery mechanisms, could lessen the burden of existing 802.11 deployments. You solve 2 problems with a single approach.

g. Question – what happens to legacy clients? Do they drop the Ether types that they don’t understand?

   Yes: 12 No: 0 Abstain: 10

7. Meeting in recess until 8:00 AM tomorrow morning.
1. Chair calls the meeting to order at 8:00 AM.
2. Review Agenda
   a. Review categories of D0.14 comments.
   b. There was some confusion on the comment date submission.
3. Categories of D0.14 comments assignment
   a. MLME – Black
   b. Periodic Measurements – Kwak
   c. Beacon Reports
   d. Busy Time Histogram
   e. Dot11CurrentChannel used for Serving Channel – Comment Resolution
   f. Remove TPC – Kwak will present a paper on Thursday
   g. Consistent power –RCPI (suspend until after duplicate review)
   h. Definitions
   i. Security
   j. MIB & PICs
   k. General Description Text
   l. Start Times
   m. ANA
   n. Miscellaneous
   o. Agarwal Comments
4. Technical Presentation – Site Report MLME Primitives - 11-04/521r0 – Simon Black
   a. It addresses comment #2, but not sure it is applicable because of the favorable straw poll about utilizing secure action frame “data” mechanism.
   b. Question – How is the MLME to SME affected by our straw poll proposal last night?
      Answer – With Tim’s proposal a new Ether type will pass from MAC to SME. The MLME will need to be involved for requests only.
   c. Comment – We will need to define a MAC Shim.
   d. Comment – This architecture is already in place in 11i. The EAPOL utilizes this “MAC Shim”.
   e. Question – should we table this issue? Answer – it does not seem to be appropriate to vote on the text, because it is dependent on the security.
   f. Chair will put this back on the agenda for Thursday.
5. Technical Presentation– Beacon Request for Scanning All Channels – 11-04/0572r0 (PPT) & 11-04/0493r0 (Text) Emily Qi
   a. Comment – This was already submitted and voted in, but was not incorporated in the draft.
   b. Comment – There is a section that describes “Off Channel Measurement Time” – you should resolve your delay and timing issues.
   c. Question – What is the definition of “all channels”? Answer – the channel band.
   d. Question – Does it incorporate country? Answer – we need to add in country and radar restrictions in definition.
   e. Question – why do you want this to be random? Answer – this could be a broadcast and we don’t want all of the STAs scanning all of the same channels.
   f. Comment – all of the STAs would be operating on the same channel.
6. Technical Presentation - New Beacon Reporting Conditions – 11-04/0483r0- Emily Qi
   a. Add two new reporting conditions 11&12.
b. **11** - Report to be issued in the periodic measurement immediately after the RCPI level of the measured STA enters or leaves a range bound by the serving AP’s RCPI and an offset (with hysteresis) from the serving AP’s RCPI.

c. **12** - Report to be issued in the periodic measurement immediately after the RSSI level of the measured STA enters and leaves a range bound by the serving AP’s RSSI and an offset (with hysteresis) from the serving AP’s RSSI.

d. Comment – need to clarify “stronger” and “weaker”.

e. Question – Once I met this condition do I continue sending reports? Answer – only send one.

f. Comment – The text does not make this clear.

g. Comment – change “issued when condition” to “issued when threshold condition”.

7. Technical Presentation – Measurement Duration in D0.14 – 11-04/0559r0 & 11-04/560r0 (Text) - Simon Black

a. Requesting station is in the best position to set the requirements on measurement duration.

b. Optimize use of measurement protocol.

c. Add “duration mandatory” bit to the measurement mode field (1) if bit is set the entire measurement should be performed or rejected and (2) if bit is clear the measuring STA may make best effort.

d. Added new section 11.7.4 describing Measurement Duration.

e. Comment – Refusal clarification needs to be added. It is already in the text in another location.

f. Question – Clarify the use of minimum duration?

g. Comment – We have duration measurements, or event detectors.

h. Question - How does the minimum duration work on event detection (Beacon Measurement)?

i. Comment – The actual duration is a derivative of 11h and was intended for Radar.

j. Comment – If the receiver sends a refusal, then we may not be saving bandwidth.

k. Comment – There was a rule in 11h that each channel had to be sampled for 90ms.

l. Comment – From the discussion there needs to be clarification.

m. Comment – The minimum duration is not needed.

n. Motion

To instruct the editor to apply the editing instructions in document 11-04-560r0 when preparing the next version of the IEEE802.11k draft.

For: 7 Against: 4 Abstain: 11

Motion Fails at 63% (7/11)

8. Clause 11.7.2 – Johnson – Comment #14 from 11-04-0480r3

a. Problem – Is this what is wanted in paragraph two. To always return to the serving channel after every non-serving channel measurement. Don't we want to be able to make multiple non-serving channel measurement in a row?

b. Remedy – Delete paragraph 2 or make this paragraph clearer.

c. Comment – We should not delete this paragraph, because it is providing the vendor with recommendation on what to do.

d. Comment – The intent of the 2nd paragraph is that should be minimum on-channel time and maximum off-channel time. We need to leave the paragraph and reword.

e. Resolution – open – assigned to task group

1. Chair calls the meeting to order 10:30 AM
2. Clause 3 – Olson – Comment #52 from 11-04-0480r3
   a. Problem – The definition of serving and non-serving channel still may not be quite accurate. A suggested change might be to refer to the configured MIB parameter dot11CurrentChannel.
   b. Remedy - Consider including dot11CurrentChannel to define serving and non-serving channel.
   c. Comment – Possible resolution could be “The channel of the AP you are associated with”.
   d. Comment – dot11CurrentChannel should be configured from an external entity.
   e. Comment – dot11CurrentChannel was originally defined for Frequency Hopping.
   f. Resolution – declined
3. Clause 7.2.3.9 – Olson - Comment #76 from 11-04-0480r3
   a. Problem – The AP Channel report should not be required to be in the probe response.
   b. Remedy – Reword to say "may" be included.
   c. Comment – The current wording “shall” means that I must always return an empty report.
   d. Question – Changing it to “may” makes it optional, is that what you want?
   e. Comment – TGh used “may” in the probe request/response.
   f. Comment – TGh did it wrong. Selecting a bad implementation does not get us a good resolution. Maybe adding the “shall”s and “may”s in the notes section might help.
   g. Question – Can we change to “may” and address it in the PICs. Answer - If the report has at least a single element in it, it is not an empty report.
   h. Resolution – open – assigned to Tim and Simon Black
10. Clause 7.3.2.21.4 – Black - Comment #85 from 11-04-0480r3
    a. Problem – Channel Number indicates the channel number on which the requesting STA instructs the receiving STA to issue a Channel Load Report. This seems incorrect (channel number is not that used for the request) and is missing a reference to Channel Band which specifies the range of valid channels.
    b. Remedy - Replace with: 'Channel Number indicates the channel number for which the measurement request applies. Channel Number is defined within a Channel Band as shown in Table 0-2.' Where Table 0-2 should be replaced with a unique identifier within a consistent Table numbering scheme for the draft as noted in a previous comment.
    c. Resolution – Accept – Instruct the editor to make change described above.
11. Clause 7.3.2.21.4 - Black - Comment #87 from 11-04-0480r3
    a. Problem - 'Channel Band indicates the frequency band, taken from , in which the receiving STA shall conduct its measurement' (1) Missing reference
    b. Remedy – Replace with: 'Channel Band indicates the frequency band for which the measurement request applies. Valid values of Channel Band are shown in Table 0-2.' Where Table 0-2 should be replaced with a unique identifier within a consistent Table numbering scheme for the draft as noted in a previous comment.
    c. Resolution – Accept - Instruct editor to make change as described above.
12. Clause 7.3.2.21.4 - Johnson – Comment #89 from 11-04-480r3
    a. Problem - the frame does not have an identifying header that states which class of frame it is.
b. Remedy – We should look at all elements in Measurement Request/Report.
c. Resolution – accept – addressed on Comment #87

13. Clause 7.3.2.21.5 - Black – Comment #92 from 11-04-480r3
   a. Problem – 'Channel number indicates the channel number on which the requesting STA
      instructs the receiving STA to report…' This seems incorrect (channel number is not that
      used for the request) and is missing a reference to Channel Band which specifies the
      range of valid channels.
   b. Remedy – Replace with: 'Channel Number indicates the channel number for which the
      measurement request applies. Channel Number is defined within a Channel Band as
      shown in Table 0-2.' Where Table 0-2 should be replaced with a unique identifier within
      a consistent Table numbering scheme for the draft as noted in a previous comment.
   c. Resolution – Accept – addressed on Comment #85

14. Serial acceptance based on Comments #85 and #87 from 11-04-480r3
   a. Comment #93 – Same as #85
   b. Comment #94 – Same as #85
   c. Comment #95 – Same as #87
   d. Comment #108 – Same as #85
   e. Comment #109 – Same as #87
   f. Comment #110 – Same as #85
   g. Comment #111 – Same as #87
   h. Comment #113 – Same as #85
   i. Comment #114 – Same as #87
   j. Comment #127 – Same as #87
   k. Comment #239 – Same as #87

15. Clause 7.3.2.25 – Johnson - Comment #168
   a. Problem - For a specification, shouldn't a better defined AP Channel Report element be
      made available so there is a chance for vendor interoperability and use? For instance AP
      channel report could mean all allowed regulatory channels while someone else's may
      mean the channels used within a managed ESS. Also is AP channel report at all related to
      Site Report? This is unclear.
   b. Remedy - Add a field to define what the AP channel list contains. Or add text to explain
      what information one can expect to be reported in the channel list.
   c. Comment – we have the ability to disseminate information, but we are unsure of the
      validity. We might be causing problems by defining too much information. Question -
      Are we are addressing a local network or multiple subnets?
   d. Comment – We did add additional information regarding site report at our last meeting
      and it is very complete.
   e. Resolution – Decline comment

16. Clause Annex D - Black - Comment #214
   a. Problem - AP service load is not a counter (and therefore it is questionable it should be in
      a counters table). It is also not a well specified measure of load - there is no way to
      compare two values of service load as there is no real definition of how a particular value
      is calculated.
   b. Remedy - Remove from MIB
   c. Resolution – Accept – Instruct editor to make change described above.

17. Clause #3 – Peyush Comments from 11-04-621r0
   a. Problem – Non-Serving Channel definition
b. Remedy – Non-Serving Channel is a channel that is not being used by a STA for the exchange of MAC Service Data Units (MSDUs) as well as MAC Management Protocol Data Units (MMPDUs).

c. Comment – Definition does not work in IBSS, because there is no association.

d. Comment – Can’t we use beaconing channel.

e. Comment – The current definition is not great, but we have not had a better definition.

f. Question – Can’t we define in both Infrastructure and Ad-hoc.

g. Resolution – open – assigned to Simon Black

18. Clause 5.2.5 – Peyush Comments from 11-04-621r0

a. Problem – P2, L6 Measure WLAN does not make it clear which MIB gets updated.

b. Remedy – Clarify

c. Resolution – decline – already addressed

19. Clause 5.4.4.1 – Peyush Comments from 11-04-621r0

a. Problem – Definition of TPC

b. Remedy – Clarify

c. Resolution – already addressed

20. Clause 7.3.2.21 – Peyush Comments from 11-04-621r0

a. Problem – “Report Bit” and “Enable Bit” clarification

b. Remedy – Clarify

c. Comment – There is a table that addresses this comment (Table 20A).

d. Resolution – open –

21. Clause 7.3.2.22 – Peyush Comments from 11-04-621r0


b. Remedy – Clarify or delete

c. Question – Are you asking if is needed in the report? Answer – yes.

d. Comment – The intent was just to echo the “Parallel Bit” in the request. Maybe we should change the wording to reflect this.

e. Comment – It could ease the implementation of keeping old reports around.

f. Comment – We copied the wording form the request, which is not correct.

g. Comment – If we remove it then it will be out of sync with TGh.

h. Resolution – open – Assigned to Simon Black.

22. Clause 7.3.2. – Peyush Comments from 11-04-621r0

a. Problem – P39, L30 as soon as possible could be replaced with “within xx ms”

b. Remedy – Clarify

c. Comment – It does say “practical” not “possible”.

d. Resolution – decline

23. Clause 7.3.2.1 – Peyush Comments from 11-04-621r0

a. Problem – P4, L1 – “Notes” column in the Beacon frame body table

b. Remedy – “or”

c. Comment – text is correct

d. Resolution – decline

24. Clause Global – Peyush Comments from 11-04-621r0

a. Problem – “Channel Number” as related to requested STA

b. Remedy – Clarify

c. Resolution – decline – already been addressed in previous comment resolution

25. Clause General – Peyush Comments from 11-04-621r0

a. Problem – 11e and 11k interaction

b. Remedy – add text explaining

c. Resolution – open – assign to task group
26. Chair will publish Peyush’s comments and Tim Moore’s 7.4.1 comment with a DCN.
27. Tim Moore wants to add a comment for Clause 7.4.1 to the list.
28. Clause 11.7.7.1 – Olson - Comment #28 from 11-04-480r3
   a. Problem - Beacon reports for the BSS that the STA is connected to should include the
      received elements. This is needed in the case that another AP has stolen the BSSID of
      the associated AP.
   b. Remedy - Remove the statement that says the received elements are not needed in this
      case.
   c. Resolution – Accept – Instruct editor to make change as described above.
29. Clause 11.7.7.1 – Olson - Comment #29 from 11-04-480r3
   a. Problem - In the previous review an updated description of the beacon table mode was
      added in the beacon request section. This description was removed during editing and
      should be added back in this section.
   b. Remedy - Add the text from doc 04/281r0 in this section. It was previously voted in.
   c. Comment – add the “body” of 04/281r0 to the end of the section 11.7.7.1.
   d. Resolution – accept – Instruct the editor to make change described above.
30. Clause 7.3.2.22.6 – Black - Comment #136 from 11-04-480r3
   a. Problem - P21, L11 'BSSID contains the 6-byte BSSID of the STA that transmitted the
      beacon or probe response.' BSSID is a property of a BSS, not a STA.
   b. Remedy - Replace with 'The BSSID field contains the BSSID from the Beacon, or Probe
      Response frame being reported.'
   c. Resolution – Accept – Instruct the editor to make change described above.
31. Meeting in recess until 4:00 PM today.
Chair calls the meeting to order 4:00 PM

Clause 11.7.7.6. – Johnson - Comment #36 from 11-04-480r3
   a. Problem - p 44, l11 - No Noise Busy Time Histogram defined in Table 0-4.
   b. Remedy - Rewrite to use a valid Medium Sensing Measurement or delete example from text.
   c. Comment – need better remedy
   d. New Remedy – Replace Noise Busy Time Histogram with RPI Time Histogram
   e. Resolution – Accept – Instruct the editor to make change described above in new remedy.

Clause 7.3.2.22.9 – Black - Comment #155 from 11-04-480r3
   a. Problem - P25, L6 reference is to Table 0-2 which is the frequency band table. Medium sensing event is in Table 0-4.
   b. Remedy - Correct reference - see also comment on figure numbering in the draft (Change to table 0-4).
   c. Comment – we have multiple tables labeled 0-2. This is a valid reference in clause 7.3.2.21.9 - definition of the subtype in the report IE. One is event subtype and the other report subtype.
   d. New Remedy – (1) Delete Table 0-2 in clause 7.3.2.21.9, (2) change reference in line L11, P17 to Table 0-4 in clause 7.3.2.22.9, and (3) change the reference on P29, L6 to Table 0-4.
   e. Reference Comments - #236 and #242
   f. Resolution – Accept – Instruct the editor to make change described above in new remedy.

Clause 7.3.2.22.9 - Black - Comment #156 from 11-04-480r3
   a. Problem – Bin Offset, Bin Interval and Number of Bins fields are undefined
   b. Remedy - Add definitions.
   c. New Remedy – Copy the definitions from 7.3.2.21.9 (the request) into 7.3.2.22.9 (the report).
   d. Comment – the new remedy is a minimal approach to resolution.
   e. Resolution – Accept – Instruct editor to make change described above in new remedy.

Clause 7.3.2.22.9 - Black - Comment #157 from 11-04-480r3
   a. Problem – P25, L10 - General comment about that the Medium Sensing Time Histogram seems misplaced in the middle of the field definitions.
   b. Remedy – Move elsewhere, or make specific to the contents of the fields of the report.
   c. Comment – It is an introduction to fields below.
   d. New Remedy – Replace the “.” with a “;” at the end of line 11 and indent all following paragraphs to the end of the section.
   e. Comment – strike it instead of indenting.
   f. Resolution – open – task group work

Clause 7.3.2.22.9 –Black - Comment #160 from 11-04-480r3
   a. Problem – P25, L20 Table 0-4. Interval definitions in the table have editorial issues (i subscript 0) and are misleading and unnecessary - a better definition is given below the table.
   b. Remedy – Suggest that the final column is simply Medium Sensing Event and the text 'within the interval (expression)' is deleted from all rows.
   c. Comment – We should leave open
   d. Resolution – Accept – Instruct editor to make change described above.

Clause 7.3.2.22.9 - Black - Comment #161 from 11-04-480r3
a. Problem - what does 'monitors the contiguous duration of the monitored state mean'?
b. Remedy - Replace with 'to compute Bin i density, Bi, 0 ≤ i < N, the STA monitors the measurement channel for the medium sensing events of the requested subtype. If a medium sensing event of the appropriate type occurs during …' 
c. Resolution – open – Assigned to Kwak/Black

8. Clause 7.3.2.22.9 - Black – Comment #163 from 11-04-480r3
   a. Problem - What happens if \( i0 + (N-1)*\Delta i \) is greater than the measurement duration?
   b. Remedy - Clarify.
   c. Resolution – open – Assigned to Black

9. Clause 11.7.5 – Olson - Comment #23 from 11-04-480r3
   a. Problem - Autonomous reporting is not completely specified. There is no description of when a STA should send and autonomous report. This is a holdover from TGh that may not apply to TGk.
   b. Remedy - Either eliminate autonomous reporting or specify how it should work.
   c. Comment – In TGh it makes sense to have autonomous reports for radar detection.
   d. Comment – You can turn autonomous reports on individually by type.
   e. Vote on declining comment
      To decline comment #23
      Comment – Olson speaks against declining.
      Comment – Black speaks for declining.

      Moved: Black
      Second: Johnson

      For: 6   Against: 3   Abstain: 7
      Vote fails at 66%
   f. Resolution – open – assigned to Black/Olson

10. Clause 11.7.4 – Black – Comment #15 from 11-04-480r3
    a. Problem - Does actual measurement duration have to be the same as the requested duration and does it have to be continuous?
    b. Remedy – Clarify
    c. Resolution – open – assigned to Black

11. Clause 11.7.5 – Black - Comment #17 from 11-04-480r3
    a. Problem - P41, L11 If responses indicating refusal, or incapable are optional how are requesting STAs meant to get any information about what can and cannot be requested? One incapable refusal could save many wasted requests.
    b. Remedy - Make responses to measurement requests mandatory.
    c. Question – what happens if a STA goes out of coverage? Answer – we already have text to describe this situation.
    d. Comment – If you don’t get the report back, then you know not to continue sending requests to the STA.
    e. Comment – Our measurements are optional, so we need a way to optimize.
    f. Comment – Can we define “incapable”? What is the difference between “refused” and “incapable”?
    g. Question – This only applies to unicast request? Answer – yes. We already have text to support this.
    h. Comment – Change the definition of “incapable” to “permanently incapable”.

Minutes TGk page 13 AirWave Wireless, Inc.
i. Comment – If the request is “refused” you would not want a response. Then you could continue requesting the STA.

j. Resolution – open – Assigned to Black.

12. Clause 11.7.7.3 - Johnson - Comment #32 from 11-04-480r3
   a. Problem - p43, l21 - Insert "or more" since more than one can occur
   b. Remedy - Insert "or more" between one and Measurement
   c. Resolution – decline – you can only get one.

13. Clause 11.7.7.4 – Johnson - Comment #33 from 11-04-480r3
   a. Problem - p43, l24 - Insert "or more" since more than one can occur
   b. Remedy - Insert "or more" between one and Measurement
   c. Resolution – decline – you can only get one.

14. Clause 7.3.2.21.6 – Black - Comment #96 from 11-04-480r3
   a. Problem - BSSID indicates the BSSID of the particular STA or STAs for which this measurement is requested. The BSSID may be the BSSID of an individual STA or may be the broadcast BSSID. The BSSID shall be set to the broadcast BSSID when the measurement is to be performed on any STA(s) on this channel. BSSID is a property of a BSS not a STA and the beacon measurement is concerned with learning about BSSs and not STAs.
   b. Remedy - Replace with: The BSSID field indicates the BSSID of the particular BSS, or BSSs for which a beacon report is requested. This may be the BSSID of an individual BSS, or may be the broadcast BSSID when requesting beacon reports for all BSSs on the channel.
   c. Comment – Everywhere else we say “BSSID of the transmitting STA”.
   d. Comment – the replacement paragraph may not be completely accurate.
   e. Resolution – open – Assigned to Olson/Black

15. Clause 7.3.2.22.6 – Black - Comment #138 from 11-04-480r3
   a. Problem - The fixed field reporting is currently defined relative to the received frame - this should be the frame being reported (as there could be multiple received frames). I'm also not sure it is really necessary to include field lengths and there are a number of other inconsistencies (TSF value and not Timestamp field, etc.)
   b. Remedy - Replace P21, L12 - 18 with the following: The Parent TSF field shall contain the lower 4-bytes of the measuring STA’s TSF timer value at the time the Beacon, or Probe Response frame being reported was received. The Target TSF field shall contain the Timestamp field from the Beacon, or Probe Response frame being reported. The Beacon Interval field shall contain the Beacon Interval field from the Beacon, or Probe Response frame being reported. The Capability Information field shall contain the Capability Information field from the Beacon, or Probe Response frame being reported.
   c. Resolution – Accept – Instruct editor to make change described above.

16. Meeting is in recess until 7:30.
1. Chairperson calls meeting to order at 7:30
2. Clause 5.4.5 – Johnson – Comment #63 from 11-04-480r3
   a. Problem - Is more text needed for an overall description of Radio Measurement or is this sufficient?
   b. Remedy – None
   c. Comment – no mention of interface between the MLME and upper-layer interfaces.
   d. New Remedy – Add bullets
      i. Providing interface via MLME primitives and MIB access for upper-layer applications to access Radio Measurements.
      ii. Request and reporting of radio environment information.
   e. Resolution – Accept instruct editor to make change as describe in New Remedy.
3. Clause 5.4.4.1 – Olson - Comment #61 from 11-04-480r3
   a. Problem - TPC is not a measurement and is out of scope of TGk. TPC should be left for the management group.
   b. Remedy - Remove TPC from TGk.
   c. Comment – we voted it in D0.14 and we added a sentence to the end of the paragraph “The transmit power control (TPC) service is used in both the 2.4 GHz and 5GHz bands for the purpose of radio measurements.”
   d. Comment – The paragraph is vague and does not describe the actual components of the TGk service utilized.
   e. New Remedy – Change the last sentence of 5.4.4.1 to read “A subset of the transmit power control (TPC) service is used for radio measurement in both 2.4GHz and 5GHz bands for measurement of link path loss.”
   f. Comment – It is already defined in 7.4.2 Table 20f
   g. Resolution – Accept – Instruct the editor to make change describe in New Remedy above.
4. Technical Presentation – Information Infrastructure 802.21 - Johnston
   a. Global Network Neighbor Map
      i. 802.11, 802.16, GSM, GPRS, WCDMA, etc.
   b. Question – what is the timeframe? Answer – target is a year for sponsor ballot. Media specific things might not be defined in the group. It may be incumbent on the specific media.
   c. Comment – there might be a better opportunity to work with the Wireless Network Management Study Group, because of timeframe.
5. Technical Presentation – AP Service Load: Improved Definition – 11-04-550r0 – Joe Kwak
   a. Comment – A packet is a layer 3 concept. Is this a MPDU? Answer – this is an MPDU.
   b. Question – How do you take in account dead time? Answer – the timer does not start until you have a packet for transmission. It is a MAC layer measurement.
   c. Comment – The last 200 packets could be from an hour ago?
   d. Comment – Voice over IP comes in bursts and aging is an issue. We can tell you the age of the measurement, but not the accuracy.
   e. Comment – Admission capacity is not taken into account.
   f. Comment – If you have priority you don’t care about contention.
   g. Comment – Some clients may value latency over capacity.
   h. Comment – We are not specifying how often the AP takes a measurement.
i. Question – What am I getting from the MIB value, a running average? Answer – the 200 packets do not have to be consecutive.

j. Comment – There needs to be more specificity like “running average of the last 200 consecutive packets”.

6. Meeting in recess until 8:00 AM Thursday 05/13.
Thursday, May 13, 2004
8:00 AM – 10:00 AM

1. Chair calls the meeting to order at 8:05
2. Attendance 19 people
3. Agenda
   a. Comment Resolution
   b. Johnston – Technical Presentation – 15 minutes
   c. Kwak – Technical Presentation – 15 minutes
   d. Moore – Technical Presentation – 15 minutes
   e. Walker and Qi – Technical Presentation – 15 minutes
   f. Motions from Walker and Moore
   g. Kwak and Emily – Technical Presentation – 15 minutes
   h. Qi motion on periodic measurements
   i. Black motion
   j. Comment Resolution – 15 minutes
   k. Kwak (3) – Technical Presentation
   l. Motion to approve teleconference minutes
   m. Vote on “Are we ready to go to letter ballot”
4. Motion to accept amended agenda – motion passes unopposed
5. Technical Presentation – Measurement Presentation – Tim Moore - 11-04-583r0 and 11-04-611r0
   a. Question – How is the MAC encapsulated in EAPOL? Answer – 11i uses the 1x method.
   b. Comment – There is a “1x protocol” stack defined in 11i from an architectural perspective, not an implementation perspective.
   c. Comment – We have defined primitives for all MAC to SME and now we are bypassing it.
   d. Comment – That precedence was set in 11i.
   e. Comment – 802.1 specifies how Data Units move up, so we don’t need any change to the specification.
   f. Comment – We only have to modify the key management (RSNA Key Management) which is within our realm.
   g. Comment – We will need to modify the 11i text.
   h. Comment – The proposal breaks the rules of using the MAC to management MAC management frames. Answer – This message is going from SME to SME.
   i. Comment – We should get rid of the EAPOL.
   j. Comment – We still need an unencrypted path for action frames.
   k. Comment – If you have a secured network you can send secure requests. If you have an unsecured network you can send unsecured requests. This assumes that the AP has implemented some portion of the 11i engine.
   l. Comment – This is worst mechanism to transport data messages, because it increases the code inside the security boundary. This makes it harder to test the state machine for the security boundary.
   m. Comment – Introducing a subliminal channel into the security boundary makes it more difficult for export.
   n. Comment – We can easily define a new Ether type. Answer – 11i did define a new Ether type and it is EAPOL key frames.
   o. Comment – This proposal takes it up to high into the implementation stack which might restrict vendors from using the NIC. The SME is distributed and the request might have to
go to the host which would wake it up and out power-save mode. Response – vendor can
implement either on or off the card.

p. Comment – TGk adopted 2 action categories from TGh which would require modification
as well.

q. Comment – This is no more restrictive on implementation “on” or “off” the NIC than 11i
RSNA Key Management.

r. Comment – This proposal makes it impossible to implement 11k without implementation
of 11i. There needs to be an implementation that can work with or without 11i.

s. Question – If we were to adopt something like this, we would be imposing the requirement
of 1x.

t. Chair calls the question.

6. Security Motions

a. Tim Moore’s Motion 11-04-0583r0
Move to instruct the editor to incorporate text from document 11-04-0583r0 into the next
version of the IEEE802.11k draft.

Moved: Moore
Seconded Stanley

For: 11 Against: 18 Abstain: 10
Motion Fails at 38%

Discussion on Tim’s Motion 11-04-0583r0

• Question – Which motion are we voting on the dual approach or all data? Answer – the
all data approach?
• Jesse Walker speaks against the motion based on security not on using the data channel.
• Dorothy Stanley speaks for the motion, because it reuses 11i framework.
• Adrian speaks against the motion because (1) does not map well with the architecture,
(2) places constraints on implementers, and (3) utilizing the wrong mechanism.
• Mike Morten speaks against the motion, because defining another Ether type is a better
implementation.
• Simon Black – would prefer to leave the unprotected action frames in. Simon wants to
amend the motion.

Move to amend the current motion from document 11-04-0583r0 to document 11-04-
0611r0.

Moved: Simon Black
Seconded Amer Hassan

Discussion on Simon’s Amended Motion

• Tim Olson speaks against the motion, because it might be easy to implement, but it
not the right solution

For: 12 Against: 13 Abstain: 14
Motion Fails at 48% (procedural).

Walker

a. Question – Has the MIB definition been assigned by the ANA. Answer – no.
b. **Motion**
   Move to instruct the editor to incorporate text from document 11-04-0594r1 into the next version of the IEEE802.11k draft.

   Moved: Walker
   Seconded: Johnston

   For: 19    Against: 15    Abstain: 5
   Motion Fails at 55%

**Discussion on Jesses Walker’s Motion 11-04-0594r1**

- Jesse Walker speaks in favor of the motion.
- DJ Johnston speaks in favor of the motion, because it does not impose restrictions on implementers.
- Question – What happens on multicast action frames? Answer – (1) They can be sent unprotected in the clear or (2) protected as described.
- Question – Is CCMP open to replay attacks? Answer – 11e has a broken system which needs to be fixed.
- Simon Barber speaks against the motion, because there is no quality of service mechanism for management frames.
- Comment – Jesse Walker believes quality of service for management frames is trivial to add to this proposal
- Dorothy Stanley would like to see a proposal using another Ether type.
- Jon Edney calls the question which passes unopposed.

8. Meeting in recess until 10:30 AM.
Thursday, May 13, 2004
10:30 AM – 12:30 PM

1. Chairperson calls meeting to order at 10:30 AM
2. Attendance 22 people
3. Motion to accept amended agenda – motion passes unopposed
4. Clause 7.3.2.21.6 – Johnson – Comment # 104
   a. Problem – p 14 - Last paragraph- Why 19 measurements
   b. Remedy - Add justification for this number. Why not 40 or 5?
   c. Comment – We selected 19 from a previous Olson comment stating that “100 was too much”, so we selected a random number.
   d. Resolution – decline Joe Kwak will address later
5. Clause 7.2.3.1 – Olson - Comment #69
   a. Problem - The wording for the TPC Report and the Power Constraint element force an AP that supports the radio measurement service to include these elements. Do we not want to word this so that an AP that supports the radio service may include these?
   b. Remedy - Suggest removing TPC from TGk. If it is left in then we need to reword this to be more like the description for AP Channel Report. Should read like this "May be present within Beacon frames generated by APs that have dot11RadioMeasurementEnabled set to true".
   c. Comment – Power constraint can be changed to “may”, but not TPC. TPC is very important.
   d. Comment – would like to make them both configurable.
   e. Question – Why would you not want to facilitate TPC? Answer – there might be clients that don’t support 11k, 11h. So power constraint for clients that do support it would have to compete with clients that do.
   f. New Remedy – Modify the notes column of Table 5 replace the “or” with “and may be present if”
   g. Question – Do we modify the PICs item? Answer - no.
   h. Resolution – Accept – Instruct the editor to make the change described in the New Remedy.
6. Clause 7.2.3.9 – Olson – Comment #75
   a. Problem - The wording for the TPC Report and the Power Constraint element force an AP that supports the radio measurement service to include these elements. Do we not want to word this so that an AP that supports the radio service may include these?
   b. Remedy - Make consistent.
   c. New Remedy - Modify the notes column of Table 5 replace the “or” with “and may be present if”
   d. Resolution – Open – Assign to Black/Olson
7. Clause 11.1.3.2.2 - Black – Comment #11
   a. Problem - For a .11k STA a BSSMeasurementSet is also returned with the BSSDescriptionSet. The text here just specifies what to do if the RCPI measurement (result) is not available.
   b. Remedy - Add text to specify that a BSSMeasurementSet is also returned if dot11RadioMeasurementEnabled is true. Also add ‘result’ as in the comment.
   c. Resolution – open – Assigned to Black
8. Clause 15.4.4.2 - Black - Comment #45
a. Problem - P46, L15 Table 66 Value here should be 0-255, not 1,2Mbit/s (or 8 bits of RCPI which is used in other sections). 0-255 is probably a better specification and the sections ought to be consistent.
b. Remedy - 0-255 is probably a better specification and the sections ought to be consistent.
c. Comment – There is a table in clause 15 that is incorrect in the current draft. Do we correct only our entries are all entries.
d. Notify TGm of the problems in clause 15.
e. Resolution – Accept – Instruct editor to make change described above.

9. Clause 7.2.3.9 – Olson - Comment #77
   a. Problem - Should RCPI be optional?
b. Remedy - Discuss and make a decision.
c. Comment – It is always required, but if there is nothing to send then special value is used.
d. Resolution – decline, because the special value is used when RCPI is not available.

10. Clause 7.3.2.22.5 – Johnson – Comment #131
    a. Problem - Which Power at the antenna (dBm) is being reported, P23 Table0-3?
b. Remedy - Define for RSSI, RCPI, or both.
c. Comment – We resolved with “RCPI” from comment #197 last meeting.
d. New Remedy – “RCPI”
e. Resolution – Accept – Instruct the editor to make the change as described in New Remedy.

11. Clause 7.3.2.22.6 - Black - Comment #135
    a. Problem - The reference to the clause defining RCPI (15.4.8.5), is only a pointer to the definition for a DSSS PHY. What about other PHY types e.g. 17.3.10.6 and 18.4.8.5
b. Remedy - Either add a list of references, or simply say 'as defined in the RCPI measurement clause for the PHY Type' and use the fact that RCPI is a defined term.
c. New Remedy - ‘as defined in the RCPI measurement clause for the PHY Type’ and use the fact that RCPI is a defined term
    d. Resolution – Accept – Instruct editor to make change as describe in New Remedy above.

12. Clause 7.3.2.22.7 – Black - Comment #144
    a. Problem - P22, L8: The reference to the clause defining RCPI (15.4.8.5) is only a pointer to the definition for a DSSS PHY. What about other PHY types e.g. 17.3.10.6 and 18.4.8.5
b. Remedy – Either add a list of references, or simply say ‘as defined in the RCPI measurement clause for the PHY Type’ and use the fact that RCPI is a defined term.
c. New Remedy - ‘as defined in the RCPI measurement clause for the PHY Type’ and use the fact that RCPI is a defined term.
d. Resolution – Accept – (Same as #135) Instruct editor to make change as describe in New Remedy above.

13. Clause 7.3.2.22.7, 11.7.7.2. – Black - Comment #147
    a. Problem - P22, L9: Why have both weighted and un-weighted average allowed? How does the STA receiving the report know which was used? Weighted according to what? 11.7.7.2 P43, L18: signal strength should be RCPI.
b. Remedy - More definition required. Correct to RCPI in 11.7.7.2
    c. Comment – We reviewed in D0.9 review and accepted.
d. Comment – With a Frame report there is a measurement period and during that period we can receive multiple frames, do we use an average or use the last frame.
e. Comment – This was put in to get flexibility in implementation.
f. Comment – PSNI has last, average, etc.
g. Comment – We should just use average.
h. New Remedy – Replace P22, L9 only with “This field shall be the average of the RCPI values of individual received frames.”
14. Clause 11.7.7.2 - Olson - Comment #31
   a. Problem – The frame report was changed to include RCPI and not RSSI.
   b. Remedy – Update the text in this section to use RCPI.
   c. New Remedy – Replace received signal power with RCPI. Change the last sentence to
      “The reported RCPI shall be the average of the RCPI values of the individual frames
      received.
   d. Resolution – Accept – Instruct the editor to make change described above in New Remedy.

15. Clause 7.3.2.27 - Black - Comment #191
   a. Problem – P29, L18 Within a probe response the RCPI element would carry the RCPI
      value measured on the Probe Request' would carry? Which probe request?
   b. Remedy – Suggest: 'Within a Probe Response frame the RCPI element shall be used to
      indicate the RCPI value measured for the corresponding Probe Request frame'
   c. Resolution – Accept – Instruct the editor to make change described above.

16. Clause 7.3.2.27 – Johnson - Comment #193
   a. Problem – Define fields of RCPI element
   b. Remedy – None
   c. New Remedy – Insert P29, L22 (1) “The length field shall be 1”, (2) Insert new Paragraph,
      and (3) “The RCPI field shall contain the RCPI value as defined in the RCPI measurement
      clause for the appropriate PHY type.”
   d. Comment – Already changed “As defined by the PHY section”
   e. Resolution – Accept – Instruct the editor to make change described in the New Remedy
      above.

17. Clause 7.3.2.27 – Olson - Comment #194
   a. Problem – Why does the description of the RCPI IE limit the value to represent a single
      measured frame? This IE should just represent an RCPI value.
   b. Remedy – Change first sentence to "The RCPI element contains a Received Channel Power
      Indication value".
   c. Resolution – Accept – Instruct the editor to make change described above.

18. Clause Definitions – Olson - Comment #52
   a. Problem - The definition of serving and non-serving channel still may not be quite
      accurate. A suggested change might be to refer to the configured MIB parameter
      dot11CurrentChannel.
   b. Remedy – The operating channel of the BSS of which the STA is a member. Non-Serving
      Channel: A channel that is not the operating channel of the BSS of which the STA is a
      member.
   c. Resolution – Accept – Instruct editor to make change described above.

19. Clause 5, 11.7.5 - Black - Comment #149
   a. Problem – What class are measurement and site report action frames. 802.11h defines
      action frames as class 1. Draft .11e narrows this to spectrum management action frames,
      leaving radio measurement frames undefined.
   b. Remedy – Specify
   c. Resolution – open – assign to task group

20. Simon Black calls for the orders of the day

21. Meeting in recess until 1:30 PM.
Thursday, May 13, 2004
1:30 PM – 3:30 PM

1. Chairperson calls meeting to order at 1:30 PM
2. Attendance – 18 People
3. Clause 7.3.2.22.8 – Black - Comment
   a. Problem - P24, L9. There is a definition of what is considered to be a hidden STA in
      11.7.7.5 that includes filtering on retries. Either put the complete definition here, or have a
      reference here to 11.7.7.5.
   b. Remedy – Hidden Station Address contains the MAC address of the hidden station being
      reported.
   c. Resolution – Accept – Instruct the editor to make change as described above.
4. Clause 7.3.2.26 – Johnson - Comment #182
   a. Problem - p28, l21 - Define current AP
   b. Remedy - Does this mean the AP one is currently associated?
   c. Resolution – open – Assigned Olson coupled with Site Report
5. Clause 7.3.2.27- Johnson - Comment #192
   a. Problem – Unclear definition p 29, l17-18
   b. Remedy – The sentence "last received packet from a given station" should be better defined
      to say something like "last received probe request from an associated STA."
   c. Resolution – Decline – already addressed in previous comment
6. Clause A.4.1.3 – Olson - Comment #208
   a. Problem – can The PICS lists TPC as required frames. Section 7.4.2 does not list these
      actions.
   b. Remedy - Either remove from PICS or add to section 7.4.2.
   c. Comment – Research 11h PICs and apply necessary changes.
   d. Resolution – Open – Assigned to Joe Kwak
7. Clause A4.13 – Black - Comment #210
   a. Problem - In RRM2, the TPC Request and Report frames are not part of the action frame
      protocol for measurements - these are defined in this draft as spectrum management action
      frames.
   b. Remedy – Add separate entry for TPC action frames
   Resolution – Open – Assigned to Joe Kwak
8. Clause A4.13 - Black – Comment #211
   a. Problem – There are some PICS entries missing: (1) MIB (based on conformance groups)
      (2) RCPI in Probe Response
   b. Remedy - Make new entries
   c. Resolution – Open – Pending resolution of Comment #225
9. Clause Annex D – Black - Comment #217
   a. Problem - P67, L23. This description of parallel doesn't seem to be correct since there is no
      difference here between back-back and parallel measurements.
   b. Comment – Change to “Run through the table and take whatever parallel or sequential
      processing needs to be done.”
   c. Remedy – Delete all of the text following “default is false” beginning at line 24.
   d. Comment – Need text will need to be rewritten as referenced in Comment #226
   e. Resolution – Accept – Instruct editor to make change as described above.
10. Clause Annex D – Black - Comment #226
a. Problem – I think that given the complexity of this MIB (e.g. the dynamic tables) some informative text is required. This could also address the issue raised during the previous review concerning the relationship between the MIB and MLME primitives.
b. Remedy – Consider adding some informative text.
c. Comment – No way to describe the process of using the MIBs
d. Comment – No way to ensure conformance to PICs.
e. Resolution – Open – Assigned to Tim Olson to ensure conformance to PICs.

11. Clause Annex D – Black - Comment #218
a. Problem - P68, L1 - This description is based on old text and should be updated. I think the scan mode definitions should be removed here. Delete from the beginning of line 10 up to and including line 24.
b. Remedy - Delete from the beginning of line 10 up to and including line 24.
c. Resolution – Accept – Instruct Editor to make change as described above.

12. Clause Annex D – Black - Comment #219
a. Problem - P69, L30 Description here is inconsistent with the main body of the draft, particularly in the use of AP/STA.
b. Remedy – Correct
c. Resolution – Open – Assigned Kwak/Qi

13. Clause Annex D – Black - Comment #221
a. Problem - P71, L63 Is TSFType defined? I couldn't find any definition.
b. Remedy - Add type definition if not present.
c. Comment – It is used in other Task Groups
d. Resolution – Open – Assigned to Black/Johnson

14. Clause Annex D – Black - Comment #222
a. Problem - P72, L69 Definition here is inconsistent with the main body.
c. Comment – TGe calls this attribute ChannelUtilization.
d. Resolution – Accept – Instruct the editor to make change as described above.

15. Clause Annex D- Black - Comment #225
a. Problem - Add MIB conformance groups and link to MIB
b. Remedy – Specify what is mandatory and what is optional.
c. Resolution – Open – Assign to MIB group

16. Clause Annex D- Johnson - Comment #231
a. Problem – Insert dot11RRMSiteReportChannelBand and its definition after dot11RRMSiteReportCurrentChannel and then renumber the dot11RRMSiteReportEntries accordingly
b. Remedy – Insert new dot11RRMSiteReportChannelBand dot11RRMSiteReport entry to reflect the addition of the channel band field to the site report element. Model after other fields.
c. Resolution – Open – Assign to site report.

17. Clause 5.2.5 – Black - Comment #54
a. Problem – 'In the measured WLAN the STA and AP can request information from their peers and populate their MIBs with the appropriate information to make decisions about their status and desired actions to take'. This is a very vague statement. Request what kind of information? What sort of decisions? Why is this of benefit?
b. Remedy – This section in general talks about 'components of the 802.11 architecture'. Replace the 5.2.5 with text that is more specific.
c. Comment – We reverted back to Comment #53

d. Resolution – Open

18. Technical Presentation – Limiting Degrees of Freedom Measurement Requests – 11-04-494r0
– Jon Edney

a. Motion
   A Friendly amendment to change “originate” to “source” and “target” to “destination”
   accept by Author.
   A friendly amendment to change “BSS” to “ESS” was rejected by the Author.

Move that TGk adopt the policy that measurement requests shall only be made in the
following situations:

- STA to its associated access point within its BSS
- Access point to an associated STA within its BSS
- STA to a STA within the same IBSS

and that the editor be instructed to add the following text after Table 12 in clause 11.7.5:

“The source and destination of a measurement request shall both be a member of the same
BSS or a member of the same IBSS.”

Moved: Edney
Seconded: Black

For: 12 Against: 3 Abstain: 4
Motion Passes at 80%
* The actual vote took place at 4:05 in the next meeting.

Discussion on Motion 494r0 (Jon Edney)

- Jesse Walker speaks against this motion, because it makes measurement frames Class 3.
- Emily Qi speaks against this motion, because it will eliminate RRM fast roaming
   possibilities.
- Simon Barber speaks against motion, because measurements are needed outside of the
  BSS.
- Tim Olson speaks for the motion, because nobody has presented a good reason not to
  protect these frames.
- Simon Barber speaks against motion, because we might be potentially utilizing the DS
  for these requests.
- Joe Kwak speaks against motion, because it affects Site Report Requests before
  association.
- Emily Qi speaks against motion, because block Dynamic information like Channel
  Load & AP Load.
- Jesse Walker offers clarification that this motion does not preclude measurement
  requests with his security proposal.

Amended Motion (Simon Barber)
Move to amend the current motion to replace “BSS” with “ESS”.

Moved: Barber
Seconded: Moore

For: 2   Against: 8   Abstain: 5
Motion Fails at 20%

**Discussion on Amended Motion (Simon Barber)**
- Tim Olson speaks against motion, because if I am a client how do I determine if I am within the same ESS.
- Jon Edney speaks against motion, because we need to deliberate the original motion.
- Simon Barber speaks for the motion, because you are fairly certain which APs are within your ESS.

19. Simon Barber calls for the orders of the day
20. Meeting is in recess until 4:00 PM.
Chairperson calls meeting to order at 4:00 PM

Attendance – 25 People

Amend Agenda

Motion to accept modified agenda passes unopposed

Clause 5.2.5 - Black - Comment#54

a. Problem - 'In the measured WLAN the STA and AP can request information from their peers and populate their MIBs with the appropriate information to make decisions about their status and desired actions to take'. This is a very vague statement. Request what kind of information? What sort of decisions? Why is this of benefit?

b. Remedy - This section in general talks about 'components of the 802.11 architecture'. Replace the 5.2.5 with text that is more specific.

c. Resolution – Open – Chair will send suggested to Simon Black

Clause General – Black - Comment #234

a. Problem - The preamble says that 'This supplement is based on the current edition of IEEE802.11, 1999 Edition Reaff (2003)'. (1) 'Current edition' is irrelevant as a specific edition is given. (2) This is meant to be an amendment. (3) This text should include all of the approved amendments as well


c. Comment – It is essential to get this right before submission

d. Comment – 11j has all of the text correct until 11i was approved.

e. Comment – Terry provided the text


g. Resolution – Open – Editor go to Terry and get the text.

Clause General – Black - Comment #234

a. Problem - The preamble says 'NOTE—The editing instructions contained in this supplement define how to merge the material contained herein into the existing base standard to form the new comprehensive standard as created by the addition of IEEE Std 802.11-1999 Reaff (2003). (1) We are writing an amendment (2) 'as created by the addition of IEEE Std 802.11-1999 Reaff (2003)' is meaningless and not relevant

b. Remedy - Reword: NOTE—The editing instructions contained in this amendment define how to merge the material contained herein into the existing base standard to form the new comprehensive standard.

c. Comment – You need to use the standard boilerplate from Terry.

d. Resolution – Open – Editor get boilerplate from Terry.

Clause 7.3.2.22.4 – Black - Comment#125

a. Problem - P22, L18 'set equal to the TSF at the time at which the measurement started' Remove equal, clarify TSF.

b. Remedy - Replace with 'set to the value of the measuring STA's TSF timer at the time at which the measurement started'

c. Comment – If you have measurements in parallel you have to have TSF.

d. Resolution – Accept – Instruct editor to make change described above.
a. Comment #134 – Same as Comment #125
b. Comment #128 – Same as Comment #125
c. Comment #142 – Same as Comment #125
d. Comment #148 – Same as Comment #125
e. Comment #154 – Same as Comment #125

10. Clause 7.3.2.21 – Karcz - Comment #81
   a. Problem - The ANA has already assigned element IDs 43, 44, and 45 to TGe.
   b. Remedy - Submit a request for unassigned element IDs.
   c. Comment – We should put xxx or k1, k2, k3 so we don’t get comments.
   d. Resolution – TGk instructs the editor provide “TBDs” for the ANA numbers until just before Letter Ballot

11. Clause 11.1.3 – Black - Comment #6
   a. Problem - P37, L10 'will be set to 255 for a passively scanning STA' and P37, L14 'will be set to the RCPI value' Use 'shall' not 'will' in both cases.
   b. Remedy – Correct
   c. Comment – Simon wanted to know why we need a different management set.
   d. Resolution – Open – Assigned to Simon Black

12. Clause 11.7.7.5 – Black - Comment #34
   a. Problem – P43, L30 address should be MAC address.
   b. Remedy - P43, L32 better to say 'for which an acknowledgement is required' P43, L34 (twice) downlink is an ill-defined term here and is not really required. It would be sufficient to say 'detected frame'.
   c. Resolution – Accept – Instruct editor to make change as described above.

13. Clause 7.2.3.4 – Johnson - Comment #70
   a. Problem - Power capability Information should be Order 6
   b. Remedy - Change 5 to 6 for Order.
   c. Comment – This will make them the same as TGh
   d. Resolution – Accept – Instruct editor to make change as described above.

14. Clause 7.2.3.6 – Johnson - Comment #71
   a. Problem – Power capability Information should be Order 7
   b. Remedy – Change 6 to 7 for Order
   c. Resolution – Accept – Instruct editor to make change as described above.

15. Clause 7.3.2.21.6 – Johnson - Comment #102
   a. Problem - Should "shall" be a "may" - p13, 119
   b. Remedy - I thought periodic measurements could be delayed depending on STA
   c. New Remedy- Change first “shall” in L19 to a “may”
   d. Resolution – Accept – Instruct editor to make change as described above.

16. Clause 7.3.2.22.5 - Johnson - Comment #130
   a. Problem - Should show field layout of Measurement Report Mode field
   b. Remedy - Define like other bit fields and use the existing definitions.
   c. Resolution – Open

17. Technical Presentation – Preiodic Measurements – 11-04-0631r0 – Joe Kwak
   a. Addresses comments #13, #18, #26
   b. Comment – change “raidon” to “random”
   c. Comment – change “station is switched to” to “on” in last sentence of 1st paragraph of clause 11.7.2
   d. Comment – “A STA shall attempt to process at least five simultaneous periodic measurements” seems to be a high number.
   e. Comment – take out sentence 5.
f. Question – What do you gain by queuing these request, it seems overly complex? Answer – Most of our measurements are periodic measurements and AP based; Queuing is already inherent in the AP.

g. Comment – Can’t we just skip the request?

18. Meeting is in recess until 7:30 PM.
Thursday, May 13, 2004
7:30 PM – 9:30 PM

1. Chairperson calls meeting to order at 7:33 PM
2. Attendance – 11 People
3. Review our progress – we have made it through most of the technical comments and only have 5 left. We will address editorial comments on the teleconferences.
4. Technical Presentation – Period Measurements – 11-04-493r2 – Emily Qi
   a. Comment – 5GHz is channel bands might need to made clearer, because Peter will provide comments. Change “all channels” to “that are valid for the regulatory domain in the specified channel band.”
   b. Question – Why is the Regulatory Domain in this text? Answer – the Band/Channel might be different depending on Regulatory Domain.
   c. Tim Olson speaks in favor of the motion, because it makes the scan more efficient.
   d. Comment – you should incorporate dual radios for next meeting.
   e. Joe Kwak speaks in favor of the motion, because it borrows from existing mechanisms in our framework. It will save issuing multiple requests.
   f. Motion
      To Instruct Editor to make following changes to 802.11k draft D.014:
      7.3.2.21.6 Beacon Request
         [Add the following texts following the second paragraph of 7.3.2.21.6]
         If Channel Number is 0, it indicates that the receiving STA shall pursue iterative measurements for all channels that are valid for the regulatory domain in the specified channel band.

         [Add the following texts following figure X-2 – Measurement Interval field:]
         If channel Number is 0 and scan mode is set to Active mode or Passive mode, the receiving STA shall iteratively conduct measurements for all channels that are valid for the regulatory domain in the specified channel band. The time between each consecutive measurement is defined in subclause 11.7.2. The receiving STA shall randomly select a channel number to start with and pursue iterative measurements for all channels during the measurement interval.

         Moved: Walker
         Seconded: Olson

   Discussion on Motion
   ▪ Why don’t we use channel report? Answer – When you use a Beacon Request, you can send on request to scan a subset of channels.
   ▪ Comment – Could apply a channel mask.
   ▪ Comment – This does not change the format only utilizes a value

For: 9 Against: 1 Abstain: 3
Motion Passes at 90%

5. Technical Presentation – Clarification for Beacon Reporting Conditions – 11-04-580r1 – Kwak
   a. Question – How does the hysteresis apply to single measurement? Answer – It does not.
   b. Comment – You will need to get rid of the hysteresis.
   c. Comment – You need to change in other parts of the draft, not just the table
d. **Motion**
   To instruct the editor to incorporate the changes in document 11-04-580r1 with the additional instruction to delete “(with hysteresis)” in every sentence beginning with “for single measurement”, when preparing the next version of the IEEE802.11k draft.

   Moved: Kwak
   Seconded: Walker

   For: 5 Against: 0 Abstain: 7

   Motion Passes at 100%

   6. **Technical Presentation - More Extensions to SMT Notification Table – 11-04-145r2 – Kwak**
   a. Comment – More information being plowed into the MIB that is not correct.
   b. Comment – It is incomplete.
   c. Question – Can you tell me what the STA experience is going to be? Will these notifications be going off all of the time? Answer – You get a notification if the STA gets a low RCPI. Answer – These will provide triggers for the wired side or external NMS.
   d. Question – How does it affect the power-save mode? It would repeat.
   e. Comment – Unlike our other measurements where there is a defined start and stop threshold, these have no bounds. How does this affect my power-save mode?
   f. Question for the editor – Can you take the instructions in the document and make proper modifications? Answer – yes.
   g. Comment – Line 10 on page 5 there is not a comma.
   h. Comment – This might give you a domino affect with all of the stations reporting. Why can’t the AP report this information? Answer – the STA on the edge of the BSS has a completely different view of the world. The AP’s channel utilization could be 70%, but the STAs could have channel utilization at 90%. Not all STAs will be simultaneously triggering at the same time.
   i. Comment – You might want to add some new SNMP entries to turn traps on and off. You might want to see optional flag and counters of these notifications.
   j. Comment – These are implicit continuous measurements which do not make sense.
   k. Comment – This does not provide the information to the AP, it only provides to upper-layers on the station. Answer – it only applies to the low signal quality.

   l. **Motion**
   Move to instruct the editor to incorporate text from document 11-04-145r2 into the next version of the IEEE802.11k draft.

   Moved: Kwak
   Seconded: Gray

   For: 2 Against: 7 Abstain: 4

   Motion Fails at 22%

   7. **Technical Presentation for comment resolution on comment #13 – Joe Kwak**
   a. **Motion**
   Move to instruct the editor to replace clause 11.7.2 with following text.

   Radio measurements may be requested for non-serving channels and a station may switch to a non-serving channel to execute a radio measurement. All stations are responsible for (1) providing a power-save notification before switching channels to execute non-serving channel measurements or (2) remaining in active mode and

   "Radio measurements may be requested for non-serving channels and a station may switch to a non-serving channel to execute a radio measurement. All stations are responsible for (1) providing a power-save notification before switching channels to execute non-serving channel measurements or (2) remaining in active mode and"
relying on application-specific knowledge, or other knowledge to determine that no incoming frames are expected on the serving channel during the period the station is measuring on a non-serving channel.

A STA shall determine the time between successive non-serving channel measurements by applying a rule that requires it to return to the serving channel for a particular length of time between non-serving channel measurements. This time may be a fixed length, or it may be determined by the STA using application-specific, or other knowledge. This rule is intended to maintain STA user services and shall take precedence over any radio measurement.

Moved: Kwak
Seconded: Barber

**Discussion on Motion**
- How does the STA return to the server channel?
- How does the strengthen the text?
- Comment – It does not address the comment..

Simon Barber Calls the question which passes unanimously.

For: 2 Against: 4 Abstain: 9
Motion Fails at 33%

8. Technical Presentation for comment resolution on comment #18 & #26 – Joe Kwak

**a. Motion**

Move to instruct the editor to replace clause 11.7.6 with following text.

A measurement request for periodic measurement is processed to set up a series of measurements. Once the series of measurements is setup, the periodic measurement process runs concurrently with other Radio Measurements, including other periodic measurements. A STA may process only one periodic measurement per BSSID at any given time. The STA shall determine if STA resources are available to process any periodic measurement request. A STA shall refuse or ignore any periodic measurement request for lack of STA resources.

The timing relationships for periodic measurements are diagrammed in Figure X-3, below. The first measurement start time in the series may include a random delay, as described above for Measurement Start Time. Subsequent measurements are scheduled at fixed, periodic intervals from the time of the first measurement. The Measurement Interval defines the total time interval during which periodic measurements are scheduled. Due to higher priority STA processing, the actual measurement start times for periodic measurements may be delayed. A delayed periodic measurement does not change the scheduled start time for any subsequent measurement. A measurement may be delayed up to an entire measurement period. If a measurement is delayed and cannot be executed during the following measurement period, that measurement is cancelled (skipped). Any scheduled start time which occurs during the actual measurement duration of the prior measurement shall cancel (skip) that scheduled measurement start time. Normally, periodic measurements are executed during the entire specified Measurement Interval, as shown in Figure X-3. However, if the STA processes a new periodic measurement request with the
same BSSID, the prior measurement process is terminated and the STA may process the new periodic measurement request.

Moved: Kwak
Seconded: Olson

**Discussion on Motion**
- Comment – “lack of resources” is not defined so “shall” has no meaning

**For:** 3  
**Against:** 3  
**Abstain:** 6  
Motion Fails at 50%

9. Approve comment resolutions from teleconferences
   a. **Motion**
   Move to instruct the editor to incorporate the following comment resolutions from teleconferences: Comment #3, Comment #4, Comment #5, Comment #7, Comment #8, Comment #9, Comment #10, Comment #12, Comment #21, Comment #25, Comment #27, Comment #30, Comment #31, Comment #36, Comment #38, Comment #39, Comment #40, Comment #41, Comment #42, Comment #44, Comment #46, Comment #47, Comment #48, Comment #49, Comment #50, Comment #51, Comment #55, Comment #56, Comment #57, Comment #60.

   **For:** 11  
   **Against:** 0  
   **Abstain:** 2  
   Motion Passes at 100%

10. Approve minutes from teleconferences
    a. **Motion**
    Move to accept April and May TGk teleconference minutes 11-04-0531r0, 11-04-0533r0, 11-04-0535r0, and 11-04-0539r0.

    **Comment** – The minutes should be posted in a cumulative form.

    **For:** 13  
    **Against:** 0  
    **Abstain:** 1  
    Motion Passes at 100%

11. Approve comment resolutions from Garden Grove.
    a. **Motion**
    Move to instruct the editor to incorporate the comment resolutions contained in document 11-04-480r6 into the next version of the IEEE802.11k draft.

    **For:** 13  
    **Against:** 0  
    **Abstain:** 1  
    Motion Passes at 100%

12. Move to adjourn the meeting
    Moved: Black
    Seconded: Johnson
    Motion passes unopposed.
IEEE P802.11
Wireless LANs

Minutes of TGm for May 2004

Date: May 17, 2004

Author: Bob O’Hara
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Phone: +1 408 635 2025
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A secretary was solicited, but no volunteer appeared. These minutes are prepared by the chair of TGm.

Goals for this meeting:
• Develop updates to standard
  – Address submissions received
  – Begin work from spreadsheet of work items
  – Volunteers needed

Submissions were solicited from those attending. The following submission was received:
  – 04/522 Vendor-specific IE

The following agenda was proposed:
• Review IEEE Patent Policy
• Review interpretation request procedure
• New business
  – Work on updates to standard
• Adjourn

  • Moved: to adopt the agenda
  • Mover: Darwin Engwer, Jari Jokela
  • Passes: Unanimous

The IEEE patent policy was reviewed with those attending, directly from the following URL:
http://standards.ieee.org/board/pat/pat-slideset.ppt

Submissions:
• 04/522 proposes text to standardize the vendor-specific IE, using the Element ID and format agreed in earlier working group meetings.
• Motion: to adopt the content of document 04/522r1 and direct the editor to incorporate it into the revision draft.
  • Moved: Darwin Engwer, Jari Jokela
  • Passes: unanimous

• Motion: to adopt the following text
  – “Data frames in an IBSS with frame control (FC) bits To DS and From DS both false”
• As the resolution to item #2 in tracking spreadsheet (03/619) (change to 5.5 3) i )
  • Moved: Jon Rosdahl, Darwin Engwer
  • Passes: unanimous

• Motion: to adopt the following:
  – Remove "Management frame" text, including deauthentication frame from 5.5 c) 2) and move the text "Deauthentication notification when in State 3 implies disassociation as well,
changing the STA’s state from 3 to 1. The STA shall become authenticated again prior to
another association." to 5.5 a) 2) iv).

- As the resolution to item 5 of 03/619.
- Moved: Darwin Engwer, Andrew Myles
- Passes: unanimous

- Motion: to adopt the following text as the resolution to item 8 in 03/619:
  - Change "Successful Authentication or Reassociation" to "Successful Association or
    Reassociation"
- Moved: Darwin Engwer, Terry Cole
- Passes: unanimous

- Motion: to adopt the following as the resolution to item 11 of 03/619:
  - Change title of table 14 to "Presence of challenge text information element"
- Moved: Darwin Engwer, Andrew Myles
- Passes: Unanimous

- Motion: to adopt the following as the resolution to item 17 of 03/619:
  - Change the first sentence of the third paragraph of 9.1.4 to "When a directed MSDU, plus
    MAC header and FCS, is received from the LLC or a directed MMPDU is received from the
    MAC sublayer management entity (MLME) with a length greater than
    dot11FragmentationThreshold, ..." (two changes in this sentence!) Also change all
    "aFragmentationThreshold" to "dot11FragmentationThreshold"
- Moved: Andrew Myles, Darwin Engwer
- Passes: unanimous

- Motion: to adopt the following as the resolution to item 21 in 03/619:
  - append to the last sentence of the first paragraph of 9.2.5.4: "for those PHYs that provide a
    PHY-CCARESET.request primitive."
- Moved: Andrew Myles, Darwin Engwer
- Passes: unanimous

- Motion: to adopt the following as the resolution to item 27 of 03/619:
  - Replace 11.1.3.2.2 c) with "Send a probe request using the BSSID and SSID parameters
    from the MLME-SCAN.request. The destination address is equal to the BSSID."
- Moved: Darwin Engwer, Jon Rosdahl
- Passes: unanimous

- Motion: to adopt the following as the resolution to item 30 of 03/619:
  - In 11.1.2.1 change "aBeaconPeriod" to "dot11BeaconPeriod" in two places and delete the
    word "basic" before "medium access".
- Moved: Andrew Myles, Jon Rosdahl
- Passes: unanimous

- Motion: to adopt the following as the resolution to item 37 in 03/619:
  - In 11.2.1.6 b): delete "If more than one bit is set in the TIM,"
- Moved: Darwin Engwer, Jon Rosdahl
- Passes: unanimously

- Motion: to adopt the following as the resolution to item 38 of 03/619:
  - Add to 7.3.2.9, at the end of the description of the maximum transmit power level: "As the
    method of measurement for maximum transmit power level differs by regulatory domain,
    the value in this field shall be interpreted according to the regulations applicable for the
    domain identified by the Country String."
- Moved: (not recorded)
- Passes: (vote not recorded)

- Motion: to adopt the following as the resolution to item 41 of 03/619:
– In 7.2.2, change "originated in the same BSS" to "originated in the BSS to which the station is joined"
  • Moved: Jon Rosdahl, Darwin Engwer
  • Passes: unanimous

• Motion: to adopt the following as the resolution to item 108 of 03/619:
  – In 10.3.3.1.2 and 10.3.3.1.4, change "BSSDescription" in all locations, except the Type column and the first occurrence in the Description column, to "SelectedBSS".
  • Moved: Jon Rosdahl, Darwin Engwer
  • Passes: unanimous

• Motion: to adopt the following as the resolution to item 47 of 03/619:
  – In 11.2.2.1, replace "aCWminx" with "aCWmin".
  • Moved: Darwin Engwer, Jon Rosdahl
  • Passes: unanimous

• Motion: to adopt the following as the resolution to item 48 of 03/619:
  – In 11.2.2.2, replace "BeaconInterval" with "dot11BeaconPeriod" and append "where ATIMWindow is the value of the ATIM Window parameter of the IBSS Parameter Set from the MLME-Start.request or MLME-JOIN.request primitive."
  • Moved: Jon Rosdahl, Darwin Engwer
  • Passes: unanimous

• Motion: to adopt the following as the resolution to item 49 of 03/619
  – In 12.3.5.11.3, delete "error check (HEC) CRC"
  • Moved: Jon Rosdahl, Darwin Engwer
  • Passes: unanimous

• Motion: to direct the editor to create 802.11rev/D0.1 by merging without change bars 802.11-1999, 802.11a-1999, 802.11b-1999, 802.11b-1999/Cor1-2001, 802.11d-2002, 802.11g-2003, 802.11h-2003. The changes from 11-04/007 and the text from the motions adopted at this session shall be incorporated using change bars.
  • Moved: Jon Rosdahl, Darwin Engwer
  • Passes: unanimously

Output documents:
  • 522r1: Vendor-specific IE
  • 523r0: This report
  • 03/619r3: Status of Work Items

Meeting adjourned at 9:30pm, 5/13/2004

Attendees:
  • Darwin Engwer
  • Jari Jokela
  • Richard Kennedy
  • Carlos Rios
  • Paul Newton
  • Andrew Myles
  • Jon Rosdahl
  • Terry Cole
  • Donald Eastlake
  • Mike Montemurro
  • Richard Paine
  • Haixiang He

Respectfully submitted,
Bob O'Hara
Abstract
Cumulative minutes of the High Throughput Task Group meetings held during the IEEE 802.11/15 Interim meeting in Anaheim from May 10 through 14, 2004.

Executive Summary (see closing report doc. 11-04-0532r1):

1. Completed all selection criteria steps required to issue a Call for Proposal (CFP) were completed as follows:
   a. Functional Requirement doc 11-03-813r12 was adopted in March
   b. Channel Model doc 11-03-940r4 was adopted
   c. Comparison Criteria doc 11-03-814r30 was adopted
   d. Usage Model doc. 11-03-802r23 was adopted
2. FRCC special committee was disbanded
3. Key dates (GMT-5) in CFP timeline were agreed to as follows:
   a. Issue CFP – May 17
   b. Deadline for Letters of Intent – June 18
   c. Proposal documents submitted – August 13
   d. First Proposal presented – September 13
4. CFP document, 11-03-858r7, was agreed to by the TG and presented to the WG on Friday 5-14-04
5. Received 9 technical proposals (not related to FRCC)
6. Plan for July meeting was generated and agreed to by the TG
Detailed minutes follow:

Monday May 10; 10:30 – 12:30 PM [~ 150 attendees at first meeting]

1. Meeting was called to order by Task Group chairperson elect Bruce Kraemer at 10:32 PM
2. New participants in .11n ~20
3. Voting for the week – Straw Polls are open voting unless indicated differently; otherwise voting members only
4. Chairs’ Meeting Doc 11-04-0429r0
5. Chair read IEEE Patent Policy as per doc. 11-04-0271r1; and issued a call to make patents known
6. No patents/applications were indicated
7. Chair notes topics NOT to be discussed during the week – license T&Cs; license terms and conditions, litigation, pricing, territorial restrictions, market share
8. Review of March Session – 0017r3 has the 24 submissions given at that meeting
   a. 73 new .11n submissions since close of Vancouver session!!!!
   b. Subcommittee commissioned in January on PHY Simulation methodology was terminated
9. Minutes from Orlando meeting were approved without comment
10. Objectives for May
    - Complete and adopt CCs
    - Complete and adopt Usage Models
    - Establish firm dates for posting letter of intent
    - Posting technical proposals to server
    - Start presentations
    - Complete Call for Proposals letter
    - Review overall project time line
    - Prepare for election of Tech Ed & V. Chair
    - Receive technical presentations
11. Chair noted we are 6 months behind original schedule
12. 24 hours of total meeting time at this meeting
13. Adrian will lead the FRCC discussion and drive to resolution.
14. Agenda Rationale
    a. Monday afternoon will begin by placing all documents and upcoming decision topics in front of the group.
    b. FRCC targeted presentations need to be heard on Monday.
    c. Voting events are not pre-set in the agenda as special orders
d. Voting will be scheduled based on agreement reached in session to allow for adequate review on finished document (2 hour Delta suggested)

e. The call for proposals letter needs to be reviewed and approved.

f. Completion of the wording should not be difficult EXCEPT for the specification of the time line. Hence, the time line also needs to be reviewed and critical dates and dependencies worked out. These two topics need to be coupled together in one session for the sake of continuity.

g. ~ 2 hours allocated to discuss both.

h. Time remaining on Thursday would be used to complete voting on any topic not resolved by Wednesday and hear any technical presentations.

i. Unless we find a need for sub-committee break-out time earlier in the week which will allow presentations earlier.

j. Presenters are asked to be flexible

15. Chair presented detailed agenda

16. Motion by Colin Lanzl to accept the agenda was seconded by John Kowalski and passed without objection

17. Bruno Jechoux has FRCC presentation to be added

18. Garth Hillman reviewed the minutes of the March meeting

19. Motion by Colin Lanzl and seconded by Adrian Stephens to accept the March minutes passed with the editorial comment to change the doc number from 03-0233 to 04-233 in the header

20. Adrian Stephens presented his report on FRCC committee, doc. 04-0495r2, which included the proposed FRCC agenda

21. As Chair had stated, Adrian confirmed time will be made for Bruno’s presentation

22. Proposed FRCC agenda was adopted without objection

23. Adrian read all 9 Functional requirements (doc.11-03-813r12)

24. Discussion

   a. What if not all FRs are complied with? A – it would be considered a partial proposal

25. Adrian turned to CCs (03-814r26)

   a. Adrian Highlighted changes since last meeting resulting from ad hoc teleconferences

   b. Goodput, backwards compatible, SNR were added definitions

   c. TGn Chair noted that the CC document is considered procedural (50% threshold) since it deals with the format of the proposals as opposed to mandatory technical content

   d. Adrian read the CCs which were addressed during the teleconference calls and other controversial CCs (2,3,6,7,11,15,18,19,20,26,27,28,46,47,51,42,51.5,52,58,59,67,67.2,80)

   e. Adrian reviewed ‘form of disclosure’ column to be completed for the proposals

   f. Adrian reviewed Impairments section – IM1, IM2, IM4, IM5, IM6

   g. No questions of clarification

26. Adrian reviewed Usage Model Doc (11-03-0802r19)

   a. Addressed changes resulting from ad hoc conference calls

   b. Fixed VoIP to an offered load of .096, 120 Bytes (10 ms) which correspond to G711 codec
c. Q – when should we have a formal liaison with .19? Chair’s answer – WG rules are changing such that .19 compliance will become mandatory at some point in the future so we should consider a formal liaison and will include on July’s agenda.

d. All scenarios were reviewed

e. Highlighted Scenario 4 since it was modified significantly during the conference calls

f. Noted Appendix 1 was deleted

g. Calls for questions of clarifications on Usage Models resulted in no questions

h. Should we renumber or leave it as sparse due to fear of cross referencing? A – Adrian suggested leaving it as is.

27. Recessed for lunch at 12:21PM

28. When we return from lunch we will address CC comments

Monday 5-10-04; 1:30-3:30PM

29. Chair reconvened session at 1:30 PM

30. Adrian opened discussion on CCs (doc. 04-0343-r11)

   a. Comment 181; CC 67.1 - Propose changing channel model F to E; Straw Poll passed (5,3)
   b. Comment 182; CC27 – constrain Phy parameters to “minimum supported data rate” failed in straw poll (0,16)
   c. Comment 183; declined since 2 dB requirement in IM6 was voted down at March meeting. This was confirmed in a review of the March minutes
   d. Comment 200; CC67 – add “or Transmitter” after “receiver” was deferred
   e. Comment 203/CC20 and 202/CC19 – deferred since Bruno was not here

31. Turn attention to Usage Model doc 11-03-802r19

   a. Straw Poll – Is Comment 180 unreasonable (7,9) so comment 180 will be dealt with
   b. Straw Poll – require proposer to justify that the Packet Loss Ratio (PLR) could be met passed (18,3)
   c. Straw Poll – Run simulations for at least a specified length and show no packet loses failed (6,16)
   d. Straw Poll – report the number of MSDUs transmitted in a simulation for each application with a PLR < 10^-4  failed (8,9)
   e. Decided to add an “Additional Disclosure” (AD5) named ‘Justification of Low PLR rates achieved’ and described as “for each application with a PLR < 10^-4, proposal shall justify that the proposed PLR could be met” passed (17,1)

32. Bruno Jechoux gave Presentation on Inconsistencies in CCs; (04-0489r1): to address comments 202,3,4

   a. Straw Poll - Include scenario 6 (Hot Spots) in CC19 passed (18,2)
   b. Straw Poll - Include scenario 6 (Hot Spots) in CC20 passed (20,2)
   c. Straw Poll - Make CC 19 mandatory failed (14,17)

33. Returning to deferred comments

   a. Comment 188 on CC67 part one - add “Each packet should use an independent channel realization” and for part 2 change to “The throughput shall be averaged over at least 100 independent realizations of the channel, each realization
long enough to allow simulation of the rate adaptation with subsequent transmission of one or more PPDUs while the Doppler process evolves. In addition, a minimum number of PPDUs, equal to 100 divided by the target FER, shall be simulated to determine throughput.”

b. Discussion - none
c. Straw Poll Accepted the changes (15,2)
d. Comment 187 on CC67 to add "The interferer to carrier energy ratio of the fluorescent effect shall be equal to its average value (0.0203)." Straw Poll passed (9,0)
e. Comment 200 on CC67 to add “or transmitter” after ‘at the receiver’
   i. Straw Poll accepted (24,3)

34. Recess at 3:25 PM

Monday 5-10-04; 4:00-6:00 PM

35. Chair called the meeting to order at 4:02 PM
36. All CC comments have now been addressed
37. UM comments will be addressed now since there only two left; this is a slight change in the FRCC agenda and was accepted by the group
38. UM Comment 185; UM Simulation Scenarios dealing with 45 degree AoA and AoD restriction;
   a. (11-03-940r3) is new Channel Model document which Colin reviewed
   b. Changes were revisions to make consistent with Usage Models
   c. Computational model too high if AoA and AoD are not fixed
   d. Should CM doc changes be accepted?
   e. Straw Poll – should antenna array orientation be specified in the UM document? failed (23,17) since technical threshold of 75% is needed in the UM document.
   f. Discussion:
      i. Doc already approved
      ii. Too late
      iii. Over spec’d
      iv. Now consistent with UMs
      v. Leave it as changed
   g. Straw poll – In the UM doc, should antenna arrays be aligned parallel to the x-axis except for point-to-point scenarios where they are aligned facing each other? Not taken due to discussion
      i. Discussion:
         a. If we don’t spec this there will remain ambiguity in the UM
b. AoA and AoD is one issue
c. Array orientation is second, separate issue
d. Poorly worded; alternatives
   a. Leave as is
   b. Let proposers disclose
   c. Specify antenna alignment

h. Straw Poll – leave as is (CM => 45 degree AoA/AoD LOS, no spec in UM doc) passes (23,3)

39. Comment 201; re simulation scenarios – wrt VoIP stations, they will likely be legacy stations due to cost; should we specify VoIP stations as legacy stations?
   a. Discussion:
      i. Assuming .11n will not improve upon legacy stations wrt VoIP is presumptuous
      ii. Let’s leave it open and not spec type of station
   b. Resolution – comment retracted

40. That means no open or deferred comments remain; let’s turn to Usage Models

41. Usage Model 4; replace comment with a note “Method for evaluation of throughput in Co-Channel Interference (CCI) case is specified in the simulation scenario”

42. Sanjiv Nanda reviewed (doc 04-0461 r1)
   a. Reuse modeling for scenario 4
   b. Straw Polls
      i. Should we remove all re-use from the usage models doc? passes (26,4)

43. Returning to agenda – Any additional Discussion on CCs?
   a. Bruno Jechoux – 4 CCs related to MAC = 18, 19, 20 and 24 all are mandatory except 19 which is optional; 19 should be mandatory as well; this is inconsistent with PAR and 5C; recommend making CC19 mandatory
   b. Motion by Bruno Jechoux to make CC19 mandatory and seconded by Sanjiv Nanda
   c. Discussion
      i. None against
      ii. In favor – yes since no new simulations required
   d. Motion passed (29,13,5) since CC is procedural
   e. Note - Herve Bonneville must authenticate his voting status (secretaries comment – Herve did confirm his voting status on Wednesday)

44. No further CC comments

45. UM comments:
   a. There may be a statement in the UM doc which may conflict with the Likely WG rules change related to .19

46. Motion for 10 min Recess to allow Sean Coffey to prepare presentation on .19 and allow Adrian time to edit scenario 4 passed without objection.

47. TGn was reconvened at 5:50
48. Sean reviewed the likely .19 changes to LMSC rules and possible impact on TGn
   a. New proposal will be to ‘require some form of coexistence compliance’ which we cannot predict
   b. Sean recommended “Remove from Usage Model document statements referring to requirements that 802.19 may add” and simply retain “Note: 802.11 TGn will liaise with 802.19 TAG regarding coexistence requirements”
   c. Discussion:
      i. As luck would have it Steve Shellhammer, chair of .19, was in audience
      ii. What is scope of the .19 methodology? A – limited to 802 wireless technologies
      iii. Would Steve be available for tonight’s TGn session? A- yes
      iv. Someone from TGn should attend .19 meeting in Terrace F tonight at 6:30
49. Orders of day recess at 6:00 PM

Monday 5-10-04; 7:30-9:30PM

50. Chair reconvened at 7:30 PM
51. Colin Lanzl reviewed changes to the Channel Model document (doc. 11-03-940r4)
    a. Fixed erroneous equations
    b. Added back AoA and AoD at 45 degrees and related text as agreed earlier today
    c. Figure numbers updated
52. Doc was put on server at 6:38 PM
53. Adrian reviewed changes to CC doc 11-04-814r27
    a. AD5 added
    b. CC19
    c. CC20
    d. CC67
    e. If CM is approved then the reference to revision numbers needs to be removed; this will result in r28 being posted
    f. Adrian asked one last time for any comments; none were received
54. Adrian reviewed changes to the Usage Model document (doc 11-03-802r20)
    a. UM4 edits
    b. Changed reference to Channel Model doc so there will be a revision 21
55. UM Doc 11-03-802r21 on server
56. CC Doc 11-03-814r28 on server
57. Chair asked group “how much time will group need to review the CC and UM and CM documents?”
58. Chair suggested 10:30 AM tomorrow for commencing the voting process; no objection was heard and the decision was made
59. Chair asked group “does the group prefer voting on the documents in a particular order?”
60. Group suggested starting with Channel Model followed by CC and then UM
61. UM went to new revision 11-03 802r22 in order to add revision history
62. Returned to discussion of “UM 8.1 Coexistence” lead by Sean Coffey
63. Motion by Sean Coffey to remove everything preceding the Note: and the word Note itself so that section 8.1 on Coexistence becomes simply “802.11 TGn will liaise with 802.19 TAG regarding coexistence requirements”
64. Steve Shellhammer commented that the new rule change will be to add an “assurance” statement to all FUTURE PARs. Steve recommended:
   a. List other likely systems in same band that TGn solutions will coexist with
65. Chris Hansen seconded Sean’s motion
66. Discussion:
   a. None against
   b. Steve asked if TGn devices will work with other devices in the same band. The answer was yes.
67. Motion passed (35,0,8)
68. Adrian put UM doc 11-03-802r22 on the server at 8:27 PM
69. Comment resolution doc. 11-04-343-r11 was put on the server at 8:27 PM
70. Adrian put CC doc 11-03-814r29 on server at 8:33 PM
71. Chair asked what group would like to do with the remaining 1 hour.
   a. Technical presentations
   b. Read documents
72. Group wanted to use the time to review the docs.
73. Colin Lanzl moved to recess early until 10:30 AM tomorrow and was seconded by Eric Jacobson passed without objection

Tuesday 5-11-04; 10:30-12:30 PM

1. Chair convened the meeting at 10:30 AM
2. Motion by Colin Lanzl to adopt 11-03-0940-04-000n as the TGn Channel Model document was seconded by Tim Wakeley.
   a. Discussion:
      i. Does this doc include the changes we discussed last evening? A – yes
   b. Motion passed (68,0,3)
3. Motion by Adrian Stephens to adopt 11-03-0814-r29 as the Comparison Criteria document for TGn was seconded by Colin Lanzl
   a. Discussion:
      i. There are a few edits and a couple of technical changes that should be made
      ii. Editorial – in CC15, removed reference to Legacy Impact and Legacy Share as they are no longer defined, and swap scenarios 17 and 18.
      iii. Motion to amend by Sanjiv Nanda to accept edit to CC15 was seconded by Colin passed without objection
iv. Comment – edit to CC16, 19; goodput per flow was not formally defined, is that OK?
v. Straw poll – is the term “goodput per flow” unambiguous? (25,0)
vi. Adrian edited r29 to include Sanjiv’s comments as r30 and put r30 on the server
vii. Straw Poll – Should usage models 1,4 and 6 referenced in CC18, CC19 be mandatory? (19,13)
viii. Motion to amend amendment to change revision number to r30 passed without objection

4. Motion by Adrian Stephens to adopt 11-03-0802-r22 as the Usage Model document for TGn was seconded by Colin Lanzl
   a. Discussion
      i. There is an inconsistency in UM 6 (Hot Spot) and needs to be updated to agree with the simulation scenarios which stated 34 stations not 25 stations; inconsistency was withdrawn
      ii. Section 4 edit second paragraph – strike last sentence
   iii. Motion to amend from Bjorn Bjerke and seconded by Colin Lanzl to strike last sentence of second paragraph of Section 4 passed without objection
iv. Adrian updated doc and posted on the server
v. Adrian made a motion to amend to change r22 to r23 was seconded by Colin Lanzl and passed without objection
   b. Motion to adopt UM doc 11-03-802r23 passed (74,0,1)

5. Chair discussed how we should now move forward given the remaining agenda items:
   a. Presentations
   b. Time Line
   c. Elections
6. Decided to hear presentations
7. Presentation #1 - Stephan ten Brink, Realtek (doc. 11-04-0298r0) Generalized Puncturing to Eliminate Pad Bits in MIMO-OFDM 802.11n
   a. Summary:
      - To make the packet length a multiple of the length of a single OFDM symbol NCBPS, pad bits (“dummy bits”) are used in 802.11a
      - With increasing data rate in MIMO-OFDM 802.11n, there will be more pad bits on average
      - Replacing pad bits by coded (redundant) bits improves performance without using extra resources (bandwidth); it comes for free
      - A simple generalized puncturing scheme was presented to perform this task
   b. Discussion:
      i. How do you generalize the mapping? A – did not answer the question directly
8. Presentation #2 - Alexander Dias, Motorola Labs (doc. 11-04-0229r1); Multiple Antenna OFDM solutions for enhanced PHY
a. Summary:
   - .11e MAC not efficient with high data rate PHY
   - Increasing the MAC efficiency would relax the constraint on PHY peak data rate
   - Number of antennas/techniques used should be chosen to reduce constraints on SNR requirements and keep reasonable range
   - Antenna configurations should depend on STA size (set of different cost/performance trade-offs)

b. Discussion:
   i. TS-SDM = transmit selection – space division multiplex
   ii. Which .11e MAC was assumed; e.g., QoS? A – don’t recall

9. Presentation #3 - Aleksandar Purkovic, Nortel Networks; (doc. 11-04-337r1); LDPC vs. Convolutional Codes: Performance and Complexity Comparison
   a. Summary:
      - Comparison in terms of performance and complexity of LDPC and two convolutional codes was presented in this contribution.
      - More advanced codes (LDPC and CC8) do perform better at the cost of reasonable increase in complexity.
      - LDPC codes have an inherent feature which eliminates need for the channel interleaver ([5],[6]); this offsets somewhat increased complexity.
      - Decoder of LDPC codes has embedded feature of exiting from the iteration loop once a codeword has been found, which means that the average number of iterations is less than the maximum. This in turn has positive effect on the power consumption.

b. Discussion:
   i. What about latency? A – did not calculate latency

10. Chair reviewed situation with Technical presentations remaining
11. Will use slot between 1:30 – 3:30 today for timeline and officer election discussions
12. Next slot for technical presentations will be 4:00 to 6:00 PM
13. Motion by Colin to recess early was seconded by Richard Kennedy passed without objection

Tuesday 5-11-04; 1:30-3:30 PM

14. Chair reconvened at 1:32 PM
15. Chair presented doc 11-04-0578r0 on how to proceed:
   a. Timeline
   b. Contingency plans related to CFP
   c. Elections
16. Key events from Selection Criteria doc. 11-03-665r9
a. #1 CFP
b. #2 Notice of Intent including partial or complete
c. #3 Submission to server
d. #4 Presentation

17. Chair presented Opt #1 which had goal of Presentations Monday July 12
18. Chair presented Opt #2 which had goal of Presentations Monday September 20 but was biased toward time to review (50 days)
19. Chair presented Opt #3 which had goal of Presentations Monday September 20 but with bias toward preparing presentations (50 days)

20. **Motion by Colin Lanzl to vote on Date for presentations was seconded by Richard Kennedy**

21. Discussion:
   a. Could an ad hoc meeting be held in August if necessary? A - yes
   b. **Motion to amend by Peter Loc and seconded by Ravi Narasimhan to include a third option to give presentations at the November meeting**
   c. Is it reasonable to assume all presentations could be given at the September meeting? A – yes, each proposer will be given 60 minutes and don’t expect more than 24 proposals to fill the anticipated 24 hours of meeting time
   d. Chris Hansen proposed a friendly amendment “Can voting use a down selection now that there may be three options (people get two votes)” and seconded by Mathew Fischer was accepted without objection.
   e. Amendment was then accepted without objection
   f. **Vote on main motion was (6) for July, (59) for September, (54) for November**

22. **Motion by Colin Lanzl to vote for preference between September of November and allow only one vote per voting member was seconded by Richard Kennedy**

23. Discussion
   a. Option #1 is fastest and we are already behind schedule
   b. Option #2 because work load is now clear and more than originally anticipated
   c. Option #1 allows 2 months
   d. Option #2 because that meeting will be in Germany and attendance will be lower
   e. If we do wait until November what would we do in the interim? A – technical presentations
   f. Can a 1st presentation be given in other than the month selected in this vote? A – this is for the TG to agree on
   g. No company wants to present early
   h. Question was called by Adrian Stephens and seconded by Colin Lanzl passed without objection
   i. **Vote on main motion was September (45), November (36) with 3 abstains**
   j. **Group agreed this was a procedural vote so presentations will begin in September**

24. Now, we need to decide on time line Options 2 or 3

25. Discussion:
a. Straw Poll – does group favor “time to review” or “time to prepare”; only one vote per member
b. Comment: After September there will be much time for review before down selection
c. Results - Preparation time bias (81); Review time bias (0)
26. So, Posting date is set at August 20
27. Comment from the floor pointed out that the September meeting starts on Sept 13 not Sept 20
28. Straw Poll – bias toward early posting of intent ~7 days or bias toward late posting of intent ~30 days after call for proposals
   a. Results early posting (14), later posting (52)
29. Motion by Colin Lanzl to adopt Friday June 18, GMT-5, 2004 as the date and time deadline to present a letter of intent to present a TGn technical proposal was seconded by John Kowalski passed (45,0,11)
30. Motion by Colin Lanzl that we adopt Friday August 13, GMT-5, 2004 as the deadline for posting all materials as specified in 11-03-665 required for TGn technical proposals was seconded by Richard Kennedy and passed (44,1,13)
31. Chair showed draft Call for Proposal Letter (doc. 11-03-858r2) which was presented by John Terry at the March meeting
32. Colin Lanzl moved that the date of Monday, May 17, 2004 as the date that the Call For Proposals will be issued was seconded by Donald Eastlake passed (50,2,2)
33. 03-850r2 will be edited by chair to include the 4 key dates just agreed upon
34. Can non-voting member present a proposal? A – nothing in the procedure to preclude that
35. Chair introduced scenarios of unexpected circumstances (see 11-04-578r0)
36. Should we adopt a contingency procedure?
37. Chair suggested forming a contingency special committee
38. Chair suggested generating a set of FAQs
39. Chair introduced discussions of elections of Technical editor and Vice Chair
40. Do we need some assistant editors? – e.g., MAC, PHY experts
41. Comments:
   a. FAQs will take too much time
   b. Just agree on the special committee
   c. No need to do either
42. Straw Poll – Prepare FAQs? (9,27)
43. Straw Poll – Formalize procedure of dealing with contingency issued? (0,20)
44. Motion by Colin Lanzl and seconded by Richard Kennedy to disband FRCC special committee passed (57,0,0)
45. How should we use the rest of TGn’s allotted time?
   a. Elections
   b. Call for Proposals (this will be crafted Wednesday afternoon)
   c. Presentations (2 are ready for the 4 PM session)
46. Orders of the day, session recessed

**Tuesday 5-11-04: 4:00-6:00 PM**

47. Session was called to order at 4:00 PM  
48. Presentation #4: Dave Bagby on behalf of Sanyo; doc 11-04-249r3; 20us-effective-preamble-for-mimo-ofdm.  
   a. Summary:  
      i. Advantages of Short Training Sequences (STS)  
         - Enables easier use of overlapped LTS for PHY overhead reduction.  
         - Detects the # Tx signals during STS time  
         - Easy synchronization.  
         - Good course frequency offset estimation.  
         - Provides optimum AGC implementation.  
         - Has good cross correlation characteristics w.r.t. to legacy STS.  
         - Have cost effective correlator implementations.  
         - Are appropriate for use with MIMO-OFDM  
      ii. Advantages of Long Training Sequences (LTS)  
         - Are appropriate for “overlapped LTS” usage.  
         - Offers fine frequency offset estimation.  
   b. Discussion:  
      i. Impact of SNR on STS considered? A – took question off - line

49. Presentation #5: Bart Van Poucke, IMEC; doc 11-04-256r0; PCCC Turbo Codes for 802.11n  
   a. Summary:  
      i. Turbo Codes (PCCC) are not good for short packet sizes  
      ii. Turbo Codes are power hungry  
      iii. Turbo codes require code termination which increases overtime  
      iv. Potential for5 low power  
      v. Flexible – code rates, unconstrained block sizes  
   b. Discussion:  
      i. What about Latency? A – no results

50. Presentation #6: Heejung Yu, ETRI; doc 11-04-279r0; Limitation on Range Extension using Multiple Antennas  
   a. Summary:  
      - Several documents say that Multiple antenna scheme is used for range extension, but we cannot perfectly achieve this as maintaining compatibility with 11a  
      - Benefit of Alamouti and MRC is throughput improvement  
      - We overcome or neglect the collision (hidden node) problem, range extension with MRC is possible.
b. Discussion

51. Presentation #7: Yusuki Asai, NTT; doc. 11-04-0259r1; Number of MIMO Multiplex for 802.11n Standards

   a. Summary:
      - Mandatory features should be 2 Tx chains for card-type devices.
      - Use of 3 or more Tx chains should be optional modes in 802.11n.

   b. Discussion:
      i. What was meant by built-in type? A – STA

52. Returning to the topic of Officer Elections

   a. Technical Editor and Vice Chair

   b. Discussion:
      i. Election rules are within the purview of the TG
      ii. What work would there be for a technical editor and vice chair between now and September?
      iii. Feel Vice Chair is more important today then Tech Editor however both need training
      iv. Benefits of holding election now?
         1. Attend CAC
         2. Training (CAC and Technical Editor)
         3. Back-up
      v. Straw Poll – should a TE election be held in May? (7,44)
      vi. Straw Poll – should a VC election be held in May? (16,28)
      vii. Make sure and announce when the elections will be held well in advance of the elections
      viii. VC is more important than TE
      ix. Straw Poll – should a TE election be held in July? (14,14)
      x. Straw Poll – should a VC election be held in July? (20,12)
      xi. May is too early
      xii. July attendance may be too sparse?
      xiii. Straw Poll – should TE election be held no earlier than September or later? (3,1)
      xiv. This is an important issue; TGe was hurt by having VC and TEs change during the course of the TG
      xv. TE has a big job
      xvi. Discussion on elections were discontinued as being premature
      xvii. Motion to recess until 7:30 by Steve Halford and seconded by Colin Lanzl

Tuesday 5-11-04; 7:30 -9:30

   53. Chair called the meeting to order at 7:30 PM
   54. Chair had edited the Call For Proposal Document 11-04-858r2 to add the time line we agreed upon earlier in the day
      and posted it as r3 over the dinner hour

Minutes of TGN
55. Chair asked group to review r3 and add edits real time.
56. Group added numerous edits such as adjusting references in header and footers, replacing John Terry’s name with Bruce’s, referencing final CC, UM and CM document revision numbers.
57. Bruce completed the edits of the group and put 858r4 on the server at 8:05 PM.
58. More edits were discovered and fixed; Chair put r5 on the server at 8:21 PM.
59. Colin Lanzl moved to empower the chair to make the final editorial changes to CFP document 11-03-858r5 and coordinate the release of the document with the chair of the working group was seconded by John Kowalski and passed without objection.

60. Discussion
   a. What does a Letter of Intent (LoI) consist of? A Name, Company and indication of intent
   b. What constitutes a complete response to CFP? A – LoI and Proposal
   c. What is policy for revising proposals once they have been made? A – merging is encouraged

61. Chair noted that the only remaining item for this meeting is to discuss plans for July.
62. Current agenda items include:
   a. Nature of .19 Liaison
   b. Technical presentations
   c. Organizational Changes including Vice Chair
   d. Identify Letters of intent that have been posted
   e. Consider .21 liaison
   f. Revisit overall .11n timeline

63. Discussion:
   a. Should we just skip the July meeting? A – no but it may be abbreviated.
   b. Where are remaining presenters for this week?
   c. Should we give back time to the WG chair
   d. As a safety net keep the time until after the mid-week Plenary tomorrow
   e. Announce at tomorrow’s plenary that TGn will give back Thursday’s time as a minimum

64. Motion to recess by Colin Lanzl and seconded by Adrian Stephens until tomorrow at 1:30 PM passed without objection.

Wednesday 5-12-04; 1:30 -3:30 PM

1. Chair called the session to order at 1:30 PM
2. Pending presentations authors – Brian Edmonston, Stephan ten Brink – were present
3. Audio improved
4. Video switch added to meeting
5. Presentation #8 – Stephan ten Brink, Realtek; doc. 11-04-553r0; MIMO Mode Table for 802.11n

Garth Hillman, AMD
a. Summary
   - Use 2(NT)x1 CIRCAL rather than full diversity, spatial rate 3/4 STBC for NT=3, 4
   - Always use all receive antennas
   - Not always use all transmit antennas simultaneously
     - Only when very high rates are desired
     - For medium rates, it is better to use fewer antennas, but higher modulation/rate; to have at least one excess antenna at receiver
   - CIRCSMX NR(NT)xNR always better (slightly) than SMX NRxNR
   - For low-complexity, suboptimal MIMO detection, excess antennas pay off
     - For example 3x3
       - for medium rate, use 2(3)x3 CIRCSMX (high rate code/modulation) rather than 3x3 SMX (medium code rate/modulation)
       - Only use 3x3 SMX when really high rates are desired

b. Discussion
   i. Considered feedback especially for TX antennas? A – no
   ii. What about doing a channel estimation and picking the best antennas for the channel? A – did not do that simulation and, besides feedback may not be the best alternative
   iii. Done on a per subcarrier basis? A –yes
   v. No code per se, just convolutional code
   vi. Low AGC, PA problems

6. Presentation #9 – Brian Edmonston, iCoding; doc (11-04-243r2); Turbo Codes for IEEE 802.11n
   a. Summary:
      - Turbo Codes, and more specifically Duo-Binary Turbo Codes, provide large performance gains in 802.11a context, as well as combined with MIMO techniques
      - Their flexibility is an important advantage, allowing a finer granularity in block size and coding rate (cf [1])
      - Incorporated in a complete system, these Turbo Codes will represent a significant advantage to achieve 802.11n goals.
   b. Discussion:
      i. Did you assess complexity? A – yes and it seems to be a wash when power is also considered

7. Chair reviewed Plans for July:
   a. Status of CFPs
   b. Tech Presentations
   c. Overall TGn Timeline
8. Discussion:
   a. Liaison with .18 RR?
   b. Joint meeting with .19 Coexistence?
   c. Notification of presentations within the next 30 days will be guaranteed a time slot in July so please get your requests in early

9. Call For Proposal Letter (11-03-858r7)
   a. Chair cleared letter with Stuart and will be presented at Friday’s closing plenary

10. Colin Lanzl moved to adjourn for the May meeting was seconded by Adrian Stephens and accepted without objection.

11. See you in Portland.
Lee Armstrong (Armstrong consulting), chair of the WAVE study group, called the meeting to order at 4:01PM. Lee reviewed the IEEE/802 & 802.11 Policies and rules.

Lee reviewed the objectives for this session and presented the agenda to the group. The agenda was approved.

The minutes from the Orlando meeting were review and approved.

Lee discussed the objectives for this and other sessions during this week.

It was mentioned that the relation between an amendment to 802.11 and the stand alone ASTM E2213-03 document was unclear to the body at this point. This would be addressed in the Monday evening session.

Lee reviewed the status of the overall WAVE program. This document was posted as IEEE 802.11-04/0554r0. He addressed the scope for WAVE and showed a schedule addressing the different phases of the WAVE programs. It was mentioned that widespread deployment could be expected in the 2007 – 2012 timeframe. The objectives of WAVE were presented which included full compliance with IEEE 802.11 (near and long term) and full compliance with existing chip sets.

Lee showed a list of the companies that wrote a letter of support to have WAVE standardized within 802.11 including most of the car manufacturers and related industry. It was mentioned that the government was not included in the list but that there was federal and state support for this technology.

It was questioned whether there was language within the FCC documents that would allow for the inclusion of other standards including the IEEE document that would replace the ASTM document. Lee mentioned that this language was not preferred, as that would allow for non-interoperable operation in this band. This would be addressed in the FCC rules by replacing the ASTM document with the IEEE document in the FCC rules as soon as the IEEE document was available.

Because there was time left during this session, it was agreed to go over the PAR and 5 criteria. It was agreed to have an ad hoc group that would go over the PAR and 5 criteria. The proposed changes that this group may come up with, will be addressed during the Monday evening session.

The session was recessed until 7:30PM.

**Monday, May 10, 2004 7:30PM Session**

The meeting was reconvened at 9:00PM.

It was agreed to delay the presentation from Broady Cash (ARINC) till tomorrow’s session, as Broady was not present. This concluded the work for this session.

The meeting was recessed at 9:01PM.
Tuesday, May 11, 2004 4:00PM Session

Lee Armstrong (Armstrong consulting) reconvened the meeting and went over the agenda for this session. It was mentioned that an ad hoc group had worked on the language in the PAR and 5 Criteria (documents 03943r6 and 030967r4) and that they were able to present the proposed changes to the group.

Broady Cash (ARINC) was introduced by Lee. Broady presented the scope and objectives of WAVE. He discussed a set of derived requirements applicable to WAVE. He addressed the business case for WAVE and he mentioned an effort that is on-going to deploy RSU’s in North America and OBU’s in cars. A first application would be probe data collection. This application will offload information to the RSU including information on temperature, windshield wipers status, light status, … Traffic information centres supported by state DOTs and the Federal Highway Association, could use this information to maintain the roadways and determine what the traffic conditions are.

A question was raised how the OBU’s would be rolled out. Broady mentioned that there are discussions going on with NITSA to have this mandatory in the car. Broady discussed a cooperative effort that was going on between Federal Highway, the OEMs, and NITSA. Tom Schaffnit (chair of the Vehicle Safety Communication Consortium – Consortium consisting of most of the OEM’s) discussed several high priority safety applications. He mentioned that there were 8 high priority applications out of a set of 80 safety applications that could be used in the car.

After the discussion on the objectives and the business case for WAVE, Lee introduced Jon Rosdahl (BNJ Consulting) who initiated the discussion on the standardization of WAVE within the IEEE 802.11 group. Jon went over the companies that send in a letter of support. These companies included several car manufacturers and other industry and organization. The licensed frequency band was addressed including the channel plan. A question was raised on how the units would be licensed. Broady gave an overview of the licensing rules. Jon gave an overview of the features that would be provided with a WAVE compliant device. He discussed the communication between vehicles and between vehicles and road side units, the high data rates (>20Mbps) for communication to the car, the 1000m range distance that must be supported with a data rate of more than 1 Mb/s for public safety applications. He discussed the voting history on the amendment or a stand alone document. Jon gave a clear overview of the advantages and disadvantages between standalone versus amendment. It is important that the 802.11 body would give a clear opinion to the study group on whether it should be a stand alone document or an amendment. There was a lengthy discussion on whether to have an amendment or a stand alone document. This would be further discussed during the evening meeting.

The motion to amend the agenda was move by Jon Rosdahl to remove agenda item 23 and include the discussion on the PAR and 5 criteria. This was seconded by Broady Cash. The motion passed unanimously.

The meeting was recessed at 5:55 PM.

Tuesday, May 11, 2004 7:30PM Session

The meeting was reconvened at 7:45PM.

Broady started the meeting presenting a tutorial on the WAVE concept (document nr. IEEE 802.11-04/0121r0). He then presented document 11-04-0363-00-WAVE called “Conversion of ASTM E2213-03 to IEEE 802.11x Format”. Comments to this representation of how a draft 802.11 WAVE amendment could look like, can be sent to wfisher@arinc.com. He than presented the WAVE document that was prepared for the WAVE Study group (document nr. 11-04-0364-00-WAVE) addressing the changes to the IEEE 802.11 (reaff 2003) document. It was recognized that a significant part of the proposed changes were already handled by workgroup .11j.

Jon Rosdahl presented the PAR and 5 criteria and presented the changes that were proposed by the ad hoc group that was established after the Monday 4PM session. The document number including the changes to the PAR is IEEE802.11-03/0943r06. It was understood that the changes made during this session to the document were editorial changes. The new document number became IEEE802.11-03/0943r07. Following on the PAR, Jon presented the 5 criteria document, document number IEEE802.11-03/0967r4. Editorial changes were made to this document and the new number became IEEE802.11-03/0967r5. It was agreed on removing the track changes from the documents.

Jon Rosdahl moved the motion for the PAR and 5 Criteria. The motion stated : “Move to adopt the par defined in 11-03-0943r7, and the 5 criteria response from 11-03-0967-r5 and request that the 802.11 WG forward them to...”
ExCom for approval for the purpose of creating the WAVE Task Group (802.11p)” This motion was seconded by Tom Schaffnit (Schaffnit consulting). The motion passed. Voting result: 22,1,3.

It was moved to amend the agenda to delete all the remaining items on the agenda with exception of agenda item 27 “Discussion of proposed WAVE TG Plans”. This motion was seconded by Justin Mcnew (Technocom). It was accepted unanimously.

The meeting was recessed at 9:10PM.

**Wednesday, May 12, 2004 8:00AM Session**

The meeting was reconvened at 8:05AM.

This morning the only agenda item that was left for the task group was the discussion on the proposed WAVE TG plan. It was mentioned by Broady that Wayne Fisher (ARINC) would be the editor of the 802.11 amendment for WAVE. Any comments provided by the members will be integrated in the current form. It will also include references to 802.11j as much as possible.

The primary objective during the next meeting is reviewing the proposed WAVE amendment to IEEE 802.11. In the mean time there will be several letter ballots before the July meeting.

The meeting was adjourned at 9:20AM.
IEEE P802.11
Wireless LANs

Minutes for the Fast Roaming SG

Date: May 10-14, 2004

Author: Michael Montemurro
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Monday May 10, 2004
10:30am

Chair: Clint Chaplin
Secretary: Mike Montemurro

• Roll Call
• Agenda – doc 11-04/515r1
• Review operating rules for a Study Group
• Review IEEE 802 procedures and patent bylaws
• Status update for FRSG: 3 comments from NESCOM
  • Contact information was wrong
  • Acronyms were not described
  • Some scope material should be in the purpose of the PAR
  • NESCOM recommended approval – final Approval would be Thursday
  • If approved, we will be meeting as a task group in the July Plenary
• Last Meeting Minutes doc 11-04/287r0
• Review agenda and objectives
  • Any decision we make at this meeting will need to be affirmed when we meet as a Task Group
  • Comments/Objections to the agenda? None.
  • Agenda is approved unanimously.
• Presentations from Adhoc Groups:
• Presentation on Task Group deliverables – doc 11-04/517r0
  • Break Current-BSS-Transition Orthodoxy into two parts: “what is specified?” versus “what is implicit?”
  • We shouldn’t have to complete the entire test methodology. We need to take it far enough that we have context for the solution.
  • We should have a definition of roaming before we get a test methodology. The test methodology should not be our objective.
This is a complex area and it will likely lead to multiple solutions. We need to make up our mind that we will accept multiple solutions.

If we have multiple solutions, they could be either complementary or contradictory.

This presentation will be updated after this session.

Presentation on BSS Transition architecture – doc 11-04/503r0

Sometimes Discovery stops the data flow. When a STA scans, it stops transmission/communication – sometimes scan times can be small and insignificant, at other times it can be significant.

Slide 10 – last message on left should be SET PROTECTION rather than SET KEYS

Slide 14 – what does “handover” mean? The term refers to information transferred from one AP to the other.

Is there anything in this presentation limit transition to BSS’s with the same SSID?

Scanning and Re-associate mechanisms are specific to BSS-transition rather than an ESS-transition.

We need to limit the scope even more to the same SSID plus some other factors.

We should consider the roaming interval from the perspective of the old AP.

Should we consider the network infrastructure components in the transition?

The first data frame should not include admission control or the 802.1x four-way handshake. The first user data frame through the network.

Any STA that relies on a discovery process that takes place before the association will take longer to roam.

The intent was to walk through the typical steps for roaming. There are likely exception under certain roaming conditions.

This document is a good base to work with for a base architecture document.

Presentation on Key Requirements for BSS Transition – doc 11-04/516r0

Has there been any consideration for the network managing the roaming rather than the STA? It’s possible for the network to make a decision to roam.

This point has been talked about before. The WNM study group is looking into the network forcing a station to roam from one AP to another.

The key is to pick the “right” AP to roam to. The network can certainly help the STA to make that decision.

The summary should include a point do address the infrastructure learning about the roaming event.

We need to decide whether we are going to address a change in IP address (layer 3 considerations)

Layer 3 considerations are not part of the scope for IEEE 802.11. However Layer 3 information could be used to determine when/where to roam?

ESS’s are not globally assigned. The same SSID could advertise different networks.

We have defined in our par roaming between AP’s in a common ESS. However there could be disjoint networks with a common ESS.

The SSID may in practice refer to more than one ESS. However everything in an ESS is addressable.

The mechanisms for deciding whom to roam to are out of scope of the PAR. However, we may discover that we may have to put some constraints on roaming decisions in order to complete the PAR.

The presentation should be updated to reflect the discussion and used as a canonical discussion.
• Are there any other presentations that should be concluded as part of the discussion?
• Recess until the afternoon session.
Monday May 10  
1:30pm

- Presentation on using EAPoL-key messages for roaming – doc 11-04-542r0 – Tim Moore
  - You can insert any IE information in the EAPoL-key message during the 4-way handshake.
  - Would we end up defining a generic mechanism? We could modify the existing EAPoL-key method or we could define a new, generic method.
  - At the moment we have security information in the EAPoL-key method. We could transfer other types of information that would be relevant to roaming.
  - One of the problems that pre-authentication has is that there is no limits on how many pre-authentication sessions a STA could hold and how valid they are at the AP.
  - Two things we need to know is: Does the AP still have the key? When was the last time the AP aged the key?
  - This presentation does not address improving the 4-way handshake. There are likely a couple of ways of helping the 4-way handshake as well.
  - There are other submissions that deal with improving the 4-way handshake.
  - This proposal only deals with exchanging information between an AP and a STA after it has been pre-authenticated.
  - This submission implies that a pre-authenticated session exists before any other information is exchanged between the STA and the AP.
  - 802.11k has a mechanism for an AP to advertise all nearby stations.
  - This proposal gives the security IE’s, the load information, and the bandwidth capabilities over what 802.11k provides.
  - Eventually you have to get some information on the RSSI. Eventually you have to go to that channel to get the RSSI information.
- We already have proposal for some of the deliverables outlined this morning – we need volunteers for team leads for each of these deliverables.
  - Bob Love volunteers to lead Functional Requirements and Acceptance Criteria. The Functional Requirements work leads on to the Acceptance Criteria.
- We haven’t discussed and documented key decisions that we have made up to now.
  - Presentation on multiple concurrent associations – doc 11-04-549r0 by Bob Beach
  - Bridging tables update slowly, but typically data traffic will only go through one AP because of the network infrastructure
  - As a thought experiment, we actually eliminate association altogether
  - The STA would hear broadcast packets from each AP that it is associated. It would receive multiple copies of the same broadcast.
  - Originally, Associations were restricted because of the issues with a hub environment. If you assume a switching infrastructure, there is no reason to restrict a STA from concurrent associations.
  - There are things like 802.11g compatibility modes and preamble type which would need to be addressed for every AP that the STA was connected to. We need to define a new state to address these types of issues.
  - The switched Ethernet assumption is a dangerous one. Wired Ethernet is not the only way that an AP can be connected. We would need to address other Later 2 Architectures.
  - Power-save Poll mode could be used to force communications between the STA and one AP (without buffering).
• There are concepts in other wireless technologies where the STA could be associated with its existing AP and the AP that it’s roaming to.
• If the STA is moving at a higher velocity, it may be impractical to associate with multiple AP’s.
• Duplicate detection could not be done with the sequence number. You could not determine that you are receiving duplicate detection. That could be a problem with UDP packets.
• It is conceivable that people could use 802.11 for voice applications out of the Enterprise environment. We would have to include that application as well.
• Is the assumption that a VoIP station is spending its time authenticating and associating with other AP’s in the background.
• The process of authentication is not atomic. It could be interleaved with other data transmission.
• You might want to define a “lease” mechanism so that the association could be timed out by the AP or the STA.
• This scheme is an alternative to pre-authentication. It is not needed.
• This scheme would not be applicable to mesh networks.
• Mesh works with un-modified STA’s.

STRAW POLL: How many people are prevented from attending 802.21 or 802.11 this week because they will impact voting rights in their own respective group?
  a) Impacted
  b) Not Impacted

Result: a – 33; b – 23.
• Back to looking for volunteers and the tasks at hand for the group:
  • The process for adhoc groups do not necessarily to be formalized
  • Do we want to keep the process informal?
  • We are beginning to get proposals. At some point we need a decision process for acceptance of proposals – and that could be done by supplying normative text.
  • The presentations so far haven’t addressed how bad the roaming problem is. We don’t have any hard requirements.
  • It would be good to quantify how bad the problem is now.
  • Everybody has the responsibility to meet the deliverables.
  • We should establish a timeline with goals for when we want to be done.
  • Could we establish a forcing function to ensure we deliver a standard or practice as quickly as possible?
  • We can’t have informal process and meet a schedule.
  • The first milestone is to determine whether we have a problem. We have results, but the results cannot be compared because they were tested in a different manner.
  • Rate Adaptation could be a big issue. We are still feeling around. The proposed solution has not been listed as part of the deliverables.
  • We need to look at solutions to better define the problem. The process should not be serialized.
  • We put out a call for proposals in July 2004; proposals come in September and November; and in January 2005 we select proposals and start Draft 0.
  • Formal proposal means normative text.
  • Formal scope and requirements should be defined by November 2004.
• What would we like to have done to entertain and decide on different proposals? We need metrics before we can evaluate proposals.
• It may not be possible to know what all the feature and requirements are before we entertain and decide on proposals. Since we are dealing with security, we will not know what all the requirements are before we are done.
• If we are going to define a process, we need the Use Cases, followed by Requirements, followed by Proposals
• Do we want to expand calls for Use Cases to Test Methodologies and Test Plans at the end of this meeting?
• The job of this body is to try and define a solution to the problem. It’s not our job to define how to test the solution. We don’t have time to test every solution.
• Is it possible that we could do this on an adhoc basis? Do we need to define everything up front? We should at least start thinking about test cases. We should go through the process but we can’t be too rigid with the process.
• We are not trying to add more functionality.
• We reached our time limit. We will recess until Wednesday morning at 8am.
Wednesday May 12
8:00am

- Final PAR has been posted as document 11-04/576r0
- The agenda has been updated as document 11-04/542r2
- Presentation on Fast Roaming Applications – document 11-04/579r0 – Roaming Applications Team
  - How can you Guarantee Bandwidth in this wireless medium? You can’t, but this requirement puts a restriction on roaming times.
  - None real-time streaming sensitivity it packet loss should be “high”
  - There are three mechanisms possible for moving link state during roaming: STA-AP messaging; AP-AP messaging; AP-AP messaging through an intermediate entity.
- Presentation on Inter-working with External Networks (WEIN) – document 11-04/607r0 – Stephen McCann
  - IEEE 802.11 specifies communications over the air – not integration with the DS
  - The 3GPP document number is 23-274 and its publicly on http://www.3gpp.org
- Presentation on Pre-Keying – document 11-04/476r3 – Jesse Walker
  - This group exists because TGi could not come to a resolution on secure fast roaming.
  - There was debate in TGi whether roaming in a secure network could be fast enough
  - Have we sufficiently defined what we mean by “make before break”? Not at this time.
  - Does “make before break” establish keys before transition? Perhaps you could establish keys at any time.
  - Slide 12 – Identity Modifications – Originally, 802.11i needed changes from 802.1x in order to work. Will we have to do it again? We don’t know yet.
  - At a minimum, some of the timeouts would need to change. This proposal splits Authentication from Key Establishment, so some of the timeouts for the 802.1x state machine may need to change.
  - It may be in the 802.11i state machine so 802.1x may not need to change.
  - We originally put the 4-way handshake after the re-association for liveliness concerns. Now we would need to have some liveliness proof during the re-association.
  - The real problem is the definition of association. Right now it has two meanings: STA-AP and STA-DS. We need to break apart these two relationships and allow the STA to maintain the forwarding function.
  - One question when does the PTK expire? We may have to make the EAPoL-Logoff message work.
  - Multiple association or two-phase associations look attractive.
  - Communicating through the DS solves a number of the channel functions and has a few advantages.
- Presentation on Tentative Association – document 11-04/606 – Clint Chaplin
  - Tentative Association is likely a better alternative to pre-keying and pre-authentication through the DS.
  - Un-associated state refers to an AP that you are not Associated or Tentatively Associated.
  - Don’t we have this now? Right now, the initial Association with the new AP breaks the association with the old AP.
  - This problem is exacerbated by 802.11F by sending the “bogus” packet to the switch to trigger a bridge update.
  - The notion of AP-AP communication should be thrown away.
• Perhaps the STA should send the packet to update the DS infrastructure.
• The “tentative” state exists in the 802.11 state diagram as “Authenticated-Not Associated”
• How is the forwarding state managed in the AP? We need to explicitly decide how we want to manage state.
• The final confirm message could come on a secure channel. The question comes to whether the PTK is live.
• The question is “what do we do with the GTK?” Do we update AP’s with the GTK?
• The AP can keep the STA updated by doing the GTK update.
• On an Associate rejection, the STA would stay in Tentative Associated state.
• There needs to be an explicit change between Associated to Tentatively Associated.
• There needs to be an explicit message to update the DS when a STA enters the Associated state.
• Schemes similar to this have been proposed in other groups independently.
• We could hold off the next presentation to the afternoon session.
• There are issues in 802.11i that have come up on PMK cache management. Would this group handle these issues?
• If there are issues with PMK caching, Fast Roaming would be impacted. Therefore this issue would be within scope.
• Recess until 1:30pm.
Wednesday May 12
1:30pm

- Review Agenda for this meeting
- Presentation on Quick Scan Mechanisms – Document 11-04/487r0 – Peyush Agarwal
  - The “modified beacon” from AP to AP is over the air – fast BSS transitions can only take place between AP’s that can see each other.
  - There needs to be a mechanism to secure the information – there needs to be a mechanism to protect this information – this method is fragile to attack
  - How is this different from the modified site report in 802.11k? This mechanism doesn’t rely on a request/response mechanism for the site report.
  - If you collect this information on initialization, it will get stale.
  - What metrics does the STA use to sort the table? The sorting mechanism is not specified.
  - The AP’s in the list for the STA are continually updated.
  - Need to do more work to quantify the transmit time saved by reducing the size of the probe response.
  - Need to quantify how much extra memory this scheme will take on the STA and the AP
  - What would happen if all AP’s start at a time. We would need a mechanism to address this. Some random delay would have to stagger the AP scans when they start up.
  - The AP only caches the fixed information on the network.
  - There is also time savings in allowing the STA to scan only specific channels.
  - Even though you have the information you propose, in practice, you would need to do a full scan. These issues are currently being addressed by 802.11k and a submission by Bernard Aboba
  - Need to quantify the size of the “modified beacon” at startup.
  - This proposal may work for 802.11b or 802.11g. However it would be difficult to implement for 802.11a.
  - It would be attractive to preserve the static information in the Beacon.
- Presentation on the definition of an ESS – Document 11-04/614r0 – Jon Edney
  - There is another technique which involves tunnelling packets back to the original AP. Is that roaming?
  - Prior to the hierarchical solutions over the last 18 months, there have never really been true implementations of a DS.
  - You could possibly have multiple portals on a single AP.
  - There are no mappings between IP subnets and DS’s or Portals.
  - The purpose of this presentation is to clarify the definition of an ESS and show why Fast BSS-Transition should not be addressing roaming where a STA moves from one IP subnet to another.
  - The important point is note that the standard states “no non-802.11 terminations are allowed”.
  - This group should define what it means to roam between a connected group of Access Points
  - Multiple portals can be could exist, each connected to different networks.
  - We should drop the term ESS and define a new term.
  - If the access points are separated by a router and they advertise the same SSID, then they are part of the same logical wireless LAN. However they are not a part of the same ESS.
  - Maybe we need to change the definitions in the base standard.
• Call for volunteers on positions of Secretary and Editor once we officially become a Task Group.
• No objections to recess until next meeting.
Wednesday May 12
4:00pm

• Some remarks regarding discussions during the last meeting:
  • The term ESS in the PAR was used to state that we are not addressing roaming in an IBSS.
  • We can always define ESS in the standard.
• Brainstorming on the scope of our work as recorded in Document 11-04/608r1
  • Document is being updated as part of discussion.
  • There are two cases – roaming between two access points with different PHY’s versus two PHY’s on the same access point.
  • IP address considerations are out of scope – cross-subnet roaming is out of scope
  • There are session oriented contents that are within scope. What session state occurs before the roam? What session state is preserved?
  • Do we need to define what we mean by a connected group of AP’s?
  • We may have to interact with liaisons with TGk, Mesh SG, WNM SG
  • Self-healing – if a STA goes away, how does persistent state timeout?
  • Do we have to address 802.11F?
  • Do we want to be wireless switch agnostic?
  • The STA makes the decision to roam, but it can use information from the AP
  • The reason why STA roaming decisions are out of scope is because vendors use roaming features as a differentiator.
  • The AP provides helpful information for the STA to roam.
  • Need to minimize the time the STA spends looking for other possible AP’s to roam to.
  • Need to make sure the DS is notified when a STA roams from one AP to another.
  • It appears that there are a number of issues with roaming in general, not simply fast roaming. The base standard does not address or describe BSS-transitions well.
  • There are a number of cases for BSS-Transition that is not specified. We are going to need to clean up the BSS-Transition description.
  • We are going to have to supply both Normative and Informative (recommended practice and clarification) text to address BSS-Transition
• Discussion on Roaming Requirements – to be submitted as document 11-04/617r0
  • Document is being updated as part of the discussion.
• No objections to recess until 4pm tomorrow.
Thursday May 13
4:00pm

- Opening comments
- Call for new additional content for the Scope Document – None.
- Call for new additional content for the Requirements Document:
  - Requirement for backward compatibility disclaimers:
    - If both AP’s in a roaming scenario do not support 802.11r, then fast BSS-transition would not be supported.
    - If the STA does not support 802.11r in a roaming scenario, then fast BSS-transition would not be supported.
    - The fast BSS-transition solution is not restricted to STA-only or AP-only.
  - Requirement for AP’s to exist in the same administrative domain and support 802.11r
  - The 802.11r solution will not decrease the total time available to transfer data. Need to define a metric to capture this requirement.
- Schedule for deliverables:
  - Updated use cases, scope, and requirements documents to be finalized in July 2004.
  - We need a straw man proposal for selection criteria for the July 2004 meeting.
  - Call for formal solution proposals in July 2004.
  - Task group internal ballot on draft in March 2005.
  - Address comments from letter ballot in May 2005.
  - There is an explicit performance goal for this work, therefore prototype or simulation results should be included with the submission.
  - Performance metrics should be finalised for the July 2004 meeting.
  - Can we solicit proposals now?
  - Do we have enough information to evaluate these proposals?
  - So we need security or QoS analysis? Do the people who submit proposals do that work?
  - We want all people submitting proposals to do this analysis.
  - The process is getting heavier. The process is going to slow down our Standards development progress.
  - We would allow people to submit incomplete submissions and build in all required pieces over time.
  - The task group does not have to build synergistic proposals. Task group members should collaborate to submit synergistic proposals.
  - There is a possibility that we may select multiple proposals.
  - We have not fully characterized the pieces that we have now in the standard.
  - There definitely is a problem to solve, particularly with VoIP applications.
  - We now have a schedule for the next year.
  - With this schedule, the standard would not be complete until late 2006, early 2007. Is this good enough?
- How do we execute on this? Do we have teleconferences? Particularly concerning Requirements, Use Cases, and Scope.

MOTION: Move to ask the Working Group to authorize teleconferences to be held by TGr no more than once every two weeks starting no earlier than May 29, 2004, and prior to July 31, 2004.
By: Jesse Walker
Second: Bob Love  
Discussion: None.

Results:  24 – Yes; 0 – No; 0 – Abstain.
• We need a sponsor for teleconferences.
• Also we need to know the times and dates.
  • Tentative dates: June 1, June 15, and June 29
  • Possible Times:
    • Noon PDT; Noon UK; Noon Japan
    • 3pm PDT; 3pm UK; 3pm Japan

STRAW POLL: What times would people prefer for the teleconference meetings?
  c) Noon PDT (3pm EDT); Noon UK (8am EDT); Noon Japan (11pm EDT)
  d) 3pm PDT (6pm EDT); 3pm UK (11am EDT); 3pm Japan (2am EDT)

By: Clint Chaplin  
Discussion: None.
Result: a – 14; b – 11.
• The teleconferences will be held at Noon. The order would be of Pacific, UK,

STRAW POLL: How many people are willing to participate in the teleconference?
By: Clint Chaplin  
Discussion: None.
Result: 16.
• First teleconference sponsor will be Jesse Walker.
• Second teleconference sponsor will be Stephano Fassin.
• Third teleconference sponsor will be Jim Wendt.
• The agenda for the teleconferences will be determined by email.
• Agenda for July will be as discussed in the schedule discussion.
• Call for other business.

MOTION: To adjourn for this session.
By: Bob Love  
Second: Nancy Cam Winget  
Discussion: None.
Result: Unanimous.
• Session end.
Attendance for the Fast Roaming Study Group

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Abstract

Minutes and attendance of the Meeting of the IEEE 802.11 ESS MESH Network Study Group held in Garden Grove, California, USA from May 11 to May 13, 2004 under the SG Chairmanship of Donald Eastlake 3rd of Motorola Laboratories. Minutes taken by Tyan-Shu Jou and edited by Donald Eastlake. An extended agenda for the meeting is at 11-04/508r5.

Contents

Significant Actions .................................................................................................................................................. 2
Full Minutes............................................................................................................................................................ 4
Attendance ............................................................................................................................................................ 15
Significant Actions
(For the detailed minutes, including these actions, see the next section of this document.)

Session I (Tuesday, 11 May, 7:30pm – 9:30pm)

1. Audience unanimously approved the previous (Lake Buena Vista, Florida) meeting minutes (11-04/0395r2) and the April 21\textsuperscript{st} teleconference meeting minutes (11-04/0465r1).

2. Status of the PAR and 5 Criteria of 802.11s TG was updated. The Chair has responded to the two questions/comments from NesCom.

3. All known presentations are categorized and the order is decided to have usage model discussion first, following by architectural presentations, and then others. Within a category, generally the reporting time to the chair decide the order.

4. Presentation #1: “Defining Usage Models for 802.11 ESS Mesh” (IEEE 802.11-04/528r1) Steven Conner, Intel Corp

5. Presentation #2: “A Rationale for Security (mis)use cases” (IEEE 802.11-04/586r1) Jasmeet Chhabra, Jesse Walker, and Steven Conner

Session II (Wednesday, 12 May, 8am – 10am)

1. Presentation #3: “Usage Models for ESS Mesh” (IEEE 802.11-04/568r0) Kevin Dick, Kue Wong, Nortel Networks

2. Presentation #4: “ESS Mesh Deployment Usage Model” (IEEE 802.11-04/590r0) Tyan-Shu Jou, Ted Kuo, Ming Sheu, Janusys Networks

3. Presentation #5: “Usage Scenario for ESS Mesh Network” (IEEE 802.11-04/600r0) Hidenori Aoki, NTT DoCoMo Wireless Lab

4. Presentation #6: “Mesh Networks for Home Entertainment” (IEEE 802.11-04/501r1) Guido R. Hiertz, Yunpeng Zang, ComNets; Jorg Habetha, Philips Research

5. Presentation #7: “Suggested Terminology and High Level Functional Components for ESS Mesh” (IEEE 802.11-04/529r1) Steven Conner, Intel Corp.; Yoichi Matsumoto, Hidenori Aoki, NTT DoCoMo

Session III (Wednesday, 12 May, 1:30pm – 3:30pm)

1. Presentation #8: “ESS-Mesh: Things That Make Me Go Hmm” (IEEE 802.11-04/602r4) Thomas Maufer, Nvidia

2. Presentation #9: “Need Clarification on the Definition of ESS Mesh” (IEEE 802.11-04/500r1) Tricci So

3. Presentation #10: “Consideration on WDS Addressing” (IEEE 802.11-04/501r1) Tricci So

4. Presentation #11: “Is the 802.11 MAC Sufficient for Wireless High Speed Mesh LANs” (IEEE 802.11-04/558r2) Guido R. Hiertz, Lothar Stibor, ComNets; Jorg Habetha, Philips Research
Session IV (Wednesday, 12 May, 4pm – 6pm)

1. Presentation #12: “Mesh Relevance in CAPWAP and AP Functional Definitions” (IEEE 802.11-04/595r2) Lily Yang, Intel; Tyan-Shu Jou, Janusys Networks

2. Initial discussion on group process

Session V (Thursday, 13 May, 8am – 10am)

1. Presentation #13: “Performance Implications of the 802.11 MAC on Multi-hop Mesh Networks” (IEEE 802.11-04/577r1) Xingang Guo, Steven Conner, Lily Yang, Intel Corp

2. Presentation #14: “Is Spanning Tree Protocol Right for ESS Mesh?” (IEEE 802.11-04/598r0) Tyan-Shu Jou, Ted Kuo, Ming Sheu, Janusys Networks

3. Presentation #15: “On ESS Mesh Device Discovery” (IEEE 802.11-04/599r0) Tyan-Shu Jou, Ming Sheu, Ted Kuo, Janusys Networks

Session VI (Thursday, 13 May, 10:30am – 12:30pm)

Tentative Agenda for future meetings

1. July (Portland, Oregon)
   a. Adopt Initial Definitions document
   b. Usage Cases and Functional/Requirements discussion
   c. Architecture Presentations
   d. Other ad-hoc subgroup results and Presentations
   e. Joint Meeting with 802.11r, etc.

2. ESS Mesh Group teleconference June 30 at 3PM PDT with 15 days advance notice. (Mostly talk about July Agenda)

3. Sept (Berlin, German)
   b. Approve Draft 0.0 (Skeleton)
   c. Other ad-hoc subgroup results
   d. Call for proposals issued immediately after meeting with deadline for submission of two weeks before November meeting.

4. Nov (San Antonio, Texas): Presentation of Proposals

5. Jan (Monterey, California): Condensation of Proposals -> Draft 0.1

6. March (Atlanta, Georgia): Refinement of Draft

Meeting adjourned at 11:27am by the Chair

Session VII (Thursday, 13 May, 1:30pm – 3:30pm)

Ad-hoc subgroups discussion (definition, usage models, routing)
Full Minutes
(For a listing of just the significant actions, see the previous section of this document.)

Session I:
Date: Tuesday, 11 May, 2004
Location: Grand F+G, Hyatt regency Orange County, Garden Grove, California, USA.
Officer presiding: Donald Eastlake 3rd
Attendance: See end of minutes.

Meeting called to order at 7:42pm by Donald Eastlake 3rd, ESS Mesh SG Chair.

(The initial slides used by the SG Chair are 802.11-04/508r0.)

Reviewed policies and procedures of IEEE:
In a Study Group, any one who has paid registration can vote, make motions, etc., regardless of their 802.11 voting status, all motions must pass by 75%. This meeting will count towards attendance. If you are aware of any patents in our area, you must bring them to the attention of the WG chair. No licensing, pricing, territories, litigation or threatened litigation, can be discussed, Please object to these and bring to the attention of the chair.

The Chair went through the IEEE-SA Standards Board Bylaws on Patents in standards and Inappropriate Topics for IEEE WG meetings.

On-line attendance recording reminded.

Audience unanimously approved the previous (Lake Buena Vista, Florida) meeting minutes (11-04/0395r2)
Audience unanimously approved the minutes of the teleconference meeting held on April 21, 2004 (11-04/0465r1)

“Free the APs” button graphics can be found in 11-04/518r0

Discussion on presentation orders:
- Steven Conner: Usage models should be before architectural components
- Tricci So: We should organize the presentations. There will be some questions presented; they should be presented before the architecture.
- Paul Lambert suggests to go with the order of questions, usage, and then component architecture

All known presentations are categorized by the SG and then decided order to go with usage, architecture definition, and others.

The Chair went through the SG agenda (11-04/508r1) for this week. The agenda is adopted by unanimously consent.

Status of the PAR and 5 Criteria:
Abbreviations were expanded at the request of a NesCom member.
A NesCom member queried as to whether this overlapped any ITU or IEC standards effort. It appears that it does not. We are expecting to become 802.11 TGs at the end of this week.

The agenda (11-04/508r1) is updated with the known presentation order and submitted to the server during the session.

Presentation #1:
“Defining Usage Models for 802.11 ESS Mesh”
(IEEE 802.11-04/528r1)
Steven Conner, Intel Corp.

Haixiang He of Nortel: in individual models, it will be helpful to specify what the terminating points are. Also In home network, is ad-hoc mode mesh, rather than ESS mesh, a better fit?
Steven: With more and more components in the same place, I believe ESS mesh can provide more control and flexibility on bandwidth usage than an ad-hoc mode network. Also in ad-hoc mode, all terminating points may need to be within range.

Jim Hauser: ESS mesh can take advantage of multiple channels. In addition to application requirement, transport layer has to be considered because some transport protocol may be very sensitive to packet loss, etc.

Raymond Aubin: Are we assuming a homogeneous network? At home, all different kinds of equipments may have different bandwidth requirements hence it may be a heterogeneous network.

Tricci So: management requirements in different models will be different, which has not been addressed.

(10 minutes recess for people to enjoy the cake left by 802.11i group.)

Presentation #2:
“A Rationale for Security (mis)use cases”
(IEEE 802.11-04/586r1)
Jasmeet Chhabra, Jesse Walker, and Steven Conner

Haixiang He: the examples are more like routing security issues than for ESS mesh. Hence the proposal of forming a subteam based on this may not be appropriate.

Session adjourned at 9:30pm

Session II:

Date: Wednesday, 12 May, 2004
Location: Grand F+G, Hyatt regency Orange County, Garden Grove, California, USA.
Officer presiding: Donald Eastlake 3rd
Attendance: See end of minutes.

Session called to order at 8:00am by Donald Eastlake 3rd, ESS Mesh SG Chair.

Updated agenda 802.11-04/508r3 will be submitted during the session.

Presentation #3:
“Usage Models for ESS Mesh”
(IEEE 802.11-04/568r0)
Kevin Dick, Kue Wong, Nortel Networks

Presentation #4:
“ESS Mesh Deployment Usage Model”
(IEEE 802.11-04/590r0)
Tyan-Shu Jou, Ted Kuo, Ming Sheu, Janusys Networks

Raymond: This presentation shows the distinction between the application usage model and a deployment usage model. The slide put all combinations into the DS, including Mesh APs, traditional APs, and bridges. Interworking between mesh routing versus spanning tree might be a very complex problem. Such a general definition of DS will require a lot of work.

Tyan-Shu Jou: Agree with your points. The picture presented indeed is controversial; it is intended to spark comments. The standard group can focus on a narrower scope, but we need to have a view of a possible deployment scenario. Vendors may add more complicated functions on their own.

Peter: I agree with your model. A question for the AP on the left: Is it only wired to a mesh AP? Otherwise you are using the definition of the DS being a plurality of wired and/or wireless.

Tyan-Shu Jou: the legacy AP on the left is connected to one Mesh AP through the wire. No wireless connection. The issue here is the client membership. The connected Mesh AP may have to manage the associated clients of the legacy AP.
Paul Lambert: What is the effect of a VLAN in the wired network behind this?
Tyan-Shu Jou: One suggestion is using Virtual AP--multiple SSIDs. Or, maybe a smart switch that can tell what VLAN the client is in.

Presentation #5:
“Usage Scenario for ESS mesh network”
(IEEE 802.11-04/600r0)
Hidenori Aoki, NTT DoCoMo Wireless Lab

Presentation #6:
“Mesh networks for home entertainment”
(IEEE 802.11-04/501r1)
Guido R. Hiertz, Yunpeng Zang, ComNets; Jorg Habetha, Philips Research

Presentation #7:
“Suggested Terminology and High Level Functional Components for ESS Mesh”
(IEEE 802.11-04/529r1)
Steven Conner, Intel Corp.; Yoichi Matsumoto, Hidenori Aoki, NTT DoCoMo

Jim Hauser: DS can be from any technologies, including possible L3 solution. But a BSS can only use L2.

Tyan-Shu Jou: The suggestion on terminology draft is good, we can make a motion at the end of the session. The scope of the proposed ESS mesh work shown in Slide 5 might be too limited. I think our solution will have to touch DS block. Also it may change the IAPP and the roaming mechanism.
Steven: Agree we may have to make other changes. The picture simply tries to give an idea.

JC Zuniga of InterDigital: We should define clearly first the usage model before defining the requirement. We can ask 802.21 to solve the wireless-wired interop issues.
Steven: 802.11s should focus on standardizing a pure wireless network, but do not prevent others to help to resolve other issues.

Kue Wong of Nortel: ESS mesh can do a lot of things and should not be limited to pure wireless only.

Raymond Aubin of Nortel: We need to attach the terminologies to architecture. If we go back to the 802 LLC document, we need to put a discipline to separate control plane and data plane. We can focus on data plane first to have a better view and then see what is in the control plane. We can address this problem better that way.

Paul Lambert: We may need a clarification on the functional models. We should support multiple connections to DS.

Peter Ecclesine: I tried to draw the attention from the audience that “ESS …appears as a single BSS to the LLC layer”.

Tricci: ESS definition is only focus on wireless LAN, not on wired. But 802.11 should interop with other 802 medium. We cannot take DS from ESS mesh work away.

Steven: In my mind, ESS mesh is not the ESS, but a building block to build an ESS.

Guido: The name of “Legacy AP” may not be appropriate.
Donald: maybe something like “non-mesh AP” will be better.

Joerg Harada: In your mind client stations do not participate in creating ESS mesh, but we would like to see that to happen.

Session recessed at 10:00 am until 1:30pm

Session III:

Date: Wednesday, 12 May, 2004
May 2004  doc.: IEEE 802.11-02/xxxr01

Location: Grand F+G, Hyatt regency Orange County, Garden Grove, California, USA.
Officer presiding: Donald Eastlake 3rd
Attendance: See end of minutes.

Session called to order at 1:30pm by Donald Eastlake 3rd, ESS Mesh SG Chair.

Attendance reminded by the chair.
Voting rights in Study Groups is repeated by the chair for new audience.
Agenda (11-04/508r3) will be kept updated to reflect the correct agenda.

Presentation #8:
“ESS-Mesh: Things That Make Me Go Hmm”
(IEEE 802.11-04/602r4)
Thomas Maufer, Nvidia

Steven: We will have to decide whether 802.11s will define the ESS or the building block to build an ESS. For example, I don’t think this group need to touch the roaming issues.
Jim Hauser: 802.11r cares more about association. 802.11s doesn’t need to.

Tricci: I have comments on your proposal for this group to go to define the requirements and to define routing algorithm right away. Since we have seen various usage models, we may need to be careful on the next step. We need to understand the solution we try to build first.

Steven: I support the usage model exercise.

Presentation #9:
“Need Clarification on the definition of ESS Mesh”
(IEEE 802.11-04/500r1)
Tricci So

Steven: In Sept. 2003 meeting, we have decided that ESS mesh station won’t require modification of legacy station. Regarding ESS mesh and WDS mesh: the “ESS” in “ESS mesh” is adjective to describe what we are working on. ESS mesh can be used to build an ESS. In my mind there is no strong difference on WDS mesh and ESS mesh.
Tricci: I disagree to treat ESS in ESS mesh to be an adjective.

Tom: An infrastructure requires portal. It seems like if there is no portal, there is no infrastructure.

JC: when it says the LLC, does that mean the solution has to be at layer 2?

Tricci: since LLC is a conversion layer, I interpret that to be it is ready to support other media. I am not promoting using Layer 2 or Layer 3. My purpose is to clearly understand the definition.

Paul Lambert: On your picture slide 8, the router should not be there. It should not be a part of the ESS.

Kue Wong: I think there exists a case that zero portals exist in an isolated wireless network.

Tom: I think a router is allowed by the language here. Language is not specific which gives us flexibility.

Tyan-Shu: the language gives us room to grow. Although we may not have interpreted all terminologies correctly, so far we haven’t made anything wrong. Even if we have had chosen “WDS Mesh” as the name of the group, we would still have a lot confusion.

JC: we should utilize the results from other groups to better interoperate with other groups.

Steven: As we move forward, we don’t get too hung up on the definition of “ESS”. We should more on the function we try to build.

Tom: Since there are chartered under 802.11 working group, we have to make sure we are following all the specifications of the work from this group.
Presentation #10:  
“Consideration on WDS Addressing”  
(IEEE 802.11-04/501r1)  
Tricci So  

Tyan-Shu Jou: what this group is heading to has no conflict to your proposal. On the other hand, the IETF Manet related IP layer solution is not using the WDS frame format. Therefore, naturally network layer link doesn’t utilize the WDS address format.  

JC: I agree with the presentation on the usage of the WDS frame format.  

Presentation #11:  
“Is the 802.11 MAC Sufficient for Wireless High Speed Mesh LANs”  
(IEEE 802.11-04/558r2)  
Guido R. Hiertz, Lothar Stibor, ComNets; Jorg Habetha, Philips Research  

Tom: Just pointed out the transmission in wireless radio is not duplex. Due to the possibility of the existence of hidden nodes, the sender won’t know whether a transmission is successful or not. That’s why an Ack is needed in 802.11. Also, TCP on wireless doesn’t have much to do with Mesh.  

Two comments from the audience: 802.11n is working on increasing efficiency on the MAC. Secondly, the curve you show doesn’t reflect the way people deploy the wireless LAN. Multiple band distribution may provide better efficiency  
Guido: There is a chance single band mesh may be used.  

Xingang Guo: Do you have some idea about the performance efficiency on multi-hop links?  
Guido: Our study shows 802.11 doesn’t perform well in multi-hop cases.  

Tyan-Shu Jou: On your point on the performance of multi-hop links: in addition to using different channel to avoid interference, adding an intermediate node may increase the signal strength hence the transmission rate of the path in some scenarios. There is a tutorial done by Intel that shows some results on that.  

Session recessed at 3:28pm  

Session IV:  

Date: Wednesday, 12 May, 2004  
Location: Grand F+G, Hyatt regency Orange County, Garden Grove, California, USA.  
Officer presiding: Donald Eastlake 3rd  
Attendance: See end of minutes.  

Session called to order at 4pm by Donald Eastlake 3rd, ESS Mesh SG Chair.  

The Chair reminded attendance taken again, and went through the presentation order in the following sessions.  

Presentation #12:  
“Mesh Relevance in CAPWAP and AP Functional Definitions”  
(IEEE 802.11-04/595r2)  
Lily Yang, Intel; Tyan-Shu Jou, Janusys Networks  

Tricci: What’s the scope of the proposed SG? Will it define anything?  
Lily: (Showing the “scoping for AP functional descriptions” slide from 11-04/481/r3) Basically the proposed SG will do the decomposition of AP functions. The ESS mesh SG can figure out what new function needed to feed into the group.  

Raymond Aubin: Interesting to see various groups found the need of the some clarification, we hope we can make the same results. So far the ESS mesh hasn’t made the decision on what to do within the MAC. I think most problems ESS TG sees will be in ESS and the new SGs will be in BSS.
JC: I can see the value of the new SG to help to clarify the definition that the result can benefit multiple groups.
Lily: Listening to the presentations in ESS SG today made me more believe that a clarification on definition will be beneficial and necessary.

Discussion on process

We will briefly address the group process topic today and discuss more tomorrow.
The Chair presents the following slides:

Generic Process Getting to a draft
- Specify requirements and comparison criteria
- Call for proposals
- Select/combine from submitted proposals
- Refine selected proposal
- Letter ballot

Study/Task Group Process
- Possible ad-hoc subgroups:
  - Usage Case document
  - Definitions document
  - Group(s) to check implication of 802.11e, 802.11h, 802.11i, 802.11k
- Teleconference
  - Suggest one before next meeting
- Need to have goals for the July Meeting

Schedule
- July (Portland, Oregon)
  - Initial Definitions document
  - Architecture discussions
  - Usage Cases and Functional requirements discussion
- Sept (Berlin, Germany)
  - Usage Cases and Functional Requirements document
  - Call for proposals issued
- Nov (San Antonio, Texas)
  - Presentation of Proposals
- Jan (Monterey, California)
- Mar (Atlanta, Georgia)

Steven: Since there are so many components that we need to work on, such as routing, MAC modification, etc. Maybe we can be more descriptive on the Architecture discussion so we can have multiple sub-groups to focus on different things to make progress in parallel.
Donald: How formal the process should be depends on how much conflict there will be. My impression is we do not have too much conflict hence hopefully we don’t need a very strict process.

Tricci: next meeting we might be the TG, so will that change the voting process?
Donald: as a TG, we don’t need separate attending sheet, and only voting members can vote.

Tom: Are the proposed documents will be part of the draft we are working on?
Donald: One TG should only produce one document. Any study group documents can be incorporated into the final document.

JC: I think the proposed schedule is a bit optimistic. A lot inter-working group work will be needed.
Donald: My expectation is by the end of the July meeting, we can come up with an initial definition document

JC: Can we have a straw poll to see people’s feeling on the schedule.
Donald: I’d like to see the voting tomorrow. So people can think about it tonight.

Tricci: Should this group to have multiple contributions? Do we need multiple sub-editors for the work.
Donald: For internal documents, we can do whatever we want. Your suggestion is possible. Please think about this tonight. We will have time to discuss it tomorrow.

Session recessed at 5:10 pm for people to have ad-hoc discussion. Anyone who wants to discuss further can stay until 6pm. The chair will be around until 6pm.

Session V:

Date: Thursday, 13 May, 2004
Location: Grand F+G, Hyatt regency Orange County, Garden Grove, California, USA.
Officer presiding: Donald Eastlake 3rd
Attendance: See end of minutes.

Session called to order at 8:10am by Donald Eastlake 3rd, ESS Mesh SG Chair.

The Chair went through the agenda of today. Some of the afternoon session might be available for ad-hoc subgroup discussion on the progress of this SG from any interested people.

Presentation #13:
“Performance Implications of the 802.11 MAC on Multi-hop Mesh Networks”
(IEEE 802.11-04/577r1)
Xingang Guo, Steven Conner, Lily Yang, Intel Corp

Tyan-Shu Jou: Will PCF help to solve any of questions you mentioned here?
Xingang: PCF may help, but most vendors do not support it. To my awareness, PCF has its own issues.

JC: How were the results generated?
Xingang: I put a few APs in an office space and changed the AP density to come up with the numbers on the figures

Jim Hauser: The NRL mesh we implemented a year ago used one channel and used a time division mechanism. One way to improve the performance of a mesh network is to adopt a scheduling mechanism.

Xingang: we are also looking into multi-channel enhancement.

Another question: You mentioned you do not want a change in the MAC, what do you exactly mean?
Xingang: It’s not my intention to say we cannot change MAC. The MAC is not designed for mesh, and of course I hope we can start afresh. But proposing to change MAC may not be the best thing to do for this Mesh TG.

Presentation #14:
“Is Spanning Tree Protocol Right for ESS Mesh?"
(IEEE 802.11-04/598r0)
Tyan-Shu Jou, Ted Kuo, Ming Sheu, Janusys Networks

This presentation analyzes pros and cons of using spanning tree algorithms versus routing algorithms. The last slide asks 5 questions:
1. Should we decide which layer (or, what address) the forwarding algorithm should be based?
2. Should we decide one forwarding algorithm?
3. Can we only define the communication message format rather than the algorithm?
4. Can we only define the MAC interface so the same hardware module can be shared?
5. How much interoperability among vendors is required?

Bob Moskowitz: My answers to your questions: 1) Layer 2 has many important protocols and features so forwarding calculation has to based on MAC address. 2) Single path forwarding really doesn't work in a rich mesh. Need to look at how long arcs are managed in a draft. It's an IEEE 802 problem but not just 802.11, and should be decided and defined in 802.1. (Bob is 802.1 liaison to 802.11.) But it may take a couple of years for 802.1 to decide on this so we need to do something in the interim. This group should prepare clear requirements and put this request on 802.1’s agenda by November.
Steven Conner: Going back to the PAR, the scope says we will develop architecture and protocols at MAC layer to deliver unicast, multicast and broadcast. I agree we may need to interoperate / interface with 802.1 bridge protocols, but do not agree to asking them to define the algorithm for ESS mesh. The work is in the ESS mesh TG domain.

Tyan-Shu Jou: Obviously there is dispute about routing and the process. To respond to Steven’s point that ESS mesh has to inter-work with all bridging, that would be a difficult task.

Dennis Baker: My answer to question 1: at MAC layer. We should hide mobility from upper layers. Make mesh appear to be a static LAN. Must have a way to distribute routing information globally within the wireless Mesh, that is, we need to develop a broadcast routing protocol. We can use a link state algorithm for unicast routing. These two can be separated, and unicast routing information can utilize the broadcast routing.

JC: Appreciate your effort to prepare these good questions. We should decide one forwarding algorithm depending on the decided usage model. We may not be ready to answer these questions at this moment.

Peter Ecclesine: The reliability and variability of the media requires more complex link states. Various cost metrics need to be considered. I don’t think we can simply take a link state algorithm. 802.11f tried defining a container class so it’s easy to send your own stuff. But that was rejected. It’s unacceptable that a group works for 3 years and just says an OUI determines everything. Hence interop is a must.

Bob: Path algorithm is going to be interesting. Maybe depend on bandwidth, error rates, etc. Bridges don’t do load splitting. Many Meshes will have multiple connections to outside world. We possibly should start with using the spanning tree and we may not stay there.

Tyan-Shu: Spanning tree has only one path. Load sharing will be important.

Tricci: There are a lot researches on load balancing using multiple spanning trees. I agree with Bob that 802.1 has done a lot of work. We should go to them to get a cohesive result.

Tyan-Shu Jou: Could use spanning tree but we may still need to change it or ask other groups to change it.

Sastry: Is 32 nodes the limit? Have usage cases been settled? The choice on routing algorithm should reflect the node number.

Donald E.: 32 is in the PAR, although it says you can think about larger. Usage cases have not yet been settled.

Raymond Aubin: One option is source routing (across the ESS Mesh). Avoids dealing with the routing algorithm. It will need new MAC frame format and there will be a limit on the radius.

Jim Hauser: Must remember that we have to do broadcast routing. It is more difficult than Unicast.

Donald: Do people want to take any straw polls? (No one was in favor of doing any polls at this stage)

Presentation #15:
“On ESS Mesh Device Discovery”
(IEEE 802.11-04/599r0)
Tyan-Shu Jou, Ming Sheu, Ted Kuo, Janusys Networks

Bob Moskowitz: 802.1af is the next rev of 802.1X. It includes discovery. Has pair wise key setup using 802.1ae enveloping. 802.1ae is in Draft 2.0. It uses GCM crypto algorithm rather than CCM due to 802.3 10GHz requirement. 802.1Xrev does not handle peering. This group should work together with those groups.

Peter E: The single administrative control issue doesn’t need to be solved in ESS mesh group. WNM is the right group.

Tricci So: Why do we need a single group key in the Mesh? Since wireless bandwidth is precious, we should avoid broadcast if possible.

Tyan-Shu: Broadcast may be more efficient than multiple unicast delivering in some scenarios.

Tricci: Using unicast can be efficient. Where you duplicate the packet is the key.
Bob M.: It's a very challenging problem to have a single group key and the re-key capability. 802.11i did it wrong because they did not require re-keying the group key when a station disassociates. We may have to start with unicast keying only.

Session recessed by the chair at 10am

**Session VI:**

Date: Thursday, 13 May, 2004
Location: Grand D, Hyatt regency Orange County, Garden Grove, California, USA.
Officer presiding: Donald Eastlake 3rd
Attendance: See end of minutes.

Session called to order at 10:30am by Donald Eastlake 3rd, ESS Mesh SG Chair.

**Group process discussion**

- Usage cases
  - Coordinator: W. Steven Conner
- Definitions
  - Coordinator: Tricci So
- Impact of Other 802 standards/drafts/study groups
  - QoS (802.11e)
    - Coordinator: Lily Yang
  - Security (802.11i, 802.1ae, 802.1af)
    - Coordinator: Bob Moskowitz (he mentioned he need another person to assist)
  - Radio Resources/Metrics (802.11k, 802.11h)
    - Coordinator:
  - Management (WNM, CAPWAP)
    - Coordinator:

- Routing algorithms:
  - Coordinator: Tricci So

**Aggressive Schedule**

- July (Portland, Oregon)
  - Adopt Initial Definitions document
  - Usage Cases and Functional/Requirements discussion
  - Architecture Presentations
  - Other ad-hoc subgroup results and Presentations
  - Joint Meeting with 802.11r, etc.
    - Discussion:
      802.11r chair: we do need a joint meeting some time.
      Peter: we also need to discuss together with 802.1. Without an agenda the meeting may be chaotic though.
      Donald: since there is no objection, I will try to arrange a 2-hr joint meeting with 11r. Peter suggested to have another one with 11k and WNR.
      JC: we may want to schedule to avoid conflicts with some other related groups.

- Sept (Berlin, German)
  - Adopt Usage Cases and Functional Requirements document/Evaluation Criteria document
  - Approve Draft 0.0 (Skeleton)
  - Other ad-hoc subgroup results
  - Call for proposals issued immediately after meeting with deadline for submission of two weeks before November meeting.

- Nov (San Antonio, Texas): Presentation of Proposals
- Jan (Monterey, California): Condensation of Proposals -> Draft 0.1
- March (Atlanta, Georgia): Refinement of Draft
Peter: call for proposal on Sept may be too late. I’d like to see the proposal earlier.
Tricci: we may want to have definition first.
Peter: I don’t agree to spend the time on usage cases. I believe functional requirements will be useful. Architecture presentation can only go so far. 802.11n is working in usage models because people don’t want it to move fast.
One person’s explanation for 11n: From 11n experience, people wanted to understand requirements and functional requirements before moving to the next step. There are a lot other experiences that the group decide not to go fast.
Steven: If the exercise is focused on practical topologies, the usage case study is to help us to refine or define the functional requirement. If we just allow people to discuss freely we may end up to come up with many things that are useless. We should use that to drive functional requirement.
Tricci: Can we have a straw poll to see what people think we should do in the next meeting.

**Straw poll:** Adopt Initial Definitions document should be a priority in July meeting

**Result:**
Yes: 33
No: 0

**Straw poll:** Usage Cases and Functional/Requirements discussion as a priority at the July meeting

**Result:**
Yes: 38
No: 0

**Straw poll:** Architecture Presentations as a priority item at the July meeting

**Result:**
Yes: 31
No: 1

**Straw poll:** ad-hoc subgroup results and Presentations at the July meeting

**Result:**
Yes: 16
No: 1

**Straw poll:** Call for proposal to be issued at the July meeting

**Result:**
Yes: 9
No: 19

Since the above results are straw polls only, they are not binding. We can still make the final decision during July meeting. For now I will remove the Call for proposal from the agenda.

Teleconference (s)
- Suggest one study/task group teleconference between May and July meetings. Requires 15 day notice. Last call was optimized for US participants.
- Moved, to authorize an ESS Mesh Group teleconference June 30 at 3PM PDT with 15 days advance notice. (Mostly to talk about July Agenda.) Adopted by unanimous consent.

Stuart Kerry (802.11 WG Chair): ESS Mesh has been proved to be 802.11s by NesCom. The closing date of the PAR is 30 Dec 2008.

Since there were no more items on the agenda, the Chair announced the meeting adjourned at 11:27 am. Remaining time until 12:30pm was taken by ad hoc meetings of subgroups of the Study Group.

**Session VII:**

Date: Thursday, 13 May, 2004
Location: Grand D, Hyatt regency Orange County, Garden Grove, California, USA.
Officer presiding: Donald Eastlake 3rd
Attendance: See end of minutes.
1:30pm – 3:30pm
This time slot is used by meetings of ad-hoc subgroups. Audience can participate freely.
Attendance

Osama Aboul-Maud
Peyush Agarwal
Jonathan Agre
Tom Alexander
Areg Alimian
Khaled Amer
Hidenori Aoki
Raymond Aubin
Malik Audeh
Dennis Baker
Bala Balachander
Veronique Bayle
John Benko
Mathide Beuveniste
Manoj Bhatnagar
Chan Hyung Chan
Ron Chang
Marashimha Chari
Jasmeet Chhabra
Leigh Chinitz
Byung Ho Chung
W. Steven Conner
Kevin Dick
Gopal Dommety
Donald Eastlake 3rd
Peter Ecclesine
Bruce Edwards
Steve Emeott
John Pakatselis
Valerio Filauro
Helena Flyyare
Dorothy Gellers
Wataru Gohda
Xingang Guo
Joerg Habetha
David Halasz
Yasuo Harada
Thomas Haslestad
Vann Hasty
Jim Hauser
Eleanor Hepworth
Karl Heubaum
Guido R Hiertz
Chris Hinisz
Cheng Hong
Fred Hzisch
Yasuhide Inoue
Bobby Jose
Tyan-Shu Jou
Naveen K Kakani
You Sung Kang
Kevin Karcz
Richard Kennedy
Takuya Kitamura
Gunter Kleindl
Mark Kobayashi
Ted Kuo
Paul Lambert
Taejin Lee
Jia-Ru Li
Liang Li
Jouni Maliner
Stefan Mangold
Mahalingam Mani
Daniela Manizzo
Art Martin
Yoichi Matsumoto
Thomas Mauffer
Stephen McCann
Bill McIntosh
Darren McNamara
Haixiang Me
Bob Miller
Sam Mo
Robert Moskowitz
Andrew Myles
Marco Naeve
Yukimasa Nagai
Tetsuya Nakamura
Knut Odman
Hirosi Oguma
Sam Oyama
Alek Porter
Alek Purkovic
Stefan Rommer
Kazuyuki Sakoda
Ambatipudi Sastry
Erik Schylander
Shusaku Shimada
Roger Skidmore
Tricci So
Heather Sze
Tsuyoshi Tamaki
Anna Tee
Eric Tokubo
Jean Tsao
Sandy Turner
Gianluca Villa
Bert Visscher
Shawn Welsh
Jack Winters
Kue Wong
Charles R Wright
Akiyoshi Yagi
Katsuhiko Yamada
Tomoya Yamaura
James Yee
Patrick Yu
Hon Mo Yung
Mike Zamalokvai
Juan Carlos Zuniga
Abstract

Minutes and attendance of the meetings of the IEEE 802.11 Wireless Performance Prediction Study Group held in Orange County, California, USA on Monday, Tuesday and Thursday, May 10, 11 and 13, 2004 under the SG Chairmanship of Charles Wright.

Session Proceedings

Meeting 1:

Date: 10 May 2004
Location: Grand B

Meeting called to order at 4.00 PM Pacific Time Monday May 10th by Charles Wright, WPP SG Chair. Tom Alexander was recording secretary.

Charles welcomed the participants to the first meeting of the week. He gave the introductory presentation, and briefly reviewed the policies and procedures for study groups. Specifically, he called out the fact that in an SG, everybody voted (no voting token or badge required), but anything passed in a SG required 75% consensus. All 802.11 policies applied as well. He also covered the IEEE-SA bylaws on Patents; he put up the SA bylaw on the screen and called the group's attention to it. He then covered inappropriate topics for the meetings: licensing terms, pricing, market share, ongoing or threatened litigation; and also mentioned that we must formally object to any such discussion.

Charles then passed around the signup sheet, and noted that SGs are required to take attendance. He noted that you are only needed to sign in once during the week. He also reminded everyone that they should also log their attendance on the 802 attendance server. He mentioned that we have had 6 teleconferences since the Orlando meetings in March, and reviewed the teleconference process, plus the formation of the two ad-hocs; the methodology ad-hoc chaired by Paul Canaan (not present) and the prediction ad-hoc chaired by Roger Skidmore (also not present). The two groups went off and considered what the purpose and scope should be for the PAR and after some time came back with their proposals. There was considerable discussion in the teleconferences on the results of their work. A couple of presentations also came out of their work: document #441 by Roger Skidmore on the topic of prediction, and a document by Paul Canaan (#462) on methodology. There was a 2 hour marathon teleconference last Thursday to come up with a proposed PAR, posted as document #491 - we will be considering this during this meeting as a baseline. He emphasized that this doesn't represent a decision by the SG, but this is the work of the SG since March that will be considered during this meeting.

Charles then brought up the minutes from Orlando (#432) and asked for approval. There was no objection to approving the minutes, and the minutes were duly approved.
Motion #1:
Move to approve the WPP SG minutes from the Orlando meeting in March 2004.

Moved: Charles Wright
Seconded: Tom Alexander

The motion passed by acclamation.

Charles then presented the proposed agenda for the week. He noted that he was going to make a call for presentations on the PAR and 5 Criteria. There would be joint meetings between 802.19 (Coexistence) on Tuesday, and he had also invited Richard Paine (Chair, 802.11k) to come and address the group on possible conflicts between TGk and WPP. More work would be done on the PAR and 5 Criteria, and then on Thursday we would vote to approve the draft PAR and 5 Criteria and forward to the 802.11 WG, to be voted for acceptance on Friday. The end goal is to accomplish item 17 on his agenda (namely, SG approval of draft PAR & 5 Criteria). Everything in between would be driving towards that goal. He then asked for any presentations, submissions, or additions to the agenda.

Larry Green stated that he had a presentation that he would like to give on the topic of the PAR. He did not have a document number for this yet, but it would be ready by tomorrow afternoon. Charles also asked Khaled if he would present on the 5 Criteria; Khaled agreed to do this, using the current draft 5 Criteria as a starting point. However, he wanted to find out who was interested in assisting on this task. Larry, Areg and Tom agreed to help Khaled. Some discussion took place on the best time to meet and hash out this work. Charles noted that having these two documents worked out and agreed to would help us get to the end goal by the end of the week.

Charles then modified the agenda with the presentation slots for Larry and Khaled on Tuesday afternoon, plus a slot of 60 minutes for Richard Paine and a slot of 60 minutes for the 802.19 coexistence discussion, all on Tuesday. He then requested a motion to approve the agenda.

Motion #2:
Move to accept the agenda.

Moved: Khaled Amer
Seconded: Larry Green

Discussion:
Question from Tom: how much time is being allocated for each presentation?

Larry then requested 30 minutes for the presentation and 30 minutes for Q&A. Khaled requested 30 minutes overall. The agenda was duly modified to show the length of the timeslots. There was no objection to accepting the modifications to the agenda.

Voting:
For: 10
Opposed: 0
Abstain: 3

Motion passes.

Charles discussed the SG timeline going forward. He noted that we may not necessarily have a WG quorum on Friday, and hence we cannot simply use that vote as an approval to send to ExCom. He said that a couple of SGs had tripped up over this in the past; when ExCom discovered that they did not have a quorum, they sent their PARs back to the WG to have the WG reaffirm with a quorum. Therefore, the approach taken would be to have the WG vote in the Friday meeting to hold a subsequent letter ballot to approve forwarding the PAR and 5 Criteria to ExCom.

Question from Khaled: Is this scenario only in case we don't have a quorum? Answer: The only way we can find out if we have a quorum is to do a quorum call, and we don't want to do that.

Charles then went on to clarify the process, assuming that ExCom approved the PAR. Essentially, at that point it would be forwarded to NesCom for approval, which was normally not a big issue. This would happen in the September timeframe. TK Tan was present and generally agreed that this was the process.
Charles then put up the proposed PAR that was discussed last Thursday (document #492r1), with the changes that were discussed on last Thursday. He noted that the only change from the previous revision was the substitution of the phrase "to enable" in place of the word "for" in the scope. He also noted, upon a question from Khaled, that everything seen in red in the document were the changes that were put in from last Thursday's teleconference. He said that he would like to go through the whole document, see the whole thing in context, and then come back to do the detailed wordsmithing. With this in view, he started with the title and read it out to the group. He said that he was somewhat on the fence with regard to the title, but we could deal with it later.

Question from Khaled: Doesn't the title have to contain the name of the group? In answer, Charles asked TK whether there was any need to have this correlation. TK replied that there was not necessarily any requirement for this, as long as it was clear that there was a good correlation. Charles further noted that we are asking for a recommended practice, not a standard or a guide. A standard is too hard, a guide is too soft, and a recommended practice is just right. He then went on through the boilerplate items in the PAR, reading each item out and generally clarifying the underlying assumptions behind them. He noted the dates in particular.

Charles then got to the Scope, and read it out as written in the draft PAR document.

Question from Khaled: Test environment? I don't know if we should limit it to a test environment. Answer: we will come back to this.

Charles then read out the purpose, as written in the draft PAR document. There was no discussion.

Question from Tom: Does the document on the server contain all of the red marked items? Answer: Yes, the only exception is the blue-marked change: "to enable".

Charles called attention to the statement on WPP not overlapping with other standards, and requested anyone in the group to bring forward anything in our scope of work that overlapped with any other standard.

Question from Mark: Will the discussion tomorrow with TGk and 802.19 affect the items in the PAR? Answer: It could potentially affect the scope and purpose, but I don't see any overlap with the groups. We want them to come in and clarify the difference between the two groups.

Comment from Mark: I guess what I was concerned with was that if something was brought up tomorrow we should be able to incorporate that. Answer: We have plenty of time before Thursday when it gets voted on.

Charles then went through the rest of the boilerplate, with no comment from the group. He finally got to item #18 of the PAR (Additional Explanatory Notes), which has a few more explanations to people as to what we intended to do and how much of it we intend to do. He then went through the explanatory notes one by one. He noted that the notes answered the question of who really would read our document, and also gave a definition of prediction. He also pointed out that there are placeholders to indicate how our scope differed from 802.11k and 802.19. This completed the presentation of the proposed PAR. He then threw the floor open to discussion, inviting Khaled to bring up the Scope first.

Comment from Khaled: It all looks good, but should our scope only apply to a test environment?

Larry Green stated that he shared Khaled's concerns about limiting a scope to a test environment; to him a test environment may be an anechoic chamber.

Question from Tom: How about "controlled environment"? We are looking for the essence of a test environment, which is control.

Mark commented: I like the idea of a “controlled environment”, this gives repeatability.

Larry felt, however, that WPP should cover both open-air and controlled environment; lots of people want an open-air environment. Areg said that he seconded Larry's thoughts on the issue, as we want to extend the scope to cover users and customers experiences, narrowing down to a controlled environment was not desirable.

Khaled pointed out that we are talking about defining metrics - e.g., throughput, jitter, etc. – and we don't need to specify where these are used. Tom then clarified that by "controlled" we would not exclude "open-air".

Comment from Mark: I hear the concerns from the users regarding including open-air, however, repeatability is a big issue. A controlled open-air environment might work. However, without repeatability all this would be difficult to use.

Charles suggested reverting to the original phrasing of "for a given set of environmental conditions". He noted that one reason for having the phrasing replaced was to avoid colliding with the Purpose, but subsequent rewording of the Purpose eliminated this need.
Comment from Khaled: One of the issues we run into is confusing what we are really after. If we are talking about evaluating products then we need to specify the environment, but if we are merely doing the measurements then we don't need to do so.

Comment from Larry: I second the motion. To clarify the scope, we should end the sentence with "application level".

Comment from Mark: I really don't believe that the removal of either of the alternatives reflects a lot of the discussion in the methodology groups.

Comment from Tom: I suggest adding the phrase "test conditions" after the phrase "measurement methodologies", because what we are after in terms of controlling the environment is to have a repeatable set of measurements, and we can't do this without controlling the test conditions.

Charles asked Mark if he was OK with it. Mark said that it was better, but he was still not happy with it. Charles then noted that we now have 3 different suggestions for the Scope. he then read out the Purpose, and asked if any or all of the suggested Scopes met the Purpose.

Question from Eric Tokubo: What's the reasoning for including networks at the end of Purpose? Answer: We had "system" in there, but that seemed a little vague, we wanted to include devices operating in a network. It was kind of hard to separate an AP from a NIC anyway.

Comment from Eric: Up until that point, we have always been discussing WLAN performance, now we have just brought in entire networks. If we want to predict network performance, then that's a really big scope, it depends on how your network is set up, and that goes into network management and set-up, even on the wired side.

Comment from Tom: We are caught between two opposing views here: one wants to predict performance in a user environment, and the other wants to keep it in a laboratory environment.

Question from Larry: I wonder if there is a little confusion with what "network" means? May I propose that we consider putting in "802.11 WLAN networks". Does this clear up the confusion?

Comment from Eric: This would be fine, I just want to get away from trying to define performance of the whole network. If you can keep it to the boundary of the WLAN then this would be good.

Comment from Charles: One kind of network measurement is roaming performance, and you can't very well test roaming performance on just a NIC. However, if you put this into a system, then automatically the wired side seems to have some influence.

Comment from Eric: I guess at the end of the day, you can consider the network to be part of the controlled environment.

Charles then added the word "802.11" in front of "WLAN devices" in the Purpose, and asked if there were any issues. None were raised. Charles then went back to the Scope, and noted again that there were 3 different proposals: as-is, putting the original wording back, and putting "test conditions" after measurement methodologies. He then conducted a straw poll on the wording, creating a slide with all 3 proposals to be voted on, using Chicago rules.

**Straw Poll #1: Chicago Rules**

**Choices:**

- Option 1: unchanged from the posted document
- Option 2: delete the phrase "test environment", leave the rest unchanged
- Option 3: add the phrase "test conditions" after “measurement methodologies” and delete the phrase "test environment"

**Results:**

- Option 1: 1 in favor
- Option 2: 7 in favor
- Option 3: 10 in favor

As the choice of the group was not completely clear, Charles then reduced the number of choices to 2 (Options 2 and 3) and ran the straw poll again, with each person being allowed to vote for only one.
Straw Poll #2:

Choices:

Option 1: delete the phrase "test environment", leave the rest unchanged

Option 2: add the phrase "test conditions" after “measurement methodologies” and delete the phrase "test environment"

Results:

Option 1: 0 in favor
Option 2: 12 in favor

Charles then congratulated the group on having voted in their first real text into the PAR. Tom noted that this helped get the blood circulating. Charles said that the Purpose did not seem to have much controversy, and asked if anyone objected to proceeding to the additional explanatory notes. There were no objections, and he duly went to "Additional Explanatory Notes" and asked the group for suggestions as to what should be put into this section.

Question from Tom: We have had a lot of discussions in the teleconferences as to the difference between WPP and TGk, can we incorporate that into the document right now? Charles replied that he had captured some of that already, and also noted that he was searching for better ways to express them. Charles then inserted a number of bullets into the suggested explanatory notes, under the difference between WPP and TGk, captured from the previous teleconference discussions. These were: online/offline, pre-production/post-production, non-running/running, test equipment making measurements / 802.11 devices measuring, measurements possible in test environment vs. impossible in a real environment., methodology differences, emphasis on methodology vs. the measurements. He then invited the group to come forward and provide additional material or modify what was presented.

Khaled commented: There are other aspects to be added. TGk is also about providing measurements to network management, while we are focused on enabling prediction and don't have anything to do with network management. Charles captured this as "WPP emphasizes definitions of metrics, TGk emphasizes network management".

Comment from Larry: I really like the first three paragraphs, and then I start bogging down in the fourth paragraphs. I would propose that we stick with the first three paragraphs and be done.

Question from Charles: Would you still feel that way if this text were written to flow nicer and read better? Answer: I would still have issues with the meaning of "on-line/off-line" and so forth.

Charles noted that it would certainly save him from having to wordsmith all this. We can certainly delete it if people think that the PAR stands on its own and doesn't need any explanation.

Comment from Khaled: The chair of TGk is going to be present tomorrow, maybe we can revisit this after that discussion. Tom agreed with Khaled. Charles then deferred the discussion to Tuesday.

Charles suggested that we could turn to the 5 Criteria and start the discussion. Khaled agreed that we should start working on it. Charles then requested the group to download document #194 from the server, which was Stephen Berger's original 5 Criteria document. He noted that we should thank Stephen Berger for having written this original document.

Charles brought up document #194 and reviewed each of the 5 Criteria. He requested Khaled to read them to the group. Khaled did so, starting at the first (broad market potential). He asked if anyone had any comments or complaints.

Comment from Larry: I have a problem with limiting to network reliability. Khaled: I agree. Maybe we should change the word reliability to performance?

Tom commented: Item a) doesn't have anything to do with reliability or attractiveness, but instead covers the applicability of the technology. Instead, we should say something like "applies to users, installers, manufacturers, and vendors, so is broadly applicable across the industry". Charles: Good comment.

Khaled and Charles then wordsmithed item a) The project will be applicable to developers of chipsets, components, equipment and software that uses or must interact with 802.11 wireless equipment, as well as users of 802.11 equipment, including system installers, IT managers and test laboratories. This was generally acceptable to the group.

The discussion then went on to item b) under Broad Market Potential. Larry said that he wanted to add "users" to the discussion. Charles wondered if the text under a) would have to be brought down here. Tom clarified that the purpose of b) was to indicate that there would be more than one person interested in seeing the standard come about, and so the statement
that lots of vendors and lots of users were interested in this standard was applicable and should be left alone. There was general agreement.

Item c) was discussed. Tom noted that the background for this was to ensure that there was no large unbalance in costs between endstations and centralized equipment; for instance, T1 technology pushed most of the costs into the central office, with the CSU/DSU being relatively low cost, but 802 LANs have typically shared the burden equally between NICs and switch ports. Some discussion took place on this topic. It was suggested that we could say that the cost of testing would be shared equally between NICs and APs. Tom proposed the statement "The project will result in balanced costs between NICs and APs", which was inserted.

The Compatibility criterion was discussed next. It was suggested that the last part of the sentence be struck (the listing of the various 802.1 standards). The group agreed, and it was struck.

The Distinct Identity criterion was discussed next. Tom suggested that the material from the explanatory notes on how WPP is different from 802.11k and 802.19 could be inserted here. Charles then remarked that in that case we could simply transfer the text over. After some discussion, the text settled on was "No other IEEE 802 project addresses wireless performance (insert scope)".

Item b) was discussed. There was some confusion as to what this really meant, and how it was different from a). Finally, it was tabled. Tom suggested asking Harry Worstell for guidance here.

Item c) was brought up. Mark requested that discussion should stop after item c). General agreement. On discussing item c), Charles noted that if we look at any other PAR & 5 Criteria we would figure out what text to put in there, so we can table this one for later as well.

Khaled requested that we should meet as an ad-hoc after the first break, and spend an hour discussing the 5 Criteria, and we could meet in front of the coffee and refreshments at 10.30 AM. The group agreed.

Charles declared the meeting in recess until 1.30 PM Tuesday in the appointed room. The meeting recessed at 6.00 PM.

Meeting 2:

Date: 11 May 2004
Location: Grand B

Meeting called to order at 1.30 PM Tuesday May 11th by Charles Wright, WPP SG Chair.

Charles opened the meeting and apologized for his really low voice, saying that he had a cold and was losing his voice. He then passed around the attendance signup sheet, and asked all those who had not signed up to sign in. He also requested everyone to sign in to the attendance server as well, and noted that Harry Worstell was the person to talk to in case of attendance server problems. After this, he went over the agenda that the SG had agreed to yesterday. Per the agenda, he requested Richard Paine to come to the front and discuss the goals and purpose of 802.11k, as in the past people had had some questions about the overlap between 802.11k and WPP. He also noted that there would be a discussion of 802.19 overlap with WPP.

Presentation titled “11k Tutorial for WPP” by Richard Paine (document #587)

Richard Paine presented a contribution "11k Tutorial for WPP" (document 11-04/587r0). He noted that this was basically a tutorial presentation on 802.11k, and also remarked that the 802.11k PAR said that they were to provide measurements and to provide them to upper layers. He noted that the big push in 802.11k was to define a set of scenarios - hotspots, etc - and then to identify the measurements required in these different environments by different applications. The idea was to identify things such as when you could roam and when you could hand off within 40 msec to another network.

Question: Is the document on the server? Answer: No, but it will be up soon.

Some of the things the group looked at were what should be added to the radio in order to be able to perform handoffs at such rates. He mentioned RSSI as an example of something that was measured in different ways. The group drew from TGh, taking the TGh mechanisms and moving them into TGk. He then showed a slide comparing the TGh mechanisms with the general architecture of 802.11. RADAR detection was taken as an example. He then showed a slide containing a network architecture diagram and indicated that the goal was seamless roaming within subnets and even across subnets.
The notion of an AP neighborhood, including STAs that the AP cannot see, was introduced. The interface to this information for upper layers was through the MIB, via OIDs that are established under the NDIS layer (Windows) or Wireless layer (Linux). He noted (Microsoft’s) “zero-config” as an example of the use of this sort of information under the driver layer. The way the group looked at this was that there was information available within the MAC, and also outside of it, that can be sent by means of a standardized request/response mechanism. He then covered the various requests and reports that 802.11k covered, noting that the reports corresponded to the requests. The site report was called out in particular as an interesting addition, as it enabled very rapid handoffs when moving between subnets or between cells. The notion of a measurement report was also covered.

Richard then covered the need to pre-authenticate to enable rapid switchover, and noted that this was in the site reports that would be made available. He noted that they were working on the security aspects of the mechanism, with a 4-way handshake to enable information interchange. Richard further noted that DARPA had some very interesting ideas on how to do radio. DARPA took the tack that all spectrum was available, and you had the ability to use whatever spectrum was needed, if it was not being used by someone else. He said that 802.11k had the notion that this was the first step towards enabling all spectrum to be used.

Richard then stated that he'd met with Charles on Sunday, and said that given the way it was described to him, he did not see any overlap between 802.11k and WPP.

Question from Fanny: is the spectrum picture the way that we were moving? Answer: not at the moment, but the FCC hasn't gotten that far yet.

Question: is this a new topic in .11k? Answer: no, no, no, but the .11k view is that you need to know all of this information to enable such a scenario to take place. You need to have the same kind of measurements to be able to figure out what radios are around you and what frequencies you can use.

There was considerable discussion and further questions on the spectrum picture that Richard had presented. Richard was heard to express some regret at presenting this picture, as it was not really the main topic of discussion but sparked much controversy.

Question: The topic is also discussed in 802.19 and 802.20, and led to much contention.

Question from Tom: Could you describe to us what our charter is? This is not a trick question, I would like to see what we look like from an outside viewpoint. Answer: To come up with a standard or amendment, the task being to figure out what radio performance is, even in an environment where there are radios all over the place, and we can assess the performance of the radio in that environment.

Charles noted that we wanted to enable planning, testing and comparison of 802.11 devices and systems, using a consistent methodology. He noted the difference in terms of on-line measurements (TGk) vs. off-line measurements (WPP). We don't define any protocol of any kind, we define test/measurement/prediction methodologies, with the information being used for prediction and planning. Another one of his one-liners is: for 802.11k, the measurements are done by the devices themselves, but for WPP, the measurements are performed on the devices by an external entity. He noted that they were sensitive to this because of comments made during in past WG Friday plenaries about the overlap between the groups.

Richard stated that he'd told Charles on Sunday that TGk does indeed do offline measurements (passive listening), so the off-line vs. on-line might be a hot-button. The prediction element is the flag for us to use, in terms of a means by which we can get measurements whereby we can eliminate the impact of other radios on the test scenarios (such as controlled test conditions). Richard noted that location is not a major element of 802.11k yet, and he doubted that it will be, but the predictive elements were mainly in terms of who we are near to and who we are moving towards. He noted that this was a real-time predictive thing rather than prediction of performance in an overall environment.

Charles noted that there was another factor: the histogram of activities such as CCA activities, etc. He noted that the only work done in this direction by WPP would be to set up the test conditions under which the histogram was to be measured, so as to verify the performance of an 11k device, rather than defining how the measurement was to be made by the devices. He also noted that the more these measurements become embedded into the APs, the tricker the terminology will become.

Question from Khaled: I'd like to show you my draft 5 Criteria and have you critique the section on differences from 802.11k. [Khaled then put the draft up on the screen.]

Richard stated that he disagreed with the section dealing with 802.11k. The section was then duly rewritten to indicate that 802.11k was all about "upper-layer access to wireless LAN information". More wordsmithing took place.

Question from Tom: would the work of WPP be useful to 802.11k? Answer from Richard: I don't think so, not in real-time measurements, but it may be useful for prediction of performance in a crowded environment.
Presentation on 802.19 Coexistence by Steve Schellhammer

Steve began by saying that in his view there was quite likely a way whereby we could work together with 802.19. He started with the history of the 802.19 group as having originated with 802.15, when the interference issues were brought up and controversy erupted. The 802.15 group formed the 802.15.2 TF, which produced a Recommended Practice that covered modeling as well as some prediction material. There were also some coexistence methodologies aimed at preventing interference. A couple of years ago, a Technical Advisory Group was formed (TAGs don't produce standards, only Recommended Practices and Guides) to address the issues caused in general by the various groups producing standards. The goal was to put in place a process whereby new groups could avoid interfering with existing groups, and to also cover the situations where such issues arose.

Steve noted that one issue that came about was the idea of predicting performance in interference scenarios. In 802.15, there was a lot of detailed work and computer scenarios that was done to implement such performance prediction, but they had a relatively challenging task in terms of explaining to the WGs as to how to do such analyses. He also mentioned that one area that we might consider working on was to take a developing protocol - e.g., 802.11n - and an established protocol such as Bluetooth, and then figure out how to predict performance.

Question from Khaled: Have you already defined the metrics you are looking into? Answer: No, we've just got started.

Question from Fanny: So possibly your doc could reference ours in terms of methodologies and test metrics? Answer: We should probably discuss this further, because I've heard of you talking about two things: measurements, which we don't do, and prediction, which we do, with the exception that you only care about a homogeneous network and we care about a heterogeneous network.

Charles exercised chair's prerogative and interrupted. He stated that there was some overlap, but in terms of a coexistence study 802.19 did not have the devices available to make measurements on, but in the case of WPP we would have them available.

Question from Fanny: I would say it is important to have standard methodologies. Analysis is not methodologies.

Steve commented that we have ways of benchmarking equipment. The topic of the group is wireless performance prediction, and this somewhat overlaps with 802.19.

Question from Tom: Is there any interest in our providing metrics and measurements on the impact of interference on 802.11 performance? Answer: This is what 802.19 is actually trying to do; however, they are producing a meta-document that tell other groups how to do it. Therefore, this would overlap.

Question from Fanny: Is your group focused on metrics and test, or are you going to tell other groups how to do it? Answer: The measurements of physical devices is well outside the scope.

Question from Fanny: Therefore there isn't much overlap? Answer: Yes, yes.

Steve said that we have to make a model of a TGn device, making assumptions; 802.19 will try to avoid any specifics about one implementation vs. another, whereas WPP is actually focused on that sort of stuff. The question is, how much wireless performance prediction. is involved?

Khaled commented: The prediction part is not really some sort of conflict we are having between the two groups - we might define a metric here and there that we share, but we don't actually conflict.

Steve noted that he wouldn't worry about our PAR, because there is no way to step on 802.19's charter, which was concerned about interoperability.

Question from Fanny: Perhaps leaving prediction out entirely would be good? Answer: Yes, that would be good.

Question from Tom Siep: Is there any interest seeing what recommendations we are going to present to the exec regarding coexistence? Some discussion took place on this topic; the group felt that they would like to see it.

Tom Siep duly brought the presentation up to the podium, and presented two slides. There was a sixth criterion to require the group to submit a conformance document along with their PAR. He noted that they were going to originally list out what they would produce or what they would interfere with, because it might not be set yet. The sixth criterion ensured that such a coexistence document would normally be submitted prior to a standard being approved, rather than begun.

Tom Siep then presented a change to Procedure 11 of the LMSC rules, stating that a coexistence assurance must be sent to the 802.19 group 60 days prior to sponsor ballot. He noted that the important thing was that 802.19 was not a policeman, but would instead comment on whether the coexistence analysis and methodology was faithfully followed, and whether it...
represented good engineering practice. The Exec would be responsible for making the determination as to how to use the comments.

Question from Bobby: I'd like to get your thoughts on how WPP is related to 802.19 coexistence? Answer: My understanding is that WPP is doing something *ex post facto*, in that the systems already exist and are the same, and 802.19 is concerned with things that don't exist yet.

Question: Would WPP have to submit a coexistence assurance? Answer: No.

Steve's presentation then ended. Charles requested the next two presenters as to whether they were ready to present. Larry and Khaled both agreed that they were ready; their document numbers were #582r1 and #585r1.

Presentation titled “Draft PAR for WPP” by Larry Green (document #11-04/0582r1)

Larry then presented a draft PAR for WPP. He read out the list of authors, covered the presentation outline, and then went through the presentation slide by slide. It was noted that the document on the server (revision 1) was the right version, but the background in the slide master indicated r0 instead of r1.

Larry remarked that there were two Purpose statements were present; one was the original Purpose statement as of yesterday, and the other was a cleaner and crisper Purpose statement.

Question from Fanny: I like the second one, except I'd like to nitpick a tad. What does "planning" mean here? Answer: What's missing on this slide is a reference to devices and networks. The changed text would add "installation" before "planning".

Question from Khaled: Do we need to choose one or the other? Answer: Yes.

Question from Fanny: If you consider being more specific on methodologies and metrics? Answer: Put the word "testing" before methodologies.

Question from Steve: Aren't we focused on performance metrics? Answer: We can put the word "performance" before "metrics".

The Purpose was edited and read:

"*The purpose of the project is to enable deployment planning, testing and comparison of 802.11 WLAN devices based on a common and accepted set of performance metrics, testing methodologies and test conditions.*"

Larry wanted to pick one or the other at this time.

Question from Fanny: Deployment planning is one of the things that would come out of it, but this is not the key purpose of the project. Can we move it to the end? In response, Charles suggested a new phrasing:

"*The purpose of the project is to enable testing, comparison and deployment planning of 802.11 WLAN devices based on a common and accepted set of performance metrics, test methodologies and test conditions.*"

Tom requested a straw poll to pick between the two. Charles then conducted the straw poll.

**Straw Poll #3:**

**Choices:**

- Option 1: Current version of the Purpose (slide 5 of Larry's presentation)
- Option 2: New version of the Purpose (slide 6 of Larry's presentation), as amended

**Results:**

- Option 1: 1 in favor
- Option 2: 14 in favor
- One person abstained from voting.

The second version of the Purpose was therefore selected, without dissent from the group.

Question from Steve: The Scope’s got the word predicting in there again. Do you guys really want that in the scope? Are you predicting what one device will do, what a bunch of devices will do, or what? Answer: The combination of measurements and prediction is what we have discussed over the past few months and that's what we have arrived at.
March 2004  

Tom further commented that we are intending to enable the prediction, not actually doing the prediction. Steve then agreed that he saw the distinction, and further commented that the 802.19 group would also be telling people how to do the prediction but not actually doing it. Charles stated that in fact the 802.19 work on how to do prediction could be combined with our work on metrics and measurements to allow people to carry out actual prediction.

Question from Fanny: Can we have the same wording between the scope and purpose regarding metrics, methodologies, test conditions? Answer: General agreement that the phrasing for both scope and purpose should be "performance metrics, measurement methodologies and test conditions".

Larry made the changes to both slides. Charles then asked for comments on the revised Scope and Purpose statements. There were none. Larry then went on to the Additional Explanatory Notes portion of the presentation.

Question from Steve: Why do you assume that those things (the amendments) have to exist? Answer: We want to be broadly scoped in light of all the 802.11 work that's going on, and we may have to create measurement metrics that accommodate all of the work that is going on, and we don't want to create a document that is obsolete before it started.

Question from Larry to Steve: We are leaving out 802.19, is this an issue? Answer: No, I don't see any concern here. However, you should coordinate with 802.19 on any potential areas of overlap, such as some of the performance metrics. Keep it vague, but warm and friendly. Khaled concurred.

Tom then proposed some additional text, which was edited by the group to read:

"The project will coordinate with 802.19 on any potential areas of synergy, such as some of the performance metrics."

Larry then moved on to the next slide, dealing with the target audience.

Question from Fanny: "project output" should be changed to "Recommended Practice". Answer: The group generally agreed to changing the phrase "The target audience for the project output" to "The target audience for the Recommended Practice".

Question from Steve: Did you say developers? Answer: Yes.

Larry finally went on to the last slide, dealing with a definition of prediction. He read the slide out to the group. Considerable wordsmithing ensued. The sentence was broken into three, after striking the word "wherein". It finally read:

"For the purposes of this project the definition of prediction is as follows: the use of multiple input parameters to estimate performance characteristics useful in 802.11 network planning. Input parameters are defined to be 802.11 device characteristics, network layout and usage parameters. Performance characteristics are defined to be parameters useful in 802.11 network planning."

Question from Tom: Do we need this at all? Answer: Khaled: The reason we came up with this definition is that throughout the conference calls we kept stumbling over the definition of prediction, so if we take it out we will have to address this issue again. Roger S. generally concurred with this.

Question from Fanny: This definition may cause people to misconstrue our work. Can we have some words such as "the actual prediction is outside our scope"? Answer: We should take a short break and come back to this.

Charles then announced a short break until 4.00 PM.

The meeting resumed at 4.00 PM. Charles restated the definition of prediction, and noted that we were wordsmithing the paragraph dealing with prediction. Khaled reiterated Fanny's suggestion that "useful in 802.11 network planning" be moved to after "performance characteristics" and the last sentence be removed. The paragraph then read:

"For the purposes of this project the definition of prediction is as follows: the use of multiple input parameters to estimate performance characteristics useful in 802.11 network planning. Input parameters are defined to be 802.11 device characteristics, network layout and usage parameters."

Charles also noted that Fanny had requested some additional text to state that the scope of the project did not include prediction. However, the group did not seem to want this.

Question from Roger: If there is any need to add more explanatory text to further bound our scope, then clearly our scope is not clear enough. There doesn't seem to be any need. Answer: We've already looked at our scope, so why don't we sleep on this. We can address this on Thursday morning.

Larry's presentation then came to an end. Charles requested him to upload his document to the server as revision 2. Khaled was then requested to come up and present on the 5 Criteria.
Presentation titled “Five Criteria For IEEE 802.11 Wireless Performance Prediction (WPP)” by Khaled Amer (document #11-04/0585r1)

Khaled presented a Word document that covered a proposal for the 5 Criteria. He first noted the participants in preparing the document, and then went through the draft 5 Criteria one by one, stopping for questions at each item.

Charles commented: I now see why the compatibility sentence specifically brought out compatibility with 802.1D, .1Q and parts of 802.1f. I would like the statement to be extended to be "the entire 802 architecture".

Tom noted: This assumes that 802.11 is compatible with the entire 802 architecture.

Question from Charles: We are not doing anything at all that is incompatible with the 802 architecture, so how do we say that? Answer: Well, this is by inference. Let's move on.

Khaled covered the "distinct identity" situation.

Question from Charles: The text in italics won't be in the final 5 Criteria, right? Answer: Yes. Charles then suggested that we should delete it. The text was deleted.

Khaled covered the overlap with 802.11k.

Comment from Roger: The text relating to "there are no other 802.11 standards" should be moved to section a). The general response from Khaled was: Oops. I propose changing in a) "No 802.11 project today" to "No 802 project today". Some discussion ensued. Roger proposed taking the first sentence of b) and moving it to a). After more discussion, the final resolution was to change "No 802.11 project" to "No 802 project" in a).

Khaled then discussed the technical feasibility portion of the 5 Criteria. he noted that the "reliability" portion took a substantial amount of discussion.

Question from Fanny: We have to work on consistency of language - change "project output" to "Recommended Practice". Answer: Charles requested Khaled to make the change.

Question from Khaled: Is it a good idea to include the word services? Answer: No objection to putting in "services". Khaled made the change.

Question from Mark: Do you want to confine yourself to existing best practices? Answer: We should strike the word "existing".

Mark still questioned whether "best practices" was too limiting, even in the future sense of the word. Charles stated that the key was the need to avoid creating a science project, but he then solicited the group's input on this matter. Khaled suggested that we should strike the first sentence and keep the less controversial one, which was the second sentence. Charles noted that it kind of hides the fact as to whether we use best practices or not. Khaled noted that this entire document did not actually apply to us as we were not developing a product. Fanny suggested: eliminate the phrase "not specify unproven measurement techniques or practices", and then combine the two sentences. Also, remove "existing". The resulting sentence was:

"The project output will use best practices in performance testing to increase the reliability of WLAN services by providing repeatable and uniform means to carry out measurements and prediction, thus enabling better deployment choices."

Mark still had an issue with this, and wanted to change "best practices" to "best practices available" or "best available practices". The basic issue was that we did not want to limit ourselves to always using the best practice, if one is not available. However, this was not generally acceptable to the group. Charles then proposed changing to:

"The use of the Recommended Practice will increase the reliability of WLAN services by providing repeatable and uniform means to carry out measurements and prediction, thus enabling better deployment choices."

Tom then interjected and noted that according to LMSC rules the 5 Criteria was not required for PARs that don't introduce new functionality, and a Recommended Practice could never introduce new functionality. Charles then remarked that in that case we might want to move to adjourn right away. (Laughter)

Khaled went on to the economic feasibility. Charles requested that the phrase "There is" should be added in front of "No direct per-device cost". In addition, Khaled changed the "project output" to "Recommended Practice".

Fanny objected to the sentence "development costs involved with changing these test procedures". She preferred:

"Manufacturers, vendors and developers are already implementing proprietary test procedures. They may incur development costs involved with bringing their existing test procedures in line with the Recommended Practice."
Khaled suggested inserting the word "performance" in front of "test procedures". However, Fanny suggested that another sentence be added to read:

"The more complete set of standardized tests will improve performance of 802.11 products and make product performance specifications easy to compare."

Tom suggested that this whole paragraph dealt with a cost/benefit ratio and should be expressed as such. He suggested changing to read "any extra development costs ... will be offset by increased product performance ...". Wordsmithing ensued. The text was then modified to read:

"Any extra development costs incurred by bringing existing test procedures in line with the Recommended Practice will be offset by increased product performance resulting from the common basis of comparison."

Mark protested that test procedures do not increase product performance, they might encourage people to improve the product, but they don't add any new functionality. Larry generally agreed with this sentiment. Tom suggested that we could change the wording to "will be offset by the benefits resulting from making product performance specifications easier to compare". Fanny suggested changing "resulting from" to "of". Charles asked Mark if he wanted any piece of the first paragraph; Mark replied that he was happy with the following:

"Any extra development costs incurred by bringing existing proprietary test procedures in line with the Recommended Practice will be offset by the benefits of making product performance specifications easier to compare."

Khaled finally finished up with the installation costs. Fanny suggested shortening "installation costs associated with WLANs" to "lower WLAN installation costs".

After this, the entire 5 Criteria were reviewed again by the group. There was some discussion on "multiple vendors and users" in the first Criterion. Tom suggested changing "aspects" to "areas". Mark proposed changing "study project" to "study group". There was some discussion about the capitalization of words.

In the technical feasibility section, Charles noted that he had a nit with the word "doing" and preferred "currently engaged in". Larry agreed, saying that he thought "doing" was less professional. Khaled proposed "currently engaged in doing". (Laughter) It was changed to "currently engaged in". Fanny suggested removing the word "testing", and people were agreeable. The discussion went on to item b); there was considerable wordsmithing around "currently exist". The final form of the sentence was:

"There currently exist test and measurement instruments that enable wireless LAN testing under various scenarios."

Fanny suggested that item a) under economic feasibility would be better worded to express that off-the-shelf test equipment would become available. Tom objected on the grounds that the Recommended Practice should not appear to be endorsing vendors of test equipment. This was generally supported, and no changes were made.

After some more minor wordsmithing of the remainder of the document, the discussion came to an end. Charles then uploaded the modified 5 criteria document to the server, amid considerable bantering between the members about not adding an extension to the document name.

Charles thanked the authors of the documents for their work. Fanny suggested that in the 15 minutes of so remaining time, we could review the PAR document again. Tom suggested that we could review the document, but we should defer wordsmithing until Thursday. Charles generally agreed, saying that given that we were tired wordsmithing would do more harm than good.

Larry recommended that we should remove all the notes from the presentation on the PAR. Charles suggested instead that we could simply create a PAR form and post that instead. This was generally agreed to. Charles suggested that somebody could take the PAR form and fill in the various pieces that were agreed to today.

**Motion #3:**

Move to recess until 10.30 AM Thursday.

Moved:  Mark Kobayashi

Seconded:  Khaled Amer

The motion passed by acclamation.

Charles then declared the meeting in recess until 10.30 AM Thursday.
The meeting was called to order at 10.30 AM Thursday May 13th by Charles Wright, WPP SG Chair. He reviewed the agenda, and noted that we have proposed PAR and 5 Criteria documents that a couple of members would like to present, and that these represent consensus from the previous meetings, and that they have been on the document server since yesterday so there was ample time for people to review them. He also reminded people about signing in if they hadn't already done so, and passed around the signup sheet. Also, he reminded people to sign in on the attendance server separately.

Charles then discussed the procedural order of things, assuming that we come up with an acceptable PAR and 5 Criteria. After this meeting, if we approve them, the WG will vote to approve them in the closing plenary. After that, there is a lot of procedural stuff to make sure that we do get on the TG path. If we are guaranteed a quorum tomorrow, our vote in the WG meeting would cause the documents to be forwarded to ExCom without further question. ExCom would, however, enforce quorum rules; if there is no quorum, then the vote in the WG meeting would be to send the PAR and 5 Criteria out for a 15-day letter ballot. If we can complete this by June 11, we can get on the ExCom agenda. In the Portland Plenary, we can then address comments on the PAR and 5 Criteria and resolve them, and then go before the ExCom meeting and get the project approved.

Question from Colin Lanzl: Are you worried about the possibility of not getting enough people voting on the ballot? Answer: You bet I am.

Colin noted that he therefore recommended that Charles make an announcement to that effect when presenting on Friday, and then repeat that on the reflector. Charles commented that if we don't get enough votes in the LB, then we can always vote to reaffirm in the plenary in July.

There was a comment that we would need to reaffirm in the 802.11 opening Plenary on Monday, followed by a suggestion to explore this with the WG Chair and see if it was an appropriate action. Charles took this under advisement and stated that he would flesh out these details separately. He ended by asking if everyone understood the process. No comments or questions came from the floor, so he pressed on and turned the microphone over to Larry Green to present the PAR document (document #613). Charles noted that the revision number in the doc was wrong, but the document number as posted was right.

Larry walked the group through the document titled "Draft PAR for IEEE 802.11 Wireless Performance Prediction (WPP)", (document #613/r0). He began by noting that the authors should get a gold star, and that this was the formal PAR document dated tomorrow (Friday the 14th). He called attention to the fact that this document was a Recommended Practice, and read out the title. He also read out the various bits of the document. Upon noting that Charles would be the SG contact, Charles demurred. Colin noted that the contact wasn't in there anyway.

Larry then read out the Scope to the group, noted that the text had been haggled through for a number of weeks, and asked for comments and questions. There were none.

Charles clarified that people could either ask questions now or hold until the end. He also noted that the two docs (PAR and 5 Criteria) would be voted on in a group.

The draft Purpose was read out by Larry, after which he opened the floor for questions and comments. There were none. Larry then continued with the rest of the PAR document, being mostly boilerplate until the Additional Explanatory Notes. The question of the international sponsor organization came up. Charles had noted that we had marked this as being "we don't know". Colin noted that we could ask Terry Cole, and WPP could be appropriately authorized to make the changes if necessary; however, no such international sponsor information was known at this time. There were no further questions on the PAR boilerplate. Larry then proceeded to the Additional Explanatory Notes.

Question from Colin: Is taking the input of TGs n, r, s a good thing to do, is this something you want to do? Answer: Would you recommend that you change this to "may"? Answer: Yes. This binds you, which you may not want to do.

Question from Colin: Should g, h and k be referenced directly? Answer: Do you think it is better to not reference this? The thinking is that TGma (revision) will absorb everything until k, so this is why we included it. Colin replied that this was fine, as long as you have a good argument.
Garth interjected: What about p? Answer: It isn't a task group yet, and these are. Response: Yes, true. Colin and Garth agreed. Charles further noted that this might come out of the 802 comments, and we could put them on the list in July.

Charles requested a straw poll to change the "shall take as input" to a "may take as input".

**Straw Poll #4:**

**Question:**

Do you agree with changing the “shall” to a “may”?

**Results:**

Yes: 14
No: 0
Abstain: 2

Charles directed Larry to change the document, with track changes turned on to highlight the changes. The word "shall" was changed to "may". He then requested Larry to continue.

Comment from Colin: 802.19 is the Coexistence TAG, and they are working on methodologies not metrics. You may want to emphasize methodologies and not metrics. 802.19 says how you construct the numbers, and not what the numbers were. Charles noted that we had had a joint coexistence meeting with Steve Schellhammer and Tom Siep, and they were OK with the text. Charles further commented that he would have liked to stop with the word "synergy".

Comment from Khaled: "such as some of the performance metrics" seems to be sufficiently open. Colin agreed that it was OK.

Larry then read out the definition of "prediction" as in the PAR.

Comment from Fanny: I think where it's positioned is confusing. I think it should be a footnote, and that we need some wording to explain that prediction is out of scope of this group.

Comment from Charles: We should re-read the scope to see if this is actually out of scope.

Question from Colin: Fanny, are you asking about prediction or prediction models being out of scope? Answer: Prediction is out of scope, just as testing is out of scope. We need to prevent people from bringing in contributions that are on prediction as it is out of scope.

Comment from Khaled: What we have in the scope is carefully worded to say that we are not doing measurements and we are not doing prediction.

Comment from Colin: You could make the case that measurement methodologies might actually include performance models. You might not want to do this.

Comment from Khaled: Maybe we can say: "as mentioned in the scope".

Comment from Fanny: Performance modeling is out of scope for the group.

Much discussion on prediction and performance modeling. Tom dissented. Colin called for a straw poll.

A straw poll was proposed: Is the existing scope adequately worded to exclude task group construction of performance models?

Question from Günter: Is there even agreement that we actually do want to exclude the issue?

Comment from Larry: If we start writing lists of what is out of scope, the list is very long. We should stick to positive statements.

Comment from Fanny: If I were a computer parsing the scope, then it would be OK. However, given the name of the TG and the enabling of prediction, we are all human beings and we should make this clear.

Comment from Colin: I have an example of how this can be misconstrued. We should also look at Gunter's question about whether it is truly out of scope.

Comment from Garth: We should ask the question that we specifically exclude modeling. Also, the word "prediction" in your title implies modeling. Prediction to me implies some kind of model.
Charles agreed that the title included Prediction. He also noted that we couldn't change the title at this time, it was a moot point.

Comment from Khaled: I have a suggestion that might take care of Fanny's concern.

Comment from Mark: I prefer to hear the straw poll first, starting with Gunter.

Comment from Khaled: What I am going to suggest here might make the concern go away and might eliminate the need for the straw poll. [There was agreement from the group, and Khaled was allowed to proceed.] Maybe we can add at the end of the definition of prediction: "the scope of the project is to enable prediction".

Another straw poll was proposed: Should prediction modeling be within the scope of this group?

Comment from Fanny: How about performance modeling?

Comment from Colin: I'm in Fanny's camp, I've been through 9 months of modeling and you want to avoid this.

Discussion between Roger and Fanny on prediction algorithms. Fanny noted that there was a difference between the modeling and the algorithms; you may need to model, but the algorithms should not be part of the scope.

Charles noted that a simple latency measurement could be construed as tied up with modeling. Colin agreed. Tom then "called the question" on the straw poll.

**Straw Poll #5:**

**Question:** Should modeling be out of the scope of this group?

**Results:**

- Yes: 11
- No: 1
- Abstain: 3

A second straw poll was immediately held.

**Straw Poll #6:**

**Question:** Should we explicitly constrain the task group to not include modeling in the Recommended Practice?

**Results:**

- Yes: 8
- No: 2
- Abstain: 4

The intent of the group being clear, Charles called for some proposed text to be brought forward. He noted that this could be done later.

Question from Khaled: If we put in explicit text excluding models, should we not have measurements in the Recommended Practice? Answer: I don’t know what it means to not have measurements in the Recommended Practice. Are you referring to performance measurements?

Colin volunteered to form an ad-hoc for producing some draft text for constraining the scope. Tom, Fanny and Khaled volunteered as well. The ad-hoc was to be held during lunch.

Larry then went on to the Additional Explanatory Notes for the Purpose.

Question from Colin: Does the word "including" cause a problem? Are you excluding anyone? Answer: We don't want to exclude anyone, college professors might read the standard, even housewives in Orange County might want to read the document.

There was some confusion about the revision of the document as posted on the server vs. the revision that was presented by Larry. Tom clarified that he had added a couple of names to the document prior to posting on the server, but had not sent this version to Larry before his presentation. Tom and Larry apologized profusely for the mix-up. Colin requested that the right filename and changes be used prior to having the ad-hoc group meet, so that they could use it as input. There was a
considerable kerfuffle about editing and saving the document to ensure that this did not happen again. Larry’s walkthrough of the PAR ended at this point.

Khaled then walked the group through the draft 5 Criteria (document #585r4). Charles asked if the names from the PAR document should be placed on the 5 Criteria document. This was generally agreed to but deferred. Khaled went through the 5 Criteria one by one, reading them out in turn and adding some explanatory comments.

Question from Colin: If you just said that the Recommended Practice instead of "project", that would be better. Answer: Yes, this is better.

Khaled duly changed "project" to "Recommended Practice" in item c) of Broad Market Potential, and continued, discussing Compatibility, Distinct identity, and so on. He suggested that the word "project" should be changed to "Recommended Practice" in item b). This was also done.

Comment from Colin: If someone raises the issue of WNM, do we have a position there? Answer: In our mind, it's completely different, WNM is network management, we are all about measurements. Charles noted that if we did not overlap with 802.11k, then we would undoubtedly not overlap with WNM. Colin agreed that this was true, and noted that he was making sure that we had a good position if someone raised the question.

There was some discussion on adding "for instance" in front of 802.19, which was eventually squashed.

Comment from Charles: We should remove the word "other" from "There are no other 802.11 standards ..."). Khaled asked if anyone objected. Nobody objected, so the word "other" was removed.

Question from Colin: Have any of these kinds of vendors come up and presented on such test equipment? Answer: Not to the WG.

Question from Tom: Do tutorial presentations count? At least two vendors presented during the tutorials. Answer: Sure, absolutely.

Colin then suggested adding in the reference to the presentations by the vendors into the technical feasibility portion of the text. Charles undertook to find the references, which Khaled added to the list. The references were 04/347, 03/931 and 03/933.

Another change was made to convert "project" to "Recommended Practice". Colin also suggested that we add the word "better" in front of "predict". This concluded the presentation. A discussion then took place on the author list. Fanny asked to have her name on the list.

Charles commented: Make sure you save this as a new revision - well, since we have to go through that rigmarole again, why don't I do it myself. Charles then did the necessary work to save the 5 Criteria as a new revision.

Khaled then proposed voting on this right away. Colin suggested that he only move on the 5 Criteria, as there was an ad-hoc that was going to work on the PAR.

**Motion #4:**

Move to approve the following document as the 5 Criteria for the WPP SG: Document number 11-04/585r5, "Five Criteria for IEEE 802.11 Wireless Performance Prediction".

Moved: Khaled Amer
Seconded: Larry Green

Discussion:

Tom: Is this up on the server? Answer: yes.

**Voting:**

For: 13
Opposed: 0
Abstain: 0

Motion passes.

At this point, Colin decided that he would like to start his ad-hoc, and placed a motion before the floor to recess for lunch.
**Motion #5:**
Move to recess until 1.30 PM Thursday.

Moved: Colin Lanzl
Seconded: Tom Alexander

The motion passed by acclamation.

Charles then declared the meeting in recess until 1.30 PM.

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**Meeting 4:**

Date: 13 May 2004
Location: Grand B

The meeting resumed at 1.35 PM. Charles reminded the group to log attendance and to sign the sign-up sheet. He said that just before lunch we had approved the 5 Criteria document and we had reviewed the PAR document. There were some concerns about the wording of the PAR and an ad-hoc was created to address that; the ad-hoc had addressed the concerns and had uploaded a new revision (#613/r2) to the server. He invited the authors to walk through the revision.

Fanny presented one slide giving the change. She explained it as a need for a note in the PAR that stated that prediction algorithms were out of scope, and presented the text to be added, followed by the actual PAR document showing the changes.

Question from Larry: What does "network planning algorithms" mean? Answer Tom: It means we are not going to work on methods and algorithms that would enable users and customers of network equipment to plan and deploy their equipment.

Charles then asked whether anyone would like to make a motion to accept the new PAR. Larry appeared willing but uncertain, so Charles graciously presented a previously prepared motion statement for his benefit.

**Motion #6:**

Move to approve the following document as the PAR for the WPP SG: 11-04/613r2, "Draft PAR for Wireless Performance Prediction".

Moved: Larry Green
Seconded: Tom Alexander

**Voting:**

For: 11
Opposed: 0
Abstain: 0

Motion passes.

There was applause and acclamation from the floor. Charles then said that he had a prepared motion to forward the PAR and 5 criteria to the WG.
Motion #7:
Move to request the chair to forward the following documents as the PAR and 5 Criteria to the Working Group:
- 11-04/613r2: "Draft PAR for Wireless Performance Prediction"
- 11-04/585r5: "Five Criteria for IEEE 802.11 Wireless Performance Prediction".

Moved: Khaled Amer
Seconded: Larry Green
Voting:
For: 12
Opposed: 0
Abstain: 0

Motion passes.

There was then some discussion on the procedural aspects of forwarding the PAR and 5 criteria to the WG. Charles brought up the procedural motion to place the PAR and 5 Criteria on the ExCom agenda for preview and approval. He also reviewed a motion to request the WG chair to initiate a 15-day letter ballot to reaffirm the WG decision to forward the PAR and 5 Criteria to ExCom. More discussion on motions followed. Colin then introduced a motion to request the WPP SG chair to request the 802.11 WG chair to initiate a 15-day letter ballot to reaffirm the WG decision regarding the PAR and 5 Criteria for WPP.

Motion #8:
Move to request the WPP SG chair to request the 802.11 WG chair to initiate a 15-day letter ballot to reaffirm the WG decision regarding the PAR and 5 Criteria for WPP.

Moved: Colin Lanzl
Seconded: Larry Green
Voting:
For: 12
Opposed: 0
Abstain: 0

Motion passes.

Charles then placed a motion before the floor to empower the SG to resolve comments on the PAR and 5 Criteria.

Motion #9:
Move to request empowerment for the WPP SG to hold special meetings as needed during the week beginning May 31 to resolve the comments received from the reaffirmation letter ballot. Such meetings will be held by teleconference.

Moved: Larry Green
Seconded: Khaled Amer
Voting:
For: 14
Opposed: 0
Abstain: 0

Motion passes.

Charles remarked that we are duly empowered and all that. Larry pointed out that the documents that were uploaded to the server had change bars in them, and proposed uploading a new version with the change bars removed. The group generally felt that this was not necessary; all that was needed was to turn off the display of changes.

Charles then proceeded with the regular agenda. As there was no old business, he went on to new business. He noted that we did not need a teleconference until the letter ballot was approved. There was some discussion of the teleconferences. Charles
stated that he was going to send a note to the reflector to that effect, unless somebody would like to have a teleconference without him, as he was involved with enough teleconferences as it was. Some discussion took place regarding the need for teleconferences to address the comments on the letter ballot.

Question from Colin: Can you comment on the timing of how quickly the leadership can figure out the letter ballot results and get them back to you? You might have to cancel two meetings.

Larry Green stated that he would like to empower the chair to hold or cancel a teleconference at will. Colin remarked that he would probably have to hold a teleconference as soon as possible after the letter ballot closes. Tom noted that it was possible to hold a ballot open for up to 60 days if it did not meet the return ratio. Charles said that this was procedural, and some people had said that there would be a hard stop.

Question from Colin: Is there any work that could be done in advance of being a task group? It's wasted work if the TG doesn't come to be, but it's probably worthwhile to do. Answer: I was planning to make a call for presentations. If people are so inclined, put them on the server ahead of time.

Colin remarked that sending lots of things to the reflector might even spur people to send in their letter ballots. Tom noted that the group might then be called "Wireless Prolific Posting".

There being no further business, a motion to adjourn was then put before the group.

**Motion #10:**

Move to adjourn.

Moved: Larry Green

Seconded: Colin Lanzl

Passed by acclamation.

Charles then thanked the group for their hard work and adjourned the session. The meeting adjourned at 2:30 PM on 5/13/04.
Attendance

Alexander, Tom
Alimian, Areg
Amer, Khaled
Bhatnagar, Manoj
Boyle, Steven
Canaan, Paul
Chung, Byungho
Dick, Kevin
Eaton, Dennis
Falk, Lars
Flygare, Helena
Goettemoeller, Mike
Green, Larry
Guirgius, Sam
Haslestad, Thomas
Hunter, David
Kang, You Sung
Karcz, Kevin
Kleindl, Gunter
Kobayashi, Mark
Lanzl, Colin
Mlinarsky, Fanny
Narasimhan, Partha
Paine, Richard
Siep, Tom
Shellhammer, Steve
Skidmore, Roger
Smith, Mark
Tokubo, Eric
Wakeley, Tim
Whitesell, Steve
Yamada, Katsuhiko
Abstract

Minutes of WIEN SG meetings held during the IEEE 802 Interim meeting in Anaheim, CA from May 10-14, 2004.

1. Executive Summary:

Executive Summary needs updating
1. Industry Update
2. Gigabit Ethernet presentations. Further study required.
4. Evolution. What is the future direction of IEEE 802.11 and where is it going.
5. Wireless Network Management presentation and motion to request that IEEE 802.11 WG form a Study Group. Motion approved.
6. Wake on WLAN presentation.
7. Interworking presentations.

Afternoon Session of IEEE 802.11 WIEN SG, Thursday 13 May 2004, 4 – 6pm

1. Logistics

WIEN Meeting called to order by Stephen McCann (Chair) at 4.05pm.

Agenda was reviewed (472r2) and it was agreed to switch the order of two presentations.

The IEEE 802 & IEEE 802.11 Policies and Rules were reviewed.

Patents and By-laws read out by the chair, together with licensing terms and associated conditions.

There are 2 sessions, both on Thursday 13th May 2004.

3. Background (634r0)
Stephen McCann (Chair) gave a short presentation about some of the background to the creation of this study group.

Questions

* Jon Edney: What is the low rate beacon issue?
* Chair: To be explained by Bernard's presentation.
* Floor: What is the ARID?
* Chair: The Access Router ID
* Colin Lanzl: Is this the SSID related to CAPWAP issues in 802.11?
* Chair: It is related, and a later presentation will mention it.
+ Floor shows sufficient interest on the background info. Chair will present some greater detail at next meeting in Portland

4. Network Selection (638r0): Bernard Aboba

* Access network discovery is not yet chartered in IETF others are already covered
  * 802.1ab, 802.1af would not be implemented by AP.
  + Chair: Why?
  + Bernard Aboba: It is created by the wired side, and it may not apply to the wireless side
* Virtual AP is to have one AP to advertise different SSID to act as different APs
  + List of requirements (in the slide)
  + 1999 standards does not specify the issue, e.g. multiple SSID
  + scalability of the virtual AP is an issue (e.g. 30% bandwidth overhead with 10 virtual APs) due to the use of beacons taking the transmission time
  + Floor: Is this feasible with the 802.11 guidelines?
  + Bernard Aboba: It is. It is just using the beacon.
  + Floor: Potentially got benefits, since it is central coordinated
  + DJ Johnson: The use of virtual AP is not the way I would tackle the network selection issue

* Chair: Do you feel that WIEN SG is the good place to fix the discovery problem/beacon scalability?
* Bernard Aboba: There is something to be done even if other solutions are available.
* Floor: Is it possible to do with probe?
* Bernard Aboba: Will be slow. And would not scale if the user number is very large.
* Floor: There are other possible solutions with the change to the stations.
* Chair: What is PKIX?
* Bernard Aboba: It is the public key infrastructure group within the IETF.
* Floor: Why is the IETF solution to problem 3 (within the presentation) a short term solution?
* Bernard Aboba: It is already started, and would not require too much change.

5. 3GPP requirements (626r0) Andrew Myers

* All the liaisons mentioned in the slides have the links provided
* Floor: Is it within the scope to recommend back to the 3GPP any changes to conform to certain thing?
* Andrew Myers: Could establish liaison with 3GPP to ask for change.
* Floor: Should be WG instead of SG to send liaison, and SG has limited life time. Could wait for the group becoming a TG to do the liaison.
* Chair: To collect summary of the issues, and review them to generalize the scope information.
* Floor: Could collect the issues, and ask the chair to establish an ad hoc group to address them.
6. WLAN Interworking scenarios (617r0) Cheng Hong

* Floor: Please point out which points (on slide 2) are in scope of this group
* Hong Cheng: Points 1, 4, 5, 6, 12 would not be in the scope. The rest are in.
* Floor: Is this group aiming at multi mode terminal?
* Chair: No. This group is pretty much concentrating on the 802.11 terminal.
* Floor: Mapping QoS is 802.21 scope
* Hong Cheng: The group would be working on the specific issue relates to 802.11. We will also support the outcome from 802.21
* DJ Johnson: Will security be just the issue of support for EAP?
* Hong Cheng: It is more than that. EAP could be left to upper layer, but the managing of keys, etc would be 802.11 specific, and the group should be looking on that aspect.
* Floor: This week in one FR meeting, the scope of BSS transition issues were discussed. Handover within the same ESS would be studied in 802.11r, handover inter-ESS would be covered in 802.21. Is handover to cellular networks within the scope of WIEN?
* Chair: This is an ongoing issue – we have discussed this with 802.21, and we are still defining our scope at the moment. We should address specific issues that impact 802.11, and we have to be careful about the generic issues which are dealt with in 802.21. Initial work is restricted to 802.11 aspects.
* DJ Johnson: the discussions in 802.21 how to model interworking in terms of the stack have lead to an interesting conclusion that there is a possibility to leave some areas undefined that are left up to the implementer. What determines loose or tight coupling is that exact self same thing, there are a bunch interfaces primitives, and 802.11 should work on local scope aspects to first in 802.21. Scope issue a lot clearer in mind than was before.
* Chair: An example of this are the beacon issues – this is a 802.11 specific issue that we need to address.
* Chair: what do you feel this groups relationship should be with 3GPP?
* Hong Cheng - as this group still SG think liaison has to go via WG, it would be good to allow 3GPP know we have interest here, and we're working on this issue so we can get information from them. What do they think the issues are that we should tackle?

* Chair: Perhaps an initial simple liaison from the WG from now - and later on, a more technical liaison.

Straw poll:
To send informational LS to 3GPP just to inform them of the existence of the SG?
For : 23
Against : 0
Abstain : 4
Chair to go to the Working Group chair to ask him about advice regarding the creation of a liaison.

7. Requirements for Network Selection (479r0) Eleanor Hepworth

* Andrew Myers: Is this addressed by wireless broadband alliance, or other SDO?
* Eleanor Hepworth: Those will not change the 802.11 spec. We want a standardized way of doing that.
* Bernard Aboba: Also have the similar discussion in 802.11r. Conclusion is that current Beacon is not enough for basic mobility.
For this kind of complicated scenario, needs even more work.
* DJ Johnson: It is something 802.21 also works on. Eleanor Hepworth mentioned two possibilities, pre-association, and post-association. With the post-association approach, there are much wider choices of solutions. Issues are how you get it, whether you could trust it.
The information itself would not change, but 802.21 would require individual technologies to figure out how to transport the information
* Bernard Aboba: Within the same domain, (802.11k) site report could work. But here, it is different, since there is different assumption, the AP could be of different technology.

8. Access Router Identifier - ARID (504r0) Chair presented on the behalf of Daniel Park
* DJ Johnson: Why the information of the Domain ID should be transmitted in a 802.11 management frame?
* Chair: Is this to be work in this scope or in 802.21?
* DJ Johnson: Yes. Solution could be sort out, but this work is in the scope of this group. And it is a 802.11 management frame issue, and a proper topic for this group.

Evening Session of IEEE 802.11 WIEN SG, Thursday 13 May 2004, 7.30pm – 9.30pm

9. Liaison Issues
* There is a need to have liaison officer for 3GPP, before a technical liaison can be sent to them. However the WG chair can send one himself, at this own discretion.
* There was a call for liaison officers. This will be discussed within the WG.

10. PAR and 5 Criteria (506r0, 507r0)
Presentation of the Scope (section 12) and Purpose (section 13) of a very early PAR document written by the chair.
* Floor: Why the 802.3 is mentioned here? External network may not be ethernet
* Chair: It is just a starting point and could be revised.
* Floor: The purpose is too broad.
* Floor: Is that a requirement for us to enhance security or QoS? Or just not to break security?
* Chair: Not to change them but to support them. They text would be changed.
* Floor: What do you have in mind to replace the 802.3
* Chair: That is what the external interface would support.
* Floor: Is this referring to 802.11 or 802.3?
* Chair: No. It is aiming at 802.11 to non-802.11 external network
* Floor: Are we talking about dual interface terminal or single interface terminal
* Chair: We are aiming just single 802.11 interface terminal.
* Floor: Not to be too restrictive about the network to interwork with.
* Stefan Rommer: It sounds too broad
* Floor: To get a list of issues we are suppose to work on.

11. A list of the Open Interworking Issues to work on
+ Air Interface Issues:
  +AR identifier
    (optimizing layer 3 mobility)
  +MAC address anonymity
  +Network Detection Selection (Discovery)
  +Beacon scalability
  +Virtual APs

* Floor: The network detection selection is covered in 802.21
* Chair: although 802.21 covers the issue, 802.11 need to provide support of that and provides means to realize that

  +Universal Access Method/802.11i

* Floor: For channel co-existence, e.g. RF overlap, certain channel management would be in scope?
* Eleanor Hepworth: Is that a Wireless Network Management issue?
* Floor: That could be an across network issue.

  +Channel management (WNM)
  +user registration
  +User clear down

+ Network to network issues:
  + Policy enforcement
* Floor: what is the network?
* Chair: not specified
* Floor: What kind of policy?
* Chair: all sorts of
* Floor: would that be of work of IETF
* Chair: some requirements from 3GPP. Need to figure later the details

  + Access Control
  + Simultaneous access

* Floor: is that related to the QoS coming down from other networks?
* DJ Johnson: In 802.21 would be doing the mapping
* Chair: Network side is covered by 802.21, and air interface is covered by 802.11e
* DJ Johnson: If the 802.11 is doing QoS mapping, it would be in the scope.

  + External QoS mapping
* Floor: Is 802.21 thinking about individual users? like the user level?
* DJ: More about the mapping
* Eleanor Hepworth: It would related to the admission control
  + Admission Control

12. Discussion on Scope section of the PAR

* Floor: what is the meaning of the second paragraph of the scope?
* DJ Johnson: The scope in the PAR is not the actual scope. It is just a guidance to the reader
5criteria is a good place to set the scope. For the scope, it is a good practice that one just identify
what will be changed, e.g. "This doc will amend 802.11MAC and PHY, etc"
* Bob Love: The scope is just for the EC to check if there is any overlap.
* Chair: Interworking would be defined in the group
* Chair: would this also mention DSL?
* DJ Johnson: To start with a small list first.

13. Discussion on Purpose section of the PAR

* Chair: Not working on the handover from 802.11 to 802.3 networks
* Bob Love: Why is it different from 802.21
* Chair 802.21 is general, and it is not addressing 802.11 specific issues.
* Bob Love: should indicate that in the scope.
The chair will send the PAR and 5Criteria out to the e-mail reflector * will come back to look at the PAR and 5Criteria next time based on the comments from the network.

14. Outline of July meeting

- Technical issues of the group
- Further refinement of the PAR and 5Criteria
- More detailed presentation on interworking background/history.

Liaison to be sent to 3GPP SA and 3GPP CN chairs, so they can be passed down to individual group.

15. Recess

The chair moved to recess the meeting, which was accepted unanimously.
Minutes of Wireless LAN Next Generation Standing Committee Meeting

Date: May 9-14, 2004

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Abstract
Minutes of WNG SC meetings held during the IEEE 802 Interim meeting in Garden Grove, CA from May 9-14, 2004.

1. Executive Summary:

   1. WAVE Briefing: focusing on the amendment versus standalone issue
   2. Access Point Functions and Behaviors: requesting the formation of a Study Group

Morning Session Monday 10:30-12:30

2. Logistics

WNG Meeting called to order by TK Tan (Philips) at 10:30.

The objectives of the session were reviewed.

The IEEE 802 & IEEE 802.11 Policies and Rules were reviewed.
Patents and By-laws read out by TK Tan, together with licensing terms and associated conditions.

There are 4 sessions this time, 2 on Monday 10th March 2004 and 2 on Thursday 12th March 2004.
The agenda was reviewed (509r1), no updates were required.

The minutes from the Orlando 2004 meeting (431r0) were reviewed. TK requested an update on the status of the evolution of IEEE802.11 issues discussed at the previous meeting. Peter Ecclesine mentioned new FCC regulations allowing wireless network operation in TV bands, and discussed issues of co-existence (see presentation 618r1).

There was no discussion on the minutes and no objection to approve as presented; minutes approved unanimously

3. WAVE Briefing
   The WAVE Study Group wished to further discuss some of the issues raised at the previous meeting with regard to whether the output of the group should be an amendment or a recommended practice.

3.1. WAVE Interface Briefing: 115r0, Lee Armstrong
   The purpose of this briefing was to cover the discussions carried out within WAVE that should perhaps be addressed at future WNG meetings. At the last session, the question about whether WAVE should be a standalone or an amendment was raised, and this series of presentations were intended to respond to some of the issues raised.

   The market requirements driving WAVE were highlighted, for example, it is expected that this technology will ultimately be integrated into all cars, and there is an initiative within the US to install APs in all lampposts.

   At the last meeting in Orlando, presentation 348r0 questioned the best format for the output of this group. Question to WNG, when launching new study groups, how should the decision as to whether the new SG should produce a PAR for an amendment or a standalone be made?

3.2. WAVE standardization for 802.11: 541r0, John Rosdahl
   The presentation addressed three main questions:
   1. Is there enough support for WAVE to go forward?
      10 companies have expressed their support in letters to IEEE802.11
   
   2. The IEEE802.11 documentation is felt to be collapsing by some members of the group
      Would WAVE be the straw that broke the camels back?
   
   3. Therefore, should WAVE be a standalone as opposed to an amendment?
      Question from the floor: in the letters of support, did anyone express a preference on the standalone versus amendment issue?
      Answer: no preference was expressed; the letters are available if anyone would like to view a copy.
Andrew Myles requested that it be noted that as an IEEE 802.11 member he fully supports WAVE standards within IEEE802.11. The issue raised about documentation maintenance is not solely related to WAVE, but WAVE has the opportunity to separate their work away from this documentation issue by going for a standalone.

Comment from the floor: the work undertaken by WAVE does require many additional features to be added to the IEEE 802.11 standard, this argues that a standalone may be better as it might be hard to retrofit all these functional requirements onto the existing standard, don’t want WAVE to be constrained.

Comment from the floor: if you look at the 802.3 document structure, they have a sequence of MAC/PHY standard covering three eras, base, Gig and 10Gig. Same thing would be good for 802.11; present documentation structure is not going to scale to all future architectures.

It was suggested that this issue was brought before WNG for information, and that maybe the rest of this discussion should take place within WAVE.

Comments from the floor indicated that actually this wasn’t a WAVE only topic, some aspects are particular to WAVE, but the general issue should be brought before the WG.

Comment from the floor: WAVE does seem to be addressing a different application space than that traditionally considered within IEEE802.11.

Lee Armstrong wished to make it clear that WAVE is not intending to only reuse bits of the existing specification, the SG do view this as an amendment and are not “throwing out” any of the existing 802.11 features, all mechanisms are in addition to, not instead of.

TK thanked the group for a good discussion, noting that this discussion would continue within WAVE meetings during the week.

Session recessed.

**Afternoon Session Monday 10th May 2004, 13:30-15:30**

TK welcomed the group, and outlined the objectives of the afternoon session. The objectives were to discuss AP functions and behaviors, with four presentations being made on this issue as part of this session.

**4. Access Point Architecture Issues**

**4.1. AP Functional Needs of CAPWAP: 544r0, Mahalingam Mani**

The presentation focused on how IEEE802.11 needs to help develop AP architecture to support more manageable networks. Traditional APs only have a local view of an area, and many benefits can be gained by introducing more of a centralized model, such as neighbor awareness. The presentation also covered the status of work within the IETF, and the planned IETF/IEEE liaison.
4.2. WLAN Mesh in CAPWAP: 527r0, Tyan-Shu Jou
The presentation introduced the concept that an ESS Mesh with a centralized controller may also help with management issues, and outlined a multi-tier split architecture of ESS Mesh networks.

Question from the floor: are you splitting both data and control plane
Response: Yes, data and control plane are both split.

The main concept that the presenter wished to be noted was that when splitting AP functionality, ought to bear in mind that in future you may want to split into more than two tiers.

4.3. Thoughts on AP functional descriptions: 481r3, L. Lily Yang
Presentation discussed how the AP could be decomposed into a number of logical functions that could then be mapped onto an architecture/physical entities. The mapping of the logical components onto physical devices was suggested to be out of scope of IEEE 802.11, and would be more within the remit of IETF. However, IEEE802.11 needs to provide the logical components first.

Comment from floor: I have some concerns about the CAPWAP approach, it is possible to define this logical decomposition, but would it result is something that could it actually be implemented? Would it be better to wait and see which AP/AC split solutions win in the market place, and in that case a SG would be academic. Architectures need to be developed iteratively, absorbing issues found as part of implementation. This doesn’t seem possible in the approach as presented here. In addition, any results from this work would effectively be telling some AP vendors that their current implementation is wrong.

Comment from the floor: with everything there is a time for markets to decide things, and there is a time for standardization. On this issue, it seems that this is the time for standardization.

4.4. The need for an AP functional description: 540r0, Darwin Engwer
Discussed why an AP description group is needed to develop some more informative material on APs. This information could be part of an informative annex in the IEEE802.11 standard, and would promote better AP designs and improved interoperability.

Comments from the floor: it maybe easy to define this split for data path components, but it may be non-trivial for the control plane aspects, which have tight time constraints etc

IEEE802.1 shouldn’t have to provide a “beginners guide” to other groups.
A straw poll was carried out to gauge opinion on whether a Study Group should be formed.
Result: 26, 1, 9

Show of hands was requested from those people who would be willing to work on this issue.
Result: 16
Question from the floor: is there another procedure we could go through to make these changes without having to form a SG then a TG etc. Could this work be done via 802.11m?

Reply from Bob O’Hara: this work falls within the mandate of 802.11m, but it would still need a lot of discussion.

Group recessed.

**Morning Session, Thursday 13th May 2004, 8:00-10:00**

Meeting called to order at 08:13

5. **Access Point Architecture Motion: 509r1**

Following on from the last session on Monday, a formal motion was raised for the formation of a Study Group to address the AP function and behavior issue.

Original motion: “Move that the WNG SC recommends that the 802.11 Working Group form a Study Group to create a PAR and 5 criteria to from form anew Task Group that will describe the Access Point functions and behaviors”

Discussion:
Stephen McCann spoke in favor of the motion, since he feels that this activity is overdue within 802.11, and it is essential that a good clear definition of Access Points are available, as this may go some way to starting an architecture definition document that 802.11 is missing. It is an important aspect to support work ongoing in new SGs such as WNM, WIEN and FR.

Request to carry out some word smithing on the Motion, seems to constrain the SG to only developing a PAR and 5C.

Motion reworded to “Move that the WNG SC recommends that the IEEE 802.11 working group form a Study Group to determine how to describe Access Point functions and behaviors with the intent to create a PAR and 5 criteria to form a new Task Group.”

Moved by: Darwin Engwer
Seconded by: Colin Lanzl

Discussion:
Question from floor: when the Study Group is formed, what would be its first couple of action items?
Darwin Engwer displayed presentation 604r0 for those members not at the meeting on Monday. This document lists the areas that the SG would investigate, such as description of portal function, ESS and DSS…Expressed the view that this information would best be captured as an informative annex to the current standard. It is information that is well understood by many people, but it needs to be official from IEEE 802.11.
Request to somehow reflect this information in the motion. This suggestion was adopted as a friendly amendment to the motion, by inserting a reference into the motion referring to document 604r0.

Final motion reads: “Move that the WNG SC recommends that the IEEE 802.11 working group form a Study Group to determine how to describe Access Point functions and behaviors (ref 11-04/604r0) with the intent to create a PAR and 5 criteria to form a new Task Group.”

Result: 45, 0, 5

Session recessed

**Evening Session, Thursday 13th May 2004, 19.30 – 21.30**

6. Wireless Operation in Shared and Unlicensed Bands

6.1. Wireless Network Operation in the TV Bands: 618r1, Barry O'Mahony

6.2. Spectrum Etiquette Rules for Shared and Unlicensed Bands (18-04-0018), Stefan Mangold

Session adjourned.
May 2004  doc.: IEEE 802.11-04/637r0

IEEE P802.11
Wireless LANs

5GHz Ad-Hoc SC Meeting Minutes

Date:      May 13, 2004
Author:    Al Petrick, IceFyre Semiconductor, apetrick@icefyre.com

- May 13, 2004 1:30PM
  o Meeting called to order
    ▪ Standing committee attendance: 10 people
  o Reviewed ITU 5GHz RLAN protection documents supplied by 802.18 Chair
  o Reviewed performance goals for 802.11a devices operating in the 5GHz frequency band
    ▪ Interference tolerance
      o -6dB I/N
        ▪ 1dB performance degradation in SNR
        ▪ 5% degradation in range at 54Mbps
  o Discussion
    ▪ General consensus:
      ▪ Consider user scenario for Home and Enterprise market
      ▪ Develop receiver model
      ▪ Define interferer types
        ▪ CW???
    ▪ Recess to come back with suggestions for usage models

- May 14, 2004 1:30PM
  o Meeting called to order
    ▪ Standing committee attendance: 12 people
  o Leigh Chinitz presented radar interference paper from Wi-Fi Alliance
  o Leigh Chinitz presented path loss model for overlapping APs for an enterprise environment using a path loss coefficient of 3.1.
    ▪ Scenarios for Tx RF power 20dBm, to 14dBm
  o Discussion
    ▪ Group decided to keep the receiver model to a minimum, and used the path loss model as the baseline for analysis, with AWG and Raleigh fading channels characteristics
  o MOTION
  o Move to use the Rate degradation model as the criteria for the analysis with the following deployment metrics:
    ▪ Home usage: Nominal rate 48Mbps no degradation below 24Mbps for stream video traffic
    ▪ Enterprise usage: Nominal rate of 18Mbps with no holes of coverage or link drop outs
  Moved: Carl Andren  Richard Kennedy
  Approved: unanimous
  o Next steps
    ▪ Host first teleconference call on May 20, 2004 to review “rate degradation model”
  o Meeting adjourned

Attendees:
CC TSien
Jan Kruys
Al Petrick
Steve Whitesell
Richard Kennedy
Andrew Myles