Minutes of the March 21, 1988 Internet Activities Board Teleconference

1 Introduction

The March 21, 1988 meeting of the Internet Activities Board took place as a teleconference between MCI facilities in Washington, D.C. and San Francisco, California. Attending at the Washington site were: Brian Boesch of DARPA, Bill Bostwick of LANL/DOE, John Cavallini of DOE, Vinton Cerf of NRI, Dave Clark of MIT, Phill Gross of Mitre, Steve Kent of BBN, Dave Mills of UDel, Dennis Perry of Unisys, and Steve Wolff of NSF. Attending in San Francisco: Bob Braden of ISI, Deborah Estrin of USC, Keith Lantz of Olivetti, Barry Leiner of RIACS, Dan Lynch of ACE, and Jon Postel of ISI. Steve Hotz of USC was in attendance serving as secretary for the meeting. The meeting was officially convened at 11:10 EST by Vint Cerf, with a few members joining the meeting already in progress.

2 Opening Plenary

Dick Liebhaber, executive Vice President of MCI, accepted the IAB's invitation to make opening remarks. He took the opportunity to greet the board and express his excitement reguarding MCI's involvement with NFSNET and new relationship with the IAB. Liebhaber proceeded to share his comments on the positive outlook for the future of universal digital communications. He pointed out that it is becoming increasingly more likely, in light of growing communication facilities, commercial and public support. He then took a few minutes to discuss some of the specifics of the MCI Teleconferencing system that the IAB would be using for this conference. Questions from the IAB about the facility prompted him to discuss some of the current work in progress and future capabilities of the system. Bob Braden pointed out that the commercial value of the facilities being provided was approximately $750/hour.

3 Agenda

As is the IAB's custom, the first official order of business was the presentation of the agenda and its subsequent revision.

The initial agenda was as follows:

- Introduction and greeting, Dick Liebhaber
- Network Management, Vint Cerf
- May 1987 IRI Research and Engineering Plan, Vint Cerf
- Inter-Organization Research Internet Workshop, Barry Leiner
- IETF and IAB support, Dave Clark

The proposed revisions to the agenda were:

- Cerf suggested a discussion of the current e-mail system and the reliability of the name server system.
- Leiner expressed concern that poor Internet performance was adversely affecting the scientific communities' view of opportunities afforded by networking, and suggested that discussion on improving performance would be appropriate.
- Braden requested that a report on the current status and activities of the FRICC be given by one of its members attending this meeting.

4 FRICC

Bill Bostwick provided a summary of the FRICC meeting that had occurred a few weeks ago in San Diego. The focus of the meeting, motivated by both economic and political reasons, was whether different agencies resources could be shared and if so, how could it be achieved. The meeting resulted in a decision to designate a person (Phill Gross) to be involved in the development of resource sharing. Initially a short term list of "things to do" is to be produced.

Phill reiterated the question from the San Diego meeting concerning what resources were actually available to share if resource sharing is to be demonstrated in a short time frame. Discussion tended to gravitate toward the "RIB" (formerly the "Snake") and concerns related to its management. It was decided at a follow-up to the San Diego meeting to form an engineering/oversight committee to deal with the issues of technical management, administrative planning, and sharing. This committee is to include a technical person for each agency to represent their interests in the planning of the RIB.

The plans to have Arpanet off-loaded temporarily to the Wideband Net and eventually to the RIB were discussed. Vint voiced concerns about homing Arpanet on the Wideband. It was pointed out that this has not been tested, definite plans for testing have not been made, and there has been no substantial traffic flow on the Wideband. Vint questioned TCP performance implications when diverting through a satellite backbone with a 1.8 second RTT. *Action Item - Cerf: That the IAB recommend to DARPA to test before cutover to the Wideband Net.* Clark mentioned that he was pessimistic that testing would occur in light of budget constraints.

Discussion returned to the technical/steering committee proposed by the FRICC: Have the correct people been assembled? Are all appropriate organizations represented? Phill pointed out that there was an attempt to convene this group once before as the INENG Steering Group. The question was raised whether DARPA represents DoD interests. Cerf pointed out the only a tenth of the machines "speaking internet" are actually on the Internet. Bostwick said that the FRICC was not closed to anyone, the only prerequisite being someone who runs or requires a network for research. Clark mentioned the need for a discussion of the principle agenda of the FRICC.

5 Network Management Convergence Meeting - Cerf

Vint reported four conclusions from the February 29th meeting:

1. The short-term needs of the Internet would be best served by using SNMP (formerly SGMP), a model of which is currently in use on the NYSERnet. Vint noted that Craig Partridge had withdrawn HEMS/HEMP from consideration in the interest of expediting the convergence on some standard.

2. In the long-term, the Internet should adopt the CMIP/CMIS standard, which is again on the ballot to become the international standard, after failing once. This choice affords the Internet the opportunity to "grab the high ground", and have operational experience that no one else will have. Vint noted that in the international standards community, implementation of a working system is preferable to a paper study.

3. In dealing with the proprietary problems of the use of SGMP, it will become the responsibility of the IETF to extend the definition of the database for the protocol. This will serve to further remove NYSERnet from proprietary responsibilities.

4. The management information base defined by HEMS should be applied as a model when extending SNMP.

A discussion ensued following Vint's report during which several points were mentioned. It was pointed out that HEMS was clearly technically superior, and that Cisco had already put a substantial amount of effort into it.

It was the general consensus that the work to upgrade SNMP must occur soon. The CMIP oriented MIB must also be extended and revised to function within the TCP/IP architecture. A two-day meeting will be held in Boston on April 4th with the intent of extending SNMP and the MIB.

Discussion turned to the possibility that there would be resistance to the extensions, at which point it was pointed out that the authors gave up responsibility for SNMP and that choices were no longer proprietary. It appears that an RFC of revisions is necessary. The question of who would win if the RFC differed from the implementation was raised. Braden suggested that IAB ratify the appointment of a person (or group) to be final arbitrator(s) of decisions as development progresses. An IDEA is to be published as a starting point for the WG; expect a draft document from IETF by June 15th. *Action Item - Cerf: The IAB should have a discussion with Mandelbaum and Schrader of NyserNet Inc., and make it clear that IAB will retract it's support if cooperation becomes a difficulty.*

Clark said that we need to codify management plans for the development of SNMP, and that it should be announced in a general public forum. Two issues were discussed reguarding the development: 1) Is there a significant technical component to this revision? 2) Will there be a careful test phase, or will it go directly from paper to implementation? Steve Kent mentioned that he was unaware of any details concerning security issues, and asked if there were other technical problem areas.

It was brought up that vendors need certain functionality now. There is concern that SNMP doesn't provide enough functionality, but an effort must be made to prevent SNMP from snowballing into a complete redesign. SNMP is intended to be the immediate solution and that an effort must be made just to get it running in the short term. There is a need to ensure a common baseline inter-vendor implementation; intra-vendor functionality may vary. The longer things are put off, the less likely it is that there will be a commonality between implementations.

The question was raised, "By what mechanism will CMIS/CMIP be motivated?" It was suggested that the SNMP WG could possibly provide a transition path from SNMP to CMIS/CMIP.

Phill Gross headed off the topic of who's to lead the WG that is to oversee the development of SNMP. Phill briefly discussed several potential candidates. The board then mentioned and discussed other candidates. Cerf, Braden, Gross, Lynch and possibly Clark will decide who is to chair the development working group for SNMP and CMIS/CMIP. The initial charge of the WG is to produce a management plan for SNMP's development.

Discussion of network management was brought to a close with IAB accepting the recommendations of Cerf's meeting. The recommendations were accepted with some reservation; Braden reiterated his concern reguarding the wisdom of choosing a system of potentially inferior technical merit. The decisions reached are to be published in an RFC by the IAB, and in the next "Connexions" cover letter.

6 IRI Research and Engineering Plan - Cerf

Vint discussed adding section B, "Project Labels", to the appendices of the IRI-TF report. This would be a list of high-level projects which encompass (hide) the lower level technical issues. He noted that displaying the "end product" could be a useful facility in motivating effort toward the underlying issues. Four possible projects were mentioned and discussed.

1. Private E-mail per the RFC by the privacy task force. Deborah Estrin inquired if this was intended for both federal and other users. Cerf replied that the aim should include everyone; federal and commercial both should be a factor.

2. Internet accounting, aimed at dealing with accounting when agencies share resources. Commercial use would be another area in which to study alternate methods of connection, access and accounting mechanisms. Leiner stated that this project did not seem to be focused correctly. Either it is too broad and should be simply policy-based routing, or it is not broad enough and should attempt to encompass other accounting and access control issues.

3. Network Management and Operation which has already been discussed at length.

4. A project to work out and demonstrate migration to ISO standards.

Questioned about the timeline for the research plan, Vint stated that an effort should be made to complete all projects within 3-5 years, although there were some concerns about the practical limitations of getting solutions out in this time frame. Vint expressed hopes that Leiner's workshop would help articulate user needs.

Leiner questioned how higher level functionality issues may also fit into this. Barry postulated that there was a need for higher level "telescience" to drive all of the lower level non-user oriented issues. He went on to mention the need for technology to support collaborative research such as conferencing, equation and message interchange standards, and workstation/supercomputer remote graphics. The question was raised whether R&D efforts were needed to promote low-speed teleconferencing or if this would be brought about commercially. The serious problems of lack of multicast and packetization issues were noted. Braden, Estrin and Leiner will work on a fifth project label to reflect application level concerns.

Leiner asked if performance is an issue to be addressed in the new section. Vint responded that it could be included under Network Management and Operation.

Clark expressed concern that the application-level examples may become actual projects instead of being drivers for the lower level issues. Dave recommended it be clarified within the report that the application level items are presented only as motivation and drivers for lower level issues, and that they are cited only as examples.

Wolff proposed that the IRI-TF report be accepted with discussed revisions and that the IAB write a statement reguarding the report. Leiner, Estrin, Lantz and Postel will write the cover for the report. *Action Item - Cerf: That the IRI-TF report be finalized and presented to the FRICC as a list of recommendations of what needs to be done.*

7 Inter-Organizational Research Internet Workshop - Leiner

Barry briefed the IAB on the planned research internet workshop; outlining the tentative purpose and format of the meeting. It is to be a workshop for both technical experts and policy-knowledgeable people to discuss general architectures that can be explored to achieve specific policy functionality. Among the questions/issues that may be addressed: What exactly do we need, and how do we achieve it? What is to be done about distributed security issues? Bottom line, how much to get the bandwidth required? Can the traffic on my network from other communicating agencies be controlled? How are various levels of sharing to be achieved, and can certain levels of service be guaranteed if paid for? The anticipated output of the workshop is a research plan for bringing about the necessary protocols and mechanisms which can meet policy demands.

Discussion turned toward who was to attend this workshop. Barry asked if the list of attendees was complete. It was suggested that Estrin and Kent or members of their respective task forces attend, since these TFs are likely to be starting points for the resulting plans of the workshop. Steve Kent suggested that users doing work in the network environment should also be represented. The user input reguarding what they expect or can "put up with" will help maintain checks and balances.

Leiner said that there should be some sense of a starting position coming into the meeting. He proposed that the FRICC draft a position paper prior to the workshop. Bostwick said that the FRICC would write a position paper.

7.1 Administrative Digression: Meeting Dates

After checking calendars, it was decided that the earliest date for Barry's workshop would be July 12th and 13th. Clark took the opportunity to discuss possible dates for the next IAB meeting, with June 23rd and 24th being the consensus. Leiner requested that the dates be interchanged. The workshop will be held June 22/23/24 tentatively at Ames Research Lab in Mountain View, Ca. The next IAB meeting will be held July 12/13 tentatively in Sante Fe. Bostwick will check into arrangements for the IAB meeting.

8 IAB/IETF Support - Clark

Dave Clark reviewed what had transpired at the January meeting. IAB came into the meeting with hopes of having an executive director and secretary funded. The primary responsibilities being to arrange meetings, report and follow up action items, act as a trusted agent, write white papers, and in general to make certain things get done. After the FRICC indicated that they were in a position to provide funding, IAB proposed four positions to be funded:

1. Executive Director - as described above
2. Chairman IETF - details to be discussed by Phill
3. Internet Engineer - in addition this person will provide technical consulting to the FRICC
4. Internet Architect - responsible for technical oversight in turning new reports into action

Clark reported that since the last meeting there had not been much progress, although there had been frank and direct discussion concerning the situation. Funding for the executive director turned out to be substantially less than envisioned. Funding for Phill as IETF chair was not in place as expected; they are to try again. The position of "midterm architect" was temporarily tabled, with hopes that a candidate may appear during Leiner's workshop. Clark briefed the IAB on the mechanical breakdown reguarding the green stamp, which left the situation hanging. The possibility of Phill fulfilling the function of IETF chair under the auspices of working at NRI was mentioned. NRI would be willing, but the support mechanism must be in place.

Vint pointed out that there was substantial vendor activity in the IETF particularly. He suggested that the IETF might possibly be funded by instituting a registration fee (circa $100) to be charged to those attending the meetings. Concern was expressed that this might have a negative impact on IETF meetings. Clark suggested that Dan Lynch investigate the possibility and willingness of the vendors to support Phill as IETF chair.

Phill then discussed his understanding of the responsibilities of the IETF chair, and stated that the magnitude of the job was too large for one part-time person. It was pointed out that the IETF chair and the midterm architect must work closely. Phill summarized the IETF chair's responsibilities in a list of administrative and a list of technical responsibilities, each with seven items.

<u>Technical Responsibilities:</u>

1. Chair the IETF Steering Group and set the overall Task Force agenda.
2. Pursue the TF technical agenda through formation of working groups.
3. Monitor and facilitate the progress of the working groups.
4. Provide technical direction for and/or chair key WGs.
5. Coordinate the review of all WG documentation i.e., RFCs.
6. Set the technical agenda for the quarterly plenary meetings.
7. Act as TF representative to report TF progress in appropriate forums.

<u>Administrative Responsibilities:</u>

1. Schedule quarterly TF plenary meetings.
2. Coordinate and distribute the agenda for quarterly meetings.

3. Collect and distribute all appropriate documentation for meetings, and handle other meeting logistics.
4. Chair major session of quarterly plenary meeting.
5. Produce proceedings for quarterly meetings.
6. Act as editor and maintain TF document series.
7. Maintain mailing lists for TF and certain WGs.

Bostwick noted that the IAB just needs to present specific proposals to the FRICC, who will then decide the most appropriate funding agency. Clark, Cerf, Gross and Lynch are to coalesce the entire funding discussion into a form suitable for presentation to the FRICC. Postel and Leiner volunteered to edit the proposal. The question of whether the technical consulting service be included in the proposal was raised. FRICC members indicated that it was necessary to include this function.

The positive commitment and extent of involvement of the vendor community was noted and discussed. Braden recommended that the IAB try to make a consistent showing at IETF meetings. Rather than continue sporadic attendance, a member should commit to attending and tracking particular IETF functions. Phill mentioned plans to formalize the IETF steering group after the funding situation was resolved.

9 Internet Performance - Leiner

The often-observed poor performance of the Internet is adversely affecting the view of networking held by a large community of potential network users. Users are complaining and just giving up. What is being done to discover the problem and to alleviate the situation?

The question was raised whether the primary problems were LAN or Arpanet transit problems. Clark said that oversubscription to Arpanet was a known problem. Postel recalled that users have on occasion tried to access supercomputers interactively to no avail. Telnet access seems prone to broken connections. Postel further postulated that Arpanet was not broken; rather other gateways were not functioning correctly.

Vint noted that installation of the 11/73s and Van Jacobsen's fixes should help, but having SNMP to monitor and detect problems is vital. Steve Kent suggested that IETF could set up a WG to handle complaints. A standard detailed report form could be designed so that the when, where and full context of the problem could be supplied to those hunting it down. Clark pointed out that autonomy made things particularly difficult and that there were few monitor/find/fix successes.

Dave Mills said that there were enough tools, albeit covert, available to find the needed information, but there was not enough time to hunt down the problems. In light of a broken EGP, lack of net measurement protocols, and the scarcity of technical people, there is not enough time to deal with any but the daily problems. Wolff commented that we have the protocols, but not enough money to analyze the data. Perhaps IETF should try to channel efforts into the assimilation of data rather than designing new management protocols.

There is a need for someone to be responsible to find and fix problems. Perhaps it should be required that a person be designated responsible for monitoring and management in each of the component networks. Wolff pointed to Merit as an example.

Gross mentioned that IETFs efforts were concentrated in the Short Term Routing Group and in developing a standard set of troubleshooting tools.

Mills added that the troubles were not in any one system; rather they appear when the collection of systems is taken as a whole. A research study of Internet inter-connection issues might be helpful. Leiner asked, " If nobody is examining the overall system structure, should IETF assemble a standing operations group?" Probably not; there should be proposals and bids for the responsibility of gateway/network monitoring. Clark pointed out that the entry cost to the Internet is low; there should be more discerning restrictions to get onto the network. Dave also pointed to a need for a communications forum other than mailing lists, where those responsible for operations can get together to deal with real-time problems.

Perhaps there should be a responsible group with the ability to poll gateways, who can be reached via an 800 number at all times.

Action Item - Leiner: A subgroup of IAB and/or IETF is to develop a plan for making a set of requirements for being an operational part of the Internet.

Leiner asked if there was a consensus that Merit would be a good locus of responsibility, or if IAB should prompt other vendors to submit proposals to perform this function. There seemed to be a general consensus for Merit. Braden pointed out that there could be problems due to IBM's information restrictiveness.

Conclusions:

- There is a need for an operational component of the Internet, in addition to architectural and engineering components.
- There should be a set of responsibilities required of each component network's management infra-structure including a designated contact person and guaranteed set of information about the network.
- Someone (i.e. BBN, NOC, Merit) should be explicitly funded to perform this function so that a real person is paid real money to be handle network performance problems.

10 E-mail - Cerf

Vint pointed out that he had frequently been experiencing unsuccessful e-mail attempts. It appears as if tables were often not updated reliably. He asked if he were the only one experiencing this problem, and if there was any insight into the problem.

Discussion turned to e-mail security. A tentative solution to the RSA Inc. licensing problem has been proposed. A RSA Inc. designated authority could be appointed to certify e-mail use of any RSA implementation for around $25 per certificate. It is proposed that a key management RFC to go along with the previous E-mail RFC be prepared. Ordering information for RSA's certificate could be included in this RFC. Leiner questioned IAB's endorsement of a specific commercial proprietary organization. The general consensus was that there was no problem with this.

11 Teleconferencing Reactions

The teleconferencing facilities were briefly discussed so that feedback could be provided to the host. Fairly positive reactions were voiced, however, two specific negative comments were raised: the halfduplex voice was very frustrating and the lack of live graphics capability was missed. Tentatively, the next teleconference will be held at the ISI/BBN facilities. IAB is curious to see the progress since the last such conference.

12 Summary - Action Items, Recommendations, To Do

- **FRICC**
  - IAB recommend to DARPA to test before cutover to Wideband Net.
- **Network Management Convergence Meeting**
  - IAB to select/ratify arbitrators for decisions involving development of SNMP
  - IAB should make it clear to NYSERnet Inc. that support will be retracted if cooperation is not as expected.
  - Codify and announce in public forum management plans for SNMP development.
  - Decide who is to chair SNMP development WG; Cerf, Braden, Gross, Lynch and Clark.
  - Publish network management decisions as RFC and in "Connexions".
- **IRI Research and Engineering Plan**
  - Compose a fifth project label dealing with application level for addition to IRI-TF report; Braden, Estrin and Leiner.
  - Write cover statement for IRI-TF report; Leiner, Estrin, Lantz and Postel.
  - IRI-TF report to be finalized and presented to the FRICC.
- **Inter-Organizational Research Internet Workshop**
  - Position paper is to be prepared prior to workshop by the FRICC.
- **IAB/IETF Support**
  - Dan Lynch to investigate possible vendor support for IETF chair.
  - Coalesce funding discussion into proposal for the FRICC; Clark, Cerf, Gross and Lynch. Postel and Leiner to review the report.
  - Organize IAB consistent attendance at IETF functions to increase visibility to vendors.
- **Internet Performance**
  - A subgroup of IAB/IETF is to develop a set of requirements for being an operational part of the Internet.
- **Next Meeting**
  - The next IAB meeting will be held July 12th and 13th. Bill Bostwick will check into Sante Fe as a possible site.