Tentative Meeting Notes
IEEE P802.11 Sponsor Ballot Comment Resolution Meeting
January 13-17,1997, Palm Bay FL
George Fishel, Secretary

Meeting opened by Vic Hayes at 8:50 on 13 January 1997.
Vic introduced Gail Hazel from Harris and she explained details of facility and the week.

Meeting objectives presented by Vic Hayes as follows:

- to resolve all comments on the Sponsor Ballot on D5.0

- to prepare documents for Sponsor Re-circulation ballot

  − draft 5.2

  − unresolved no comments (if any)

Review of agenda:

Tentative Agenda
IEEE P802.11 Sponsor Ballot Comment Resolution meeting
January 13-17, 1997, Palm Bay, FL
Venue in doc.: 96/160
Objectives of the meeting

Agenda, part 1

- 1.0 Opening of session 97-01-13/8:30 AM

- 2.0 Review and Approval of agenda

- 3.0 Comments left from November meeting

  − 3.1 96/156-5 c: 1,4,7,10,11,13,23,31-35
       96/156-2 c: 24,26,32,41,47,48,49
       96/157 fig 84

  − 3.2 Update of PHY MIB with comments received and consistency check with MAC MIB

- 4.0 Comments from doc.: 96/135-7

Agenda, part 2

- 5.0 Comments on Formal Description

  − Walk-through

- 6.0 Output from this meeting

  − 6.1 draft 5.2

    • consistency check throughout

  − 6.2 unresolved comments (if any)

  − 6.3 Rebuttal to remaing NO-votes

- 7.0 Any other business on sponsor ballot

- 8.0 Closure   97-01-17/12:01 PM

Agenda approved as submitted by unanimous consent.

Vic requests a volunteer to walk through all comments. Simon Black, Phil Belanger, and Al Petrick said they would read through comments.

Vic explained sign in sheet and how voting works.

Vic asked for volunteers to review comments on clause 8.
Dave Bagby, Simon Black and Bob O'Hara volunteered to review the comments on clause 8.

Vic asked " who would like to lead the group through Clause 5".
Plil Bekanger volunteered

Vic asked, "Who will update the Phy MIB?"
Simon suggested that we take that question off line and Vic agreed.

All agreed that we had outlined enough work until lunch.

Clause 8 will meet in the Challenger Room and Clause 5 will meet in Discovery.

Meeting divided into smaller groups to begin comment resolution at 9:36.

The full working group of 802.11 re-convened at 1:30 PM on Tuesday 14 January 1997
Meeting started with Johnny Zweig presentation on comment resolution of Clause 5.
The following list contains changes made by the group:

<div align="center">Clause 5 Subgroup</div>

- First, we went through Rich Seifert's comments (in 96/135-7) to check that all were resolved
satisfactorily. Propose to change some comment-resolutions by further clarifying text and thereby
accepting some comments that were declined in Vancouver.

   Accept #7 (5.2.3 etc.) by rephrasing to eliminate rhetorical questions
   Accept #9 (5.2.4.1) by rewording section to clarify different ways bridges/APs function
   Partially accept and clarify #2 (5.3.3) requesting that we not allow IP as a DS technology.
     Eliminate explicit reference to Mobile IP, but state explicitly that DS may be any
     technology at all (LAN, WAN, Layer 2, Layer 7, etc.)
   (no change) Decline #1 (5.4.1.2) requesting specification of the Integration Service.
   Accept #12 (5.4.3.1) requesting elimination of statement that connectivity implies authority to
     exchange data, by clarifying that physical access to the LAN is more difficult to restrict
     than in the wired LAN case
   Decline #13 (5.4.3.1, 5.7.6) regarding complete specification of Authentication scheme, by
     explaining that existing text is sufficiently detailed to provide interoperability
   Accept #14 (5.4.3.2) and #15 (5.4.3.3) requesting minor wording clarifications.
   Decline #16 (5.4.3.3, etc) requesting elimination of WEP as superfluous given the existence of
     802.10, because commenter does not agree with motivation for including WEP and does
     not seem to define "interoperable" the same way 802.11 does
   Decline #18 (5.5, etc.) requesting that all conformance requirement statements be placed only in
     the clause appropriate to that requirement, because 802.11 chose to structure our
     document differently from other 802 standards.
   Accept #19 (5.6) requesting that STA in an IBSS not be forced to be able to associate, because
     current wording does not impose such a requirement
   Decline #20 (5.6) requesting a note that 802.1D functionality could be present in 802.11 stations
     in an IBSS as superfluous, since routers and bridges can use any LAN technology
   Accept #21 (5.7) requesting rewording of sentence
   Accept #22 (5.7.7) requesting that sentence say that authentication can be with an AP or a STA
     by changing "address of the AP" to "address of the station" and eliminating
     parenthetical statement.
   Accept #6 (5.2.3) regarding "red blocks" by referring to them as "dark (solid) blocks"
   Accept #10 (5.3.1, 5.3.2) requesting wording change
   Accept #11 (5.4 etc) requesting change "xx.xx" to correct reference

> Accept #17 (5.5) requesting that "AP is always in State 3" be clarified with a state machine
>
> Accept #5 (5.2.1.1) requesting that title of section be corrected

Now go through 96/156-2 and deal with all unresolved comments:

> ??? #12 (5.3.3) refers to 7.1.3.3.1 which does not have a comment from GC and is unintelligible
>
> #26 (5.4.2.2) withdrawn, because mentioning NAV and TSF in clause 5 is unnecessary
>
> Unresolved: #32 (5.4.3.3) requesting clarification of how Privacy and MSDU Delivery services interact.
>> PROPOSAL: MIBVariable changes should only take effect at specific points in time (i.e. use the values in place at time T....) i.e. Exclude Un-encrypted takes effect only when an AP starts a BSS, when joining/starting an IBSS or when associating with an infrastructure BSS. The privacy Invoked, key-mapping table, default key, key-ID and default key array take effect when an MSDU is passed from LLC to the MAC or when the PHY_RXEND. indication happens at the end of a received frame.
>
> Accept #41 (5.5) requesting that ATIM be Class 1, since otherwise you can never authenticate with power-save STAs.
>
> Decline #47 (5.7.4) requesting clarification of how to deliver Disassociate frames to STAs in power-save mode, as redundant
>
> Accept #48 (5.7.7) requesting that the broadcast destination be allowed for De-authenticate frames (same as Disassociate frames). Requires harmonization in Clause 10
>
> Accept #49 (5.8) requesting using "full names" for the two PLME_SAPs, since "PLME_SAP" already is the full name of the PLME_SAP. Commenter referred to Clause 10.1, and figure corrected to depict Data Link Layer/Physical Layer to conform to ISO and 802.2 conventions.

Unresolved item for group discussion: MT #42, 43, 44 from 96/156-2 (sections 5.xx) comment resolutions do not resolve the problem, since there does not exist a way to determine membership in an IBSS, so there is no way to find the STAs with which one must authenticate to send anything. Wim requested (and was declined) that we get rid of IBSS authentication, since SKA can be implicitly done by using WEP.

The preceding items were agreed upon by all members present and passed by unanimous consent.

The following MAC issues were discussed under the guidance of David Bagby in the full working group meeting:

<div align="center">Jan '97 MAC group agenda</div>

Goals for Jan 97
- We have one goal - Complete Process Sponsor Ballot Comments.
- I do not intend to be formal this week.

Open comments:
- 156-5c: (clause 8)
  - 1 author withdrawn
  - 4 Already fixed in clauses 10,11
  - 7 corrected
  - 10 editorial no change needed
  - 11 accepted - figure fixed
  - 13 figure made "prettier" and label added.
  - 18 - changed from Nov mtg - encryption now covers ICV - need to change state diagrams to match. - acquires a Yes vote.
  - 23 made to match 802 style standard.
  - 31 declined - is job of higher layer.
  - 32 already resolved in Nov, clause 8 comment updated to refer to clause 6 #1

- – 33 already resolved in Nov, clause 8 comment updated to refer to clause 6 #2
- – 34 already resolved in Nov, clause 8 comment updated to refer to clause 7 #7
- – 35 already resolved in Nov, clause 8 comment updated to refer to clause 7 # 8
- 156-2c (clause 5)
  - – 24
  - – 26
  - – 32
  - – 41
  - – 47
  - – 48
  - – 49
- 157 (clause 12, figure 84)
  - – 84 ???? who ???? Fixed - MT text will go back to Bob O.
- 135-7 Lost rich comments
  - – 1 declined - not spec DS impl.
  - – 2 declined - ds not req to be layer two only.
  - – 3 done
  - – 4 done
  - – 5 corrected
  - – 6 done
  - – 7,8 - no comment # done in clause 5
  - – 9 declined - language ok, style issue.
  - – 10 done
  - – 11 done
  - – 12 declined
  - – 13 declined
  - – 14 changed
  - – 15 changed
  - – 16 declined - WEP does not duplicate 802.10
  - – 17 corrected
  - – 18 no action taken/required.
  - – 19 no change needed.
  - – 20 declined. misunderstanding of definition of STA/AP.
  - – 21 changed
  - – 22 no change needed - STA/AP def misunderstood.
  - – 23 keep stricly ordered class even thouhg ISO no longer requires it as old implmenations will take time to catch up.
  - – 24 accepted - wording corrected.
  - – 25 - corrected - ds must meet 15802.
  - – 26 - accepted
  - – 29 decline, text not thought redundant
  - – 30 accepted.
  - – 31 editorial change left to editor.
  - – 32 declined - WEP ok.
  - – 33 in progress - state machines being added.
  - – 34 done
  - – 35 done
  - – 36 decined comment ture, but is a sys issue not an L2 issue.
  - – 37 accepted.
  - – 38 declined - backoff alg diff from 802.3
  - – 39 done
  - – 40 done
  - – 41 done

- 42 done
- 43 declined - a spec technically can not require a non- l2 thing to exist
- 44 declined - situation not as claimed by reviewer.
- 45 accepted.
- 46 declined - ad hoc pwr mgt reviewed in detail and not believed to contain any problems (some corrections to draft made).
- 47 declined (pwr mgt not removed) - cited language corrected.

- Grp issues:
  - strictly ordered. (Lost rich#23)
    - » Keep (& complete?) or kill?
  - WE KEEP IT!
    - » Simon Black and Tom Tsoulogiannis to provide extra language...

- to do more work on...
  - privacy interface details
    - » johnny, db, mf
    - » leave as MIB, add when action takes place language.
  - Simon Black to ask Wim :
    - » no auth in ibss and not direct send in bss of ess?
    - » auth vs find membership of IBSS.
    - » Bcast mcast vs TA & WEP.

The Following report was made by Mike Trompower on comment resolution action to clauses 14, 15, 16:

the three PHYs were updated such that uniformity with clause 10 is maintained.
Clause 10 implements certain management primitives which requires physical layer actions and the hooks for these actions were added.
All PHYs can report the data rate used to receive a frame
All PHYs can be reset
All PHYs can be directed to change its frequency of operation (IR PHY only has a single channel)
All Phys can be directed to enter a low power (DOZE) state
figure 95 of the DSSS phy was edited to fit on the page

Meeting adjourned about 6:00 PM. Many members waited around for hard copy of the new state machine document.

Wednesday 15 January 1997
Meeting re-convened at 9:15 AM. Vic Hayes gave an overview of the week's activities.

Michael Fischer presented document number IEEE P802.11-97/001 Draft of MAC Formal Description. Concern was expressed over the lateness of the state machine text. However, all present agreed the text was needed in the document. The edited state machine text will be added as a "normative" annex to the draft standard. This point was accepted unanimous vote.

Michael Fischer also presented document number IEEE P802.11-97/002 Tutorial on MAC
Formal Description.
Remainder of day spent on new state machine document.
Thursday 16 January 1997
The morning was spent resolving comments
At 1:00 PM the full working group was reconvened to review meeting status. The following changes were made in the agenda:

Agenda, part 2
- 5.0 Comments on Formal Description

  - 5.1 update draft
    - 163: 2.4/2.8/2.9/2.10/2.11/4.3/4.4/5.4
    - privacy stuff Johnny
    - strictly ordered (Simon+Tom language)
    - MAC data service primitives (MOM)

  - 5.2 Walk-through
- 6.0 Output from this meeting

  6.1 draft 5.2
    - 6.1.1 consistency check throughout
    - 6.1.2 MIB check Friday/3.4/
    - 6.1.3 PICS check Friday
    - 6.1.4 update of state diagrams Michael….
    - 6.1.5 comment resolution files Simon

  6.2 unresolved comments (if any)
    - solved:

      - Ad Kamerman YES

      - Putnins YES

      - Russ Housley YES

      - Ron Mahany YES

      - Wim Diepstraten/ Oral Yes

      - Anil Sanwalka/ Oral Yes

      - Michael Fischer/ Oral Yes

      - Ken Clements Oral Yes

      - Tom Phinney   Simon calls

      - Michael Griffioen   Simon calls Wim

      - Rich Seifert Bob calls tonight

  6.3 Rebuttal to remaining NO-votes
- 7.0 Any other business on sponsor ballot
- 8.0 Closure   97-01-17/12:01 PM

Darwin kept notes on comment resolution of Formal Description. The following notes reflect those changes:

1997 Jan 16: The Plan

- Closure - Consensus - Convergence !!
- Must complete text changes by Friday noon

- State machines must be updated to match final text

  ──must occur in time to be included with the sponsor ballot recirc vote

                     Items That Need to be Resolved

- MF Items - DONE

- SB Items - DONE

- Rich Seifert - 3 items - DONE

- 96/135-8 comments - DONE

- JZ Privacy issue

- Strictly ordered issue - DONE

- MAC Data Service primitives - DONE

- call Rich Seifert - DONE

                          MF Items

- 1.1 special backoff procs during ATIM window - DONE

- 1.2 DONE

- 1.3 DONE

- 1.4 DONE

- 1.5 - DONE

- 2.1 - DONE

- 2.2 - DONE

- 2.3 - DONE

- 2.4 - DONE

  ──changing the power mgmt mode
    - w.r.t. clause 10.3.1.1
    - STA must complete an acked transaction sequence before the state change can be completed
    - MF wants to ensure that the pm state change takes effect "immediately", or at least very very soon; desires clarification

change of ACTIVE status at the AP could be delayed because the STA has no pending trafic to send, to which it can append the PM status change
    - can change to AWAKE state, but not in ACTIVE mode yet since the AP has not yet been informed
    - is the issue that the STA SME cannot gain knowledge of the PM state change?
    - or
    - that the MLME cannot accomplish the state change because it has no way to send a NULL frame

add a requirement to clause 11 that a NULL frame can be sent to the AP to accomplish the PM state change if no other outgoing traffic is pending
    - add a state parameter to 10.3.1.1 so that the state can be changed directly (ina number of different ways)
    - Modes: ACTIVE, POWER_SAVE
    - States: AWAKE, DOZE

Solution = Add a boolean parameter to 10.3.1.1 called WAKEUP; if true the effect is to enter the AWAKE state immediately. Of course this parameter is only meaningful if the current mode is POWER_SAVE. This parameter has no effect if the current mode is ACTIVE.

- ●

- 2.5 - withdrawn
- 2.6 - withdrawn
- 2.7 DONE
- 2.8 DONE
- 2.9 DONE

  —ref clause 6.2.1.3

  —re undeliverable status codes

  —add new codes:
    - retry limit exceeded - DONE (that is (b))
    - lifetime timeout - DONE (that is (i))
    - j) undeliverable (no BSS)
- 2.10 - DONE

  —re clause 6.2.1.2

  —suggestion = notification priority will equal that which was used for delivery of the last fragment

  —no text changes needed
- 2.11 - DONE

  —NAV handling at the end of a scan process
if after completion of the scan the STA returns to a different channel it ought to remind the NAV value that was known for that channel prior to the start of the scan

  —clause 11.1.3.1 ??

  —pseudo code version of our suggested change:
    - push NAV
    - push channel
    - scan
    - pop channel
    - if (Channel == LastChannelScanned)

        — drop

    - else

        — pop NAV

        — NAV -= ScanInterval

        — NAV = min (NAV, aProbeDelay)

---

clause 11.3.1.2.2

SB: drop NAV when scan starts and return to old channel with a fresh NAV and accept the consequences; if a clever implementor chooses to save the NAV and restore it after the scan they may do that.

JZ: NAV and aProbeDelay recap; large NAV is an invitation to do just such a scan

adopted Simon's suggestion: leave it alone; clever implementors are free to be clever

- 2.12 DONE
- A3.1 DONE
- A3.2 DONE
- A3.3 see JZ;s privacy
- A3.4 informative only
- B3.1 -> MIB check
- B3.2 see JZ's PRIVACY
- B3.3 DONE
- B3.4 -> MIB check
- B3.5 (B3.2) DONE
- B3.6 (B3.3)
- 4.1 agreed, but not done yet
- 4.2 agreed, but MF must create text
- 4.3 - DONE

    check for PhyRxStart.indicate or PhyCca.indicate(busy) prior to an active scan probe request tx?

    Decided that PhyCca.indicate(busy) is the correct value.

    must change text in clause 11.1.3.2.2

- 4.4 - DONE

    IR preamble length

    solution = round it up to the next bit

    add to clause 13.1.4.17

    also add exact values to the table at the end of clause 16

- 5.1 DONE
- 5.2 non-normative - DONE
- 5.3 non-normative - DONE

- 5.4 - DONE

  — clause 9.8, last paragraph

  — use "advised to" in place of "shall"

  — final text = "it is recommended that"

- 5.5 withdrawn

                           SB Items - DONE

- clause 5.5
- clause 8.3.2
- clause 9.2.5.2
- clause 9.2.5.6
- clause 9.3.6
- clause 9.2.8
- clause 9.3.1
- clause 9.3.3.1
- clause 9.3.3.4
- clause 9.3.4.2
- clause 9.4
- clause 9.6
- clause 9.7
- clause 11.1.3
- clause 11.1.3.2.1
- clause 11.1.3.3
- clause 11.1.4
- clause 11.2.1
- clause 11.2.1.2

                  Rich Seifert - 3 items from last night - DONE

- remove "shall" from all service primitives, change to "may"

  — clauses 6, 10, 12, 13, 14, ...

- 10.1 add a shall making the presence of an SME a normative item

- clause 9.2.4 add a note about ensuring statistical independence between the random numbers generated by different STAs, also to clause 11.3.1

              96/135-8 comment resolution revisions needed: - DONE

- clause 8 cmt 18, rdh re encrypting ICV: was declined but could now be accepted

- 8.2.1 by RDH,e,n: suggest 802.10c for key distribution mechanism

- all by TLP,E,n: MAC layer vs sublayer

- all by TLP,E,n: clause vs section

- all+7+all by TLP,E,Yes: change CRC to FCS

- all by TLP,-,n: indefinite article prior to acronyms

- all+9+all by TLP,E,Yes: frgaments vs. segments

- all by TLP,e,n: table offset from left margin

- 1.2,2 by TLP,e,n: punctuation

- 3 by TLP,e,n: grammar

  - JZ Privacy issues

- see JZ's document (MF had concerns too)

- additional notes:

  — shared key authen procedure only covers the case where both parties desire to participate

    - suggests shortening the 4 frame sequence if a STA does not support shared key authen

    - this is already clarified in the state machines

    - status codes are already covered by clauses 7.2.3.10 and 7.3.1.9

  — authenication is unilateral (i.e. unidirectional) or bilateral?

    - AP is not required to initiate an authentication, but it could

    - resolved

  — clause 8.2.3: encrypting/ decrypting with a NULL key

  — temporal characteristics

- all issues resolved in discussion

- JZ needs to create the text

- review of proposed text changes:

  - Strictly ordered service class issues - DONE

- We decided to keep it in the draft.

- but SB needs to create text

- Simon presented the changes to clauses 9.8 para 3, 11.2.1.4 (d) and 11.2.2.4 (a) sentence 2.

- accepted, text changes were made in the draft

  - MAC Data Service primitives - DONE

- MOM (multiple outstanding MSDUs)

- clause 6.2.1.3

- resolved by changing the text

  - call Rich Seifert - DONE

- time = 19:00 EST (16:00 PST)

- Goal = discuss with him the text vs state machines and the EQUAL precedence of the two.

- Rich insists that the state machines must be normative and take precedence over the text.

- He is adamant that there can be one and only one controlling normative specification for each behaviour.

- If there is a conflict between the text and the state machines, which one would prevail?

- Our idea to individually address conflicts and issue supplements is unacceptable. The spec must be clear and unambiguous.

- MF suggested that Rich is only complaining about the "MAC" state machines. Perhaps we could pull out only those pages and place them in the appropriate sections of the spec.

Telephone conference with Rich Seifert on 1-16-97 at 19:00 EST
Rich was opposed to the word "shall" used in the text and felt the state machine is "normative" as voted in the Vancouver meeting and that state machine should take priority over the text. He thought that all "shall" statements should be changed to "should" statements in the text and his vote would remain "NO" it these changes were not made.

Friday morning 1-17-97
review JZ's privacy text changes

ensure that MF's issues have been covered adequately

- PICS review

- Doug Smith & SB have comments on state machines, these were directly brought to Michael Fischer

At I:00 PM a telephone conference was conducted with PC Week Magazine and the current status of the IEEE 802.11 document was presented.

Meeting concluded at 1:45 on Friday.

Attendance list

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