

To: T10 Technical Committee
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Subject: T10/02-194r0 SES-2 Protocol-specific device element information

Revision History

Revision 0 (28 June 2002) first revision

Related Documents

ses2r00 SCSI Enclosure Services - 2 revision 00

Overview

The 8 bit SLOT ADDRESS field in the Device element for the Enclosure Status diagnostic page contains the address of the device. However, the 8 bit size of the field makes this usable only for parallel SCSI. Larger addresses are needed for Fibre Channel and Serial Attached SCSI.

Also, many protocols support devices with multiple ports. The relationship between the ports should be reported.

Suggested Changes

Create a new Device Element Status diagnostic page to return more information about each device for which a device element is presented in the Configuration and Enclosure Status diagnostic pages. Make the SLOT ADDRESS field in the Device element for the Enclosure Status diagnostic page only defined for parallel SCSI.

A matching Device Element Control diagnostic page could be added to write protocol-specific information about each device such as bypass controls; this is not proposed here.

6.1.x Device Element Status diagnostic page

6.1.x.1 Device Element Status diagnostic page overview

The optional Device Element Information diagnostic page provides additional information about Device elements.

The Device Information diagnostic page reports an OVERALL STATUS field for each TYPE DESCRIPTOR HEADER in the Configuration diagnostic page that defines a device element and an ELEMENT STATUS field for each of the device elements that have been allowed for by the corresponding NUMBER OF POSSIBLE ELEMENTS field.

Only device elements are included in the Device Element Information diagnostic page. The device elements shall be in the same order as the device elements in the Enclosure Status diagnostic page.

The Device Element Information diagnostic page returns a device information descriptor for each of the device elements that have been allowed for by the NUMBER OF POSSIBLE ELEMENTS field in the Configuration diagnostic page. The device information descriptors shall be in the same order as the ELEMENT STATUS fields in the Enclosure Status diagnostic page.

The Device Element Information diagnostic page is read by the RECEIVE DIAGNOSTIC RESULTS command. If a PAGE CODE of 09h is transmitted using a SEND DIAGNOSTIC command, the command shall be treated as having an invalid field error (see 4.4).

The format of the Device Element Information diagnostic page is described in table x.

Table x - Device Element Information diagnostic page

<u>Category</u>	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
<u>Diagnostic page header</u>	<u>0</u>	<u>PAGE CODE (09h)</u>						
	<u>1</u>	<u>Reserved</u>						
	<u>2</u>	<u>(MSB)</u>	<u>PAGE LENGTH</u>					<u>(LSB)</u>
	<u>3</u>							
	<u>4</u>	<u>(MSB)</u>	<u>GENERATION CODE</u>					<u>(LSB)</u>
	<u>7</u>							
	<u>8</u>	<u>Zero or more Device Element Information descriptors</u>						
	<u>n</u>							

The format of the Device Element Information descriptor is specified in table x.

Table x - Device Element Information descriptor

	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
<u>0</u>	<u>Reserved</u>			<u>PROTOCOL IDENTIFIER</u>				
<u>1</u>	<u>DEVICE INFORMATION DESCRIPTOR LENGTH (n - 2)</u>							
<u>2</u>	<u>PROTOCOL-SPECIFIC INFORMATION</u>							
<u>n-1</u>								

The PROTOCOL IDENTIFIER field is defined in SPC-3 and identifies the protocol of the device being described by the Device Element Information descriptor.

The DEVICE INFORMATION DESCRIPTOR LENGTH field indicates the length of the Device Element Information descriptor.

6.1.x.2 Fibre Channel Device Element Information descriptor

The format of the Device Element Information descriptor for Fibre Channel devices is specified in table fc.

Table fc – Fibre Channel Device Element Information descriptor

	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
<u>0</u>	<u>Reserved</u>				<u>PROTOCOL IDENTIFIER (0h)</u>			
<u>1</u>	<u>DEVICE INFORMATION DESCRIPTOR LENGTH (n - 2)</u>							
<u>2</u>	<u>NUMBER OF PORTS</u>							
<u>3</u>	<u>Reserved</u>							
<u>4</u>	<u>(MSB)</u>							
<u>11</u>	<u>NODE WWN</u>							
	<u>(LSB)</u>							
	<u>One port descriptor for each port</u>							
<u>12</u>	<u>PORT POSITION</u>							
<u>13</u>	<u>Reserved</u>							
<u>14</u>	<u>Reserved</u>							
<u>15</u>	<u>Reserved</u>							
<u>16</u>	<u>PORT REQUESTED HARD ADDRESS</u>							
<u>17</u>	<u>(MSB)</u>							
<u>19</u>	<u>PORT FC ADDRESS</u>							
	<u>(LSB)</u>							
<u>20</u>	<u>(MSB)</u>							
<u>27</u>	<u>PORT WWN</u>							
	<u>(LSB)</u>							
<u>28 - n</u>	<u>...</u>							

[Editor's note: add 4 more reserved bytes before the node WWN to keep the port descriptors 8 byte aligned?]

The PROTOCOL IDENTIFIER field of 0h indicates the descriptor is describing Fibre Channel SCSI ports.

The NUMBER OF PORTS field indicates how many SCSI ports are being described. There is one port descriptor for each port.

The NODE WWN field contains the node WWN of the corresponding Fibre Channel node.

The PORT POSITION field indicates the position of the corresponding Fibre Channel port on a Fibre Channel arbitrated loop.

The PORT REQUESTED HARD ADDRESS field contains the Fibre Channel Arbitrated Loop requested hard address of the corresponding Fibre Channel port.

The PORT FC ADDRESS field contains the Fibre Channel address of the corresponding Fibre Channel port. Applications may compare the lower 8 bits of this field with the PORT REQUESTED HARD ADDRESS field to determine whether the port was assigned its requested address.

The PORT WWN field contains the port WWN of the corresponding Fibre Channel port.

6.1.x.3 Serial Attached SCSI Device Element descriptor

The format of the Device Element Information descriptor for Serial Attached SCSI devices is specified in table sas.

Table sas – Serial Attached SCSI Device Element Information descriptor

	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
<u>0</u>	Reserved				PROTOCOL IDENTIFIER (6h)			
<u>1</u>	DEVICE INFORMATION DESCRIPTOR LENGTH (n - 2)							
<u>2</u>	NUMBER OF PHYs							
<u>3</u>	Reserved							
	One phy descriptor for each phy							
<u>4</u>	Reserved							
<u>7</u>								
<u>8</u>								
<u>15</u>	PHY AS ADDRESS							
<u>16 - n</u>	...							

The PHY SAS ADDRESS field contains the SAS address used by the corresponding phy.

7.3 Field definitions for all element types

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7.3.2 Device element defined for enclosure pages

The format of the CONTROL INFORMATION field for a device element type in the Enclosure Control diagnostic page is defined in table 29.

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The format of the STATUS INFORMATION field for a device element type in the Enclosure Status diagnostic page is defined in table 30.

Table 30 — Device element for Enclosure Status diagnostic page

	7	6	5	4	3	2	1	0
0	COMMON STATUS							
1	SLOT ADDRESS							
2	Rsvd	DO NOT REMOVE	Rsvd	Rsvd	READY TO INSERT	RMV	IDENT	REPORT
3	Rsvd	FAULT SENSED	FAULT REQSTD	DEVICE OFF	ENABLE BYP A	ENABLE BYP B	BYP A ENBLED	BYP B ENBLED

For the ELEMENT STATUS field, the SLOT ADDRESS field is set to the value of the SCSI target address defined for the device slot of the primary parallel SCSI target port of the SCSI target device and is vendor specific for SCSI target devices without parallel SCSI target ports.

[Editor's note: this change clarifies which address is used for multi-ported devices (which the dual bypass bits imply are supported), and limits it to parallel SCSI.]

For the OVERALL STATUS field, the SLOT ADDRESS field is vendor specific.

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7.3.3 Device element defined for array pages

The eD device element for the Array Control diagnostic page and the Array Status diagnostic page contains information related to the device's use in a storage array. Those fields and bits common to the eD device element for the device Enclosure Control diagnostic page shall have effect if they

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are set by either the Enclosure Control diagnostic page or the Array Control diagnostic page. The mapping between the visual indicators associated with the Array Control diagnostic page and the requests to set those indicators is vendor specific.

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