Draft Minutes
Automation/Drive Interface (ADI) Working Group
Ad Hoc Meeting
T10/02-147r0
April 30, 2002 – Nashua, NH
9:05 AM – 6:00 PM

For reference, the final agenda is included:

Agenda

1. Introductions: Group

2. Call for secretary: Paul Suhler
   > Joe Breher will not be able to continue as secretary of the working group.

3. Approval of this agenda: Paul Suhler

4. Approval of previous meeting minutes: Paul Suhler
   a. 3/12/2002 meeting minutes 02-084r0
   b. 4/15/2002 conference call minutes 02-146r0

5. Review of action items: secretary
   a. Paul Entzel to disclose Quantum's physical layer specification. *Complete – 02-133r0*
   b. Joe Breher to investigate whether he is able to disclose Exabyte's physical layer specification, and to disclose it to the group if able to.
   c. Erich Oetting to investigate whether he is able to disclose StorageTek's tape to library interface specification, and to disclose it to the group if able to.
   d. Michael Banther to generate a straw man summary of the various vendors' physical layers.
   e. Bob Griswold to take concepts developed at the meeting as a straw man, and use them to develop an initial specification proposal for ADT.
   f. Michael Banther to define minimal set of control commands, and status items, as per autoloader.
   g. Lee Jesionowski to develop straw man interface status page.
   h. Lee Jesionowski to scrutinize TapeAlert mechanism, and begin developing usage and persistence rules, and error reporting, and additional data items for ADI.
   i. Paul Suhler to generate and post 106r1, incorporating discussion. Complete.
   j. Bob Griswold to take "Why do well known logical units require that all their commands be mandatory?" to CAP. *Complete – 02-116r1.*
   k. Bob Griswold to take "Can we resurrect standard Inquiry data device-type modifier field?" to CAP. *Complete – 02-116r1.*
   l. Michael Banther to contact T10 chair for proper handling of patent disclosure.
   m. Paul Suhler to schedule teleconference. *Complete.*
   n. Bob Griswold to ask plenary for permission to schedule teleconference for week of April 17th. *Complete.*
   o. Rod Wideman to update the command proposal as 097r1.
   p. Paul Suhler to update 02-106r1 to r2 , splitting the command table into two tables – one for SSC, one for ADI.
   q. Rod Wideman to present summary of data mapping into encapsulated SCSI.

6. Discussion items:
   a. Status of skeleton standards Bob Griswold
   b. Drive polling frames (updated) 02-097r1 Rod Wideman
   c. Information availability 02-180r0 Rod Wideman
   d. ADC and SSC commands for ADI devices 02-106r2 Paul Suhler
   e. Consideration of SAS as a physical and transport layer (02-021r1), Lee Jesionowski
   f. Physical layer comparisons 02-148r0 Michael Banther

7. Unscheduled business:
8. Next meeting requirements: Paul Suhler
9. Review new action items: secretary
10. Adjournment: Group

Minutes of Meeting

1. Paul Suhler called the meeting to order at 9:05 AM. The attendees of the meeting introduced themselves. The following people were in attendance.

Name	Organization	email
Rod Wideman	ADIC	rod.wideman@adic.com
T. Tran	Compaq	t.d.tran@compaq.com
Chris Williams	Compaq	chris.williams@compaq.com
Robert Griswold	Crossroads Systems	rgriswold@crossroads.com
Micael Banther	Hewlett Packard	michael_banther@hp.com
Kevin Butt	IBM	kdbutt@us.ibm.com
Lee Jesionowski	IBM	ljesion@us.ibm.com
Paul Entzel	Quantum	paul.entzel@quantum.com
Alfred Missbrenner	Quantum	affred.missbrenner@quantum.com
Paul Suhler	Seagate Technology	paul.a.suhler@seagate.com
Tuong Vu	Sony	tuong.vu@am.sony.com
Erich Oetting	Storage Technology	erich_oetting@stortek.com

2. Paul Suhler asked if anyone would volunteer to act as secretary as Joe Breher would not be able to attend. Paul Entzel volunteered.

3. The agenda (02-139r0) was amended to add an item to discuss SAS (02-021r1) and to remove the last 2 items from section 6.

4. The previous meeting minutes were approved without dissent. The minutes from the conference call were also approved without corrections.

5. The secretary read off the action items from the previous minutes:

    a. Paul Entzel to disclose Quantum's physical layer specification. *Complete, 02-133r0.*
    b. Joe Breher to investigate whether he is able to disclose Exabyte's physical layer specification, and to disclose it to the group if able to. *Carryover in Joe's absence.*
    c. Erich Oetting to investigate whether he is able to disclose StorageTek's tape to library interface specification, and to disclose it to the group if able to. *Carryover.*
    d. Michael Banther to generate a straw-man summary of the various vendors' physical layers. *Complete, 02-148r0.*
    e. Bob Griswold to take concepts developed at the meeting as a straw man, and use them to develop an initial specification proposal for ADT. *Complete, ADT-r00.pdf posted to the T10 FTP site 5/01/02.*
    f. Michael Banther to define minimal set of control commands, and status items, as per autoloader. *Withdrawn.*
    g. Lee Jesionowski to develop straw man interface status page. *Carryover.*
    h. Lee Jesionowski to scrutinize TapeAlert mechanism, and begin developing usage and persistence rules, and error reporting, and additional data items for ADI. *Complete.*
    i. Paul Suhler to generate and post 106r1, incorporating discussion. *Complete.*
    j. Bob Griswold to take "Why do well known logical units require that all their commands be mandatory?" to CAP. *Complete – 02-116r1.*
    k. Bob Griswold to take "Can we resurrect standard Inquiry data device-type modifier field?" to CAP. *Complete – 02-116r1.*
    l. Michael Banther to contact T10 chair for proper handling of patent disclosure. *Complete.*

m. Paul Suhler to schedule teleconference. *Complete.*
n. Bob Griswold to ask plenary for permission to schedule teleconference for week of April 17th . *Complete*.
o. Rod Wideman to update the command proposal as 02-097r1. *Complete.*
p. Paul Suhler to update 02-106r1 to r2, splitting the command table into two tables – one for SSC, one for ADI. *Complete.*
q. Rod Wideman to present summary of data mapping into encapsulated SCSI. *Today's agenda*.

6. Discussion Topics

6A. The skeleton for ADT is available as ADT-r00.pdf with boilerplate information only. Items will be added from proposals approved by this committee as needed.

6B. 02-097r1 drive polling frames update. Rod Wideman presented this updated document based on feedback from the last meeting and the conference call. Rod drew the group's attention to section 1.1, "Remaining Actions" for a list of the issues remaining with this proposal. Chris Williams asked for some reserved bytes in the VHF frame for additional feedback from the drive. Discussion included additional sensor information, such as cartridge position sensors or tachometer readings. A second suggestion was to add a length field to the packet so additional fields could be appended with an indication they are present. No conclusion was reached regarding these suggestions.

Several new fields have been added to the VHF data, such as Compress, Write Protect, Error, and Error Changed. The status and state bits in byte were debated for completeness again. Most concerns were around the "load complete" and "unload complete" bits involving when they are reset.

There was quite a bit of discussion about the tape alert flags. The group would like to defer any re-definition of this feature to SSC, who have it on their agenda already.

6C. Rod Wideman presented a document that describes the ADI Data Availability (02-180r0). The purpose is to discover how much of the requested data is already available and where the new data should be placed. There is concern in the group about using some of the currently defined LOG parameters due to the vagueness of their definition and the variety of implementations that exist today. The overhead of LOG parameters is also a concern.

When discussing the combined tape alert parameter, the bit ordering and byte ordering of the flags is contested. A decision on the issue is continued to a later meeting.

Bob asked if this proposal should be incorporated into ADC as is. Michael Banter moves the encapsulated portion of this proposal as modified into ADC. Rod Wideman seconded. Paul Entzel asked if the LOG pages might be better suited to be 2 parameters of a single page. The characteristics of tape alert was raised as an issue with combining it with other parameters. The group voted on the motion and it was approved unanimously.

Bob Griswold moved we include 02-097r1 bit definitions with the above proposal in ADC. Paul Suhler seconded. The group approved the motion unanimously.

6D. Paul Suhler presented 02-106r2 "ADI SCSI Commands". The document has been modified per decisions made at the last ADI meeting and the conference call. The group agreed that a note or informative annex may be required in ADP to describe limitations that may be imposed on an SSC device accessed via the ADP protocol.

Rod would like MODE parameter changes to the SSC device to post a UA to the ADC device. Also, MODE parameters changed on the ADC device that affect the SSC device should post a UA on the SSC device.

Other changes:
- Change the word "change" in section 1.2 to "influence".
- Change "shall" to "should" in the first paragraph of section 2.
- Change the following commands to mandatory:
  1. MODE SENSE(6) and MODE SENSE(10).
  2. READ ATTRIBUTE.
  3. SEND DIAGNOSTIC (selftest only).
  4. REPORT DENSITY SUPPORT.
  5. REPORT LUNS.
  6. REPORT SUPPORTED OPERATION CODES.
- Section 3.2 will be changed to state that LOG parameters of the SSC and ADC device servers are independent.

The topic of error counts in LOG pages was discussed several times. Paul Entzel stated that most tape drives clear these parameters when a cartridge is loaded or unloaded, so they are not cumulative for the drive. Rod said that the library vendors are looking for a method to compare the health of multiple tape drives with respect to each other using error counts that are consistent.

Lee stated that there should be consistency between the LOG SENSE page 2 and 3 values and the READ ATTRIBUTES values for error counts.

In order for libraries that can not write a MAM device the ability to support WRITE ATTRIBUTES commands, the restriction on WRITE ATTRIBUTES in ADC was removed.

MODE parameters are discussed again. The parameters in question are the density code, write protect, and compression enable. Other parameters may also be included. The group questions if these MODE parameters should affect the SSC MODE parameters, and if so, how.

Rod Wideman moved that 02-106r2 as modified be included in ADC. Kevin Butt seconded. The motion passed unanimously.

6E.   Lee Jesionowski presented 02-021r1 "IBM Library/Drive Interface". With updated recommendations for ADP Recommendations. He also added a column to the comparison table that lists characteristics of SAS. The goal of this change is to attempt to leverage SAS concepts into our transport layer or possibly even use frame header and such directly.

6F.   Michael Banther presented 02-148r0 comparison of physical layers. The question was raised as to the value of the drive reset hardware line. Rod stated it is a nice feature to have due to the higher stress level on the hardware caused by a power cycle. Michael will continue to take inputs and update the document. The group agreed that ADT should include link layer frames to allow negotiation of baud rate and stop bits. Each side should start at 9600 baud, 2 stop bits. The group is interested in adding a command to the protocol to cause a switch to legacy protocol.

7.   No unscheduled business was raised.

8.   The consensus was that the group should continue to meet for a full day at the next T10 meeting. A conference call will also be scheduled before the next T10 week.

9.   The action items were reviewed and updated.
   a. Bob Griswold will request the Device Type name currently defined as ADI be changed to ADC in SPC-3.
   b. Rod Wideman will send source for the accepted proposals (02-097r1 and 02-180r0) to Bob Griswold.
   c. Rod Wideman will get a document number for his second proposal and post it to T10. *Complete*.

> d. Michael Banther will produce a proposal for additional MAM attributes. This will incorporate some of the additional data called for by 02-097r1.
> e. Rod Wideman will generate a list of configurable MODE features.
> f. Paul Suhler will update 02-106r2 and provided it to Bob Griswold.
> g. Paul Suhler will find the document we produced in January laying out the transport layer frame and submit it to Bob Griswold for inclusion in ADT. Default settings for baud rate and stop bits will be included.
> h. Everyone should review 02-158 "SAS Overview" so it can be considered as a model for ADT.
> i. Michale Banther will produce a proposal for the physical layer signals for ADP based off of 02-148r0. The proposal will include a recommend connector on the back of the drive.
> j. Bob Griswold will create new revisions of ADP, ADT, and ADC based on the proposals approved at this meeting.
> k. Rod Wideman will produce a proposed state diagram covering the VHF polling frame status bits.
> l. Find a permanent secretary for this committee.
> m. Paul Suhler will schedule a conference call on Wednesday, June 12th. Paul will post a notice to the reflector announcing this call. Agenda will include general status from Bob and discussion about SAS.

10. Adjournment: Group

> The meeting was adjourned at 6:00 PM.