

To: Members of X3T10

From: Erich Oetting

Re: SMC Device Identification (97-148 r1)

The SMC Read Element Status command has optional fields for reporting the SCSI bus address and LUN for attached data transfer devices. The SCSI bus address field is one byte, and the LUN field is 3 bits. Both fields are too small to handle the allowed range in SCSI-3. Rather than simply increasing the field size, I propose obsoleting this method in favor of passing Device Identifiers in Element Descriptors.

Make the SCSI bus address, LUN, Not Bus, ID valid and LUN valid fields in the Data transfer element descriptor obsolete.

Add language to restrict the use of the SCSI bus address, and LUN fields to addresses that will fit in the fields.

Add a new optional bit to the Read Element Status command to request the return of an Identification descriptor for each returned element descriptor.

For a Data Transfer Element, the Identification descriptor refers to the attached device (disk or tape drive), and would match an Identification descriptor available by sending an Inquiry command directly to the attached device.

For other classes of Element, the Identification descriptor refers to the Element, and does not identify any media currently stored within.

An Import/Export Element used to transfer media between two media changers would return the same Identification descriptor when queried by either media changer.

The format of Identification descriptors is already defined by the Device Identification Page EVPD data in SPC.

Read Element Status CDB

Bit	7	6	5	4	3	2	1	0
Byte								
0	Operation code							
1	Reserved			VolTag	Element type code			
2	(MSB)	Starting element address						(LSB)
3								
4	(MSB)	Number of elements						(LSB)
5								
6	Reserved							DvcID
7	(MSB)	Allocation length						(LSB)
8								
9								
10	Reserved							
11	Control							

Add a DvcID flag (byte 6, bit 0) to the Read Element Status CDB.

A DvcID bit of one indicates that the target shall report Device ID information for Data Transfer Elements and Import/Export Elements if this feature is supported. A value of zero indicates that Device ID information shall not be reported. If the Device ID feature is not supported, this field shall be treated as reserved.

Data Transfer Element Descriptor

Bit	7	6	5	4	3	2	1	0	
Byte									
0	(MSB) Element address								
1								(LSB)	
2	Reserved			Access	Except	Reserved	Full		
3	Reserved								
4	Additional sense code								
5	Additional sense code qualifier								
6	Not bus	Reserved	ID valid	LUN valid	Reserved	Logical unit number			
7	SCSI bus address								
8	Reserved								
9	SValid	Invert						Reserved	
10	(MSB) Source storage element address								
11								(LSB)	
12									
47	Primary volume tag information (Field omitted if PVolTag = 0)								
48									
83	Alternate volume tag information (Field omitted if PVolTag = 0)								
84									
87+IL	Identification Descriptor (Field moved up if volume tag information field(s) are omitted.)								
88+IL									
z-1	Vendor unique (Field moved up if volume tag information field(s) are omitted.)								

1. Add the following restrictions:

Devices with SCSI bus addresses above 255 shall set the ID valid field to zero. Devices where LUN is over 7 shall set the LUN valid field to zero.

Add the Identification Descriptor field after the Volume Tag fields, replacing a Reserved field. The length of this new field is variable, but defined by the Identifier Length (IL, byte 87) within the field. Make the same change to all Element Descriptor types.

Identification Descriptor

Bit	7	6	5	4	3	2	1	0
Byte								
0	Reserved				Code Set			
1	Reserved				Identifier Type			
2	Reserved							
3	Identifier Length (n-3)							
4	(MSB)							
n	Identifier							
								(LSB)

The Identification descriptor returns an identifier for the attached data transport device. The Code Set, Identifier Type, and Identifier fields are defined by the Device identification page in SPC. If no Identifier is available or the Device ID bit in the CDB is zero, the Identifier Length shall be zero.

For a Data Transport Element, the Identification descriptor field returns an identifier from the attached device (disk or tape drive). The same Identification descriptor field should be available via an Inquiry command issued to the data transport device (disk or tape drive).

For an Import/Export Element, the Identification descriptor field returns a unique identifier for the Import/Export device. An Element used to exchange media between two media changers should return the same Identification descriptor via either media changer.

For a Storage or Medium Transport Element the Identification descriptor field refers to the Element, and is not an identifier for any media stored in this location.