

To: T10 Technical Committee
From: Rob Elliott, Compaq Computer Corporation (Robert.Elliott@compaq.com)
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Subject: SPC-3 VPD Page 83 Device Identifier rewrite

Revision History

Revision 0: first revision

Related Documents

T10/SPC-2 revision 18
T10/97-101r2 IEEE Tutorial for SCSI use of IEEE company_id (Bob Snively, Sun)
T10/00-232r4 Asymmetric SCSI Behavior (target port groups) (Ken Moe, Sun)
T10/01-004r0 Logical unit groups (Rob Elliott, Compaq)

T11/FC-FS revision 0.50

Overview

SPC-2 refers to Fibre Channel specifications for VPD Device Identifier type 3h. For SRP and iSCSI devices, it would be preferable to avoid the Fibre Channel reference, since the identifiers are not Fibre Channel specific.

This proposal suggests documenting two of the subtypes – IEEE Registered and IEEE Registered Extended – in SPC-3 itself. No functional changes are proposed.

Suggested changes

Text is based on SPC-2 revision 18. Numerous changes are anticipated as a result of the SPC-2 letter ballot but they are not incorporated here in sections where the existing text is unchanged.

[addition to 2.3:]

2.3 Normative approved references for optional features

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Information on IEEE company IDs may be found at <http://standards.ieee.org/regauth/oui>.

[new definitions and acronyms:]

3.1 Definitions

3.1.xx Network Address Authority (NAA): An organization such IEEE that administers network addresses.

3.2 Acronyms

EUI-64 Extended Unique Identifier/64-bit global identifier
IEEE Institute of Electrical and Electronics Engineers
NAA Network Address Authority

[changes to 8.4.4:]

8.4.4 Device identification page

[move existing text into new subsection 8.4.4.1 since additional subsections are being introduced]

8.4.4.1 Device identification page overview

The device identification page (see table 108) provides the means to retrieve zero or more identification descriptors applying to the logical unit. Logical units may have more than one identification descriptor (e.g., if several types or associations of identifier are supported).

Device identifiers, if any, shall be assigned to the peripheral device (e.g., a disk drive) and not to the currently mounted media, in the case of removable media devices. Media identification is outside the scope of this standard. Operating systems are expected to use the device identifiers during system configuration activities to determine whether alternate paths exist for the same peripheral device.

NOTE 62 In the case of virtual logical units (e.g., volume sets as defined by SCC), the Identifier field (see table 111) should be an IEEE Registered Extended name. The IEEE Registered Extended name has a code of 3h in the Identifier type field and an NAA value of 0110b as defined in ~~FC-PH, FC-PH-3 or FC-FS~~ 4.4.6.3.

[table 177 – Device identification page]

The PERIPHERAL QUALIFIER field and the PERIPHERAL DEVICE TYPE field in table 177 are as defined in 7.6.2.

[table 178 – Identification descriptor]

Each Identification descriptor (see table 111) contains information identifying the logical unit, physical device, or access path used by the command and returned parameter data. The ASSOCIATION field indicates the entity that the Identification descriptor describes. If a physical or logical device returns an Identification descriptor with the ASSOCIATION field set to 0h, it shall return the same descriptor when it is accessed through any other path.

The CODE SET field specifies the code set used for the identifier field, as described in table 179. This field is intended to be an aid to software that displays the identifier field.

[table 179 – Code set]

The ASSOCIATION field specifies the entity with which the IDENTIFIER field is associated, as described in table 180.

[table 180 - Association]

The IDENTIFIER TYPE field specifies the format and assignment authority for the identifier, as described in ~~table 181~~ section 8.4.4.2.

[Editor's note: new table 181 moved to a subsection so the description of the table values can be nearby.]

~~[table 181 – Identifier type]~~

The IDENTIFIER LENGTH field specifies the length in bytes of the IDENTIFIER field. If the allocation length field of the command descriptor block is too small to transfer all of the identifier, the identifier length shall not be adjusted to reflect the truncation.

The IDENTIFIER field contains the identifier as described by the ASSOCIATION, IDENTIFIER TYPE, CODE SET, and IDENTIFIER LENGTH fields.

[the following section 8.4.4.2 is entirely new, breaking original table 181 into a combination of text sections and tables. Naming the identifier type values is new.]

8.4.4.2 Identifier types and identifier formats

The IDENTIFIER TYPE field specifies the format and assignment authority for the identifier, as described in table 181.

Table 181. Identifier type

Value	Identifier type
0h	Vendor-specific
1h	T10 vendor ID
2h	EUI-64
3h	NAA
4h	Relative target port
5h	Target port group [proposed by 00-232]
6h	Logical unit group [proposed by 01-004]
7h - Fh	reserved

8.4.4.3 Vendor-specific identifier format

No assignment authority was used and consequently there is no guarantee that the identifier is globally unique (i.e., the identifier is vendor-specific).

8.4.4.4 T10 vendor ID identifier format

The first 8 bytes of the identifier field are a Vendor ID (see annex C). The organization associated with the Vendor ID is responsible for ensuring that the remainder of the identifier field is unique. One recommended method of constructing the remainder of the identifier field is to concatenate the product identification field from the standard INQUIRY data field and the product serial number field from the unit serial number page.

Table x. T10 vendor ID IDENTIFIER format

Bit Byte	7	6	5	4	3	2	1	0
0	T10 VENDOR ID							
1								
2								
3								
4								
5								
6								
7								
8	VENDOR SPECIFIC							
n								

8.4.4.5 EUI-64 identifier format

The identifier field contains a Canonical form IEEE Extended Unique Identifier, 64-bit (EUI-64). In this case, the identifier length field shall be set to 8. Note that the IEEE guidelines for EUI-64 specify a method for unambiguously encapsulating an IEEE 48-bit identifier within an EUI-64.

[Editor's note: field sizes are included with field names to a) ensure that all bits are noticed in unaligned data structures, and b) highlight that the vendor specific portion is a different length in EUI-64 vs. NAA IEEE Registered. Notes are added in each NAA section to help highlight b).]

Table xx. EUI-64 IDENTIFIER format

Bit Byte	7	6	5	4	3	2	1	0
0	IEEE COMPANY ID (24 BITS)							
1								
2								
3	VENDOR SPECIFIC EXTENSION IDENTIFIER (40 BITS)							
4								
5								
6								
7								

8.4.4.6 NAA identifier format

8.4.4.6.1 NAA identifier format overview

The identifier field contains a 4 bit Name Address Authority (NAA) field followed by an identifier. This is compatible with the Name_Identifier format defined in FC-FS.

Table xxx. NAA

NAA	Description
0000 - 0100	Restricted (for FC-FS)
0101	IEEE Registered
0110	IEEE Registered Extended
0111 - 1111	Restricted (for FC-FS)

8.4.4.1.28 4.4.6.2 NAA IEEE Registered identifier format

When NAA is IEEE Registered, the IDENTIFIER field shall contain the 24-bit IEEE company ID in canonical form followed by a 36-bit vendor specific identifier. This format is described in Table x.

[Editor’s note: IEEE uses “vendor-specified extension identifier.” FC-FS uses “vendor-specified identifier.” SPC-2 prefers “vendor specific” as the prefix. That is chosen along with FC-FS’s suffix.]

NOTE xx: The EIU-64 identifier format includes a 40 bit vendor specific identifier. The IEEE Registered identifier format includes a 36 bit vendor specific identifier.

Table xxxx. IEEE Registered NAA IDENTIFIER format

Bit Byte	7	6	5	4	3	2	1	0
0	NAA (0101b)				(MSB)			
1	IEEE COMPANY ID (24 BITS)							
2								
3	(LSB)				(MSB)			
4	VENDOR SPECIFIC IDENTIFIER (36 BITS)							
5								
6								
7								

8.4.4.1.38 4.4.6.3 NAA IEEE Registered Extended identifier format

When NAA is IEEE Registered Extended, the IDENTIFIER field shall contain the 24-bit IEEE company ID in canonical form followed by a 36-bit vendor specific identifier followed by an additional 64-bit vendor specific identifier extension. The separate vendor specific spaces allow a node to be identified by the 24-bit IEEE company ID and 36-bit vendor specific identifier. The

node may then generate additional unique sub-identifiers using the vendor specified identifier extension. The logical format of IEEE registered extended is described in Table x.

NOTE xx: The EIU-64 identifier format includes a 40 bit vendor specific identifier. The IEEE Registered Extended identifier format includes a 36 bit vendor specific identifier.

Table xxxxx. IEEE Registered Extended NAA IDENTIFIER format

Bit Byte	7	6	5	4	3	2	1	0
0	NAA (0110b)				(MSB)			
1	IEEE COMPANY ID (24 BITS)							
2								
3	(LSB)				(MSB)			
4								
5								
6	VENDOR SPECIFIC IDENTIFIER (36 BITS)							
7	(LSB)							
8	(MSB)							
9								
10								
11	VENDOR SPECIFIC IDENTIFIER EXTENSION (64 BITS)							
12								
13								
14								
15	(LSB)							

8.4.4.7 Relative *Target* Port identifier format

If the ASSOCIATION value is 1h, the IDENTIFIER value contains a four-byte binary number identifying the *target* port relative to other *target* ports in the device using the values shown table 182. In this case, the CODE SET field shall be set to 1h and the IDENTIFIER LENGTH field shall be set to 4. If the ASSOCIATION value is not 1h, use of this identifier type is reserved.

[table 182 – Relative *target* port identifier values]

[add appropriate target port group and logical unit group text here, each in its own section]

[returning to existing text. Moved into subsection]

8.4.4.8 Example

The example described in this paragraph and shown in table 183 is not a normative part of this standard. This example of a complete device identification VPD page assumes that the product is a direct-access device with an T10 Vendor ID of “XYZ_Corp”, a product identification of “Super Turbo Disk”, and a product serial number of “2034589345”. Furthermore, it is assumed that the manufacturer has been assigned a 24-bit IEEE *company_idcompany ID* of 01ABCDh by the IEEE Registration Authority Committee and that the manufacturer has assigned a 24-bit *extension_identifiervendor specific identifier* of 234567h to this logical unit. The combined 48-bit identifier is reported in the 64-bit format as defined by the IEEE 64-bit Global Identifier (EUI-64) standard. The data returned in the device identification VPD page for this logical unit is shown in table 183.

[table 183 – Device identification example]