
IEEE P802.11
Wireless LANs

Approved Minutes of the IEEE P802.11 Full Working Group

Sept 15-20, 2003

Raffles Plaza Hotel / Swissôtel the Stamford, Singapore

Joint 802.11 / 802.15 Opening Plenary: Monday, Sept 15, 2003**1.1. Introduction**

- 1.1.1. Meeting called to order by Stuart J. Kerry at 8:10AM.
- 1.1.2. The agenda of the 81st session of 802.11 is in doc: IEEE 11-03-655r2, This session is including 802.11, 802.15, 802.18 RREG TAG, 802.19 Coexistence TAG, and 802.20.
- 1.1.3. Secretary – Tim Godfrey
- 1.1.4. Straw Poll of new attendees at this meeting: 45
- 1.1.5. There are 446 people in the room.
- 1.1.6. TK Tan gives an introduction to Geok-Leng Tan, director of Network and Enabler Technologies in the Technology group of IDA (Infocomm Development Authority) of Singapore.
- 1.1.7. Geok-Leng Tan presents an overview of the regulatory organizations and standards activity in Singapore.

1.2. Announcements

- 1.2.1. Thanks to Cisco's local office for sponsoring this meeting.
- 1.2.2. Logistics for lunch, breakfast, breaks, and the Wednesday evening social are announced
- 1.2.3. Network support is outside the Bailey room.
- 1.2.4. Straw poll for room sizes:
 - 1.2.4.1. Members attending 802.15.3a: 70 – will be in atrium
 - 1.2.4.2. Members attending 802.11n: 77 – will be in collier
 - 1.2.4.3. Members attending 802.11k: 3
- 1.2.5. The chairs note that the meeting space is public access, and members should not leave property in meeting rooms. Chairs must also guard projectors.
- 1.2.6. Voting tokens should have been provided at registration. If not, see Al Petrick, Rick Alfin, or your WG chairs.

1.3. Policies and procedures

- 1.3.1. Al Petrick reviews document 802.11-00/278r8
 - 1.3.1.1. Review of WG officers and duties.
 - 1.3.1.2. Operating policies and procedures and the hierarchy of organizations and rules are reviewed. The source documents are listed in document 278r8, and available on our server

- 1.3.1.3. Rules for registration, photography, and media recording are presented.
- 1.3.1.4. Review of the electronic attendance logging rules. Contact information must be maintained up to date by members on the server.
- 1.3.1.5. The rules for gaining and maintaining voting rights are presented. Document 462r14 "New Members Orientation" has further details.
- 1.3.1.6. The rules for voting rights and participation in working group, task groups, and study groups is reviewed.
- 1.3.1.7. Review of individual membership and anti-trust rules.
- 1.3.1.8. Al Petrick reviews the rules on Patents, according to the standard bylaws. All members must be aware of this policy. Al Petrick reads the following text to the group:

IEEE-SA Standards Board Bylaws on Patents in Standards

6. Patents

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

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

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

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

Slide #1

Approved by IEEE-SA Standards Board – December 2002



Inappropriate Topics for IEEE WG Meetings

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

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

Slide #2

Approved by IEEE-SA Standards Board – December 2002



1.3.1.9. Al Petrick reviews the rules on copyrights.

1.4. IP Statements

1.4.1. Stuart J Kerry calls for any new IP statements, and on behalf of 802.15, 18,19, and 20

1.4.1.1. There are no new statements.

1.5. Network and attendance

1.5.1. The details of the wireless network and attendance system are described in document 03/044r4

1.5.2. The operation of the attendance recording system and document submissions are reviewed.

1.6. Joint meeting Agenda

1.6.1. The agenda is in document IEEE 11-03-655r2.

1.6.2. Stuart J. Kerry reviews the agenda as shown.

1.6.3. The agenda is adopted with unanimous approval

1.7. Minutes

1.7.1. There are no matters arising from the minutes of July 2003.

1.7.2. The minutes are accepted with unanimous consent

1.8. Interim Meetings

1.8.1. The chairs have requested hosts for May and September 2004.

1.8.2. January 2004 will be Vancouver Canada hosted by 802. LMAC

1.8.3. May 2004 options: Samsung hosting in Korea, and Nanotron hosting in Berlin.

1.8.4. Stuart J. Kerry reviews the requirements for hosting an interim meeting. Members should approach their respective WG chairs.

1.8.5. Discussion

1.8.5.1. Requests for information on visa requirements for countries, and members from other countries. The chairs note that this will be discussed on Wednesday.

1.8.6. Straw Polls on May 2004 venues.

1.8.6.1. Seoul, Korea: 28

1.8.6.2. Berlin Germany: 90

1.8.7. September Venues

1.8.7.1. Bay Area is the predominate offer of hosts. We have a tremendous deal at the Hyatt Monterey. We would like to find a Bay-area host to take advantage of this offer.

1.9. Financial Summary

1.9.1. Bob Heile presents the overview of the joint working groups financials.

1.9.2. We expect a deficit at this meeting of about \$25,000. Current account balance is ~\$85,000

1.9.3. New rules for wireless groups treasury. We will set up the ability to formally operate with a treasury under 802 rules. We had a letter ballot to suspend the rules that prevented operating with a treasury.

- 1.9.4. There will be an IEEE bank account, will have to follow IEEE audit rules, and form an executive committee, and appoint a treasurer.
- 1.9.5. We had an audit for all of 2002 that has been submitted to IEEE. We will also audit all of this years business on the custodial account before moving funds to the new IEEE account.
- 1.9.6. The executive committees will be formed from the Working Group's chairs advisory committee.
- 1.9.7. The executive committees voted to approve the 2003 year to date audit for the amount not to exceed \$3,400 to be carried out by Face to Face Events, and to purchase a server not to exceed \$1000 for the IEEE server farm to host the www.802wirelessworld.com application. These were both voted and approved unanimously in both 802.11 and 802.15 executive committees.
- 1.9.8. Discussion
 - 1.9.8.1. Is there a way to get this information available in all working groups?
 - 1.9.8.2. Will we be able to self-sponsor meeting? Yes: the modified rules allows that our reserve could be built to the point where we could cover the liability. It would also allow a stable meeting fee.
- 1.9.9. The operational and procedural rules for 802 are not always clear. As the wireless groups have gone from under 100 to over 500, it has been an increasing challenge to put on the meetings and managing them. We have always been dutiful in polling the membership, but some 802 members felt it necessary to reprimand the Wireless Chairs for improper operations.
- 1.9.10. 802 Executive Committee, July executive session.
 - 1.9.10.1. The Executive Committee met on Monday, July 21st in a closed executive session.
 - 1.9.10.2. Mat Sherman, acting as vice-chair of the 802 executive committee, reads the following statement (from the minutes of the 802 executive session) to the members of 802.11 and 802.15:

WHEREAS, alleged financial irregularities have come to the attention of the Executive Committee (EC) of the LAN/MAN Standards Committee (LMSC); and these alleged irregularities have been studied by an investigative committee appointed by the LMSC Chair; and that investigative committee reports:

1. Mr. Kerry and Mr. Heile have respectively operated the 802.11 and 802.15 Working Groups with treasury;
2. Mr. Kerry and Mr. Heile have failed to conform to IEEE financial management procedures;
3. Mr. Kerry and Mr. Heile have failed to comply with IEEE policies for budgeting and audits;
4. Mr. Kerry and Mr. Heile have operated their Working Groups in violation of LMSC P&P financial reporting requirements;
5. Mr. Kerry and Mr. Heile have operated their Working Groups in violation of their Working Group rules on financial operations;
6. Mr. Kerry and Mr. Heile have jeopardized LMSC's relationship with superior bodies by not reporting the treasury to the LMSC Treasurer as required;
7. Mr. Kerry's and Mr. Heile's failure to provide financial reports has caused that significant financial matters were not properly reported to the Computer Society or IEEE-SA within the LMSC's annual financial report; and
8. Mr. Kerry and Mr. Heile have exceeded their authority as WG Chairs by entering into a software development agreement with an outside vendor with a minimum amount of \$75,000 that spans three sessions, and have done this without authorization of the Executive Committee.

WHEREAS, there is no allegation or evidence of misappropriation or malfeasance, Mr. Kerry and Mr. Heile have fully reported financial operations to their Working Groups, the actions taken by Mr. Kerry and Mr. Heile were with the consensus of their Working Groups, and Mr. Kerry and Mr. Heile have committed to do everything necessary to bring the operation of their Working Groups into compliance in a timely way, including but not limited to:

1. open a checking account compliant with IEEE title and signatory policies and transfer all funds into that account;
2. file financial reports with the LMSC Treasurer for each interim session beginning with calendar year 2002;
3. have calendar year 2002 operations audited by IEEE Audit Operations;
4. seek modification of Working Group rules as necessary to be consistent with operation with treasury;
5. to fully report on the software development agreement to the EC and their Working Groups;
6. and to seek ratification of the software development agreement by the EC.

THEREFORE BE IT RESOLVED, the Executive Committee of the LAN/MAN Standards Committee does hereby formally reprimand Mr. Stuart Kerry, Chair of the IEEE 802.11 Working Group and Mr. Robert Heile, Chair of the IEEE 802.15 Working Group for breach of their fiduciary duties.

FURTHER RESOLVED, that Mr. Kerry and Mr. Heile are directed to bring their Working Groups into full compliance with LMSC P&P and with the requirements of all superior IEEE bodies by 31 August 2003.

FURTHER RESOLVED, that the LMSC Treasurer provide appropriate guidance for specific tasks required to meet the 31 August 2003 compliance date, and that the LMSC Treasurer report to the EC on the success or failure of Mr. Kerry and Mr. Heile to bring their Working Group operations into compliance.

FURTHER RESOLVED, that the LMSC EC reserves the right to take appropriate additional actions as justified by any additional irregularities discovered, any insufficiency in mitigating the current situation or in bringing 802.11 and 802.15 operations into compliance.

Moved: Bob Grow

Seconded: Geoff Thompson

Passes: 10/0/0

- 1.9.10.3. Mat Sherman, speaking as an 802.11 member, affirms that Stuart and Bob have done a good job, and done the best they could for the committee. Does not fault them for their actions and was not aware of the issue.

- 1.9.11. The WG chairs note that they are well on the path towards fixing the issues.
- 1.9.12. Questions ?
 - 1.9.12.1. Have we met the 31st of August deadline? Yes
 - 1.9.12.2. Carl Stevenson stated that he would like to echo support of Bob and Stuart. They have done a good job in making the meetings operate and very productive. The statement was affirmed by acclamation from the body.

1.10. Voting Summary for 802.11

- 1.10.1. Document 402r14
- 1.10.2. Total voters 447. 107 nearly voters, At the close of the July meeting, 20 voters lost rights.

1.11. Approve or modify the 802.11 WG agenda

- 1.11.1. Modifications?
 - 1.11.1.1. 802.11K is requesting an ad-hoc. Request adding the motion to the agenda today.
 - 1.11.1.2. Motion to modify the agenda to add a motion to approve a TGk interim.
 - 1.11.1.2.1. Moved Richard Paine
 - 1.11.1.2.2. Dennis Kuwahara
 - 1.11.1.2.3. Motion passes 74 : 0 : 0
- 1.11.2. 802.11 Minutes of July
 - 1.11.2.1. The minutes are approved with unanimous consent

1.12. 802.11 Policies and Procedures

- 1.12.1. Document 03/434r1
- 1.12.2. Lists the proposed rules changes and rationale.
- 1.12.3. This is already reflected in the r6 policies and procedures, which will be forwarded to ExCom for approval in November.

1.13. Documentation Update

- 1.13.1. Report in 03/701r0
- 1.13.2. 60% of submission have formatting errors.
- 1.13.3. Request that documents with errors are fixed and re-submitted.
- 1.13.4. Correct formatting is required according to our rules.
- 1.13.5. No pictures or company logos are permitted on the first page.
- 1.13.6.

1.14. 802.11 Task Group Updates

- 1.14.1. TGe – John Fakatselis
 - 1.14.1.1. Will be working on comment resolution this week.
 - 1.14.1.2. An Ad Hoc meeting was held and 30% of the comments were resolved.
 - 1.14.1.3. We hope to complete the resolution and conduct a recirculation ballot.
- 1.14.2. TGh – Mika Kasslin

- 1.14.2.1. TGh will not be meeting. RevCom has approved 802.11H to be published. The work is completed.
 - 1.14.2.1.1. The PAR for 802.11n has been approved
- 1.14.3. TGi – Dave Halasz
 - 1.14.3.1. LB60 was on draft 5.0, 87% approval, 850 comments
 - 1.14.3.2. There was an interim meeting to address comment.
 - 1.14.3.3. The draft has been updated based on comment resolutions.
 - 1.14.3.4. Issue with WAPI – issue for Chinese compliance. Will discuss with Carl Stephenson in 802.18.
- 1.14.4. TGj – Sheung Li
 - 1.14.4.1. Working to resolve comments from LB56 regarding 10MHz channelization.
 - 1.14.4.2. Hope to issue recirculation ballot this week.
- 1.14.5. TGk – Richard Paine
 - 1.14.5.1. Since the last meeting, there have been teleconferences. Technical presentations to prepare for letter ballot. Issues include signal quality, and modifying measurement, and getting the MIBs correct. There will be an ad-hoc technical meeting in October.
 - 1.14.5.2. Motion: Believing that TGk work will be progressed significantly, and the work conducted per 802.11 policies and procedures, and announced; Approve and ad hoc meeting to be held by TGK prior to the November 802 plenary.
 - 1.14.5.3. Moved Richard Paine
 - 1.14.5.4. Second Denis Kuwahara
 - 1.14.5.4.1. Vote: Motion passes 71 : 1 : 1
- 1.14.6. TGm – Bob O'Hara
 - 1.14.6.1. There are two new requests for interpretation: dealing with interoperation of CW and retry counters, and related to country information element in 802.11d
- 1.14.7. TGn – Matthew Shoemake
 - 1.14.7.1. This will be the first meeting. Objectives include selection procedure, scheduling conference calls, channel models and usage models will be reviewed.
 - 1.14.7.2. These will be adopted this week.
 - 1.14.7.3. A secretary will be elected this week. Volunteers should see Matthew or Stuart Kerry.
 - 1.14.7.4. Hoping to work on comparison requirements
 - 1.14.7.5. A press release will go out on the formation of task group N.
- 1.14.8. WNG Standing Committee – TK Tan
 - 1.14.8.1. There are some typos in the schedule at registration. Meetings start at 3:30PM today.
 - 1.14.8.2. Will have industry updates, and regulatory updates. There will be discussions on ad-hoc, and mesh networking.
- 1.14.9. DSRC SG – Lee Armstrong
 - 1.14.9.1. Lee is appointed interim chair
 - 1.14.9.2. This week will be spent in explaining how this work fits in to 802.11 and other standards organizations.
 - 1.14.9.3. A PAR and 5 criteria will be discussed this week.
 - 1.14.9.4. Discussion
 - 1.14.9.4.1. Is there a chance to reschedule the last day? No, the agenda has been approved, and rooms are not flexible.

- 1.14.10. WG Technical Editor
 - 1.14.10.1. Terry Cole cannot attend. Al Petrick will conduct the editors meeting.
- 1.14.11. The Fast Roaming SG –
 - 1.14.11.1. The WG chair announces that the Fast Roaming SG chair position is open, and volunteers and nominations are requested.

1.15. 802.15 general

- 1.15.1. Voter status: 185 voters, 47 nearly voters.
- 1.15.2. The WG policies and procedures are reviewed by Jim Allen.
- 1.15.3. The 802.15.1a PAR was approved

1.16. 802.15 TG updates

- 1.16.1. TG1a – Tom Seip.
 - 1.16.1.1. Will meet on Tuesday for the first time.
 - 1.16.1.2. Will review Bluetooth 1.2 specification. The Task Group will decide how to handle any changes that happen in parallel.
 - 1.16.1.3. Officers will be confirmed.
 - 1.16.1.4. A Draft Or0 has been created for consideration.
- 1.16.2. TG2, TG3 and TG4
 - 1.16.2.1. These groups are all completed and are being published. TG4 is collecting information for future activities for extension to the MAC
- 1.16.3. TG3a – Bob Heile
 - 1.16.3.1. Will continue down-selection process. Will vote for confirmation. There will be a second confirmation vote held – probably 10:30AM Tuesday.
- 1.16.4. SG4a – Larry Taylor
 - 1.16.4.1. Alternate PHYs for 802.15.4. We have had two teleconferences. Technical work has not started. Have issued a call for applications.
- 1.16.5. Interest Group in millimeter waves – Reed Fisher
 - 1.16.5.1. The group was formed in San Francisco. Will meet tonight. There are 5 contributions.

1.17. Other Group Updates

- 1.17.1. Publicity Activity Review – Brian Mathews
 - 1.17.1.1. Will receive reports from industry groups, and review draft press release texts.
 - 1.17.1.2. There will be press release for 802.15.1a task group formation.
- 1.17.2. 802.18 Radio Regulatory – Carl Stephenson
 - 1.17.2.1. July Plenary – prepared 802 filings with FCC.
 - 1.17.2.2. Prepared filing to NPSTC (pubic safety related to 4.9GHz spectrum).
 - 1.17.2.3. Joint meetings to be held with task groups.
 - 1.17.2.4. Working on 802.11d issues with FCC and Japan
 - 1.17.2.5. Chinese WAPI security issues. Translated documents will be provided on the server, but should not be widely distributed.
 - 1.17.2.6. Planning to move 802.18 web site to conform to normal conventions for 802.
- 1.17.3. 802.20 MBWA – Jerry Upton / Mark Klerer
 - 1.17.3.1. 802.20 has 184 voters.
 - 1.17.3.2. There are multiple email lists.

1.18. Announcements

- 1.18.1. 453 people have registered for this meeting
- 1.18.2. IDA is sponsoring an event on Friday afternoon for the Singapore community.
- 1.18.3. There will be a UWB related event on Saturday.

1.19. Motion to adjourn the joint session

- 1.19.1. Unanimous consent

2. Mid-week Plenary, Wednesday, September 16, 2003

2.1. Opening

- 2.1.1. The meeting is called to order by Stuart J. Kerry at 10:30AM.
- 2.1.2. There are 283 people in the room.
- 2.1.3. The agenda is now R3.
 - 2.1.3.1. New business has been added

2.2. Announcements

- 2.2.1. 802.11a is allowed in Singapore.
- 2.2.2. The electronic attendance has been fixed. There were also issues with worms on the network.
- 2.2.3. March 2004 802 Plenary. The Orlando location has been removed, since the hotel has gone out of business. A new location will be announced.
- 2.2.4. Volunteers are solicited for the Fast Roaming Study group

2.3. IP Statements

- 2.3.1. A statement has been received from Motorola. It has been forwarded to Dave Ringle at the IEEE. The patent notice applies to 802.11e.
- 2.3.2. Are there any other IP statements? No
- 2.3.3. The WG chair asks if all members aware of the IP patent policy. If not, members should see the chairs or vice chairs.

2.4. Agenda

- 2.4.1. The current agenda is presented to the group.
- 2.4.2. Call for any old business - none
- 2.4.3. Any additional items for new business – none
- 2.4.4. The agenda is adopted by unanimous consent.

2.5. Reports from Liaisons

- 2.5.1. 802.11 to 802.1
 - 2.5.1.1. none
- 2.5.2. 802.11 to 802.15
 - 2.5.2.1. None
- 2.5.3. 802.11 to 802.15.3a
 - 2.5.3.1. None
- 2.5.4. 802.11 to 802.16
 - 2.5.4.1. none – liaison dropped

2.5.5. 802.11 to 802.18

- 2.5.5.1. Denis Kuwahara: document 18 / 0060
- 2.5.5.2. RR-tag met on NPSTC petition for reconsideration.
- 2.5.5.3. Prepared comments on FCC petitions on UNII rules
- 2.5.5.4. Discussed FCC deferral to IEEE for UWB ruling
- 2.5.5.5. Discussed Chinese security WAPI document
- 2.5.5.6. Discussion
 - 2.5.5.6.1. There was a motion on an output letter? Will that be today? There was a document voted in RR TAG that will be voted on

2.5.6. 802.11 to Wi-Fi Alliance

- 2.5.6.1. Bill Carney – document 11-03-757r0
- 2.5.6.2. Report on Tokyo members meeting
- 2.5.6.3. Report on membership and certified products to date.

2.5.7. 802.11 to JC61

- 2.5.7.1. None

2.5.8. 802.11 to CableLabs

- 2.5.8.1. None

2.5.9. 802.11 to 3GPP-SA2

- 2.5.9.1. None – liaison dropped

2.5.10. 802.11 to IETF

- 2.5.10.1. Dorothy Stanley 00-03-763
- 2.5.10.2. New IETF activities – New RADIUS working group
- 2.5.10.3. Wireless fast handoff research group may be formed.
- 2.5.10.4. Report on 802.11i dependencies on IETF AES-CCM, and via 802.1aa
- 2.5.10.5. EAP method definition and requirements
- 2.5.10.6. Discussion
 - 2.5.10.6.1. What is the overlap of IETF fast roaming, and our Study Group? There could be, but the IETF intent is to standardize interaction between layer 2 and layer 3, and the infrastructure.
 - 2.5.10.6.2. CAPWAP – is there a conflict with the concept of terminating the wireless MAC layer at the CAPWAP manager, with respect to the 802.11 architecture of ESS? No - the discussion is where the implementation is done, between AP and centralized access router.
 - 2.5.10.6.3. Liaison may be needed on this topic

2.5.11. 802.11 to MMAC

- 2.5.11.1. Inque –san

2.5.12. Agenda change

- 2.5.12.1. The chair asks to insert a motion on a regulatory output document into the agenda
 - 2.5.12.1.1. No objections

2.6. 802.11k: Security of Action Frames

2.6.1. Document 766r0, Richard Paine

- 2.6.2. Issue – protection is needed from spoofing, but 802.11k is not chartered to add security. 802.11i decided it was not possible to provide the needed security management frames. The action frames are a subset of the general solution

- 2.6.3. 802.11k and 802.11h are both affected.
- 2.6.4. Proposing WG action to form SG or take other action to address this requirement.
- 2.6.5. Discussion
 - 2.6.5.1. The WG chair states that TGm's charter does not include 802.11h.
 - 2.6.5.2. The TGi chair states that the concern is holding up the progress of 802.11i. Many task groups will have security issues, but they cannot all be sent to 802.11i to be handled.
 - 2.6.5.3. Members of 802.11k will visit 802.11i on Thursday.
 - 2.6.5.4. This is a general issue the WG needs to address. Every TG will have security issues, and this will keep coming up.
 - 2.6.5.5. We did discuss this in WNG, and recognize there is a problem. WNG will issue a call for proposals for November to request approaches for this issue.
 - 2.6.5.6. David Halasz, Richard Paine, and TK Tan will discuss this issue and bring it to the Friday Plenary.
 - 2.6.5.7. Although the work in 802.11i has been completed, they did not secure management. This needs to be addressed. Every PAR should describe potential security issues that might become an issue. Each TG would need to handle it separately. Prefers to have a single TG to continue to deal with security.
 - 2.6.5.8. The WG chair states that the CAC will discuss this on Thursday, and determine a direction

2.7. Request for ANA number assignment

- 2.7.1. Document 11-03-767 - James Yee
- 2.7.2. Requesting vendor proprietary element.
- 2.7.3. Motion: request that the 802.11 WG Assigned Number Authority assign the following Element Identification numbers 168 and 169 as "Marvell Proprietary"
 - 2.7.3.1. The mover has verified that these numbers are not currently assigned.
 - 2.7.3.2. Moved James Yee
 - 2.7.3.3. Second Peter Loc
 - 2.7.3.4. Discussion
 - 2.7.3.4.1. Believe that we have a mechanism for vendor specific elements. Why are we seeing vendor requests? Why does Marvell need these specific numbers?
 - 2.7.3.4.2. It was stated in the March meeting that devices that are out there could request numbers already in use.
 - 2.7.3.4.3. From when are these products out there? Believe they meet the requirement – does not want to discuss history or timing.
 - 2.7.3.4.4. Against – this should use the existing proprietary elements. The amnesty was back in March. This request is way too late. The number space is limited, and it will be exhausted too soon if we assign vendor proprietary numbers.
 - 2.7.3.4.5. The mover must justify to the body why these specific numbers are needed.
 - 2.7.3.4.6. The March 2003 minutes were reviewed, and a motion for a Broadcom proprietary element were discussed.
 - 2.7.3.4.7. The January 2003 minutes are reviewed, where the formation of the vendor-specific elements was discussed.

- 2.7.3.4.8. The chair notes that the minutes have a specific direction for use of vendor-specific elements
- 2.7.3.4.9. The WG chair states that this motion is out of order.
- 2.7.3.4.10. The WG chair asks for any objection. There is no objection to the ruling.
- 2.7.3.4.11. Member Yee is instructed to use the vendor specific elements

2.8. 802.11 Mesh Networking

- 2.8.1. A presentation was given in WNG. A PAR and 5 Criteria were presented for discussion.
- 2.8.2. The PAR and 5 criteria are in 759r1 and 760r2 and on the server.
- 2.8.3. The vote was 30 : 0 : 12 in WNG
- 2.8.4. The WG chair notes that we have a lot of work in TGi and TGe that have to finish. We will have a full agenda in November, with another SG starting up.
- 2.8.5. A motion will be brought to the body on Friday in the WNG motions.
- 2.8.6. Discussion
 - 2.8.6.1. Based on presentations, it appears that we will be overlapping work already done in 802.1 standards.
 - 2.8.6.2. This was discussed, but the group feels that there is new work to be done that is not in 802.1.
 - 2.8.6.3. The chair of 802.1 will be consulted between now and the motion on Friday.
 - 2.8.6.4. There isn't an official process to comment on PAR and 5 criteria. There is nothing like the ExCom procedure from other Working groups . Suggest that an email ballot with written responses be conducted instead of a vote.
 - 2.8.6.5. The chair notes that the ballot would be 40 days. This will be discussed at the CAC meeting Thursday.

2.9. Press Release for 802.11h

- 2.9.1. Brian Matthews
- 2.9.2. Drafting a press release to announce final approval of 802.11h. Document 11/765r1 that will be forwarded to IEEE marketing staff.
- 2.9.3. There will be a conference on Friday and Saturday. Document 711r2 has more details.

2.10. 802.18 Motions

- 2.10.1. Moved: To approve document 18-03-0061-00-0000_802_18_Rep_Cmts_ET-03-122.doc, authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the 802 Executive Committee for the required 5 day pre-filing review, and file the document in a timely fashion with the FCC.
 - 2.10.1.1. Moved Carl Stephenson on behalf of 802.18
 - 2.10.1.2. Approved unanimously by 802.18 and 802.15
 - 2.10.1.3. Second Denis Kuwahara
 - 2.10.1.4. Motion ID 438
 - 2.10.1.5. Discussion
 - 2.10.1.5.1. Review of the issue and our response?

2.10.1.5.2. These are reply comments. Related to actions at the WRC 2003. There are refutations on comments from ARRL, and consistent with comments initially filed.

2.10.1.6. Vote: Motion Passes 70 : 0 : 3

2.11. Recess at 11:45AM

3. Closing Plenary, Friday, September 18, 2003

3.1. Opening

- 3.1.1. The meeting is called to order by Stuart J. Kerry at 8:15AM.
- 3.1.2. The agenda for today's meeting is reviewed.
- 3.1.3. Are there any items to add to the agenda? None
- 3.1.4. The agenda is adopted with unanimous consent
- 3.1.5. There are 323 people in the room.

3.2. Announcements

- 3.2.1. The CAC meeting dates and schedules are announced and contained in the agenda.
- 3.2.2. For those with attendance problems, please email to Al Petrick for corrections.
- 3.2.3. New members with 75% attendance will become aspirant will be added to the technical reflector. New members will be granted access to the web site
- 3.2.4. There are still 60% of the documents formatted wrong. Page numbers must be included in documents so the information can be referenced in minutes.
- 3.2.5. TK Tan announces events after our meeting: There will be an 802 wireless seminar organized by IEEE and Singapore. This will be in Atrium area. Tomorrow, there is a UWB workshop at the IIR facility, 9:00 to 4:30.
- 3.2.6. the WG chair announces that in our CAC meeting yesterday, we discussed how to move 802.11 into the forefront by taking on more work. We are looking at mesh networking, fast roaming, DSRC, etc. The consensus of the CAC is that we have to embrace the influx of work. We need to assess our membership and reconsider the number of parallel meeting tracks. We have more varied levels of interest, and we will be able to manage the overlap.
- 3.2.7. We are still looking for a Treasurer. We have a CPA that could assist, but the volunteer must be able to attend meetings.
- 3.2.8. We have Clint Chaplin volunteering for chair of the fast roaming study group. An interim chair will be appointed before the next meeting.
- 3.2.9. We will also be looking for a chair for the mesh networking SG.
- 3.2.10. The Chair thanks Lee Armstrong for running the DSRC SG. The WG chair confirms Lee Armstrong as the SG chair. The WG confirms Lee Armstrong as SG chair by acclamation.

3.3. IP Statements

- 3.3.1. The WG chair asks for any new IP statements
- 3.3.2. The WG chair asks if anyone is unaware of the IP policy. None

3.4. Treasury

- 3.4.1. The WG is working on a sponsorship for an additional server.

3.5. TG Reports**3.5.1. TGe – John Fakatselis**

- 3.5.1.1. Continued comment resolutions for LB59.
- 3.5.1.2. Changes were approved for a subsequent draft
- 3.5.1.3. Interim meeting will be held October 27th to 30th in Melbourne FL
- 3.5.1.4. The objective will be comment resolution, with a recirculation planned at the November meeting.
- 3.5.1.5. The Task Group has re-confirmed actions taken in the August interim meeting

3.5.2. TGi – Dave Halasz

- 3.5.2.1. Will bring motions for 15 day recirculation concluding no later than October 10th, followed by another
- 3.5.2.2. Interim meeting October 14-16 in Herndon VA
- 3.5.2.3. LB 60 reached 87% approval, 850 comments, 718 accepted, 132 rejected. 100% addressed
- 3.5.2.4. Security Maintenance. Once TGi is ratified, then how do we address security concerns. This was discussed in WNG.
- 3.5.2.5. Plan to go to Sponsor Ballot at November Plenary.

3.5.3. TGj – Sheung Li

- 3.5.3.1. Report in document 799
- 3.5.3.2. Discussed candidate drafts. 1.1.5.* Two drafts still under consideration.
- 3.5.3.3. Remaining issue of disagreement is on the 20Mhz mode with a double cyclic prefix – should it be optional or omitted?

3.5.4. TGk – Richard Paine

- 3.5.4.1. Report in 03/799
- 3.5.4.2. Need to complete MIBs for letter ballot. Will work on at Ad-Hoc.
- 3.5.4.3. Objective for November, complete specification and conduct letter ballot.
- 3.5.4.4. Will hold weekly teleconferences

3.5.5. TGM – Bob O'Hara

- 3.5.5.1. Report in 03/710r0
- 3.5.5.2. Addressed two interpretation requests and other inputs to 802.11.
- 3.5.5.3. Started to develop updates to the standard.
- 3.5.5.4. Actions on interpretation requests will be brought for a motion.
- 3.5.5.5. One Interpretation responses is in document 03/752.
- 3.5.5.6. The groups decisions on the country information elements interpretation requests are presented. (in document 03/754)
- 3.5.5.7. Discussion from the floor
 - 3.5.5.7.1. 802.11J changes the interpretation of country information elements. This interpretation is OK for the baseline standard, but will subsequently change the interpretation.
- 3.5.5.8. TGM tracking document 03/619r1 identifies items that have been reviewed and status.

3.5.6. TGn – Matthew Shoemake

- 3.5.6.1. Report in document 03/800
- 3.5.6.2. Reviewed 5 submissions during the week.
- 3.5.6.3. Developed selection procedures (03/665r9) and usage models (03/355r11)
- 3.5.6.4. Garth Hilman was elected Secretary
- 3.5.6.5. Formed channel model committee, and functional requirements and comparison committee.
- 3.5.6.6. Call for Proposals was not issued. Will wait for comparison criteria completion.
- 3.5.6.7. Channel models were not adopted – a few issues remain.
- 3.5.6.8. The committees will hold conference calls starting 30 days after this session. Week of Oct 20th. Details will be announced on 802.11 email reflector.
- 3.5.6.9. Objectives for Nov 2003: elect Vice Chair, Editor. Complete selection procedures steps 2 – 5, including call for proposals.
- 3.5.6.10. Discussion
 - 3.5.6.10.1. Has the selection procedure adopted changes from 802.15.3a? Yes, 802.11n is based on the 3a procedure, but some changes have been made.
 - 3.5.6.10.2. The WG chair states that the appointment of a vice chair should be selected only when the work load makes it essential. The WG chair requests that TGn monitor the status, and consider when a vice chair is necessary. The addition of a vice chair impacts the makeup of the CAC committee.
 - 3.5.6.10.3. The limitation of 30 days notice for teleconferences is impeding progress. The WG chair notes that this is due to 802 LMSC rules. We need to plan a meeting ahead.

3.5.7. Publicity – Brian Mathews

- 3.5.7.1. Report in document 03/711r0
- 3.5.7.2. Received industry reports from industry groups
- 3.5.7.3. Press releases were drafted regarding final approval of 802.11h and 802.15.1a, and will be forwarded to IEEE staff
- 3.5.7.4. Discussed issue with FCC deferring to IEEE for decisions. This is specific to 802.15
- 3.5.7.5. Discussed plans for response to Chinese WAPI issue. Will be handled through our regulatory group

3.5.8. WNG – TK Tan

- 3.5.8.1. Report in 03/703r0
- 3.5.8.2. Three sessions were well attended.
- 3.5.8.3. Had presentations from industry groups, Ad-Hoc ESS Subnets and Mesh Networking.
- 3.5.8.4. Discussed security maintenance activities. Will accept proposals in November on the topic
- 3.5.8.5. Discussed wireless interworking, there was consensus on wanting to move forward to a new study group.
- 3.5.8.6. November objectives: WLAN and 3G interworking, Mesh Networking, Security Maintenance, WLAN broadcasting, and industry updates.

3.5.9. DSRC Study Group – Lee Armstrong

- 3.5.9.1. Met in 3 sessions. The program was described to new members reviewing past activities in other standards organization.
- 3.5.9.2. The unique requirements for vehicle operation of wireless LAN were reviewed.

- 3.5.9.3. Standards have been developed in ASTM, and in other groups in IEEE.
 - 3.5.9.4. The objective is interoperability of the entire system within North America.
 - 3.5.9.5. Prepared a draft PAR and 5 Criteria.
 - 3.5.9.6. The SG accepted the PAR and 5 Criteria with unanimous consent.
 - 3.5.9.7. The name DSRC is a legacy name that has an inaccurate connotation. The name could not be changed in ASTM. In the 802.11 committee, the name should be changed.
 - 3.5.9.8. A motion was made to select a new name for the standard.
 - 3.5.9.9. The new name as Wireless Access in the Vehicular Environment (WAVE)
 - 3.5.9.10. WG Technical Editor
 - 3.5.9.10.1. Al Petrick substituting
 - 3.5.9.10.2. Terry Cole was unable to attend
 - 3.5.9.10.3. Will follow up after this meeting
 - 3.5.9.10.4. Editors are required to participate
 - 3.5.10. ANA Status – Duncan Kitchin
 - 3.5.10.1. Not present
 - 3.5.11. 802.18 Radio Regulatory TAG – Carl Stephenson
 - 3.5.11.1. Report in 18-03-062
 - 3.5.11.2. Prepared filings for the FCC, against UWB radar and on 5GHz NPRM.
 - 3.5.11.3. Some editorial comments may be inserted to address 802.16 concerns
 - 3.5.11.4. Discussion
 - 3.5.11.4.1. Comments on FCC part 2 and part 15 NPRM? The FCC just released a new NPRM on part 2 and part 15. There will be a 45 day comment window once the NPRM is published. We will prepare comments by email correspondence and conference calls.
 - 3.5.12. 802.19 – Jim Lansford or Ian Gifford
 - 3.5.12.1. Not Present
- 3.6. Special Orders – Motions**
- 3.6.1. TGi Motions
 - 3.6.1.1. Believing that comment responses in 11-03/659R4 and 802.11i draft 6.0 satisfy WG 802.11 rules for letter ballot recirculation, authorize a 15-day LB recirculation to conclude no later than October 10, 2003. The LB recirculation shall ask the question “Should the attached 802.11i draft 6.0 draft be forwarded to SB?”
 - 3.6.1.1.1. Moved Dave Halasz on behalf of TGi
 - 3.6.1.1.2. Dave thanks Tim Moore for his efforts in making this possible
 - 3.6.1.1.3. Motion ID 440
 - 3.6.1.1.4. Vote on the motion: Passes 76 : 0 : 3
 - 3.6.1.1.5. This will be Letter Ballot 61
 - 3.6.1.2. Motion for conditional LB recirculation: Believing that TGi will pass motions resulting in letter ballot comment responses and a draft that satisfies WG 802.11 rules for LB recirculation at a duly authorized meeting conducted in good order, Conditionally authorize a 15-day LB recirculation to conclude no later than November 7, 2003, conditional on the existence of a comment response database and draft document by

TGi meeting the WG rules for letter ballot. The LB recirculation shall ask the question “Should the attached 802.11i draft 7.0 be forwarded to SB?”

3.6.1.2.1. Moved Dave Halasz on behalf of TGi

3.6.1.2.2. Motion ID 441

3.6.1.2.3. Vote: Motion passes 78 : 0 : 1

3.6.2. TGm Motions

3.6.2.1. To request the working group to accept and forward the interpretation response contained in document 03-752r0 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.

3.6.2.1.1. Moved: Bob O'Hara, on behalf of TGm

3.6.2.1.2. Motion ID 442

3.6.2.1.3. Vote: Motion passes 78 : 0 : 1

3.6.2.2. To request the working group to accept and forward the interpretation response contained in document 03-754r0 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.

3.6.2.2.1. Moved: Bob O'Hara, on behalf of TGm

3.6.2.2.2. Motion ID 443

3.6.2.2.3. Vote: Motion passes 72 : 0 : 3

3.6.3. TGn Motions

3.6.3.1. Move to authorize ongoing conference calls of the TGn Channel Model and FRCC Special Committees beginning the week of October 20, 2003.

3.6.3.1.1. Moved Matthew Shoemake on behalf of TGn

3.6.3.1.2. Discussion

3.6.3.1.2.1. Should the ongoing nature be re-affirmed in November 2003?

3.6.3.1.2.2. Generally, when we pre-authorize teleconferences . Generally we at least set a limit of the year and go in 6 month periods.

3.6.3.1.2.3. The TG chair understands, and asks for a bit of latitude.

3.6.3.1.2.4. The chair of the channel model committee states that the meetings will be held on Thursdays, and are bi-weekly, and 8:30 pacific time.

3.6.3.1.2.5. Is this motion necessary – Isn't only an 30 day notice required?

3.6.3.1.3. Motion to amend: Add the words “to the end of the November 2003 plenary”

3.6.3.1.3.1. Moved Peter Ecclesine

3.6.3.1.3.2. Second Denis Kuwahara

3.6.3.1.4. The meeting is recessed for two minutes as the chairs discuss the need for motions for teleconferences.

3.6.3.1.5. The WG Chair states that the motion is out of order in that it is not required. The only procedure is that teleconferences must be announced 30 days in advance on the reflector.

3.6.3.1.6. Discussion

3.6.3.1.6.1. David Skellern states that the 8:30AM Pacific time for teleconference is unfriendly for members in the Asia-pacific time zones.

3.6.3.1.6.2. Colin states that teleconferences will alternate times suitable for Asia and Europe

3.6.4. Publicity Motions

3.6.4.1. Believing that the final approval of 802.11h is newsworthy and that information in 11-03-765 is accurate and appropriate for a press release, approve transmission of aforementioned document to IEEE SA marketing staff.

3.6.4.1.1. Moved Brian Mathews on behalf of Publicity Committee

3.6.4.1.2. Motion ID 444

3.6.4.1.3. Motion passes 76 : 0 : 0

3.6.5. WNG Motions

3.6.5.1. Move that WNG approve 802.11-03-0759-01-0wng PAR for IEEE 802.11 ESS Mesh and 802.11-03/0760-02-0wng Five Criteria for IEEE 802.11 ESS Mesh and request 802.11 Working Group approve and forward to the 802 exec for approval 802.11-03-0759-01-0wng PAR for IEEE 802.11 ESS Mesh and 802.11-03/0760-02-0wng Five Criteria for IEEE 802.11 ESS Mesh

3.6.5.1.1. Moved TK Tan on behalf of WNG

3.6.5.1.2. Motion ID 445

3.6.5.1.3. Motion to Table this motion indefinitely

3.6.5.1.3.1. Moved Peter Ecclesine

3.6.5.1.3.2. Second John Kowalski

3.6.5.1.3.3. Vote on the motion to table: Passes 48 : 4 : 21

3.6.6. DSRC Motions

3.6.6.1. Move to conduct a 40 day WG letter ballot for approval of the PAR document 03/778r4, and 5 Criteria document 03/779r4, for DSRC, and forward to ExCom for Approval

3.6.6.1.1. Moved Lee Armstrong

3.6.6.1.2. Second Dave Halasz

3.6.6.1.3. Discussion

3.6.6.1.3.1. Given that this has the same situation as the WNG motion, and the 4 hour rule, more work is needed.

3.6.6.1.4. Motion to table

3.6.6.1.4.1. Moved John Kowalski

3.6.6.1.4.2. Second Peter Ecclesine

3.6.6.1.4.3. Vote on the motion to table: Motion passes 36 : 17 : 22

3.6.7. Recess for break until 10:15

3.6.8. 802.18 RR TAG Motions

3.6.8.1. Moved: To approve document 18-03-0057-00-0000_VISTA_UWB_Waiver_Rep_Cmts.doc, authorizing the Chair of 802.18 to do necessary editorial and formatting changes, submit to the 802 Executive Committee for the required 5 day pre-filing review, and file the document in a timely fashion with the FCC.

3.6.8.1.1. Moved Carl Stephenson

3.6.8.1.2. Second Denis Kuwahara

3.6.8.1.3. Motion ID 446

3.6.8.1.4. Vote: Passes 54 : 0 : 2

3.6.8.2. Dave Skellern thanks the membership from coming to this hosted venue. He thanks Stuart Kerry and Bob Heile for their efforts in putting this meeting together. The WG thanks Cisco for sponsoring the meeting

3.6.8.3. Carl Stephenson asks the body: Is there any objection to adding a paragraph to the regulatory response to address 802.16 concerns? None

3.7. *New Business*

3.7.1. None

3.8. *Motions from the floor*

- 3.8.1. Move to recommend to the WG first vice chair that the WG policies and procedures require that all attendees accessing the network while in 802.11 meetings have current virus checking software and to stipulate any attendee not compliant to this provision be blocked from network access in order to reduce propagating viruses/worms to other attendees.
 - 3.8.1.1. Moved Peter Ecclesine
 - 3.8.1.2. Discussion
 - 3.8.1.2.1. How do we get 802 to follow along? The network contract is currently owned by 802.11/15. 802 follows our lead, so they will comply by default.
 - 3.8.1.2.2. Applauds the intent of avoiding the problem, but the wording is misguided. We cannot require software, but we can prohibit bad behavior on the network.
 - 3.8.1.3. Motion to amend: Strike "have current virus checking software" and replace with "must provide fair access to the network"
 - 3.8.1.3.1. Moved Dave Halasz
 - 3.8.1.3.2. Second Jesse Walker
 - 3.8.1.3.3. Discussion
 - 3.8.1.3.3.1. This does not address the need to block malicious software
 - 3.8.1.3.3.2. We can't act as everybody's IT department. We can't make that a responsibility of our network staff.
 - 3.8.1.3.3.3. Agrees with the spirit, but we need to think this through with respect to all the issues.
 - 3.8.1.4. Motion to table (motion to amend and main motion).
 - 3.8.1.4.1. Moved Matthew Shoemake
 - 3.8.1.4.2. Second Colin L
 - 3.8.1.4.3. Vote on the motion: Passes 65 : 1 : 1
- 3.8.2. The WG chair directs the 1st vice chair to discuss this issue with the network providers and the CAC, and prepare a plan of action. Members may address suggestions to Al Petrick.
- 3.8.3. Discussion
 - 3.8.3.1. We should vote to increase registration fees to improve the support of the network.

3.9. Next Meeting and Announcements

- 3.9.1. November 9-14, Albuquerque NM
- 3.9.2. Still looking for hosts for September 2004
- 3.9.3. Problems with attendance, reflectors, or voting, please email Al Petrick. Documentation issues to Harry Worstell.
- 3.9.4. TK Tan requests presentations for this afternoon's seminars. Thanks for coming to Singapore.
- 3.9.5. The WG chair thanks TK Tan for his contributions helping with the meetings.

3.10. Adjourned at 11:00AM

Last Name	First Name
Aboul-Magd	Osama
Adachi	Tomoko
Ahn	Jaemin
Allen	Richard
Alukuru	Sivaram
Andelman	Dov
Andrus	David
Aoki	Hidenori
Aoki	Tsuguhide
Arbaugh	William
Armstrong	Lee
Asai	Yusuke
Audeh	Malik
Awtrey	Anthony
Baker	Dennis
Balakrishnan	Jaiganesh
Ban	Taewon
Bangerter	Boyd
Barman	Kaushik
Benveniste	Mathilde
Bims	Harry
Bjerke	Bjorn
Black	Simon
Boer	Jan
Bonneville	Herve
Buttar	Alistair
CANCHI	RADHAKRISHNA
Cain	Peter
Carney	Bill
Cash	Broady
Chang	Eugene
Chaplin	Clint
Cheng	Hong
Chin	Kwan-Wu
Chindapol	Aik
Cho	Jiyoung
Choi	Eunyoung
Coffey	Sean
Conner	W. Steven
Cook	Kenneth
Cramer	Mary
Crowley	Steven
De Vegt	Rolf
Douglas	Brett
Durand	Roger

Eaton	Dennis
Ecclesine	Peter
Edney	Jonathan
Ellis	Jason
Engwer	Darwin
Eriksson	Patrik
Estrada	Andrew
Euscher	Christoph
Evensen	Knut
Fakatselis	John
Falk	Lars
Feinberg	Paul
Fischer	Matthew
Flintstone	Frederic
Flygare	Helena
Formoso	Ruben
Gerges	Ramez
Ghazi	Vafa
Gilbert	Jeffrey
Goren	Aviv
Green	Patrick
Gummadi	Srikanth
Gyselinckx	Bert
HAGIWARA	Junichiro
Haisch	Herman
Halasz	David
Hansen	Christopher
Harada	Yasuo
Harkins	Daniel
Hassan	Amer
Hasty	Vann
Hauser	James
Hayashi	Morihiko
He	Haixiang
Heberling	Allen
Hepworth	Eleanor
Hermodsson	Frans
Hideaki	Odagiri
Hillman	Garth
Hinsz	Christopher
Hjelm	Mikael
Hoghooghi	Michael
Hosur	Srinath
Huang	Xiaojing
Hunter	David
Imamura	Daichi

Inoue	Yasuhiko
Jalfon	Marc
Jechoux	Bruno
Jeong	Moo Ryong
Jiang	Daniel
Jimi	Kuniko
Johnson	Brian
Jokela	Jari
Kakura	Yoshikazu
Kandala	Srinivas
Karimullah	Khalid
Karnik	Pankaj
Kerry	Stuart
Ketchum	John
Khieu	Andrew
Kikuma	Tomohiro
Kim	Inhwan
Kim	Youngsoo
King	Wayne
Kinney	Patrick
Klein	John
Kleindl	Guenter
Koga	Keiichiro
Kohl	Blaine
Kowalski	John
Kubota	Shuji
Kuehnel	Thomas
Kumagai	Tomoaki
Kurihara	Thomas
Kuwahara	Denis
Kwak	Joe
LIM	Jaewoo
LaRosa	Jon
Lanzl	Colin
Lee	Chi Kin
Lee	Insun
Lefkowitz	Martin
Levy	Joseph
Lewis	Mike
Li	Sheung
Lim	Wei Lih
Liu	Der-Zheng
Liu	Der-Zheng
Loc	Peter
MARUYAMA	NAOTAKA
Makishima	Doug

Malik	Rahul
Mani	Mahalingam
Mathews	Brian
Matsumoto	Yoichi
McCann	Stephen
McClellan	Kelly
McNew	Justin
Medvedev	Irina
Mehta	Pratik
Meyer	Klaus
Moore	Tim
Moreton	Mike
Morioka	Yuichi
Mueller	Joseph
Mulder	Willem
Murakami	Yutaka
Murch	Ross
Murray	Boyd
Myles	Andrew
Nagai	Yukimasa
Naka	Katsuyoshi
Nakamura	Michiharu
Nakase	Hiroyuki
Narasimhan	Ravi
Ngo	Chiu
Nguyen	Tuan
O'Hara	Bob
Oguma	Hiroshi
Ohtani	Yoshihiro
Oomen	Peter
Oyama	Satoshi
Oyama	Satoshi
Paine	Richard
Pal	Arpan
Paljug	Michael
Palm	Stephen
Park	Joon Goo
Patel	Vijay
Petrick	Al
Pope	Stephen
Ptasinski	Henry
Purkovic	Aleksandar
Quinn	Liam
Ramakrishnan	Sthanunathan
Reid	Anthony
Ritter	Benno

Rommer	Stefan
Sadri	Ali
Sakoda	Kazuyuki
Sakurai	Shoji
Sandhu	Sumeet
Sato	Hideaki
Sawai	Ryo
Schnacke	Richard
Schreder	Brian
Schrum	Sid
Schylander	Erik
Sherman	Matthew
Shoemake	Matthew
Singh	Manoneet
Sinivaara	Hasse
Skafidas	Efstratios (Stan)
Skellern	David
Spiess	Gary
Stanley	Dorothy
Stephens	Adrian
Stevenson	Carl
Stivers	Fred
Struhsaker	Paul
Sumanasena	Abhaya
TAGIRI	HIROKAZU
Takagi	Masahiro
Tal	Nir
Tamaki	Tsuyoshi
Tan	Ah Peng
Tan	Chee Bing
Tan	Pek-Yew
Tan	Teik-Kheong
Tang	Wai-Cheung
Tee	Lai-King Anna
Terry	John
Thiagarajan	Ganesan
Tomcik	James
Tsao	Jean
Tsien	Chih
Tuch	Bruce
Van Nee	Richard
Vandenameele	Patrick
Vlantis	George
Walker	Jesse
Wandile	Vivek
Wang	Stephen

Ware	Christopher
Watanabe	Fujio
Wentink	Menzo
Wieczorek	Alfred
Williams	Michael Glenn
Wojtiuk	Jeffrey
Wong	Jin Kue
Worstell	Harry
Wright	Charles
Wu	Gang
YUN JOO	KIM
Yamaura	Tomoya
Yee	James
Yee	Jung
Yeh	Chih Hao
Yin	Jijun
Yoke Yong	Lai
Yung	Hon
choi	dohyung
imamura	kimihiko
kurihara	Thomas
leberger	uriel
van Leeuwen	Richard
van Waes	Nico
van Zelst	Allert

**IEEE P802.11
Wireless LANs**

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

Singapore

Date: September 15 - 19, 2003

Author: David Hunter
Vetronix
Phone: 805 966 2000 x3145
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1. Monday Morning, September 15, 2003

1.1. Opening

1.1.1. Call to order

1.1.1.1. John Fakatselis (JohnF) called the meeting to order at 10:50pm (delayed due to equipment setup).

1.1.2. Review of the agenda (JohnF)

- 1.1.2.1. Tentative meeting agenda: 11-03-655r2-WG-802.11-WG-Tentative-Agenda-September-2003.xls
- 1.1.2.2. JohnF reviewed the proposed agenda.
- 1.1.2.3. Fixed Time agenda items will be handled at 4:30pm Thursday, September 18, 2003.
- 1.1.2.4. Review minutes from previous meeting.
- 1.1.2.5. Call for papers.
- 1.1.2.6. The Fixed Time agenda Items are listed on the agenda.

1.1.3. Approval of the agenda

- 1.1.3.1. JohnF: Are there any comments on the agenda?
- 1.1.3.2. MatthewS: Is there time for approval of the work by the ad-hoc meeting?
- 1.1.3.3. JohnF: Yes, that will come up in the Business topics.
- 1.1.3.4. JohnF: I ask the voting members, are there any objections to approving this agenda?
- 1.1.3.5. JohnF: I see no objections, so we have an agenda for this meeting.

1.2. Review of 802.11 policies and rules

1.2.1. Review Objectives for this Session

- 1.2.1.1. JohnF reviewed the general objectives of comment resolution.

- 1.2.1.2. JohnF: Are there any comments on these objectives or other objectives that anyone here has?
- 1.2.1.3. JohnF: I hear none, so we are agreed on the comments.

1.2.2. New participants

- 1.2.2.1. JohnF: How many new participants here today?
- 1.2.2.2. {Secretary: three people raised their hands.}

1.2.3. Reviews of voting rules and process (JohnF)

- 1.2.3.1. JohnF reviewed the general task group voting procedures and willingness for open participation, but that motions must be made and voted by voting members.
- 1.2.3.2. JohnF: For the past two meetings were the first ones in which we didn't have a point of order, and hopefully we can keep it that way.
- 1.2.3.3. Osama Aboul-Magd (OsamaA): Only people who previously voted can vote on a recirculation, correct?
- 1.2.3.4. JohnF: Yes, once it has gone to the whole Working Group as a whole and has achieved 75% positive vote, it is frozen except for the areas in which there are comments already. All "No" votes must be backed up with specific comments. The recirculation is frozen both to the people who voted earlier and the comments that were made previously. But you still have the right to put in your opinions on the document, even though you didn't participate earlier.
- 1.2.3.5. Mathilde Benveniste (MathildeB): We still have problems with the website.
- 1.2.3.6. Harry Worstell (HarryW): The network is having problems; please see the help desk (Doug and Tony) to get the browsers configured correctly.
- 1.2.3.7. Charles Wright (CharlesW): You need to delete the cookie associated with 802WirelessWorld and start over.

1.2.4. Last Meeting Summary

- 1.2.4.1. JohnF: Sрни will walk us through the outcome of the Recirculation Ballot. We also held an Interim meeting in New Jersey after the Recirculation Ballot. This group got about 50 percent of the comments taken care of.

1.3. Recirculation Ballot Discussion

1.3.1. Recirculation ballot status, 03/658r4, Sрни Kandala

- 1.3.1.1. SрниK: 923 comments; 529 are technical; 375 are part of a "No" vote. The New Jersey meeting resolved 90 technical comments and I have resolved 90 editorial comments, so we have about 750 comments to go. We also resolved about 10 more comments in the teleconference last week.
- 1.3.1.2. Sid Schrum (SidS): There are about 6 more comments that we resolved that we need coordinate on; these are not yet listed in 658r4.
- 1.3.1.3. JohnF: So we need to go through the rest of the comments this week in order to get to another recirculation ballot.
- 1.3.1.4. Matthew Sherman (MatthewS): The comments and minutes from that Interim meeting are unavailable right now, since we can't get to the server. Can we entertain them tomorrow?
- 1.3.1.5. JohnF: Yes. Also the group of 10 from the teleconference were not formally approved, so they will have to be covered in an additional paper. The goal is to get those 100 plus comments resolved by tomorrow, at least.

1.4. Comment resolutions

1.5. Approval of minutes of July 2003 Plenary Meeting

1.5.1. Request for approval

- 1.5.1.1. JohnF: Are there any questions or issues with the minutes of the July 2003 meeting in San Francisco?
- 1.5.1.2. JohnF: I hear none. The minutes of July 2003 are approved with unanimous consent.
- 1.5.1.3. JohnF: We need to do the same for the minutes of the Interim meeting in New Jersey, but I would like to postpone this until those minutes are available. Do I hear any objections to the postponement of this review? Hearing none, we will postpone this discussion until these documents are available.

1.6. Papers and Comment Resolutions

1.6.1. Call for papers

- 1.6.1.1. JohnF: What papers are available to be presented?
- 1.6.1.2. Stephen Wang (StephenW): I have a paper, 03/661r0, that was uploaded to the server on Friday.
- 1.6.1.3. MathildeB: One paper on EDCF, 03/676r0.
- 1.6.1.4. JohnF: Any more? I hear none. When you present your papers, indicate the exact comments you are addressing.
- 1.6.1.5. StephenW: How do we know when we are scheduled to present?
- 1.6.1.6. JohnF: As long as you meet the 4 hour rule we can schedule you in. But we will need to wait until the papers are available to the participants.
- 1.6.1.7. Matthew Fischer (MatthewF): That requires 4 hours of session time, even if you put the paper on the server a month ago.
- 1.6.1.8. JohnF: We still have about 429 comments left. We typically did about 200 comments at a time per meeting session, so we need to double our production output. I am looking for a way to do this. I suggest breaking up into ad-hoc groups so we can work in parallel.
- 1.6.1.9. Andrew Myles (AndrewM): It would be nice to hear the new papers first.
- 1.6.1.10. JohnF: That's a good suggestion and we will do that.
- 1.6.1.11. AndrewM: Can the editor get the draft out by the end of the week?
- 1.6.1.12. JohnF: He doesn't have to get the draft out. We just need to agree on the changes and authorize him to implement the changes. If he makes any mistakes, we can correct those later.
- 1.6.1.13. Srinik: I believe we have to split into two or three groups.
- 1.6.1.14. JohnF: I believe this group is big enough for three groups.
- 1.6.1.15. Srinik: Suggest Clause 9, Clauses 7 and 11, and all other comments.
- 1.6.1.16. JohnF: Any objection to this split?
- 1.6.1.17. CharlesW: Am concerned with having more than two groups; how about starting with just 7 and 9 and going on to other topics when we finish with those?
- 1.6.1.18. SidS: Would like to find out what people in here want to work on these. How about a show of hands on participation?
- 1.6.1.19. JohnF: How many people are going to be working on Chapter 9 and 11, how many are 7?
- 1.6.1.20. JohnF: I count only 1 person for 7; and the rest all on 9. We need to balance that a little more.
- 1.6.1.21. AndrewM: How about only one group working on 9; you won't get far with uninterested people working on 7.

- 1.6.1.22. JohnF: Even if only one person is on 7, it's worthwhile. But is anyone else willing to help Charles on Clause 7? I count about 3 more; so now we have 4 people on 7. How many are still going to work on 9,11? I count about 12 people on 9 and 11.
- 1.6.1.23. MatthewS: If you solve 9 and 11, much of Clause 7 may work itself out.
- 1.6.1.24. CharlesW: I'd suggest the same thing – to work from functionality.
- 1.6.1.25. Mike Moreton (MikeM): How about functional groups?
- 1.6.1.26. CharlesW: Could split 9 and 11 into functions.
- 1.6.1.27. JohnF: I'd like that; it would give us some parallelism.
- 1.6.1.28. AndrewM: Perhaps EDCA, HCCA
- 1.6.1.29. MatthewS: We have two papers on power save.
- 1.6.1.30. Srinik: It appears that there are about 150 technical and editorial comments in 9; 40 in 11; and about 150-200 on 7 and the rest are "others".
- 1.6.1.31. JohnF: My fear is that everyone will be working on 9,11 and overlooking the others that have more comments. But lets say we do 9,11 today. If we can accomplish that, we will have accomplished more than other meetings.
- 1.6.1.32. Srinik: Functionality could split along the EDCA and HCCA line.
- 1.6.1.33. JohnF: Is there any comment on that?
- 1.6.1.34. MikeM: What about other groups?
- 1.6.1.35. Srinik: We're limited to about 2 groups by the size of this room.
- 1.6.1.36. JohnF: How many in EDCA and how many on HCCA. I count 7 and 5. Who wants to be leader?
- 1.6.1.37. Srinik: I volunteer Richard.
- 1.6.1.38. Richard van Leeuwen (RichardL): I suppose I can do that.
- 1.6.1.39. MatthewF: I can try to finish the HCCA before 6 pm when I fall asleep on the keyboard.
- 1.6.1.40. MatthewS: I can do the HCCA group.
- 1.6.1.41. CharlesW: Please review the guidance on what kind of things get done in a recirculation.
- 1.6.1.42. JohnF: The general guidance is no drastic changes this time; we are working for the second recirculation ballot. The last thing you want to do is create no additional "No" votes.
- 1.6.1.43. MatthewS: A drastic change likely is not an answer to the comment.
- 1.6.1.44. CharlesW: What if a comment that asks for something that is beyond the scope?
- 1.6.1.45. JohnF: It won't really be beyond the scope; we just have to balance our response.

1.7. Closing

1.7.1. Recess for Ad-Hoc Group Work

- 1.7.1.1. JohnF: We'll split the room for the EDCA and HCCA groups. Hearing no other comments, we'll recess for ad-hoc group work until the 1:00pm meeting.
- 1.7.1.2. Recessed for ad-hoc group work, 11:50am.

2. Monday Afternoon, September 15, 2003

2.1. Opening

- 2.1.1.1. JohnF called the meeting to order at 1:00pm.

- 2.1.1.2. JohnF: For those of you who were not involved in this morning's meeting, we have recessed until the 3:30 meeting for ad-hoc work.

2.2. Recess for Ad-Hoc Work

2.2.1. Recess

- 2.2.1.1. JohnF recessed the meeting at 1:05pm for ad-hoc group work until the 3:30pm meeting.

2.3. Reconvening

- 2.3.1.1. JohnF re-opened the meeting at 3:30pm.
- 2.3.1.2. Srinik: Are we going to cover the comments first, before the papers?
- 2.3.1.3. JohnF: No, we're going to entertain the papers now.
- 2.3.1.4. MathildeB: My paper is on the same topic.
- 2.3.1.5. JohnF: We'll take them up back to back then.

2.4. Paper Presentations

2.4.1. *Unscheduled eDCA Power Management, 03/0698r0 and 03/0699r0, Stephen Wang, et. al.*

- 2.4.1.1. StephenW: This paper addresses comments:
- 2.4.1.2. Thomas Kuehnel (Thomask): Is there any IP related to this proposal?
- 2.4.1.3. Srinik: Point of Information: is there known IP from past declarations?
- 2.4.1.4. StephenW: Motorola has a previous IP declaration from 1994, and there is a further intent to create a new statement for this proposal.
- 2.4.1.5. AndrewM: On slide 10: For the queuing it is vendor specific, is this about EDCA?
- 2.4.1.6. StephenW: For EDCA this is up to the vendor.
- 2.4.1.7. AndrewM: In this diagram, what happens if the last Ack is lost?
- 2.4.1.8. StephenW: One thing that could happen is that the AP could retry the packet while the STA is in sleep mode. Then will just lose the packet.
- 2.4.1.9. AndrewM: The advantage of the legacy is that don't go to sleep until that ack comes back.
- 2.4.1.10. StephenW: The difference between these two is not only the frame change; also, legacy can't guarantee the QoS.
- 2.4.1.11. AndrewM: I don't agree. The most valuable difference for your proposal is that you specify how APSD works.
- 2.4.1.12. StephenW: That is already defined in APSD.
- 2.4.1.13. CharlesW: Why can't the STA just go to sleep a little bit later?
- 2.4.1.14. AndrewM: Except that the time it takes for the ack to come back is very uncertain.
- 2.4.1.15. MathildeB: If you look at 11.2.1.4h, you see that the AP has to send buffered frames to the STA once it wakes up. I believe the description you have given is inaccurate; I should have made a more detailed presentation sooner. What if you have 2-way traffic, but there is silence suppression? Then have to have null frames for signaling?
- 2.4.1.16. StephenW: If you use silence suppression, that is correct.
- 2.4.1.17. MatthewF: Is there still a service period, so once the uplink frame is send, the AP knows how long.
- 2.4.1.18. StephenW: Yes, we are not attempting to change that.

- 2.4.1.19. AndrewM: So the STA doesn't go to sleep right away?
- 2.4.1.20. MatthewF: That's part of the question: does the STA stay away for the full period it advertised?
- 2.4.1.21. StephenW: There is nothing to prevent you from doing that.
- 2.4.1.22. Wei Lih Lim (Isaac): If STAs only have uplink, does the slide 12 proposal apply?
- 2.4.1.23. StephenW: You are not prevented from using it, but don't know why you would like to.
- 2.4.1.24. Isaac: So does this proposal has an advantage for uplink only?
- 2.4.1.25. StephenW: This just does better for bidirectional traffic; if you have only uplink traffic, then you can use EDCA.
- 2.4.1.26. SidS: In the past there was concern that there is no urgency inferred; we're trying to say that the AP needs to get the traffic down. The AP can't wait until whenever it feels like it.
- 2.4.1.27. StephenW: If the AP sets this up, then the AP has already committed to transfer the frame as quickly as possible (if it accepts your TSPEC).
- 2.4.1.28. MatthewS: For clarification: the idea is that it starts its service period at the same time the legacy would have started. Am concerned that it is possible for service periods from different STAs to overlap. The AP would have an obligation to support another service period while you are negotiating a new one.
- 2.4.1.29. StephenW: The AP should service higher priority service periods first; if both are the same priority, then it can even flip a coin.
- 2.4.1.30. MathildeB: There is the advantage that the AP is making a commitment.
- 2.4.1.31. JohnF: No other questions?
- 2.4.1.32. StephenW: We would like to bring up a motion on this later.
- 2.4.1.33. JohnF: Then let's look at the other paper that is relevant to this topic.

2.4.2. APSD vs. Reverse Polling for EDCA, 03/676r0, Mathilde Benveniste

- 2.4.2.1. MathildeB: This paper addresses D5.0 ballot comments: 441, 210 (209, 330, 331, 324, 325, 460, 466, 467 and 526). The description of APSD in the previous paper is inaccurate. APSD is different from reverse polling in that in the latter the downlink transmission happens following the receipt of an uplink frame, not at times that are known in advance. There actually are three ways to do reverse polling in the TGe draft; Stephen's paper described the first two. The third is similar to the first; this will be covered in the next paper.
- 2.4.2.2. MatthewS: I have a number of questions, but will only ask two or three now. I believe that we've already made the decision to support two power saving methods – both APSD and a more legacy type of mechanism, reverse polling. This is not an either-or mechanism. See slide 9. I disagree with this analysis. Statistically, upstream and downstream don't have to be related. In truth downlink timing is random.
- 2.4.2.3. MathildeB: I agree that APSD is very useful. Also if you don't optimize you could end up with a greater uplink+downlink delay.
- 2.4.2.4. MatthewS: I don't think so; I could always set it up for APSD such that I just miss both of them. In reverse polling you can always optimize for one of them.
- 2.4.2.5. MathildeB: But then the other can suffer twice the delay.
- 2.4.2.6. MatthewS: But that occurs randomly.
- 2.4.2.7. MathildeB: The problem is that you can double your worst case performance.
- 2.4.2.8. SidS: I think slide 9 gets to the heart of what is accomplished with the scheme of the previous paper. Though we can establish a schedule with APSD that can anticipate the frames, the clock is in the AP, and so is not synchronized with either the clock that synchronizes the uplink traffic and the one that synchronizes the downlink traffic. On average you'll likely incur a delay of 50 percent of both uplink and downlink traffic. Second point: are you saying that you also are supporting the other proposal?

- 2.4.2.9. MathildeB: I believe that that is a valuable proposal. My paper is not a comparison to that, but to what is available in legacy. The point is that if you are scheduling on the uplink arrival, then you are not guaranteed a better overall delay. Slide 9 is a good example that you are not. At times you can double your worst case delay. Another point: Stephan claimed that APSD has to synchronize with upper layers; that is not the case at all.
- 2.4.2.10. JohnF: We're running out of time. Could we limit the statements to 2 minutes?
- 2.4.2.11. ThomaskK: I have a question. On slide 10 this indicates there is no dead time in between. I don't know that this is a valid comparison.
- 2.4.2.12. MathildeB: If the AP has pending frames, which can happen more than 50 percent of the time, then the AP knows that it has the frames. With reverse polling that it might not know it has these frames. That is what this is trying to show.
- 2.4.2.13. ThomaskK: What about the neighbor BSS that has a very slow link?
- 2.4.2.14. MathildeB: Then both will suffer equally from that.
- 2.4.2.15. StephenW: One question and two statements.
- 2.4.2.16. JohnF: Please limit that to 2 minutes.
- 2.4.2.17. StephenW: Your comment about silence suppression: what does the AP have to do to tell the STA to go back to sleep? Does APSD support that?
- 2.4.2.18. MathildeB: You can use a TIM to tell it, or you could send it a Null frame, but you don't have to use that. You could use the TIM. Some people don't prefer that?
- 2.4.2.19. StephenW: But then the STA has to stay awake for the next beacon.
- 2.4.2.20. MathildeB: Yes, it's either/or.
- 2.4.2.21. StephenW: It is not true that the AP has no knowledge when the STA is awake. You can use the TSPEC to specify that. Second statement: your comment about when the AP receives reverse poll it has to wait for all buffered data: but this is no different.
- 2.4.2.22. RichardL: I have a statement: even if several stations have the same codec, there will be some drift. So by doing reverse polling you're at least optimizing uplink.
- 2.4.2.23. MathildeB: I disagree with these comments.
- 2.4.2.24. JohnF: I'll give you a minute at the end to respond.
- 2.4.2.25. AndrewM: Let's just get the reverse polling mechanism right, since we intend to keep it.
- 2.4.2.26. SidS: A statement: I have the same point as Richard. We need to fully understand the mechanism of drift.
- 2.4.2.27. JohnF: I want Menzo {Wentink} to present on this subject.
- 2.4.2.28. MathildeB: I have another paper.
- 2.4.2.29. JohnF: Menzo's paper is directly on this power saving subject.

2.4.3. Piggybacked Inter-Service Time, 03/730r1, Menzo Wentink

- 2.4.3.1. Menzo Wentink: Effectively if there are a lot of STAs in power saving mode, there won't be much savings in power save. Each ends up waiting for all of the others. This is still a rough idea of an enhancement.

2.4.4. Continuation of APSD vs. Reverse Polling Presentation, Mathilde Benveniste

- 2.4.4.1. SrinikK: When will we bring up a motion on these comments?
- 2.4.4.2. JohnF: I'll let Mathilde respond to the comments now.
- 2.4.4.3. MathildeB: I need about 7 minutes to complete this presentation.
- 2.4.4.4. JohnF: You have about 5 minutes, because we need 10 minutes to make a decision in the 15 minutes we have left.
- 2.4.4.5. MathildeB: Let me go quickly to the other presentation.

2.4.5. Reverse Polling, 03/663r0, Mathilde Benveniste

- 2.4.5.1. MathildeB: The reverse polling mechanism is basic legacy power saving, but you use the Null+Ack, so you have a double Ack at the end. It does add some overhead with respect to the 03/661 proposal, but it is not the 33 percent claimed. This will add a lot to channel utilization efficiency.
- 2.4.5.2. StephenW: So you're recommending making some changes to the legacy spec; does this group have authority to do that?
- 2.4.5.3. MathildeB: This is what we've been doing for years. This is just a proposal on the table that fills in my previous paper. This doesn't have the weakness of the lost ack. The legacy power management is left intact; this is for QAPs.
- 2.4.5.4. StephenW: But you can't use legacy frame types.
- 2.4.5.5. MathildeB: Yes you can use those frame types.

2.4.6. Power Management Proposal

- 2.4.6.1. Chris Ware (ChrisW): I would like to have a straw poll with respect to the slide that Mathilde just had up. This addresses the comments on slide 2 of 03/699r0. Straw Poll: are you in favor of supporting the Proposal as it is in 699r0, or as amended by Mathilde's Can vote for both.
- 2.4.6.2. JohnF: I count 8 for, 12 against, and 7 people abstain.
- 2.4.6.3. ChrisW: With that I would like to defer this motion until Tuesday.
- 2.4.6.4. MathildeB: My presentation is not against the 699 proposal; with this addition I would strongly support that proposal.
- 2.4.6.5. JohnF: Are you going to modify the normative text?
- 2.4.6.6. ChrisW: That is our intention.
- 2.4.6.7. JohnF: Can the ad-hoc groups not cover all of the comments listed in this presentation until that is presented?
- 2.4.6.8. Srinik: I believe we need to spend more time on the other comments.
- 2.4.6.9. JohnF: This paper addresses 9 no-voters, so I believe it has been worth this time. But when it comes up again, I am going to limit the remaining discussion to 10 minutes, since we know all the positions here. Since we want to bring this up tomorrow, then you need to submit it tonight.
- 2.4.6.10. ChrisW: We would prefer to address this tomorrow afternoon.
- 2.4.6.11. JohnF: That is fine. It is now 5:30pm. We will meet back at 7:00pm. I ask the ad hoc task groups to report back then.

2.5. Closing

2.5.1. Recess

- 2.5.1.1. JohnF recessed the group at 5:32pm until the Evening meeting.

3. Monday Evening, September 15, 2003

3.1. Opening

3.1.1. Call to order

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

3.1.2. Ad-Hoc Work

- 3.1.2.1. JohnF: As we decided earlier, we need more time to work in the ad-hoc groups. Are there any objections to recessing until 8:30pm for ad-hoc group work, and entertaining any motions at that time? Hearing none, that's what we'll do.

3.2. Recess for Ad-Hoc Work

3.2.1. Recess

- 3.2.1.1. JohnF recessed the meeting at 7:10pm until 8:30pm for motions.

3.3. Reconvening

3.3.1. Opening

- 3.3.1.1. JohnF called the meeting to order at 8:35pm.
- 3.3.1.2. JohnF: Are there any motions that are ready now? Hearing none, and listening to the ad-hoc discussions, I believe that you are making good progress. Does everyone agree that we should continue with the ad-hoc group work and reconvene tomorrow for motions?

3.4. Closing

3.4.1. Recess for ad-hoc work

- 3.4.1.1. JohnF: Are there any objections to doing that? I hear none, so we will continue the ad-hoc meeting now and reconvene in the next session at 8am tomorrow.
- 3.4.1.2. JohnF recessed the meeting at 8:40pm.

4. Tuesday Morning, September 16, 2003

4.1. Opening

4.1.1. Call to order

- 4.1.1.1. JohnF called the meeting to order at 8:08 am.

4.2. Agenda Discussion

4.2.1. Papers

- 4.2.1.1. JohnF: Is the Motorola paper ready yet?
- 4.2.1.2. ChrisW: It won't be ready until tomorrow (it turned out to require some complicated logic), so we'll have to discuss it Thursday.
- 4.2.1.3. JohnF: Are there any other papers ready? Hearing none, then does everyone agree that we should continue with the ad-hoc group work and reconvene at the 10:30 session?

4.3. Recess for Ad-Hoc Work

4.3.1. Recess

- 4.3.1.1. JohnF: Hearing no objections, we will continue the ad-hoc group work and reconvene in the next session at 10:30am.
- 4.3.1.2. JohnF recessed the task group meeting at 8:10am.

4.4. Reconvening

- 4.4.1.1. JohnF reconvened the meeting at 10:32am.

- 4.4.1.2. JohnF: Are there any motions or debates right now?
- 4.4.1.3. MatthewS: We'd rather discuss these in the afternoon meeting.
- 4.4.1.4. JohnF: What's the ad-hoc progress?
- 4.4.1.5. Srinik: We've completed about 70 in the ad-hoc groups so far.
- 4.4.1.6. JohnF: Do we want to start on the format comments?
- 4.4.1.7. Srinik: We need to finish the 9 and 11 comments first.
- 4.4.1.8. JohnF: Then let's continue with the ad-hoc group work.
- 4.4.1.9. JohnF: Are there any objections to recessing for ad-hoc work until the afternoon session? Hearing none, the task group is recessed until the afternoon session.

4.5. Closing

4.5.1. Recess

- 4.5.1.1. The meeting recessed for ad-hoc work at 10:35am.

5. Tuesday Afternoon, September 16, 2003

5.1. Opening

5.1.1. Call to order

- 5.1.1.1. JohnF called the meeting to order at 1:08pm

5.2. Comment Process Review

- 5.2.1.1. JohnF: What do we want to do about comment resolutions now?
- 5.2.1.2. Srinik: We have resolved 71 comments so far.
- 5.2.1.3. MatthewS: And that is in one day; so we will resolve at most 310 of the 529 technical comments.
- 5.2.1.4. JohnF: Can we do another recirculation ballot after this meeting?
- 5.2.1.5. MatthewS: No. No chance.
- 5.2.1.6. JohnF: Then I would like to cover frame questions, since they should be non-controversial. At a minimum I would like to knock out the comments we have resolved so far, as well as the ones from the New Jersey interim meeting and from the teleconference. Also I expect to ask the groups to continue their ad-hoc work tomorrow, even though we do not have official meeting times for the day.

5.3. Recess for Ad-Hoc Work

5.3.1. Recess

- 5.3.1.1. JohnF: With that, does anyone object to continuing the ad hoc group work until the next session, at 3:30pm? Hearing none, we are in recess until the next session.
- 5.3.1.2. The meeting recessed for ad-hoc group work at 1:23pm.

5.4. Reconvening

5.4.1. Opening

5.4.1.1. JohnF called the meeting to order at 3:45pm.

5.5. Comment Discussion

5.5.1.1. JohnF: Do I have any requests for anything but ad-hoc work activities?

5.6. Closing

5.6.1. Recess

5.6.1.1. JohnF: Hearing no requests, we will continue with the ad-hoc activities.

5.6.1.2. The meeting recessed at 3:50pm for ad-hoc group work until the Evening meeting.

6. Tuesday Evening, September 16, 2003

6.1. Opening

6.1.1. Call to order

6.1.1.1. JohnF called the meeting to order at 7:20 pm.

6.1.2. Ad-Hoc Work

6.1.2.1. JohnF: Does everyone want to continue with ad-hoc groups, or have presentations?

6.1.2.2. MatthewS: We're working well in ad-hoc groups, in fact our group has finished Clause 11. Do we want to move to Clause 7 or Clause 9?

6.1.2.3. SriniK: Would rather move to Clause 9.

6.1.2.4. MatthewS: So our group will move to Clause 9.

6.1.2.5. JohnF: Are there any objections to recessing until Thursday morning for ad-hoc group work? Hearing none, that's what we'll do.

6.2. Closing

6.2.1. Recess

6.2.1.1. The meeting recessed at 7:25pm for work in ad-hoc groups.

7. Thursday Morning, September 18, 2003

7.1. Opening

7.1.1. Call to Order

7.1.1.1. JohnF called the meeting to order at 8:10am.

7.2. Discussion of Procedures

- 7.2.1.1. JohnF: Are there any motions or documents available now?
- 7.2.1.2. MatthewF: We gave a list to the editor, but don't know where his most recent document is right now.
- 7.2.1.3. SidS: We have resolved a number of comments. Matthew has the updated spreadsheet.
- 7.2.1.4. ChrisW: Our proposal is in the documents 03/698 and 03/699, which have been on the server.
- 7.2.1.5. CharlesW: I will have a presentation later today that will resolve a number of comments. When do I need to get it on the server?
- 7.2.1.6. JohnF: Typically it will be 4 hours; but please see me if you need an exception.
- 7.2.1.7. CharlesW: What is scheduled for this evening?
- 7.2.1.8. JohnF: We don't have an evening session; our sessions end at 5:30pm today. This afternoon there will be coverage of a number of comments and we have the fixed orders. We also have been authorized to have an October interim meeting; so we also need to see whether that meeting will make sense.
- 7.2.1.9. ThomasK: I uploaded two days ago a presentation on frame formats.
- 7.2.1.10. JohnF: Now would be a good time to present that. Matthew, could you update that group? How many comments have been covered?
- 7.2.1.11. MatthewS: In the original rev there were 70 comments resolved, but unfortunately the spreadsheet isn't updating correctly.
- 7.2.1.12. JohnF: Then after the paper from Thomas we'll go into recess for ad-hoc group work.

7.3. Papers

7.3.1. *"Clarification of EDCA Parameter Element", 03/0743, Thomas Kuehnel*

- 7.3.1.1. ThomasK: This proposal resolves comment 923. There were two variations of the EDCA parameter set element – one with 1 octet, one with 18. This proposal is for 18 octets, which most developers have said will be easy to implement. Text is added to clauses 7.2.3.1, 7.2.3.5, 7.2.3.7, 7.3.2.14 and 7.3.2.20 and an ACInfo field is added to the QoS capability element format. The ACInfo field has the same functionality, but the number of permutations has been reduced.
- 7.3.1.2. MathildeB: Are you removing elements from the beacon?
- 7.3.1.3. ThomasK: No.
- 7.3.1.4. MathildeB: So the effect is that they are not in all beacons?
- 7.3.1.5. ThomasK: Yes. The EDCA, a long element, is not present in all beacons. Still, the short one is present in any case.
- 7.3.1.6. MathildeB: In the Interim meeting in New Jersey you were proposing a different load element.
- 7.3.1.7. ThomasK: That's a different issue.
- 7.3.1.8. Srinik: How about calling this name "QoS Capability"?
- 7.3.1.9. CharlesW: Does WME now diverge from this?
- 7.3.1.10. ThomasK: This is implicitly in WME. This distinction is already in that document, since we already had long and short element. But we also had a QoS capability element. So we have now merged the short element and the QoS capability element.
- 7.3.1.11. MatthewF: Does this paper deal with the problem of identifying which form is used when a probe request is sent?
- 7.3.1.12. ThomasK: Yes. See the 7.2.3.9 directive in this paper – to remove the QoS Capability element.
- 7.3.1.13. ThomasK: So I propose to change the name in this document.

- 7.3.1.14. SriniK: The name change is just an editorial issue.
- 7.3.1.15. JohnF: So please write your motion on the screen.
- 7.3.1.16. ThomasK: I move to instruct the editor to incorporate 03/743r0 into the next version of the TGe draft.
- 7.3.1.17. RichardL: Second.
- 7.3.1.18. JohnF: Is there any more discussion on this motion? Hearing none. Is there any objection to approving this motion? Hearing none, this motion is passed by unanimous consent.

7.3.2. Ratification of Interim Meeting

- 7.3.2.1. JohnF: I was directed at the CAC to ratify the changes made in the Interim meeting. So we need some time to review those changes.
- 7.3.2.2. MatthewS: The technical document is 03/658r5 and this has been on the server for weeks.
- 7.3.2.3. JohnF: Please review this document and I will ask if anyone has exceptions to the resolutions made in this meeting.
- 7.3.2.4. SriniK: 03/677r1 is the minutes for this meeting.
- 7.3.2.5. JohnF: I would like to ratify both documents in this meeting. Please review those documents.
- 7.3.2.6. MatthewS: Our ad-hoc group has resolved about 70 comments in the 9.x clauses, except clauses 9.10.1 and 9.10.2.
- 7.3.2.7. JohnF: In a few minutes I will ask for discussion of 03/658r5 and we will vote whether to ratify the minutes. So please review those now.
- 7.3.2.8. JohnF: Are there any comments on this document? Hearing no takers for suggestions or comments, at this time I would like to ask the voting members if there are any objections to ratifying this document, 03/658r5, which was approved at the August Interim meeting? Hearing none, this document is approved unanimously.
- 7.3.2.9. JohnF: Now we need to take up the minutes of that meeting, document 03/677r1. Is there any discussion of these minutes? Hearing none, is there any objection by the voting members to the approval of this document? Hearing none, this document is approved unanimously.

7.4. Recess for Ad-Hoc Work

7.4.1. Recess

- 7.4.1.1. JohnF: Please make sure you review the paper 03/698r0 and we will discuss that at 10:30am. So, if there are no more papers, we will recess for ad-hoc work until the 10:30am session. Hearing none, we are in recess.
- 7.4.1.2. The meeting recessed at 9:02am until the 10:30am session.

7.5. Reconvening

7.5.1. Opening

- 7.5.1.1. JohnF called the meeting to order at 10:32am.

7.6. Papers

7.6.1. "Further Discussion on EDCA Power Saving Mechanisms", 03/698r0 and 03/699r0, Stephen Wang, et al

- 7.6.1.1. JohnF: We discussed the next topic quite a bit of time Monday, but I will allow more discussion now, partly because we won't be able to go to another ballot

- this week, and partly because I see a number of new faces here that weren't here Monday.
- 7.6.1.2. StephenW: This is partly in response to the discussion we had Monday. In this proposal a TSPEC is used to set up an unscheduled service period and a data Ack is protected by the DL Data NAV. This proposal is optional; you can still use the legacy approach – though at the cost of additional power drain. If lost Ack is a bigger issue to you than power drain, then just use the legacy approach. But the QoSNull piggyback proposal requires additional careful assessment.
- 7.6.1.3. JohnF: Any discussion on this?
- 7.6.1.4. AndrewM: On slide 2 you talk about legacy power management. I believe there is no such thing, since MoreData bit is always set 0.
- 7.6.1.5. StephenW: Good point.
- 7.6.1.6. ChrisW: We believe the lost Ack problem is significant, but also believe that we need to decide between the various proposals that have been made.
- 7.6.1.7. MathildeB: I can support this proposal, especially because this doesn't require so many changes to the draft. I will make an additional proposal to handle the lost Ack problem that is consistent with this proposal.
- 7.6.1.8. MatthewS: I want to second what Mathilde is saying. This proposal is an improvement over legacy. One enhancement is that legacy is one frame at a time; this proposal has the major advantage of covering multiple frames. I also support fixing the one issue (lost Ack) within this context.
- 7.6.1.9. StephenW: I believe if we don't solve that problem, we could cause even more comments.
- 7.6.1.10. Srinik: I also favor this proposal, but would like to see the patent statement.
- 7.6.1.11. JohnF: I have only a hard copy of that.
- 7.6.1.12. StephenW: I believe that I can find the soft copy.
- 7.6.1.13. JohnF: I will allow you to read this, but there will be no discussion of this.
- 7.6.1.14. ChrisW read from the Motorola document "Letter of Assurance for Assigned Patents".
- 7.6.1.15. ThomasK: A question to Mathilde: are you aware of the IEEE patent policy?
- 7.6.1.16. MathildeB: Yes, I believe so. Honestly I haven't read them in detail, but I have read the statements on the web and have heard many statements by the IEEE 802.
- 7.6.1.17. JohnF: I believe everyone should review those policies.
- 7.6.1.18. JohnK: I would like to ask for a straw poll: who would favor this proposal.
- 7.6.1.19. JohnF: I count 23 for; 0 against.
- 7.6.1.20. Michael Moreton (MikeM): I would just prefer to wait until we see the fix before we vote on this.
- 7.6.1.21. AndrewM: I would favor allowing a superset.
- 7.6.1.22. JohnF: Let me make a comment here, since we are in the comment resolution phase. Please remember that Stephen represents "No" voters, so this might change some "No" votes; is that correct?
- 7.6.1.23. StephenW: Yes.
- 7.6.1.24. ChrisW: There are a number of other "No" voters on this issue?
- 7.6.1.25. JohnF: How many "No" voters made related comments?
- 7.6.1.26. Srinik: About 7 or 8.
- 7.6.1.27. JohnF: If those were reversed, we would get into the strong 90 percents. We don't often have a "No" commenter making a proposal of what would reverse their vote. And we are currently in the phase of trying to increase our percentages.
- 7.6.1.28. MathildeB: One possible way to deal with this is that I'm working with the normative text, and, if John could relax the 4 hour rule, I could propose something here. Is that alright with everybody?

- 7.6.1.29. JohnF: What is your procedural question here?
- 7.6.1.30. MathildeB: Would you be willing to waive the 4 hour rule so that we can take my proposal to a vote after they have heard it? This is a new proposal, but it is very simple.
- 7.6.1.31. JohnF: Since it's new I can't make a comment without seeing the paper. When you submit it, I will ask the group whether they can waive the 4-hour rule.
- 7.6.1.32. MatthewF: Accepting this would change a "No" vote to "Yes" is a misrepresentation; this may be just one of many issues for each "No" voter.
- 7.6.1.33. JohnF: I said "possibly", and please keep that in mind.
- 7.6.1.34. SidS: I express support for seeing Mathilde's proposal and voting at that when it is proposed. I would like to make two points about this: (1) I support this proposal and I favor voting on this proposal now, because it is complete and will work. (2) It may be the case that our discussion turns up other complications later, but we can treat them then.
- 7.6.1.35. MatthewS: Stephen is not a voter, but many of his colleagues are voters who voted on this. I would also support Mathilde's proposal if it were supported by others.
- 7.6.1.36. MathildeB: I have received support from several companies for my proposal.
- 7.6.1.37. JohnF: That really isn't necessary; it was just a suggestion by Matthew. As an individual you can make any proposal you like.
- 7.6.1.38. JohnK: I support what Sid said: support this proposal now, and Mathilde can work on her proposal and make that later.
- 7.6.1.39. ChrisW: I agree with what John said, and would like to make the motion: I move to instruct the editor to incorporate the normative text in document 03/698r1 into the next draft of TGe.
- 7.6.1.40. SidS: Second.
- 7.6.1.41. MikeM: I would like to see a full proposal, but I believe that we don't need further discussion on it, so I call the question.
- 7.6.1.42. JohnK: Second.
- 7.6.1.43. JohnF: Voting members only, is anyone objecting to calling the question? Seeing none, the question is called. So now we vote.
- 7.6.1.44. JohnF: The motion is technical; voting members only. This motion passes with 20 : 2 : 5.

7.6.2. Additional Proposals

- 7.6.2.1. JohnF: We need to see if there are more proposals. I know Charles is working on one but isn't ready yet. And Mathilde is working on one and isn't ready yet. Are there any other presentations available? Hearing none, what about the ad-hoc groups?
- 7.6.2.2. Srinik: Document 03/658r7 has all the comment resolutions through Tuesday and was put on the server Tuesday night. This document includes the resolutions by both of the ad-hoc groups.
- 7.6.2.3. JohnF: So r7 has adequate time on the server, and so we can vote on those when we reconvene.
- 7.6.2.4. MatthewS: By the end of lunchtime today we can have r8 with new resolutions.
- 7.6.2.5. JohnF: So everyone look for r7 and r8 on the server, and we will review those after lunch.
- 7.6.2.6. JohnF: If there are no objections, we will recess for ad-hoc work until the afternoon session. Hearing none, we are recessed for ad-hoc work.

7.7. Closing

7.7.1. Recess

- 7.7.1.1. JohnF recessed the meeting at 11:17am until the afternoon session.

8. Thursday Afternoon, September 18, 2003

8.1. Opening

8.1.1. *Call to order*

8.1.1.1. JohnF called the meeting to order at 1:12pm.

8.2. Discussion of Papers

8.2.1. *Schedule*

8.2.1.1. JohnF: Are there any further papers? Hearing none, we will go back to ad-hoc work. Special orders start at 4:00pm today. We will discuss other new business. We have been pre-approved for an Interim meeting in October and we will discuss that then.

8.2.2. *Recess*

8.2.2.1. JohnF: Since there are no papers available now, we'll recess until 3:30pm for the ad-hoc groups to work. We'll have reports from the ad-hoc groups then.

8.2.2.2. The meeting recessed for ad-hoc group work at 1:16pm.

8.3. Reconvening

8.3.1. *Opening*

8.3.1.1. JohnF called the meeting to order at 3:32pm.

8.4. Motions

8.4.1. *New*

8.4.1.1. JohnF: What remains on the agenda is Old Business, New Business

8.4.1.2.

8.5. Fixed Agenda Items

8.5.1. *Old Business, New Business*

8.5.1.1. JohnF: I don't have any business from previous sessions. Does anyone have any topics for old business? I am not aware of any. Hearing none, we'll move to new business. We have been approved to have an Interim meeting in October. I would suggest that we should take advantage of it. I'd like to hear some discussion of it, then whether there is anyone interested in hosting it.

8.5.1.2. Isaac: Can we send out for recirculation from that meeting?

8.5.1.3. JohnF: Yes, it will be an interim meeting. Any further discussion? I hear none, so we'll plan to have one and discuss the location later. Is anyone opposed to having teleconferences?

8.5.1.4. CharlesW: I believe we should have teleconferences.

8.5.1.5. SidS: We're already approved to hold teleconferences.

8.5.1.6. JohnF: Yes, but we could just say we aren't having teleconferences. Is anyone opposed to holding teleconferences? Hearing none, we'll have teleconferences, too. So now let's look for a date for the October meeting.

- How about the week of the 6th or the 13th, then we could send for a 15 or 20 day recirculation ballot and would then be in good shape for November. Matthew, could you show some motions on the projector?
- 8.5.1.7. MatthewS: Ok.
- 8.5.1.8. SriniK: I move to hold the interim meeting October 13-16, starting Monday at 2pm and ending Thursday at 4pm. Meeting hours will be 8-6, except Monday and Thursday.
- 8.5.1.9. JohnK: Second.
- 8.5.1.10. JohnF: How many comments do we have left?
- 8.5.1.11. SriniK: About 260.
- 8.5.1.12. JohnF: We can knock them out in the next meeting cycle, because we have teleconferences too.
- 8.5.1.13. SidS: The starting time Monday will be a function of where it is.
- 8.5.1.14. JohnF: That's ok, we can keep consistent with what we've done. I can offer Florida as one possible location.
- 8.5.1.15. Isaac: The week of the 6th would be better for me.
- 8.5.1.16. MatthewS: How about a straw poll on dates?
- 8.5.1.17. JohnF: Vote for one or the other: who would be willing to attend on October 13th? Who would be willing to attend the 6th? I see only 2 people and 4 people. Any more discussion?
- 8.5.1.18. MatthewS: I move to amend the motion to the week of the 6th and ending the 9th.
- 8.5.1.19. SriniK: Second.
- 8.5.1.20. JohnF: Is there any discussion on this motion to amend? Is there any objection to accepting this? I see one objection, so we will vote. I count 4:1:12, so the motion to amend passes. Now to the main motion, as amended. Does anyone object to this motion? Seeing none, this motion is passed unanimously.
- 8.5.1.21. MatthewS: I move to fix the location of the interim meeting at Melbourne, Florida.
- 8.5.1.22. SriniK: Second.
- 8.5.1.23. JohnF: Any discussion? Hearing none, is there any objection to this motion? Hearing none, this motion is passed unanimously.
- 8.5.1.24. JohnF: Is there any discussion on the teleconferences?
- 8.5.1.25. SriniK: I will not make it back to Portland until Tuesday, so don't know if I can set up the teleconference in time for next week.
- 8.5.1.26. JohnF: Either we can have someone else host it, or can someone else do it?
- 8.5.1.27. MatthewS: Either Amjad Soomro or I can host it.
- 8.5.1.28. JohnF: OK. Just make sure that you announce it so that everyone is informed.
- 8.5.1.29. JohnF: Matthew Fischer just approached me about the Interim meeting. Since Stuart is here, I want to ask Stuart about this. We would like to hold the meeting on October 6; does the previous announcement of the Interim count as being 30 days before?
- 8.5.1.30. Stuart Kerry: If you had requested October 13th in the opening Plenary you could have made 30 days. But October 6th would not. Why did you need it these weeks?
- 8.5.1.31. JohnF: In order to have a 15 day recirculation ballot before the November meeting.
- 8.5.1.32. AndrewM: I would argue that a 15day recirculation is not enough to evaluate the changes from the number of comments we have now.
- 8.5.1.33. JohnF: It's now special orders time, 4pm, so let's do that now and later come back to this subject. The two special orders are: (1) to cover the comment resolutions that we have so far; and (2) whether we go to recirculation or not. I would like to discuss the 15 day recirculation issue along with that.
- 8.5.1.34. MathildeB: I would like to announce that we have new normative text on the server in document 03/793.

- 8.5.1.35. JohnF: If you can summarize r7 and r8 and show us those, then we can see if anyone has objections to those.

8.5.2. Comment Resolutions from the Ad-Hoc Groups

- 8.5.2.1. Srinik: This is document 658r8, posted at 12:05pm today. This includes all of the comment resolutions from 658r7. These cover 9.9.1, 9.9.2 and clause 11. We have resolved 150 comments this week. We have 297 left, but have resolved 20 more since Noon. But those don't meet the 4-hour rule, so we're not bringing them up now. The comments being resolved here are marked in green in this document. Are there any questions about particular ones?
- 8.5.2.2. Isaac: Comment 326. I was confused here about APSD because I had been told earlier that APSD for a non-AP QSTA, then the aggregation can only be 1, not 0.
- 8.5.2.3. Srinik: There also can be best effort that should be aggregated, and otherwise this would not be. The issue is the last sentence of (b) in 9.9.2.4.
- 8.5.2.4. Isaac: My understanding is that if APSD is on, then there is no non-aggregated case.
- 8.5.2.5. MatthewS: That is my understanding as well.
- 8.5.2.6. Isaac: So will the last sentence of the recommended change be added?
- 8.5.2.7. MatthewS: No, that is not part of the proposed resolution.
- 8.5.2.8. Isaac: In comment 446, shouldn't it be "or" instead of "and"?
- 8.5.2.9. Srinik: I agree; we will remove this comment from this list and come back to it.
- 8.5.2.10. Isaac: What does it mean in some resolutions to say "counter".
- 8.5.2.11. Srinik: That's for another proposal.
- 8.5.2.12. MatthewF: That is just the West Coast term for "alternate resolution". I believe that "alternate resolution" would be better.
- 8.5.2.13. CharlesW: What about 9.9.2.1 comments?
- 8.5.2.14. Srinik: Those are not included; we are waiting for a proposal on resolution. Any more comments?
- 8.5.2.15. JohnF: Please craft the motion without the comment resolution you have agreed to leave out.
- 8.5.2.16. Srinik: I move to accept the resolutions contained in 02/658r8 that are marked green, with the exception of comment 445, as the response to the corresponding comments. Further instruct the editor to incorporate any instructions that are provided in the "Recommended Disposition" column in the next TGe draft.
- 8.5.2.17. JohnF: Before I ask for a second, are there any friendly amendments to this motion? Hearing none, is there a second?
- 8.5.2.18. MatthewS: Second.
- 8.5.2.19. JohnF: Is there any discussion on this motion? Hearing none, is there any objection to this motion? Hearing none, this motion is passed unanimously.
- 8.5.2.20. JohnF: Are there any other comments on the first of the special orders?
- 8.5.2.21. MathildeB: I have a paper.
- 8.5.2.22. JohnF: We are in special orders; I asked for papers at 3:30 and there were none. If we have time after the special orders, I will ask whether anyone objects to having more papers.
- 8.5.2.23. JohnF: There has been a challenge of our decision to have a meeting. I now agree that it is very borderline to argue that our previous announcement meets the 30 day rule. To meet the 30 day requirement, the earliest would be the week of October 20th. Then we can't do a 15 day recirculation, but we can still have an interim and approve interim motions. So it will still help to have this meeting.
- 8.5.2.24. Srinik: I agree it is better to do it right; it is better to have it the week of the 20th. I believe it will be very hard to finish all the comments in this meeting anyway.

- 8.5.2.25. JohnF: Any more discussion on this topic? I hear none. So I would like to know if anyone has an objection to rescind the motion we passed regarding the October 6th Interim meeting. Hearing no objection, we have rescinded the motion for an October 6th Interim meeting. Now we know we can't fit in a recirculation ballot. I am still offering Florida, but we can't do it the week of the 20th. The week of the 27th is possible.
- 8.5.2.26. AndrewM: Need to ask the question of who might come on the week of the 27th.
- 8.5.2.27. JohnF: How many would be able to attend? I see only about 3-4 hands. I guess we have no choice but to attempt that date. Usually we have about a dozen people finally show up.
- 8.5.2.28. SriniK: I move to hold the interim meeting October 27-30, starting Monday at 2pm and ending Thursday at 4pm. Meeting hours will be 8-6, except Monday and Thursday.
- 8.5.2.29. JohnK: Second.
- 8.5.2.30. JohnF: Is there an discussion? Hearing none, is there any objection to passing this motion? Hearing none, this motion passes unanimously.
- 8.5.2.31. JohnF: Srini will be announcing the teleconferences, except the next one, which Matthew will confirm and announce.
- 8.5.2.32. JohnF: Is there any objection for Mathilde to present?
- 8.5.2.33. MatthewS: I would rather there be a presentation, but no motions now, and will call the orders of the day if an attempt is made to make a motion. The problem is that we have not met the 4 hour rule.
- 8.5.2.34. JohnF: I have to make it clear that this is outside the agenda, so if someone calls the orders of the day, I would have to rule in favor of that individual.

8.5.3. "Proposed Normative Text for Remedy to Lost Ack Problem", 03/793r0, Mathilde Benveniste

- 8.5.3.1. MathildeB: This addresses the ballot comments listed in this document. We'll have this situation in cases like reverse polling.
- 8.5.3.2. MatthewS: I believe you should use CFPoll rather than CFAck. I would like more time to think about this, and so intend to call for orders of the day.
- 8.5.3.3. MathildeB: But we are having a discussion about this.
- 8.5.3.4. SriniK: I believe that we don't need more discussion, so I call for the orders of the day.

8.6. Closing

8.6.1. Session close

- 8.6.1.1. JohnF: The orders of the day have been called, so this meeting is over.
- 8.6.1.2. The session closed at 4:46pm.

**IEEE P802.11
Wireless LANs**

Minutes 802.11i September Singapore Meeting

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Abstract

This document contains the meeting notes from the IEEE 802.11i September 15-19, 2003 interim meeting, held in Singapore.

1. Monday September 15th, 2003

Meeting called to order on Monday, September 15th, 2003 10:45am by the Chair.

Agenda:

1. Review IP policy and letters received
2. Chairs status – LB 52,57,60, Portland OR IEEE 802.11i meeting
4. Comment resolution: 03/683 Submission, Request Submissions for coment resolution, and other submissions
5. Prepare for next meeting

Ch: Any objection to adopting the agenda? No objection. Agenda adopted.

Chair read patent policy as displayed on the slides.

CH: Any patents to disclose? No, none identified. Any questions on the patent policy? No questions.

CH: Chair Status: Submission 03/683 is a replacement submission incorporating the editorial and many technical comments from LB60. Some comments were submitted as both technical and editorial. The document and comment spreadsheet are on the document server FTP site. These documents are also on a flash card & USB adapter, which are being passed around the room, if you're having problems accessing the server. Documents were on the server at 10:45am. Thus the vote on this document can happen at 2:45pm today.

C: Spreadsheet shows all but 7 comments pending.

CH: Dorothy is serving as secretary, since Frank can't make this meeting. If you are willing to help out, let us know.

CH: LB status, LB 52 passed with 76%, 2400 comments, LB57 passed with 78%, 1400 comments, LB 60 passed with 87%, 850 comments. Review the spreadsheet. If we were to vote to adopt document 03/ 683, we wouldn't be quite at this level; need to verify that all of the comments were addressed. Follow-up with motions, and go to re-circulation again.

Brought up in the ad-hoc, good to follow-up with people who made comments to make sure that their comments have been addressed.

Thanks to Jesse for organizing the Portland meeting. The TG developed 03/683 in Portland.

CH: Are there any submissions? I have one on the PICS, 03/705 – Annex A. 03/704, Clause 7; some of these may have been addressed in 704.

C: 03/709 Henry Ptasinski, EAPOL-Key Group key encapsulation, 8.5.2.

C: 03/713 Jesse Reference Diagram, Clause 5.9

C: Have you done one for the MIB comment?

CH: No, need to do those. Group needs to decide on resolution.

CH: Any other submissions?

C: Pre-authentication text needs to be submitted. Bernard wrote a white paper, need to cut and paste that in as a submission. Need to figure out the process to get an Ethertype.

CH: General discussion topics?

C: Yes. Need to figure out how to get the work done. Tim and Jesse to decide

C: Terry's comment on how to incorporate into 2003 version of the base IEEE 802.11 specification. Can't do deltas until 2003 version is available. Reject the comment since 2003 version not available. Or accept, and get a copy of the 2003 spec to work from. Assign to Jesse. Resolution – reject the comment.

C: Propose informational text on how to avoid man-in-the middle EAP attacks.

C: Bill Arbaugh is putting together a IRTF working group charter. Ask for comments back. Have meetings concurrent with the IEEE meetings. The IRTF group should link up with fast roaming SG.

CH: Is anyone ready to make motions at this time?

C: Any previous work to capture?

CH: Large amount of work was put in 03/683, can't vote on this until 2:45pm.

C: Get version 3 of 03/683 from the server or one of the flash cards.

CH: Work in an ad-hoc fashion now, until we can vote on the submissions (have been on the server).

C: Ask one question first: There are 2 comments requesting to merge the .11i MIB into the .11 MIB.

Which way do we want to do it?

C: Makes sense to merge it.

C: Market will require certification, WI-fi will require that RSN be supported.

C: What is the practical difference?

C: A pain to import MIBS from files. All of other groups have just incorporated their values.

C: Reason was that security was optional.

C: Shouldn't matter. Can be optional. Easier to work with if integrated.

C: What are the changes?

C: Delete 35 lines from current text. Merge the variables, Compliance section already merged. Add new text on the end, straightforward. Modify the submission to include this.

Ch: Clause C comments – Asking to put formal specification. What do we have in the document?

C: A statement that the specification is for WEP only. Refer to the main body of the text for TKIP and CCMP.

C: Commenter says that this is insufficient. Need a technical response saying why the text is sufficient.

CH: Have seen similar comments, that text is not sufficient. Can make the claim that the text is sufficient.

C: This will be taken to the standards board.

C: Respond that there are a large number of interoperable implementations that are based on this text.

C: But need TGI interoperability.

C: We do have a first cut at the work needed.

C: Need someone to do this.

Ch: This comment has been around several times. Have noted that we could modify annex C. TG decided to go with the response that we have. Current Annex C is incomplete. IEEE 802.3 removed the SDL from their spec.

IEEE 802.11i decided to leave Annex C there, and call out that it applied only to the older sections. Commenter will continue with this comment. We can go to sponsor ballot with this. Excom will look at this to decide whether or not to go to sponsor ballot. We were trying to address the comment. Could go back to the commenter.

C: IEEE 802.11h was allowed to go to sponsor ballot without changes to annex C.

CH: Intent is to move forward, not to be antagonistic. Can continue on this path, or modify the annex. Or identify something else, short of annex C modifications that could meet the commenter's need.

C: At Excom, they don't decide if a formal description is needed. Look to see that the process has been followed to adequately deal with the comments. Comment will re-appear at the sponsor ballot. Then need to convince the sponsor pool and standards board.

CH: We have discussed and decided on a direction in the past. Suggest we take a straw poll on direction:

Straw Poll:

IEEE 802.11 Tgi should continue with the current direction of resolution for Annex C comments.

Vote: 18-0-5

CH: Continue and discuss with commenter.

C: Need to craft a technical response:

1. The text does fully define the operation, thus an additional specification in Annex C is not needed.
2. Cite IEEE 802.11h experience
3. The WFA WPA experience was based on the 802.11i Draft 3.0, which did not include Annex C changes. Many interoperable implementations of WPA have been built.

4. IEEE 802.3 has removed Annex C from their specifications. This shows that the section is not required for an 802 specification.

CH: Work this as an ad-hoc discussion? Chair will do this.

C: Comment 742, dealing with countermeasures needs to have the group's agreement.

C: Need to craft a technical response. 60 seconds is there to rate limit the attacker to one success per year. This was needed to discourage the forgery attacks.

C: The best known attack on 2(32).

C: No, the best is 2(29). Do a statistical survey of binning the hashes.

C: Brought this up several meetings ago. Niels said that this was going down a dangerous path. Being very careful with this. A contrived attack is known, which was 2(30).

C: When one is doing these designs, it's better to have a margin. Design goal was 2(20). Assume that there is an attack of this type.

C: Setting the bar too low.

CH: Do we want to reject this comment?

C: Yes. Discussion was that we needed to decide the level of discouragement needed. Have 1 year now.

Straw Poll:

Comment 742 should be rejected.

CH: Discussion?

C: If best attack is 2(30), then need 30ms as countermeasure delay to get 1 year.

C: If can't come to consensus on levels, then can't come to agreement.

C: Why is this group now worried over DOS attacks?

C: Some VOIP applications want to avoid additional DOS options. If want to avoid this, use AES based encryption, CCMP.

C: If worried about DOS, don't use this technology.

C: Then why do we have the countermeasures?

C: To prevent confidentiality attacks.

Straw Poll:

Comment 742 should be rejected.

Vote: 18-1-3

C: Discuss what the level should be used.

CH: Need someone to craft the response. Jesse volunteered.

C: This comment is complaining about dropping all of the users, not the 60 sec duration.

C: Had conversation with David Wagner, agreed that you need a lockout period. What should the duration be? No one really knows.

C: Did a crypto analysis showing 2(29), I'll upload the paper.

CH: Any objection to meeting in an ad-hoc fashion from not until 2:45pm this afternoon? Look at 03/683, see which comments still need to be included.

No objection. Work in an ad-hoc fashion after lunch.

Meeting called to order at 2:45pm.

CH: Now have motion on Document 03/683 as planned.

Motion: Adopt the text in document 03/683r2 as Version 5.1 of the IEEE 802.11i Draft.

Motion: Tim Moore

Seconded: Henry Ptasinski

Discussion:

C: will it still be able to go through and make sure that all comments have been addresses?

CH: Yes. Still have individual motions for several

C: Ok, just wanted to make sure there will be changes

C: Have found more editorial changes

Ch: We're not done for the week. Still have changes to make. Follow-up submissions needed now to finish up the spreadsheet.

C: Need for a wider distribution list?

Ch: Would like to look at the comments in a different light. See how many people have submitted comments, check with these people to see that they are satisfied with the comment resolution. Not everyone is here. Maybe send e-mail to them.

C: 5.1 is not the final for this meeting

C: There may be more changes. If we find more changes, can get these in.

C: This document is the stepping off point for this week, not 6.0.

C: Clean up by the end of this week.

CH: Any other comments?

Vote: 13-0-1 Motion Passes

Motion: In Clause 7.3.2.9.3, add the text “Figure 9” to the end of the third sentence.

Motion made by Tim Moore

Seconded: Clint Chaplin

Discussion: None

CH: Any discussion? None

Ch: Any objection to the motion? None. **Motion Passes by unanimous consent.**

Ch: Recess for the day.

2. Tuesday, September 16th, 2003

Ch: Call meeting to order at 10:35AM.

Motion: Reject comment 336 03/659 and include the following text as the reason for rejecting the comment:

While the claim this comment makes is true, there is no evidence that the lack of a formal description makes any difference in practice. Indeed, the evidence is to the contrary. The text of the TGi draft is sufficiently detailed and complete as to permit independent implementations. This claim may be verified by empirical observation. Wi-Fi Protected Access

(WPA) is based on an earlier version of the TGi draft, D3.0. Tgi draft D3.0 was sufficiently detailed to permit independent interoperable implementation of 802.1X supplicants from 4 different vendors, RADIUS servers from 2 different vendors, station NICs from 9 different vendors, and access points from 4 different vendors. This claim may be verified by consulting [http://www.wi-fi.org/OpenSection/Certified Products.asp](http://www.wi-fi.org/OpenSection/Certified_Products.asp).

Aside from key caching and incorporation of the group key into the 4-Way Handshake, the changes to the TGi draft after D3.0 have been exclusively to clarify text, not add new features. This means can we expect the current draft is more easily implemented than D3.0, which has already led to successful independent interoperable implementations. Furthermore, 802.11h was approved without any changes to the formal description in Annex C, and IEEE 802.3 has removed Annex C completely, indicating that IEEE 802.11, 802, and RevCom all believe that updates to the formal description are not necessary for correct and interoperable implementations of the standard. TGi therefore rejects comment 336 of 03/659.

Motion : Jesse Walker

Seconded: Clint Chaplin

Discussion? None

Vote: 16-1-0 Motion Passes.

CH: Discussion on reasons to vote no, if “no” voter is willing to share these now..

C: Many changes being made to the text, in parallel, can lead to conditions where text conflicts with itself.

CH: Have interoperable solutions.

C: Yes. But formal descriptions would prevent conflicts.

CH: Any other discussion? None.

CH: Announcement – Clarify meeting times for tomorrow, Wednesday. We start at 1pm in the afternoon. Some of the early printed sheets showed us meeting at 8am. The graphic is the definitive schedule source.

CH: Read comment 157, and the proposed change.

C: What does this mean?

C: “discard” is the proper word to use, this is what the base spec uses.

:C: Add words saying “without affecting the association state”.

Motion to address comment 157:

Motion to address comment 157: In clause 7.2.2 page 19, line 4, replace

“These frame types shall be checked that the frame body is null and if not discard the frame.”

with

“These frame types shall be checked that the frame body is null and if not discard the frame without indication to LLC.”

Motion : Henry Ptasinski

Second: Jesse Walker

CH: Discussion? None, Objection? None, **Motion passes by unanimous consent.**

CH: I'll ask Dorothy Stanley to act as the chair, while I make the next set of motions.

C: Discussion on comment of 03/704. Read through the proposed change. Any discussion? Opinions on adding a cipher, which says, add an option for "no encryption"

C: Does this apply only to the group key?

C: No, table includes Pairwise key.

C: Reason for no encryption?

C: To handle legacy equipment, e.g. for public space hotspot applications. Let station in and then offer encryption.

Motion: Adopt the changes in submission 03/704 to resolve comment 62.

Motion: Dave Halasz

Second: None

Motion was attempted but a second failed. Cite this as the reason to reject the comment.

C: Broadcasts need to come from different BSSIDs

C: Not against people coming in with no encryption.

C: If sta understands the ciphersuites, then can at least do TKIP.

C: Hotspot application. Have people who can do encryption to at least

Encrypt unicast traffic. Broadcast in the clear.

C: Authentication doesn't generate keys today.

C: People want multiple modes on different BSSIDs. In TGI, have logical APs with different BSSIDs

C: Look at comment 159. Table for AKM suite selectors. Adds text into the middle column to be consistent.

Motion: Adopt the changes in document 03/704 to resolve comment 159.

Motion – Dave Halasz

Second: Jesse Walker

CH: Discussion? None, Objection? None, **Motion passes by unanimous consent.**

C: Next comment is related. Also in AKM suite selector table. Why is there “none” instead of “PSK”

C: Because the authentication is implicit, no explicit authentication, done via the PSK.

Motion: Adopt the changes in document 03/704 to resolve comment 159a

Motion: Dave Halasz

Second: Dan Harkins

CH: Any Discussion? None, Objection? None, **Motion passes by unanimous consent**

C: Next comment is on Annex A. Don't view as controversial. Look at comment 36. Modifications to the PICS. CF1 is AP, and CF2 IBSS.

Motion: Adopt the changes in document 03/705 to resolve comment 36.

Motion: Dave Halasz

Second: Jesse Walker

CH: Any Discussion? None, Objection? None, **Motion passes by unanimous consent**

Chair returned to Dave Halasz

C: Discussion on Comment 742 Have many attacks, but using different keys. Don't know who the attack is against. Since packet was received with correct FCS and ICV check.

C: Attacking different keys, discussed with Neils. Probabalistic versus guaranteed.

C: Is it really 2(32)?

C: Differential attack against n people – still back to probabilistic attack.

C: Commenter wants less restrictive measures. What does that mean? Could reduce the 60 second limit. No one likes it, but need a compelling argument and need to understand the consequences. Have tried to obtain advice, experts don't know. It's a matter of judgement as to what's a disincentive to an attacker from creating forgeries.

C: Are half blind here. 2(20) is a design goal. Ended up with 2(30). Being cautious, stay with 2(20). Nobody knows what might come down in the future. Is there a reason to leave it the way it is? There are deployed products, which use this value. All for making a change if we know that there is a better value. But we don't

C: If the best attack is 2(30) then some number of milliseconds is the right order of magnitude. There hasn't been a lot of experience with Michael. AES, RSA have been extensively studied. There has been some study of Michael, but a lot of unknowns. Not evident that people are going to try to use this attack. If they want to do DOS, there are easier ways. Have to work hard to make a Michael attack work. Try to create a forgery.

We do allow the STA to associate to another AP.

Straw poll:**Comment 742 should be rejected.****Vote: 8-2-9****Consensus is to reject. Need to craft the text including reasons.**

CH: After lunch, continue with comments that need more time on the server. Continue at 1:30.

CH: Any objection? None. Meeting recessed until 1:30pm.

CH: Call meeting to order at 1:30pm.

C: Document 03/709, Deals with encapsulation of the GTK in the 4-way handshake. Changes are proposed to make it cleaner, more extensible. Key ID is now reserved, key data field as TLV. Allows key data field to be used for other purposes.

Ch: Why was this done?

C: GTK encapsulation – added on GTK to existing list.

C: Easy to chain these together, multiple keys, group key plus PMKID. Makes it extensible. Each one is self describing as in IEs.

C: Isn't this the same as a proposed change in SF?

C: No, this is different.

C: This turns the data field into a generic place to add extensions.

C: This is a good thing to do. Once EAP keying is done, there may be additional info that needs to be included in the message. If a higher-level protocol adds info, this can easily be done. The real problem is there is never an assertion by the AS of who the client is talking to. This gives a way to convey this info in the future.

C: Use the flag so that key data is protected. One flag controls whether or not the entire structure is encrypted or not.

C: May want to have one that's generic, and others that are specific to the field.

C: Chained together like IEs are in beacons. Right now, couldn't insert something ahead of the GTK. Using the OUI allows for vendor specific changes.

**Motion: Adopt the changes in 03/709r1 to address comments 197 293, 367, 733, 734,735, 844,
And correct the spelling of “shal” to “shall”.**

Motion: Henry Ptasinski

Seconded:Clint Chaplin

CH: Any discussion?

C: Are there restrictions on the data which could be included?

C: No restrictions. Receiver must ignore fields it does not understand.

C: Calling it “key data” then is not completely accurate.

C: Could change, usage is widespread

Vote: Motion passes 15-0-4

C: Need to examine this mechanism to make sure that a subliminal channel is not introduced.

C: Look at 03/744. This includes a number of editorial changes people identified in 03/683 and the changes needed to include the .11i MOB into the .11 MIB.

C: Are the MIB numbers correct?

C: As correct as can be.

Motion: Adopt the changes in document 03/744r1 to include the 802.11i MIB as part of the 802.11 MIB, and include selected editorial fixes.

Motion: Tim Moore

Seconded: Jon Edney

CH: Any discussion? None. Any Objection? None, **Motion passes by unanimous consent.**

Motion: Adopt the following changes:**Clause 8.1**

Delete last 2 sentences since definition in clause 3

This standard defines two classes of security algorithms for IEEE 802.11 networks: algorithms for creating and using a Robust Security Network Association, called *RSNA* algorithms, and *pre-RSNA* algorithms. Pre-RSNA Devices implementing Robust Security Network Association algorithms are called *RSN-capable*. STAs are otherwise referred to as *pre-RSNA*.

Clause 3

Pre-RSNA Equipment: A **device** is said to be **Pre-RSNA Equipment** if it is not capable (due to configuration or design) of creating Robust Security Network Associations.

General

Replace “non-RSNA” with “pre-RSNA” – 4 occurrences

8.4.4.1 – 3 occurrences

11.3.1 also remove “capable”

Motion: Tim Moore

Second: Kelly McClelland

CH: Any Discussion? None. Any Objection? None, **Motion passes by unanimous consent.**

Motion: Reject comment 742 and include the following text as the reason for rejecting the comment:

The counter-measures represent a compromise, to do what is feasible within the MIP constraints of legacy equipment. As a compromise, it makes many unhappy, because TKIP becomes inapplicable to some market segments. But TKIP also fails to provide the security guarantees of the more robust design based on AES, so makes the security community unhappy.

The comment suggests that failure to receive data is the only critical problem. But it is just as dangerous to interpret forged data as authentic. The suggested change increases the chance of undetected forgery, and this is a dubious bargain.

Motion: Jesse Walker

Second: Dorothy Stanley

Ch: Any wordsmithing?

Ch: Are we on the right track?

C: Yes, on the right track. Discussed in the past – fix WEP, or just do AES.

Decided to fix WEP. Not able to do everything. Fits in the spirit of the solution.

C: Originally had more text. TKIP not acceptable for govt, financial markets. The best we can do.

C: Hard to define “best”. Should be able to use less than 60 sec.

C: Suggestions for compelling reason?

C: No justification for 60 sec. Design goal required 60 sec shutdown, instead of looking at the results of the solution.

CH: Straw poll indicated agreement (or not) on disposition. Still need to make a motion. Wordsmith the comment? Does anyone want to change the wording.

C: Don't believe the change increases the change of unprotected forgery.

C: If we reduce the number, we don't know what the safety margin is. We're walking blind on this.

C: Have convinced ourselves that waiting a minute will be a deterrent to people launching forgery attacks. Does not deter DOS attacks. But there are easier ways to do DOS>

CH: Any Discussion? Any Objection? None

Vote: 15-1-0 Motion passes.

CH: We therefore reject the comment.

Motion: For the four reasons stated below, comment 745 should be rejected.

- 1. The 1999 802.11 standard makes the assumption that there is no session oriented information until after 802.11 Association. A security association cannot be constructed without the presence of a session.**
- 2. Pre-authentication would not be forwardable across the DS if authentication were to occur using 802.11 MAC authentication frames. This would limit the flexibility of pre-authentication design.**
- 3. The task group felt it was advantageous to utilize the existing 802.1X EAPOL frames for authentication rather than invent new 802.11 specific frames for this purpose. When 802.11 1999 was passed, there was no standard for 802 authentication. However, since then 802.1X has been passed and 802.11i has decided to leverage that standard.**
- 4. The task group felt it was important to remove authentication from the MAC since 802.11 is not the appropriate place to define authentication mechanisms.**

Motion made by Clint Chaplin

Second: Henry Ptasinski

Discussion

CH: Any objection to adding the word “to”? No. Accepted.

Vote: 19-0-0 Motion Passes

CH: At this point, ready for Bill Arbaugh’s presentations. Any objection to recessing until 3:30pm this afternoon?

No objection. Recessed.

CH: Convene at 3:35pm with Bill Arbaugh’s presentations

C: See document 03/731.

PSK with everyone using the same PSK. Insiders have active and passive attacks.

- An insider can capture the 4-way handshake and derive the PTK, then intercept traffic passively.
- - An insider can establish a man in the middle easily. Act as the AP.
- All by insiders, but no-one really cares about insider attacks.

Certificate system flaw: How does the STA know that the presented certificate belongs to an AAA server?

No way to verify that it comes from the server, someone can come with a valid cert, and act as a man-in-the-middle

MSFT caught this in L2TP and carried the prevention technique to EAP/TLS. Kudos to Microsoft on this one..

XP requires both a server and client OID in certificates

C: STA only accepts a server cert with the proper OID, Assumes CA only issues OID to AAA servers.

C: Recommend adding informational text to the draft explaining the dangers of PSK and strongly suggesting the use of both a server and client OID. Seek approval by the appropriate body of standard OIDs.

C: How does the OID help? Couldn't I just buy a server?

C: Yes, but you wouldn't get a server cert from the CA. CA is trusted.

C: Admin of the CA determines who can get a server OID.

C: For the auth to be meaningful, have to have conventions like this, or know the credential of the other party.

C: Many people just want to do pre-shared key. They need to be aware of this.

C: Need to point out limitations of PSK.

C: PSK has its use – e.g. SOHO. But some enterprises plan to use it, too much overhead with IEEE 802.1X.

C: Same thing happened in IPSEC.

C: If education is the problem, go to the Wi-Fi Alliance.

C: Need text in draft for CYA.

C: WFA asking for deployment strategy.

Straw poll by Bill Arbaugh:

The draft should include text indicating that PSK systems are vulnerable to insider attacks.

CH: Any further discussion? None.

Vote: 18-0-5

Straw poll by Bill Arbaugh:

The draft should recommend using EAP methods whose credentials differentiate between server and client roles. One example is the use of EAP-TLS digital certificates with client and server OIDs.

C: Should be more general. Credentials should differentiate between the client and server. Need a way to determine that the credential is valid. Works in an enterprise, may not work in a hotspot.

C: Server role is indicated by the OID.

C: Is a cert for the auth server needed?

C; Within a domain, a mail server can masquerade as a AAA server.

C: Should have a way to determine that it's a server of the type you expect. Ideally the OID would specify server type.

C: Sometimes have a device acting as server and client – print server.

C: If have both, that's ok. You've been authorized to have that role.

C: We haven't put this kind of info in the draft.

C: Clause 5.2.2.2 and 8.1.4 (informational) describe usage of EAP methods. Can add the text there.

C: Examples help to clarify the intent. Like to see them.

CH: Any further discussion? None.

Vote: 17-0-4

Document 03/746 – Proposed IRTF Research Group on Fast Hand-offs

C: Encourage research, and derive standards based on experimentation. Clear that fast roaming support will require work at layer 3. A research group is less formal than an IETF WG and the basis for drafts is experimental. IRTF RGs have had good success in moving ideas from the lab to standards in the past. A good way to link with 802.11

C: Draft charter available, located in tgi's working area. Contact Bill Arbaugh or Insun Lee insun@samsung.com if you are interested in being a charter member.

C: Fast roaming is a name that can be applied to a multitude of domains.

C: Looking at NAS-AAA interaction and inter-domain and intra-domain handoffs.

C; Need to have a summit among all the groups that are working on fast handoff.

C: Make something that works. About 75% of the code needed for the NAS-AAA interaction is in a testbed.

C: IRTF can be restricted in membership. Can operate in closed mode. The chairs determine the mode. Start in Open mode. Go to closed if needed.

C: Has the group been chartered?

C: Russ Housley has briefed the IESG. Charter being developed, with list of members. Vern Paxon then approves or not. He passes it to the IESG, they approve or not.

C: Result is a set of RFCs.

C: E-mail list will be going when have members.

C: Do need to have a summit. Need to work the politics. Many groups looking at this from different points of view.

C: Goal is to work closely with IEEE. There are several groups within IEEE.

C: Of all those groups there are few with validity. Need standards for these types of solutions. IRTF is a good place to go. Seamoby hasn't come through.

C: Will there be so many participants that you can't make progress?

C: If it gets to that point, close the group.

C: Conflict – IEEE 802.11 has to create consensus.

Document 03/713. there were 2 Comments 370 and 658, asking for an architecture diagram.

Motion: Instruct the editor to Replace figure 11 in clause 5.9.5 with the figure in document 03/713r1.

Motion: Jesse Walker

Second: Andrew Khieu

C: Why is the controlled port in the MAC?

C: The natural point is above the MAC. But packets don't cross the MAC SAP until keys are in place.

C: In the original diagram the DS interface isn't drawn. Hasn't been included as an architectural element.

C: Is this the right place for the 802.1X interface?

C: Yes.

CH: Any Discussion? None. Objection? None. **Motion passes by unanimous consent.**

Motion: PMKID – Comments 112, 113, 386, 421, 422, 662, 732

Motion to delete from 8.4.1

first bullet from PTKSA

- **PTKID, as defined in Clause 8.5.1.2. The PTKID identifies the PTK security association.**

first bullet from GTKSA

- **GTKID, as defined in Clause 8.5.1.2. The GTKID identifies the GTK ID.**

delete from 8.5.1.2

A PTK identifier is defined as

PTKID = HMAC-SHA1-128(PTK, "PTK Name" || SSID)

where the length of the SSID is the length from the SSID IE.

delete from 8.5.1.3

A GTK identifier is defined as

GTKID = HMAC-SHA1-128(GTK, "GTK Name" || SSID || BSSID)

where the length of the SSID is the length from the SSID IE.

Motion: Tim Moore

Second: Dan Harkins

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

C: There are two categories of remaining comments on PMKID. Would be ideal to have a PMKID that is the same as that which the EAP group is coming up with, and a couple of changes to cover corner cases.

C: Could reject the comments, with the explanation.

Motion: Reject Comments 112, 386, 662, with the following rationale:

We do not want another dependency on a draft standard. We may re-consider this when EAP Key naming becomes a standard. Synchronize with the EAP group at the October 802.11i meeting. We will continue discussion with the EAP group for alignment, prior to the 802.11i Sponsor ballot submission.

Motion: Tim Moore

Second: Jesse Walker

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Motion:

PMKID = HMAC-SHA1-128(PMK, "PMK Name" || BSSID || STA-MAC-Addr)

Change to

**PMKID = HMAC-SHA1-128(PMK, "PMK Name" || Authenticator-MAC-Addr ||
Supplicant-MAC-Addr)**

Motion: Tim Moore

Second: Dan Harkins

CH: Discussion on the motion?

C: Should the BSSID be tied into this?

C: In dual mode a/g/ might have different MAC addresses. Now, need to re-authenticate.

C: In an IBSS – issue with BSSID?

Vote: 14-0-3 Motion passes.

C: One more case to consider. Some applications will require sharing PMKIDs on the STA.

C: With this current definition, can share on the AP side.

C: Dangerous. Client will need to be re-written. Need a way to know that auth has happened.

C: Need to be consistent – AP and STA side.

C: Define AP first. AP can be a physical box with a set of APs inside.

C: Have a problem with the definition.

C: Clients with multiple MAC addresses. Currently can't share. MAC address is the only identifier. When that changes, it's a new peer, unless there is a mechanism to say that it's the really the same peer.

C: If MAC addresses are in the same box, OK. But no way to prove this.

C: Might be possible to fix in the keying framework.

C: Otherwise need to add in other IDs.

C: Time check. Dinner break is now at 5:30pm. Recess until 7:30 pm.

CH: Call the meeting to order at 7:47pm.

CH: TK Tan and Bruce Cramer would like to review the AD-Hoc AP par and 5 criteria with us. They'll come tonight.

MIB variables proposal 03/753 – Tim Moore

C: Folks at MSFT looked at MIB variables that would be useful to de-bug connection problems. List of 7 variables, store globally or per-sta, of what was negotiated. Identify policy de-bugging. RSN config entries allow either one globally, or per client. One gives more info, but takes more memory.

C: Can multiple auth suites be requested?

C: It's always one.

C: Why not enhance tracing capability?

C: Yes, but this is for the AP, and we don't control the AP. Equivalence for this in 802.11 for other variables.

C: Are these variables mandatory?

C: Yes, none of the MIBS are optional. If implement the feature, have to implement the MIB.

C: This is info that a support organization would love to have.

Motion: Add the MIB variables and definitions in 03/753 to the draft.

Motion: Tim Moore

Seconded: Andrew Khieu

CH: Any Discussion?

Vote: 8-1-0 Motion passes

C: Curious, what is the objection?

C: Just don't want to implement it. We have very good tracing implemented already.

Ch: Have one PMKID comment left, Clause 8.4 comments, and presentation from TK Tan on Mesh network PAR and 5 criteria.

C: Recess for 30 minutes.

Presentation by WNG – Par and 5 criteria for ESS Mesh

C: Build an ESS Mesh – extend WDS.

C: Why bypass SG phase?

C: If we look at the time to a result, can't see something that 6 months of study will produce which would change what we would undertake. Have a demonstrated protocol to start with.

C: There must be a reason for the SG.

C: Mesh has been demonstrated as working. Scope of problem is defined.

C: Trying to form TG around something that you already have, rather than letting people come in with proposals.

C: Disagree. Have a protocol, but PAR does not bind us to it. Is a point at which to start.

C: Is there a designated AP that is "special"?

C: No restriction to this in the PAR.

C: Review scope of project as defined.

C: Securing a MESH network is difficult. Try to limit the scope, so that it can be secured. Assumptions so far are that the APs be controlled by a single administrative entity.

C: What sort of security are you looking for? Sender is the real sender? End to end or hop by hop security? Tgi is hop by hop security.

C: Control the APs as in an ESS today.

C: Need to avoid the rogue AP problem.

C: APs are the devices that build the mesh. The mesh is dynamic. Each AP must trust the others.

C: Keep thinking about the IP multicast problem. One AP is the designated AP for authentication.

C: Could you look at this as Pre-shared Key IBSS?

C: Are you trying to make sure that all of the clients and APs are securely enrolled and sending authorized traffic?

C: Intent is to narrow the problem to securing the APs only. Re-use existing mechanisms for the clients. Add just what is needed for the WDS extensions. Client shouldn't have to differentiate and be aware that there is a mesh. What are the problems that we have to solve?

C: Next hop needs to be secure. Need a way for the clients to authenticate the APs.

C: The mesh is creating connectivity between APs. Client sees APs as it does today.

C: Remove magic constants. 32/255.

C: Need to make this a bounded problem. The IETF has been looking at very large networks.

C: 32 comes in for convergence reasons. Might want to allow variation.

C: Word "target" is used – a necessary ambiguity.

C: In WDS, TA and RA are unicast. Don't broadcast traffic.

C: In the 4 address frame format, don't have broadcast.

C: What happens to a broadcast packet?

C: AP has to protect the routing info. The AP must encrypt and decrypt on each hop.

C: Registration of APs. How to securely add it to the mesh. Same admin domain, with credentials.

C: Is there a requirement to re-key the mesh when an AP leaves?

C: There are ways to do this in the key hierarchy?

C: Can you have mixed wireless and wired?

C: Current view – just wireless, with link to wire.

C: Similar to and IBSS, use this as a basis.

C: Within an ESS, could some of the DS links be wired? Probably need to allow for this.

C: Portals are used, a gateway to another 802 subnet. Can gateway though a router.

C: ESS may have a mix of distribution links. There are security implications. The DS can be wired in .11. Here, have to address security on the wireless link. Some APs on wireless, some on wired. Explicit topology information.

C: Setting up the “routing info” is this being set up over the wired link? No.

C: Including both will make the problem more complex.

C: If we bound the problem as stated, is the wording that is in the scope reasonable from a security standpoint?

C: No Phy changes are in scope. Limit scope to a single admin domain – to bound the problem.

Straw poll by Steve Connor: The following security scope within the proposed IEEE 802.11 ESS Mesh PAR is reasonable:

The amendment shall extend IEEE 802.11i security mechanisms for the purpose of securing an ESS Mesh in which all of the APs are controlled by a single administrative entity.

Vote: 20-0-1

CH: Recess until 1pm Wednesday? No objection.

3. Wednesday, September 17th, 2003

CH: Call the meeting to order at 1:10pm.

CH: One PMKID comment, Clause 8.4, Pre-auth submissions. Want also to look at comments by submitter.

C: Want to do Clause 8.4 and the pre-auth text first.

C: Document 761 includes the Clause 8.4 motions.

Proposed Motions:

Comment 17: In 8.4.1, how does there exist more than one PMK between an AP and a station? It follows from the fact that a client will maintain only one association at a time?

Motion: After bullet 2 of the list for establishing a new security association, insert the informative note:

Informative Note. It is possible for more than one PMK to exist. As an example, a second PMK may come into existence through PMK caching. A STA might leave the ESS and flush its cache. Before its PMK expires in the AP's cache, the STA returns to the ESS and establishes a second PMK from the AP's perspective.

Motion: Jesse Walker

Second: Clint Chaplin

CH: Discussion on the motion?

C: Why is a history kept?

C: PMKs come from different sources

C: Might come from pre-authentication

C: No requirement to cache more than one, but not prohibited.

C: Why would a STA rely on the cacheing?

C: 0,1, or more can be cached.

C: Can't guarantee the state making sense. State most often makes sense with distributed database if the network can be partitioned. We have a partitioned network.

C: PMK – Auth server and supplicant. AS gives to Authenticator.

CH: Any more discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Motion: Change the sentence “A STA roaming within an ESS establishes a new security association by one of three schemes”

to

“A STA roaming within an ESS establishes a new **PMKSA by one of three schemes”.**

Motion: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comments 85, 98, 406: In 8.4.1, the commenter thinks it is more reasonable to include SSID in PMK SA rather than in PTK and GTK SA, and believes that the credential which will produce PMK during EAP authentication process will be chosen by SSID.

Motion: Add the following text after the list of PMKSA attributes:

Also included in the Authenticator PMKSA is every authorization parameter specified by the AS or by local configuration. This can include other parameters, such as the STA’s authorized SSID.

CH: Discussion on the motion?

C: Not sure this was agreed to in Portland. We should say yes or no to this, not weasel around it. Why stop at the SSID?

C: This may or may not be there.

C: How does the supplicant know the auth parameters?

C: If state is not synchronized, that's an avenue for attack. Have worried about this.

C: This is normative text. Not externally visible, so shouldn't be normative.

C: To make it work, need this. Supplicant and Authenticator SAa are different. Auth parameters are a function of local policy.

C: Wordsmithing?

C: Make it an informative note?

C:

Straw poll: We should make this text an informative note.

Vote: 8-0-10

Motion: Add the following informative note after the list of PMKSA attributes:

Informative Note:

Also included in the Authenticator PMKSA is every authorization parameter specified by the AS or by local configuration. This can include other parameters, such as the STA's authorized SSID.

Motion: Jesse

Second: Tim

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 174: 8.4.1 has the text: "In a BSS, there is one GTK". The definition of BSS is "IBSS or Infrastructure BSS" so this is incorrect.

Motion: Replace "In a BSS, there is one GTK SA" with

"in an **Infrastructure BSS**, there is one GTK SA ".

Motion: Jesse

Second: Kelly McClelland

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 175: 8.4.1, in its description of roaming step 1, it uses “cryptographic keys” to mean “temporal keys”, while step 3 uses the same term to mean "PMK"

Motion: Replace both instances of “cryptographic keys” in step 1

With

“PTKSA,” and the instance in step 3 with “PMK”.

C: Clean up terminology.

Motion: Jesse Walker

Second: Gary Spiess

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 378: This comment on 8.4.1 asks what are the units for the PMK Lifetime.

Motion: Replace “Lifetime” in the list of PMK attributes with

“Lifetime, specified by the lesser of the dot11RSNAPMKLifetime MIB variable and the AAA session timeout attribute”.

Motion: Jesse Walker
Second: Dan Harkins

C: Portland discussion. People getting confused w/ timeouts. Session timeout starts when 4-way handshake completes.

C: AAA delivers a key and the lifetime of the key. PMK lifetime bounds length of all possible sessions with the PMK. Can have lifetimes for the PTKS.

C: This argues for this as part of the PTK SA.

C: Re-auth is for re-auth, not a new key.

C: The key stays as long as the PMK lifetime.

C: Need another discussion. On the informative note.

C: Suggest lesser of 2 values and the AAA session timeout attribute”. Why does EAP care? EAP has nothing to do with lifetimes. Doesn't know about lifetimes.

C: AAA server tells how to use the key

C: Key lifetime and session lifetime (governs authentication) are different.

Vote: 9-1-6 Motion passes.

Comment 408: In 8.4.1 the PTK SA should not include SSID.

Motion: Remove the SSID from the list of PTKSA Attributes.

Add the following sentence after the list of PTKSA parameters as an informative note

Informative Note:

The PTKSA may include any authorization parameter specified by the AS or by local configuration. This may include the STA's authorized SSID.

C: Is there another comment dealing with the GTK?

C: GTKS global across multiple Auth sessions.

C: One broadcast group per bssid.

C: SSID remains as SA?

C: The SSID is part of the GTKSA.

Motion: Jesse Walker

Second: Tim Moore

Vote: 14-0-4 Motion passes

Comment 409: In 8.4.1 the PTK SA should include BSSID and STA MAC address.

Motion: Add "Authenticator MAC address" and "Supplicant MAC address" to list of PTK SA elements.

C: No inheritance structure is defined. Need to make these explicit

Motion: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 432: 8.4.1 includes the incorrect phrase “it is the same as the EAP SA”

Motion: Change the sentence “When the PMKSA is the result of a successful IEEE 802.1X authentication, it is the same as the EAP Security Association from the EAP authentication.”

to

“When the PMKSA is the result of a successful IEEE 802.1X authentication, it is derived from the EAP Security Association from the EAP authentication.”

Motion: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 724: In 8.4.1, in an IBSS the addresses used in the PMKSA definition are ambiguous.

Motion: In "The PMKSA consists of the following elements ... BSSID ... STA-MAC-Addr",

change

"BSSID" to "Authenticator MAC Address"

and

"STA-MAC-Addr" to "Supplicant MAC Address"

Motion: Jesse Walker

Second: Henry Ptasinski

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 725: In 8.4.1, the GTKSA element list should include Authenticator/TA MAC address if direction vector is receive (at least for IBSS).

Motion: Add Authenticator MAC Address to element list.

Motion: Jesse Walker

Second: Kelly McClelland

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 772: 8.4.1 says "If it does not have a cached PMK for ..."

Motion: Change this to "if it does not have a cached PMK for any of the supplied..."

C: Defer to later.

Comment 726: In 8.4.2, Since the RSN IE contains a single version number, this requirement

"A STA shall request the highest Version field value it supports among all those a peer STA advertises" is confusing

Motion: Change to

“A STA shall request the highest version field value it supports that is less than or equal to the version advertised by the peer STA.”

Motion: Jesse Walker

Second: Gary Speiss

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 107, 383, 510, 669: In 8.4.4, the purpose of including cipher suites in the beacons and probe responses is to advertise capabilities. How else would STAs determine if they can communicate compatibly?

Motion: Delete the first Informative Note from 8.4.4, and change the paragraph

The IEEE 802.1X entities of two directly communicating STAs negotiate pairwise key cipher suites using one of the 4-Way Handshakes. Thus, each pair of STAs within an IBSS may use the EAPOL-Key 4-Way Handshake to negotiate a pairwise key cipher suite. As specified in Clause 8.5.2, Messages 2 and 3 of the 4-Way Handshake convey an RSN IE. The Message 2 RSN IE includes a list of allowed pairwise key cipher suites, and the RSN IE in Message 3 reports the selected pairwise key cipher suite; the Message 3 RSN IE shall specify a pairwise key cipher suite from those suggested in Message 2, or else the 4-Way Handshake shall fail. Beacons within an IBSS shall specify an empty list of pairwise key cipher suites.

to read:

In an IBSS, all STAs must use a single broadcast cipher suite, and all STAs must support a common subset of unicast cipher suites, but any pair of STAs may negotiate to use any common unicast cipher suite they support. Each STA shall include the broadcast cipher suite and list of unicast cipher suites it supports in its Beacons and Probe Response messages. If the broadcast cipher suite is not the same, then the two STAs shall not establish a PMKSA between them. Similarly, if their unicast cipher suites do not overlap, then the two STAs shall not establish a PMKSA between them.

The IEEE 802.1X entities of two directly communicating STAs negotiate pairwise key cipher suites using one of the 4-Way Handshakes. As specified in Clause 8.5.2, Messages 2 and 3 of the 4-Way Handshake convey an RSN IE. The Message 2 RSN IE includes the list of pairwise key cipher suites enabled by its sender, and the RSN IE in Message 3 reports the selected pairwise key cipher suite; the Message 3 RSN IE shall specify a single pairwise key cipher suite from those suggested in Message 2, or else the 4-Way Handshake shall fail.

C: Portland resolution – delete informative note and revise paragraph to allow advertisement of IEs

C: Changing the purpose of the 4-way handskake. Need to prevent downselect.

C: This is in an IBSS. No association. May not have seen these RSNIEs before. Have to do the negotiation here, since don't have association messages.

Motion: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 381: 8.4.4 fails to specify which 4-Way Handshake determines the pairwise key cipher suite used.

Proposed Motion: Add the following text at the end of the re-write proposed by the Motion to address comment 107:

The pair of STAs shall use the pairwise cipher suite specified in the 4-Way Handshake Message 3 sent by the Supplicant STA with the lower MAC address.

C: Issue is that this is missing from the normative text.

C: In 8.4.9, have "Initiated by the STA with the lowe MAC address.

C: Solve this the same as for 382 and 660.

Comment 382, 660: 8.4.4 fails to specify which PTK is used to secure the Group Key Handshake from each STA.

Clause 8.4.9 specifies that each party uses the PTK derived in the 4-Way Handshake it initiated. This is specified in 8.4.9.

Motion: Insert the following sentence at the end of Clause 8.4.4:

The pair of STAs shall use the pairwise cipher suite specified in the 4-Way Handshake Message 3 sent by the Authenticator STA with the higher MAC address.

Delete the third sentence in the second paragraph in Clause 8.4.9.

Motion: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 434: 8.4.5 contains an informational note saying that APs may allow specific MSDUs to flow through the authenticators uncontrolled port" has interactions with VLANS, this needs to be specified.

Motion: Delete the informative note.

C: Portland resolution was that we haven't resolved relationships between vlans, BSSIDs, etc.

Motion: Jesse Walker

Second: Clint Chaplin

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 767: The first sentence of 8.4.5 conflicts with the later MIB decision tree and keying state machines. According to the pseudocode the AP or STA do not actually block non 802.1X data in the uncontrolled port. Additionally 802.1X does not reference an AP or STA making this statement confusing

Motion: Replace the first sentence in Clause 8.4.5,

When the policy selection process chooses IEEE 802.1X Authenticaiton, this specification assumes that a STA's Supplicant or an AP's Authenticator ordinarily blocks all non-IEEE 802.1X MSDUs after association completes, but prior to completion of IEEE 802.1X authentication and key management.

with

When the policy selection process chooses IEEE 802.1X Authenticaiton, this specification requires that an IEEE 802.1X controlled port blocks all non-IEEE 802.1X MSDUs after association completes, but prior to completion of IEEE 802.1X authentication and key management.

Motion: Jesse Walker

Second: Gary Spiess

CH: Any discussion? None. Objection? None. **Motion passes by unanimous consent.**

Comment 774: 8.4.6 says "If the STA believes that the AP has cached it's PMK, the STA may utilize PMK caching (Clause 8.4.6.2) during it's (re)association. " The next sentence goes on to talk about pre-authentication. It implies that pre-authentication is the only way a PMK can be cached. This is not true.

Motion: Delete second sentence in paragraph following the numbered list, "If IEEE 802.11 pre-authentication fails..will fail."

Motion: Jesse Walker

Second: Clint Chaplin

CH: Any discussion? None. Objection? None. **Motion passes by unanimous consent.**

Comment 849: On p 65, lines 40-42, 8.4.6 describes STA behaviour on 802.1X failure, but not AP's behaviour

Motion: Add the following sentence at the end of the last paragraph, before the last 2 informational notes:

: "If IEEE 802.1X authentication fails, then the AP shall disassociate the STA."

Motion: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion passes by unanimous consent.**

Comment 729: In 8.4.6.2, if both sides assert possession of a cached PMK and the 4-Way Handshake fails both sides must delete the cached PMK for the selected KEYID" should be normative.

Motion: Change "must" to "shall"

Motion: Jesse Walker
Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 777: 8.4.6.2 has abiguouity in PMK caching defintion.

Potential Motion: Insert the following sentence after the sentence “If it does not have a valid PMK it clears the bit in its (re)association request.”

“Any PMK IDs in a (re)association request shall be ignored if the PMK caching bit is not set.”

C: PMK caching bit has been deleted, since PMK cacheing is mandatory.

C: Commenter satisfied. No motion made.

Comment 385, 661: In 8.4.7 the authentication mechanism is very specific to limited configurations and use cases.

Motion: Add the following two paragraphs to clause 8.4.7:

The model for security in an IBSS is not general. In particular, it assumes that all of the STAs are in direct radio communication. In particular, there is no routing, bridging, or forwarding of traffic by a third STA to effect communication. This assumption is made, because the model makes no provision to protect IBSS topology information from tampering by one of the members.

If one STA believes that it is out of range of another STA, then it shall delete the PTK and GTK SAs it shares with that STA. This replaces the same function provided by an association in an Infrastructure BSS.

C: Text with some overlap has been added.

Move: Jesse Walker

Second: Tim Moore

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 850. 8.4.7 stipulates use of essentially 2 802.1X processes, with each STA acting as both a Supplicant and Authenticator. No provision is made for when one of the Authenticators enters re-authenticate state and sends and EAPOL-Start to a connected Supplicant. This can produce an out of balanced situation since the process is to wait for both 802.1X exchanges to run and then throw out one PMK and use the other. A mechanism is needed to trigger the other side. Thus the AS with the shortest timeout wins.

Motion: Add following after the second paragraph:

If the Authenticator of the STA's peer enters its re-authenticate state and sends an EAPOL-Start, this process is to run to completion, and the STA's authenticator shall initiate the opposite authentication handshake. If either authentication fails, then the STAs shall delete any PMK, PTK, or GTK SAs that may exist between them.

C: Dave Nelson has added related text.

C: Ok, that text addresses this comment. No motion made.

Comment 78: In 8.4.8, a paragraph starts talking about 802.1X but ends up referring to the 802.1aa state variable.

Motion: In anticipation of 802.1aa being incorporated into 802.1X, change references to 802.1aa to 802.1X throughout the document.

C: Can't go to revcom until .1aa has been finished. Presume that .1aa will become .1X.

C: Already done as an editorial comment.

Comment 79: A paragraph 8.4.8 starts "The AP may queue..." makes no sense. The same applies to any of the handshake messages which is AP can't send. The fact that it queues it and then discards it doesn't mean it should always disassociate - it might vreate a new message after discarding the first.

Motion: Delete the cited paragraph.

C: Had a related comment that if group key handshake doesn't complete, de-authenticate after the timeout.

C: Fixed by the resolution of another comment. No motion made.

Comment 417: 8.4.8 contains the sentence, "IEEE key state machines signal the completion if key management by utilizing the MLME-SETKEYS.request" is wrong.

Motion: Delete this sentence.

C: Comment already addressed.

Comment 187: 8.4.9 says that a check is required that the multicast cipher and AKMP match that in beacons and probe responses. What if it doesn't? What if the beacons don't contain an RSN IE (because this is a TSN, and all the recent beacons have been sent by pre-RSNA devices)

Motion: The consistency of Beacons in an IBSS must be maintained, but the method of achieving this consistency is outside the scope of this standard. Clarifying text has been added.

C: Already adopted.

Comment 188: 8.4.10 doesn't cover all the cases.

Motion: Replace with "An RSNA is terminated by invocation of any of the MLME association, reassociation, disassociation, authentication, or deauthentication request or indication primitives. Both the MAC, and the IEEE 802.1X Supplicant and Authenticator shall delete all temporal keys, and all state derived from those keys, before invoking one of these primitives, or on receiving one of these primitives. In addition, the IEEE802.1X Supplicant and Authenticator shall also delete the PMK if PMK caching is not enabled."

C: Already adopted and included.

Comment 418: 8.4.10 deletes the GTK if an AP or a STA in IBSS if the GTK is generated by the STA. This should not happen.

Motion: Change the sentence to read "In the case of an ESS, the non-AP STA shall delete all PTK and GTK SAs, and the AP shall delete the PTK SA."

C: Already included and adopted.

Comment 191: 8.4.10.1 starts out being about the ESS case only. Step 2 tells you to do something. Then it tells you not to do it if you're in an ESS. Then it tells you to do it if you're in an IBSS. It's all somewhat confused.

Motion: Replace all but the informative note with the following. "In order to recover from state mismatches between two STAs, a STA shall execute the following procedure on receiving an encrypted MPDU from a destination for which it does not have an installed key. 1) The frame shall be discarded. 2) If the STA is RSNA capable and has joined an IBSS, the authentication procedure as described in section 11.32 shall be executed. 3) Otherwise the deauthentication procedure described in section 11.3.3 shall be executed as if the MLME-DEAUTHENTICATE.request primitive had been invoked."

C: Done.

C: Need to go back and finish comments 699, 772, and 182.

Comment 772: 8.4.1 says "If it does not have a cached PMK for ..."

Motion: Change this sentence to

The Authenticator shall perform another IEEE 802.1X authentication if it does not have a cached PMK for at least one of the supplied PMKIDs.”

Motion: Jesse Walker

Second: Dorothy Stanley

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Motion: Add the following paragraphs to Clause 8.4.6.1

Pre-authentication uses the IEEE 802.1X protocol and state machines with EtherType TBD, rather than the EtherType 0x888e.

Informational Note:

Some IEEE 802.1X Authenticators may not bridge IEEE 802.1X frames, as suggested in IEEE 802.1X 2001 Annex C.1.1. A unique Ethertype is used for pre-authentication to enable pre-authentication frames to be bridged by such devices.

Pre-authentication packets are sent between the Supplicant’s MAC address and the Authenticator’s MAC address. The Authenticator’s MAC address is the BSSID of the AP with which the Supplicant is pre-authenticating.

The result of pre-authentication is a PMKSA. The PMKSA is valid for use with the 4-Way Handshake after the Supplicant has associated to the AP with which it had pre-authenticated.

The Supplicant has a PMKSA when it successfully completes EAP method authentication over IEEE 802.1X. The Authenticator has the PMKSA when the Authentication Server completes the authentication, passes the AAA Key to the Authenticator, and the Authenticator creates a PMKSA. The PMKSA is inserted into the PMK cache. Therefore, if the Supplicant and Authenticator lose synchronization with respect to the PMKSA, the 4-Way Handshake will fail and the PMKSA will be deleted.

Motion: Tim Moore

Second: Clint Chaplin

Discussion: None.

Vote: 18-0-0, Motion Passes.

Motion to address comment 18:

Motion: Delete the first Informational Note in Clause 8.4.2

Motion: Tim:

Second: Jesse

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

To address comment 16

Motion: Replace the last sentence in the first informational note after bullet one in Clause 8.4.1 with:

Finally, it is non-conformant with IEEE 802.11 to hide the SSID.

Motion: Tim Moore

Second: Gary Spiess

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Motion to address comment 377

Motion:

In clause 8.4.1, Delete bullets: Unicast cipher suite list and broadcast/multicast cipher suite lists from PMKSA elements and add them to PTKSA and GTKSA elements

Motion: Tim Moore

Second: Jesse Walker

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

In clause 8.4.1, Delete bullets: Unicast cipher suite list and broadcast/multicast cipher suite lists from PMKSA elements and add them to PTKSA and GTKSA elements respectively.

Motion by Gary Spiess to add “ respectively.” to the end of the above text, as shown above.

Second: Dorothy Stanley

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

To address comment 721

Inconsistent definition for PMK SA: First defined as "PMK SA The result of a successful IEEE 802.1X exchange, pre-shared PMK information, or PMK cached via some other mechanism." Later defined as "The PMK SA is either statically defined via a pre-shared secret or the result of a successful IEEE 802.1X authentication"

Motion: Delete the later definition found in the first sentence after the bullet list in Clause 8.4.1:

The PMK SA is either statically defined via a pre-shared secret or the result of a successful IEEE 802.1X authentication."

Motion: Tim Moore

Seconded: Henry Ptasinski

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 75

Motion: In Clause 8.4.1, Rename the Clause and add subsections as follows:

8.4.1 Security Associations

8.4.1.1 Security Association Definitions

(From the beginning of the text to up to and including the GTKSA definition.

8.4.1.2 Security Association Life Cycle

**(From the sentence beginning “The life cycle of a security association”
to the end of the text.)**

Motion: Tim Moore

Seconded: Jon Edney

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

CH: What are the remaining comments? I have comments 182, 699, and 421. Also need to plan for the Herndon meeting. Meeting is pre-authorized. Can make motions to modify the draft in Herndon.

Motions for Draft 6.

Pre-authorize sending out Draft 7.

Craft a motion to go to Sponsor ballot in November. Need to get it on the agenda for excom.

Recess until 9:00 AM Thursday.

4. Thursday Morning

CH: Call the meeting to order at 9:10am Thursday

CH: Have 3-4 motions. Then review the text, contact commenters.

C: What is the timeframe for procedural motions?

CH: Need a motion to go to re-circ at 9pm tonight. Need draft done and on the server at 5:00pm. Need Motion to instruct the editor to prepare the draft at 2pm. Will meet with AL Petrick to prepare Friday motions.

- Go to re-circ
- Conditionally put out another recirc in October.
- Put on the excom agenda taking Draft 7.0 (output of October Meeting) to Sponsor ballot.

C: Draft 7? Have to send a document out of re-circ. Why not 8, out of November?

CH: Can only make comments on text that has changed. In Nov, have results from Comments on Draft 7. To insure that we can go to sponsor, send the same Draft to Re-circ. To go to sponsor ballot, have to have no new no votes on the previous recirc.

CH: If don't go to sponsor ballot in Nov, then look at Rule 10, go to SB in an interim. Have to say what the draft is, and forward everything to revcom.

Motion

Delete from clause I.1.2 text [transmitted as: xx xx xx DefKeyID xx xx xx xx] from each tkip test vector

C: In the test vectors, there is text that the pseudo code no longer generates.

Motion: Tim Moore

Second: Gary Spiess

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Motion to address comment 699

Replace the 5th informative note in Clause 8.4.1.2 with the following informative note:

Informative note: Prior to the completion of IEEE 802.1X authentication and the installation of keys, the IEEE 802.1X controlled port in the AP will block (i.e. filter) all data frames. The IEEE 802.1X controlled port returns to the unauthenticated state and blocks all data frames upon completion of an MLME-DELETEKEYS.request. The IEEE 802.1X uncontrolled port allows at least IEEE 802.1X frames to pass to the Supplicant and Authenticator. Although IEEE 802.1X does not require Supplicant filtering, this specification assumes that the Supplicant conforms to the same filtering as the Authenticator in order to provide the needed level of security. Non-filtering Supplicants compromise RSN security and should not be used.

Discussion: Is this a new note?

C: No, this is correcting an existing note.

Motion: Tim Moore

Second: Jesse Walker

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Comment 182: 8.4.4.1 indicates that a STA may be unable to distinguish a TSN from a pre-RSNA BSS. Equally an RSNA-capable device may not include the RSN IE when in a TSN (if it has only received beacons so far that don't include it). Trying to specify behaviour based on what sort of SN it is fundamentally a waste of time.

Motion: Replace text of clause 8.4.4.1 with

Non-RSNA STAs generate Beacons and Probe Responses without an RSN IE, and will ignore the RSN IE, because it is unknown. This allows an RSNA STA to identify the non-RSNA STAs from which it has received Beacons and Probe Responses.

If an RSNA STA instead identifies another IBSS member on the basis of a received broadcast/multicast message, it cannot make this judgment directly. An RSNA STA may authenticate or initiate a 4-Way Handshake, in an attempt to establish a security association with the peer. If the peer is non-RSNA, then it will fail to respond. In this case, the RSNA STA may treat the peer STA as non-RSNA and attempt to communicate using non-RSN methods.

Motion: Jesse Walker

Second: Henry Ptasinski

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

C: Discussion on PMK sharing. See document 03/769.

C: Desire: Want to share a PMK between multiple APs within a physical box; or between multiple STAs within a box. Really: Share keying info from a 1x auth among multiple MAC addresses. Security – do not reuse symmetric key, but can derive keys from the MSK. MSK delivered to client machine and AP. Can derive multiple PMKs from the MSK.

C: Are we fooling ourselves into believing that we really changing things?

C: Key being used for different purposes? Same purpose – derive PTKs.

C: No, it's a different context. Peer doesn't know what to expect.

C: Example from IPSEC.

C: Ike Phase 1 uses cookies bound to the authentication. They are the session identifiers.

CH: Potential issue – disagree that the solution solves the problems.

C: Several issues – security issue, This can be done on the APs and Clients. Don't have to touch the RADIUS servers. How do you look up PMKs? NIC has to know how to look up PMKs? Which ones to look up? Can't pre-calculate the PMK from the MSK.

Need additional info from the AP – add an authenticator group MAC address. A MSK from a .1X auth from any authenticator with the same group address can be used to derive a PMK for use with this authenticator.

C: How does NAS (AP) know that the peer is authorized for that service. Might be authorized for 802.11, but not for some other service.

C: When cache a PMK, need to cache the authorization attributes too.

C: May be the case that there is no solution for all the properties that we're looking for.

C: Issue: symmetric keys known by more than 2 parties and used across contexts lose value.

C: Agree. Have already violated this rule – key known by AS, supplicant and authenticator.

C: Depends on the trust models. AS is trusted – so really have 2 parties.

C: Key authorized for one use. What happens if used for another purpose? – a different problem than the symmetric case of crypto re-use of keys.

C: What is the use of the key, from the AS perspective? Have been authenticated, and can generate key material. Don't see that this is a solution.

C: This is the standard crypto solution.

C: If run through a PRF, get another key. We were doing a binary copy – which was the problem. PRF puts pixie dust on the PMK.

C; Another problem, recognizing rogue APs.

C: If there is no solution to this problem, that's important, we make it known, we make tradeoffs. Have the discussion now about this usage. May have too many inconsistent requirements. Selling ourselves short by jumping immediately to a solution. Dialogue is leading to the right type of answer.

C: Three problems: - re-use of symmetric keys, binding to MAC addresses, authorization mismatch – have text in for this.

C: Can move PMKSA, not just the PMK.

C: Key must be moved with the context.

C: All APs in one physical box. PMK not being moved. Using the PMK to do the same thing over and over again.

C: Auth w/username& pwd, AAA says – VLAN1, must be used.

C: AP with b/g/ - 2 BSSIDs if make this fix, just have to do the 4-way handshake. AP with 2 BSSIDs. PMK tied to BSSID. This plus the implementation fix

CH: Recess for morning break.

Chair called meeting to order 10:35pm

CH: Remember to sign the electronic attendance.

CH: Continue with discussion.

C: Group address needed to help implementation. Add MAC address to the RSNIE. Group address in Beacon and Probe Response contain authenticator address.

C: How to guarantee that MAC addresses are really in the group?

C: Can't. But trust that the AS gives the key to only one AP cluster. Meant to increase the domain of the PMK cache.

C: Why can't you do what you want to do today, without this.

C: If ignore assumption about PMK, could do it on the AP side. Assume that supplicant won't share. Use MAC address to search PMKs. If supplicant shares, then have to search.

C: Index into the PMK cache. An optimization problem. Search every key in the cache. Want a faster way to do the indexing. Not a security issue. A performance implementation issue.

C: Want to find the MSK.

C: Could use an MSKID, but that's in the domain of the EAP working group. Where does the group address come from? Pick one of the NICs in the machine.

C: Sounds a lot like cookies in IKE.

C: Small number of techniques to optimize searches.

C: Could it be a string?

C: Yes, but in RSNIE, want something small and fixed length. Don't have to worry about arbitrariness of long strings to search through.

C: Could mix in the identifiers into the resulting MSK.

C: Concatenate the two group addresses. Binds the MSK to the PMK.

C: If we add a hierarchy, make it worth something.

C: Here, we explicitly allow the supplicant to share MSKs across BSSIDs.

C: Group address doesn't provide binding. It enables optimized implementations. Auth needs to know if I have 2 NICs, will the supplicant share MSKs between them.

C: Need the AAA server to attest to this binding.

C: Equivalent to the problem we have with MAC address.

C: We've given AAA a group scope rather than a MAC address scope.

C: Must PMKs be tied to BSSIDs. Or is PMK at SSID level. Should be a subset. Why a MAC address?

C: The MAC address is an identifier.

C: MSK is bound to the two group addresses. Not just BSSID, also include the MAC address.

C: Not an individual, a group identifier. Why would you create a different supplicant and authenticator address?

C: Single name as MIB variable, same name.

C: No, need different names.

C: AP and STAs can share SSID, but can't share PMK. Give each side an identity.

C: What would the supplicant group ID be?

C: Pick one of the STA NICs.

C: Why does it have to be a MAC address? Could be just a number.

C: Identity needs to be consistent. Could be just numbers.

C: Make implementation harder.

C: These group names are transmitted in the clear. Could just pick a number. What happens if 2 STAs
Pick the same number.

C: Difference between MSKIDs versus group name, or machine name, Auth and get the MSK. Never communicate that.

C: Want to identify the PMK.

C: Have 1000 authenticators. Send PMKID? Need to send MSKID.

C: Random number or MAC address. MAC address is ok.

C: Chose MAC address, makes the implementation easier.

C: Single physical entity. Don't pass the PSK to different physical entities.

C: Can use one of the MAC addresses.

C: Creating a new SA? MSKSA is inside EAP. We talked about the MSK, but not the details about the MSKSA. MSKSA will be talked about in the EAP document. Have redefined the PMKSA.

C: Can the cache hold the MSK? vs. calculate PMKs .

C: PMK cache goes from a static to dynamic cache.

C: Cache the PMK calculation, up the prior to the BSSID.

C: Get in now – 774 has text for this. Minimum needed to put this in. Sit on this until October, or put this in now.

C: Need external review.

C: Will get comments – please explain this.

Straw Poll 1 by Tim Moore:

If needed, text supporting PMK “Sharing” within a physical box should be added during the WG process.

Vote: 5-4-6

Straw Poll 2 by Tim Moore:

If needed, text supporting PMK “Sharing” within a physical box should be added during the sponsor ballot process.

Vote: 4-4-7

Motion: Incorporate document 774r0, with the PRF changes to include the Supplicant and Authenticator Group addresses into the PRF, into the draft

Motion: Tim Moore:

Second: Fred Haisch

Discussion:

C: Speak against. Not technically ready for inclusion. Would change to no vote.

C: There is a perceived security issue here. Take issue that there really is a security issue.

C: Debate whether this is needed or not. Was discussion in Portland. Discussion on timing. There was another benefit –if had APs that supported 2 radios, and AP has 2 MAC addresses, would have to do full re-auth; does have a benefit. May not be baked. Speak in favor of the proposal.

C: Where does it say that you would have to re-auth?

C: PMKID has Auth and STA MAC addresses mixed in. No point in sending the PMKID to Auth with a different MAC address. Can send it, but there's no point.

C: Disagreement on the problem being solved. Has far reaching effects.

C: Being one of the companies that want to have a solution to this problem. We would develop a proprietary solution. Can't articulate why strict sharing of PMKs is a problem. If don't do something, will have multiple solutions. This solution may not be the final one, but addresses some of the concerns that have been raised.

C; There is a real issue here. Interesting and promising work done. But premature to put this in. Need a solution to this problem today. Let's have analysis and external review first, bake it before putting it in. There are an infinite number of real problems that the market needs have fixed. Draw the line at what can be included now. Improper to be putting new things in now, and don't have a high degree of confidence in.

C: Agree. Danger that new applications and vendors will continue to find that there are functions that are still needed.

C: This is not a new issue. Has been known for a long time, and set aside. Now getting to the point where the technical issues need to be completed. Have been dealing with other tech issues. Just getting to the point of trying to solve it not. Some of arguments - either MAC address or identifier will work technically. Arguments are over which is better. More interesting issue is making sure the security is right. Copying the PMK – crypto people say don't do this – introduce potential problem.

C: Violating assumptions of client by moving the PMK around. Can't tell the move from the compromise of the key. Have to assume that PMK only copied to people who should have it. PMKID can go to anyone. AAA server is trusted.

C: Don't have all the pieces in place yet in AAA. But this puts the pieces in place that AAA needs

C: PMK is already compromised – AAA server to the AP. AP has no binding to the PMK.

C: Not true. Make an extraordinary assumption – trust the AAA server.

C: Claim that go around the process. No. Shouldn't be surprised that this.

C: No further interaction with the RADIUS server. Timeouts?

C: Auth attributes are carried along in the SA. Perhaps add note that the session timeout starts when received the value. Radius server sends back 60 minutes. STA roams after 59 minutes. Only one minute left.

C: Implementation details. Not moving the PMK, move the attributes. Same crypto boundary – in a single physical box. Supplicant doesn't know this. How far to share PMKs.

C: Need to put the mechanisms in place to support this.

C: External knowledge – BSSID

C: This does address a real problem. May not be completely there, but close.

Motion: 8-6-3 Motion fails.

C: To proceed: Let's study the proposal and if we can arrive at consensus that this is a good solution, will speak in favor of it next time.

C: Might be a good idea. Timing wise, might benefit us to incorporate this in sponsor ballot.

C: There is urgency in the market for a solution. Need agreement that this (part of) an adequate solution.

C: Although motion failed, continue work.

C: Go back to the original comment. Fix was to delete the supplicant MAC address from the PMKID derivation.

Motion to address comment 421

Motion:

Delete the supplicant MAC address from the PMKID derivation in Clause 8.5.1.2.

Motion: Tim Moore

Second: Dan Harkins

Vote: 5-4-7 Motion Fails

C: What is the right reject reason? Motion made, comment rejected.

C: All the comments have now been addressed!

C: Next step: Ask the editor to create the draft.

C: Draft 5.2 is available now in the TGi working group area. Work after lunch to review, prior to asking the editor to generate the next draft.

Recess until 1:00pm.

CH: Meeting called to order 1:15pm

Motion

Change clause 8.4.4 lines 12-14**From:**

Informative Note: When an IBSS network uses pre-shared keys, STAs can negotiate a unicast cipher. However, any STA in the IBSS can derive the pairwise keys of any other that uses the same pre-shared key by capturing the first two messages of the 4-Way Handshake.

To:

Informative Note: When an IBSS network uses pre-shared keys, STAs can negotiate a unicast cipher. However, any STA in the IBSS can derive the pairwise keys of any other that uses the same pre-shared key by capturing the first two messages of the 4-Way Handshake. This provides malicious insiders with the ability to eavesdrop as well as the ability to establish a man-in-the-middle.

Motion: Andrew Khieu

Second: Fred Haisch

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

Motion:

Add the following paragraph to section 8.4.3

Informative Note: When an ESS uses pre-shared keys, STAs negotiate a unicast cipher. However, any STA in the ESS can derive the pairwise keys of any other that uses the same pre-shared key by capturing the first two messages of the 4-Way Handshake. This provides

malicious insiders with the ability to eavesdrop as well as the ability to establish a man-in-the-middle.

Motion: Fred Haisch

Second: Andrew Khieu

Discussion? Malicious insider can also forge packets.

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

CH: Have a request to discuss/approve TGi security statement in a letter being sent to 3GPP.

C: Here is the current draft of the letter:

To: Magnus Olsson, Chairman of 3GPP SA2

Cc: Niels Andersen, Chairman of 3GPP SA

Date: 18th September, 2003

Subject: Response to LS received from 3GPP SA2

Dear Magnus,

We thank you for the liaison from 3GPP SA2 (3GPP document number S2-032727 with attachments S2-031745 and S3-030265) on RADIUS-Diameter co-existence. IEEE 802.11 WLAN Next Generation (WNG) Standing Committee wants to thank SA2 for providing this analysis and status update and we appreciate the recommendation to be able to interwork with existing implementations supporting RADIUS.

The LS from 3GPP SA2 addresses co-existence and transition issues with RADIUS and Diameter. The IEEE 802.11 Task Group i (TGi) is working on an Enhanced Security amendment (IEEE 802.11i). The IEEE 802.11i draft specifies the usage of EAP as authentication protocol but does not specify any particular AAA protocol. It is out of TGi's scope to select any particular AAA protocol and the IEEE 802.11i amendment is agnostic to the usage of RADIUS and Diameter.

For your information, within the IEEE 802.11 WNG, there are future plans to address general interworking issues on the WLAN side of interworking architectures, e.g. AAA protocol issues.

We hope this clarifies the status in IEEE 802.11 and we look forward to further interactions and cooperation between IEEE 802.11 WNG and 3GPP on the topic of 3GPP-WLAN Interworking. We look forward to a close cooperative relationship with 3GPP SA2 and seek an active participation of your delegates in our efforts.

Date of next IEEE 802.11 meetings:

IEEE Plenary Meeting: Nov 9 –14, 2003, Albuquerque, New Mexico, USA

IEEE Interim Meeting: Jan 11-16, 2004, Vancouver, BC, Canada

Best Regards

Stuart Kerry

Straw Poll by Stefan Rommer:

Tgi agrees with the following statement in the liaison letter.

The LS from 3GPP SA2 addresses co-existence and transition issues with RADIUS and Diameter. The IEEE 802.11 Task Group i (TGi) is working on an Enhanced Security amendment (IEEE 802.11i). The IEEE 802.11i draft specifies the usage of EAP as authentication protocol but does not specify any particular AAA protocol. It is out of TGi's scope to select any particular AAA protocol and the IEEE 802.11i amendment is agnostic to the usage of RADIUS and Diameter.

Vote: 14-0-3.

Motion:

Change the following paragraph in list item 2 of Clause 8.1. 4

From

When IEEE 802.1X authentication is used, the specific EAP method used performs mutual authentication. This assumption is intrinsic to the design of RSN in IEEE 802.11 LANs and cannot be removed without exposing both the AP and the STA to man-in-the-middle attacks. EAP-MD5 is an example of an EAP method that does not meet this constraint.

To:

When IEEE 802.1X authentication is used, the specific EAP method used performs mutual authentication. This assumption is intrinsic to the design of RSN in IEEE 802.11 LANs and cannot be removed without exposing both the AP and the STA to man-in-the-middle attacks. EAP-MD5 is an example of an EAP method that does not meet this constraint. Furthermore, the use of EAP authentication methods where server and client credentials cannot be differentiated reduces the security of the method to that of a pre-shared key due to the fact that malicious insiders can masquerade as servers and establish a man-in-the-middle.

Motion: Jesse Walker

Second: Tim

CH: Any discussion? None. Objection? None. **Motion Passes by unanimous consent.**

CH: Had discussed asking the editor to prepare the draft. Also a once-over review. Available on the server at 5:00.

C: Draft 5.2 is on the server in the working group area.

Motion to instruct the editor to prepare Draft 6.0. Editor is empowered to make editorial changes. Tech changes require motions. Only accept editorial – spelling and grammar changes at this point.

Have doc 6.0 on the server at 3:30. Allows 4 hours, not including the dinner break.

Meet at 8:30pm this evening, do procedural motions, then the motion for re-circ.

Motion

Instruct the editor to prepare the text for IEEE 802.11i Draft 6.0.

Motion: Dan Harkins

Second: Clint Chaplin

Discussion? None

Vote: 18-0-0, Motion Passes.

Volunteers to look for editorial errors:

Jon Edney 1,2,3

Henry Ptaskinski 5

Fred Stivers – 4,6

Kelly McClellan 7

Fred Haisch 9 to Annex

Clint Chaplin, Dorothy Stanley, Fred Stivers 8

Andrew Khieu Annex

CH: Any objection to working in an ad-hoc fashion until 3pm, and then recess until 8:30pm? No objection.

Chair called the meeting to order at 8:45pm.

Motion for Recirculation of 802.11i-D6.0

Believing that comment responses in 11-03/659R4 and 802.11i draft 6.0 satisfy WG 802.11 rules for letter ballot recirculation,

Authorize a 15-day LB recirculation to conclude no later than October 10, 2003. The LB recirculation shall ask the question “Should the attached 802.11i draft 6.0 draft be forwarded to SB?”

Movers:

TGi: Marty Lefkowitz /Mike Moreton Result: 14-0-0

Motion for Conditional LB Recirc

•Believing that TGi will pass motions resulting in letter ballot comment responses and a draft that satisfies WG 802.11 rules for LB recirculation at a duly authorized meeting conducted in good order,

Conditionally authorize a 15-day LB recirculation to conclude no later than November 7, 2003, conditional on the existence of a comment response database and draft document by TGi meeting the WG rules for letter ballot. The LB recirculation shall ask the question “Should the attached 802.11i draft 7.0 be forwarded to SB?”

Movers:

TGi: Dan Harkins/Kelly McClellan Result: 15-0-0

Motion: Move to Adjourn.

Objection?

Meeting Adjourned.

**IEEE P802.11
Wireless LANs**

Minutes for the TGk for the

Date: September 15 - 19, 2003

Author: Harry Worstell
AT&T
180 Park Avenue
Phone: 973-236-6915
e-Mail: hworstell@research.att.com

Monday, September 15, 2003
3:30PM

Chair: Richard Pain
Secretary: Harry Worstell

- 1) Call to order 3:30PM
- 2) Attendance
 - Richard Pain
 - Harry Worstell
 - Lars Falk
 - Roger Durand
 - Jesse Walker
 - Insun Lee
 - Bill Arbaugh
 - Shoji Sakurai
 - Steve Pope
 - Uriel Lemberger
 - Malik Audeh
 - Marty Lefkowitz
 - Joe Kwak
 - John Klein
 - Aik Chindapol
 - Vlaus Meyer
 - Moo Ryong Jeong
 - Hesse Sinivaare
 - Mikael Hjelm
 - Fred Heisch

Covered Patent policy
Covered inappropriate topics in IEEE meetings
Discussed objectives for the session

- Resolve technical issues
- Specification Submissions

Letter Ballot Work
EVM vs. PSNI Issues
Nortel Presentation
Mod of measurement
Fast roaming

- 3) Agenda
 - a. Review P#P
 - b. Approve agenda
 - c. set objectives
 - d. update from teleconferences
 - e. approve minutes ----- moved to Tuesday AM
 - f. matrix review
 - g. Tech presentations
 - h. dinner break
 - i. tech presentations
 - j. recess
- 4) Approve Agenda
 - a. unanimously
- 5) Ad-Hoc meeting is Wednesday- Thursday- Friday of the week of October 13.
- 6) Call for Submissions
 - a. 03/684 Lefkowitz
 - b. 691 Lefkowitz
 - c. 692 Lefkowitz
 - d. 693 Lefkowitz
 - e. 685 Lefkowitz
 - f. 681 Falk
 - g. 729 Arbaugh Answers to optimal channel time – Wednesday
 - h. 728 Skellern – 3 docs measurement start time – Wednesday
 - i. Kwak Periodic 3 docs measurements Tues
 - j. Kwak MAC loading measurements Tues 3 docs
 - k. Kwak EVM/PSNI Wed
 - l. 666r4 KIM/Rodger postpone to October - ~Thursday
 - m. Hasa/ Black Wed
- 7) Rodger was handed chair
- 8) Richard presented 490r4 of Microsoft as an update and example of submissions he would like to see from service providers
 - a. Insert 490r4
 - b. asked that participants use 490 as a template for their services
- 9) Lars Falk presented document number 681r1 “Reassociation Counter”
 - a. Insert 681r1
 - b. Discussion
 - i. counter resides in the client
 - ii. the network will actually do the handover in cellular/IP phone networks and the client will only request the transfer. In WLAN networks, the client may do the handover
 - iii. If the AP is doing load balancing the number may not be accurate
 - iv. what is the utility telling us? if many reassociations occur it may be an indication to move to another network...it is one indicator

- v. Motion to come later in the week
- 10) Jesse Walker on a call for interest.
 - a. data transferred in action frames
 - b. how can it be prevented from forgeries
 - c. can 11i be extended to the K work
 - d. should management frames be included
 - e. will tgi apply to multicast and broadcast messages....yes
 - f. Don't want to delay Tgi ...may need a study group to look at these issues
- 11) Move to modify agenda to include a session on security
 - a. moved by Jesse
 - b. seconded by Rodger Durand
- 12) Discussion on Security
 - a. Sensitive information on ESSs
 - b. Denial of service
 - c. send beacon reports
 - d. spoof site report
 - e. spoofing management frame
 - f. 11h has the same problem
 - g. QoS could spoof the AP to think there is a radar in place and move the channels and reuse them
 - h. Take it to the WG and do a call for interest with a list of issues that can't be addressed in K
 - i. Move that the TGk chair on Wednesday the 17 of sept bring to the attention of the working group the problem of unauthenacated management frames and the impact to 802.11
 - j. Moved by Pope
 - k. Second Marty L
 - l. approve 12 No 0 Abstain 3
 - m. motion Passes
 - n.
- 13) move to modify the agenda to have the Skellern presentation
 - a. Moved Stuart Kerry
 - b. Second Jesse
- 14) Unanimous.....Motion Passes
- 15)
- 16) David Skellern presented 728r0 "Start Time"
 - a. Insert 728
 - b. Spec a time in a request but it may not happen instantly
 - c. So why spec the TSF at all? is a good idea to coordinate if it can...best effort
 - d. proposal and vote on Wednesday
- 17) recess for dinner 5:25pm

Monday, September 15, 2003
Evening Session 7:00PM

Call to order 7:30PM

Attendance

Richard Pain
Roger Durand
Lars Falk
Harry Worstell
Tomoko Adachi
Yosuhiko Inoue
Lemberger Uriel
Shoji Sakurai
John Klein
Joe Kwak
Malik Audeh
Marty Lefkowitz
Mikael Hjelm

Marty Lefkowitz presented 03/684 “Beacon Compression”

Insert 03/684

Comment on 11i

should not be too concerned due to because you can't spoof beyond the ESS

Moved to recess

Moved Malik Audeh

Marty Lefkowitz

Recess at 7:46

Tuesday, September 16, 2003

8:00 AM meeting

Call to Order – 8:00 AM

Minutes of July-to-September teleconference calls
approved unanimously

Minutes of July 2003 session
approved unanimously

Presentation 03/682 from Brian Johnson of Nortel

insert 682

Discussion:

SUI-1 and SUI-5 are outdoor channel models from 802.16

SUI-5 was the worst channel – no line of site to AP and incorporates reflectors

Have not run fading channel models only the models used in the standards
activity

Doppler was not added for these simulations

slide 6mbps PHY--- The pink curve is a perfect channel

transmit rate is in bits/sec in the expressions

measured raw bit error rate and not all bits are considered in error

all results are taken from the first expression

SNR is averaged over the entire simulation run...long term

SUI-5 would be off the chart on max expected throughput vs. SNR chart

still needs to do show any PSNI measurement will pick up any ISI will show the same performance

Joe Kwak presented a number of papers

03/735 “Two New MAC Measurements”

Insert 735

Discussion:

Draft text is in document 03/604r1

the word Optimal used in 128 level should not be used because the optimal level should be selected by the network manager

How do we know the right variables are selected? Need justification for MIB variables are necessary for incorporating them in the draft.

The Tge draft there in not a lot of knowledge of traffic cue

If we are going to standardizing AP loading then we should state that.

Transmit Que size is missing on the client side but may not be useful to the network.

With the scheduler not being defined and the que being in the scheduler, standardizing the variable may be difficult to implement.

Break 10:04am

Call to Order at 10:35AM

Move to modify the agenda to add the paper “802.11k Security Action Frames”

Moved by Malik Audeh

Seconded by Rodger Durand

Chair was relinquished to Rodger Durand

Richard Pain presented 03/xxx “802.11k Security Action Frames”

Insert 03/xxx

Discussion

Not presently within the scope of the TGk PAR

Remove the line that states that TGk take action on the security issue

Chair was relinquished to Richard Pain

Joe Kwak

Move to instruct the editor to incorporate text from document 11-03-0604-01-000k-MIB_TcQ_Size.doc into TGk draft 0.6 specification document

Moved by Joe Kwak

Seconded by Harry Worstell

for 2 against 8 abs 6

Motion Fails

Joe Kwak presented 03/732 “Periodic Measurements”

insert 03/732

Discussion:

document 733r0 is the normative text for Beacon Report
document 734r0 is the normative text for Periodic Measurement

Can we add some reasonable limitations to this? ... The periodic report and the conditional report need to be incorporated together. This decreases the traffic load on the system for periodic measurements. Abuses from the network manager can not be avoided.

Will bring up Thursday with revised normative text.

recess for the day unanimous

Wednesday, September 17, 2003

8:00AM to 10:00AM meeting

Call to Order 8:00AM

Attendance

Richard Paine
Harry Worstell
Roger Durand
Gary Spiess
Lars Falk
John Klein
Mikael Hjelm
Mare Jafon
Klaus Meyer
Shoji Sakurai
Kue Wong
Harry Bims
Malik Audeh
Moo Ryong Jeong
Simon Black
Vijay Patel
David Skellern
Fred Heisch
Uniel Lemberger

Chair's Overview of Status

Agenda

Arbaugh presentation
WNG Joint session at 8:30am
Skellern presentation
Kwak presentation
Falk presentation 03/681
Durand – MIB Overview
Lefkowitz presentation

Agenda approved buy unanimous consent

Lars Falk presented 03/681r3 “Reassociation Counter”
03/737 is the details of the presentation

Motion:

Move to instruct the editor to incorporate the Reassociation Counter proposal of 03/737r0 into the TGk draft where appropriate and, if necessary, modify the text to be consistent with the draft.

Moved Lars Falk

Second Mikeal Hjehm

For 8 Against 3 Abstain 4

Motion Fails 72%

WNG

Bruce Kraemer gave an overview as to WNG issues

Need for radio aware metrics in TGk for a PAR Ad-Hoc ESS

Proposed PAR is in the TGk work area on the server

Steve Conner presentation of the proposed PAR text

Insert the documents

Stated the scope item 12 and item 18 project areas of the PAR

Discussion:

Have a starting point of trust because of the closed area on 1 control site of person as in a home and home owner

Wants more instantaneous metrics and statistics from TGk

Radio awareness is that the AP handoff mech will tell clients other channels to look for to handoff to

Think of this as supporting fast handoff with radio information

Straw Poll for support of the text in the PAR

Could you support the PAR as it is presented today for 802.11 ESS Mesh?

For 12 Against 2 Abstain 6

Comment from no votes

- It looks like a mess not a mesh
- Afraid it will delay TGk

Would like the MASH group to supply what they need for metrics and a paper in the November session and they agreed to do so.

David Skellern presented document 03/728r1 “Start Times” and 03/762 Normative text for the draft.

Propose to remove the measurement start time field from 7.3.2.19.1, in the draft

Normative text is in 03/762

Motion:

Move to instruct the editor to incorporate the changes described in 03/762r0 into the TGk 0.6 draft document

Moved David Skellern

Second Roger Durand

Chair calls the motion out of order due to the document not being on the server for 4 hours.

Marty Lefkowitz request a Straw Poll

No Objection

Discussion:

- Doesn't think the overhead necessary for the benefit is worthwhile
- Measurements do not take precedence here, it is just a supporting mechanism
- Don't see the need for microsecond timing in the measurements
- If this is intended to take the measurement when possible, why have microsecond start time.
- was put in to be consistent with TGh
- must contend 2 times if used, if just the measurement it is 1 time
- Doesn't seem to help rogue client detection

Group agreed to let Marty show his text for keeping the start times

Marty Lefkowitz presented 03/764r0

Straw Poll:

Is the mechanism of delayed start times in measurement requests to precisely coordinate measurements by different entities with in a BSS or ESS valuable enough to leave a start time in the TGk Draft.

For 4 Against 9 Abstain 6
30% for the poll

Roger Durand presented 03/758 which were updates from J Kim.

03/754 is the word document

Discussion:

Recess until 1:00pm unanimous

Wednesday, September 16, 2003
1:00PM-3:00PM

Call to Order 1:00 PM

Attendance:

Richard Pain
Harry Worstell
Roger Durand
Harry Bims
Lars Falk
Aik Chindapol
John Klein
Joe Kwak
Gang Wu
Darwin Engwer

Bob O' Hara
Mikael Hjelm
Marc Jalfon
Uriel Lemberger
Klaus Meyer
Shoji Sakurai
Malik Audeh
Martin Lefkowitz
Steve Pope
Peatik Mehta
Peter Ecclesine
Insan Lee
Jon LaRosa
Andrew Myles
Simon Black
Charles R. Wright
Eleanor Hepwcth
Hassa Sinivaara
Bill Arbaugh
Moo Ryong Jeong

Presentation by Arbaugh 03/792r0

Insert presentation here

Discussion:

- ping flooding did not see differences in contention time with 6 STAs
- ping flood used UDP with small packets
- is hard to accept the results when ping flooding did not show what was expected
- more work needs done with PHY participants included in the evaluations
- in optimal channel time what is your recommendation

Straw Poll

Would the group support optimal channel time support in the draft?

yes 3 no 2 abstain 19

David Skellern reviewed his earlier presentation 03/728r2

Motion:

Move to instruct the editor to incorporate the changes to the text described in 03/762r0 into the TGk 0.6 draft document

Moved David Skellern

Second Roger Durand

Motion Passes 77% 10 : 3 : 8

Marty Lefkowitz presented 03/693r1 "Domain Signalling"

insert presentation

Discussion:

- Work still needs to be done to the packet

- Likes the principal but has concerns in synchronizing the neighbours and clock drifts.
- not such an easy this to do...given the amount of memory on a card
- varies with temperature and AP vendor to AP vendor
- need to re-engineer the systems and won't give enough benefit given the effort to do this
- We should consider some of these enhancements due to different levels of APs to address low end and high end AP and not preclude complexity as options.

Marty Lefkowitz presented 03/613r1 "Directed Probe Request with no response option"
insert presentation

Discussion:

- Presentation will be done in TGj on this issue
- Must have a known power level as full power for the probe.
- need to allow the probe request to go to a specific STA along with broadcast which is not in the standards now

Marty Lefkowitz presented 03/692r0 "Beacon Compression and the Site Report"
insert presentation

Discussion:

- None

Move to recess until 3:15pm

Moved Charles Wright

Seconded Lars Falk

Unanimous

Recess at 3:50PM

Break

Call to Order 3:15PM

Joe Kwak presented document number 03/773r0 "EVM Simulations for OFDM"

Insert Presentation (7 mb presentation will try to reduce size)

Discussion:

- Agree that a second point is needed
- the Second point is the 50nS IEEE Fading Model
- For AWGN the result is given instantly but for fading more points must be taken to reassure the measurement is correct
- In experience these solutions work where they are fitted but will fall apart when deviated from the base line
- Must provide the usefulness of proposals over all receivers which should be done with all the measurements
- Wants more information on the implementation aspects
- Don't have enough time to fully evaluate this given the time of TGk
- Doesn't believe this works based on work in the lab
- RCIP is not a measure of link quality but is a useful measure
- EVM does not reflect frame error rate in many cases

motion to modify the agenda to allow Peter E to present the paper

Moved Marty
Second Joe Kwar
Motion Withdrawn

Move to modify the agenda to discuss additions to complete 11k work.

Moved Dave Skellern
Second Peter E
unanimous

Dave Skellern feels that the only thing necessary to complete the TGk work is to complete the MIB.

Do you believe we need to do a PICs....Yes

Move to recess 4:48PM

Moved Harry Worstell

Second Malik

Unanimous

Thursday, September 18, 2003
10:30AM-12:00PM

Call to Order

Attendance:

Brian Schreder
Kari Laihonen
Rahul Malik
Tan Pek-Yew
Jari Jobela
Hiroshi Oguna
Kuniko Jimi
Moo Ryong Jeong
Garth Hillman
Tsuguhide Aoki
Simon Black
Eleanor Hepworth
Wayne King
Lars Falk
David Nollern
Joe Kwak
Malik Audeh
Marty Lefkowitz
Gary Spiess
Roger Durand
Shoji Sakurai
Tsuyoshi Tamaki
Kimihiro Imamura
Yusuke Asia
John Klein
Klaus Meyer

•Agenda

- Kwak mod and vote on AP Service Load

Kwak mod and vote on Periodic Beacon

- Kwak TPK for TGk
- Service Provider Holes in 11k – Worstell, Falk
- PC OEMs holes in 11k – Dell (Pratik)
- Chip Manufacturer Holes in 11k – Intel

Network Manufacturer Holes in 11k – Cisco

- Wireless Switch Vendor Holes in 11k – Lefkowitz
- Network Management software developer Holes in 11k – Cognio
- Operating System Vendor Holes in 11k – Microsoft 490r4
- Cellular Equipment Provider Holes in 11k – Nokia, Samsung
- University researcher Holes in 11k – Univ of Maryland
- Vertical Industry Wireless Equip provider – Intermec (Spiess)
- Straw Polls
- Control PAR?

Motion

Move to approve the agenda.

Move Pritek

Sec Malik Audeh

Motion Passes Unanimously

Pritek from Del

- If customer wants a feature it is difficult to determine what is in the MIB to support that requirement
- Would like a parallel document to define in more layman's terms to define the meaning of cryptic variables like are in the MIBs (How is 11 k going to be used)
- Document can be of benefit to the WiFi Alliance and other IT managers
- How does the acceptance and use of k effect the PC/OEM provider
- OS is one part of the system from an over all system perspective they are agnostic as to where the information comes from as long as it is available
- Is there any other paper in the standard that can be used as a template for the request...none that is known but a paper such as this from this group would be respected more then from somewhere else.
- What do you mean by rogue AP...it is where the customer can find APs or clients that are not part of the network and needs to be detected and there needs to be a consistent way to find them

Charles Wright presentation 03/768r0

- Most agree with the presentation
- May want to do this in the fast roaming groupcant use in FH PHYs by FCC Rules
- After the first beacon you can be able to keep the time information
- This is to also address clock drift
- Is very useful in network to AP sync

Marty Lefkowitz presented 03/685 "Neighbourhood TBTT Offset"

- This proposed keeping track of the offsets of the clients
- This would age out after a period of time but the algorithm is outside of the specification
- give the ability took look for information you didn't have before
- Is worthy of looking at but we need to look at the

Lars Falk

- Processing power of APs with short packets limits the number of VoIP calls

Garth Hillman

- Architecture that is evolving
 - Complete wireless LAN solution with a processor that dose the MAC
 - limited processing power
 - Limited memory
 - Host does the processing
 - split into upper MAC and Lower MAC
 - calc done in lower MAC due to time constraints
 - Power not as critical as in handheld

- Memory more available for storing MIB elements
- discussion:
 - how does the network know the ability of the processor
 - do it by discovery as the technology advances
 - will depend much on the operating system

Malik Audhe

- Need for infrastructure to make better decisions
 - more knowledge to clients
 - overall power consumed is very critical
 - Important stats like RCIP to provide the network provider manage the network
 - The RF measurements are very important for Rogue detection and location
 - Optional parameters are very useful for wide range of scenarios and should not be taken out of the draft
 - There is a switch/AP and NIC that feeds the services

Rodger Durand

- Central Manager
 - enable all functions all the way down to the client
- Distributed
 - Autonomous self organising networks
 - Load balancing need automated as LANs become denser
 - Frequency Reuse – need to know the power of neighbourhood APs
 - get a power measurement on uncorrelated energy as well as correlated energy – peak noise measurement

Victoria Poncini is not here so 03/490r1 has been referenced for consideration

Hassa

Document 03/792 TGk Issues

Explain The gateway bit

Edge of service bit

The comment that calibration

Observed measurement are better than outside measurements

1 dB is very doable for RCPI

How can we make TGk extensible so we can move forward.

There is already a framework to do that in TGh

802.3 has a mechanism to do extensible work

as soon as the TG work completes a maintenance PAR is started

C: the maintenance PAR is to only correct errors in the present standard and not incorporate new things

Gary Spiece presented document 03/775r0 “Backward Looking Measurements”

Insert Paper here

782 Slide 3 has to do with MESH issues and will not be able to be presented

MOTION:

Move to amend the agenda to move 03/782r0 up in the agenda to be presented now .

Moved Harry Worstell

Seconded Marty Lefkowitz

Question called

Yes 2 No 6 Abstain 4

Motion fails 25%

MOTION:

Move to amend the to have Joe Kwak’s presentations ahead of the Straw poll

Moved David Skellern

Second Malik Audeh

yes 11 No 0 Abstain 1

Motion passes 100%

Joe Kwak presented 03/605r2 "MIB AP Service Load"
insert document here

Motion:

Move to instruct the editor to incorporate text from 11-03-605-02-000k into the next version

TGk Draft

Moved Joe Kwak

Second Roger Durand

Approve 8 Reject 1 Abstain 5

Motion Passes 88.8%

Joe Kwak presents 03/733r1 "Proposed Text for Beacon Periodic Measurements"

Insert paper here

This does not mean that start time is going back into the draft? NO

Break

Thursday, September 17, 2003
1:00PM-3:00PM

Thursday, September 17, 2003
3:30PM-5:30PM

Call to Order

Call to Order

Motion:

Move to instruct the editor to incorporate the changes in 11-03-733-01-000k into the next version TGk Draft

Moved Joe Kwak

Second Roger Durand

Approve 8 Reject 0 Abstain 10

Motion Passes 100%

Joe Kwak presented document 03/787r0

Discussion:

- The text does not change the probe response, just a clarifying it
- C: must be sent many times and increases the overhead on the media
- this is informational and the process is already in the present standard
- C: if it is allowed it should be specified in the SDL and is being checked
- C: in power save STAs the unsolicited probe response will not be useful

Motion:

Move to instruct the editor to incorporate the changes of 11-03-787-01-000k into the next TGk draft.

Moved Joe Kwak

No Second was obtained

Joe Kwak presented 03/786r0

No Discussion

Motion:

Move to instruct the editor to incorporate the text in 11-03-786-00-000k into the next TGk draft.

Moved Joe Kwak

Second Roger Durand

Approved 7 Against 3 Abstain 9

Motion Fails 70%

Motion:

Move to amend the agenda to move the presentation of 03/782 slide 3 to the end of the agenda

Moved Malik Audeh

Second David Skellern

Approve 10 Reject 0 Abstain 4

Motion Passes 100%

Straw Polls

Poll #1

With the exception of the MIBs, are we ready to go to letter ballot?

yes 0 no 16 abstain 8

Poll #2

Should STA capabilities be described?

Yes 8 No 0 Abstain 11

Recess

Thursday, September 17, 2003
7:00PM-9:30PM

Call to Order 7:00pm

Attendance:

David Skellern

Joe Kwak

Lars Falk

Martin Lefkowitz

Malik Audeh

Roger Durand

Shoji Sakuroi

Kimihiro Imamura

Tusuke Asai

Tomoaki Kumagai

Yasuhiko Inoue

Shuij Kubota

Thomas Vinehnel

Wayne King

Eleanor Hepworth

Stephen McCann

Mare Jalfon

Der-Zheng Lin

- Presentation by Harry Worstell on the issues of the network this week
- Discussion on the WiFi Alliance and asking the UNH for input to the measurements
- talked about the ad-hoc meeting in Seattle October 15, 16, 17 – discussed some possible locations in Seattle
- Dave Skellern
 - making MIB extensible is not going to be easy
 - each vendor lists the measurements they support

- they users can pick the measurements they need
- additional MIB variables can be added
- There will be additional measurements added in the future and the IEEE 802.11 group needs to change its philosophy to allow the industry to move faster.
- Most challenges are in the management interface area
- Would like some process in the standards to update the standard without a 3 year process
- When you inherited something that is old and not updated (SNMP) is there a way to manipulate that to compile templates.
- Maybe the things like security that need to be fixed need to be fixed in the group that needs them if 802.11 won't address them.

Motion to adjourn

Moved Roger

Seconded Dave Skellern

Unanimous

802.11m Report September 2003

Goals for September 2003

- Interpretation requests
 - Draft responses to requests and forward to WG
- Other inputs
 - Review
- Develop updates to standard
 - Volunteers needed

Submissions?

- Are there any submissions?
 - Terry Cole: 199r1 – WG Editor's potential errata list
 - Andrew Myles: 382r7 – Annoying things
 - **Adrian Stephens: 667r0 – MA-Unitdata.request**
- Are there any new interpretation requests?
 - Contention Window and Retry Counters
 - Country Information Element

Proposed Agenda

- Review IEEE Patent Policy
- Review interpretation request procedure
- New business
 - Review interpretation requests received
 - Draft responses to interpretation requests
 - Forward to full WG
 - Review other inputs
 - Develop work plan to update standard for interpretation requests and other inputs
 - Begin work on updates to standards
- Adjourn

IEEE-SA Standards Board Bylaws on Patents in Standards

6. Patents

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

- a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement the proposed IEEE standard against any person or entity using the patent(s) to comply with the standard or
- b) A statement that a license will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination

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

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

Interpretation Procedure

- <http://standards.ieee.org/reading/ieee/interp/>
- Send email to Linda Gargiulo
(l.gargiulo@ieee.org)
- IEEE forwards requests to the WG
- WG responds

Work Items

- Interpretation requests
 - Contention Window and Retry Counters
 - Country Information Element
- Request from Adrian Stephens: MA-UNITDATA.request
- Andrew's accumulated list 382r7 – Problems with the 802.11 MAC standard and 802.11a PHY standard (mostly)
- Documents from Jon Rosdahl
 - 11-01-340r2-W-Errata list Justifies need for Corrigenda for 802.11
 - 11-02-091r0-W-Errata-list-for-802-11d-needs-corrigendum
 - 11-02-092r0-W-Scanning-process-requires-parameter-block-for-802-11a
 - 11-02-093r0-W-Errata-List-for-802-11a-needs-corrigendum
- Document supplied by Terry Cole (other inputs)
 - 11-03-199-W-Potential-WG-Editor-Errata
- 802.11F Association primitives
- Update informative text on regulatory information for 802.11a and 802.11b, provide table for 802.11d (collect in an appendix?)
- IBSS coalescence
- PCF
- Optional/mandatory match between text and PICS
- SDL (remove, improve, abstract), MSCs?
- Email Terry received during 2003 edition process
- Recommendation of phase-in for compliance

Interpretation Requests

- Contention Window and Retry Counters
- Country Information Element

Interpretation Request

The CW is 'controlled' by the Station counters, increasing in size every time either of the Station counters increases. It is reset to CWmin only

- after a successful MSDU transmission, or
- when either of the Station counters reaches their respective limit.

Interpretation Request (cont.)

- Consider a scenario where a station *continually* fails to transmit successfully:
 - The CW will increase, until condition b) above is met, at which point it will revert to CWmin.
- However, the Station retry counters are not reset at this point, and will continue to increase;
 - condition b) will not be met again, and
 - CW will increase (or remain at CWmax) for all subsequent (failed) attempts, regardless of the state of the respective MSDU counters.
- Is this the intended behavior? It seems odd that the CW will be reset after the first failure (when b) is met, and the MSDU is discarded), but not for subsequent MSDUs.

Interpretation Response

- The standard is unambiguous and describes the intended behavior.
- It is intended that a station that is unable to successfully communicate with its intended receiver(s) will select its backoff value for all frames transmitted from a window with an upper bound of CW_{max}
 - after an initial reset to CW_{min}

Motion to adopt 03-752

- Moved: That document 03-752r0 be adopted as the response to the interpretation request regarding contention window and retry counter operation.
- Moved: Darwin Engwer
- Seconded: Al Petrick
- Vote: Unanimous

Motion to forward to WG

- Motion: to request the working group to accept and forward the interpretation response contained in document 03-752r0 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.
- Moved: Al Petrick
- Seconded: Darwin Engwer
- Vote: Unanimous

Interpretation Request

- The phrase “...maximum power...allowed to be transmitted” in the Country information element is ambiguous. The most likely interpretations include:
 - TPO (Transmitter Power Output)
 - EIRP (Effective Isotropically Radiated Power)

Interpretation Response

- The standard does not specify a measurement method for the value of Maximum Transmit Power Level
- The value is to be interpreted according to the country indicated in the Country String

Interpretation Request (cont.)

- Apart from a limit on radiated power, the regulations usually contain a PSD (Power Spectral Density) limit. In some domains, the PSD limit is more strict than the TPO/EIRP limit and thus further limits the transmitted power.
- How is the value in the information element to be interpreted?

Interpretation Response (cont.)

- The standard does not provide this information.
- It is up to the implementer to determine the correct transmit power level for their implementation from the information provided in the information element.

Interpretation Request (cont.)

- The Country Information Element does not indicate whether a particular subband has indoor/outdoor restrictions. How should this information be derived?

Interpretation Response (cont.)

- The standard does not allow the mixing of indoor and outdoor band descriptions in the same information element.

Motion to adopt 03-754

- Moved: That document 03-754r0 be adopted as the response to the interpretation request regarding contention window and retry counter operation.
- Moved: Darwin Engwer
- Seconded: Al Petrick
- Vote: Unanimous

Motion to forward to WG

- Motion: to request the working group to accept and forward the interpretation response contained in document 03-754r0 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.
- Moved: Al Petrick
- Seconded: Darwin Engwer
- Vote: Unanimous

Review other inputs

- Completed review of all input documents

Output Documents

- 710r0: This report
- 752r0: Interpretation Response 1-09/03
- 754r0: Interpretation Response 2-09/03
- 619r1: Status of Work Items

Adjourn

- Time for adjournment reached
- Meeting adjourned at 9:30pm

**IEEE P802.11
Wireless LANs**

Minutes of High Throughput Task Group Meetings

Date: September 15-19, 2003

Author: Garth Hillman
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Abstract

Minutes of the High Throughput Task Group meetings held during the IEEE 802.11/15 Interim meeting in Singapore from September 15 through 19, 2003.

Executive Summary: Approved document 11-03-665r9 as the official 802.11n Selection Procedure Approved document 11-03-355r11 as the official 802.11n Usage Models Elected Garth Hillman (garth.hillman@amd.com) as the IEEE 802.11n Secretary Formed the TGn **Channel Model Special Committee** Colin Lanzl (clanzl@aware.com) appointed chair pro tem Formed the TGn **Functional Requirements and Comparison Criteria (FRCC) Special Committee** Adrian Stephens (Adrian.P.Stephens@intel.com) appointed chair pro tem

Detailed minutes follow:

Monday September 15, 10:30-12 noon [~102 attendees]

:

1. Meeting was called to order by Task Group chairperson Matthew Shoemake at 10:50 AM
2. Agenda doc. 11-03-0724-r0
3. Objectives = Adopt
 - a. Usage Models (UM) Special Committee Output document – Adrian Stephens
 - b. Channel Models (CM) Special Committee Output document – Venko Erceg is not here; Colin Lanzl will handle Venko’s duties this week

- c. Selection Procedure – doc. 03-0665 r3
- d. Call for Proposal time permitting
- e. Functional Requirements and Comparison Criteria time permitting
- f. Hold elections for secretary – 8 AM Wednesday morning
4. Chairperson read IEEE Patent Policy – standard IEEE slide #1
5. Inappropriate topics were reviewed by Chairperson – standard IEEE slide #2
6. Voting Rules were reviewed by Chairperson
 - a. Voting restricted to WG members only except for straw polls
7. Chairperson reminded members to format documents correctly and get them on the server BEFORE presenting them
8. Agenda time intervals and objectives reviewed:
 - a. Selection Procedure (probably one day)
 - b. UM reports (report [15 min], 4 hours of F2F not in parallel with other TGn activity)
 - c. CM reports (two docs – report [5] and channel model doc [15] => 30)
 - d. Submissions (doc. 03-0700 Rahul Malik [15], 03-0662 [30] Adrian Stephens; Frans Hermondsson 03-0690 [30], Jan Boer 03-0714 [20], Dave Skellern (doc.03-0717-00 [40]) => 2 hours 15 minutes total for general submissions)
 - e. Approve CM
 - f. Approve UM
 - g. Approve Selection Procedure
 - h. **Motion** to approve the agenda – by Colin Lanzl and seconded by Dave Skellern
 - i. Discussion
 - i. **Motion to Amend** - to add an agenda item to discuss election of vice –chair and editor at the November meeting in Albuquerque by Adrian Stephens
 1. Discussions - Nominations on Monday in November with elections on Wednesday in November 2003 session; motion to amend seconded by Colin Lanzl
 - ii. Motion to amend passed (34,0,0)
 - iii. **Motion to approve agenda passed unanimously**
9. Nominations for secretary
 - a. Colin Lanzl nominated Garth Hillman
 - b. No further nominations
10. **Motion** by Adrian Stephens to hold elections for Vice-Chair and Editor at the November 2003 session seconded by Ali Sadri.
11. Discussion:
 - a. TG Will rapidly become more complex especially with requirements, models, simulations and selection drafts therefore an editor and vice-chair will be needed quickly;
12. Vote passed (28,0,8)
13. Selection Procedure Report:
 - a. History reviewed by Chairperson

- i. 03-626 r0 was straw poll document at July meeting
 - ii. Two conference calls on August 27 and September 3 [minutes of those meetings are in doc. 03-0740r0]
 1. Doc. 03-665r3 selection procedure was iterated as a result of these calls
 2. Now 21 step procedure
 3. We got to about step 7 on the CCs
 4. Adrian Stephens modified the flow chart as promised
14. Usage Model Report – (doc 03-0702 r0) by Adrian Stephens
- a. Cumulative minutes – 03-0354r10
 - b. Output Document – 03-0355r8
 - c. Reviewed residential usage model
 - d. Methodology for turning into simulation scenario
 - e. Status update and Future work
 - f. Noted Simulation scenarios are largely untested; expect some bumps!
 - g. How do we handle maintenance?
15. Channel Model Report - (03-0715r0) by Colin Lanzl on behalf of Venko Erceg
- a. Doppler model now spec'd
 - b. Individual Tao angular spread has been updated
 - c. Doc 03-161r2 = model document
 - d. Matlab program – publicly available at http://www.info.fundp.ac.be/~lsc/Research/IEEE_80211_HTSG_CMSC/distribution_terms.html
 - e. Fluorescent lights included in models D and E
 - f. Possibly one or more model scenarios related with large outdoor stadiums *may* be added
 - g. Polarization and antenna orientation deemed not germane to simulations
16. Meeting was recessed until 1:30 PM at 11:53AM

Monday September 15; 1:00 –5:00 PM [~104 attendees]

1. General Submissions:
 - a. Presentation - Doc. 11-03/0662 by Adrian Stephens; Selection Criteria and Functional Requirements Document [20 min.] included:
 - i. Selection Requirements Document Format Proposal:
 1. Unambiguous
 2. Relevant to PAR and 5C
 3. E.g., Throughput and Range
 4. Spectral efficiency
 5. Backwards Compatibility

- ii. Functional Requirements Document Format Proposal
- iii. Summary:
 - 1. Needed metrics
 - 2. Fnc Req'ts document outline
 - 3. Possible Selection Criteria Format to present results
- b. Presentation – Doc 11-03/0690 by Frans Hermodsson; A More Efficient MAC; (co-author Lars Falk with TeliaSonersa)
 - i. Focus of presentation is on Hot Spots
 - 1. Requirements
 - a. 100 Mbps
 - b. Different traffic types
 - c. Many users per AP
 - d. Short set up and tear down times
 - e. Reliable and robust
 - f. Spectrally efficient
 - g. Low power consumption
 - h. Interface robustness
 - i. Backwards Compatibility
 - 2. Implications
 - a. Efficient MAC
 - b. Small packet size
 - c. Reservation based
 - d. Centralized control
 - e. Admission control
 - f. Various classes of QoS
 - g. Power control
 - h. DFS
 - i. Adaptive Phy modes and ARQ
 - 3. Current Status
 - a. With today's MAC limit is about 75 Mbps
 - b. Large PDU => too high ARQ overhead
 - c. But today 30-40% of SDUs are <100 Bytes!
 - d. TPC and DFS currently only for .11h and 5 GHz
 - 4. Reservation Based Service (RBS)?
 - a. RBS better than CSMA even with HC
 - 5. Suggests concatenating into super frames

6. Backwards compatibility possible by:
 - a. Using PCF
 - b. RTS/CTS
 - c. Other
7. Conclusion
 - a. Centralized RBS worth looking at
8. Discussion
 - a. ATM like and ATM not successful
 - b. HL2 not successful
 - c. Should try and build on .11 strengths
 - d. Rebut – not suggesting HL2
 - e. Management of multiple subnets problematic (i.e., overlapping BSSs)
- c. Presentation – doc. 11-03/0700; Rahul Malik; Panasonic, HT WLAN a CE Perspective
 - i. Market to date has been PC/Enterprise centric
 - ii. CE market not ready but this is changing
 1. Home
 2. Hot Spots
 - iii. CE Requirements
 1. Hot Spot and CE are diametrically opposite in terms of requirements
 2. CE market – no single data rate > 28 Mbps but, many of them
 3. Therefore solution should be
 - a. Adaptable
 - b. Scalable
 - iv. Issues to address
 1. Highly portable devices (e.g. cell phones)
 2. Large # of users (e.g., cell phones)
 3. Aggregate network throughput
 4. Not just cable pt to pt replacement
 - v. Discussion
 1. Why does a cell phone need large BW; why not just use cell phone and cellular network
 2. Rebut – lower cost via VoIP
 3. How can we please everyone?
 4. Could we see a straw poll to help guide Adrian – Is higher # devices (e.g., 100) using average BW more important than smaller number of devices (e.g., 10) each consuming higher BW
 5. Straw Poll Discussion:
 - a. Add single STA to single STA mode?

- b. Why was 28.8 Mbps selected as highest application? Answer HDTV. What about picture in picture; that would be higher than 28.8.
 - c. What is meant by 'large number of devices'? Answer - 100 is large, small is 10
 - d. High throughput on handheld device – VoIP phones
 - e. We need to address both extremes especially if range is factored in
 - f. The MACs will be inherently different so optimising for both will be very difficult
6. Results of straw poll – more devices (12); smaller number of HT devices (62)
7. Presentation Discussion cont'd:
- a. Range?
 - b. Answer – home 10 meters and LoS;
- vi. Presentation – doc. 11-03/0717-01; Paul Feinberg, WFA; WFA HT Market Req'ts Input to .11n
- 1. Background
 - a. Liaison with .11n
 - b. MRD output doc.
 - 2. Summary of Req'ts
 - a. Models
 - b. Timing
 - c. Performance
 - d. Coverage
 - e. Capacity/Interference/Robustness
 - f. Network Topologies
 - g. Mixed Mode Operation
 - h. Power Consumption
 - i. Backward Compatibility/Coexistence
 - 3. Target Markets
 - a. Domestic Entertainment and Commercial Information – Infotainment
 - b. Rate <-> Range continuum; e.g., 80 Mbps at 20 meters and 10 Mbps at 100 meters
 - c. Identified 7 reference applications
 - d. Environments – 8 total based on demographics
 - e. Backhaul – consensus was that this is of lower priority
 - 4. Status
 - a. 1st draft has been submitted
 - b. .11n has already provided feedback
 - c. Straw Poll held in WFA to continue work on this topic passed
 - 5. Next Steps
 - a. More liaison

- b. Generate final draft
 - c. Consider WFA final input at quarterly meeting in December
 - vii. Discussion
 - 1. IEEE UM opposite from WFA point of view; how can we align?
 - 2. WFA viewpoint is market focused
 - 3. IEEE viewpoint is simulation focused
- d. Presentation doc. 11-03/0714; Jan Boer, Agere; Backwards Compatibility (BC) for a MIMO system
 - i. Recalled the BC statement in .11n PAR
 - ii. MIMO systems can operate in a SISO mode but they have to be able to detect the SISO transmission
 - iii. Coexistence requirements
 - 1. Lower order system must defer as it can detect the preamble and length info to recognize higher order transmission
 - 2. Preamble Structures which could be made compatible
 - a. Repeating preambles n times where n=number of transmitters
 - b. Example of compatibility of 3x3 MIMO system with an .11a system
 - c. Use bit 4 in signal field to indicate a MIMO transmission is ongoing
 - 3. Rate field and length fields now- per antenna
 - 4. Add extra signal field to indicate the number of antennas
 - 5. Length field – known if number of antennas known
 - iv. Alternative to repeating preambles could be diagonally loading preamble subcarriers
 - 1. Diagonally load so subcarriers are orthogonal
 - 2. Signal field – similar diagonal loading to indicate number of antennas and rate per antenna
 - v. Alternative to both of these Protection Mechanisms would be RTS/CTS
 - 1. as in .11g or .11a
 - vi. Preamble overhead considerations
 - a. Effect of preamble length is not negligible and should use other techniques such as frame aggregation or bursting
 - vii. Conclusion: MIMO and OFDM systems can be made backwards compatible and coexist with .11g and .11a systems
 - viii. Discussion:
 - 1. If use bit 4 should a SISO system ever set r4 to 1? A = NO
 - 2. Range? A = next phase of investigation
 - 3. What is impact of Diagonal load approach on the channel Estimator? A = probably yes but tbd
 - 4. Channel state feedback, is it necessary? A = not use in .11a or g and was not considered here
 - 5. Could PER be used? A = don't know

6. Protection mechanism is least complex approach; is overhead part of your throughput considerations? A = no, throughput is at the data SAP.
 7. Diagonal loading; does it allow a rate adaptation mechanism on top of this? A = same signal field which encodes the rate info
 8. Impact of protective mechanisms; how would we deal with an all MIMO BSS? We need to include this consideration in our requirements spec.
 9. Slide #4; deferring not on power only? A = cannot defer on power only since you must know length
 10. Diagonal loading versus preamble; is it exclusive OR? A = both could be used; diagonally loading will work with up to 3 antenna
2. Selection Procedure Discussion (doc. 11-03/0665r3)
 - a. Chairperson reviewed current Draft r3
 - b. General discussion indicated still many issues such as :
 - i. Allow second confirmation vote with additional technical input and time constraints if submission was compromised due to server malfunction? A = need clarification?
 - ii. Need time constraint and clarification of members or just proposers can make additional inputs at the start of step 17.
 - iii. Step 18 should be followed by an opportunity for presentations? A = yes
 - iv. Logical error in flow chart between step 14 and step 16; new step needs to be added
 - v. Flow Diagram Step 6 – who determines if proposal is complete? A = per text for step 6
 - vi. .3a did not independently verify proposal performance in channel models; should we add such a step?
 - vii. How do we handle MAC simulations when MACs are considered proprietary
 3. Started discussing selection procedure paragraph by paragraph:
 - a. Changes of the Procedure
 - i. can be done at any time motions are in order
 - ii. Do we allow retroactive changes? A = yes if the body agrees by a 75% vote
 - b. Definitions – Complete and Partial
 - i. ‘Complete’ determined by Self-classification or the body? A = Self-classification with a 75% vote to override required from the body
 - ii. When can this override vote be held? A = during the process of the step
 - iii. Change text to specify “Microsoft Word format”
 - iv. How many proposals may a member make? I.e., what is to stop a proposer from dividing his proposal as well as offering it as a complete proposal? A = don’t know how to prevent that
 - v. Verification issue – how do we verify as complete; difficult to get around self-classification due to 75% threshold
 - vi. Should .11n define a “completion” template?

- vii. Modify definition of ‘Complete’ to add “All complete proposals must disclose how the PAR requirements, Functional requirements and mandatory requirements of the Comparison Criteria are met in the format required in the respective documents”
 - viii. Modify definition of Partial to add “All partial proposals shall disclose which Functional Requirements and Comparison Criteria they meet and how they meet them. This disclosure shall be done using the format required in the Functional Requirements and Comparison Criteria documents.”
4. Recessed until 7:00 PM

Monday September 15, 7:00 – 9:30 PM

1. Chairperson called the meeting to order at 7:07 PM
2. Returned to ‘should’ versus ‘shall’ discussion
3. Decision made to change shall to should carried without objection
4. Definitions of Complete and Partial proposals were adopted without objection
5. Step #1 was adopted without objection
6. Step #2:
 - a. Assumes proposal *may* adopt ‘some’ of the channel models but not all
 - b. Yes there is some discretion; at the moment none of the 8 scenarios are marked as optional or mandatory
 - c. In fact the channel model for stadiums has not been created
 - d. Stadium channel model would take 6-8 months
 - e. Remember, we are trying to build channel models to compare proposals rather than build a product
 - f. Insert the word ‘mandatory’ before ‘usage models’?
 - g. Who decides which ones are mandatory and optional?
 - h. Delete ‘corresponding to the usage model’? Straw poll favoured this (no count taken)
 - i. Our goal is to limit mandatory work
 - j. Step #2 was adopted without objection after deletion
7. Step #3
 - a. Straw poll
 - i. Add A - ‘These Functional Requirements shall be based on the Usage Models and the Channel Models.’
 - ii. Add B - ‘The Usage Models and Channel Models shall be taken into account in setting the Functional Requirements’
 - iii. Add neither A nor B
 - b. Straw poll – A (5), B (13), Neither (23)
 - c. Straw Poll: Change ‘must be met’ to ‘shall be addressed’ as used in Step #4;
 - d. straw poll ‘must’ (19), ‘shall (19) so further discussion
 - e. Can Functional Requirements be addressed later on? A – yes but very difficult since requires 75%
 - f. **Motion** by Rolf Van Vegt to change “must be met” to “shall be addressed” and seconded by John Kowalski

- g. Motion failed (12,17, 2)
- h. Add – “The Functional Requirements shall contain a template that defines the format the presenters shall use to declare compliance with requirements”
- i. Define Channel Models, Usage Models, Functional Requirements, Comparison Criteria
- j. Chairperson proposed definition
 - i. Functional Requirements#1 – A list of essential features, performance and behaviours of the amendment. The Functional Requirements shall contain a template that defines the format the presenters shall use to declare compliance with requirements
 - ii. Discussion –
 - 1. Adrian presented a page from his earlier proposal and it included:
 - a. Minimum
 - b. Binary
 - c. Meet PAR and 5C
 - 2. Functional Requirements #2 - A list of mandatory features, performance and behaviours of the amendment. These requirements shall be consistent with the PAR, the 5Criteria and Usage Models. The Functional Requirements shall contain a template that defines the format that presenters shall use to declare compliance with requirements.
 - 3. Comparison Criteria -A - - A list of optional features and metrics related to the usage models. The Comparison Criteria shall contain a template that defines the format that presenters of proposals shall use to compare responses
 - 4. Comparison Criteria B- - A list of metrics and their definitions by which proposals shall be compared. The Comparison Criteria document shall contain a template that defines the format that presenters shall use to compare responses.
 - 5. It was noted that metric could refer to mandatory as well as optional features.
 - 6. Functional Requirement#2 and Comparison Criteria Definition B were adopted without further discussion
 - iii. Steps #3 and #4 were adopted without further objection
 - iv. Step #5 ‘Call for Proposal’ Discussion
 - 1. Straw Poll:
 - a. A – 1 thru 4 in parallel and then 5 (visual majority)
 - b. B – 1 thru 5 in parallel (little support)
 - 2. How much time after call for proposal? A = at least 2 months
 - 3. Add a statement to indicate that Selection Procedure text takes precedence over the flow chart in the event of a conflict.
 - v. Step #6 discussion

1. Add “Prior to the first vote the presenters shall classify their proposals as partial or complete” as the first sentence.
2. Why 75% to change classification? Is it not more of a procedural issue and therefore should require only 50%
3. Straw Poll – 75% (23) or 50% (9)
4. Assume all proposals are partial until the group agrees it is complete was not supported.
5. Step #6 was adopted without further objection
- vi. Step #6 ‘Aside’ discussion
 1. Adopted without objection
- vii. Step #7 discussion
 1. Discussion should NOT be limited to voting members
 2. Move to delete “Discussion shall be limited to voting members passed unanimously
 3. Replace ‘All presentations of proposals’ with ‘All proposal documents and related materials (Presentation Material, Functional Requirements Declaration, Comparison Criteria Declaration and Technical Specification)’ passed unanimously
 4. Straw poll to delete ‘presentation material’
8. Motion to recess until 1 PM Tuesday

Tuesday September 16; 1:00-9:30 PM

1. Continue with Selection Procedure, now Reference Doc 03-0665r4
 - a. Step #7 discussion continued
 - i. Remove Presentation Material
 - ii. Actually adds value
 - iii. Straw Poll – remove presentation material (12) or, leave it in (16)
 - iv. Could be interpreted to freeze discussion within that 30 day window so add text like “Any mergers resulting from the initial proposals shall be posted at least 10 days prior to presentation”
 - v. Straw poll A – mergers should be allowed during the 30 day period (29); B – mergers shall not be allowed during the 30 day period prior to the FIRST showing (11)
 - vi. Therefore add “Any mergers resulting from the initial proposals shall be made available to the voting members at least 10 days prior to the session at which they will be presented. Merged proposals shall also include documents and related material.
 - b. Step #8 discussion
 - i. Panel discussion – panel composed of surviving proposers?
 - ii. Why should questions not be impromptu as opposed to written before hand?
 - iii. Why not do both – submit questions in writing and impromptu?

- iv. Replace “The questions should be submitted to the TGn chair in advance and in writing.” with “Questions to the Panel shall be taken from the floor” received majority support (visual)
- c. Step #9 discussion
 - i. Reconcile this text with the new Step #7
 - ii. When does this step occur?
 - iii. We need to provide a time bound for this step (prevent phillabuster)
 - iv. 3 types of time – time to create merger. time to make merger available, time to present; all need to be bounded
 - v. This is prior to any vote
 - vi. Generally ‘special orders’ are associated with proposals which automatically bound times
 - vii. Partial proposals will only survive if they merge
 - viii. Replace “In the event that such a merger occurs, additional time will be provided such that the merger proposal(s) may be presented to the TGn voting members” with “The Task Group shall set the time for the presentation of merged proposals as a special order in the agenda”
 - ix. Replace “with complete proposals” in the first sentence with “that result in complete proposals”
 - x. Straw Poll – A – A time constraint such as 60 days should be added between Step #9 and the down selection (9)
B – No time constraint should be added (7)
 - xi. OK, so what should time constraint be?
 - xii. Avoid long gaps
 - xiii. Add “In the event of a merger there shall be at least 60 days allocated before the down selection begins”
 - xiv. Merged technologies require time for simulations; should we define a merging cycle?
 - xv. A continuum of possibilities
 - 1. Allow proposers to ask the body for time?
 - 2. Allow group to decide?
 - xvi. Straw Poll: A – In the event of a merger, there shall be at least 60 days allocated before down selection begins (2) or B – Partial proposals will be given the opportunity to solicit mergers that result in complete proposals. In the event of a merger, presenters of mergers shall be allowed to request additional time ‘to generate the merged proposal and present to the Task Group’. The Task Group will approve and/or determine the amount of time allowed prior to presentation of the merged proposals, and the time for presentation shall be fixed in the agenda. The Task Group shall set the time for the presentation of merged proposals as a special order in the agenda (visual majority)
 - xvii. The proposers need time to simulate and the body needs time to digest the merged proposal
 - xviii. Are we not encouraging merging candidates to delay merging?
 - xix. Doesn’t this encourage partial proposals until the last minute? I.e., playing games
 - xx. We simply can’t define a ‘gaming’ proof procedure
 - xxi. Step #9 was accepted without further discussion
- d. Step #10 discussion

- i. No discussion believe it or not!
- e. Step #11 discussion
 - i. Not reflected in the flow diagram
 - ii. Add “During step 9 and during ...” to the start of the step.
 - iii. Change ‘75% majority’ to ‘2/3 of the voting members present’
 - iv. How do we resolve the ‘completeness’ of a merged proposal at this late stage?
 - v. Answer – self-certification as before with override from the TGn if 75% vote
 - vi. No further objection
- f. Step #12 discussion
 - i. Shall ‘chairs discretion’ be retained?
 - ii. Change ‘At the chairs discretion’ to ‘An elimination vote shall then be taken’
 - iii. Change last sentence to read “The Task Group shall eliminate from consideration all proposals that do not obtain at least 25% support from the ballots cast”
 - iv. No further objection to Step #12
- g. Step #13 discussion
 - i. No comments
- h. Step #14 discussion
 - i. Do we need this step?
 - ii. Delete Step #14
- i. New Step #14 (former Step #15)
 - i. No discussion
- j. New Step #15
 - i. “In the event that there is only one proposal remaining Step 16 shall be skipped and the procedure shall be advanced to Step 17”
- k. Step #16 discussion
 - i. Remove parentheses
 - ii. No further discussion
- l. Step #17
 - i. Do we need to submit the NO votes verbally and in writing?
 - ii. Insert ‘state in writing’ after “who voted NO shall” => “who voted “no” shall be requested to provide to the chair their reason(s) for voting no and what would be required to change their vote”
 - iii. Straw poll 0 A – remove “to affirmative” (2) or keep “to affirmative” (7)
 - iv. Change – ‘working group’ to “be submitted to the 802.11n editor”
 - v. No further objection to Step #17
- m. Step #18
 - i. Insert “or a proposal withdraws” after “decide to merge at this point”

- ii. Straw Poll – remove last sentence Yes (4) No (22)
- iii. What about low hurdle proposal, would we bring it back?
- iv. What happens if only 2 proposals exist at Step #16
 - v. Add “unless there were not three proposals that initially entered step #16” to the last sentence
 - vi. Why 75%; do the operating rules require 75%
 - vii. Need at least 75% in a TG if you hope to get 75% at the WG
- viii. Add “remaining or all proposals that initially entered step 16, if there were less than three.” after three proposals
- ix. No further objection to Step #18
- n. Step #19
 - i. Accepted without change
- o. Step #20
 - i. Ref Aside – Change “a resolution identified with 75% support” to “resolved”
 - ii. No further discussion
- p. Step #21
 - i. Should we allow ourselves the opportunity to improve the draft before forwarding to the working group?
 - ii. Answer = no (visual)
 - iii. No further objection to Step#21
- 2. Channel Model – (doc. 03-161r2) presented by Colin Lanzl for Venko Erceg
 - a. Colin reviewed the proposed Channel Model document; some points emphasized
 - i. First and foremost the channel models are meant for comparisons of proposals and not for optimal design of products
 - ii. Extended .11a Medbo model to MIMO systems
 - iii. 6 channel models
 - iv. Model E is warehouse model not to open stadium model
 - v. Section 4.4 references an Appendix where a fixed set of distributions are calculated to generate means for AOA and AOD for each channel model since they will be used in many usage models and will not have to be recalculated each time
 - vi. Elevation AS (angular spread) significantly smaller than Power AS
 - vii. Each Tap AS assumed to be the same as the cluster AS
 - viii. Doppler model for interferers 6Hz at 5 GHz and 3 Hz at 2.4 GHz
 - b. Discussion
 - i. Does it apply equally to all taps or just the taps of a single cluster
 - ii. Answer – to all taps individually
 - iii. 60 MPH => 100 Hz at 2.4 GHz
 - iv. Background noise is assumed to be Gaussian; is this true given microwave ovens (only at 2.4) and the like?
 - v. Intent is to adopt this model with Gaussian noise because it is adequate to compare proposals

- vi. Model A is not meant to be a real channel and that should be explicitly stated.
- vii. Model B – small room and large k factor; how can this be?

Break for Dinner

Reconvened at 7:06 PM

- viii. Note that for the channel models:
 - 1. 200 Hz at tap 9 on Model F
 - 2. Added fluorescent lights
- ix. Any dependency on antenna separation? No, if within a half of wavelength separation
- x. Matlab program is available at
http://www.info.fundp.ac.be/~lsc/Research/IEEE_80211_HTSG_CMSC/distribution_terms.html
- xi. Interferers are considered as external to the model e.g., microwave ovens
- xii. Again, the model is really a set of tools to use to compare proposals
- xiii. What parameters have not been included?
 - 1. Answer – unique antenna configurations; polarization,
- xiv. Channel model team feels the User Model team should select the appropriate parameters for comparison
- xv. Should a set of realizations be created by the channel model team?
- xvi. Models express more multi-path than is actually encountered in real environments and therefore the gain by MIMO systems is overestimated?
 - 1. Response was that the parameter is in fact realistic
- xvii. Doppler spectrum is overly conservative; in a real environments there is much more rapid changes due to people and pets moving for instance; Coherence time of the channel is smaller than 10 ms
 - 1. Response was that the parameter is in fact realistic
- xviii. Should Model F contain a LOS?
 - 1. Answer – not meant to be a model to design a product to
- xix. Need models that actually do reflect reality; the problem with .11a was that the model did not
- xx. Rahul Malik - Has commented on Table II but his comments were not recognized; much larger K factors suggested for models B and C
 - 1. Response that a K factor of much greater than 10 has not been seen in the data
 - 2. Look at Intel's rather detailed measurements for enterprise and townhouse environments
- xxi. Use case for large stadiums that would ordinarily be LOS; could not find data in literature; we would have to take that data and that could take 6-8 months!
- xxii. IEEE does not hold ownership of the Matlab model; Dr. Schumacher and the Un of Namur in Belgium owns the copy right of the code

3. The Chairperson noted that both the Study Group Usage Model (UM) and Channel Model (CM) Special Committees have expired as of this September meeting since the TGn has been officially formed.
4. Time for Channel Model team to meet in ad hoc session to receive comments on doc 03-161r2 was set for tomorrow at 2:00 PM during the TGn time slot .
5. Adrian Stephens asked that TGn recess at 8:00PM and restart as an ad hoc at 8:10 PM for the UM team to meet; the TGn members agreed and the meeting was recessed at 8:00 PM. The UM team ad hoc meeting will end at 9:30 PM.
6. The UM committee appointed a secretary and separate notes were taken and published as doc.03-354r10

Wednesday September 17, 2003-09-16; 8:00 – 10:00 AM

1. Secretary nominations were closed with only one nomination, Garth Hillman. Garth was elected secretary without objection.
2. Remainder of this morning will be devoted to discussion of the Usage Models
3. 1:00 PM – 3:00 PM will be devoted to adopting the Channel Model doc. 11-03/161r2, and adopting Selection Procedure
4. We will return to the Usage Model discussion for the remainder of the day, 3:30 – 5:30 PM
5. Goal for today – adoption of Usage Model, Channel Model and Selection Procedure documents.
6. The remaining 2 hour meeting time on Thursday will be spent on:
 - a. Formulating a method to maintain the Channel Model and Usage Models going forward
 - b. Formulate a method to develop Functional and Comparison Criteria; Actually developing the Functional Criteria and Comparison Criteria will be the primary activities at the plenary meeting in Albuquerque in November since our selection procedure agreed to yesterday says that we must complete Step #4 before we can issue a call for proposals, Step #5
7. Meeting was recessed at 8:13 AM in order to go into ad hoc meeting to complete Usage Model doc. 11-03/355r9.
8. The UM committee appointed a secretary and separate notes were taken and published as doc.03-354r11
9. TGn will reconvene at 1:00 PM today.

Wednesday September 17, 2003; 1:00 – 5:30 PM

1. Chairperson called the meeting to order at 1:06 PM
2. Will start with Channel models
3. Colin Lanzl asked for Channel Model concerns
 - a. K factor in Model B (residential) too large
 - b. Need for K factor in models D&E (small and large enterprise) questioned
 - c. Others
 - i. Outdoor case; yes but let's defer until after concerns on the channel model are captured
 - ii. How will Interference model be handled? Answer - not planned by channel model committee

- iii. Channel model A assumes no delay spread and no K factor; it should explicitly be stated that this model is a limiting case to generate maximum rate and range and that it is not meant to be representative of a particular usage case environment.
- 4. How to proceed given the serious issue related to K factors
 - a. Form Sub committees?
 - i. Channel Model and Simulation subcommittee?
 - ii. Functional and Comparison Criteria Sub-committee?
 - b. Appoint chair pro tem now because many of the channel model experts are not at this meeting and appoint chair at Albuquerque when attendance is expected to be better
 - c. Discussion:
 - i. Why not try and approve the document
 - ii. Keep simulation and channel models as separate
 - iii. Straw poll on approving Channel Model document now?
 - 1. Introduce Channel model motion now (6) or wait for Albuquerque (26)
 - iv. Straw Poll – hold interim conference calls on Channel models passed (26,0)
 - v. Straw Poll – form Channel Model sub committee (14,3)
 - 1. Combine with simulation committee?
 - 2. Doc almost there so hold conference calls just for Channel Models issues
 - 3. Keep Simulation and Channel Models separate
 - 4. Channel model committee discussed the simulation issue and felt it should be handled separately
 - 5. Simulation ‘Methodology’ instead of Simulation only subcommittee
 - 6. Let simulation methodology come out of comparison criteria?
 - 7. Phase I for simulation committee – methodology to create comparison criteria; Phase II for simulation committee- after down selection to allow maintenance of simulation
 - 8. Want a simulation that always reflects the draft
 - 9. Do we have the resources to develop a generic simulation; that is a major work commitment
 - 10. Simulation before proposals is key to be able to evaluate proposals
 - 11. Why not just challenge the simulations used by the proposer
 - 12. A generic simulation is extremely difficult
 - 13. Most simulations will be proposal specific
 - 14. Simulation must be for the complete system; this is a large task which could be reduced by using a common baseline simulation
 - 15. Surviving proposer should put their simulation into the public domain
 - 16. Doing a generic simulation will introduce significant TGn delay

- d. **Motion** to form a Functional Requirements and Comparison Criteria (FRCC) special committee that is chartered to draft the 802.11n FRCC documents per the 802.11n Selection Procedure by Colin Lanzl and seconded by Bjorn Bjerke
 - i. Discussion
 1. Procedure?
 - a. Documents would be created for approval by TGn – Functional would typically be technical and Comparison Criteria would typically be a procedure
 - b. Can TG make modifications? Answer – yes
 - c. Who votes – voting members of TGn as a whole
 - d. Functional Requirements must be as defined in the Selection Procedure
 - e. What/Who specifies how the Functional Requirements will be used? Answer – the TGn
 - f. If we don't have a separate simulation subcommittee then will the FRCC be responsible for simulations? Answer – TBD by TGn
 2. Motion passes (34,0,3)
 - e. **Motion** to form a Channel Model special committee that is chartered to complete and maintain the Channel models for 802.11n by Srinikandala and seconded by Adrian Stephens passed (26,1,3)
 - f. Any objection to the Chairperson appointing pro tem chairs for each committee now and have a formal election at the November – none heard
 - g. Colin and Adrian were appointed and accepted the pro tem chair positions without objection from the floor
 - h. **Motion** to enable the TGn Channel Model Special Committee and the TGn Functional Requirements and Comparison Criteria Special Committee to hold conference calls after the September 2003 sessions and until their work is completed by Colin Lanzl and seconded by Srinikandala was adopted by unanimous consent
 - i. Due to the 30 day rule the first CC cannot be held until 30 days after the announcement in the WG
5. Chairperson reviewed Selection Procedure document 11-03-0665r8
 - a. Step #16 Insert “and/or make technical changes to their proposals. If a merger occurs or if technical changes are made to a proposal, all presenters shall” before “have the opportunity” in the middle of the clause
 - b. Annex A modifications to make annex reflect text of the Selection Procedure
 - i. Comments
 1. Step 11 - Changed the initial Sentence “during Steps #9, 16 and 18” from “after Step #9 and during the down selection voting selection”
 - c. Changes reflected in 11-03-0665r9draft 9
 6. **Motion** to adopt doc 11-03-665r9 as the official Selection Procedure document made by Colin Lanzl and seconded by John Kowalski passed (35,0,1)
 7. TGn was recessed at 2:48 PM until 3:30 pm
 8. TGn session was called to order at 3:35 PM

9. TGn was recessed until 8:00 AM tomorrow immediately and reconvened as an ad hoc meeting to focus on Usage Models doc. 11-03-355 r9 as lead by Adrian Stephens.
10. The ad hoc meeting appointed a secretary see doc 03-354r12

Thursday September 18, 8:00 – 10:00 AM

1. Meeting was reconvened at 8:19 AM
2. Chairperson gave control of the meeting to Adrian Stephens and his Usage Model Committee. The TGn secretary became secretary for the Usage Model meeting and the minutes of that meeting follow:
3. Changes to UM document was reviewed:
 - a. Added mean and standard deviation scores to the model Table
 - b. The lowest scores received were for Public park and Multi-point
 - c. The highest scores were for Residential at 2.8 and Enterprise at 2.7
4. Straw Poll – How many favour limiting the ‘mandatory’ usage models to the top 5 namely:
 - i. Legacy
 - ii. Co Channel
 - iii. Residential
 - iv. Enterprise
 - v. Hot Spot
 - b. And leaving the remaining cases as optional
 - c. Result (34,0)
5. Adrian then added a new ‘Status’ column to the Table indicating ‘mandatory’ and ‘optional’
6. So the optional models include:
 - a. Residential IBSS
 - b. Conference room
 - c. Public Park
 - d. Multi-point
7. Adrian recommended that when we vote to accept the document we do so with the simulation scenarios temporarily removed because they are not consistent with the models that have been modified.
8. Straw Poll – Should we focus on the 5 mandatory models rather than all of the models? Agreed unanimously
 - a. Discussion
 - i. We don’t have a mandatory usage case for outdoors
 - ii. We don’t have adequate ‘outdoor’ channel models
 - b. Straw Poll – should we add an outdoor case to the Hot Spot usage model? Failed (6,14)
9. Discuss Enterprise mandatory model
 - a. Discussion

- i. How realistic is it?
 - ii. Not enough VoIP stations
 - iii. Are the number of VoIP stations [6] in this scenario adequate?
 - iv. Straw Poll – too low (11); about right (12)
 - v. Notice that aggregate offered load is > 100 Mbps; does this mean QoS is implied?
 - vi. Yes, it is assumed that .11e will be in the legacy standard
 - vii. So, we should assume QoS in our simulations?
 - viii. Yes
 - ix. Co-channel interference is clearly needed but could we simplify the simulation by assuming the co-channel interferers are collocated
 - x. Is this too complex an issue to discuss here?
 - xi. It is relatively easy to replicate a BSS (i.e., collocate)
 - xii. What about simulation time?
 - xiii. Worst case, the simulations scale as n^2
 - xiv. Each BSS in this scenario has 27 STAs
 - xv. At Intel, using Op Net, they have simulated over 100 STA BSSs in a reasonable time so this should be OK
 - b. Straw Poll – should we deal with the simplification issue now (5), should a special committee address this issue (17), let's just leave things as they are (0)
 - c. Decision was to instruct the UM maintenance committee to consider simplification of the co-channel interference simulation
 - d. Discussion cont'd
 - i. What happened to the printing application
 - ii. Answer – it was merged with the local file transfer application
 - e. Adjacent channel interference effects; should it be treated similarly to co-channel environment?
 - f. Yes just as complex as co-channel
 - g. Could usage model maintenance committee consider adjacent channel interference as well?
10. Unanimously agreed to instruct the maintenance committee to simplify the co-channel interference simulation *and* the adjacent channel interference simulation
11. Have we finished with Enterprise ? Yes(18,0)
12. Turned to Mixed-Mode legacy
- a. Discussion
 - i. Which legacy systems:
 1. b
 2. g
 - ii. Need both
 - iii. What results will this give us?

- iv. Is this a deliberate low bar?
 - v. Answer - yes since we are trying to demonstrate coexistence but not how well the systems coexistence
 - b. Straw poll – should load in this usage case be significantly increased? Failed (3,15)
 - c. Are we done with this usage case? Yes (25,0)
- 13. Turned to Co-channel Model
 - a. Discussion
 - i. Are APs considered as *completely* overlapping? Answer - No
 - ii. Adrian indicated that this is another case of inconsistency and therefore recommended simulation scenarios should be made informative in this revision of the document since they are not consistent with the modified usage models. After consistency has been restored the simulation scenarios will be restored to normative status. There was no objection
 - iii. Done discussing this usage case? (22,0)
- 14. This concludes discussion of mandatory Use Cases
- 15. Returning to optional use cases; consider the Conference Room
 - a. Reasonable to have VoIP component?
 - b. Replace VoIP with best effort (BE)?
 - c. Straw Poll – replace VoIP traffic with BE traffic at the same volume as VoIP traffic failed (5,10)
 - d. Proposed to change to VoIP application in table to Conference Room VoIP
 - e. Done with this use case (11,0)
- 16. Public Park/Outdoor
 - a. Discussion
 - i. Add note that, “at this time, there is no outdoor channel model”
 - ii. Channel model committee needs guidance – does UM special committee want channel model committee to develop an outdoor channel model?
 - iii. Straw poll – 1) delete any mention of outdoor channel model (3), 2) Invent an outdoor channel model(3) 3) Develop and validate an Outdoor Channel Model (9)
 - iv. Why only 12 or 13 voting when prior votes were at the 25 level?
 - v. Answer - Want to Spend time on mandatory modes not optional items
 - vi. Validation of model will not be quick since there is little to no data in the literature and therefore the data will have to be gathered; generation of the outdoor channel model itself can be quick
 - vii. Too long of a delay in the process for an optional mode!
 - b. Adrian asked the Chairperson to hold a vote on this important issue at the TGn level
 - c. Are we finished with this optional use case/ Yes (25,1)
- 17. Point to Multi-point Backhaul Optional case
 - a. Discussion
 - i. None

- b. Are we done? Yes (12,0)
- 18. This completes consideration of all of the Usage Models
- 19. Consider Coexistence paragraph (in Models 9 and 11)
 - a. Discussion
 - i. 11h like mechanisms will be mandated anyway
 - ii. What will adding that complexity accomplish?
 - b. Adrian added a statement that .19 may require we consider at least interference from the primary users in the 5 GHz band
 - c. How will we simulate this?
 - d. Answer – we will need guidance from 802.19
- 20. Simulation Scenarios
 - a. Discussion
 - i. TX Power
 - ii. RX Noise Figure
 - iii. Simulation duration
 - iv. Effective loss due to lumped TX/RX errors
 - b. Scenario #1 – reviewed
 - i. Location
 - 1. Why are stations along the wall?
 - 2. It was just the characteristics of the real life test case considered
 - 3. Walls will not be considered in the simulation since they are already in the channel models
 - ii. Rate
 - iii. Delay
 - iv. MSDU size
 - v. Channel model
 - vi. Data Type
 - vii. Source
 - viii. Destination
 - c. No further discussion
- 21. This completes the discussion of the document
- 22. Return control of meeting back to TGn
- 23. Motion – “to adopt doc. 11-03-355r11 as the IEEE 802.11n Usage Models and direct the IEEE 802.11n Functional Requirements and Comparison Criteria Special Committee to perform maintenance as needed” was made by Adrian Stephens and seconded by John Kowalski passed (35,0,1)
- 24. New Business – None
- 25. Unfinished Business – None

26. Session adjourned at 9:49 AM until the Plenary meeting in November
27. Secretaries note – the FRCC document 03-355r11 was given a new documentation number after the meeting, which is consistent with the new server and numbering system – doc. 11-03-0802-000n.

Minutes Not Yet Available