Accredited Standards Committee*
X3, Information Technology

To: Membership of X3T10.1

From: Lawrence J. Lamers, Chair X3T10.1 (acting)

Subject: Minutes of X3T10.1 Working Group : April 29-30, 1996
                  April 29-30, 1996 -- South Burlington, VT

_____
Agenda

1. Opening Remarks

2. Attendance and Membership, Introductions

3. Approval of Agenda

4. Approval of Minutes

5. Document Distribution

6. Review of Old Action Items

7. 2nd Generation Protocol Layer Topics []
    7.1 Review of scope for S3P
    7.2 Enhanced Status (95a133r0)
    7.3 Alternate Pathing (95a187r0)
    7.4 Hot Swapping (95a206r0)
    7.5 Protocols for other ULPs
    7.6 Opportunities for improved array performance (96a134) [Hawes]

8. 2nd Generation Transport Layer Topics
    8.1 Congestion Policy () [Monia]
    8.2 Buffer Thresholds () []
    8.3 SSA-TL version field () [Hawes]
    8.4 Autosense () [Scheible]
    8.5 TL Support for SAT Regions (95-127r2) [DeWilde]
    8.6 Interlocked Election of Master Process (95a210r2) [DeWilde]
    8.7 Async Alert Queue Depth (96a121) [Scheible]

9. 2nd Generation Physical Topics
    9.1 Connector test results
    9.2 Interconnect Tests () []
    9.3 Electrical issues () []
    9.4 Device Interface to Enclosure (96a127r1) [Judd]

10. Call for Patents

11. Action Items

12. Meeting Schedule

13. Adjournment

1. Opening Remarks

Larry Lamers convened the meeting at 9:00 am. He thanked Bernie Cummings of IBM Microelectronics for hosting the meeting.

As is customary, the people attending introduced themselves. A copy of the attendance list was circulated for attendance and corrections.

It was stated that the meeting had been authorized by X3T10.1 and would be conducted under the X3 rules. Ad hoc meetings take no final actions, but prepare recommendations for approval by the X3T10.1 task group. The voting rules for the meeting are those of the parent committee, X3T10. For the ad hoc, other than straw votes, the voting rules are: one vote per participating company.

The minutes of this meeting will be posted to the X3T10 BBS and the SSA Reflector and will be included in the next X3T10.1 committee mailing.

The X3T10 BBS has moved - the new phone number is 719-533-7950.

The SSA IA web site has been updated and is now more user freindly and correctly links to the current working drafts.

The first generation SSA draft proposed standards will enter public review on May 10, 1996, closing on July 10, 1996.

Larry stated that the X3T10.1 mailings are part of the X3T10 mailings. Persons that want to receive documents should subscribe to the X3T10 mailings by sending their request to the secretariat. An electronic option is available.

2. Attendance and Membership, Introductions

Attendance at working group meetings does not count toward minimum attendance requirements for X3T10 membership. Working group meetings are open to any person or company to attend and to express their opinion on the subjects being discussed.

The following people attended the meeting.

name	company	telephone	email
Lawrence Lamers	Adaptec	408-957-7817	ljlamers@aol.com
Charles Brill	AMP, Inc	717-592-6198	cebrill@amp.com
Chuck Grant	AMP, Inc/Madison	508-752-2884 x725	charles_grant@madisonusa.ccmail.compuserve.com
Bill Mable	Amphenol Interconnect	607-786-4236	
Michael Wingard	Amphenol Interconnect	607-786-4241	
Bill Ham	Digital Equipment Corp.	508-841-2629	ham@subsys.enet.dec.com
Charles Monia	Digital Equipment Corp.	508-841-6757	monia@shr.dec.com
Sam Shimkage	Fujitsu (OADG)	408-764-9466	
Daniel Tsai	IBM	408-256-5729	
Martin Chesters	IBM Corporation	44-1705-486363	mchesters@vnet.ibm.com
Adge Hawes	IBM Corporation	011-44-1705-486363	adge@vnet.ibm.com
Chris Parker	IBM Corporation	912-892-2719	
John Scheible	IBM Corporation	512-823-8208	scheible@vnet.ibm.com
William F. Washburn	IBM Corporation	914-892-6300	wfwashburn@vnet.tbm.com
Wolfgang Drichelt	ITT Cannon	49-7151 699 233	101573.2601@compuserve.com
Wayde King	ITT Cannon	714-757-8264	wking@mailgw.canon.itt.com
Werner Pfitzenreiter	ITT Canon	7151-699147	
Dennis Moore	KnowledgeTek, Inc.	303-465-1800	dmoore@netcom.com
Gary Manchester	Molex, Inc.	708-527-4043	gmanchester@usa.molex.com
Kelly Tenuta	Molex, Inc.	708-527-4605	ktenuta@usa.molex.com
Mark DeWilde	Pathlight Technology	607-266-4000	mark@ironics.com
Ken Erickson	Samsung	408-232-3641	kerickso@samsung.com
Jackson Wang	Tandem Computers	408-285-9914	wang_jackson@tandem.com
Sam Sanyal	VLSI Technology, Inc.	408-922-5371	sanyal_s@sanjose.vlsi.com
Neil Edmunds	Xyratex	011-44-1705-486363	neiledmunds@uk.xyratex.com
David E. Instone	Xyratex	01705 486363	dinstone@uk.xyratex.com

3. Approval of Agenda

The agenda was approved.

4. Approval of Minutes

The minutes of the last Working Group meeting (see 96a120r0) were approved.

5. Document Distribution

Larry Lamers stated that the next mailing deadline is Wednesday, March 20, 1996.
Documents are available on the BBS (714) 533-7950 in area 26 and at ftp.symbios.com in
/pub/standards/io/x3t10.1

95a210 r2	Interlocked Election of Masters	M. DeWilde
96a121 r0	Asynchronous Alert Queue Depth	J. Scheible
95a227r1	TL Support for SAT regions	M. DeWilde
95a226r1	SAT Algorithm Extensions	M. DeWilde
95a114r1	AET and AST in Data Transfer SMSs	J. Scheible
96a191 r0	Minimum ESD Tolerance Specification	M. DeWilde
95a133 r0	SCSI Status SMS Enhancement	J. Scheible
96a127 r1	Device Services Interface	A. Hawes
96a129r0	Networking over SSA	M. DeWilde
96a128r1	2nd Generation Document Schedule	J. Scheible
96a131r0		
96a134r0	PCI to SSA Adapter	A. Hawes
X3T10.1/1147D r0	SSA Transport Layer - 2	
X3T10.1/1146D r0	SSA Physical Layer - 2	

6. Review of Old Action Items

None.

7. 2nd Generation Protocol Layer Topics []

7.1 Review of scope for S3P

John Scheible reviewed the proposals incorporated in the proposed working draft.

7.2 Enhanced Status (95a133r0)

Data transfers SMSs would not be used for autosense, instead sense data would be sent via SCSI STATUS SMS. If truncated the initiator protocol level would issue a REQUEST SENSE command.

The working group recommended that 95a133r1 be accepted..

7.3 Alternate Pathing (95a187r0)

There was a lengthy discussion of support for alternate pathing. The concept of a logical path with in order delivery attribute, was adopted. If more than one logical path is requested of the transport layer, then multiple paths would exist. The transport layer, if not capable of handling breaks in the path, would indicate path breaks to the protocol.

The working group recommended that this concept be included in the model.

7.4 Hot Swapping (95a206r0)

Add one bit to SCSI COMMAND SMS to indicate that a status verify is required from the initiator prior to the target releasing its resources, (ala ACA process). The new CONFIRM STATUS SMS contains information on the data that needs to be retransmitted if any. Out of order transmission needs to be automatically disabled for this to work.

This feature can be used to re-path data transfers. Document 96a131 was developed during the meeting.
If the complete bit is set the CONFIRM STATUS SMS acts as a status confirmation.

The working group recommended that 96a131r0 be accepted.

Charles Monia made a presentation on issues surrounding hot swapping on serial interfaces as they relate to tape devices.

7.5 Protocols for other ULPs

Mark DeWilde made a presentation on the investigation he is doing to support TCP/IP over SSA.   The TCP approach throws away IP, creates a set of SMS to open and close connections, and ship date with the existing protocol. The IP is a tunneling approach, replacing the header with a set of SMSs and the data is handled the same as current transport layer. Both of these are mapping approaches. Further work is necessary before being pursued. A lot depends on Marks workload.

7.6 Opportunities for improved array performance (96a134) [Hawes]

Adge Hawes presented information on a method of improving the XOR process for array configuration using the spatial reuse feature of SSA. The existing XPWRITE command may not be best suited for SSA. The essence of the proposal is to add 4 bytes to the Data Reply to allow forwarding the XOR data to another node.

7.7 Autosense () [Scheible]

Drop AST/AET concept (95a114r1) in favor of 95a133, extended SCSI Status SMS. IF the sense data fits within the SMS it may be cleared, else it is held for a subsequent REQUEST SENSE.

Debate on the implementation of the NACA bit in the control byte and its affect on the target. Charles Monia stated that even with the NACA bit cleared, and autosense, a contingent allegiance condition should exist until a clear ACA is sent by the S3P layer in the initiator.

8. 2nd Generation Transport Layer Topics

John Scheible reviewed the proposed working draft.

8.1 Congestion Policy () [Monia]

Charles - congestion at local host can cause problems, need a policy that gives forwarding priority. This would need a new mode that discards application frames to the node in favor of forwarding frames to other nodes. Charles will draft a proposal and send it out on the reflector.

8.2 Buffer Thresholds () []

A recommendation to buffer application frames was included based on 95a175. This needs some ingenuity in implementing to handle commands efficiently. Charles asked if the proposal for multiple buffers, more than one outstanding receiver ready were going to be considered. Optical extenders may need this feature. Adge Hawes stated he will champion this.

8.3 SSA-TL version field () [Hawes]

Adge Hawes requested a version code for a UIG96PH document that represents a 40 MB/sec upgrade of the UIG95PH products. A version number of 04h was assigned temporarily pending outcome of discussion with SSA-IA. Some guidelines on how to establish transport levels is expected from Richard Rolls.

8.4 TL Support for SAT Regions (95-127r2) [DeWilde]

Mark DeWilde presented a revision of his proposal for establishing SAT regions. This mechanism allows tuning of the web to support localized traffic. Consensus to delete the master alert portion and recommend it as modified.

8.5 Interlocked Election of Master Process (95a210r2) [DeWilde]

Mark DeWilde resurrected his proposal on the interlocked election of master process. This process resolves the issues that may arise when joining two webs. This topic needs further review and discussion before a recommendation is made.

8.6 Async Alert Queue Depth (96a121) [Scheible]

Its a good thing. Recommend to incorporate into the next working draft revision.

9. 2nd Generation Physical Topics

9.1 Connector test results

Wayde King of Canon presented test results on impedance measurements. There is a need to relayout the test board to get a constant impedance. This should improve the test results. The current testing indicates that 40 MB/sec can be met with a 500ps rise time.   The testing was done with production cables.

Werner Pfitzenreiter presented data on transfer impedance (shield effectiveness). The test method was the line injection procedure (IEC ref 48B-451, test method 512-23xx).

The consensus was to keep the existing measurement points for the signals.

Wolfgang will provide data comparing the test specified in PH2 with the line injection method at the next meeting.

SSA-PH2 will require source termination and AC coupling for the drivers behind the pins of the device connector. Martin Chester will provide a proposal for the performance requirements at the next meeting.

9.2 Interconnect Tests () []

Recommendation to add a requirement for the interconnect test in 7.5.1 to use K28.5 characters. This should also be corrected into PH1. This requirement already is specified in the driver test.

9.3 Electrical issues () []

PH1 allows a 1500 ns window for negative excursions. The intent is to tighten up the PH2 to a 750 ns window.

Recommend that the 2 pf become 1.5 pf max. in 7.1.3.1.

An active driver requirement - the delivered slew rate at the connector is critically dependent on the position of the termination resistor. The maximum slew rate of 4 v/ns assumes the worst case position. This also affects the distance that can be driven. The 4 v/ns is being recommended because of source termination causing the driver current to double.

Chris Parker stated that components that are more than half a rise time away are not seen by the driver. However what is delivered to the pin is affected.

There was concern that existing test equipment is not adequate to make the needed measurements. A 4 giga-sample scope measures 250 ps which is barely adequate at 2 v/ns.

Recommendation to change the test because the AC coupling allows a zero volt reference. New figure 6, see Bill's foil. Also modify 7.1.3.1 and 7.1.3.3.

9.4 Device Interface to Enclosure (96a127r1) [Judd]

Adge Hawes brought a new revision of the document. Unfortunately the file is in Book Master, so was only available on paper.

10. Call for Patents

Larry Lamers requested that anyone aware of any patents required for the proposals be disclosed in accordance with the ANSI patent policy. Refer to the minutes of prior meetings for items already identified.

11. Action Items

10)   Wolfgang Drichelt will provide data comparing the test specified in PH2 with the line injection method at the next meeting.
11)   Martin Chester will provide a proposal for the performance requirements at the next meeting.
12)   Adge Hawes to provide an electronic version of 96a127r1.

12. Meeting Schedule

The next working group meeting of X3T10.1 is scheduled for April 29-May 1, 1996, in Burlington, VT at the Ramada Inn & Conference Center, South Burlington, VT, hosted by IBM. Phone: (802) 658-0250. The meeting will begin at 9:00 AM.

The long-term SSA week of meetings are scheduled as follows:
Week of August 26, 1996 in Ithaca, NY hosted by Pathlight.*
Week of October 28, 1996 in Hawaii, hosted by IBM.*
Week of February 24, 1997 in *.
Week of June 23, 1997 in *.
Week of October 27, 1997 *.
* = Tentative locations

Please note that changes to this schedule may occur. All changes to meeting dates, locations, and agendas will be posted to the X3T10-SSA reflector.

13. Adjournment

The meeting adjourned at 1:30 p.m. on Wednesday.