Tentative Minutes of the IEEE P802.11 Working Group

Plenary Meeting
Fort Lauderdale, FA
November 11-15, 1991

Monday, November 11, 1991, Plenary Working Group

3:30 - 6:50 pm.

The meeting was called to order at 3:30 PM, Vic Hayes, chairman of IEEE 802.11[1] being in the chair, Jim Neeley vice chair, Bob Crowder note-taker, Vic Hayes final production of minutes.

1. Opening

    1.1   **Introduction**: All people in the room were invited to mention their names and affiliation.

    1.2   **Voting rights**. The chair gave a brief summary of the voting rights rule and requested voting members to obtain their token for voting from the Vice Chair.

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1.3   Attendance list. The attendance list is passed around mornings and afternoons. Initial the attendance list at the current morning or afternoon meeting.

1.3   Logistics. Document distribution at the meeting is done using pigeon holes (a file system). See Jim Neeley for instruction. Note that you may use the pigeon holes for mail.

1.5   Other announcements. The Chair announced that the FCC had ordered for an "en banc" hearing on the subject of Personal Communications Services (refer to agenda item 7.1 for details). To meet the deadline, he had applied for a slot in the hearing to represent this Working Group. So IEEE 802.11 may be selected to be one of 24 speakers. He requested that the WG assist in developing his remarks to the FCC.

2. Approval of the minutes of previous meetings

2.1   Worcester, MA meeting May 6-9, 1991 - Doc.11/91-72 - *Approved by Consensus.*

2.2   Kauai'i, HI meeting July 1991, Doc. 11/91-87. Strike on page 9, next to last line of section 6.2.1 the words: "and P-Persistent CSMA". - *Approved by Consensus.*

2.3   Palo Alto, CA meeting Sept.1991, Doc. 11/91-107. Change on page 14, section 11.1 the name to Visser. - *Approved by Consensus.*

2.4   Matters arising from the minutes J. Cheah ask if the Requirements Document agreed in Palo Alto is an extension of the PAR? K. Biba (#1) says it provides detailed numbers to refine requirements already in the PAR, but it is possible that additional requirements to support real systems may emerge.

The Chair supports the above position. R. Crowder asks if this is the consensus of the WG. No one objects except as below.

K Biba says if additional requirements beyond the PAR are uncovered then we either change the PAR or elect to work according to the Requirements document. L van der Jagt supports K.Biba #1.

Document distribution; the chair stated that document copying and mailing took nearly two weeks because of the stapling per document. 3 people expressed preference for individually stapled documents that arrive later. Chair will distribute one bulk packet, with each document starting on the right side page.

3. Reports

3.1   Report from the 802.11 ad-hoc 1 meeting K.Biba reports on Monday. AM PHY Ad-Hoc Group (AHG) meeting; 3 reports were received: from Wim Diepstraten of NCR, David Waskevich of Spectrix & Roger Samdahl of Photonics. Orest Storoschuck will chair an extension of this ad-hoc group to define a standardized format for obtaining data from all vendors.

L. vdJagt says his is implementation data rather than PHY data. Discussion appears to agree this is data on what is achieved by real WLANs today.

3.2   Report from the Executive Committee meeting The Chair reports the highlights of the Monday November 11, AM meeting of the Executive Committee. ANSI has established an ARCNET CANVASS Body. IEEE P802 has declared to have no position. Experts wishing to ballot should contact ANSI directly.

The Executive Committee is in the process of revising both the IEEE P802 Functional Requirements and the IEEE P802 Operating rules. A ballot resolving meeting has been scheduled for Monday, November 11, 6:00-8:00 h PM in Suite 1020.

The following IEEE Document were published since the last plenary meeting:

  802.5b Unshielded Twisted Pair for Token Ring at 4 Mbit/s,

  802.5c Dual Ring operation, and

  1802.3 Conformance Testing.

Copies will be distributed to registered participants of this meeting during this week's session, subject to availability.

ANSI has requested support for their international secretariat functions; Our interest would be in the secretariatship of JTC1. The cost would be approximately $300 per year from IEEE 802. attenders. R. Crowder objected since his small company is already an ANSI member & thus pays ANSI dues. L vdJagt says lack of funds is a sign that ANSI is not providing an economical service.

P. Eastman cited advantages of ANSI as Secretary of JTC1, e.g. we receive clarifications in English on the same time zone. The Chair says no other country might accept the secretariatship of JTC1 as the members of ISO have already distributed the tasks among them. R. Crowder suggests that the JTC1 Secretary be divided among several countries. He notes that IEEE staff ought to support IEEE 802 in their work.

IEEE 802 is seeking 1 or 2 persons as to serve as Recording Secretary of 802

3.3   Financial statement of 7th meeting Bill Stevens reported on finances.

Presentation and discussion should be 1 hour 10 minutes maximum per paper. Finances are as follows:

Income from payments remitted at the Palo Alto meeting:	$ 3375.00
Balance from Worcester:	$ 402.87
Host (Apple Computer) contribution	$ 373.67
Total income:	$ 4151.54
Expenses at the Palo Alto meeting:	
Total expenses:	$ 4151.54
Remaining balance:	$ 0.00

Apple Computer absorbed the excess cost of the Palo Alto meeting. L vdJagt expressed thanks to Apple (approved by acclamation). The **financial statement** was *approved* with 17Yes, 0Abs, 0No.

4. Registration of contributions

Appendix 2 lists the documents relevant for this meeting. Up to doc: 130 were available or announced to be available at this meeting.

5. Adoption of the Agenda

Discussion is based on the Temporary Agenda distributed in Oct.1991 with doc: IEEE P802.11/91-110. There were questions on the need to repeat the Voting Rules announcement and other AdminisTrivia each day. The Chair agreed that he would limit such announcements to 120 s. per day.

Discussion of ad-hoc groups

1.L. vdJagt requests ad-hoc groups for MAC & PHY. K. Biba requests the MAC ad-hoc group be divided into Centralized & Decentralized. R. Crowder cites very bad experience with 10BASE-F (Active & Passive) & in Fieldbus (Centralized & Decentralized). He proposes 3 ad-hoc group - PHY, MAC, Architecture (Bridges, Distribution to APs, Security,etc. K. Biba agrees to withdraw his proposed split in favor of Bob Crowder's. J Cheah says MAC & PHY are irrevocably linked, so he favors combining these ad-hoc group.L vdJagt says there needs to be close interaction between MAC & PHY but they can work most effectively separately.

R. Crowder says he believes that certain MACs can work well on a variety of PHYs.

C. Rypinski supports the above view - certain MACs can be media independent. K Biba supports the 2nd above view. O. Storoschuck says he is concerned that unless there is close coordination between MAC & PHY, the error conditions may be masked. J. Neeley says we should spit up & define the interfaces between the MAC-PHY

J. Cheah says that MAC & PHY are closely coupled. MAC designers must learn PHY. He estimates that BER = 1/1000 at 1 Mbit/s. R. Lewis says that can even be disagreement over whether BER < 1/1000 can be achieved in the ISM bands.

2. Is it the intent to have the Arch ad-hoc group separate and will it perhaps define a new internet? K Biba says he believes Arch should be separate - deal with Spanning Tree Bridges, Routers, etc. and that we will have multiple PHYs in our standard.

R Crowder says MAC & Arch should be separate since the technologies are distinct & that we should use known bridging technology. He says PHY experts should trust MAC designers at least for a little while. He also says that PHY people need to define media characteristics in terms like BER, outage, etc. so MAC people can deal with it. K. Biba supports the above view.

R. Crowder moves **to set-up MAC & PHY ad-hoc groups to meet separately for 1.5 days followed by a half day joint meeting**. Second by L. vdJagt.

C. Rypinski moves **to amend the motion, changing 1.5 days to 1 day**. Second W. Stevens. Amendment *passes* with 17Yes, 3Abst, 0N.

Discussion - The discussion brings out the concern of a lack of understanding of PHY by MAC persons, but it is noted that there is a record for spiting the two. V. Hayes, committee chair notes that if the meeting is held per the motion there will be only 0.5 days for work on Requirements or other common work. It was also noted that time is needed to hear all papers.

At 6:15PM R Crowder moves **to call question**. Second K. Biba. Motion to call the question *passes* with 13Yes, 0Abst, 0N.

The amended motion **to set-up MAC & PHY ad-hoc groups to meet separately for 1.5 days followed by a half day joint meeting** then *passes* with 8Yes, 4Abst, 5N.

J. Cheah moves **that WG members study the Requirements doc. (11/91-108) and be prepare to discuss it in plenary WG on Thursday morning**. Second by O. Storoschuck. The motion *passes* with 11Yes, 1Abst, 0N.

Question raised as to the Agenda for the next 3 days. The following schedule was offered.

Agenda

Tues AM	= plenary, guideline for ad-hoc groups
Tuesday PM	= PHY,MAC, FCC
Wednesday AM	= PHY,MAC, FCC
Wednesday PM	= PHY,MAC, T1P1
Thursday	= Plenary

The Chair will assign time to all papers for Tues AM.

It was moved **to adopt Agenda & Adjourn at 6:40pm** - *Consensus*

Tuesday AM, 12 November, 1991

0.   **Opening**. The meeting opened at 8:44am with 45 people present.

0.1   Announcements The following conferences related to wireless LANs were announced and calls for papers were expressed:

EFOC-LAN92, Paris FR, June 24-26, 1992

IEEE Selected Topic in WLAN, Vancouver, CAN, June 25-26, 1992

IEEE Globecom92 - Orlando,FL, Dec.92

0.2   Attendance list, registration, voting rights

0.3   Temporary document list update no changes

0.4   Agenda adjustments The Chair announced that the new Agenda was available.

0.5   Introduction of people

6.   Liaison bodies

6.1   Reports

- T1

R. Dayem reported that T1P1 had sent a liaison letter (doc: 91-120) where they requested further liaison to coordinate all work related to wireless; they also requested a copy of our requirements document. R. Dayem plans to attend the meeting, V. Hayes may be there also.

- ETSI

S. Black reports from ETSI along doc: 91-118. There are 44 Company members: 24 manufacturers, 5 telecommunication service providers and 2 regulatory agencies represented in the Technical Committee "Radio Equipment and Systems". They have an ad-hoc group working on radio LAN that are studying 3 Categories of LAN:

* Cat.1: products on the market in ISM bands - Term rate = 200 kbit/s, < 1 Mbit/s /ha/floor hopes to liberalize low power (ISM) band regulation.

* Cat.2: portable - Term rate = 2 Mbit/s, 3-10 Mbit/s/ha/floor

   DECT is example - 1 Company has product, allocation for 10 channels to carry 2 Mbit/s in Europe at 1992

* Cat 3: HIPERLAN High Performance Term rate 20 Mbit/s, 100-1000 Mbit/s/ha/floor

ETSI has funded full time effort for liaison to IEEE 802.11 to avoid duplication and for editing assistance to the group.

- Japan

H. Haruyama presented doc: 91-127, reporting that the Research and development center for radio systems (RCR) has established a study group for Wireless LAN in May 91. In June 91, a Working Group under the Study Group was established and in September a radio sub-Working Group was established. Refer to the document for details.

H. Haruyama offered to be the liaison between RCR and IEEE P802.11, which was accepted by the meeting.

- CCIR TG 8/1

W. Stevens reported that R. Allan attended the joint party of CCIR and CCITT to define the service of Future Public Land Mobile Telecommunications Systems (FPLMTS). The proposal to include the definition of data at up to 20 Mbit/s was accepted in the Dallas, TX, part of the meeting. R. Fudge, the chairman of the London part of the meeting, objected to private nature of the services. At the end the definition was found in the new draft service definition. V. Hayes attended the London meeting; the report is distributed in doc: 91-129.

6.2 Establish ad-hoc groups

T1P1 response,

L. vdJagt moved **that in light of IEEE 802.11's role in International standardization, that the MAC & PHY AHG be placed at SG status and that they be charged with developing one or more draft working documents of sufficient substance to be considered for our final standard. These documents are to be presented to the full (IEEE 802.11) committee by March 1992**.

Chair rules *motion out of order* at this time.

R. Dayem moves **that he draft a cover letter & transmit the draft of Requirements Doc. (108) to T1P1**. Second by J. Neeley.

Discussion: R. Crowder says it is out of order to transmit the document before it is discussed. R Dayem says better to send something now. D Buchholz says he is not ready. The motion fails with 7Yes, 3Abst, 11No.

R Dayem will tell T1P1 that requirements will be ready at a future date.

7. Regulatory bodies

Further distribution of letter to Administrations; this point was inadvertently skipped.

7.1 Reports

- US

S. Wilkus introduces doc: 91-114, the policy statement and order of the FCC regarding PCS. The important part being that:

- the FCC orders an En banc Hearing on Dec.5,1991 and

- the FCC now agrees that PCS includes CPU networks (Data PCS).

Some important points are: - Private as well as public usage & new players like CATV, -should support local, US, & Intl services (Intl is new), -Allocation needed from 1.8 to 2.0 GHz & other Freq.with experimental licenses, - establishment of a Small Business Advisory Committee.

   - Europe,

V. Hayes reports from the CEPT on European frequency allocation status. Refer to doc 91-119 for details.

7.2   Establish ad-hoc groups

C. Rypinski moves, J. Cheah seconds, **to empower the Chair to represent IEEE 802.11 at the en banc hearing of the FCC on the matter of new ruling for PCS, scheduled for December 5, 1991, subject to selection by the FCC and subject to approval by the IEEE 802 ExComm**. This motion *passes* with 21Yes, 1Abst, 0No.

Motion by C. Rypinski, second by L. vdJagt **to refer the preparation of the remarks and the speech for the FCC En Banc hearing to an ad-hoc group. The group is to work along the lines of the PAR, the general requirements of 11/91-108, the letter to administrations, & the previously submitted documents to the FCC.** This motion *passes* with 24Yes, 0Abst, 0No.

8.   WLAN Requirements

8.1   Reports

K. Biba drew the attention of the group to the result of his ad-hoc group on Wireless LAN requirements represented in doc: 91-108. The document defines what the user needs to be delivered from the MAC and PHY in various market segments (see tables on pages 11 and up).

K. Biba had made a summary of common MAC characteristics in the following way:

   *   tolerant of modest MSDU loss rate 10-2 -> 10-3, assuming higher layer reliability,

   *   No apparent pattern with respect to station movement speed:

      - ≤ 2 m/s must be supported,

      - ≤ 0 m/s strongly desired.

   *   No apparent pattern with respect to destination distribution; wireless and wired destinations are equally likely

   *   transparent interworking,

   *   privacy/denial of service,

   *   power management,

   *   graceful degradation..

A table for WLAN application configurations could be depicted as follows:

Node density	numberr of nodes
≤10/ha	21 or 5000
≤100/ha	36 or 1000
≤1000/ha	45
>1000/ha	116 or 5000

So, networks tend to be either small <100 or very large >1000.

Defining the delay tolerance as $\frac{\text{tolerated delay variance}}{\text{dely}}$ than the following table would be valid:

Delay Tolerance	Delay Range	Dely variance Range	Arrival Rate Range	MSDU Size Range
	ms	ms	ms	octets
<<1 (note a)	≤30	≤5	2->30	32->600
≥1 + ≤10 (note b)	2->500	10->1500	2->180000	10->1261

note a: "real time" stream

note b: "datagram" request/response

The "market size" in nodes/yr. today (i.e. not only wireless)

Market segment	nodes per year
Education	E6
Meeting	5E5
Financial	E4
Office	E7
Medical	5E5
Industrial	5E5-E6
Retail	5E5
Warehousing	5E5

Further work is required.

W. Stevens could not yet make document 91-130 available.

9. Architecture

9.1 Introduction of papers

J. Cheah introduces doc 91-111 which contains an analysis of Slotted Aloha, CSMA and SALOHADAMA.. Slotted Aloha depends on good collision detection (low errors) and also can not allow capture effects.

J.Cheah always knew that his proposed system (SALOHADAMA) degrades into CSMA, but nevertheless shows advantages (refer to the paper). The used Barker sequence gives unique advantage it has effectively a perfect throughput curve. J.Cheah says his system has only 1 extra block (Barker Seq.) over NCR WaveLAN.

Discussion: K. Biba points out that the assumptions of paper don't match current systems. He presented paper in Palo Alto that simulates results with real system.

C. Rypinski presents doc: 91-112 for D. Vaman of the Stevens Institute.

R. Zavrel introduces his doc 91-113 with a proposal for Management of WLAN PHY. The vice-chair points out that the copyright material included in the paper will be scrubbed. R. Zavrel points out that this problem has already been solved for HAM Radio - ARRL Procedures; there are 4,000,000 worldwide HAMs. Their Q signals and QN (network) control signals are "models" of actions that can be taken by a MAC to manage a PHY network. The paper has scenarios of the Standard.Operating Procedures.

C. Rypinski introduces doc: 91-116 with architectural considerations for large scale wireless networks. CSMA models don't consider effect of a large number (i.e. hundreds) of nodes. There is a concern over receipt of same frame by multiple AP and the related effect on Bridges. He proposes a HUB controller (ala frame relay) which allows system to take advantage of redundant radio paths rather than require elimination.

L Dang introduces doc: 121 on Wireless PHY Technology with a plea for Direct Seq.CDMA which would needs 30 Mhz. To conserve battery power a Tx=100mW could just consume a total =300mW but just several mW for stand-by. For progress he contends:

1. agreement on channel model - cant verify any proposal without channel model, i.e some knowledge about Rayleigh or not, # rays, delay spread,

2. standard needs NOT to be complete, now too ambitious,

3. Throughput agreement,

4. Sequential .Access MAC maybe 1 way for CSMA.

P. Cripps introduces doc: 91-122, Engineering choices for portable WLAN adapters for Texas MicroSystems. Their focus is on Laptop and Desktop products. Important considerations are: Size should fit internal.modem slot, power <50ma at 5V Price to the end User < $500 (250), range 100-200 ft thru normal walls, Non licensed. With these-attributes he is sure we would sell now.

ISM band at 2.4 GHz is target band. DSSS with signaling above 1 Mbit/s gives serious distortion. Since 1989 we can do frequency hopping, which is more robust than DSSS. Protocol proposed is enhanced CSMA with link level ACK and a tailored error recovery in MAC depending on Media characteristics (don't retry during fade or microwave blast).

K.C. Chen, now works for the National Tsing Hua Univ and for ITRI, both at Taiwan. He introduced 2 papers. One also presented at Telecom '91 (Geneva) and the other at Globecomm '91 at Phoenix.

R. Rosenbaum presented the result of some research in WLAN Health Issues as presented in doc:91-128.

The paper also identified work in standards committees on subject matter.

9.2 Establish ad-hoc group

L. vdJagt moved (as earlier, but now in order) **that in light of IEEE 802.11's role in International standardization, that the MAC & PHY AHG be placed at SG status and that they be charged with developing one or more draft working documents of sufficient substance to be considered for our final standard. These documents are to be presented to the full (IEEE 802.11) committee by March 1992**. P. Eastman seconds.

Discussion: V Hayes expresses concern that with no charter the groups may produce something of no value. L vdJagt is concerned that if we don't have standard soon we will be reviewing European and Japanese

standards. Several support to split into MAC & PHY. L. vdJagt pointed to the discussion of yesterday where the MAC and PHY groups will coordinate each meeting. N. Silberman expressed concern over split of MAC and PHY. A.Flatman draws the attention of the group to the need of an ARCHITECTURE definition first, this has been the experience of other 802 WGs. C. Rypinski states that we could classify proposal by type; this may lead to convergence, MAC group could possibly classify but not decide. W. Stevens supports the motion as we need to make progress. J. Cheah points out that people are well aware of differences in proposals; splitting could sort out the issues.

P. Eastman **calls the question**. There was a second; 20Yes, 5Abst, 3No (28 votes) *Carries.*

Vote on Motion results in 13Yes, 3Abst, 14No. *Fails*. (30 votes) The note taker calls for a verification of the vote as the numbers are not the same. The Chair counts the number of voting members, which turns out to be 31. Some people may have been out of the room momentarily; but the number of voters warrants a correct count on the latest votes.

J. Cheah says 2 of proposals can do either Central or Distributed. P. Eastman moves, R.Crowder seconds, **to proceed on a distributed approach**

As the room has to be split in two, the Chair has to watch the orders of the day and adjourns with above motion on the table at 12:50.

10.   Adjourn for ad-hoc groups

The MAC and PHY ad-hoc groups met separately on Tuesday PM and Wednesday AM.

The MAC and PHY ad-hoc groups met jointly on Wednesday PM.

The Hearing ad-hoc group met Tuesday PM, Tuesday Evening, Wednesday, all day till Thursday 1 AM. This group sometimes consisted of one person.

Thursday, November 14, 1991, Plenary Working Group

The meeting is called to order around 8:44 AM. P. Eastman withdraws motion as he observes enough progress in last 2 days. R Crowder agrees; he anticipates formation of Sub Groups.

0.   Ethernet issue

The chair announces that he is invited to check the groups sentiment on the following issue:

802.1 and .10 want PAR to support interoperation with Ethernet within IEEE 802 standards. At the July ExComm meeting similar proposals were rejected to prevent setting a precedent of references to not-standardized matter in IEEE standards. Many frames on 802.3 networks carry Ethernet frames. A lack of consistent rules within 802 standards affect interoperation of standard equipment construction of 802 & FDDI. They request that 802.11 resolves that 802 should be allowed to address coexist issues.

After some discussion it was decided to have a straw vote to advise (non-binding) what they each voter would like the Chair to vote. The result being: 11Yes, 12Abst, 7No.

8.   WLAN Requirements

8.3   Discussion on the Requirements Document, doc: 91-108 lead by K. Biba.

K. Biba wanders whether we could have a separate Sub Group to define overall statistics, or try to do this in Plenary. R. Crowder observes that pages 6 & 7 are out of character with rest of the document and do not appear to have a basis in survey data. L. vdJagt thinks we need to characterize inter-arrival time of packets. C. Rypinski proposes a need gross data rate per user/ hour. R. Dayem proposes to incorporate 21 points from MAC ad-hoc group.

R. Crowder agreed to remove personal points on the MAC 21 point document and to include the cleaned up version in the minutes. He has serious comments on pages 6 and 7 of subject document.

The following plan was established to proceed with the document: All comments should be received by 11/22/91. Small Group will meet by E-mail or Telcon to revise. Revised Document will be mailed to IEEE 802.11 by 12/25/91.

The meeting proceeded with collecting comments:

1 include Network Management although the main information should be available in 802.1standards.

R.Crowder: choice of 600 oct MSDU is based on segmentation by some particular network - real ASDU sizes are larger than 600 oct. K. Biba precises to 576 = Novel, 600 or occasionally larger on TCP/IP. It was reminded that OSI can fragment and that we are talking in MSDU sizes rather than ASDU. R. Crowder: sizes greater 600 in Request/Response are typical in MMS. K. Biba requests R.Crowder to submit additional data.

W. Diepstraten observes that there does not appear to be information regarding roaming on page six. There also does not appear to be information about moving while in operation. Roaming operation within a EBSA is discussed.

After break it was noted that additions would be made to cover roaming. K. Biba then opens the discussion of pages 6 and 7. W. Diepstraten asks questions about the meaning of the definitions and K. Biba states that definitions are for users of a MAC service. There is an issue of these numbers are one hop without going outside of a BSA. K. Biba clarifies that this is within a BSA.

D. Johnson asks about the definitions of service initiation time. K. Biba says his model is that Service initiation time is the startup time to get to the first MSDU to start and that nominal transfer delay to put out subsequent packets. Service initiation is like connection setup time in a phone conversation. K. Biba states that in reviewing the data the service initiation time tends to be large, for instance, 500 ms. You are willing to wait to mount and eternal drive but not for the individual files once the drive is mounted. There is an issue that maybe people don't want to wait brought up by D. Johnson.

J. Cheah thinks Service initiation time variability is important because many applications can tolerate it, and if it can't it might be set to zero.

K. Biba says this is the MAC portion of the log on time. B. Crowder asks about what definition deals with needs to deliver information on a regular periodic basis. K. Biba responds that transfer delay variance and MSDU interarrival time combine to document this type of requirement.

K. Biba says the paradigm of service is that we offer one a service that transmits MSDUs with a degree of service quantified by these parameters. MSDU length is what one instance of an application will request the MAC to send in terms of length. The MSDU arrival rate is how these Msdus arrive at the MAC in time. Nominal transfer delay is how long it takes from the time the MSDU arrives at the MAC service interface and is returned to a receiving MAC service interface. Transfer delay variance (changed to standard deviation by comment from Don Johnson) is the amount that the transfer delay varies from one packet to the next. MSDU loss rate is the rate at which higher levels demand the MAC to deliver message. i.e how many messages can be lost. Service Initiation time is discuss above but there is a discussion about how does this relate to retry and recovery from transmission errors. K. Biba summarizes that retries should probably should be put into arrival distribution. There is an desire to change Service initiation time to stream setup time.

J.Cheah suggests that stream setup assumes an implementation and the Service initiation is more general. S. Messenger suggested that there is a maximum transfer delay and delays longer than this should be considered lost packets. D. Johnson wants to make sure that service initiation will not apply to every transmission in a file transfer environment. K. Biba will make sure that the first MSDU is the one that this applies to. Don also has a concern about MSDU loss rate and what we can say about ultimate loss rate after higher level interaction to reduce it. K. Biba says we are trying to estimate what the application actually needs so that if the IEEE 802 requirements are not the application requirements that perhaps a discussion of waivers of requirements beyond those already listed in the PAR.

C. Rypinski questions whether he can get the overall traffic load from this and K. Biba suggests that you can and maybe you need application duty cycle. Application might have duty cycle specification on it which is basically the percentage of the time the application is active. Bob Crowder says there are two parameters, the rate of session initiation and how long does each session last. K. Biba says there is a need for better definitions in this area and he will do that. A hectare is 100 meters by 100 meters. W. Diepstraten vice a desire for the ability to get total traffic per station, K. Biba says he will generate the required 2 parameters. Application session initiation distribution and a Session duration distribution. More discussions ensues and K. Biba will go away and synthesize the appropriate definitions.

Copies of a blank table will be generated for people to fill in like a questionnaire.

K. Biba put items on pages 6 and 7 to solicit and resolve controversy. There is a question about whether there is priority and K.Biba says there is not.

Bob Crowder suggests we remove these so that the data consensus can be achieved quickly and put these is a different document that can be advanced separately. C. Rypinski observes that these are marketability issues and as such he would like them removed as they are already in collective minds. Peter Cripps registers his concern that cost is very important and should be kept in as it is essential to success. B. Rosenbaum states that he favors keeping the requirements in. K. Biba holds a straw poll.

B. Crowder asks is this personal advice for your personal document or is it committee intent. K. Biba states that at this time it is his document but that he is soliciting input so that it can become the committee document. The straw poll was strongly for. M. Graube asks K. Biba to allow non voters to speak Bob spoke and said he thought it would polarize the group unnecessarily and impede growth. L. vdJagt says that we are looking for data to evaluate designs and get proposals that can be benchmarked against the other general requirements. C. Rypinski echos the sentiments and states that a lot of this is already in the par and all of it is greyscale. D. Buchholz also reiterates. B. Rosenbaum says echoing what is in the par should not be a problem, and that if these are marketing issues you could probably argue that the numbers are also marketing issues. K. Biba says we will eventually need a general section and we might as well get it now. Low cost as a goal is discussed with the standard discussion of whether it is allowed, and statements that how can it be kept out.

J. Cheah states that low cost in one persons eyes might be high cost in other persons eyes. He has a desire for low complexity. N. Silberman says he want the section in and the cost effective might be a more reasonable term. C. Rypinski says low cost is a function of application and C. Rypinski says perhaps marketable cost might be a better term. The conclusion on the matter of cost requirement discussion, the view is that the term "cost effective" is most appropriate. Nathan suggested that the size of the device should be stated.

Larry said that for the reason of various viewpoints, the section i.e. section 2 should be left out. Ken replied that the requirements should remained to cover the essence of the requirements. Dale wish to get clarification on unrestricted portability and licensing. Discussion follows on licensing. Larry breaks from the discussion, and stated that the requirement section 2 is like putting the cart before the horse, that specific application would cause contention on what is stated in the general requirement.

Discussions followed among Ken, Chan and Crowder. Ken said in summary that he will ensure that what is in the PAR will be reflected faithfully in this section. Steve Messenger raised a point on the ability of the standard to reject jammers. K. Biba replied that the Denial of service is included specifically for this aspect. Dale and B. Crowder highlighted the isochronous services are not properly represented in this document. The nature of the isochronous services by voice and video. The categories do not accurately represent the intention carried in the PAR. C. Rypinski raised the point that the general requirement should not list contentious requirements such as specific isochronous services. More discussion continued on the interests in the specific applications, and that specification camps will exert their presence.

K. Biba said that he will faithfully edit the general requirement sections as in the PAR.

A. Flatman moved, S. Black second, **that 802.11 gives the membership of the interim meeting of January 1992 the authority to release for working group letter ballot the requirements document immediately following that meeting.** Vote: 17Yes, 4Abst, 0No. the motion *carries*.

R. Dayem and A. Flatman commend K. Biba with the remarkable result achieved in the short time; the meeting supports the gentlemen with acclamation!

 The meeting adjourned at 12:09 pm for lunch.

Thursday PM, 14 March, 1991

0.   Opening   1:00 pm

0.1   Announcements

The chair indicated that we were invited to nominate 2 members for **liaison with 802.1** on management and Interworking, each. For the time being it was agreed to nominate B. Eastman and V. Hayes.

The chair announced that there would be an **Interim joint 802.1 Management** and the various dot.groups scheduled for January 13 - 14, 1992. He observed the clash with our own meeting.

The chair announced that the IEEE will provide **Training of officers** at the next meeting in one of the tutorial slots. Participation is open to any registered participant.

11.   Tentative Meeting schedule

Date	Month	Year	Place	type	Location	Host
13-16	January	1992	Raleigh, NC	Inter	TBD	IBM
9-13	March	1992	Irvine, CA	Plenry	Irvine Marriott Hotel	
11-14	May	1992	Leiden, Netherlands	Inter	TBD	NCR
6-10	July	1992	Bloomington, MN	Plenry	Radisson Plaza South	
14-17	Septemb	1992	Chicago area	Inter	TBD	Motorola
9-13	November	1992	La Jolla, CA	Plenry	Hyatt Regency Hotel	
TBD	January	1993	Los Angelos area	Inter	TBD	Xircom
8-12	March	1993	?New Orleans/			
			Hilton Head?	Plenry	TBD	
TBD	May	1993	Baltimore area	Inter	TBD	Ship Star
12-16	July	1993	Denver, CO?/	Plenry	Sheraton Denver	
			Kauai, HI?		Tech Center	
TBD	Septemb	1993	TBD	Inter	TBD	Open
8-12	November	1993	?Ft. L'dale, FL	Plenry	Crown Sterling Suites	

11.1   Confirmation of the January 1992 meeting, Raleigh, NC, the meeting was confirmed by consensus

11.2   Objectives for the Raleigh, NC meeting

Finalizing Requirements document

To begin the work of the mac and phy groups

11.3   Last Mailing date 17 Dec

11.4   Any other intermediate meeting needed? no need identified

11.5   Confirmation of March (plenary) meeting the meeting was confirmed by consensus

11.6   Confirmation of the May meeting the meeting was confirmed by consensus

12.   Reports from ad-hoc groups

C. Rypinski moves, O. Storoschuk second, **to create a PHY and a MAC sub-group with the charter to study, define and report on their respective subjects to 802.11 and to continue their work until 802.11 decides completion of the work**.

L. vdJagt moves, D. Johnson second, **to postpone the main motion till after the brief report of the ad-hoc group** this motion *carries* with 11Yes, 9Abst, 3No.

L. vdJagt reported from the **PHY group and from the joint meeting**. refer to the separate report for details (doc: 91-133).

B. Crowder reported from the **MAC group**.

Back to the postponed motion: **to create a PHY and a MAC sub-group with the charter to study, define and report on their respective subjects to 802.11 and to continue their work until 802.11 decides completion of the work**.

D. Lewis moves, P. Eastman second, **to call for the question**. This motion *carries* with 18Yes, 3Abst, 3No.

The postponed motion carries with 15Yes, 2Abst, 9No.

J. Cheah moves, O. Storoschuk second, **that the existing chairs of the group remain in the capacity unless they wish to relinquish their capacity.** Motion *carries* with 14Yes,12Abst, 0No.

V. Hayes introduced the output of the group that prepared the **Remarks for the FCC hearing**.

After extensive editing the result (published in doc: 91-133) is approved for further processing by a motion from C. Rypinski, second by S. Black, **that the draft remarks for the hearing be reviewed by attorneys and than filed at the FCC subject to ExComm approval, as edited on 14 November at 5:45 pm.** The motion *carries* with 13Yes, 0Abst, 0No.

Note 1 from Chair: The ExComm approved the document for legal review and further processing with a motion quoted in appendix 3. Document 91-132 was then reviewed and rewritten to better reflect the requested answers from the FCC by a group of legal attorneys sponsored by NCR, Apple and IBM. The final result was approved for filing by the chairs of 802.11 and 802.0. Doc 91-136 is the document as filed on December 4, 1991.

Note 2 from Chair: IEEE P802.11 was <u>not</u> selected to address the FCC on the December 5 hearing. From the over 75 applications for a slot, only 18 could be honored.

13.   Review of document list

       13.1   Approval of output documents

             This has been taken care of by individual motions

       13.2   Destination of input documents

             This was left to the chair's discretion.

14. Any other business

Although the vice-chair had not officially sent his resignation, it was understood that he would no longer be supported by his company to participate in the work of the working group. It was therefore moved:

Thanks to Jim Neeley for all his help to IEEE 802.11. This motion *passed Unanimously*.

15 Adjourn

The session was adjourned at 5:50 pm.

Appendix 1
Attendance list

Mr. ROBERT ACHATZ	US Department of Commerce	+1 303 497 3498
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Appendix 1
Attendance list (continuation)

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Appendix 1
Attendance list (continuation)

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Mr. STEVE WILKUS	AT&T Bell Laboratories	+1 908 949 2051
Mr. CHARLES T. YAGER	Micro Linear	+1 408 433 5200
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Appendix 2
Document list

IEEE P802.11/91-72	Tentative minutes of the May 1991 meeting
IEEE P802.11/91-87	Tentative minutes of the July 1991 meeting
IEEE P802.11/91-107	Tentative minutes of the September 1991 meeting
IEEE P802.11/91-108	Requirements for WLAN
IEEE P802.11/91-109	Letter to administrations
IEEE P802.11/91-110	Tentative agenda for the November 1991 meeting
IEEE P802.11/91-111	Multiple Access: Throughput and Delay (Dr. Jonathon Y.C. Cheah, HNS)
IEEE P802.11/91-112	Time split token-based contention protocol for IVD service over wireless LANs (Sharad Kumar & Dhadesugoor R. Vaman, Stevens Institute of Technology)
IEEE P802.11/91-113	A proposal for a PHY layer Management system in Wireless LANs (Bob Zavrel, GEC Plessey)
IEEE P802.11/91-114	FCC Policy Statement and order
IEEE P802.11/91-115	Venue for January 1992 meeting
IEEE P802.11/91-116	Architecture considerations for large scale wireless personal voice-data networks (Chandos Rypinski, LACE)
IEEE P802.11/91-117	Venue for May 1992 meeting
IEEE P802.11/91-118	Liaison Report from ETSI
IEEE P802.11/91-119	Status of CEPT
IEEE P802.11/91-120	Liaison statements from T1P1
IEEE P802.11/91-121	Physical Layer technology (Lucian Dang, Rockwell)
IEEE P802.11/91-122	Engineering choices for portable wireless LAN adapters (Peter Cripps)
IEEE P802.11/91-123	PHY Experiences - Diffused IR (Spectrix)
IEEE P802.11/91-124	PHY experiences - Diffused IR (Photonics)
IEEE P802.11/91-125	High Load Novell Network Performance Using Spread Spectrum (NCR)
IEEE P802.11/91-126	Wireless Mac and PHY Layer Specifications (KC Cheng)
IEEE P802.11/91-127	Report of Wireless LAN Standardization in Japan (Hideaki, Toshiba)
IEEE P802.11/91-128	Review into the research of the medical implications of RF transmissions (Bob Rosenbaum, Windata)
IEEE P802.11/91-129	Report of Joint CCIR-CCITT meeting on FPLMTS
IEEE P802.11/91-130	Multimedia requirements (Apple)
IEEE P802.11/91-131	Attendance list--->minutes
IEEE P802.11/91-132	Remarks of Victor Hayes to FCC en banc
IEEE P802.11/91-133	PHY ad-hoc group report
IEEE P802.11/91-136	Remarks of Victor Hayes to FCC en banc hearing (As filed)
IEEE P802.11/91-137	Summary of requirements fo Multimedia Applications: A preliminary study

Appendix 3
Executive Committee motion re Remarks to FCC

Project 802 Resolution

Date:___14 November 1991

Mover: Hayes

Motion: That the ExComm approves the filing of doc: IEEE P802.11/91-132 at the FCC after legal review by 3 attorneys and final clearance by the chairman of 802.0 and the chairman of WG 802.11.

That the ExComm further empowers the chairman of WG 802.11 to represent IEEE P802 at the en banc hearing of the Federal Communications Commission (FCC), on the matter of new ruling for Personal Communications Services scheduled for 5 December 1991 if selected by the FCC to appear.

Second: Eastman

For:	Against:	Abstain:	(Motion)
14	0	1	*Passes*