To: INCITS T10 Committee

From: Paul Entzel, Quantum

Date: 17 July 2003

Document: T10/03-211r1

Subject: Modifications to SMC-2 to resolve Letter Ballot comment Q52.

1   Revision History

Revision 0:
Initial revision of the proposal created at the May 2003 T10 working group meeting.

Revision 1:
Changes from discussion of the proposal by the SMC-2 working group at the July 2003 T10 meeting in Colorado Springs:
♦   Remove the MAC bit and rewrite proposal to instead remove the MAMS bit added to revision 5c of SMC-2.
♦   Replace the CMP bit with a 3 bit field called Medium Type
♦   Add XX-RA and XX-WA fields to Device Capabilities mode page to replace the DMAC bit.

2   General

Letter Ballot comment Quantum-52 states that other features implemented by vendors should be standardized. Specifically, fields indicating bar code reader present, MAM capability, and cleaning management were suggested.

These issues were discussed at the T10 meeting in May, 2003 and this proposal was written to address this letter ballot comment.

3   Proposal

3.1   Read Element Status command changes

3.1.1   Add to all READ ELEMENT STATUS descriptors

Remove the MAMS bit from the READ ELEMENT STATUS element descriptors. This functionallity will be replaced by additions to the Device Capabilities mode page.

Add the following fields to byte 9 of all of the READ ELEMENT STATUS descriptors, replacing the reserved field:

Add a 2 bit field called VTQ: The Volume Tag Qualifier (VTQ) field indicates that the validity of the volume tag fields. Table X defines the values for this field

Table X – VTQ field values

Value	Description
00b	Volume tags are valid. This value shall be returned when the volume tags have been determined or the medium changer does not contain a volume tag reader (see device capabilities mode page description).
01b	Volume tag fields are invalid because the volume tags are currently inaccessible (e.g. medium is loaded in a data transfer element such that a barcode label can not be accessed and there is no prior knowledge of the label).
10b	Volume tag fields are invalid because the volume tags are unreadable or there is a problem with the volume tag reader.
11b	Reserved

Add a bit ED: The Element Disabled (ED) bit shall be set to one if the element is disabled (e.g. a magazine or drive is not installed or has been logically disabled). This bit shall be set to zero when the element is enabled.

Add a 3 bit field called Medium Type. The Medium Type field shall report the type of medium currently present in the element as determined by the medium changer. Table Y describes the values for the Medium Type field.

Table Y – Medium Type field values

Value	Description
000b	Unspecified. The medium changer does not support this field, can not determine the medium type, or the element is empty
001b	Data medium
010b	Cleaning medium.
011b – 111b	Reserved

3.1.2 Other changes to READ ELEMENT STATUS command

Remove the sentence from the FULL, ACCESS, IMPEXP bits descriptions that claims they are not valid when the EXCEPT bit is set to one.

Add to bit 7 of byte 2 of the IE descriptor, OIR: The Operator Intervention Required (OIR) bit shall be set to one when operator intervention is required to make the import/export element accessible. The OIR bit shall be set to zero if the ACCESS bit is set to one or if no operator intervention is required.

3.2 Changes to Device Capabilities mode page

Add the following fields to byte 3 of the Device Capabilities mode page:

Add a one bit field called BTV with the following description: The Byte Three Valid (BTV) bit shall be set to one when fields in byte 3 of the Device Capabilities mode page are supported per this standard. The BTV bit shall be set to zero when byte 3 of the Device Capabilities mode page are treated as reserved.

Add a one bit field called VTRP with the following description: The Volume Tag Reader Present (VTRP) bit shall be set to one by the medium changer to indicate that a volume tag reader is installed in the medium changer (e.g. optical bar code reader). The VTRP shall be set to zero to indicate that a volume tag reader is not present or is not functional.

Add a one bit field called ACE with the following description: The Auto-clean Enabled (ACE) shall be set to one if the medium changer is managing the data transfer element cleaning process. This bit shall be set to zero if the medium changer is not managing the cleaning process.

Add the following 2 bit fields:
- ♦ Bit 6 and 7 of byte 4 named MT-RA.
- ♦ Bit 6 and 7 of byte 5 named ST-RA.
- ♦ Bit 6 and 7 of byte 6 named I/E-RA.
- ♦ Bit 6 and 7 of byte 7 named DT-RA.
- ♦ Bit 6 and 7 of byte 12 named MT-WA.
- ♦ Bit 6 and 7 of byte 13 named ST-WA.
- ♦ Bit 6 and 7 of byte 14 named I/E-WA.
- ♦ Bit 6 and 7 of byte 15 named DT-WA.

Add the paragraph to define these fields:
The XX-RA and XX-WA field indicate the resources the medium changer require to support the READ ATTRIBUTE (RA) and WRITE ATTRIBUTE (WA) commands for each element type. If the required resources are not available the device server may reject a READ ATTRIBUTE or WRITE ATTRIBUTE command. Alternately, the device may accept the command but delay processing it until resources are available. Table Z describes the values for these fields.

Table Z – XX-RA and XX-WA Type field values

Value	Description
00b	No MAM access available. READ ATTRIBUTE and WRITE ATTRIBUTE commands that access elements of this type shall be rejected by the device server with CHECK CONDITION status. The Sense Key shall be set to Illegal Request and the additional sense code shall be INVALID FILED IN CDB.
01b	No resources required for MAM access. The device server shall introduce little or no delay in processing of READ ATTRIBUTE and WRITE ATTRIBUTE commands due to resources.
10b	MTE required for MAM access. If no MTE elements are available, the device server may send a CHECK CONDITION status to a READ ATTRIBUTE or WRITE ATTRIBUTE command addressed to elements of this type. The Sense Key shall be set to Illegal Request and the additional sense code shall be INVALID FILED IN CDB.
11b	MTE and DTE required for MAM access. If no MTE elements are available, or no DTE elements are available, the device server may send a CHECK CONDITION status to a READ ATTRIBUTE or WRITE ATTRIBUTE command addressed to elements of this type. The Sense Key shall be set to Illegal Request and the additional sense code shall be INVALID FILED IN CDB.