

Automation/Drive Interface (ADI) Working Group Minutes
Ad Hoc Meeting
T10/03-171r0
5-6 May 2003 – Nashua, NH

1. Introductions: Group

Paul Suhler called the meeting to order at 1:00 PM. He thanked the host, Hitachi. The attendees introduced themselves. The attendees are listed at the end of these minutes.

As the regular secretary, Michael Banther, was absent, Susan Gray offered to take minutes for the first day of the meeting.
2. Approval of the agenda: 03-170r0 Paul Suhler
3. Approval of previous meeting minutes: Paul Suhler
 - a. 10 – 11 March 2003 meeting 03-117r0
 - b. 26 March 2003 teleconference 03-151r0
 - c. 8 April 2003 teleconference 03-159r0
 - d. 23 April 2003 teleconference 03-161r0

There were no corrections to the minutes of previous meetings and teleconferences. The minutes were approved by acclamation.
4. Call for Patents Paul Suhler

Paul Suhler issued a call for patents. There were no responses.
5. Review of action items: Paul Suhler
 - a. Rod Wideman to produce a proposal for device server interaction section in ADC document. *Carryover.*
 - b. Lee Jesionowski to create a proposal for method to convey Interface Status changed. *Carryover.*
 - c. Paul Entzel to write up a proposal for the ADC model of TapeAlert. *Agenda item.*
 - d. Bob Griswold to follow up with SNIA Interoperability Conformance Test Program (ICTP) Subcommittee regarding test/emulation tool. *Carryover.*
 - e. All will review nomenclature and propose changes, specifically port references and device server references. *Agenda item.*
 - f. Michael Banther to propose corrections to the physical section of ADT. *Closed.*
 - g. Paul Suhler will revise 03-165 per discussion item b in 03-161r0. *Closed.*
 - h. Paul Suhler will revise 03-077 per discussion item a in 03-161r0. *Closed.*
 - i. Paul Suhler will send the source for 03-140r1 to Paul Entzel. *Closed.*
 - j. Paul Entzel will incorporate 03-140r1 into ADT. *Closed.*

- k. Rod Wideman will incorporate the third figure from 03-140r1 into ADC. *Closed.*
- l. Paul Suhler will send 03-087r2 to Rod Wideman. *Closed.*
- m. Rod Wideman will incorporate 03-087r2 into ADC. *Closed.*
- n. Paul Suhler will revise 03-095r2 per discussion item e in 03-161r0 and send to Rod Wideman. *Closed.*
- o. Rod Wideman will incorporate 03-095r2 as revised into ADC. *Closed.*

6. Discussion items:

- a. ADI Bridging Proposal 03-077r6 Paul Suhler

Paul Suhler walked the group through the revisions.

1) Reviewed definitions.

Add “SMC” to local and remote device server terms and update all references throughout the proposal.

The group broke off into a general discussion of terminology that should be used to refer to the various objects that make up the automation and drive devices. In the end, the following terms were agreed upon:

- Data transfer device contains the following:
 - ADC device server (automation drive command)
 - SMC device server (for purposes of bridging)
 - RMC device server (removable medium command)
 - Bridging application client
- Automation device contains the following:
 - SMC device server
 - Automation application client

A new diagram is needed in the ADC model section that shows the device server interactions in the data transfer device and automation device. Rod Wideman generated a diagram during the discussion. Paul Suhler will include it in the next revision of the proposal.

Lee Jesionowski noted that the primary interface port is referred to four different ways in the ADC.

- Primary port
- Service delivery port
- Primary service delivery port
- Primary interface port

The group agreed that they should all be replaced with “DTD primary port” or “automation primary port” as appropriate. A definition for each will also need to be added.

Rod Wideman noted that the terms local and remote device server can be confusing as it is not obvious which device is which. The group was unable to come up with better terminology and decided to stick with local and remote.

2) ADI Bridging Introduction

The group attempted to reword the bridging introduction section to update the terminology and provide a bridging overview. It was suggested that the section be changed to first describe the objects that make up the device servers and applications clients and then the detail the flow of operation. It was left to Paul Suhler to finish.

“Commands or requests” can be replaced with just “requests”.

3) Local device server operation

Change “local device server shall not report protocol-specific mode pages” to “remote device server”. The reason for this is that the remote device server has no way of knowing what the appropriate protocol-specific mode page data should be. The remainder of the paragraph referring to the race condition was removed.

4) Add new section, Bridging Manager Operation

There was discussion about a race condition. Specifically, if the local remote SMC device server is processing a command that invalidates the cache in the local SMC device server, the Notify DTD command to clear the cache must complete before responding to the original command. Mode Select is an example of this.

To alleviate the race condition, make the bridging manager single threaded. In addition, instead of using Notify DTD to invalidate the cache, a response code value of 06h in the SCSI Response IU means the all cached data is invalid. Since this reporting is part of the command response so there is no race condition.

Asynchronous unit attentions are the only issue and there is always a race condition for these, it is just a matter of how big the window is. Once the command has started processing, a unit attention can not be reported.

In order to be consistent with SAM, the remote SMC device server must return Unit Attentions. The bridging manager shall discard these responses and retry the command. This is safe since Unit Attentions that are to be reported to the primary host, are reported via the BUA bit.

Not ready is a possible valid response and shall be returned to the primary host.

Since the bridging manager can only managed one command at time, the local SMC device server must manage any queuing of commands.

5) Caching SMC data and status section.

The group reworked this section.

It was decided that the data cached is part of the local SMC device server and not the bridging manager.

Remove discussion about race condition and replace with refreshing cache has priority over other incoming commands. Therefore, they may be inserted at the front of the command queue.

There are two cases in which the local SMC device server must invalidate the current cache data and refresh it.

- IDC, MDC bits set in Notify DTD (explicit notification)
- 06 value returned in SCSI Response IU

6) ADC Clause 6.2.2.3.3, Medium Changer Descriptor Parameters

The description of the CACHE field is missing a statement regarding what it means when it is set to 0.

7) Section 7.1.3 of ADT

Add statement that a response code value of 06h invalidates all cached data.

b. ADC Notify Data Transfer Device

03-165r1

Paul Suhler

Based on the preceding terminology discussions:

- Change automation device to automation application client.
- Change Data transfer device to RMC device server
- Change bridging manager local SMC device server

The group agreed that this command should be mandatory.

The paragraph discussing the race condition was removed since it is no longer a concern.

The Notify DTD command is modeled after INQUIRY and REQUEST SENSE commands. It does not return check condition unless there is something wrong with the command.

Paul Suhler needs to request a service action code for this command.

Paul Suhler made a motion to incorporate 03-165r1 as revised into ADC. Paul Entzel seconded the motion. The group passed the motion by acclamation.

The meeting adjourned for the night at 6:00 PM and resumed at 9:00 AM on Tuesday.

Rod Wideman offered to take minutes.

- c. Add content to model section of ADT 03-163r0 Paul Entzel

Addresses four editors notes introduced in ADT (editors notes 4, 5, 6, and 7). Also adds content in the model section.

Section 4.1 about default operating parameters moved up to model section because applies to both startup and recovery. It will then be easier to reference.

Section 4.2 is new to present and define Port States. Susan Gray asked what state you enter after requesting Log-Out. Port would go to initial state, so Paul Entzel will add statement for that state (enter after receiving ACK for port logout). Paul Entzel wondered why we needed Logout again; Rod Wideman and Lee Jesionowski offered that it was helpful for recovery from an automation standpoint; would allow drive to know a controlled sequence was taking place prior to a shutdown as opposed to just hard transition. Gives drive a chance to perform any clean-up.

Lee Jesionowski asked what definition was for hard reset (initial state). Reference was from SAM, but includes power up. Will scratch redundant reference to power up. Discussion went towards what reset for ADT. Since ADT's reset signal is not a hard reset (only causes a port logout), need to rename Reset signal and define what hard reset is. We investigated how SAM defined hard reset (section 6.3.2 of SAM-3). Lee Jesionowski suggested that perhaps Task management target reset is our hard reset. Current effect is not defined, was removed in SAM-3. Since we have logical unit reset capability, debated need for target reset. Proposed that target reset be removed, and definition of hard reset needed because SAM indicates it is defined by transport layer. "Branch to 0" type reset capability may be vendor unique; discussed whether we need to accommodate standard way.

General note that references to both power up and hard reset can be reduced to just hard reset.

Lee Jesionowski pointed out that 6.5.5, port logout, describes from point of view of receiver except for last item (d) which is for sender. Need to clarify that both sender and receiver revert to default parameters.

Recovering state only has one unique state, so reference should be to the link error recovery subclause instead. Upon further discussion, state only entered upon receipt of initiate recovery IU indicating previously received and acked frames will be resent.

Discussion as to what constituted a state. Paul Entzel explained it was having different responses to events that occur. States are not symmetrical, meaning that only some states are valid for both drives and automation.

Table A is focused on what state is, with subsequent sections describing how they are entered, what happens while in a state, what events cause them to leave state.

State machine diagrams lacking sufficient tool to generate. Paul Entzel open to submitted diagrams.

Section 4.3 could benefit from small table describing N-states, just introducing state names. Lee Jesionowski asked about Accept set to one, but with parameters changed. Paul Entzel felt would fall into Otherwise case. Lee Jesionowski thought might fall into negotiation error substate. Paul Entzel will add action to match from N2.

Susan Gray asked whether N0 state allowed port login frames after having sent one. Lee Jesionowski asked whether state entered after having sent login or after having received ack. P1 doesn't state whether before or after ack (Paul Entzel thinks on just send, without ack). As such, Paul Entzel thinks N0 still needed to represent condition until both ports are actually in process of negotiating. Paul Entzel will reword N0 description to resolve; including how entered (upon initiating port login exchange) and how exited (upon receipt of ack).

Susan Gray asked whether we explicitly state that returning accept bit as one should also state that parameters are not changed. Paul Entzel to clarify on step 2 of N1.

N2 state transitions to N0 after having initiated login; same comment for N3.

Receiver of login IU enters N1 prior to sending ack (current wording describes)

“frame” should be “IU” (several).

Lee Jesionowski asked what happens in N1 if login not returned. Timeout needed when waiting for a port login. Could use general large timeout; agreed to 15 seconds.

Need to associate deadlock section with initiate state. Lee Jesionowski suggests dropping section directly into N0 state. Susan Gray asked if N1: Login should be N1: Negotiate; Paul Entzel concurred with both.

Section 4.4. ack frames should be ack IUs (several). Receipt of Initiate Recovery frame needs to resolve what to do with outstanding acks not yet sent by receiver. Discussed when to reset counters, count offset to include IR IU, violate offset for IR IUs. Allow ACK and IR IUs to be sent when at max offset, reset to 0 upon receipt of ACK IU to IR IU.

Section 4.5. Rod Wideman requested clarification of purpose C, such that identifying the frame is mentioned. Additional wording clarifications noted. Update frame number description in 6.3 to reference this new subclause as needed. Source text from 6.3 to be added and modified in this proposal. Change section title to “Frame number counters” and add subclauses for both next to send and expected. Modify ADT 6.6.1.3 to reference new expected frame number subclause.

Section 4.6. wording clarification that frames acked and discarded until frame number matches.

Paul Entzel moved that 03-163r0 be included into ADT as modified. Paul Suhler seconded. Discussion ensued to review comments collected thus far, none found to be too worrisome. Passed by acclamation.

- d. ADC Target Port Groups Commands 03-181r0 Chris Williams

Discussion as to what asymmetric logical unit behavior meant, seems consistent with what we want.

Paul Suhler moves that 03-181r0 be included in ADC; Paul Entzel seconded, passed by acclamation.

- e. ADC Device Server for Auto Load-Unload 03-180r0 Chris Williams

Latest e-mail from MB suggests that either this proposal or a rewording of the ENABLE bit description would be acceptable.

Discussion ensued as to what ENABLE actually controlled. Thought is that this could be resolved by saying logical unit is not reported to REPORT LUNS command on “DTD primary port”. Also rename descriptor as RMC logical unit descriptor. Debated auto unload placement.

Rod Wideman was given an action item to make editorial changes as discussed. Michael Banther to review editorial changes as needed and can resubmit 03-180r0 if needed.

- f. Discussion of TapeAlert Paul Entzel

Paul Entzel began discussion that TA is broken. Common problem is that initiator knowledge is consistently maintained across logins. Especially problem with FC now. Problem as to whether information is reported per initiator or not.

Question as to whether to address anything for ADC specifically, such as whether flags are states or reports of events. Discussed state of current utilization and needs. Thought was that if used, were converted into SNMP traps.

Discussed possibility of converting into states for ADC, then describe when reset. Challenge is how to resolve flags that are more events than states.

Proposal is to:

- Change the description in VHF for TAFS field to now indicate TAF changed (0-1, 1-0).
- Change the TA status log page to reflect states instead of events. Flags are not consumed upon retrieval
- 4.2.6 to cover model behavior of flags being states, etc.
- Add modified version of TA table into log page and add column to describe clearing effects (events such as load of medium, receipt of command, etc.).
- Rename to TA state flag

- g. Review of ADC ADCr03 Rod Wideman

Reviewed editor's notes, collected editorial changes. Rod Wideman to incorporate.

- h. Discussion of Device Interaction Rod Wideman

Solicited additional input as to what this subclause should include. Identified new picture to use, not ready conditions to include.

- i. Review of ADT ADTr04 Paul Entzel

Reviewed editor's notes, which to keep, which are resolved. Discussed utilization of figures, especially that related to bridging. Noted that now could probably eliminate bridging related figures.

Paul Entzel gave an overview of the work he's doing with clause 8, application layer, to describe how the SAM remote procedure calls map onto the transport protocol services. He intends to model after SAS and SPI-5.

Discussed need for pinouts on connector. Lee Jesionowski to bring in proposal.

- j. ADI Bridging Proposal revised 03-077r7 Paul Suhler

Reviewed Paul Suhler's updates to 03-077r6 from yesterday.

Discussion as to whether new picture should show shared physical mechanism. Additional updates to decouple communication between ADC device server and local SMC device server were made (since device servers do not directly interface to each other).

Paul Suhler moved that 03-077r7 (as modified) be accepted for inclusion in ADC and ADT. Paul Entzel seconded. Approved by acclamation.

- k. ADC Notify Data Transfer Device revised 03-165r2 Paul Suhler

Reviewed Paul Suhler's updates to 03-165r1 from yesterday. Cleaned up to decouple ADC and SMC device servers consistent with 03-077r7. The result was 03-165r2.

7. Dates for Teleconferences Group

Discussed possibility to change ad hoc teleconferences on Mondays instead of Wednesday.

8. Review of New Action Items Rod Wideman

- a) Rod Wideman to update ADC to reflect terminology changes. (e.g. device server and primary port references)
- b) Paul Suhler to revise 03-077r6 per these meeting notes.
- c) Paul Suhler to revise 03-165r1 per the discussion.
- d) Paul Suhler to send revised 03-165r1 to Rod Wideman.
- e) Rod Wideman to incorporate the revised 03-165r1 into ADC.
- f) Library vendors to decide what reset capabilities are needed (e.g., hard reset, branch to 0, target reset) and provide feedback at next conference call in two weeks. Susan Gray to write proposal based on input.
- g) Paul Entzel to revise 03-163r0 and include in ADT as modified.
- h) Rod Wideman to make editorial changes to Stream Device descriptor based on discussion (ENABLE bit description, rename Stream Device descriptor to RMC Logical Unit descriptor, also rename to SMC and ADC descriptors)
- i) Rod Wideman to write proposal for TA flag behavior
- j) Rod Wideman to update ADC editor's notes as discussed
- k) Lee Jesionowski to provide Rod Wideman with ADC editorial comments (email or phone)
- l) Lee Jesionowski to provide pinout proposal for ADT connector.
- m) Paul Suhler to post 03-077r7 and send to Paul Entzel and Rod Wideman for inclusion in ADT and ADC
- n) Paul Entzel to incorporate 03-077r7 into ADT
- o) Rod Wideman to incorporate 03-077r7 into ADC

9. Adjournment Group

Paul Entzel moved we adjourn at 6:52 PM, Paul Suhler seconded, motion carried.

Attendees:

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