TO:	T10 Membership
FROM:	Paul A. Suhler, Quantum Corporation
DATE:	20 June 2006
SUBJECT:	T10/05-049r3, SSC-3 Physical Device Model

Revision 0:

- Initial proposal based upon discussion in SSC-3 working group meeting, 19 January 2005, T10/05-048r0, discussion item 6.4.

Revision 1:

- Revisions based upon discussion in SSC-3 working group meeting, 9 March 2005, T10/05-111r0.

Revision 2:

- Revisions based upon Rod Wideman's email of 21 March 2005.

- Added Dave Peterson's UML figure.

Revision 3:

- Updated SSC-3 references.

Background

In the course of developing the Automation/Drive Interface – Commands (ADC) standard, the ADI working group found that it was necessary to separate the concept of the physical device from that of the device server, mainly because it was necessary to have two different device servers controlling a single physical device. However, the concept of a physical device has never been formalized.

Actions from outside the device server can affect its execution of commands. Examples include insertion of media by a media changer, automatic cleaning, inputs from a front panel, and commands executed by an ADC device server.

Proposed Changes

1. Add the following to clause 3.1 Definitions:

3.1.X physical device: An object in a SCSI target device that performs operations on a volume (e.g., reading, writing, loading, and unloading).

2. Add the following to clause 4.2 Sequential-access device model:

4.2.X Physical device

A sequential-access device contains one or more physical devices. A physical device performs operations upon the medium (e.g., loading, unloading, positioning, writing and reading the medium, and reading and writing medium auxiliary memory).

The physical device is controlled by various entities, which may include:

- a) One or more SCSI device servers (e.g., SSC and ADC);
- b) An operator interface;
- c) A management interface; and
- d) A media changer.

A media changer may control the physical device by inserting a medium into the device.

These entities perform operations that change various attributes of the physical device. These attributes affect the operations on a volume . Figure X shows in UML notation an example of the entities in a SCSI target device, and shows the attributes which comprise the physical device. The set of attributes implemented by a physical device is vendor-specific.
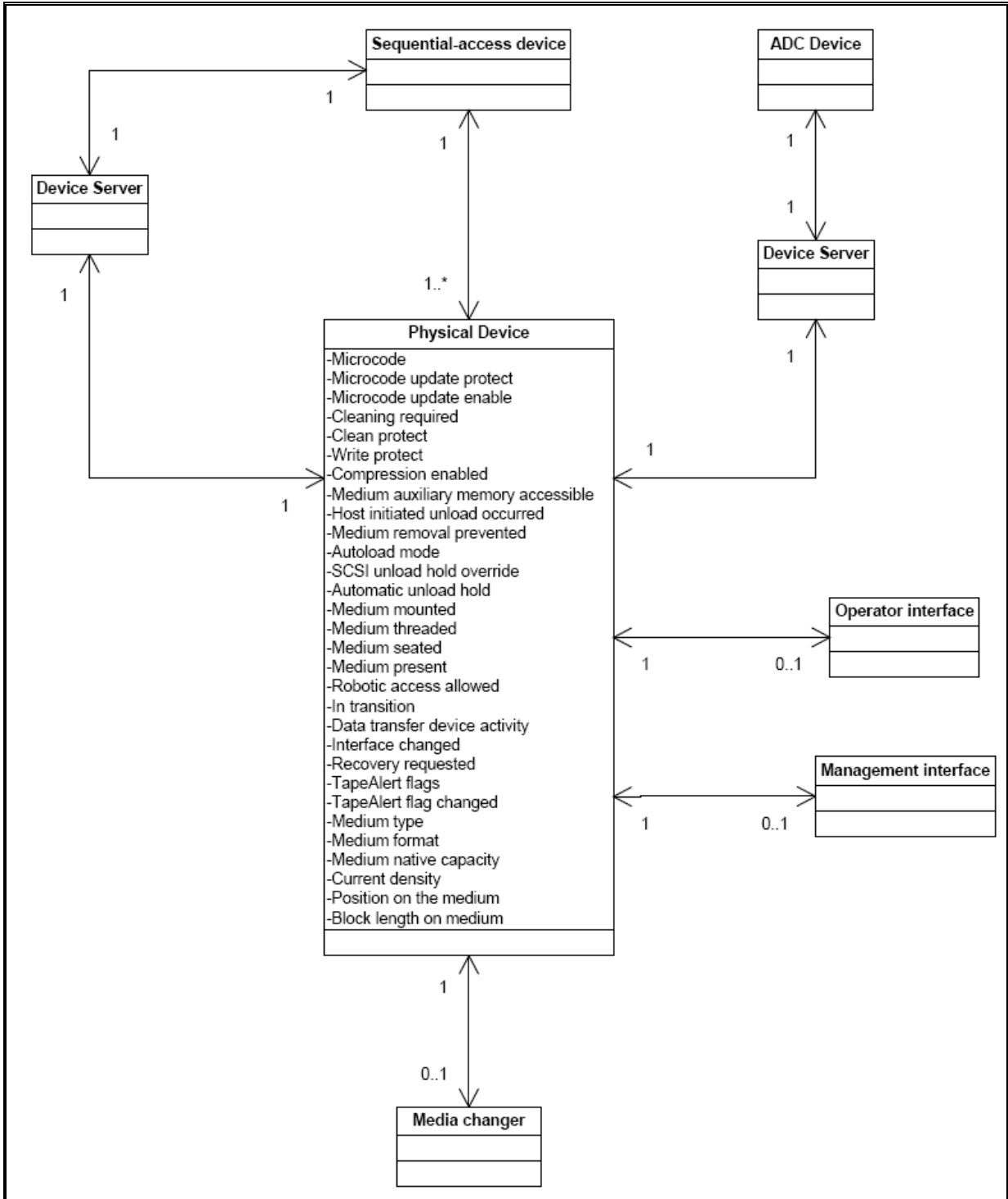
Figure X – UML description of physical device

Table X lists which INCITS standard defines each attribute.

Table X – Physical device attributes

Attribute	Reference
Microcode	SPC-3
Microcode update protect	ADC
Microcode update enable	ADC
Cleaning required [1]	ADC
Clean protect	ADC
Write protect	ADC
Compression enabled	ADC
Medium auxiliary memory accessible	ADC
Host initiated unload occurred	ADC
Medium removal prevented	ADC
Autoload mode	SPC-3
SCSI unload hold override	ADC
Automatic unload hold	ADC
Medium mounted	ADC
Medium threaded	ADC
Medium seated	ADC
Medium present	ADC
Robotic access allowed	ADC
In transition	ADC
Data transfer device activity	ADC
Interface changed [2]	ADC
Recovery requested	ADC
TapeAlert flags	A.1
TapeAlert flag changed	ADC
Medium type (e.g., non-WORM data, WORM data, cleaning, microcode) [3]	7.7.4
Medium format (e.g., LTO-1, LTO-2, SDLT-x, etc.) [3]	8.3.4
Medium native capacity	7.7.3
Current density	ADC
Position on the medium	4.2
Block length on medium	SPC-3

Editor's Note:

1. I'm leaving Cleaning Required in for now, since it means that no reads or writes will be accepted until the drive is cleaned. No TapeAlert flag precisely covers this. Cleaning Requested is redundant with the TapeAlert Clean Periodic or Clean Now flag, so it's not listed separately above.

2. Interface Changed pertains to a port, rather than the physical device per se. However, since the TapeAlert flags are all included here and a couple of those pertain to the port, I've left this attribute in for now. Do we want to include all TapeAlert flags?

3. The parenthetical examples in each row will not be in the change to SSC-3; they are here for clarification. However, this may mean that we should have a paragraph for each attribute. Are these references adequate? Should SSC-3 have definitions for them?