

**IEEE P802.11  
Wireless LANs**

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**Title**

**Date:** September 16, 1999

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## **1.1. Tuesday AM**

### **1.1.1. Agenda**

- 1.1.1.1. *Appointment of Secretary – Tim Godfrey*
- 1.1.1.2. *Policies Overview*
- 1.1.1.3. *Study Schedule*
  - 1.1.1.3.1. *September 99, Generate*
- 1.1.1.4. *Call for Papers*
- 1.1.1.5. *5 Criteria Overview*
- 1.1.1.6. *PAR*
- 1.1.1.7. *Presentation of Papers*
  - 1.1.1.7.1. *discussion*
- 1.1.1.8. *New Business*
- 1.1.1.9. *Presentation to WG Plenary*

### **1.1.2. Discussion on agenda**

- 1.1.2.1. *Peter E – add presentation of papers*
- 1.1.2.2. *Bob O – add New Business*

### **1.1.3. Agenda Adopted without objection**

### **1.1.4. Policies Overview**

- 1.1.4.1. *Straw Poll – number of 1<sup>st</sup> time participants in 802?  
(approx 8)*
- 1.1.4.2. *Overview of 802.11 structure and policies.*
  - 1.1.4.2.1. *Voting rights*
  - 1.1.4.2.2. *Debates*
  - 1.1.4.2.3. *Key Motions (Roberts Rules)*

### **1.1.5. Study & Schedule Overview**

- 1.1.5.1. *Study Authorization and Charter*
  - 1.1.5.1.1. *Approved by ExCom*
  - 1.1.5.1.2. *Original Motion: Moved to approve the Working Group initiated by 802.11 for 802.11 enhancements with the charter to investigate for Qos and Cos metrics, enhances security mechanisms for support long keys, key negotiation and distribution, and investigate enhancements to the authentication process with the aim to submit a PAR by March 2000*
- 1.1.5.2. *Schedule to Completion*
  - 1.1.5.2.1. *Sept 1999 – Generate Candidate Enhancement Projects. Initial Draft on objective.*
  - 1.1.5.2.2. *Nov 1999 – Generate Candidate Enhancement Projects. Initial PAR draft.*

1.1.5.2.3. *Jan 2000 – Finalize Enhancement projects list.  
Update PAR Draft.*

1.1.5.2.4. *March 2000 – Finalize PAR. Submit PAR to Excom.*

1.1.5.3. *Schedule this week*

1.1.5.3.1. *Tuesday 8:30 – 12:00*

1.1.5.3.2. *Wednesday – 10:30 – 12:00*

1.1.5.3.3. *Thursday – 8:30 – 10:30*

1.1.5.3.3.1. *DSRC 1:30 – 4:30*

1.1.5.3.4. *DSRC is a transportation group considering using  
the 802.11 MAC. They have asked for time to make a  
presentation.*

### **1.1.6. Call for Papers**

1.1.6.1. *Enhancing 802.11 with QoS – Maarten Hoeben  
99/197*

1.1.6.1.1. *Requests 20 minutes.*

1.1.6.2. *Requirements for IAPP – Richard Paine 99/198*

1.1.6.2.1. *Requests 30 minutes*

1.1.6.3. *Multimedia Transport over wireless – Amar Ghori  
99/196*

1.1.6.3.1. *Requests 30 minutes*

1.1.6.4. *Greater than 40 bit WEP – Richard Paine 199/208*

1.1.6.4.1. *Requests 10 minutes*

1.1.6.5. *Voice over IP – Dean Kawaguchi*

### **1.1.7. Five Criteria Overview**

1.1.7.1. *The checklist for evaluating a project*

1.1.7.1.1. *1 – Broad Market Potential*

1.1.7.1.2. *2 – Compatibility with IEEE Standard 802 family.*

1.1.7.1.3. *3 – Distinct Identity*

1.1.7.1.4. *4 – Technical Feasibility*

1.1.7.1.5. *5 – Economic Feasibility*

1.1.7.2. *Technical Presenters should address these criteria.*

### **1.1.8. Overview of PAR form**

1.1.8.1. *Basic form to be filled out – review of existing PAR.*

1.1.8.2. *Attach a supplement with additional information  
showing the fulfillment of the 5 criteria.*

### **1.1.9. Presentation of Papers**

1.1.9.1. *Document 99/197 - Enhancing 802.11 with QOS and  
introductory discussion. Maarten Hoeben.*

1.1.9.1.1. *Candidate Project – Qos: NWN would like to  
enhance 802.11 to perform QoS based on PCF. How do  
you have to extend PCF to make it provide the necessary*

- features? (*Upstream Scheduling*). Target applications include *Soft Realtime Services*.
- 1.1.9.1.2. *Candidate Project – 802.1p Priorities. Integration of IETF QoS work into wireless domain.*
  - 1.1.9.2. *Document 99/208 - Greater than 40 bit WEP. Richard Paine.*
    - 1.1.9.2.1. *Candidate Project – Need for higher levels of encryption as technology progresses. The definition of “Wired Equivalent Privacy” changes over time. Need to enhance the standard in the area of scalable key length as well as alleged authentication flaws that may compromise security. Evaluate other existing schemes (IETF, Bluetooth, etc). Improvements to MAC management to support Key distribution, exchange, key length negotiation, and algorithm selection. Address regulatory and export issues.*
  - 1.1.9.3. *Document 99/198 – Requirements for IAPP. Richard Paine*
    - 1.1.9.3.1. *Candidate Project – Enhance the 802.11 MAC to establish an Inter Access Point Protocol to maintain connectivity, authentication, security, Qos and IP services through handoffs. AP to server authentication with privileged classes.*
  - 1.1.9.4. *Document 99/196 – Multimedia Transport over Wireless. Amar Ghori*
    - 1.1.9.4.1. *Candidate Project – Enhance the 802.11 MAC to accommodate multimedia applications. Emphasis on enhancements in the areas of Latency, BW, Priority, channel protection (error correction), and data streams.*

## **1.2. Wednesday Morning**

### **1.2.1. Call to order**

- 1.2.1.1. *Second session 10:30AM – 12:00*
- 1.2.1.2. *Objective of week – Identify candidate projects for PAR.*

### **1.2.2. Presentation of Papers**

- 1.2.2.1. *Load Balancing and Beacon Customization (Maarten) Document 99/227*
  - 1.2.2.1.1. *Extend the beacon to provide information on the current load conditions of the access point.*
  - 1.2.2.1.2. *Discussion –*
    - 1.2.2.1.2.1. *There will be objections to proprietary extensions to the standard.*
    - 1.2.2.1.2.2. *There is currently an interoperability issue with the current structure of elements in the beacon.*

- 1.2.2.1.3. *Candidate Project – enhance the 802.11 MAC to accommodate load balancing and avoid interoperability issues*
- 1.2.2.1.4. *Candidate Project – enhance the 802.11 MAC to include proprietary vendor information without compromising interoperability.*
- 1.2.2.2. *IEEE 802.11 and Voice Over IP, Bob Beach, Symbol. Document 99/228*
  - 1.2.2.2.1. *Symbol products using 802.11 for VOIP.*
  - 1.2.2.2.2. *25 calls per 1Mb/s FH AP. (10-12Kb/s per call). Lots of small packets, bursty.*
  - 1.2.2.2.3. *Why not PCF? Too complex, simpler mechanism work just as well. Polling mechanism wastes packets.*
  - 1.2.2.2.4. *Proposes changing 802.11 MAC so that AP can have priority access to the channel over STAs. (reduced backoff slots) Give voice packets priority over data packets.*
  - 1.2.2.2.5. *Discussion*
    - 1.2.2.2.5.1. *Disagreement that the PCF has only overhead in polling. DCF also has significant overhead in retries and backoff. Polling does not incur significant overhead, and allows advantages in balancing. Dangerous to mess with backoff mechanism.*
  - 1.2.2.2.6. *Candidate Project – enhance the 802.11 MAC to facilitate Voice over IP.*

### **1.2.3. Project list**

- 1.2.3.1. *Recommendation: change references to security to privacy.*
- 1.2.3.2. *Recommendation: separate enhanced authentication from stronger privacy.*
  - 1.2.3.2.1. *Candidate Project – Enhance the 802.11 MAC to use stronger authentication mechanisms.*
- 1.2.3.3. *Once we agree in general terms what the projects are, we will edit the wording.*

### **1.2.4. Key Questions for the PAR**

- 1.2.4.1. *Backward Compatibility with legacy 802.11 MACs.*
  - 1.2.4.1.1. *Discussion*
    - 1.2.4.1.1.1. *Backward compatibility is not required. It is allowed to introduce a new MAC for a new PHY. Example – Hiperlan II is not compatible with Hiperlan I.*
- 1.2.4.2. *Are there any existing alternatives?*
- 1.2.4.3. *Is there another standards group addressing this issue or more appropriate to address the issue?*

1.2.4.4. *Do we feel that the candidates are going beyond the charter of 802.11?*

1.2.4.4.1. *Discussion of the charter*

1.2.4.4.1.1. Outside of 802, there are bodies that are addressing entire solutions, not just the MAC and PHY layer.

1.2.4.4.1.2. We have to do the work here for the IAPP level issues. 802.1 is not going to do it for us. The issue is whether any other group is going to claim it.

1.2.4.4.1.3. There is a precedence for 802.14 and 802.12 and 802.9 where they have included higher layers within their own standard.

1.2.4.4.1.4. Authentication via RADIUS (Remote Authentication Dial-In User Service) in the IETF would affect the authentication issue.

1.2.4.4.1.5. There is some work going on in 802.1x for enhanced authentication.

1.2.4.4.2. *Discussion of IAPP*

1.2.4.4.2.1. The original IAPP proposal was dropped because it was contentious and would delay progress on the main standard.

1.2.4.4.2.2. The LLC group “retired” and individual MAC and PHY groups took over the work. The original charter didn’t allow this work. Now, we can do whatever we put in a PAR and can get approved.

### **1.2.5. Straw Poll**

1.2.5.1. *Number of proposals that would be presented in a working group? (To determine technical feasibility)*

1.2.5.1.1. *Dean K: Symbol*

1.2.5.1.2. *Maarten, Amar: Sharewave / NWN Joint proposal*

1.2.5.1.3. *Harry W*

1.2.5.1.4. *Bob O (potential presentation for client in authentication and privacy)*

1.2.5.1.5. *Victoria (Microsoft)*

1.2.5.1.6. *Richard : Boeing.*

### **1.2.6. Next Session, tomorrow 8:30AM**

1.2.6.1. *We will address the scope of the project and frame it into a PAR.*

1.2.6.2. *For future presentations (next meeting), bring more detail, and organize according to the Five Criteria.*

1.2.6.3. *We will use presentation text to solidify the PAR.*

### **1.2.7. Adjourn**

## **1.3. Thursday Morning**

**1.3.1. Agenda Today**

- 1.3.1.1. *This morning 8:30 – 11:00*
- 1.3.1.2. *This afternoon 1:00PM DSRC (Transportation application)*

**1.3.2. Summary of papers presented****1.3.3. Call for new papers**

- 1.3.3.1. *None*

**1.3.4. Potential Projects**

- 1.3.4.1. *QoS*
- 1.3.4.2. *Enhanced Privacy*
- 1.3.4.3. *IAPP*
- 1.3.4.4. *Multimedia*
- 1.3.4.5. *Load Balancing*
- 1.3.4.6. *Voice over IP*
- 1.3.4.7. *Enhanced Authentication*
- 1.3.4.8. *Improve state diagrams (removed)*

**1.3.5. Key Questions for a new PAR**

- 1.3.5.1. *Is compatibility with legacy 802.11 maintained?*
- 1.3.5.2. *Are there any existing alternatives?*
- 1.3.5.3. *Is there another standards group addressing this issue?*

**1.3.6. Discussion**

- 1.3.6.1. *Improvements to state machines should be taken up as a maintenance item on the original standard. This would require a new PAR, which would need an interpretation request.*
- 1.3.6.2. *The existing diagrams are adequate to specify the protocol and develop interoperable implementations.*
- 1.3.6.3. *Postpone discussion until this can be discussed with Allen Heberling*
- 1.3.6.4. *Straw Poll – Is fixing the state diagrams a candidate for the PAR for this TG? 4 Yes, 17 No, 2 Don't Care.*
- 1.3.6.5. *Straw Poll – Do we think this work should be referred to the working group level so that it gets solved? 20+ Agree, 2 Disagree.*
- 1.3.6.6. *Concerns about IAPP being a viable work for this PAR (above the layers that we have a charter for).*
  - 1.3.6.6.1. *It is at network level, above the MAC and above the LLC. Thus it is out of the 802.11 charter.*

- 1.3.6.6.2. *We can always create a reconciliation layer.*
- 1.3.6.6.3. *General consensus that IAPP is within the charter and is necessary work.*

### **1.3.7. Refining of Work Categories and Scope**

- 1.3.7.1. *Combine Multimedia, QoS, and VoIP into one category.*
  - 1.3.7.1.1. *Qos as a term needs to be more precisely specified. It is a poorly defined topic.*
  - 1.3.7.1.2. *Proposed Scope: To enhance the 802.11 MAC to support streaming over wireless with emphasis on enhancements in the areas of Latency, bandwidth, priority, error correction, channel agility policies.*
- 1.3.7.2. *Combine Enhanced Privacy, IAPP, Load Balancing, Extended Beacon, and Enhanced Authentication.*
  - 1.3.7.2.1. *Proposed Scope: Enhance the 802.11 MAC to implement stronger privacy protection. Enhance MAC management functions in the areas of algorithm negotiation, key length, and key management to accommodate a more secure 802.11 system.*
  - 1.3.7.2.2. *Proposed Scope: Enhance the 802.11 MAC to establish an inter AP protocol to maintain connectivity and ensure smooth hand off and continuity of services between APs.*
  - 1.3.7.2.3. *Proposed Scope: Enhance the 802.11 MAC to facilitate load balancing.*
  - 1.3.7.2.4. *Proposed Scope: Enhance the 802.11 MAC to accommodate proprietary vendor-specific information without compromising interoperability.*
  - 1.3.7.2.5. *Proposed Scope: Enhance the 802.11 MAC to use stronger authentication mechanisms.*

### **1.3.8. Contributors for next meeting**

- 1.3.8.1. *Qos and Multimedia*
  - 1.3.8.1.1. *Amar (Sharewave), Maarten (NWN), Bob*
- 1.3.8.2. *Enhanced Privacy*
  - 1.3.8.2.1. *Richard (Boeing), Victoria (Microsoft)*
- 1.3.8.3. *IAPP*
  - 1.3.8.3.1. *Richard (Boeing)*
- 1.3.8.4. *Load Balancing*
  - 1.3.8.4.1. *Maarten*
- 1.3.8.5. *Enhanced Authentication*
  - 1.3.8.5.1. *Bob O*

### **1.3.9. Discussion**



- 1.3.9.1. *Will all of these work areas be in one PAR? Yes, all of this is within the charter of the SG. We may have sub sections on the PAR.*

### 1.3.10. Adjourn

## 1.4. Thursday Afternoon

### 1.4.1. Presentation by DSRC

#### 1.4.1.1. Introduction

1.4.1.1.1. *A group from ASTM (American Society for Testing and Materials) is writing a standard*

1.4.1.1.2. *Group is 1751 DSRC*

1.4.1.1.3. *Looking for fast deployment by using a MAC that already exists and may meet our needs.*

#### 1.4.1.2. Applications

1.4.1.2.1. *Micro/Pico cell communication zones*

1.4.1.2.2. *Transit Signal Priority, Collision Avoidance, In-Vehicle Sensing*

1.4.1.2.3. *Authorization for transit vehicles at gasoline pumps.*

### 1.4.2. Questions for 802.11

1.4.2.1. *This is a high speed application. Vehicles moving up to 120Mph. 40mS time zone where communication can occur. What Is the minimum time needed to enter the net and transfer 5 frames of data?*

#### 1.4.2.1.1. Discussion

1.4.2.1.1.1. *How much data? Say 5 64 byte transfers.*

1.4.2.1.1.2. *The real question is how long did it take to establish communication with the AP?*

1.4.2.1.1.3. *Discussion on associate response time.*

1.4.2.1.2. *Potential solution with PCF mode, beacon time of 4mS. Station associates, and is immediately polled by AP to provide data.*

1.4.2.2. *Is the Ack part of the next frame's time window.*

1.4.2.2.1. *No, they are back to back. The ack is protected.*

1.4.2.3. *If we want to implement as separate uplink from downlink with a narrowband channel, would that affect the MAC layer? 802.11 is designed for half-duplex.*

1.4.2.4. *Is there a qualification standard for MAC implementations? The WECA group's charter is to establish interoperability. Also UNH interoperability labs. There is also the PICs which is part of the standard.*

1.4.2.5. *Is CDMA possible. No.*

### 1.4.3. Questions for DSRC from 802.11

- 1.4.3.1. *What companies and organizations are a part of the group? Introductions of DSRC group*
  - 1.4.3.1.1. *Wes Mayes. Amtec Systems Division of Intermecc. Transportation systems group. Toll and Toll applications.*
  - 1.4.3.1.2. *Bar Stevens . Smart Move (software co) Vehicle computers*
  - 1.4.3.1.3. *Bob Tierny – Mark 4 industries..*
  - 1.4.3.1.4. *Ichio Tachikawa. Electric Industry of Japan. ISO TC204 committee*
  - 1.4.3.1.5. *Mohamed Khafar*
  - 1.4.3.1.6. *Karl Kain. Mitre – employed by federal hwy administration.*
  - 1.4.3.1.7. *Paul Manual. Mark 4 Industries. Telecom Stds Advisory of Canada. Other DSRC standards work.*
  - 1.4.3.1.8. *Brody Cache. ARINC ( communications for airlines and govt contracting) Helping with DSRC investigation.*
- 1.4.3.2. *Why the 5.9GHz band? DSRC wanted primary or co-primary status in a band. Most of DSRC operations already in 902-928 band. A lot of activity already going on in 5.8.*
- 1.4.3.3. *What is the future to make it a worldwide band? May not become a worldwide, but in North America.*
- 1.4.3.4. *What is the timeframe for equipment deployment? Next 2 years is goal.*
- 1.4.3.5. *What is the quantity of devices? The goal is to have a DSRC device in every car. Initially, in emergency vehicles and buses.*
- 1.4.3.6. *Who will deploy the infrastructure devices (Aps)? Combination of government and private concerns.*
- 1.4.3.7. *Do you have a PHY solution? There are several choices. Will be decided in 2-3 months. Suggestion to test a 5Ghz radio from 802.11a.*

#### **1.4.4. Discussion**

- 1.4.4.1. *Time to develop existing 802.11 MAC? 3.5 years: Nov 1993 selected protocol to July 1997 Approval.*
- 1.4.4.2. *Future work of 802.11. MAC enhancements SG charter.*
- 1.4.4.3. *Did we hear any new requirements from this presentation? The vendor proprietary information capability in AP beacons that we have already identified as an improvement would be applicable for the safety beacon application.*

#### **1.4.5. Adjourn**