

Minutes of T11.1 HIPPI Ad Hoc Working Group
June 9-10, 1998
St. Petersburg Beach, FL

Approved minutes with corrections identified at the July meeting.

1. Opening remarks and introductions

The Chairman, Don Tolmie of Los Alamos National Laboratory, opened this at 9 AM and thanked Chuck Brill and AMP 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. Don volunteered to produce the minutes.

2. Review / modify the draft agenda

Draft agendas were distributed via e-mail before the meeting and hard copies were distributed at the meeting. At the meeting, the HIPPI-6400-SC items were shuffled to:

- 6.1 Public Review status
- 6.2 General directions
- 6.3 Document review

Additional items were added under Scheduled Transfer:

- 7.5 Tiling
- 7.6 FetchOp
- 7.7 Connection management bits
- 7.8 FSMs for Put, Get, and FetchOp

9.7 was added for ST-API discussions. These minutes reflect the approved agenda.

3. Review minutes of previous meeting

The minutes of the May 12-13, 1998, working meeting in Mountain View, CA, were reviewed. Roger Ronald moved, and Jeff Young seconded, to approve the May 12-13, 1998 working meeting minutes as written. Motion passed unanimously.

4. Review old action items

The action items from the May meeting were reviewed.

1. 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)
 2. 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)
 3. Everyone to review the HIPPI-6400 MIB. (Carryover)
 4. Jean-Michel Pittet to update "ARP and IP Broadcast over HIPPI-800" Rev 00 with the changes agreed to at the April and May meetings. (Done)
 5. Jean-Michel Pittet to request another HIPPI-800 Hardware Type from IANA. (Carryover)
 6. Jean-Michel Pittet to forward the request for an IETF Working Group to the IETF. (Carryover)
 7. Jean-Michel Pittet to generate an "ARP and IP over HIPPI-6400" document. (Carryover)
 8. Don Tolmie to issue an e-mail notice that the ARP portion of the HIPPI-LE standard (ANSI X3.218-1993) will be deleted unless someone replies that it is used in an implementation. (Done)
 9. Don Tolmie to draft a Project Proposal for a revision of ANSI X3.218 (HIPPI-LE). (Done)
 10. John Gibbon to talk to Marck Doppke about processing the HIPPI-800 switch MIB through the IETF. (Carryover)
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11. Greg Chesson to draft an IEEE tutorial on HIPPI-6400 ULA usage and the ULAs special to HIPPI-6400. (Carryover)
 12. Roger Ronald and Greg Chesson to investigate whether the jitter problems identified with HIPPI-6400-OPT short-wavelength optics also apply to HIPPI-6400 copper. (Carryover)

13. Roger Ronald to submit a public review comment from T11.1 against HIPPI-6400-PH. (Done)
 14. Roger Ronald to submit a public review comment from T11.1 against HIPPI-6400-SC. (Done)
 15. Michael McGowen to detail methods for topology discovery and alternate path usage in environments containing multiple HIPPI-6400-SC switches. (Overcome by events)
 16. Vasu Kengeri to detail bridge behavior with the HIPPI-800 ARP. (Done)
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17. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular ST Operation was rejected. (Carryover)
 18. 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. (Carryover)
 19. Jim Pinkerton to do a rewrite of ST original Annex C (now annex D). (Overcome by events)
 20. Bob Willard to write up something on big/little endian issues for inclusion in the document. Craig Warner to check on the status of this effort. (Carryover Bob's part)
 21. Greg Chesson to collect text for a "folklore" annex in the document. (In process)
 22. Greg Chesson to draft text describing how you differentiate duplicate operations from legal operations. (In process)
 23. Jim Pinkerton to draft a timestamp option for the optional payload for inclusion in the next ST revision. (Carryover)
 24. Bob Willard to draft text for ST 6.1.4.4 on FetchOp collision and lockout cases. Craig Warner to check on the status of this effort. (Carryover Bob's part)
 25. Craig Warner to provide FSM's for the operations associated with persistent memory. (Done)
 26. Don Tolmie to update the ST over Fibre Channel annex in ST Rev 1.8. (Carryover)
 27. Don Tolmie to update ST Rev 1.8 with the changes agreed to at the May meeting. (Done)
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28. Michael McGowen to collect, tabulate, and document everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments. (Carryover)
 29. Greg Chesson to draft the Need and Scope clauses for the API for ST Project Proposal. (Done)
 30. Don Tolmie to complete the draft of a Project Proposal for an API for ST. (Done)
 31. Greg Chesson to identify a Technical Editor(s) for the proposed API for ST standard. (Done)
 32. Barney Maccabe to provide meeting information for the July 20-21, 1998 meeting in Albuquerque. (Done)

5. HIPPI-6400-PH (ref: Rev 2.2a, March 31, 1998)

5.1 SuMAC and cable test results

Jim Pinkerton reported that Rev 1.1 SuMAC chips have been delivered to SGI, and some have been distributed to Harris and Raytheon. Tom Gilbert of Harris reported that he got two of the new SuMACs running in his lab on Friday afternoon before this meeting, connected with a 10 m cable. Tom said that it ran error-free for a 20-hour test with a fixed data pattern, and 16 hours with no CRC errors and random data (wasn't able to check the random data on reception, could only check for CRC errors). SGI and Raytheon should power their implementations up the following week.

Roger Ronald reported that Gore determined that the 40 meter cables that had been giving people trouble had been assembled with the equalization network at the receiver instead of at the transmitter. It was felt that this was the most likely cause of previous errors. Berg is making a new PC card for the connector to put the equalizer at the right end.

Herb Van Deusen of W.L. Gore presented the results of their cable testing. They confirmed their earlier numbers and then went from there. The 40 m assembled cable that had been giving trouble at SGI showed a very poor eye pattern, even when driven from the end with the equalizer. Gore determined that the cable assembly process increased the high-frequency loss over that of a discrete quad. Adding another equalizer in series with the 40 m cable improved the eye pattern significantly. The equalizer values used in the cable assembly were unknown since the equalizer was potted in the connector backshell. Gore now recommends slightly

different equalizer values, e.g., 200 ohm and 18 pF. See the HIPPI Standards Activities web page for a copy of Herb's presentation, and material from August 1997 that is a reference point.

The bottom line is that everything is looking up! The SuMAC is running at full speed and the deskew circuitry is working. The cable tests indicate that 40 m cables should work OK if we can get the right equalizer components at the right end. We should have the testing done by the August meeting.

Jim Pinkerton said that SGI is duplicating the Gore test setup to have a common reference point. The Gore setup only tests a single bit. Another SGI test setup will test multiple bits in parallel (using SuMACs). Ed Cady indicated that three other vendors (not in the HIPPI-6400 community) were interested in our physical layer, and maybe even the SuMAC.

Bob Willard asked about a sharper exit angle for the cable to reduce the room needed in the back of a cabinet. Ed noted that Berg presently offers a 45° exit, and offered to work with DEC, e.g., a sample connector.

Berg is working on a modification to the connector to reduce the EMI leakage. It was felt that any changes they make would not affect the standard.

5.2 Jitter considerations

At the April, 1998, HIPPI-6400 Optical meeting in Palm Springs, the jitter associated with short-wavelength optics was identified as a problem. A concerted effort is going to be made to resolve these jitter questions. At the April meeting Roger Ronald also questioned whether we had similar jitter problems with the HIPPI-6400 copper interface. Roger Ronald and Greg Chesson have an action item to try to see if the jitter problems identified by Steve Joiner of HP affect copper implementations in a similar fashion. Nothing new was reported at this meeting.

5.3 Public Review status

The public review period closed June 9. The only comment came from T11.1, and was intended to 'pause' the processing process rather than require another public review while we completed testing with 40 m cables. The public review comment

submitted was:

HIPPI-6400-PH specifies a high speed electrical interface for communication over a relatively long distance (40 meters maximum). The signaling technology used is new and innovative. Without testing at the full distance, there is no assurance that the goals of the standard are achievable. Such testing has not been completed. Therefore, allowing the standard to go forward at this time is premature and might result in publishing a standard that made exaggerated claims.

It was agreed that we should have the testing done by the August meeting so we can take the appropriate action then, i.e., forward without changes or accept document changes.

6. HIPPI-6400-SC (reference Rev 1.9, January 5, 1998)

6.1 Public review status

Like HIPPI-6400-PH, the public review period closed June 9. The only comment came from T11.1. It was felt that HIPPI-6400-SC would require technical changes, and hence a second public review. The public review comment submitted was:

Methods proposed in HIPPI-6400-SC are inadequate to prevent broadcast loops. Approval of the current document would result in a standard that would not properly support multi-switch broadcast. This would make HIPPI-6400 ineffective in supporting some higher level networking protocols.

The broadcast function requires a switch to identify the inbound port a Message arrives upon. This capability is needed, but unstated. For a broadcast server, the same information on inbound port number is needed and there is no defined way for the information to pass from the switch to the broadcast server.

6.2 General directions

At previous meeting the issue of how to do auto-configuration of multiple switches was debated. We currently specify IEEE 802.1d, which results in a spanning tree and avoids loops. Missing were ways to utilize redundant links and shortest paths. Other protocols, e.g., RIP and OSPF, may supply these capabilities but have not been fully investigated.

After considerable discussion it was agreed that the present document should be modified to become a base document that conforms to present implementations (allowing vendors to claim conformance to a standard). This would be achieved by removing parts of the present document. The auto-configuration would then be contained in a separate document, or a revision to HIPPI-6400-SC. This meets our near term goals of having a standard in hand soon, and allows sufficient time to develop the auto-configuration methods.

6.3 Document review

Roger Ronald provided two revisions of the document for the meeting. Rev 2.0 included Jeff Young's comments, and Rev 2.1 also removed the broadcast server. The changes were accepted with a few minor changes. Roger took an action item to modify the document to match current HIPPI-6400 switch vendor's practices, with the intent to get it ready to forward at the August T11.1 Plenary.

7. Scheduled Transfer (reference Rev 1.9)

7.1 Review general document changes

The changes were mostly accepted as written with additional changes in some places. Figure D.3 was missing some parts (probably a PDF problem), and it was agreed that STU_num should be added to the validation parameters. Greg Chesson had pointed out over e-mail that Table 8, on page 38, should include the Request_Memory_Region operation and its responses. This was accepted for inclusion in the next revision. No other major blunders were discovered.

7.2 Optional payload changes

The new "Linear Address Base" in B.2.3 was reviewed. It was agreed to change the name from "Virtual Address" to "Linear address base" in table B.1. The last part of the second paragraph of B.2.3 will be changed to the same format as in clause 8 on page 30.

It was agreed that "Opcode" and "Option-data" should not be capitalized. Some other editorial changes were also made. Jim Pinkerton did not have

a timestamp option available, so that is an ongoing action item.

7.3 Annex D.5, Transfer example

Don had drafted this example based on the first example in the original Annex C. The text and table were reviewed and some correction made, e.g., changed x'2000' to x'D' for note 19, and x'2000' to x'800' for note 43, in table D.1.

7.4 Short data message flow control

Ian Philp expressed some concern over the potential overhead involved with persistent memory operations. He proposed an addressing scheme that essentially created a circular buffer that multiple hosts could write into. He felt that without this ability, large amounts of memory would need to be allocated for each host, and with lots of hosts this was intractable.

Other people did not share Ian's concern, saying that they would use host-based aggregation at the Source, or a FIFO at the Destination NIC, to solve the problem. It was agreed that the document would not change as a result of this concern.

7.5 Tiling

Ian Philp questioned our intent for Offset values in intermediate Blocks. He pointed out that while we may have had the intent to start intermediate Blocks with Offset = 0, it is not explicitly stated in the document. It was pointed out that allowing non-zero Offsets would allow a coarse receive-scatter capability. It was agreed that we should tighten up the Offset specification, even though it eliminated the receive-scatter capability (thought to be only marginally useful). It was also agreed that Offset should have a byte granularity. Ian took an action item to draft text for the next revision.

7.6 FetchOp

Bob Willard raised a concern that back-to-back Puts, Gets, or FetchOps could give ambiguous results if they aren't delivered to the ULP in the proper order. After some discussion it was agreed to add wording something like "The Responder shall expose the ULP data in Put sequences to the ULP in the same order as the Put sequences are received by the Responder." in each of the Put, Get, and FetchOp sections.

7.7 Connection management bits

Jim Pinkerton proposed using the D bits in the Flags field during a Virtual Connection setup to indicate whether the underlying physical layer(s) guaranteed in-order and non-duplicated messages. Jim proposed that intermediate nodes could adjust the bits, much like the Max_STU parameter. For example, routers would indicate out-of-order is possible. Problems were pointed out with this proposal, and it was agreed that it would not be included in the document.

7.8 FSMs for Put, Get, and FetchOp

Craig Warner presented draft finite state machines (FSMs) for the persistent memory operations. Some review was done, but not in great detail. Jim Pinkerton reviewed it off-line and passed some suggestions to Craig. For example, delete the FSMs that have only a single state. Jim requested that common error cases be included, e.g., when a FetchOp_Complete is lost. Words should also be added about when the FSMs are instantiated. Craig took an action item to update his draft.

8. HIPPI-LE (reversion Rev 3.4)

At the May meeting it was pointed out the "ARP and IP Broadcast over HIPPI-800" RFC was superceding the ARP capability in HIPPI-LE. Since we had to revise, or reaffirm, or withdraw, HIPPI-LE anyway due to its sunset date, it was felt that now was an appropriate time to remove the ARP text to avoid user confusion over which ARP method they should use.

Don had put out an e-mail notice asking for input from anyone who had implemented the ARP features of HIPPI-LE since we did not want to invalidate any implementations. There were no responses, and no one at the meeting knew of any cases either.

Rather than review the HIPPI-LE document at the meeting, Jean-Michel Pittet took an action item to identify to Don Tolmie the text that should be removed. Don took an action item to modify the document.

9. Other HIPPI items

9.1 ARP and IP Broadcast over HIPPI-800

9.1.1 IETF processing status

Jean-Michel Pittet reported that he is delaying applying to the IETF for a Working Group until the e-mail reflector archive capability is resolved. The revised "ARP and IP Broadcast over HIPPI-800" Internet Draft will not be submitted to the IETF until we have reviewed the latest changes.

9.1.2 Document review

The initial document review was completed at the May meeting, with lots of changes suggested. Jean-Michel presented an updated document, Rev 00, dated June 1998, which was reviewed at this meeting. (The revision number will change when it is submitted to IETF.) The document review started at clause 5. Most of the suggested changes made at this meeting were editorial in nature. The review stopped when Jean-Michel had to run for his plane. Jean-Michel requested that people forward any other suggested changes to him for the next revision.

9.2 HIPPI end-point MIB

Don has a copy of the 1995 document which he put on his web page. It is an Internet Draft by John Renwick that expired in March 1996, and has been removed from the IETF Internet Draft repositories. If we want to pursue this MIB further then we need a champion for it. Nothing new at this meeting.

9.3 HIPPI switch MIB

Marck Doppke of Essential Communications has a draft document out for comment. John Gibbon said that this HIPPI switch MIB should be a product soon. Nothing new at this meeting.

9.4 HIPPI-6400 MIB

Von Welch of NCSA has a draft document, based on HIPPI-6400-PH Rev 1.4, out for comment. Von was not at this meeting and nothing new was reported.

9.5 HIPPI-6400 ARP and IP RFC

Jean-Michel Pittet said that the HIPPI-6400 ARP and IP RFC would essentially be a cut-and-paste of the

ARP over HIPPI-800 document. He is concentrating on the -800 document now since it is the harder one; the -6400 version should be a subset.

9.6 Tutorial for HIPPI-6400 ULA use

Greg Chesson has obtained the format material from Bob Snively of Sun. Drafting of the actual text is pending.

9.7 Scheduled Transfer - API

Jim Pinkerton presented hand-written slides outlining his suggested approach for a "Scheduled Transfer - Application Programming Interface Mappings (ST-API)" standard. Don's electronic rendition of Jim's slides is on the HIPPI Standards Activities web page.

In summary, Jim proposed mappings to MPI, VIA, Sockets, and Winsock. An API may be developed for ST in the process of creating the mappings (i.e., the sum of all of the mappings), but an ST-API is not the main goal of this project. Of special note is that QOS is a non-goal.

The Project Proposal that Don prepared (based on input from Greg Chesson) was reviewed. A minor change was made in the Needs section to say that the result would be "portable", and the completion date was changed from August 1999 to December 1999. This project proposal will be voted on at the T11.1 Plenary following this meeting.

10. Future meeting schedule

10.1 Interim meeting, July 20-21, 1998

The next interim working meeting will be hosted by Barney Maccabe at the University of New Mexico in Albuquerque. Several hotels close to the airport were identified. (See the meeting announcement on the web page at <http://www.cic-5.lanl.gov/~det/> for further details.)

Monday - July 20 : 1 PM - 9 PM
Tuesday - July 21 : 8 AM - 9 PM

10.2 Plenary week, June 9-10, August 11-12, Portsmouth, UK

The August Plenary week meetings will be on Wednesday, August 11, from 6 PM to 8 PM. The location is the Forte Posthouse, Pembroke Road, Portsmouth, Hampshire, UK P01 2TA, phone 01705 827651, Fax 01705 756715. Paul Levin and Xyratex are the hosts. The group name for reservations is "American National Standards Institute", and the group room rate is 95£ (Sterling) single or double occupancy. The reservation cutoff date is June 30. (See the meeting announcement on the web page at <http://www.cic-5.lanl.gov/~det/> for further details.)

We had previously considered canceling this meeting due to potential low attendance, but now need the meeting to complete some T11.1 Plenary votes and keep HIPPI-6400-PH and -SC in the processing path. As long as we are having the Plenary, then we will also have the working meeting.

Note that there is some new information about travel from the airports to the hotel on the HIPPI Standards Activities web page.

Tuesday 8/11 9 AM - 6 PM HIPPI ad hoc
Tuesday 8/11 6 PM - 9 PM HIPPI-6400-OPT
Wednesday 8/12 9 PM - 6 PM HIPPI ad hoc
Wednesday 8/12 6 PM - 8 PM T11.1 Plenary

10.3 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. Recent additions and changes are underlined and bold. The September 1-2 meeting is tentative.

1998 -

Jul 20-21 Interim Albuquerque, NM UNM
Aug 11-12 Plenary Portsmouth, UK Xyratex
Sep 1-2 Interim Richardson, TX HP
Oct 6-7 Plenary Ft. Lauderdale, FL Adaptec
Dec 14-18 Plenary Tucson FSI

The 1999 and 2000 schedules just include 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	Huntington Beach, CA	Qlogic
Apr 12-16	Plenary	Palm Springs, CA	Brocade
Jun 7-11	Plenary	Minneapolis, MN	Ancor
Aug 2-6	Plenary	Minneapolis, MN	ENDL
Oct 4-8	Plenary	Ft. Lauderdale, FL	Adaptec
Dec 6-10	Plenary	Reno, NV	Solution

2000 (dates approved, locations and hosts open) -

Feb 7-11	Plenary	San Diego, CA (?)	QLogic
		Austin, TX (?)	Crossroads
Apr 3-7	Plenary	Palm Springs, CA (?)	Brocade
Jun 5-9	Plenary	Boise, ID	HP
Aug 7-11	Plenary	New Hampshire (?)	Hitachi (?)
Oct 2-6	Plenary	San Diego, CA (?)	QLogic
		Austin, TX (?)	Crossroads
Dec 4-8	Plenary	(?)	(?)

11. Review action items

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

1. 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.
2. 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.
3. Everyone to review the HIPPI-6400 MIB.
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8. John Gibbon to talk to Marck Doppke about processing the HIPPI-800 switch MIB through the IETF.

9. Jean-Michel Pittet to inform Don Tolmie of the ARP text in HIPPI-LE that should be removed.
10. Don Tolmie to update HIPPI-LE document.

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21. Don Tolmie to update ST Rev 1.9 with the changes agreed to at the June meeting.

22. Michael McGowen to collect, tabulate, and document everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments.

13. Adjournment

The meeting adjourned at 4:40 PM on June 10, and was followed by the T11.1 Plenary at 6:30 PM.

Attendance

Ed Cady	Berg	503-359-4556	edcady@aol.com
Jeff Young	Cray Research Inc.	612-683-5536	jsy@cray.com
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