

Minutes of T11.1 HIPPI Ad Hoc Working Group
August 5-6, 1997
Honolulu, Hawaii

1. Opening remarks and introductions

The Chairman, Don Tolmie of Los Alamos National Laboratory, opened this meeting and thanked Paul Boulay and Hitachi Computer Products (America) 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). There are no changes in the scope of the technical work considered, i.e., being concentrated on all HIPPI topics and Scheduled Transfer. Don noted that this was not the T11.1 Plenary meeting, which will meet immediately following this working meeting to formalize the results of this working meeting and consider other matters. He also noted that the minutes for the working meeting and the Plenary would be separate. It may take us a while to get our procedures worked out to minimize duplication between the two groups.

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

Francois Gaullier said he would like to have a discussion of the Future Directions of ST, which was added as section 9.6.

These minutes reflect the approved agenda. Don, with help from Tina Pan of Los Alamos, will produce the draft meeting minutes.

3. Attendance and membership

There are no membership requirements for participation and voting in the working meeting. Voting is done on a company basis rather than an individual basis. The list of attendees is at the end of these minutes.

4. Document distribution

Don noted that the documents for the meeting were available before the meeting on the web site at <http://www.cic-5.lanl.gov/~det>, and attendees had been instructed to bring the appropriate documents to the meeting. Only a very few extra documents were available at the meeting.

5. Review minutes of previous meeting

The minutes of the interim HIPPI meeting of July 8-10, 1997, in Minneapolis / St. Paul, MN, were reviewed. A mistype was pointed out in the sixth line of 5.3, i.e., change "much" to "must". (*The copy on the web site will be corrected.*)

Bob Willard moved, and Greg Chesson seconded, to approve these minutes as corrected. Passed unanimously.

6. Review old action items

The action items from the July 8-10, 1997, meeting were reviewed for the current status.

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. (In Process)
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. Roger Ronald to check on Raytheon E-Systems HIPPI-6400 Switch MIB progress. (Done)

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6. Roger Ronald to put HIPPI-6400 Switch MIB developer in touch with Marck Doppke to further development of HIPPI Switch MIBs. (Done)
7. Kevin Lahey, Jeff Young, Jean-Michel Pittet, and Greg Chesson to begin an IP and ARP over HIPPI-6400 RFC. (In Process)
8. Greg Chesson to put Jean-Michel Pittet in touch with Phil Cameron of Essential Communications for ARP over HIPPI work. (Done)
9. Jean-Michel Pittet to develop an RFC for ARP over HIPPI-800. (In Process)

10. 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. (Done)

11. Everyone to suggest changes to HIPPI-FP and bring in proposals for them. (Carryover)
12. Don Tolmie to revise HIPPI-FP, X3.210-1992, with the ULP-id for HIPPI-6400 encapsulation and get the HIPPI-FP document ready to forward. (Done)

13. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular HIPPI-ST Operation was rejected. (In Process)
14. Greg Chesson to do a first draft of HIPPI-ST over Ethernet. (Carryover)
15. Jim Pinkerton to resolve the use of R_id, S_id, B_id and their use in Request_To_Receive. (Carryover)
16. Jeffrey Chung to develop state tables for inclusion as an ST annex. (In Process)
17. Jerry Leitherer of Genroco to develop a mapping for carrying ST over Fibre Channel. (Carryover)
18. Greg Chesson to draft a lead paragraph for annex A describing the generic media-dependent information that would be passed to/from a lower-layer protocol. (Overcome by events)
19. Don Tolmie to take the necessary steps to change the name of HIPPI-ST to Scheduled Transfer Protocol (ST), i.e., without "HIPPI". (Done)
20. Greg Chesson to check on Port registration values and access whether we should change to a value of x'1' for the well-known Port. (Done)
21. 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 HIPPI-ST. (Carryover)
22. Don Tolmie to update HIPPI-ST Rev 0.8 with the changes agreed to at the July meeting. (Done)

23. Roger Ronald and Craig Davidson to include the address mapping between HIPPI-800 and HIPPI-6400 in future revisions of HIPPI-6400-SC. (Carryover)
24. Roger Ronald to update HIPPI-6400-SC Rev 1.3 with the changes agreed to at the July meeting. (Done)

25. Hansel Collins to draft text to replace -PH table 8, which gave the values for the cable coupling network. (Done)
26. Hansel Collins to finish the cable driver test jig, test cable system, and determine the Source driver's output impedance. (Done)
27. Hansel Collins and Steve Joiner to determine the values to replace the 'TBDs' in the copper clauses of HIPPI-6400-PH. (Carryover)
28. Hansel Collins and Steve Joiner to draft definitions of pulse width distortion and jitter for use in HIPPI-6400-PH. (Carryover)
29. Michael McGowen to collect and tabulate everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments. (Carryover)
30. Don Tolmie and John Ellis to resolve the connector drawing discrepancy noted by Genroco. (Done)
31. Don Tolmie to update HIPPI-6400-PH Rev 1.5 with the changes agreed to at the July meeting. (Done)

32. Hansel Collins, Steve Joiner, and Dan Schwartz to come up with a pulse width distortion number for HIPPI-6400-PH table 9, or something equivalent, e.g., jitter. (In Process)
33. Don Tolmie to do an initial draft of HIPPI-6400-OPT. (Done)
34. Dan Brown to update the optical parameter table with the values agreed to at the June meeting. (Done)

7. HIPPI-6400-PH

Revision 1.6, date July 22, 1997, was the document used at this meeting.

7.1 Copper cable interface

At the July meeting in Minneapolis we voted to put the equalizer in the connector backshell, with up to 4 inches between the driver chip and the connector. At that time the indications were that we would be able to support cable lengths from 1 to 40 meters. Since that time there has been further simulations and testing at SGI, E-Systems, and at Gore.

Hansel Collins, Christine Foster and Roger Ronald presented their results from this past month's work. Christine had slides (available from the web page); Hansel and Roger just described their testing. Roger gave, and it was echoed by the rest of the group, a big THANK YOU to Gore for all of the testing and simulations that they have done.

Due to the different set ups from SGI and Gore/E-Systems, there was a long discussion on the advantages and disadvantages of having the equalizer on the backshell or on the board. We concluded that longer distances could be supported if the equalizer was on the board, but distances less than 10 meters then became impossible. The possibility of somehow shorting out an on-board equalizer was discussed, but implementation difficulties for in-field use made us give this up (questionable signal quality).

We have shown that 1-40 meters is possible with the equalizer in the backshell and 10-50 meters is possible with the equalizer on the board. Roger Ronald voiced a strong need for cables shorter than 10 meters. Everyone agreed that a 150 Ω terminator at the source driver was a good idea. A stub termination, rather than fly-by, at the receiver also worked better. Hansel Collins noted that if we put the equalizer in the backshell then we have effectively precluded a 1 GHz copper solution.

Roger Ronald moved, and Bob Willard seconded, to reaffirm the vote to have the equalizer in the backshell (with the blocking capacitor on the board). Passed unanimously.

It was also decided to change the eye mask to the one in Bill McCoy's notes for Figure 24 in -PH. It is

more conservative, more closely tracks reality, and has more specification points.

Don will add the new Table 12 values with comments to clarify as necessary. He will also fix up Figure 23 with more dimensions, and add a new figure showing a dummy receiver for driver testing.

7.2 Local electrical interface

The changes to clause 15 were reviewed. It was agreed that we should only specify the required voltage levels, not the coupling networks between the components. It is unlikely that there will be another SuMAC type chip in the near future, but making the specification SuMAC-specific is not desirable.

Hansel Collins has some notes on how LVDS relates to the SuMAC voltages.

7.3 Review other changes from Rev 1.5 to Rev 1.6

The additional text defining when the Admin micropackets could be sent was reviewed and approved.

The changes to the annex A CRC parallel implementation examples, as suggested by Wally St. John of SGI, were reviewed and accepted. The CRC calculation example, provided by James Hoffman of SGI, was gratefully accepted. Don Tolmie noted that the example had already prevented one incorrect design from being fabricated.

Gene Dornhoff of Los Alamos requested a change to 11.1, noting that requiring a training sequence to be identified by the FRAME signal was too restrictive, and we should also allow identification from the CLOCK signal. It was agreed to change this wording as requested.

7.4 Plans for forwarding

The T11.1 rules, specified in Standing Document 2 (SD2) and available from <http://www.x3.org/>, state that we can forward a document by either a meeting vote or letter ballot. Don suggested a simultaneous letter ballot in T11.1 and T11. (*At the T11.1 Plenary, Roger Cummings pointed out some logistical problems with a simultaneous letter ballot. Hence, we will probably not do a formal letter ballot in T11.1.*)

At this point, we are still on schedule to forward in October.

Bob Willard expressed concern over availability of the SuMAC documentation, and said that DEC might vote NO if the issue is not resolved. Others pointed out that this is not a technical issue and should be separate from voting for or against a technical standard.

8. HIPPI-6400-SC

8.1 Review changes from Rev 1.3 to 1.4

Roger Ronald led the discussion on the July 23, 1997, revision of -SC since he is the technical editor. Like for 6400-PH, only the contentious issues are reported here, otherwise you can assume that the changes marked in Rev 1.2, dated June 2, 1997, were accepted pretty much as written.

8.2 HNF's OUI assignment for ULAs

It was noted that the HNF OUI assigned value was not documented in -SC. Greg Chesson has an action item to draft OUI usage text for an IEEE Tutorial. We will look at it and see where it fits, e.g., in an Annex, body of the document, Technical Report, etc.

Roger will rename section 6 (Admin Micropackets) and rearrange it.

Jean-Michel Pittet is providing an escape mechanism for broadcasting ARP messages. He proposed examining the EtherType field; if ARP or Reverse ARP, then send it to the output port connected to the ARP server. This avoids the port re-map, which is a slow process. This procedure should be specified in an RFC rather than in -SC.

8.3 Plans for forwarding

We reaffirmed our plan to forward HIPPI-6400-SC at the same time we forward HIPPI-6400-PH, i.e., October, 1997.

9. HIPPI-ST

9.1 Review changes from Rev 0.8 → Rev 0.9

The changes in this July 29, 1997 revision were reviewed. Only the major and contentious issues that generated a lot of discussion are reported here, otherwise you can assume that the changes marked in the document were accepted pretty much as written.

There were several additions to the Acronym list requested, i.e., FTP, IEEE, RFC, ST, and TCP.

The well-known port was changed from x'0000' to whatever IANA specifies, and the whole paragraph in 4.3.2 was rewritten. This change, with some edits, was accepted.

The maximum Block size (Max-Block) acceptable to intermediate devices had been added. The "don't care" value was changed from x'0' to x'3F'.

Ian Philp of Los Alamos questioned the need for the B_id parameter, i.e., each Block with a unique Block identifier. He felt that each Block was sufficiently unique with the B_num parameter. It was pointed out that the B_id parameter was needed to identify multiple outstanding Request_To_Receive data operations.

New clause 4.3.9 was added, trying to clarify the multiple uses of EtherType. It was accepted.

New clause 4.4.11 was added for "Blocks enabled", a parameter that is desirable during striping. It was accepted.

There was some confusion on the usage of the Originating Source and Final Destination since they switch roles between a read and write operation (especially for the Request_To_Send). Don will look into finding better terminology (maybe sender/recipient, master/slave) and making the change to the entire text.

In annex A, new front text was added to outline the information passed between ST and a lower layer. The mappings for 6400-PH and HIPPI-FP were expanded to include the new parameters and clarify the CCI information. Errors were pointed out in Figures A.1 and A.2 where "HIPPI-ST" should now be "ST", and S_count should be S_num.

9.2 Intermediate device interactions

Ian Philp of Los Alamos questioned having intermediate devices modify parameters in the ST header, saying that to do so they would need to implement a fair amount of the ST protocol. He felt that this was unlikely, especially for devices associated with ATM circuits. Don Tolmie noted that the Max-STU size was another parameter that was also modified by the intermediate device.

It was decided that if the intermediate device does not support ST, then the connection just will not work. The device must know about ST. While not totally happy with this resolution, Don accepted it.

9.3 ATM, FC, Ethernet, etc. as lower layers

There was no new text, or presentations, on ST over AMT, Fibre Channel, or Ethernet. Hence, nothing new for this meeting.

9.4 Review changes in Annex C examples

Tina Pan has been concentrating on Annex C, adding more descriptive text to make the examples more self-explanatory and easier to read.

The intermediate device in example C.3 was changed from a bridge to an ST-compliant gateway, which gives it the ability to handle ST protocol change requests on the fly.

9.5 Change name to "Scheduled Transfer Protocol"

The HNF Marketing Committee has expressed reservations about the "HIPPI" name, saying that in some camps it has a negative connotation, e.g., "it is only something for the propeller-heads". They had requested that we look at changing the name to something that could be more readily marketed. This was considered at previous meetings. The decision was to keep the HIPPI name with the standards documents since it was too imbedded in the text, and we did not feel the negative connotations as much as they did.

Don Tolmie felt that the HIPPI-ST document was somewhat different in that it intended to be used more heavily with other protocols, e.g., Ethernet, ATM, and FC lower layers. Hence, the proposal was to change the name of "HIPPI-Scheduled Transfer (HIPPI-ST)" to "Scheduled Transfer Protocol (ST)". Discussion followed.

Francois Gaullier moved, and Greg Chesson seconded, to request that the HIPPI-ST name be changed to "Scheduled Transfer Protocol (ST)". Motion passed unanimously. This will be on the T11.1 agenda for formal action.

9.6 Future of ST

Francois Gaullier expressed concern about ST's life post-T11.1 – he would like to see it extended beyond our small community. Greg Chesson pointed out that when VIA is announced, that ST will get publicity (since SGI's VIA implementation will run over ST). Greg also outlined other places where he is presenting ST talks, e.g., to a NASD group looking at storage. Greg would also like to present a briefing for the Fibre Channel group. He suggested pushing multiple implementations with the HNF. SGI can contribute a sockets interface for ST over Ethernet.

10. IEEE related items

10.1 Tutorial for HIPPI-6400 ULA use

Greg Chesson is drafting an IEEE Tutorial for HIPPI-6400 ULA use. Nothing new was reported at this meeting (see 8.2).

11. IETF related items

11.1 IP over HIPPI, RFC 1374

Nothing new at this meeting.

11.2 ARP over HIPPI-800

Jean-Michel Pittet from SGI is also working on this project.

11.3 HIPPI end-point MIB

Mark Kelley of Cray Research had said that he would start working on the end-point MIB again. Mark was not at this meeting, and nothing new was reported. Jeff Young took an action item to pulse Mark and report the status on the reflector.

11.4 HIPPI switch MIB

Nothing new at this meeting. Marck Doppke of Essential Communications has a draft document out for comment.

11.5 HIPPI-6400 MIB

Nothing new at this meeting. Von Welch of NCSA has a draft document out for comment.

11.6 HIPPI-6400 ARP and IP RFC

Greg Chesson said that Kevin Lahey, Jeff Young, Jean-Michel Pittet are developing an RFC for HIPPI-6400 ARP and IP.

12. HIPPI-800 topics

12.1 HIPPI-FP

Don Tolmie presented HIPPI-FP Rev 4.6, dated July 24, 1997. The only technical change between this version and the previous one available from the HIPPI standards web site is the inclusion in 5.4.1 of a statement that unlisted ULP-ids are reserved, and inclusion of a ULP-id assignment for HIPPI-6400 encapsulation. The format of the document was changed to reflect the new ANSI style, with the main difference being a larger font size. Only editorial changes exist between the published ANSI standard and Rev 4.5 which was on the web. These editorial changes, requested by the ANSI and ISO editors, are included in Rev 4.6.

There has been a call for other suggested changes to the document, and so far none have come forward. Without further changes proposed, it was agreed at the June meeting to forward this document at the same time we forward the HIPPI-6400 documents.

Don asked everyone to do a read-through and check for mistakes since changes can still be made until we forward in October.

13. HIPPI-6400-OPT (Optical)

This portion of the meeting was reported in a separate set of minutes.

14. Future meeting schedule

14.1 Interim HIPPI and ST meeting, September 9-11, Mountain View, CA

This interim meeting will cover HIPPI-6400 and ST issues. Discussion of copper issues will start at 1 PM on Wednesday, September 10.

Tuesday, 9/9 - 1 PM - 9 PM

Wednesday, 9/10 - 8 AM - 9 PM (copper 1 PM)

Thursday, 9/11 - 8 AM - 2 PM

The location is the SGI facility, Building 42, Cray Conference Room. Greg Chesson and SGI are the host. (See the meeting announcement on the web page at <http://www.cic-5.lanl.gov/~det/> for further details.)

No hotel has been specified, so make your own reservations. Roger Ronald noted that staying near the airport is not a bad commute even during rush hour.

14.2 Plenary week, October 7-8, Tucson, AZ

During the T11 October plenary week, the following HIPPI meetings are scheduled:

Tuesday, October 7 -

9 AM - 6 PM — HIPPI Wkg Group (copper 9 AM)

6 PM - 8 PM — HIPPI-6400 Optical

Wednesday, October 8 -

9 AM - 10 AM — HNF Plenary

10 AM - 6 PM - HIPPI Working Group

6 PM - 9 PM — T11.1 Plenary (HIPPI)

The location is the Doubletree Hotel at Randolph Park. Gary Stephens and Bob Kembel of FSI are the hosts. (See the meeting announcement on the web page at <http://www.cic-5.lanl.gov/~det/> for further details. Note that the reservation deadline is September 5.)

14.3 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.

1997 -

Sep 9-11 Interim Mt. View, CA SGI

Oct 7-8 Plenary Tucson, AZ FSI

Nov 4-6 Interim Albuquerque, NM LANL

Dec 9-10 Plenary Orlando, FL DPT

Don Tolmie questioned the need for a meeting in November based on forwarding the HIPPI-6400 documents in October and not having the letter ballot responses back yet. Greg Chesson stated that he hoped that we would have other topics, e.g., MIBs, RFCs, etc. for review at that time. We will leave the November meeting on the schedule for now.

The 1998 schedule is less firm, but here is what is currently being considered. 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; more may be scheduled as we see the need. Recent additions and changes are underlined.

1998 -

Jan 13-14	Interim	Mt. View, CA	SGI
Feb 10-11	Plenary	San Diego	Qlogic
<u>Mar 10-12</u>	<u>Interim</u>	<u>Minneapolis</u>	<u>Cray</u>
Apr 21-22	Plenary	Palm Springs, CA	Brocade
Jun 9-10	Plenary	St. Petersburg Beach, FL	AMP
Aug 11-12	Plenary	<u>Portsmouth, UK</u>	<u>Xyratex</u>
Oct 6-7	Plenary	Ft. Lauderdale, FL	Adaptec
Dec 8-9	Plenary	<u>Monterey, CA</u>	<u>Sun</u>

15. Review action items

(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.
4. Everyone to review the HIPPI-6400 MIB.
5. Kevin Lahey, Jeff Young, Jean-Michel Pittet, and Greg Chesson to begin an IP and ARP over HIPPI-6400 RFC.
6. Jean-Michel Pittet to develop an RFC for ARP over HIPPI-800.

7. Jeff Young to pulse Mark Kelley about the HIPPI end-point MIB and report the status on the reflector.

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.

9. Everyone to suggest changes to HIPPI-FP and bring in proposals for them.

10. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular HIPPI-ST Operation was rejected.
11. Greg Chesson to do a first draft of HIPPI-ST over Ethernet.
12. Jim Pinkerton to resolve the use of R_id, S_id, B_id and their use in Request_To_Receive.
13. Jeffrey Chung to develop state tables for inclusion as an ST annex.
14. Jerry Leitherer of Genroco to develop a mapping for carrying ST over Fibre Channel.
15. 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 HIPPI-ST.
16. Don Tolmie to update HIPPI-ST Rev 0.9 with the changes agreed to at the August meeting.

17. Roger Ronald and Craig Davidson to include the address mapping between HIPPI-800 and HIPPI-6400 in future revisions of HIPPI-6400-SC.
18. Roger Ronald to update HIPPI-6400-SC Rev 1.4 with the changes agreed to at the August meeting.

19. Hansel Collins and Steve Joiner to determine the values to replace the 'TBDs' in the copper clauses of HIPPI-6400-PH.
20. Hansel Collins and Steve Joiner to draft definitions of pulse width distortion and jitter for use in HIPPI-6400-PH.
21. Michael McGowen to collect and tabulate everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments.
22. Don Tolmie to update HIPPI-6400-PH Rev 1.6 with the changes agreed to at the August meeting.

15. Adjournment

The meeting adjourned at 5:40 PM on August 6.

Attendance

Ed Cady	Berg	503-359-4556	edcady@aol.com
Jeff Young	Cray Research Inc.	612-683-5536	jsy@cray.com
Gordon Boyd	Digital Equipment Corp.	603-884-1309	boydg@mail.dec.com
Bob Willard	Digital Equipment Corp.	508-493-5482	willard@wonder.enet.dec.com
Brian Breuer	Genroco	414-644-8700	brian@genroco.com
Francois Gaullier	Hewlett-Packard	4-7614-5181	francois_gaullier@hp-france-cm1.cm.hp.com
Christine Pan	Los Alamos National Lab	505-665-8557	cspan@lanl.gov
Don Tolmie	Los Alamos National Lab	505-667-5502	det@lanl.gov
Tim Plunkett	Naval Surface Warfare Ctr	540-653-1090	tplunke@nswc.navy.mil
Joe Parker	Optivision	650-855-1775	parker@optivision.com
Roger Ronald	Raytheon E-Systems	972-205-8043	rronald@esy.com
Greg Chesson	Silicon Graphics	650-933-3496	greg@sgi.com
Hansel Collins	Silicon Graphics	650-933-2921	hac@enr.sgi.com
Jean-Michel Pittet	Silicon Graphics	650-933-6149	jmp@sgi.com
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