

Date: March 4, 2025

To: T10 Committee

From: Brad Besmer, Broadcom

Subject: T10/24-066 SPC-7 SBC-6 SNT Add NVMe Information VPD Page

## **Overview**

This proposal adds an NVMe Information VPD page

## **Revision History**

R0

- Initial Revision

R1

- Updates per CAP working group
- Added editors notes regarding SNT in bibliography
- Updated section numbering to reflect latest SNT draft
- Updated various Normative References
- Added definitions for NVMe Fabric Device and NVMe PCIe Device
- Updated abbreviations
- Updated the description of the NVMe Information VPD page
- Added more NVMe spec version values to the NVMe Information VPD page
- Added FWUG field to the NVMe Information VPD page
- Updated descriptions for PCIe Device only fields

R2

- R1 was approved at the Nov 2024 meeting, however had some issues.
- Bytes 104-107 defined 2 fields, so moved NVME BASE SPEC VERSION field to bottom
- Shifted the other VERSION fields down by 8 bytes
- VSID field was 12 bytes, should have been 8 bytes, which caused FWUG to move up also and increased the number of reserved bytes.
- Updated PAGE LENGTH field
- Updated to SPC-7

R3

- Updated PAGE LENGTH field
- Removed "SPEC" from all of the version fields
- Increased the Reserved space at the end of the page

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- Removed annotation for why space is reserved at the end of the page

## SPC-7 Changes

EdNote: Add SNT to the bibliography

EdNote: Change SAT-x from Normative Reference to Bibliography if appropriate

**Table 512 – Vital product data page codes**

VPD Page Name	Page code	Reference	Support
....			
Mode Page Policy	87h	SPC-6	See SPC-6
<a href="#">NVMe Information</a>	<a href="#">8Eh</a>	<a href="#">SNT</a>	<a href="#">See SNT</a>
Power Condition	8Ah	SPC-6	See SPC-6
...			

EdNote: Add to Table E.14 – VPD page codes

8Eh    D

NVMe Information

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## SBC-6 Changes

EdNote: Add SNT to the bibliography

Table 258 – VPD page codes for direct access block devices

VPD page name	Page code <sup>a</sup>	Reference	Support
....			
Mode Page Policy	87h	SPC-6	See SPC-6
<a href="#">NVMe Information</a>	<a href="#">8Eh</a>	<a href="#">SNT</a>	<a href="#">See SNT</a>
Power Condition	8Ah	SPC-6	See SPC-6
...			

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# SNT Changes

EdNote: Integrate after 24-060

## 2 Normative References

EdNote: Add new normative reference

*NVMe® over PCIe Transport Specification Revision 1.1, August 5<sup>th</sup>, 2024 <sup>1)</sup>*

*NVM Express® Zoned Namespace Command Set Specification Revision 1.2, August 5<sup>th</sup>, 2024 <sup>1)</sup>*

*NVM Express® Management Interface Specification Revision 2.0, August 5<sup>th</sup>, 2024 <sup>1)</sup>*

*PCI Express® Base Specification Revision 6.2, February 24, 2024. <sup>2)</sup>*

EdNote: Add new footnote

2) For more information on the documents published by the PCI-SIG., see <http://www.pcisig.com/>.

## 3.1 Definitions

### 3.1.X NVMe Fabric Device

an NVMe device that implements the message-based transport model

### 3.1.Y NVMe PCIe Device

an NVMe device that implements the memory-based transport

## 3.2 Symbols and abbreviations

EdNote: Add new abbreviation

### 3.2.1 Abbreviations

..	NVMe-PCI	<i>NVM Express NVMe over PCIe® Transport Specification (See clause 2)</i>
	NVM-MI	<i>NVM Express Management Interface Specification (See clause 2)</i>
	PCIeBASE	<i>PCI Express Base Specification (See clause 2)</i>

## 11.5 Vital product data parameters

### 11.5.1 Overview

The VPD page translations defined in this standard are described in Table 4.

Table 4 VPD page translations

VPD Page Name	Page code	Reference	Support
Block Device Characteristics	B1h	10.5.1.1	Optional
Block Limits	B0h	10.5.1.2	Optional
Device Identification	83h	10.5.1.3	Mandatory
Extended Inquiry Data	86h	10.5.1.4	Optional
Logical Block Provisioning	B2h	10.5.1.5	Optional
Mode Page Policy	87h	10.5.1.6	Optional
<a href="#">NVMe Information</a>	<a href="#">8Eh</a>	<a href="#">12.4.1</a>	<a href="#">Mandatory</a>
Supported Block Lengths and Protection Types	B4h	10.5.1.7	Optional
Supported VPD Pages	00h	10.5.1.8	Mandatory
Unit Serial Number	80h	10.5.1.9	Optional
All others	See applicable command standard		

## 13.4 SNT specific VPD pages

**EdNote: All of 12.4.1 is new**

### 13.4.1 SNT specific VPD pages overview

VPD pages that are unique to the SCSI to NVMe Translation standard are described in 12.4. These VPD pages are for use by the SNTL and are shown in table 18.

Table 18 – SNTL specific VPD pages

VPD Page Name	Page code	Reference	Support
NVMe Information	8Eh	12.4.1	Mandatory

### 13.4.1 NVMe Information VPD page

The NVMe Information VPD page contains:

- information about the SNTL;
- information about the NVMe device; and
- information about the namespace associated with the logical unit.

Table 19 defines the NVMe Information VPD page.

Table 19 – NVMe Information VPD page

Byte\Bit	7	6	5	4	3	2	1	0	
0	PERIPHERAL QUALIFIER			PERIPHERAL DEVICE TYPE					
1	PAGE CODE (8Eh)								
2	(MSB)	PAGE LENGTH (C0h)							(LSB)
3									
4									
...	Reserved								

7					
8					
...		SNT VENDOR IDENTIFICATION			
15					
16					
...		SNT PRODUCT IDENTIFICATION			
31					
32					
...		SNT PRODUCT REVISION LEVEL			
35					
36					
...		MODEL NUMBER			
75					
76					
...		SERIAL NUMBER			
95					
96					
...		FIRMWARE REVISION			
103					
104	(MSB)	PCI VENDOR ID			
105					(LSB)
106	(MSB)	PCI SUBSYSTEM VENDOR ID			
107					(LSB)
108	(MSB)	PCI DEVICE ID			
109					(LSB)
110	(MSB)	PCI SUBSYSTEM DEVICE ID			
111					(LSB)
112					
...		PCI DEVICE SERIAL NUMBER			
119					
120	(MSB)	CONTROLLER ID			
121					(LSB)
122		FORM FACTOR			
123	Reserved	VSID VALID	NUUID VALID	NGUID VALID	EUI64 VALID
124					
...		EUI64			
131					
132					
...		NGUID			
147					
148					
...		NUUID			
163					
164		VSID			

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...	
171	
172	FWUG
173	Reserved
...	
179	
180	NVME BASE VERSION
...	
183	
184	NVM COMMAND SET VERSION
...	
187	
188	ZNS COMMAND SET VERSION
...	
191	
192	Reserved
...	
207	

The PERIPHERAL QUALIFIER field and the PERIPHERAL DEVICE TYPE field are described in SPC-7 and shall be set as described in 8.1.2.

The PAGE CODE field and the PAGE LENGTH field are described in SPC-7 and shall be set as shown in table XX.

**EdNote:** XX is the table titled *“INQUIRY parameter data translations”*

The SNT VENDOR IDENTIFICATION field shall contain an 8-byte ASCII string identifying the vendor of the SNTL. The data shall be left aligned within the field. The vendor identification string shall be one assigned by INCITS for use in the Standard INQUIRY data VENDOR IDENTIFICATION field. A list of assigned vendor identification strings is in SPC-7 and on the T10 web site (<https://www.t10.org>).

The SNT PRODUCT IDENTIFICATION field shall contain 16 bytes of ASCII data as defined by the vendor of the SNTL. The data shall be left-aligned within the field.

The SNT PRODUCT REVISION LEVEL field shall contain four bytes of ASCII data as defined by the vendor of the SNTL. The data shall be left-aligned within the field.

The MODEL NUMBER field shall be set to the contents of the NVMe Identify Controller data structure (CNS 01h) MN field (see NVMeBASE) (i.e., Model Number).

The SERIAL NUMBER field shall be set to the contents of the NVMe Identify Controller data structure (CNS 01h) SN field (see NVMeBASE) (i.e., Serial Number).

The FIRMWARE REVISION field shall be set to the contents of the NVMe Identify Controller data structure (CNS 01h) FR field (see NVMeBASE) (i.e., Firmware Revision).

The PCI VENDOR ID field shall be set to the contents of the NVMe Identify Controller data structure (CNS 01h) VID field (see NVMeBASE) (i.e., PCI Vendor ID).

The PCI SUBSYSTEM VENDOR ID field shall be set to the contents of the NVMe Identify Controller data structure (CNS 01h) SSVID field (see NVMeBASE) (i.e., PCI Subsystem Vendor ID).

For an NVMe PCIe Device:

- a) the PCI DEVICE ID field shall be set to the contents of the PCI Express Type 0/1 Common Configuration Space DID register (i.e., offset 00h, bits 31:16) (see NVMe-PCI);
- b) the PCI SUBSYSTEM DEVICE ID field shall be set to the contents of the PCI Express Type 0/1 Common Configuration Space SSID register (i.e., offset 2Ch, bits 31:16) (see NVMe-PCI); and
- c) the PCI DEVICE SERIAL NUMBER field shall be set to the contents of the optional Serial Number register in the Device Serial Number Extended Capability (see PCIeBASE) if present, otherwise this field shall be set to zero.

For an NVMe Fabric Device:

- a) the PCI DEVICE ID field shall be set to zero;
- b) the PCI SUBSYSTEM DEVICE ID field shall be set to zero; and
- c) the PCI DEVICE SERIAL NUMBER field shall be set to zero.

The CONTROLLER ID field shall be set to the contents of the NVMe Identify Controller data structure (CNS 01h) CNTLID field (see NVMeBASE) (i.e., Controller ID).

If the NVMe-MI Receive command is supported, then the SNTL shall use an NVMe-MI Receive command and set the FORM FACTOR field to:

- 1) the contents of the NVMe Upstream Connector Element Descriptor FF field (see NVM-MI) (i.e., Form Factor) if non-zero;
- 2) the contents of the NVMe MultiRecord Area data structure FF field (see NVM-MI) (i.e., Form Factor) if non-zero; or
- 3) zero (i.e., unspecified);

otherwise, the FORM FACTOR field shall be set to zero.

The EUI64 VALID bit indicates the EUI64 field is valid (i.e., not set to all zeros).

The NGUID VALID bit indicates the NGUID field is valid (i.e., not set to all zeros).

The NUUID VALID bit indicates the UUID field is valid (i.e., not set to all zeros).

The VSID VALID bit indicates the VSID field is valid.

The EUI64 field shall be set to the NVMe Identify Namespace data structure (CNS 00h) EUI64 field (see NVMeCS).

The NGUID field shall be set to the NVMe Identify Namespace data structure (CNS 00h) NGUID field (see NVMeCS).



The `NUUID` field shall be set to the `NID` field in the first NVMe Identify Namespace Descriptor List data structure (CNS 03h) (see NVMeBASE) with a `NIDT` value of 3h (i.e., Namespace UUID).

The `VSID` field is vendor specific.

The `FWUG` field shall be set to the NVMe Identify Controller data structure (CNS 01h) `FWUG` field (see NVMeBASE).

The `NVME BASE VERSION` field shall be set to the contents of the VS Controller Property (see NVMeBASE Controller Properties section) (i.e., Version).

The `NVM COMMAND SET VERSION` field shall be set to the Identify Controller Data Structure (CNS 06h, CSI 00h) `VER` field (see NVMeCS).

The `ZNS COMMAND SET VERSION` field shall be set to the Identify Controller Data Structure (CNS 06h, CSI 02h) `VER` field (see NVMeZNS).