

Tentative Minutes of the IEEE P802.11 MAC Group

Plenary meeting
 Enschede, Netherlands
 July 8-11, 1996

Monday, July 8th, 1996

The MAC group did not meet because the opening plenary session lasted until about 7PM.

Tuesday, July 9th, 1996, 8:30 AM

The meeting was called to order at 8:30 AM by Michael Fischer, acting MAC chair, in place of David Bagby who was unable to attend this meeting. Due to a lack of a volunteer for secretary, and a week where the main work in full MAC group would be to confirm the letter ballot responses from smaller groups processing particular sets of comments, it was decided to operate in the same manner as the full working group, with the chair and Bob O'Hara taking notes on the wording and votes on motions, and to compile the minutes from those notes.

Old Business

Approval of minutes of the March, 1996 and May, 1996 meetings.

MAC Motion #1: To approve the March, 1996 MAC minutes as distributed in document 96/055.

Moved: Chris Zegelin, seconded: Bob Marshall

MAC Vote: 7, 0, 2 **Motion #1: passes**

The minutes document from May, 1996 (96/084) has never been distributed because it got misplaced by Stuart or Vic at the end of the Waltham meeting. Chris Zegelin will attempt to obtain a copy from Symbol, but the results of that meeting were the motions to confirm the ballot comment processing. The text and results of those motions are in document 96/083 (May MAC Report), so the chair suggested approval of that document in lieu of the 96/084.

MAC Motion #2: To approve the May, 1996 MAC minutes as distributed in document 96/083, which contains all of the motions and voting results from that meeting.

Moved: Chris Zegelin, seconded: Simon Black

MAC Vote: 7, 0, 2 **Motion #2: passes**

Approval of Agenda

The chair identified a single agenda item for the entire MAC meeting: To do the necessary ballot comment processing to be able to forward a draft to IEEE 802 Executive Committee for sponsor ballot. Based on the decision at opening plenary, this is to be done by addressing as many comments as we have time for, identifying the technical vs. editorial changes. This agenda was approved without dissent.

Processing of Letter Ballot Comments

After a short discussion about how to process the 230 MAC and general comments, it was decided to do an initial pass with the whole MAC group to classify the comments as clearly editorial, non-contentious, and those needing detailed discussion or where significant differences of opinion existed. This required approximately 2 hours, and yielded the conclusion that there were over 200 comments that would be relatively easy to resolve, and fewer than 30 issues requiring complex or contentious decisions on the part of the full MAC group. The group decided to attempt to process all comments, including those from yes and late ballots, and to pick up editorial changes as they went, so that the full text changes could be ready for merging by the editor(s) at the end of the week.

At 11:30AM the MAC group divided into small groups to process particular portions of the comments:

General, Annex & Intro clauses: coordinated by Bob O'Hara

Clauses 5 & 6: coordinated by Chris Zegelin, resolution record by Ravi Nalamati

Clause 7: coordinated by Simon Black, resolution record by Miri Ratner

Clause 8: to be addressed later in the week

Clause 9: to be addressed after clause 7 to minimize inconsistent resolution of related issues

Clauses 10 & 11: coordinated by Michael Fischer, resolution record by John Biddick

The groups were to work until 3:30PM, when the full MAC group would reconvene to record status and approve as much of the progress as possible. Focus should be on comments which can be resolved without excessive time or controversy. All technical NO vote comments were to be identified, but not resolved. The NO votes would be handled by the full MAC group on Wednesday morning.

Tuesday, July 9th, 1996, 3:30 PM

The meeting reconvened at about 3:45PM for reports from the small groups.

General, Intro (clauses 3 & 4), and Annex:

Bob O'Hara reported that there were 48 total comments on these sections. 27 were resolved and the text changes generated in the small group (plus 1 in opening plenary). 16 were PHY related and would not be dealt with by MAC group (these were #1-#3, #11-#16, #30, #34-#37, #43, #46). One was procedural (#1 from 106-6, on patent policy) and would be referred to the full working group. The final 3 needed to wait until later in the week (#45, needing commenter input while the commenter was coordinating a different small group, and #32 & #33 on state machines, which were informative, so the normative material should be discussed first). Bob O'Hara then presented the proposed resolutions of the 27 comments processed in the small group.

MAC Motion #3: **That all presented changes from general & annex comments be accepted.**

Moved: Bob O'Hara, seconded: Jon Rosdahl

MAC Vote: 10, 0, 0 **Motion #3: passes**

MAC Motion #4: **To adopt the new definitions and abbreviations into clauses 3 & 4 as proposed.**

Moved: Bob O'Hara, seconded: Chris Zegelin

MAC Vote: 9, 0, 0 **Motion #4: passes**

Clauses 5 & 6:

Ravi Nalamati reported that there were 31 total comments on clauses 5 & 6, but only 30 to process because 1 was a duplicate. 28 were resolved and the text changes generated in the small group, leaving #11, #30 and #39 from 106-3 open for further discussion in MAC group. He recommended that #11 and #39 be considered together because they concerned a single subject. He then presented the proposed resolutions to the 28 comments processed in the small group (these will appear in 96/106-3r1).

MAC Motion #5: **That all proposed changes from clauses 5 & 6 be accepted as presented.**

Moved: Ravi Nalamati, seconded: Chris Zegelin

MAC Vote: 10, 0, 1 **Motion #5: passes**

Clause 7:

Simon Black reported that there were 50 total comments on clause 7, 43 in 106-3 and 7 in 106-6. Of these 47 have been resolved and the text changes generated in the small group. However, the proposed resolution of comment #87 from 106-3 also requires a text change in clause 11 which has not yet been done. Of the other 3 comments, 1 (#68 from 106-3) is part of a technical NO vote and 2 (#57 and #69 from 106-3) need more discussion in MAC group. He then presented the proposed resolutions to the 47 comments processed in the small group (these will appear in 96/106-3r1).

MAC Motion #6: **That all presented changes from clause 7 comments be accepted.**

Moved: Simon Black, seconded: Wim Diepstraten

MAC Vote: 10, 0, 0 **Motion #6: passes**

Clause 10:

Michael Fischer (as small group coordinator, not chair) reported that there were 2 comments on clause 10, both of which were resolved, with text changes generated. He then presented the proposed resolutions (these will appear in 96/106-4r1).

MAC Motion #7: **That all presented changes from clause 10 comments be accepted.**

Moved: Michael Fischer, seconded: Chris Zegelin

MAC Vote: 10, 0, 0 **Motion #7: passes**

Clause 11:

Michael Fischer (as small group coordinator, not chair) reported that there were 30 total comments on clause 11, 29 in 106-4 and 1 in 106-6. He noted, that comment #1 in 106-3 is duplicated as comment #22 in 106-4, and should be processed in clause 11 because that is where most of the subject appears. Of these 30 comments, 26 have been resolved and the text changes generated in the small group. Of the other 4 comments, 1 (#21 from 106-4) is part of a technical NO vote and 3 (#17, #22 and #30 from 106-4) need more discussion in MAC group. He then presented the proposed resolutions to the 26 comments processed in the small group (these will appear in 96/106-4r1).

MAC Motion #8: **That all presented changes from clause 11 comments be accepted.**

Moved: Michael Fischer, seconded: Simon Black

MAC Vote: 10, 0, 0 **Motion #8: passes**

It being after 6:00PM, the MAC group recessed until 8:30AM Wednesday. Chair announced that the room was available in the evening, and suggested that people return at 7:45PM to process additional comments in small groups:

Clause 8: coordinated by Michael Fischer

Clause 9: coordinated by Simon Black

Approximately half of those at the afternoon session returned for some of all of the evening session.

Wednesday, July 10th, 1996, 8:30 AM

The meeting was called back to order by Michael Fischer at 8:40AM. He reported that the small group work on Tuesday evening had completed processing clause 8 comments and processed a few comments from clause 9. It was decided to capture the clause 8 progress at once, then deal with the technical NO votes, then go back to small groups to finish clause 9 comments.

Clause 8:

Michael Fischer (as small group coordinator, not chair) reported that there were 11 total comments on clause 8, all of which were processed, and the text changes generated in the small group. The resolution of these also requires consistency changes in clauses 10 & 11, the text for which has been generated (including accepting the other half of a half-accepted, half-declined comment approved yesterday in the clause 10 motion). These inconsistencies also existed between clause 11 and the ASN.1 MIB in Annex D, although no commenter noticed this (and the ASN.1 MIB was the most correct of the sections on this matter). He then presented the proposed resolutions to the 11 comments processed in the small group (these will appear in 96/106-3r1).

MAC Motion #9: **That all presented changes from clause 8 comments, and the associated consistency changes in clauses 10 and 11 be accepted.**

Moved: Michael Fischer, seconded: Simon Black

MAC Vote: 9, 0, 0 **Motion #9: passes**

Clause 9:

Simon Black reported that there were 63 total comments on clause 9, 51 from 106-3 and 12 from 106-6. One (#136 from 106-3) is part of a technical NO vote. Four were processed Tuesday evening. He suggested that we not take time to accept the 4 resolved comments, but to resume small group processing, with more than one group working on clause 9, after handling the technical NO votes.

Response to Technical NO Votes:

The chair relayed a request from Vic Hayes that we attempt to resolve the technical NO votes before the business day began in North America, and FAX the proposed resolutions to the voters so they might be able to respond on Wednesday as to whether these responses would be sufficient to overcome their concerns and permit them to change their NO votes to YES votes.

There was about 1.5 hours of discussion on the technical NO votes from Anil Sankwalka and Joe Kubler. There was little controversy about the issues, but considerable discussion of how to best overcome the commenter's objections without making major or technical changes to the draft, which the group felt to be unnecessary. On the sequence numbering comments regarding broadcast/multicast and ATIM frames there appeared to be no need to make a change, since both the approach in D4.0 and the approach recommended by Anil yielded equivalent results, and the lack of an exposed interface that permitted the cache of recent receptions to be observed made the issue even less critical because there were almost no circumstances under which the differences in behavior due to how this aspect of sequencing and duplicate filtering was implemented could be observed.

MAC Motion #10: **That we decline the 2 technical no comments from Anil's no vote with the following rationale:**

Clause 7, comment 68: **There is no necessity for the requested change, as it is a simple design optimization rather than a fault in the protocol, as sequence numbers in multicast/broadcast frames can safely be ignored because the Retry bit in those frames will never be set.**

Clause 11, comment 21: **There is no necessity for the requested change, as it is a simple design optimization rather than a fault in the protocol, as sequence number in ATIM frames can safely be ignored as the effect of accepting a duplicate ATIM is null.**

Moved: Bob O'Hara, seconded: Wim Diepstraten

MAC Vote: 9, 0, 0 Motion #10: passes

Jon Rosdahl volunteered to FAX a hardcopy of the motion and vote, as it appeared on the video projector, to Anil for his concurrence.

Discussion of Joe Kubler's comment proceeded with less controversy, as it was rapidly agreed that the group could accept the comment, but as an editorial clarification, since the desired functionality was implicit from the operation of other sections of clause 9.

MAC Motion #11: **That we accept comment 136 on clause 9, using the suggested text from Joe Kubler from his technical no vote, but place the text in a separate paragraph after the paragraph indicated in the comment (since the referenced paragraph refers to CF-Pollable stations). This change, however, is a clarification, not a technical change to the standard.**

The change is not technical because in 9.2.5.4 it is stated that the NAV is updated only when the new duration is greater than the existing duration. In 9.3.2.2 the only conditions which may reset the NAV are CF-End or CF-End+ACK.

Moved: Jon Rosdahl, seconded: Bob O'Hara

MAC Vote: 9, 0, 0 Motion #11: passes

Simon Black volunteered to FAX a hardcopy of the motion and vote, as it appeared on the video projector, to Joe for his concurrence.

Full Group Discussion of Complex Issues:

There was then about 35 minutes of discussion about comments #11 and #39 from 106-3 pertaining to the lack of architectural description and MAC service specifications for power management in clauses 5 & 6. The consensus (with few people participating, and fewer actively concerned with this issue as the meeting

continued through the normal time for the mid-morning coffee break) was to decline these comments, since the necessary normative text describing the behaviors of the relevant functions was already present in clauses 9, 10 and 11.

MAC Motion #12: **That we decline comments #11 and #39 from 96/106-3 (on MSDU delivery service and power management service) due to lack of available text and lack of time to create such text.**

Moved: Bob O'Hara, seconded: Howard Hall

MAC Vote: 2, 0, 5 Motion #12: passes

Because this relatively minor issue took about half an hour to resolve, there was general preference to resume working on the unprocessed comments, and return to the complex and/or contentious issues on Thursday morning.

Clause 9:

The MAC group then broke up into three small groups:

- Clause 9, continuing from where left on Tuesday evening: coordinated by Simon Black
- Clause 9, starting at the end of 106-3 and working backward: coordinated by Bob O'Hara
- Inter-clause consistency checking: coordinated by Michael Fischer

Small group work continued until noon. There was no further MAC session on Wednesday because the Full Working Group meeting lasted all afternoon, and the IEEE 802 social event was Wednesday evening.

Thursday, July 11th, 1996, 8:30 AM

The meeting was called back to order by Michael Fischer at 8:40AM. He mentioned a conversation he had on Wednesday evening with Paul Eastman regarding the state of the draft and the nebulous state of the conditional approval procedure rules due to ExCom not renewing the provisional conditional rules at the beginning of the week. Paul offered the opinion that, if we could overcome all the no votes, plus resolve essentially all comments while making only editorial changes to the draft, we could bring forward a motion to go to sponsor ballot without the need for a confirmation ballot, thereby avoiding the time for the reconfirmation ballot, the need for a meeting in August, and the conditional approval rules uncertainty. Michael also stated he reviewed all comment resolutions approved by MAC group on Wednesday, and all so far are, in fact, editorial (in terms of their impact on the draft, how the commenter classified the comment is not relevant in this case). An informal check with some PHY group members yielded the same opinion about their comment resolutions. Attempts would be made to maintain "only editorial" changes while working on the remaining issues to retain the possibility of being able to go directly to sponsor ballot with D5.0.

Update on Resolution of Technical NO Votes:

Vic Hayes reported that Joe Kubler accepted the resolution of his comment, and sent a FAX unconditionally changing his NO to YES.

Simon Black reported that after a verbal acceptance of the comment resolution by Anil, his response FAX indicated a highly conditional willingness to change his vote. Vic felt that his response would not be acceptable to ExCom as acknowledgement of successful resolution of the NO vote. Jon and Simon both spoke to Anil on Wednesday evening, and determined that his remaining objections could be overcome by adopting a comment from Tom T's late arrival ballot pertaining to clause 9.2.8. This comment (106-6, #19) has not yet been processed, but appears to be relatively benign. A discussion followed about how to

incorporate this comment without introducing a technical change or inconsistencies with other clauses. After several attempts at alternate wordings, the following was agreed upon:

MAC Motion #13: **That clause 9.2.8 be amended to state:**
The receiving station shall keep a cache of recently received <source-address, sequence-number, fragment-number> tuples. A receiving STA may omit tuples obtained from broadcast/multicast or ATIM frames from the cache.

Moved: Simon Black, seconded: Wim Diepstraten

MAC Vote: 8, 0, 2 Motion #13: passes

Simon Black volunteered to call Anil early in the afternoon and attempt to secure a less conditional confirmation of his willingness to change his NO vote to YES.

Resolution of Remaining Letter Ballot Comments:

The MAC group then resumed small group work for about one hour to complete the remaining unaddressed clause 9 comments, then reconvened to approve the results of that work and discuss the complex issues deferred from earlier small group work. The motions are in the order the outstanding issues were discussed. The group decided to forego the traditional review of the MAC report prior to closing plenary because the report PowerPoint file was the document used to capture text of the motions all week, and was on the screen much of the time during full MAC group discussions, so its contents were well known.

Complete 106-3 comment #30:

This comment raises questions about whether an AP is implicitly in State 3 with regard to the distribution system. The discussion on this extended beyond the scope of the comment, which concerned whether APs could send certain type of frames, such as CF-End, when there were no associated stations, to include such topics as whether it was necessary for the APs in an ESS to associate with each other before the ESS convey MSDUs to and from the DSM. Changing the class of certain types of frames, or making portions of the information in certain types of management and control frames be in different classes than other information in those same frames, was felt to be as confusing as the existing situation, while adding a significant risk of unintended side effects. The consensus was to clarify the relationship between the APs and DS, which, if insufficient by itself, was felt to provide the basis to disambiguate future questions of this type in a manner consistent with the MAC operation already specified in clause 9.

MAC Motion #14: **To add statement to clause 5.5 to indicate that an AP is always in state 3 because it is inherently able to communicate with the DS.**
NOTE: This is a clarification of existing functionality regarding access to and communication with/over the DS. This does not change the requirement that stations authenticate with an AP before communicating via the DS.

Moved: Chris Zegelin, seconded: Wim Diepstraten

MAC Vote: 11, 0, 0 Motion #14: passes

Complete 106-3 comment #57:

This comment suggests that multicasts need to be sent twice when using the strictly-ordered service class.

MAC Motion #15: To decline comment #57 from 96/106-3 because:

- 1) Service class is per-MSDU, not per-STA, so the the requested behavior is inappropriate.
- 2) The broadcast address is defined in IEEE802-1990, so we should leave this alone.

Moved: Simon Black, seconded: Chris Zegelin

MAC Vote: 10, 0, 0 **Motion #15: passes**

Complete 106-3 comment #69:

This comment requests inclusion of the time to next TBTT field in Beacon frames, which was removed from clause 7 at the May, 1996 meeting because nothing in clauses 9 or 11 called for anything to be placed in this field. Commenter expressed the opinion that the May decision was undesirable, but that the required change was too large to incorporate at this time, and recommended declining his own comment.

MAC Motion #16: To decline comment #69 from 96/106-3 because this is a request for new functionality and similar proposals have been voted down on at least 2 previous occasions.

Moved: Jon Rosdahl, seconded: Wim Diepstraten

MAC Vote: 10, 0, 0 **Motion #16: passes**

Complete 106-3 comment #76:

This comment requests one of the reserved capability bits be used to indicate that the AP is operating with "exclude unencrypted" active. Commenter disagreed with those who considered this new functionality, but agreed that the potential for useless transfers over the WM was sufficiently rare that if the group was willing to tolerate occasional inefficiency, there was nothing broken about the current mechanisms.

MAC Motion #17: To decline comment #76 from 96/106-3 because this is a request for a minor technical improvement, the inclusion of which is unjustifiable at this late date.

Moved: Simon Black, seconded: Jon Rosdahl

MAC Vote: 8, 0, 2 **Motion #17: passes**

Complete 106-3 comment #87:

This comment concerns inconsistency between 7.3.2.1 and 11.2.5.1 regarding what bits are to be (or may be) set in TIMs. After considerable discussion of how to resolve the conflict (there were no significant disagreements about the desired functionality), a reasonably simple clarification was proposed.

MAC Motion #18: To resolve comment #87 from 96/106-3 by changing the text in the 6th paragraph of 7.3.2.1 to read:
 Each bit in the traffic-indication virtual bitmap shall correspond to traffic buffered for a specific station within the BSS that the AP is prepared to deliver at the time the beacon or probe response frame is transmitted. Bit number N shall be 0 if there are no directed frames for the station whose Station ID is N. If any directed frames for that station are buffered, and the AP is prepared to deliver them, bit number N in the traffic-indication virtual bitmap shall be 1. A PC may decline to set bits in the TIM for CF-Pollable stations that it does not intend to poll (see clause 11.2.5.1)
ALSO, in clause 11.2.5.1 (c): delete the words "CF-Pollable"

Moved: Wim Diepstraten, seconded: Simon Black

MAC Vote: 11, 0, 0 **Motion #18: passes**

Complete a group of Clause 9 comments:

This covers a group of non-contentious comment responses processed by the small group working back from the end of 106-3. These resolutions were briefly presented, but not debated, in full MAC group.

MAC Motion #19: To approve the proposed resolution of comments #130 through #146 from 96/106-3 (see 96/106-3r1), other than comment #136 (already approved on Wednesday in plenary motion #18).
NOTE: none of these result in technical changes.

Moved: Ravi Nalamati, seconded: Bob O'Hara

MAC Vote: 9, 0, 1 **Motion #19: passes**

Complete another group of Clause 9 comments:

This covers a group of non-contentious comment responses processed by the small group working forward through 106-3. These resolutions were briefly presented, but not debated, in full MAC group.

MAC Motion #20: To approve the proposed resolution of comments #101 through #126 from 96/106-3 (see 96/106-3r1).
NOTE: none of these result in technical changes.

Moved: Simon Black, seconded: Wim Diepstraten

MAC Vote: 10, 0, 0 **Motion #20: passes**

Complete 106-4, comment #17:

This comment proposes yet another mechanism for improving broadcast/multicast reliability. While this mechanism may not suffer from the deficiencies which lead to the previous proposal being voted down on at least 2 occasions (most recently at the May, 1996 meeting), there was insufficient time and insufficient support in the comment to adequately assess the impact of this change. There is also not a consensus in MAC group that broadcast/multicast reliability is broken and in need of improvement.

MAC Motion #21: To decline comment #17 from 96/106-4 because this is a request for a minor technical improvement, the inclusion of which is unjustifiable at this late date.

Moved: Jon Rosdahl, seconded: Wim Diepstraten

MAC Vote: 9, 0, 1 **Motion #21: passes**

Complete 106-4, comment #22:

This comment identifies an oversight in specification of MAC response time bounds that could lead to potential inability of conformant stations to be unable to associate with conformant APs in certain cases; and proposes applying an existing response time bound to cover these cases. There was little disagreement that there was a hole in the existing specification (although whether any sane implementation would fall into that hole is considered unlikely by most participants). However, before a consensus on whether the proposed solution was appropriate, Bob O'Hara pointed out that the proposal was incomplete, because the same hole existed for authentication frames, and might exist for other management frames. Rather than adopt an incomplete solution, the MAC group preferred to leave the specification unchanged, allowing further opportunity to assess both the need to solve this problem, and to select a mechanism that provides a complete solution, during the sponsor ballot period.

MAC Motion #22: To decline comment #22 from 96/106-4 because this is a non-trivial functional change, which may be useful, but is incomplete as proposed, because the problem identified extends beyond the cited Association and Reassociation frames to (at least) Authentication frames, and perhaps to other management frame types.

Moved: Wim Diepstraten, seconded: Jon Rosdahl

MAC Vote: 7, 0, 2 **Motion #22: passes**

Complete 106-4, comment #30:

This comment suggests changing the default aProbeDelay value to reduce the chances that a scanning station will clobber other traffic. The group felt that there was not an established need for this change, and that since the request was only to change the default, if there was a need to do this in certain environments, the MIB attribute was GET-REPLACE so the change could be done per-STA via the management entity.

MAC Motion #23: To decline comment #30 from 96/106-4 because this is a non-trivial functional change for which the impact has not been adequately investigated, and for which the need has not been substantiated.

Moved: Jon Rosdahl, seconded: Chris Zegelin

MAC Vote: 8, 0, 2 **Motion #23: passes**

Complete 106-2, comment #45:

This comment requests updating the MAC PICS to properly reflect the optional PCF characteristics. The problem with the existing PICS is that the PCF is an all-or-nothing option, whereas in Clause 9 the point coordinator is required (if present) to deliver frames, but is not required to maintain a polling list nor to issue CF-Polls. There are also separate capability bits dealing with these two cases, so the difference is observable at an exposed interface. Michael Fischer (as commenter, not as MAC chair) presented the

proposed change, which adds the necessary options to PC4, and which adds a second table to A.4.4.2 covering reception of the various MAC frame types (needed because all CF-Pollable stations must be able to receive CF-Polls, but not all point coordinators must be able to transmit CF-Polls). The proposed change also corrects an unrelated error in the PICS entry for PS-Polls (which are listed as from the AP in D4.0).

MAC Motion #24: To accept comment #45 from 96/106-2 to incorporate the changes to the MAC PICS to properly describe the optional characteristics of the PCF.

NOTE: This also corrects an error in the PICS for PS-Poll, which was shown being transmitted only by APs rather than only by non-APs.

Moved: Simon Black, seconded: Bob O'Hara

MAC Vote: 9, 0, 0 Motion #24: passes

Complete 106-6, comments #11, #17, #18:

The comment processing group recommends declining these three comments due to large potential for introducing new problems and inconsistencies if the text is not crafted very carefully. No text was provided by the commenters, and the lack of clarity seems to be of much greater concern to the commenters than to any of those present at this meeting, since there were no volunteers to generate the text this week.

MAC Motion #25: To decline comments #11, #17 and #18 from 96/106-6 due to lack of text provided by the commenters and lack of time to generate such text (in a form which did not produce new, undesired side effects or inconsistencies). (see 96/106-6r1)

Moved: Simon Black, seconded: Jon Rosdahl

MAC Vote: 7, 0, 3 Motion #25: passes

Complete 106-6, comments #13-#16, #20:

The comment processing group recommends accepting 106-6 comments #13 and #16 (accept in principle but use different words for consistency with other clauses) as editorial clarifications. They further recommend and declining comments #14 (the requested algorithm has been voted to be unnecessary and/or outside the scope of the standard on several occasions), #15 (the requested algorithm appears in clause 9.3.3), and #20 (the requested restriction is unnecessary, and may even be undesirable in certain cases).

MAC Motion #26: To approve the proposed resolution of comments #13, #14, #15, #16 and #20 from 96/106-6. (see 96/106-6r1)

NOTE: None of these accepted comments make technical changes.

Moved: Bob O'Hara, seconded: Chris Zegelin

MAC Vote: 10, 0, 0 Motion #26: passes

Complete 106-3, comments #34 and #35:

The comment processing group recommends closing the final two 106-3 comments (#34 and #35) with a change for editorial consistency. The two comments are related, and the proposed change is acceptable to both commenters. The proposed new wording in clause 5.7.1 is:

When a Station wishes to send data to another Station it sends a Data message. In an ESS the message shall be handled by the Distribution Service if the ToDS bit is set, otherwise the Data message is sent directly. In an IBSS, the Data message is sent directly.

The reference to the MAC state machines in clause 9.1.5 is an artifact left from the time that the state machines were normative. This reference should have been removed when the state machines were transferred to an informative annex.

MAC Motion #27: To resolve comments #34 and #35 from 96/106-3 to replace text from 5.7.1 and delete references to state machines in 9.1.5. (see 96/106-4r1)

Moved: Jon Rosdahl, seconded: Wim Diepstraten

MAC Vote: 8, 1, 1 Motion #27: passes

The vote on motion #27 is the **only** instance of a dissenting vote on any MAC motion during the entire week! Because of its singular nature, the acting MAC chair felt it appropriate to record the circumstances: The dissenting vote was cast by Chris Zegelin, who, during discussion of this motion, stated that there were problems with some high-layer protocols if direct station-to-station transfer of data frames were allowed among stations associated with an infrastructure network. Several other members agreed that there were protocols with which problems could occur, but felt this was not a flaw in the 802.11 MAC, and did not justify removing a function which was indicated as being useful by MAC group members in several previous votes. Furthermore, there is nothing in the resolution of these comments (or elsewhere in the draft) which prevents stations from sending all data frames via distribution services (ToDS bit set) when associated with infrastructure networks.

Goals for the next meeting:

If the request for letter ballot is approved, there is no need for an August meeting, and the only goal for November, 1996 is to process sponsor ballot responses and have a revised draft for rebalot or forwarding, as appropriate.

If a confirmation ballot proves to be necessary, there needs to be an August meeting, with the only goal being to resolve the issues from the confirmation ballot, allowing us to proceed to sponsor ballot.

Remaining unaddressed issues:

At this point there were only 3 unaddressed, non-PHY comments. The discussion below (other than adjournment of the MAC group meeting) occurred during the closing plenary, but is recorded here because there was nobody taking detailed minutes of discussion in the full working group meeting.

Comment #1 from 106-6 relates to patents and IEEE policy, and is being handled by the P802.11 chair.

Comments #32 and #33, are two, diametrically opposed dispositions of the MAC state machines in Annex C. Comment #32 calls for replacing the current, out-of-date state machines with updated versions, which the commenter has volunteered to provide. Comment #33 calls for removing the state machines entirely.

These comments are being left for closing plenary because:

- (a) The state machines are informative, so these are the lowest priority ballot comments to address
- (b) a choice among these, opposing alternatives should be made by the full MAC group
- (c) the comments are from the MAC chair & acting MAC chair, so somebody else (WG chair in this case) should moderate the discussion.

Nobody in the MAC group argued that the existing material in Annex C was desirable to retain. The major question was whether people in the sponsor ballot group were going to react worse to out-of-date state machines or to no state machines at all. Simon Black proposed a third alternative, which was approved in

plenary motion #45: To delete the state machine content, but to leave Annex C as a placeholder containing "TBD". It was felt by some members that a sponsor ballot with an intentionally blank Annex C would produce the most useful comments regarding whether the sponsor group wants informative state machines or normative state machines, while avoiding having to process the swarm of comments on inconsistencies between the MAC specification clauses and the state machine operational characteristics that would come back if the existing state machines were left in.

Michael Fischer, who has been working on updated MAC state machines for several months, indicated that, with MAC functionality no longer a moving target, a set of consistent, up-to-date state machines could be available on the FTP server **before** the next meeting, permitting the detailed review which is appropriate, but which cannot be done during an 802.11 meeting. Several people indicated an interest in re-inserting (updated, reviewed) state machines at the August meeting (if such a meeting takes place). The opinion of the Editor was that modifications of informative text could be done at that time without requiring another confirmation ballot. However, other people felt that the best way to get input regarding the possible need for normative state machines was to send an intentionally blank Annex C to sponsor ballot; while taking the time for sufficient review that, should normative state machines be required, we could insert them in November, 1996, with confidence that they describe MAC behavior correctly.

Adjournment:

A motion to adjourn was approved without dissent at 1:20PM on Thursday, July 11, 1996. The MAC group thanks Vic Hayes for delaing the start of closing plenary until 2:00PM to permit us to approve the remaining comment responses and to have a short break before the full working group meeting.

