To: T10 Technical Committee
From: Bianca Tudosa, Veronica Hernandez and Kevin Marks
Date: April 26, 2006
Subject: T10/06-180r0 – ADC-2/ADT-2/SSC-3: Reporting Microcode download in progress thru DT Device Activity and other fixes

Revision History

Revision 0 (04/26/06) – Initial proposal

Related Documents

T10/1741-D - Automation/Drive Interface - Commands - 2 (ADC-2) Revision 4
T10/1742-D - Automation/Drive Interface - Transport Protocol - 2 (ADT-2) Revision 1
T10/1611-D – SCSI Stream Commands - 3 (SSC-3) Revision 2

New text to be added

~~Text to be deleted~~
<<Editorial Text>>

Overview of changes

1. Currently, when a microcode update is taking place on a target device via a communication interface other than the Automated Device Interface (ADI), the automation device does not have a method to be aware that the microcode update is taking place with the current revision of the ADC-2 draft standard. This proposal adds this functionality.
2. Due to the fact that the Automation device may miss the DT DEVICE ACTIVITY field being set to “Microcode update in progress” (as proposed in 1) because of the polling cycle and amount of time the DT device may response to Log Sense during the microcode update, this proposal also extends the Port Logout IU payload in ADT-2 to include a reason code for the logout.
3. Propose using “Microcode” or “Microcode update” instead of “Firmware” in text and Tape Alert tables in ADC-2 and SSC-3. ADC-2 has 4 occurrence of “firmware” and 11 occurrences of “microcode.” This would make it more closely match SPC dealing with Write Buffer and microcode updates.
4. Several Tables have <Not Bold> in the title – Assume an editing error.
5. In Table 16 — VHF DATA DESCRIPTOR field, byte 3, bit 7 is defined as the VS bit and does not have a bit definition, except in Note 8 and appears to not be in small caps. So I assume it is indicating that the contents are vendor specific. The Note 8 states that if VS bit is set to one, then ...” This makes it sound like this is a field with if set to 1 then ….?
6. Miscellaneous proposed changes to subclause 6.1.2.4.4 Serial Attached SCSI port status data
7. Miscellaneous proposed changes to subclause 6.2.2.3.5 Serial Attached SCSI descriptor parameter format

1) Proposed Changes to ADC-2 for 1:

6.1.2.2 Very high frequency data log parameter

<<Add row to Table 17 - DT DEVICE ACTIVITY field values>>

Table 17 — DT DEVICE ACTIVITY field values

Value	Description
….	……..
0Ah	Formatting medium
0Bh	Calibrating medium
0Ch	Other DT device activity
0Dh	Microcode update in progress
0~~D~~Eh-7Fh	Reserved
80h-FFh	Vendor-specific DT device activity

2) Proposed Changes to ADT-2 for 2:

6.5.5 Port logout information unit

….
<< 6th Paragraph>>

The payload of the Port Logout IU is shown in table 16.

Table 16 — Port Logout IU payload contents

Byte\Bit	7	6	5	4	3	2	1	0
0	(MSB)			LOGOUT DURATION				
1								(LSB)
2	REASON CODE							
3	Reserved							

The LOGOUT DURATION field contains the length in seconds that the port that receives the Port Logout IU shall remain in P3:Logged-out state. A value of zero indicates that the port that receives the Port Logout IU shall remain in the P3:Logged-out state until it receives a Port Login IU.

The REASON CODE field contains the reason the port logged out. REASON CODE values are shown in table 17.

<< New table 17 added>>

Table 17 - REASON CODE field

Value	Description
00h	Reason not stated
01h	Microcode update in progress
02-FFh	Reserved

After a port sends an ACK IU in response to a Port Logout IU it shall set its operating parameters to default and enter the P3:Logged-Out state. Once the originator of a Port Logout IU receives an ACK IU for that exchange, it shall set its operating parameters to default and enter the P0:Initial state. See 4.3 for a definition of the port states.

<<….>>

3a) Proposed Changes to ADC-2 for 3:

4.2.4.1 Load states

<<….>>

<<Insert Table 2 — Load example >>

In this example, the DT device is loaded by the automation device first placing a medium into the DT device, then pushing the medium far enough into the DT device so that the DT device engages the medium and completes the operation in one continuous motion.

1) The load sequence begins with the DT device initialized, no medium present and robotic access allowed;
2) The automation device then places the medium into the DT device, which is not yet recognized by the DT device;
3) After the initial placement, the automation device pushes the medium into the DT device, such that medium presence is detected and the DT device assumes control of the medium and seats it;
4) The DT device continues transitioning through states as it threads the medium;
5) After threading, the DT device has some final microcode~~firmware~~ preparations to make; and
6) The load is complete.

<<….>>

4.2.6 TapeAlert application client interface

<<….>>

Table 4 — Additional TapeAlert state flag clearing conditions <Not Bold>(part 2 of 2)

Flag	Name	Additional clearing condition
…	…	…
22h	~~Down-load~~ Microcode update fail	Start of next microcode update~~firmware download~~
…	…	…
3Ah	Microcode~~Firmware~~ failure	After service resolution
…	…	…

<<….>>

6.2.2.4.2 RMC logical unit descriptor format

<<3rd Paragraph after table 52 — AUTOLOAD MODE field >>

An automatic unload hold (AUH) bit set to one disables ejecting the medium when the medium is unloaded due to DT device specific conditions (e.g., cleaning complete, invalid medium type, microcode~~firmware~~ update complete, unsupported format, or other error conditions detected by the DT device). An AUH bit set to zero shall have no effect on the ejecting of the medium. The AUH bit does not affect the unload operation initiated via the physical user interface of the DT device.

3b) Proposed Changes to SSC-3 for 3:

4.2.15 TapeAlert application client interface
4.2.15.1 TapeAlert introduction
<<…>>

Table 9 — TapeAlert flags (Continued)

Flag	Name	Type	Severity	Additional clearing condition
…	…	…	…	…
22h	~~Download~~ Microcode update fail	O	W	Start of next microcode update~~firmware download~~
…	…	…	…	…
3Ah	Microcode~~Firmware~~ failure	O	W	After service resolution
…	…	…	…	…

<<….>>

A.2 TapeAlert flag associated information

<<….>>

Table A.1 — TapeAlert log page parameter codes (Continued)

Code	Flag	Recommended application client message	Probable cause
…	…	…	…
22h	~~Down-load~~ Microcode update fail	The microcode update ~~firmware download~~ has failed because you have tried to use the incorrect microcode ~~firmware~~ for this tape drive. Obtain the correct microcode ~~firmware~~ and try again.	~~Firmware download~~ failed.
…	…	…	…
3Ah	Microcode~~Firmware~~ failure	The tape drive has reset itself due to a detected microcode ~~firmware~~ fault. If problem persists, call the supplier help line.	~~Firmware~~ bug.
…	…	…	…

<<….>>

4) Proposed Changes to ADC-2 for 4:

<<Tables 4, 5, and 12 have <Not Bold> in table title>>

Table 4 — Additional TapeAlert state flag clearing conditions ~~<Not Bold>~~(part 1 of 2)
Table 4 — Additional TapeAlert state flag clearing conditions ~~<Not Bold>~~ (part 2 of 2)
Table 5 — Command set for automation/drive interface ~~<Not Bold>~~ (part 1 of 2)
Table 5 — Command set for automation/drive interface ~~<Not Bold>~~part 2 of 2)
Table 12 — Log page codes ~~<Not Bold>~~ (part 1 of 2)

Table 12 — Log page codes ~~<Not Bold>~~ (part 2 of 2)

<< Also noticed that the table of tables does not match some table titles. >>

5) Proposed Changes to ADC-2 for 5:

<< No changes proposed >>

6) Proposed Changes to ADC-2 for 6:

7.1.2.4.4 Serial Attached SCSI port status data

The format of the DT device primary port status data for a ~~serial attached SCSI~~SAS port (see SAS-1.1) is shown in table 22.

Table 22 — Serial Attached SCSI port status data format

Byte\Bit	7	6	5	4	3	2	1	0
0	NEGOTIATED PHYSICAL LINK RATE				Reserved		SIGNAL	PIC
1	(MSB)							
	~~CURRENT~~ HASHED SAS ADDRESS							
3								(LSB)

A port initialization complete (PIC) bit ~~is~~ set to one indicates that the port has successfully completed speed negotiation and the identification sequence (see SAS-1.1). When ~~the~~ port initialization is complete the SAS port is ready to receive an ~~open~~OPEN address frame.

A SIGNAL bit set to one indicates that a signal is detected at the DT device primary port (e.g., COMINIT detected). A SIGNAL bit set to zero indicates a signal is not detected.

<< What exactly is a SIGNAL when it comes to SAS. FC status data format has an e.g. that explains this. >>

The NEGOTIATED PHYSICAL LINK RATE field indicates the negotiated physical link rate (see SAS-1.1) for the SAS port.

The ~~CURRENT~~ HASHED SAS ADDRESS field ~~indicates~~ contains the hashed version of the SAS address of the SAS port (see SAS-1.1)~~24 bit hashed address that is~~ assigned to the DT device primary port. ~~The CURRENT HASHED SAS ADDRESS shall be ignored when the PIC bit is set to zero.~~

<< Is the usage of CURRENT because of the ability to change the Target port ID, if not, then do not see the need for CURRENT, as it does not change, unlike FC where the LOOP ID or N_PORT_ID can. Additionally the current field definition did not seem to define the field. Out of curiosity why was the Target Port Identifier (SAS address) not chosen, because it seems that an application client needs to know how to do the hash in order to make use of the HASHED SAS ADDRESS?

The HASHED SAS ADDRESS would seem to be valid regardless of the PIC value?>>

7) Proposed Changes to ADC-2 for 7:

6.2.2.3.5 Serial Attached SCSI descriptor parameter format

~~t~~Table 47 describes the format of the descriptor parameter for SAS port types.

Table 47 — ~~SAS~~ Serial Attached SCSI descriptor parameter format

Byte\Bit	7	6	5	4	3	2	1	0
0	Reserved				MPIN		Rsvd	PE
1	Reserved							
3								
4	(MSB)							
11	PORT NAME IDENTIFER							(LSB)

A DT device receiving a MODE SELECT command for an enabled DT device primary port, where the command attempts to change the value of the MPI field or PORT IDENTIFER field, shall return CHECK CONDITION. The sense key shall be set to ILLEGAL REQUEST with the additional sense code set to INVALID FIELD IN PARAMETER LIST. If the DT device primary port is disabled, the DT device may change the MPI field or PORT IDENTIFER field and enable the DT device primary port with the same MODE SELECT command.

A Port Enable (PE) bit set to one enables the DT device primary SAS port. When the PE bit is set to zero, the DT device shall not enable any phy contained in the DT device primary SAS port's phy (see SAS-1.1).

<< Assume the Port Enable bit is for an entire wide port (all phys) if present.>>

The modify port identifier name (MPIN) field and PORT NAME PORT IDENTIFER fields control the DT device primary SAS port's name identifier (see SAS-1.1) as defined in the table 48.

Table 48 — MPIN field

Value	MODE SENSE command [a]	MODE SELECT command [a]
00b	The MPIN field shall be set to zero for a MODE SENSE command. The PORT IDENTIFER NAME field shall contain the currently assigned port identifier value.	Do not modify the DT device primary port's name identifier (see SAS-1.1). The PORT IDENTIFER NAME field shall be ignored.
01b	Invalid value for a MODE SENSE command.	Reserved.
10b	Invalid value for a MODE SENSE command.	Set the DT device primary port's name identifier to the manufacturer's default value. The value in the PORT IDENTIFERNAME field shall be ignored.
11b	Invalid value for a MODE SENSE command.	Set the DT device primary port's name identifier to the value contained in the PORT IDENTIFERNAME field.

[a] See SPC-3

The PORT IDENTIFERNAME field contains the DT device's primary SAS port name identifier (see SAS-1.1). When the MPIN field is set to 11b, the PORT IDENTIFERNAME field shall contain an NAA IEEE Registered format identifier identifier type name identifier (see SPC-3).