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NVM Express® Technical Proposal

Technical Proposal ID	TP4138 – Enable Namespace Management command to support Key Value Command Set
Revision Date	2022-03-15
Builds on Specification(s)	NVM Express Key Value Command Set Specification 1.0a
References	TP4095a Namespace Capability Reporting

Technical Proposal Author(s)

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Technical Proposal Overview

This proposal adds the:

- reporting of the Format Index used to determine the format of an allocated namespace associated with the Key Value Command Set in the I/O Command Set specific Identify Namespace data structure; and
- ability for the host to specify the format for creating a namespace associated with the Key Value Command Set by adding a Format Index to the Host Software Specified Fields data structure.

Revision Date	Change Description
2021.11.01	Initial draft
2021.12.23	Changed the 2021 date to 2022. Added headers to the navigation pane.
2021.01.06	Aligned with TP4095a
2022.01.13	Removed all comments, accepted all changes, and convert all references and cross-references to text.
2022.01.19	Added acronym to field name.
2022.02.11	Corrected trademarks and copyright dates.
2022.03.06	Integrated
2022.03.14	Editorial changes
2022.03.15	Removed Note 1 from figure 38 as the information is redundant.

Description for Changes Document for:

NVM Express Key Value Command Set Specification 1.0a

New Features/Feature Enhancements/Required Changes:

- Update the Namespace Management command - mandatory
 - **New requirement / incompatible change**
 - Add the Format Index to be specified in the Host Software Specified Fields.
- Update the Identify command - mandatory
 - **New requirement / incompatible change**
 - Add the Format Index to be reported in the I/O Command Set specific Identify Namespace data structure for the Key Value Command Set.
 - References
 - Technical Proposal TP4138

Markup Conventions:

Black:	Unchanged (however, hot links are removed)
Red Strikethrough:	Deleted
Blue:	New
Blue Highlighted:	TBD values, anchors, and links to be inserted in new text.
<Green Bracketed>:	Notes to editor

Description of NVM Express Key Value Command Set specification 1.0a changes:

Modify a portion of section 4.1.5.1 as shown below:

4 Admin Commands for the Key Value Command Set

...

4.1 Admin Command behavior for the Key Value Command Set

...

4.1.5 Identify Command

...

4.1.5.1 I/O Command Set specific Identify Namespace data structure (CNS 05h, CSI 01h)

...

<Note: The Reported field in Figure 36 is defined by TP 4095>

Figure 36: Identify – I/O Command Set specific Identify Namespace Data Structure, Key Value Type Specific

Bytes	O/M 1	Description	Reported ²						
...									
28	O	Format Progress Indicator (FPI): Refer to the NVMe Base Specification.	No						
29	M	KV Format Capabilities (KVFC): This field defines capabilities associated with the KV format. <table><tr><th>Bits</th><th>Definition</th></tr><tr><td>7:4</td><td>Reserved</td></tr><tr><td>3:0</td><td>KV Format Index (KVFI): This field indicates the Format Index that was used to format the namespace.</td></tr></table> <p>This field is contained in the Formatted LBA Size (FLBAS) field in the Changed Namespace Event data structure of the Changed Namespace Event in the Persistent Event Log (refer to the NVM Express Base Specification).</p>	Bits	Definition	7:4	Reserved	3:0	KV Format Index (KVFI): This field indicates the Format Index that was used to format the namespace.	No
Bits	Definition								
7:4	Reserved								
3:0	KV Format Index (KVFI): This field indicates the Format Index that was used to format the namespace.								
31:29 30		Reserved							
35:32	O	Namespace Optimal Value Granularity (NOVG): This field indicates the optimal value granularity for this namespace. This field is specified in bytes. The host should construct Store commands that store multiples of NOVG bytes to achieve optimal performance. A value of 0h indicates that no optimal value granularity is reported.	No						
...									

Modify a portion of section 4.1.6 as shown below:

4.1.6 Namespace Management command

...

Figure 38: Namespace Management – Host Software Specified Fields

Bytes	Description	Reported
Fields that are a subset of the I/O Command Set specific Identify Namespace data structure (refer to Figure 36)		
07:00	Namespace Size (NSZE)	Yes
29:08	Reserved	
30	Namespace Multi-path I/O and Namespace Sharing Capabilities (NMIC)	Yes
31	KV Format Capabilities (KVFC)	Yes
91: 34 32	Reserved	
95:92	ANA Group Identifier (ANAGRPID) ¹	Yes
99:96	Reserved	
101:100	NVM Set Identifier (NVMSETID) ¹	Yes
103:102	Endurance Group Identifier (ENDGID)	Yes
511:104	Reserved	
Notes:		
1. A value of 0h specifies that the controller determines the value to use (refer to the Namespace Management section in the NVMe Base Specification). If the associated feature is not supported, then this field is ignored by the controller.		