Accredited Standards Committee*
NCITS, Information Technology

Doc. No.: T11.2/00-187v0
Date: March 27, 2000
Meeting: Speed negotiation ad hoc
Ref. Doc.:
Reply to: Bill Ham

To: Membership of T11.2 and T11.3

From: Bill Ham, secy, speed negotiation joint ad hoc

Subject: Draft minutes of the joint speed negotiation ad hoc con call on March 24, 2000

Agenda

1. Opening remarks and introductions
2. Review/modify the agenda
3. Attendance and membership
4. Details
5. Next meetings
6. Action Items
7. Adjourn

Results of Meeting

1. Opening remarks and introductions

This con call meeting was authorized by the joint T11.2/T11.3 group for purposes of determining if the proposed speed negotiation algorithm recently approved by T11.3 for inclusion in FC-FS specifies all that is needed for robust interoperable operation. This con call was hosted by Compaq, chaired by Bill Ham and lasted from 1 to 3 PM central time.

The output expected from this ad hoc is a set of specific cross references to existing standards or other documents that define all the requirements that are not specifically documented by the algorithm. If other requirements are needed to specify the negotiation process those requirements will be identified.

2. Review/modify the agenda

The agenda consisted of using the process set forth in the following:

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SPEED NEGOTIATION PROCESS CROSS REFERENCES

- **SUGGESTED PROCESS**
- **EXAMINE EVERY STEP IN THE ALGORITHM FOR THE FOLLOWING:**
  - **PROTOCOL REFERENCE**
  - **PHYSICAL REFERENCE**
  - **PHYSICAL SIGNALS**
  - **TIMING REQUIREMENTS**
    - **START TIME (WHO MEASURES AND HOW DETECTED)**
    - **END TIME (WHO MEASURES AND HOW DETECTED)**
  - **ANALOG LEVELS REQUIRED**
  - **POSSIBLE DEADLOCK CONDITIONS**
- **ASSIGN ACTION ITEMS TO PROPOSE RESOLUTION FOR ANY HOLES FOUND**

3. Attendance and membership

Attendance is open to all members of T11.2 and T11.3 that have an interest in the referenced subject. The following people were present:

As this list was recorded with only verbal input and the callers were polled only at the beginning of the con call errors in spelling and company affiliation are likely. Further, this list may not be complete and there is no record of who actually participated in the entire call.

Mat Wakeley, Agilent
Carl Zeitler, Compaq
Bill Martin, Gadzoox
Bob Snively, Sun
George Penokie, IBM
Allen Kramer, Seagate
Bill Ham, Compaq
Dick Casey, Ancor
Joe Tin, Brocade
Bob Dalghren, Brocade
Bob Nixon, Emulex
Raul Dtezya?, Emulex
Mike Hanworth, Emulex
Jeff Scotten, Emulex
Tom Lindsay, 'Vixel
Greg McSorley, EMC
Lazkin Crutcher, Maxim interconnect products
Mark Foley, Maxim interconnect products
James Myers, Picolight

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Rick “Neumann, Picolight
Steve Muzilla, Molex
Gary O’Connor, Molex
Ramsey Clark, Agilent
Ken Sharp, Agilent
Dave Hyer, Compaq
Hiro Hashimoto, Fujikura
Alex Iguchi, Fujikura
Hari Naidu, Fujikura
Rich Feldman, Gadzoox
Kevin Kramer, IBM
Clint Schow, IBM
Ken Jackson, IBM
Bob Lester, Vitesse
Glen Koziuk, Vitesse
Jerimiah Tussey, Vitesse
Jim Coomes, Seagate
Alvin Nguyen, Compaq

4. Details

A document, 00-172v0, containing an interim analysis of the negotiation algorithm presented in 99-649v1 was used as the vehicle for discussion. This document had been prepared by internal discussions within Compaq and used the framework established at the earlier meeting.

The discussions were broken into four parts:

- Physical architecture and implications
- Revised flow diagram presented as a state diagram
- Detailed discussion of each step in the algorithm
- Summary of main findings

Rather than attempt to describe all the details in these minutes reference is made to version 1 of the 00-172v0 document where the details are captured.

In general the physical architecture presented in 00-172v0, with minor refinements was acceptable by the group for use with optical interfaces. It was requested that the copper interfaces also be addressed, especially the implications of the port bypass circuits and the impact of the lack of certain transceiver control signals that may be present in the optical implementations. It was agreed that the copper implementations would be addressed after the analysis of the algorithm for the optical interface was completed. The differences between different styles of packaging for the optical transceivers was also discussed.

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Since the versions of 00-172 beyond v0 contain significant input from other than Compaq all references to this being a Compaq analysis will be dropped.

It was agreed that the assumptions presented in 00-172v1 would be acceptable for the first pass analysis. It was noted, however, that implementations of transceivers may exist that have retiming or reclocking in the transceiver package. This could have important implications with respect to the ability of the transceiver itself to measure time. The transceivers under discussion for this pass are considered to be analog elements only (but with logical control signals that are activated by the internal analog properties of the transceiver and with responses to incoming logical control signals.)

The technical possibility and practical feasibility of a transceiver meeting all the requirements of both full and double speed for both the transmitter and receiver without any change was reaffirmed. (This does require tighter control of the parameters but overlapping regions of the specifications for both speeds exist. It was not determined whether such overlaps are feasible for speed higher than double. It is also noted that for extended length operation that overlapping regions may not be feasible. Therefore, transceiver control signals may be required for speed negotiation across more than two speed ranges or for some length regimes.

A slight technical modification was made to the flow chart in 99-649v1 and the state diagram corresponding to the algorithm was presented in 00-172v0. The group agreed that this modified diagram was accurate and captured the intent of the algorithm. It was easier to see how the process works in this modified diagram and that there is a very critical branch point at the successful achievement of word sync. It is impossible to proceed past this point unless word sync is achieved. This feature effectively prevents changing the transmitter speed to lower than the maximum if the incoming signal stays at maximum. If both sides do not achieve word sync at the maximum rate the process hangs.

This feature of the algorithm would not allow a link that could not achieve word sync at the maximum designed rate to reduce the speed to a lower value. Failure to achieve word sync at the highest speed because of excessive length, poor connector, degraded transceiver performance, degraded cable assembly performance, excessive system noise or other similar cause creates a deadlock condition. Specifically, the ability to decrease the transmitter data rate to allow operation for a link that is incapable of working at the highest rate is not supported in the present algorithm.

The requirement that the receiver NOT achieve word sync if it is not “set” to the nominal incoming data rate was confirmed. This is done in the protocol chip by forcing the protocol chip receiver circuitry to the nominal “set” rate. This scheme ensures that even if the analog receiver in the transceiver can pass the bits at rates for which it is NOT designed that word sync will not be obtained. [Comments have been received after the con call that indicates that some implementations do not adhere to this requirement.]

The behavior of the reset response to Tx_disable in 00-172v0 was shown to be erroneous. See 00-172v1 for details.

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5. Next meetings

Another meeting will be requested for the next plenary week on Thursday at 8 AM.

6. Action Items

6.1 Old action items (from previous meetings):

Bill Ham to schedule a teleconference call before the next T11 plenary week.
Status: done

Bill Ham to ensure that the meeting time is available and to place the report / further work items on the agenda of the joint T11.2/T11.3 group on Wednesday PM.
Status: done

All interested parties to place issues and concerns on the T11 reflector.
Status: done

6.2 New action items from this meeting

Bill Ham to issue minutes from the con call
Status: new

Bill Ham to create new rev of 00-172v0
Status: new

Mat Wakeley to propose fixes for the 2x/2x deadlock issue
Status: new

Bill Ham to create agenda for the next plenary week agenda
Status: new

Review 00-172v1 and comment - all
Status: new

7. Adjourn

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The meeting adjourned at 9:00 AM on Thursday.

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