



LEGAL NOTICE:

© Copyright 2007 - 2018 NVM Express, Inc. ALL RIGHTS RESERVED.

This NVM Express Management Interface 1.0a specification is proprietary to the NVM Express, Inc. (also referred to as "Company") and/or its successors and assigns.

NOTICE TO USERS WHO ARE NVM EXPRESS, INC. MEMBERS: Members of NVM Express, Inc. have the right to use and implement this specification subject, however, to the Member's continued compliance with the Company's Intellectual Property Policy and Bylaws and the Member's Participation Agreement.

NOTICE TO NON-MEMBERS OF NVM EXPRESS, INC.: If you are not a Member of NVM Express, Inc. and you have obtained a copy of this document, you only have a right to review this document or make reference to or cite this document. Any such references or citations to this document must acknowledge NVM Express, Inc. copyright ownership of this document. The proper copyright citation or reference is as follows: "**© 2007 - 2018 NVM Express, Inc. ALL RIGHTS RESERVED.**" When making any such citations or references to this document you are not permitted to revise, alter, modify, make any derivatives of, or otherwise amend the referenced portion of this document in any way without the prior express written permission of NVM Express, Inc. Nothing contained in this document shall be deemed as granting you any kind of license to implement or use this document or the specification described therein, or any of its contents, either expressly or impliedly, or to any intellectual property owned or controlled by NVM Express, Inc., including, without limitation, any trademarks of NVM Express, Inc.

LEGAL DISCLAIMER:

THIS DOCUMENT AND THE INFORMATION CONTAINED HEREIN IS PROVIDED ON AN "**AS IS**" BASIS. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, NVM EXPRESS, INC. (ALONG WITH THE CONTRIBUTORS TO THIS DOCUMENT) HEREBY DISCLAIM ALL REPRESENTATIONS, WARRANTIES AND/OR COVENANTS, EITHER EXPRESS OR IMPLIED, STATUTORY OR AT COMMON LAW, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, VALIDITY, AND/OR NONINFRINGEMENT.

All product names, trademarks, registered trademarks, and/or servicemarks may be claimed as the property of their respective owners.

NVM Express Workgroup
c/o Virtual, Inc.
401 Edgewater Place, Suite 600
Wakefield, MA 01880
info@nvmexpress.org

Technical input submitted to the NVM Express™ Workgroup is subject to the terms of the NVM Express™ Participant's agreement. Copyright © 2014-18 NVMe™ Corporation.

NVM Express™ Technical Errata

Errata ID	003
Revision Date	5/8/2018
Affected Spec Ver.	NVM Express™ MI 1.0a & TP 6002
Corrected Spec Ver.	

Errata Author(s)

Name	Company
Austin Bolen	Dell EMC

Errata Overview

- Clarify that status bits are independent in the out-of-band and in-band tunneling mechanisms
- Clarify how to treat NSID in the in-band tunneling mechanism
- Clarify how to treat Controller Identifier in the in-band tunneling mechanism

Revision History

Revision Date	Change Description
4/22/2018	<ul style="list-style-type: none">• Initial draft clarifying that status bits are independent in the out-of-band and in-band tunneling mechanisms. Also clarifies how NSID and Controller Identifier work in the in-band tunneling mechanism.
4/23/2018	<ul style="list-style-type: none">• Wording updates after workgroup review
5/7/2018	<ul style="list-style-type: none">• A few more wording updates from workgroup review on 5/7
5/8/2018	<ul style="list-style-type: none">• Fixed copy/paste error for existing text that is not modified by this ECN

Description of Specification Changes

Modify a portion of Section 4.3.1 (NVMe-MI Send Command) as shown below:

The NVMe-MI Send command is an NVMe Admin Command as defined by this specification and the NVM Express Specification. It is used to tunnel an NVMe-MI Command in-band from host software to an NVMe Controller that transfers data from a host to an NVMe Controller (similar to a write operation). The data being transferred is in one or more of the following locations: Request Data, NVMe Management Dword 0, NVMe Management Dword 1.

NVMe-MI Commands may apply to the NVM Subsystem, Controllers, and/or Namespaces. The Controller Identifier of the Controller to which the NVMe-MI Send command is issued is not used when processing the tunneled NVMe-MI Command. If the tunneled NVMe-MI Command requires one or more Controllers to be specified, then the applicable Controller Identifiers are specified by the tunneled NVMe-MI Command. The Namespace Identifier (NSID) field of the NVMe-MI Send command (bytes 7:4 of the Submission Queue Entry) is not used and should be cleared to 0h by host software. If the tunneled NVMe-MI Command requires one or more Namespaces to be specified, then the applicable Namespace Identifiers are specified by the tunneled NVMe-MI Command.

Modify a portion of Figure 39 (NVMe-MI Send Command Request Message to NVMe Admin Command SQE Mapping Table) as shown below:

NVMe-MI Command Request Message		NVMe Admin Command SQE Mapping
Description	Byte	Description
This field has no equivalent in NVMe-MI.	03:00	Command Dword 0 (CDW0): Refer to the NVM Express specification.
If the tunneled NVMe-MI Command requires one or more Namespaces to be specified, then the applicable Namespace Identifiers are specified by the tunneled NVMe-MI Command.	07:04	Namespace Identifier (NSID): This field should be cleared to 0h by host software. Refer to the NVM Express specification for more details.
These bytes have no equivalent in NVMe-MI.	23:00 08	Refer to the NVM Express specification.

Description of Specification Changes

Modify a portion of Section 4.3.2 (NVMe-MI Receive Command) as shown below:

The NVMe-MI Receive command is an NVMe Admin Command as defined by this specification and the NVM Express Specification. It is used to tunnel an NVMe-MI Command in-band from host software to an NVMe Controller that transfers data from an NVMe Controller to a host (similar to a read operation). The data being transferred is in one or more of the following locations: Response Data, NVMe Management Response.

NVMe-MI Commands may apply to the NVM Subsystem, Controllers, and/or Namespaces. The Controller Identifier of the Controller to which the NVMe-MI Receive command is issued is not used when processing the tunneled NVMe-MI Command. If the tunneled NVMe-MI Command requires one or more Controllers to be specified, then the applicable Controller Identifiers are specified by the tunneled NVMe-MI Command. The Namespace Identifier (NSID) field of the NVMe-MI Receive command (bytes 7:4 of the Submission Queue Entry) is not used and should be cleared to 0h by host software. If the tunneled NVMe-MI Command requires one or more Namespaces to be specified, then the applicable Namespace Identifiers are specified by the tunneled NVMe-MI Command.

Modify a portion of Figure 45 (NVMe-MI Receive Command Request/Response Message to NVMe Admin Command SQE/CQE Mapping Table) as shown below:

NVMe-MI Command Request Message		NVMe Admin Command SQE Mapping
Description	Byte	Description
This field has no equivalent in NVMe-MI.	03:00	Command Dword 0 (CDW0): Refer to the NVM Express specification.
If the tunneled NVMe-MI Command requires one or more Namespaces to be specified, then the applicable Namespace Identifiers are specified by the tunneled NVMe-MI Command.	07:04	Namespace Identifier (NSID): This field should be cleared to 0h by host software. Refer to the NVM Express specification for more details.
These bytes have no equivalent in NVMe-MI.	23:008	Refer to the NVM Express specification.

Modify a portion of Section 5.2.2 (Health Status Change (Configuration Identifier 02h)) as shown below:

This Configuration Identifier is used to clear selected status bits in the Composite Controller Status field of the NVM Subsystem Health Data Structure, (refer to Figure 59), returned by the NVM Subsystem Health Status Poll command.

The Composite Controller Status field of the NVM Subsystem Health Data Structure is used to report the occurrence of health and status events associated with the NVM subsystem. When a bit in this field is set to '1', it remains a '1' until cleared.

A Configuration Set command that selects Health Status Change may be used to clear corresponding bits selected in NVMe Management Dword 1 of the Composite Controller Status field to '0'.

A Configuration Set command that selects Health Status Change operates independently in the out-of-band mechanism and the in-band tunneling mechanism.

An NVMe Storage Device supporting the out-of-band mechanism shall have an independent copy of the Composite Controller Status dedicated to the out-of-band mechanism. In the out-of-band mechanism, a Configuration Set command that selects Health Status Change only applies to the copy of the Composite

Controller Status dedicated to the out-of-band mechanism. Refer to section 5.4 for more details on Composite Controller Status.

An NVMe Storage Device supporting the in-band tunneling mechanism shall have an independent copy of the Composite Controller Status dedicated to the in-band tunneling mechanism. In the in-band tunneling mechanism, a Configuration Set command that selects Health Status Change only applies to the copy of the Composite Controller Status dedicated to the in-band tunneling mechanism.

Modify a portion of Section 5.3 (Controller Health Status Poll) as shown below:

The Controller Health Status Poll command is used to efficiently determine changes in health status attributes associated with one or more Controllers in the NVM Subsystem.

The Controller Health Status Poll command operates independently in the out-of-band mechanism and the in-band tunneling mechanism.

An NVMe Storage Device supporting the out-of-band mechanism shall have an independent copy of the Controller Health Data Structure (refer to Figure 55) and the Controller Health Status Changed Flags (refer to Figure 56) dedicated to the out-of-band mechanism. In the out-of-band mechanism, a Controller Health Status Poll command only applies to the copy of the Controller Health Data Structure and the Controller Health Status Changed Flags dedicated to the out-of-band mechanism.

An NVMe Storage Device supporting the in-band tunneling mechanism shall have an independent copy of the Controller Health Data Structure and the Controller Health Status Changed Flags dedicated to the in-band tunneling mechanism. In the in-band tunneling mechanism, a Controller Health Status Poll command only applies to the copy of the Controller Health Data Structure and the Controller Health Status Changed Flags dedicated to the in-band tunneling mechanism.

The Controller Health Status Poll command uses NVMe Management Dwords 0 and 1. The format of NVMe Management Dword 0 is shown in **Error! Reference source not found.** and the format of NVMe Management Dword 1 is shown in **Error! Reference source not found.**

Modify a portion of Section 5.4 (NVM Subsystem Health Status Poll) as shown below:

The NVM Subsystem Health Status Poll command is used to efficiently determine changes in health status attributes associated with the NVM Subsystem.

The NVM Subsystem Health Status Poll command operates independently in the out-of-band mechanism and the in-band tunneling mechanism.

An NVMe Storage Device supporting the out-of-band mechanism shall have an independent copy of the NVM Subsystem Health Data Structure (refer to Figure 59) dedicated to the out-of-band mechanism. In the out-of-band mechanism, an NVM Subsystem Health Status Poll command only applies to the copy of the NVM Subsystem Health Data Structure dedicated to the out-of-band mechanism.

An NVMe Storage Device supporting the in-band tunneling mechanism shall have an independent copy of the NVM Subsystem Health Data Structure dedicated to the in-band tunneling mechanism. In the in-band tunneling mechanism, an NVM Subsystem Health Status Poll command only applies to the copy of the NVM Subsystem Health Data Structure dedicated to the in-band tunneling mechanism.

The NVM Subsystem Health Status Poll command uses NVMe Management Dword 1 as shown in **Error! Reference source not found.**