

Minutes of T11.1 HIPPI Ad Hoc Working Group  
January 13-14, 1998  
Mountain View, CA

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## 1. Opening remarks and introductions

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The Chairman, Don Tolmie of Los Alamos National Laboratory, opened this meeting and thanked Greg Chesson and SGI for hosting this meeting. This group is constituted as both the HIPPI Working Group under T11.1, and the HIPPI Networking Forum (HNF) - Technical Committee (TC).

Don lead a round of introductions. The list of attendees is at the end of these minutes.

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## 2. Review / modify the draft agenda

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Draft agendas were distributed via e-mail before the meeting and hard copies were distributed at the meeting. Don had added some late items and distributed revised copies at the meeting. Jean-Michel Pittet requested a specific time for a HIPPI-800 ARP presentation, and it was set at 11:00 on Wednesday. No other items were added, or changes made. These minutes reflect the approved agenda.

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## 3. Review minutes of previous meeting

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The minutes of the December 9-10, 1997, working meeting in Orlando were reviewed. No additions or corrections were made. Roger Ronald moved, and Jim Pinkerton seconded, to approve the December 9-10, 1997 working meeting minutes as written. Motion passed unanimously.

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## 4. Review old action items

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1. Everyone to review the HIPPI-800 Switch MIB and pass comments to Marck Doppke. (Carryover)
2. Von Welch to contact HIPPI-6400 MIB users and developers for comments on the current draft, and to prepare a presentation on the MIB for a future meeting. (Carryover)
3. Von Welch to look at developing a HIPPI-6400 host system MIB (for a NIC), to be done now as an annex of the present MIB with the possibility

of splitting it out as a separate document at a later date. (Carryover)

4. Everyone to review the HIPPI-6400 MIB. (Carryover)
5. Kevin Lahey, Jeff Young, Jean-Michel Pittet, and Greg Chesson to begin an IP and ARP over HIPPI-6400 RFC. (In process)
6. Jean-Michel Pittet to develop an RFC for ARP over HIPPI-800. (Done)
7. Jeff Young to check into the status of the HIPPI end-point MIB that had been started by Mark Kelley. (Carryover)
8. Greg Chesson to contact Bob Snively of Sun about material and format for an IEEE tutorial on HIPPI-6400 ULA usage, and the ULAs special to HIPPI-6400. (Carryover)
9. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular ST Operation was rejected. (Carryover)
10. Jeffrey Chung to develop state tables for inclusion as an ST annex. (In process)
11. Greg Chesson to send e-mail detailing reasons for not doing a queue for client/server applications, and suggesting how they could be done in ST. (In process)
12. Jerry Leitherer to continue work on the ST over Fibre Channel mapping with special attention as to whether Class 2 or Class 3 is appropriate, and if the FC TCP/IP profile should be used instead of FC-LE. (Done)
13. Jim Pinkerton to do a rewrite of ST Annex C. (Carryover)
14. Bob Willard to write up something on big/little endian issues for inclusion in the document. (Carryover)
15. Greg Chesson to collect text for a "folklore" annex in the document. (In process)
16. Greg Chesson to draft text describing how you differentiate duplicate operations from legal operations. (Carryover)
17. Jeff Young to evaluate the relative merits of the TCP and ISO checksums. (Overcome by events)

18. Jeff Young to investigate CLIP instead of LANE as the method for ST over ATM. (Done)
19. Don Tolmie to update ST Rev 1.3 with the changes agreed to at the December meeting. (Done)

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20. Michael McGowen to collect and tabulate everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments. (Carryover)

## **5. HIPPI-6400-PH (ref: Rev 2.1, December 2, 1997)**

### **5.1 Review SuMAC test results**

Bob Newhall reported that the SuMAC chip is running quite well. The SGI test board has four SuMACs interconnected for a variety of tests. The deskew logic has a bug that they are working around. (One way is to bypass the deskew logic and test the rest of the functionality. The other way is to set the deskew logic at a higher Clock rate and then back the Clock down to the normal frequency.) They longest working cable they have is 5 m long.

Roger Ronald reported that the testing at E-Systems and Harris was proceeding. They have one good cable between them, which they are shipping back and forth. A cable made with Madison Cable wires would not work – it didn't have shields over the individual wires.

Doug Johnescu of Berg described some of the problems that they had seen with the cables. A major problem occurred when the over-mold was cast over the wires attached to the connector's internal PC board. Evidently, the over-mold stressed the wires, breaking some, and ending up with some opens and shorts in the final cable. A related problem was that you could not re-work the terminations after the over-mold was added (the only solution was to cut off the connector and try again. Berg was starting to use a removable shell instead of the over-mold.

Another problem was a lack of Gore cable (400 m is scheduled for delivery to Berg on January 19, bulk shipments are not due until April). People expressed a concern about the relative size of the cable compared to the connector, and worried about cable reliability when the cable was flexed. Doug felt that the overall strain relief jacket would protect the cable adequately.

Hansel Collins suggested that for testing purposes Berg build a 40 m cable with 0 ohm wires replacing the equalizer components. Roger Ronald said that from the vendor's point of view it was most important that a 40 m cable be delivered to SGI since SGI had the best test setup.

Don Tolmie remarked that he had recently seen some Myrinet systems and was impressed with the ribbon cable used for short runs. Greg Chesson suggested that we actively investigate ribbon cable for short HIPPI-6400 links.

### **5.2 Electrical connector proposals**

At the December meeting Greg Chesson had described problems that SGI was having laying out the PC board to accept the connector. Part of the problem was that there was very little room between the pins, making routing difficult. SGI had been working with Berg to come up with an acceptable layout.

The original connector attached to the user's PC board with through-hole pins, in a 4-row staggered arrangement on 50 mil centers. Berg proposed an 8-row staggered arrangement that gave more room between pads for routing signal lines. SGI's evaluation of Berg's proposal was negative, with problems associated with longer traces (due to a deeper layout) and insufficient ground plane. A proposal to use the original 4-row arrangement with ball-grid assembly (BGA) was discussed and accepted. The BGAs allow the use of 12 mil vias (vs. 47 mil pads for through-hole mounting). The Berg people present would not speculate on a delivery date for BGA connectors.

It was noted that the present HIPPI-6400-PH document allowed the use of a BGA mounted connector. The possibility of starting over with a different connector was briefly discussed, but rejected.

Hansel noted that the current specification calls for 55 ohm board traces on the transmit signals, and 75 ohm traces on the receive signals. Achieving the 75 ohm traces has been difficult and Hansel suggested that we model the system with both the transmit and receive sides using 55 ohms. Roger Ronald took an action item to have Bill McCoy model the system with uniform 55 ohm traces and provide a judgement as to the distance and signal quality penalties associated with this scheme.

Greg Chesson had a long phone conversation with some Berg cable assembly people on Wednesday, and reported the results to the group. – Berg confirmed the January 19 date for 400 m of Gore cable, and bulk cable in April. They accepted the concept of including the equalizer capability on a 40 m test cable. They were aware of the BGA proposal and said that it would not affect their work. They were also interested in looking at ribbon cable and at a connector with loopback wiring. A poll of the HIPPI group suggested that about 100 loopback connectors would satisfy our known requirements now.

Sharing testing and simulation results via e-mail was encouraged.

### **5.3 Proposed document changes**

Don Tolmie requested a stake in the ground for the connector issue. Roger Ronald moved, and Don Tolmie seconded, that the Berg connector text and figures be retained in the document without change. Motion passed a company vote: 9 for, 0 opposed, and 0 abstentions. (Note - changing to BGA or a different mounting pattern does not require any changes in the document.)

No other changes to the document were suggested at this time.

### **5.4 Plan for forwarding**

HIPPI-6400-SC Rev 1.7 passed its T11 Letter Ballot on November 21 with a vote of 69 for, 0 opposed, and 15 not voting. Comments were received with two of the "for" votes. The comments were resolved and approved at the December meeting. At the December meeting we also voted to hold the document to resolve the connector issues and allow more SuMAC testing.

Based on the SuMAC testing, and the current connector discussions, it was felt that forwarding in February was very iffy; April was a more realistic date. The general consensus was that people much preferred having adequate testing and a solid document, rather than pushing the document forward and then having to withdraw it for corrections.

## **6. HIPPI-6400-SC (ref: Rev 1.9, January 5, 1998)**

### **6.1 Review changes**

Rev 1.9 had a few editorial changes. Namely, the text in clause 8 was modified to make it clear that the broadcast servers are connected by a direct HIPPI-6400 link, and to clean up some bullet punctuation on page 21. These changes were reviewed and accepted.

### **6.2 Plan for forwarding**

It was agreed that the document will be kept in step with HIPPI-6400-PH, and forwarded for first public review at the same time.

## **7. Scheduled Transfer (ref: Rev 1.4, December 23, 1997)**

### **Executive summary of ST work at this meeting:**

- Most of the document changes were accepted, and some more changes were made.
- Using the TCP checksum was accepted with major re-wording to 8.3.
- SGI's aliasing work led to:
  - lengthening the Transfer-id fields to 32 bits,
  - shuffling the fields within the header,
  - inclusion of text concerning parameters wrapping, and
  - inclusion of text in clause 9 describing the hierarchy of operations and parameters to be checked.
- The minimum buffer size of 256 bytes was reaffirmed.
- Using only the D2\_Area for HIPPI-FP mappings was reaffirmed.
- ST over ATM was reviewed, and a few changes made.
- ST over Fibre Channel was reviewed and some changes were made. Both ST over ATM, and ST over FC, will be included in the next revision.
- A proposal for the state table format was reviewed and accepted.

### **7.1 Review document changes**

The changes made to create Rev 1.4 were reviewed in detail.

The definition changes for Data operation, Memory Index, and Request for Comment, were accepted as written. The definition for Opaque data was modified by changing "...the Scheduled Header..." to "...a Data operation's Schedule Header...". It was agreed to add acronyms for ATM, FC, and VC.

In the second paragraph following Figure 3, "(with Op = Data)" and "(with Op ≠ Data)" were added following "...Schedule Header...". A sentence reading "If a Control operation is not a legal length then it shall be discarded.". The other changes in 4.2, and figure 5, were accepted as written.

In 5.1 and 6.1, changed "...a checksum..." to "...an optional checksum...", and changed "...included..." to "...mentioned further..." twice.

In 5.2.5, changed "...size of a Block..." to "...number of bytes in a Block..." since there had been no mention of the units before. The maximum Block size was changed from 63 to 48, i.e.,  $2^{32}$  (number of unique B\_num's) times  $2^{16}$  (number of unique STU\_num's), to avoid aliasing.

In the last paragraph of 5.2.6, the second sentence about a value of x'FFFF' was removed as being redundant with the previous paragraph.

A global change was made for the CTS\_req parameter, i.e., changed "...number of Blocks..." to "...number of outstanding Blocks..." and changed "...continuously exposed..." to "...to see exposed at any given time...".

A global change was made in the Request\_Answer operations flags, namely, changed "...has been accepted but the subsequent xxx operation may be delayed..." to "...has been recognized, final action is pending...". This change was made to allow sending another Request\_Answer at a later time to reject the original operation.

In 6.1.4.3, under Get, changed "...to specify..." to "...it specifies...". The same change was made in 6.1.4.4 under Fetch. Also in 6.1.4.4, added a new second sentence reading "Since the length is fixed at 64 bits, not T\_len parameter is used.". This allowed us to specify \* for Op\_len in the FetchOp and delete the check for a legal length.

In 6.2.1, the identifiers were all changed from 16 to 32 bits in length. This was done to achieve Jim Pinkerton's aliasing goals.

We considered changing the text in 6.2.2, specifying that you qualify an operation on the -id first and then check Mx, but realized that it could be done in either way and we didn't want to constrain implementations.

In 6.2.3, deleted "...and FetchOp..." twice in the last paragraph since we replaced the T\_len parameter in FetchOp's with \*.

In 6.2.6, we agreed to add text to specify that STU\_num shall not wrap within a Block. This is also to prevent aliasing.

In 6.2.9, deleted the last sentence about the Opaque data not being included in the calculations (not needed since the Opaque data is in the Scheduled Header).

In 6.2.11, second paragraph, changed "...shall the..." to "...shall be the...".

In 6.3, changed the last sentence of the second paragraph to text supplied by Ian Philp (to better qualify figure 11). Towards the end of 6.3, changed "Max\_STU size ≤..." to "Maximum STU size ≤..." in two places.

In 8.2, under "Interrupt", changed the note from "...delivered silently" to "...delivered silently and do not consume a Slot (see 5.2.6)".

## **7.2 Checksum algorithm**

On speculation, Don had included the IP checksum algorithm in clause 8.3. At the December meeting Jeff Young had suggested using the ISO checksum (also known as the Fletcher checksum) since it additionally checked for out-of-order data. Greg Chesson stated that the IP checksum was preferable to the Fletcher checksum because: (1) Fletcher is tough when you have to recalculate the checksum, e.g., in a router, (2) a parallel implementation of Fletcher would be difficult, (3) it isn't as strong as a CRC and CRC is easier to implement in parallel, and (4) IP checksum hardware was already available in many places so we could easily re-use it. The committee agreed, and we will use the IP checksum.

The text in 8.3 was reviewed, and changes suggested. Jerry Leitherer and Gordon Boyd drafted some text and gave it to Don on disk. Jim Pinkerton gave Don a copy of RFC 1071 containing the

checksum algorithm. Don will use these resources to draft text for the next revision.

### **7.3 Duplicate operation detection and actions**

Greg Chesson had an action item to draft something for this in clause 10.3. Jim Pinkerton presented two drafts describing changes being proposed by SGI to avoid aliasing. The first requirement was that the Transfer-id's needed to be expanded from 16 to 32 bits (to support WAN distances, possible loops, and WAN times of 120 seconds).

To fit the expanded parameters in the present 40-byte Schedule Header, the Op\_len field was deleted, the size of the Opaque data was reduced from 48 to 32 bits, and the Get's and FetchOp's R-Mx parameter discarded. Don questioned deleting the R-Mx parameter, and the answer was that it was felt to be excess since it was a Data Source's parameter and could be derived from the G-id and F-id parameter by the Data Source. Other fields and parameters were shuffled, and now the parameters are more consistent, e.g., the -Mx parameters are in the B\_id field for both assignment and use (where before they were assigned in the Param field and used in the Sync field. (See Jim's proposal for the gory details of all the parameter moves.) The group accepted Jim's "ST notes for WG meeting 1/13/98" proposal.

Jim's next step was to avoid aliasing by making sure that a parameter could not wrap within a sequence, or within the time the sequence could occur again. Hence, the requirement that STU\_num shall not wrap within a Block was added to 6.2.6. Similar notations will be added to the Transfer identifiers in 6.2.1. Jim divided the ST messages into a hierarchy of Connection operations, Transfer operations, Block operations, and STU operations. A fallout was that the maximum Block size was scaled down from  $2^{63}$  bytes to  $2^{48}$  bytes, i.e.,  $2^{32}$  (number of unique B\_num's) times  $2^{16}$  (number of unique STU\_num's), to avoid aliasing.

It was agreed that the text describing the anti-aliasing concept, and hierarchy, would be added to clause 9. Don will take a cut at the text and have Jim review it before putting it out for general consumption.

### **7.4 Error processing detailed review and error reason codes**

Don Tolmie expressed concern over the current clause 10 that defines the error processing. He felt that lots of changes have been made in the document and the error processing clause may not have kept up. Also, Greg Chesson and Jeffrey Chung had an action item to consider "reason codes" to explain why a particular ST operation was rejected. It was felt that detailed "reason codes" would not be practical – there are too many ways to check things that would be different between implementations, e.g., do you check Transfer-id or Mx first? If general cases pop up, then we will consider adding them.

The changes to clause 10 were reviewed. In the first paragraph, it was agreed to add the sentence reading "The scheme for logging multiple errors in a single operation is implementation dependent."

In 10.1, the end of the first paragraph was changed from "...include:" to "...may include, or be the sum of:". In the paragraph following the bullets, changed "... (i.e., Data operations)..." to "... (i.e., Data operations associated with Read and Write sequences)..." In the last paragraph, changed "...shall be re-tried..." to "...may be re-tried..."

In Table 8, deleted the word "mandatory" from the title.

The various actions upon receiving specific duplicate operations were discussed. Don volunteered to take a first cut at a listing of these actions, and Greg Chesson volunteered to help.

The new paragraph in 10.4 was replaced with "If an erroneous Cksum is detected (see 8.3) then the operation shall be discarded and a Cksum\_Error shall be logged."

Gordon noted that 10.7.2 was missing the word "not", i.e., "does match" should be changed to "does not match".

In 10.7.6 the maximum Blocksize was changed from 63 to 48 as discussed earlier. The open issue was removed confirming that "shall" was the proper word.

### **7.5 Minimum buffer size of 256 bytes**

In an e-mail, Ian Philp of Los Alamos questioned the need for a minimum buffer size of 256 bytes. He asked if there any good reasons for including this restriction as part of the Scheduled Transfer standard? For example:

- Are there any architectural reasons that buffers must be 256 bytes?
- If buffers were allowed to be smaller, would that in any way affect the efficiency of the implementation even when it happens to be using large buffers?
- DMA efficiency is increased with larger buffers, but should the standard mandate that users/implementers use ST in the most efficient way? How small might buffers actually be before DMA performance gets so bad that copying the data into larger buffers first is better?

If there are no implementation reasons for making buffer sizes 256 bytes then why should we restrict an application that wants to transfer smaller buffers (as might happen if a user's data is scattered in small non-contiguous portions of memory)? Ian noted that VIA has no such restrictions on its scatter/gather buffer pointer lists, so would someone have trouble providing an efficient and portable implementation of the VIA API over ST?

As far as scatter-gather was concerned, Greg Chesson and Jim Pinkerton felt that it would be much more efficient to do the gather in software, send it as one unit, and then scatter via software or firmware on the receiving side. I.e., using ST buffers was not efficient for these functions.

The conclusion was that the present size of 256 bytes was as low as people would like to go, and some argued that it should even be larger.

### **7.6 Lack of a length parameter in ST Header**

Robert Hyerle had raised this question when he and Don were working on ST over ATM. The group felt that there was no problem as long as a SNAP header was included for media that did not provide a native length field. It was noted that none of the current mappings have any problems.

### **7.7 Use of D1\_Area in HIPPI-FP mapping**

Concern had been expressed by Tom Gilbert of Harris, and someone from IBM-Austin, over not using the HIPPI-FP D1\_Area for the headers when mapping ST over HIPPI-FP. They said that implementations expected headers in the D1\_Area, directed to a particular memory area. Likewise, the D2\_Area was directed to the user's memory area. Presently in ST annex A.2, all of the headers, and user data, are in the D2\_Area (based on the concept that it will be easier to map to other protocols by keeping the headers and data together).

We discussed this issue one more time in an attempt to put it to bed. Sentiments were expressed both ways, including the fact that the present HIPPI-LE document for encapsulating IP used the D1\_Area. Probably the comment that carried the most weight was that John Renwick felt that having everything in D2 was preferable, and since he had written the RFC using the D1\_Area, i.e., if someone who had been intimately involved felt this way, then it was for good reason. Hence, the agreement to put everything in the D2\_Area was reconfirmed and the ST document will remain as is.

### **7.8 ST over ATM as the lower layer**

Robert Hyerle of Hewlett-Packard had provided ST over ATM, Rev 2.0, dated September 24, 1997 previously, but had not been available to present it at one of our meetings. Robert's proposal was based on using the ATM Forum's LAN Emulation (LANE) specification as the basis for the mapping. At the December meeting we reviewed a draft that Don Tolmie had done based on Robert's proposal. It supported three different variants from the ATM LANE (LAN Emulation) document as proposed by Robert. The variants are DIX (Digital/Intel/Xerox) Ethernet, 802.3, and 802.5. The proposal was met with mixed feelings, and Jeff Young took an action item to look at CLIP as an alternative.

Don Tolmie provided an updated annex A.4 with the changes agreed to at the December meeting. Don also stated that his network guru at Los Alamos felt that DIX was unnecessary, and that support for Token Rings, while never large, was withering in relation to Ethernet (and Fast Ethernet may be what causes Token Ring's final demise). Robert Hyerle provided his rationale for choosing LANE (an e-mail message to Jeff Young which Don made available on

the web page) – this was reviewed, and the group accepted the recommendation to use LANE.

Unfortunately, neither Jeff Young or Robert Hyerle were present at this meeting, but had provided some input via e-mail. After some discussion, it was agreed to continue using LANE for compatibility with the user community, and to include all three mappings for completeness. Michael McGowen suggested, and everyone agreed, that the ST over Ethernet figure should have the 16-bit offset at the beginning of the figure so that it would line up on 32-bit boundaries for the LLC/SNAP Header and beyond.

### **7.9 ST over Fibre Channel as the lower layer**

Jerry Leitherer of Genroco provided ST over Fibre Channel, Rev 2.3, dated January 9, 1998. There had previously been questions about the use of Fibre Channel Class 2 or Class 3. Class 1 had been deemed not appropriate since it could not multiplex. The Rev 2.3 proposal was still based on FC-LE, but allowed using FC Classes 1 and 3. Jerry stated that he had omitted Class 2 due to possible poorer performance. After some discussion, it was decided to include Class 2 (as well as Classes 1 and 3), to allow the widest usage in Fiber Channel environments.

Originally Jerry had restricted STUs to a single FC Frame based on the possibility of Class 3 out-of-order problems. In this revision he had changed to allow multiple Frames (with a note that Class 3 environments may want to restrict to single Frame STUs), and this was accepted. Other less major changes were discussed and agreed to. Jerry took an action item to update his proposal and provide a clean copy to Don for inclusion in the next ST revision.

### **7.10 State tables**

Jeffrey Chung had an action item to provide state tables for an informative annex, but was not present at this meeting. Jim Pinkerton presented some work that had been done on the Connection state table (based on some work done in the committee about a year ago). He presented it as work in progress and asked for comments on its format and content.

Don Tolmie felt that including text to describe each state was desirable as it would give a new reader insight into how the nits of ST really worked. Jim,

and others, felt that including the text was a lot of work, would consume a lot of pages, and was essentially giving away the candy store (an implementer that truly wanted the details could figure them out from the raw tables). It was agreed that raw tables, without text describing the individual states, should be included in the document. The group realized that checking the state tables for completeness and correctness would be a major task for the group.

### **7.11 Annex C draft**

The previous annex C had been removed as being horribly out of date, and Jim Pinkerton previously took an action item to draft a new annex C based on some of his work. Nothing new was presented at this meeting.

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## **8. Other HIPPI items**

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### **8.1 ARP over HIPPI-800**

Jean-Michel Pittet presented a proposal and asked for comments. He noted that the using a variable "hln" hardware address length parameter would make things easier for the different lower layers, e.g., 12-bit for HIPPI-800, 24-bit for Fibre Channel, and 48-bit for Ethernet. He also discussed bridging/translating issues (e.g., for Ethernet), and broadcast ARP server issues. Jean-Michel agreed to update his proposal and provide a copy to Don for posting on the web. At the next meeting he said he would be ready to discuss timeouts.

### **8.2 HIPPI end-point MIB**

Jeff Young, via e-mail, said that he had not been able to find Mark Kelley's MIB, but would continue looking.

### **8.3 HIPPI switch MIB**

Marck Doppke of Essential Communications has a draft document out for comment. Marck was not at this meeting and nothing new was reported.

### **8.4 HIPPI-6400 MIB**

Von Welch of NCSA has a draft document out for comment. Von was not at this meeting and nothing new was reported. Don raised the question of if, when, and how, we were going to publish the MIBs.

It was noted that Von had done the MIB based on frustration with configuring the HIPPI network at Supercomputer shows. Someone offered the opinion that Von's MIB may be overkill for many implementations as they would do things in a more vendor-specific manner, and a subset that addressed the interoperability issues might be more acceptable.

### **8.5 HIPPI-6400 ARP and IP RFC**

Jean-Michel said that he is also working on this document, and it would essentially be a cut-and-paste of the ARP over HIPPI-6400 document. He is concentrating on the -6400 document since it is the harder one; the -800 version should be a subset. He hopes to be able to take both documents to the IETF meeting later in the year.

### **8.6 IEEE Tutorial for HIPPI-6400 ULA usage**

Greg Chesson is drafting an IEEE Tutorial for HIPPI-6400 ULA use. Nothing new was reported at this meeting.

## **9. Future meeting schedule**

### **9.1 Plenary week, February 10-11, San Diego, CA**

The next working meeting will be at the Hyatt Islandia (Mission Bay), 1441 Quivira Road, San Diego, CA 92109, phone (619) 224-1234. Skip Jones and QLogic are the host. The group name for reservations is American National Standards Institute and the group room rate is \$123 plus 10.5% tax. The reservation cutoff date is January 9, 1998. (See the meeting announcement on the web page at <http://www.cic-5.lanl.gov/~det/> for further details.)

Tuesday - February 10 :

9 AM - 6 PM : HIPPI working meeting

6 PM - 9 PM : HIPPI-6400 Optical

Wednesday - February 11 :

9 AM - 6 PM : HIPPI working meeting

6 PM - 8 PM : T11.1 Plenary

### **9.2 Interim meeting, March 10-12, Minneapolis, MN**

The next interim working meeting will be hosted by Jeff Young and Cray Research in Minneapolis/St. Paul, MN. The meeting will be held at the Cray

facility, and Jeff has set up a block of rooms at the Hampton Inn. See the HIPPI Standards Activities web page at [www.cic-5.lanl.gov/~det/](http://www.cic-5.lanl.gov/~det/) for further details and travel directions.

We had originally planned for a 3-day meeting, but with the current work load have cancelled the third day. The meetings now are:

Tuesday - March 10 : 2 PM - 9 PM

Wednesday - March 11 : 8 AM - 9 PM

### **9.3 Future meeting dates and locations**

The T11.1 ( i.e., HIPPI), Plenary meeting will be on Wednesday evening of the T11 Plenary week, following the HIPPI working meetings.

The 1998 schedule is firm. Note that T11 schedules the plenary meetings. Hopefully HIPPI-6400 will be far enough along that we will not continue to need interim working meetings after May; the May date was firmed up since we now see the need. Recent additions and changes are underlined and bold.

#### **1998 -**

Apr 21-22	Plenary	Palm Springs, CA	Brocade
May 12-13	Interim	Mt. View, CA	SGI
Jun 9-10	Plenary	St. Petersburg Beach, FL	AMP
Aug 11-12	Plenary	Portsmouth, UK	Xyratex
Oct 6-7	Plenary	Ft. Lauderdale, FL	Adaptec
Dec 14-18	Plenary	Tucson	FSI

All of the 1999 schedule is new, and just includes the Plenary weeks; no interim working meetings are scheduled yet. Meeting locations and hosts marked with (?) are tentative at this time. The meetings in bold underline without a (?) have been firmed up. Note that the HIPPI and T11.1 meeting days are not specified; they will be somewhere within the Plenary week.

#### **1999 -**

Feb 8-12	Plenary	San Diego, CA	Qlogic
Apr 5-9	Plenary	Palm Springs, CA	Brocade
Jun 7-11	Plenary	Minneapolis, MN (?)	Ancor
Aug 2-6	Plenary	Rochester, MN (?)	ENDL
Oct 4-8	Plenary	Ft. Lauderdale, FL	Adaptec
Dec 6-10	Plenary	Lake Tahoe, CA (?)	Solution



## **12. Review action items**

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*(The action items are grouped by project or category to hopefully make them easier to find.)*

1. Everyone to review the HIPPI-800 Switch MIB and pass comments to Marck Doppke.
  2. Von Welch to contact HIPPI-6400 MIB users and developers for comments on the current draft, and to prepare a presentation on the MIB for a future meeting.
  3. Von Welch to look at developing a HIPPI-6400 host system MIB (for a NIC), to be done now as an annex of the present MIB with the possibility of splitting it out as a separate document at a later date.
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8. Greg Chesson to contact Bob Snively of Sun about material and format for an IEEE tutorial on HIPPI-6400 ULA usage, and the ULAs special to HIPPI-6400.
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9. Doug Johnescu to determine the stack-up of the BGA version of the Berg connector and post the results in an e-mail.
  10. Roger Ronald to have Bill McCoy investigate the possibilities of using 55 ohm traces on the received signal lines.
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11. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular ST Operation was rejected.
  12. Jeffrey Chung to develop state tables for inclusion as an ST annex.
  13. Greg Chesson to send e-mail detailing reasons for not doing a queue for client/server applications, and suggesting how they could be done in ST.
  14. Jim Pinkerton to do a rewrite of ST Annex C.
  15. Bob Willard to write up something on big/little endian issues for inclusion in the document.

16. Greg Chesson to collect text for a "folklore" annex in the document.
  17. Greg Chesson to draft text describing how you differentiate duplicate operations from legal operations.
  18. Don Tolmie to extract information from Jim Pinkerton's Aliasing presentations of 1/98 for inclusion in ST clause 9. Jim should review the material for correctness before posting the next revision on the web.
  19. Jerry Leitherer to update his ST over FC document with the changes agreed to at the January meeting, and forward a copy to Don for inclusion in the next ST revision.
  20. Don Tolmie to update ST Rev 1.4 with the changes agreed to at the January meeting.
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21. Michael McGowen to collect and tabulate everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments.

## **13. Adjournment**

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The meeting adjourned at 7 PM on January 14.

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**Attendance**

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