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# **Mellanox Connect-IB® Firmware (fw-ConnectIB) Release Notes**

Rev 10.12.1100

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Mellanox Technologies  
 350 Oakmead Parkway Suite 100  
 Sunnyvale, CA 94085  
 U.S.A.  
[www.mellanox.com](http://www.mellanox.com)  
 Tel: (408) 970-3400  
 Fax: (408) 970-3403

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# Release Update History

*Table 1 - Release Update History*

Release	Date	Description
Rev 10.12.1100	October 01, 2015	Initial version

# 1 Overview

These are the release notes for the Connect-IB® adapters firmware, fw-ConnectIB Rev 10.12.1100. This firmware supports the following protocols:

- InfiniBand – SDR, DDR, QDR, FDR10, FDR
- PCI Express 3.0, supporting backwards compatibility for v2.0 and v1.1

## 1.1 Supported Devices

This firmware supports the devices and protocols listed in Table 2.

**Table 2 - Supported PSIDs**

Device Part Number	PSID	Device Name
MCB191A-FCAT	MT_1230110019	Connect-IB® Host Channel Adapter, single-port QSFP, FDR 56Gb/s, PCIe3.0 x8, tall bracket, RoHS R6
MCB192A-FCAT	MT_1240110019	Connect-IB® Host Channel Adapter, dual-port QSFP, FDR 56Gb/s, PCIe3.0 x8, tall bracket, RoHS R6
MCB193A-FCAT	MT_1220110019	Connect-IB® Host Channel Adapter, single-port QSFP, FDR 56Gb/s, PCIe3.0 x16, tall bracket, RoHS R6
MCB193A-FBAT	MT_1220110030	Connect-IB® Host Channel Adapter; single-port QSFP; FDR 56Gb/s; PCIe2.0 x16; RoHS R6
MCB194A-FCAT	MT_1210110019	Connect-IB® Host Channel Adapter, dual-port QSFP, FDR 56Gb/s, PCIe3.0 x16, tall bracket, RoHS R6

## 1.2 Supported Cables and Modules

Please refer to the LinkX™ Cables and Transceivers web page

([www.mellanox.com](http://www.mellanox.com) -> Products -> Cables and Transceivers) for the list of supported cables.

### 1.2.1 Validated and Supported DDR/SDR Cables

**Table 3 - Validated and Supported DDR/SDR Cables**

Speed	Cable OPN #	Description
DDR	MC1204128-005	MELLANOX PASSIVE COPPER HYBRID CABLE IB DDR 20GB/S QSFP TO CX4 5M
DDR	MC1204130-001	MELLANOX PASSIVE COPPER HYBRID CABLE IB DDR 20GB/S QSFP TO CX4 1M
DDR	MC1204130-002	MELLANOX PASSIVE COPPER HYBRID CABLE IB DDR 20GB/S QSFP TO CX4 2M

**Table 3 - Validated and Supported DDR/SDR Cables**

Speed	Cable OPN #	Description
DDR	MC1204130-003	MELLANOX PASSIVE COPPER HYBRID CABLE IB DDR 20GB/S QSFP TO CX4 3M

## 1.2.2 Validated and Supported QDR/FDR10 Cables

**Table 4 - Validated and Supported QDR/FDR10 Cable**

Speed	Cable OPN #	Description
FDR10	MC2206128-004	MELLANOX PASSIVE COPPER CABLE VPI UP TO 40GB/S QSFP 4M
FDR10	MC2206128-005	MELLANOX PASSIVE COPPER CABLE VPI UP TO 40GB/S QSFP 5M
FDR10	MC2206130-001	MELLANOX PASSIVE COPPER CABLE VPI UP TO 40GB/S QSFP 1M
FDR10	MC2206130-002	MELLANOX PASSIVE COPPER CABLE VPI UP TO 40GB/S QSFP 2M
FDR10	MC2206130-003	MELLANOX PASSIVE COPPER CABLE VPI UP TO 40GB/S QSFP 3M
FDR10	MC2206130-00A	MELLANOX PASSIVE COPPER CABLE VPI UP TO 40GB/S QSFP 0.5M
FDR10	MC2206310-300-L	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP 300M
FDR10	MC2206310-XXX-E	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP from 3M up to 100M
FDR10	MC2206310-XXX-F	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP from 3M up to 100M
FDR10	MC2206310-XXX-T	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP from 3M up to 100M
FDR10	MC2210411-SR4	MELLANOX OPTICAL MODULE 40GB/S QSFP MPO 850NM UP TO 100M
FDR10	MC2210411-SR4E	MELLANOX OPTICAL MODULE 40GB/S QSFP MPO 850NM UP TO 300M
FDR10	MFS4R12CB-100	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP 100M
FDR10	MFS4R12CB-XXX	MELLANOX ACTIVE FIBER CABLE VPI UP TO 40GB/S QSFP from 3M up to 100M
QDR	MC2206125-007	MELLANOX PASSIVE COPPER CABLE 4X QSFP 40GB/S 25AWG 7M
QDR	MC2206126-006	MELLANOX PASSIVE COPPER CABLE 4X QSFP 40GB/S 26AWG 6M
QDR	MC2206310-300	MELLANOX ACTIVE FIBER CABLE 4X QSFP 40GB/S 200M
QDR	MFM4R12C-QDR	40GB/S INFINIBAND QSFP OPTICAL MODULE IN SINGLE BOX

### 1.2.3 Validated and Supported FDR Cables

**Table 5 - Validated and Supported FDR Cables**

Speed	Cable OPN #	Description
FDR	MC2207126-004	MELLANOX PASSIVE COPPER CABLE 4X QSFP 56GB/S 28AWG 4M
FDR	MC2207128-003	MELLANOX PASSIVE COPPER CABLE 4X QSFP 56GB/S 28AWG 3M
FDR	MC2207128-0A2	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 2.5M
FDR	MC2207130-001	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 1M
FDR	MC2207130-002	MELLANOX MELLANOXPASSIVE COPPER CABLE 4X QSFP 56GB/S 30AWG 2M
FDR	MC2207130-00A	MELLANOX PASSIVE COPPER CABLE 4X QSFP 56GB/S 30AWG 0.5M
FDR	MC2207130-0A1	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 1.5M
FDR	MC2207310-030	MELLANOX ACTIVE FIBER CABLE 4X QSFP 56GB/S 30M
FDR	MC2207310-100 )	MELLANOX ACTIVE FIBER CABLE 4X QSFP 56GB/S 100M
FDR	MC2207310-XXX-E	MELLANOX ACTIVE FIBER CABLE VPI UP TO 56GB/S QSFP from 3M up to 100M
FDR	MC2207310-XXX-T	MELLANOX ACTIVE FIBER CABLE VPI UP TO 56GB/S QSFP from 3M up to 100M
FDR	MC2207312-003	MELLANOX ACTIVE FIBER CABLE VPI IB FDR (56GB/S) AND ETH 40GBE QSFP 3M
FDR	MC2207312-050	MELLANOX ACTIVE FIBER CABLE VPI UP TO 56GB/S QSFP from 3M up to 300M
FDR	MC2207312-100	MELLANOX ACTIVE FIBER CABLE 4X QSFP 56GB/S 100M
FDR	MC220731V-003	Mellanox Active Fiber IB QSFP 3M
FDR	MC220731V-100	Mellanox Active Fiber IB QSFP 100M
FDR	MC2207411-SR4L	MELLANOX OPTICAL MODULE IB FDR 56GB/S QSFP MPO 850NM UP TO 30M



## 1.2.4 Validated and Supported EDR Cables

**Table 6 - Validated and Supported EDR Cables**

Speed	Cable OPN #	Description
EMC FDR QSFP	038-004-066-01	EMC FDR QSFP+ to QSFP+ copper cable 2M
EMC FDR QSFP	038-004-067-01	EMC FDR QSFP+ to QSFP+ copper cable 3M
EMC FDR QSFP	038-900-027-01	EMC FDR QSFP+ to QSFP+ copper cable 5M
EMC FDR QSFP	038-900-030-01	EMC FDR QSFP+ to QSFP+ copper cable 8M
EDR	MCP1600-E001	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 1M
EDR	MCP1600-E002	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 2M
EDR	MCP1600-E003	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 3M
EDR	MCP1600-E00A	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 0.5M
EDR	MFA1A00-E003	MELLANOX active fiber cable, VPI, up to 100Gb/s, QSFP, 3m
EDR	MFA1A00-E005	MELLANOX ACTIVE FIBER CABLE VPI UP TO 100GB/S QSFP 5M
EDR	MFA1A00-E050	MELLANOX active fiber cable, VPI, up to 100Gb/s, QSFP, 50m
EDR	MFA1A00-E100	MELLANOX ACTIVE FIBER CABLE VPI UP TO 100GB/S QSFP 100M

## 1.3 Tested Switches

### 1.3.1 Tested QDR/FDR10 Switches

**Table 7 - Tested QDR/FDR10 Switches**

Speed	Switch Family	OPN # / Name	Description
QDR	N/A	489184-B21	HP BLc 4X QDR IB Switch Module

### 1.3.2 Tested FDR Switches

**Table 8 - Tested FDR Switches**

Speed	Switch Family	OPN # / Name	Description
FDR	N/A	648312-B21	HP BLc 4X FDR IB Switch Module
FDR	N/A	648311-B21	HP BLc 4X FDR IB Managed Switch Module

### 1.3.3 Tested EDR Switches

**Table 9 - Tested EDR Switches**

Speed	Switch Family	OPN # / Name	Description
EDR	Switch-IB	SB7790-EB2F	36-port EDR 100Gb/s InfiniBand Switch Systems

## 1.4 Tools, Switch Firmware and Driver Software

Firmware Rev 10.12.1100 is tested with the following tools and driver software:

**Table 10 - Tools, Switch Firmware and Driver Software**

	Supported Version
MLNX_OFED	3.1-1.0.0/3.0-2.0.0/2.4-x.x.x
MFT	4.1.0
SwitchX®/SwitchX®-2 Firmware	v9.3.3180
SwitchX-IB™ Firmware	v11.0200.0114
InfiniScale® IV Firmware	v7.4.3000
Linux Inbox Drivers	<ul style="list-style-type: none"> <li>• RHEL5.9</li> <li>• RHEL5.10</li> <li>• RHEL5.11</li> <li>• RHEL5.12</li> <li>• RHEL6.0</li> <li>• RHEL6.1</li> <li>• RHEL6.2</li> <li>• RHEL6.3</li> <li>• RHEL6.4</li> <li>• RHEL6.5</li> <li>• RHEL6.6</li> <li>• RHEL7.0</li> <li>• RHEL7.1</li> <li>• Ubuntu 12.04</li> <li>• Ubuntu 14.04</li> <li>• SLES11.2</li> <li>• SLES11.3</li> <li>• SLES12.0</li> </ul>

## 1.5 Revision Compatibility

Firmware fw-ConnectIB Rev 10.12.1100 complies with the following programmer's reference manual:

- *ConnectIB Programmer's Reference Manual (PRM), Rev 2.01 or later*, which has Command Interface Revision 0x5. The command interface revision can be retrieved by means of the QUERY\_FW command and is indicated by the field `cmd_interface_rev`.

## 2 **Changes and New Features in Rev 10.12.1100**

This version has no new features, only a version change.

### 3 Known Issues

The following table describes known issues in this firmware release and possible workarounds.

**Table 11 - Known Issues**

Index	Issue	Description	Workaround
1.	Upgrading/Downgrading	Flashing the firmware requires server reboot. Firmware cannot be flashed twice without server reboot after first flashing	Reboot the server after firmware flashing
2.	MADs	Setting the port to 'sleep' state is not supported.	N/A
3.	PCIe	Link width x1 might get Replay Timer Timeout, on speed change.	N/A
4.		L1 power state enter requests are ignored by the device.	N/A
5.	Miscellaneous	<b>[For customers developing custom low level drivers]</b> The device does not recover if the requested number of pages are not supplied during device initialization.	N/A
6.		PF direct pass-through is not supported (since PF FLR is not supported).	-
7.	Quality of Service	On rare occasions, SL to VL modification with functioning QPs results in traffic hangs.	Configure SL2VL during SM initialization
8.	Virtualization	Function (PF/VF) TX port counters are not supported.	-
9.		<b>[For customers developing custom low level drivers]</b> VFs internal FLR is not supported in PF teardown HCA command.	Before unloading the PF driver, PF driver must disable all its active VFs by performing the following: 1. Run the <code>disable_hca</code> command on all the <code>function_ids</code> 2. Wait until firmware returns all VFs allocated pages.
10.		PF driver must work with pages event queue.	-
11.		<b>[For customers developing custom low level drivers]</b> VNodeInfo and VPortGuidInfo virtualization Attributes MADs are not supported.	-
12.		Vport transmit packets are not blocked if vport policy is Down.	-

**Table 11 - Known Issues**

Index	Issue	Description	Workaround
13.	Virtualization	<b>[For customers developing custom low level drivers]</b> The value of log_max_ra_res_qp in set_hca_cap command should be the same in all functions.	-
14.		Privileged Vport egress traffic is not blocked when Vport is not active.	-
15.		Any local (internal) loopbacked packet is counted by the Vport counters, although Vport counters should count only traffic that crosses the Vport.	-
16.		Vport number in virtual trap might be reported incorrectly	-
17.	DC transport	DC transport is not supported when SR-IOV is enabled.	-
18.	Link	ibstat reports the link speed as FDR instead of FDR10.	-
19.		mlxconfig tool displays some Ethernet only configuration such as RoCE status.	N/A
20.	Firmware Upgrade	Older MFT versions (4.0.0 and 3.8.0) may indicate that the latest GA firmware is old or that it cannot be compared with the existing firmware. A message similar to the below will be displayed upon firmware upgrade stage: # flint -d <mst device> -i <image> burn  Current FW version on flash: 12.1100.6630 New FW version: 12.0012.0572  Note: The new FW version is not newer than the current FW version on flash.  Do you want to continue ? (y/n) [n] : Y	Choose one of the options below to upgrade firmware: <ul style="list-style-type: none"> <li>Upgrade to the latest MFT version (4.1.0)</li> <li>Type "y" after the note flint provides</li> <li>Run flint with the "-force" flag</li> </ul>

## 4 Bug Fixes History

Table 12 lists the bugs fixed in this release.

**Table 12 - Fixed Bugs List**

#	Category	Description	Discovered in Release	Fixed in Release
1.	Diagnostic Tools	Fixed an issue which caused hardware fatal error when running ibdump.	12.0100.6440	10.12.0780
2.	Port Link	Fixed an FDR10 incorrect speed indication reported due to the usage of a translation function from the hardware speed to the PRM speed twice.	12.0100.6440	10.12.0780
3.	Phy Management	Fixed a Phy manager PCS event handling when the port's next state was disable.	12.1100.6630	10.12.0780
4.	MADs	Fixed an issue that caused invalid data returned by EyeOpening MAD.	12.0100.6440	10.12.0780
1.	Virtualization	Reduced the VF ICM footprint for VFs.	10.0100.6440	10.1100.6630
2.	Miscellaneous	Increased the number of regular memory region from 2 <sup>21</sup> to 2 <sup>22</sup> .	10.10.5052	10.0100.6440
3.	DC transport	Fixed health buffer false alarm "irisc stuck" indication when using DC transport.	10.10.5020	10.10.5054
4.		Fixed rare unexpected completion with error on DC QPs.	10.10.5020	10.10.5054
5.	Link Speed	On rare occasions, after PXE boot, the port speed came up as SDR instead of a higher speed.	10.10.5020	10.10.5054
6.	Thermal sensors	On very rare occasions, firmware wrongly reported board over-temperature warning.	10.10.5020	10.10.5054
7.	DCT	destroy-DCT command handling may experience delays while the DCT port is down.	10.10.4064	10.10.5020
8.	MAD	Fixed an issue causing diagnostic counters VS-MAD page offset to start at a wrong address.	10.10.4020	10.10.5020
9.	DC transport	Fixed stability issue in the event of no-local-DC-resources	10.10.4020	10.10.4064
10.		Fixed improper handling of multiple DCT errors	10.10.4050	10.10.4064
11.		Fixed bad handling of DC RNR state	10.10.4050	10.10.4064
12.	DC transport	Reduced DCT destroy firmware handling time	10.10.4020	10.10.4050
13.	Ports	Fixed link flapping issue which occurred when LLR was active.	10.10.3000	10.10.4050

**Table 12 - Fixed Bugs List**

#	Category	Description	Discovered in Release	Fixed in Release
14.	PCIe class code of the device	Deprecated code 0x0c0600 was changed to 0x020700 (InfiniBand network adapter)	10.10.3000	10.10.4020
15.	Atomic support	Atomic response endianness is always a big endian	10.10.1000	10.10.3000
16.	Miscellaneous	<b>[Documentation fix in PRM v2.01, no changes to the firmware code.]</b> Port asynchronous events documentation are different from the PRM. All port events have a type value of 0x9. The following subtype values are used for the following events: <ul style="list-style-type: none"> <li>• link down=0x1</li> <li>• link up=0x4</li> <li>• link initialized=0x5</li> <li>• lid change=0x6</li> <li>• PKEY change=0x7</li> <li>• GUID change=0x8</li> <li>• client reregister=0x9</li> </ul>	10.10.1000	10.10.3000
17.	InfiniBand Transport	Alternate Path Migration (APM) triggers only a single affiliated asynchronous error event in the case of a path migration failure.	10.10.2000	10.10.3000
18.		Using a min_rnr_nak value of 0x5 will cause failures when creating reliable connection (RC) QPs.	10.10.2000	10.10.3000
19.	DC	On rare occasions DC Initiator completions might be lost.	10.10.2000	10.10.3000
20.	Data Integrity Signature	The following signature rules are not supported (Numbering based on "signature rules table" in PRM): <ul style="list-style-type: none"> <li>• Rule #12: T10 DIF</li> <li>• Rule #13: T10 DIF CS</li> <li>• Rule #14 T10 DIF CS</li> </ul>	10.10.2000	10.10.3000
21.	Quality of Service	VL arbitration configuration does not ensure minimum bandwidth for VL as configured.	10.10.1000	10.10.2000
22.	False alarm report	On very rare occasions, a false firmware "hanged" report is printed in the dmesg.	10.10.1000	10.10.2000
23.	CQ buffer resize	CQ buffer resize not supported	10.10.1000	10.10.2000
24.	Ports	When connecting to InfiniScale family switches and non-Mellanox InfiniBand switches DDR and QDR speeds may show line errors and in some cases might downgrade to SDR speed.	10.10.1000	10.10.2000

## 5 Firmware Changes and New Feature History

**Table 13 - Firmware Changes and New Feature History**

Firmware Version	Description
10.12.0780	<ul style="list-style-type: none"> <li>• Dynamically Connected (DC) transport</li> <li>• Non-Volatile Configuration (NVConfig). For the complete list, please refer to Section 7, “Supported Non-Volatile Configurations,” on page 19.</li> </ul>
10.1100.6330	<ul style="list-style-type: none"> <li>• Added support for SR-IOV</li> <li>• Added support for MADs Virtualization Attributes according to “ib_virt_annex_v17”</li> <li>• Updated Virtualization command set according to the new PRM.</li> <li>• Enabled SR-IOV, NUM_VFS and INT_LOG_MAX_PAYLOAD_SIZE configuration via the mlxconfig tool</li> </ul>
10.0100.6440	<ul style="list-style-type: none"> <li>• T10 DIF pipeline Data Integrity Signature off-loading - Beta level</li> <li>• Automatic Path Migration</li> <li>• Congestion Control</li> <li>• Programmable Port/Node GUID</li> <li>• Thermal monitoring and protection</li> <li>• Port LEDs indications</li> <li>• Physical Port Counter - Beta level</li> <li>• Q Counter - Beta level</li> <li>• V port commands</li> <li>• Config space address in MAD management class 0x09</li> </ul>
10.10.5054	<ul style="list-style-type: none"> <li>• Enabled firmware burning (using mstflint) when the driver is down.</li> <li>• Bug Fixes (See <a href="#">Section 4, “Bug Fixes History,”</a> on page 14.)</li> </ul>
10.10.5020	<ul style="list-style-type: none"> <li>• Added support for EDR cables (up to FDR speeds).</li> <li>• Added additional InfiniBand spec optional counters</li> <li>• Improved resource allocation for absolute-priority VL's (when VL-high-limit is set to 255 in SM) to reduce latency of high priority traffic.</li> <li>• Bug Fixes See <a href="#">Section 4, “Bug Fixes History,”</a> on page 14.</li> </ul>
10.10.4064	<ul style="list-style-type: none"> <li>• Bug Fixes (see <a href="#">Section 4, “Bug Fixes History,”</a> on page 14)</li> </ul>
10.10.4050	<ul style="list-style-type: none"> <li>• Suspend to RAM (S3) support</li> <li>• Diagnostic counters vendor-specific MAD support, as defined by VS-MAD spec version 1.2</li> <li>• Bug Fixes (see <a href="#">Section 4, “Bug Fixes History,”</a> on page 14)</li> </ul>
10.10.4020	<ul style="list-style-type: none"> <li>• On Demand Paging (ODP) Memory can now be used without pinning memory beforehand. Supported transports are UD and RC</li> <li>• ODP support is GA for RC RDMA-write, RC send, and UD send. Beta level for RDMA-read/atomics</li> <li>• Enhanced Atomic Operations to include all PRM atomic operations of 32 bytes or below</li> <li>• Dynamically Connected (DC) transport improvements</li> </ul>



**Table 13 - Firmware Changes and New Feature History**

Firmware Version	Description
10.10.3000	<ul style="list-style-type: none"> <li>• Dynamically Connected (DC) transport (at GA level)</li> <li>• Enabled Atomic Operations. For further information, please refer to the PRM section “Atomic Capabilities”</li> <li>• Added sniffer QP support (Note: Sniffer QP is currently not available in MLNX_OFED v2.2-1.0.0 or the MFT tools package)</li> <li>• Increased the maximum number of InfiniBand partitions to 0x1000</li> </ul>
10.10.2000	<ul style="list-style-type: none"> <li>• Dynamically Connected (DC) transport (at Beta level)</li> <li>• CORE-Direct® <ul style="list-style-type: none"> <li>• Provides Collective Off-loading in HCA</li> <li>• Frees CPU to perform computation in parallel with collective operations</li> </ul> </li> <li>• T10 DIF Data Integrity Signature off-loading</li> <li>• Removed software limitations that were required for the use of Mellanox-certified FDR InfiniBand cables with Mellanox FDR InfiniBand adapters and switches. Please refer to "Memo: FDR 56Gb/s InfiniBand Cables" that was released on Dec/2013. Mellanox will offer an EXTENDED diagnostics support plan which will be available for mixed environments only and that will help identify issues they may encounter with the FDR installations.</li> <li>• User Memory Registration (UMR)</li> <li>• InfiniBand Automatic Path Migration</li> </ul>
10.10.1000	<ul style="list-style-type: none"> <li>• Initial Release of Connect-IB™</li> <li>• Port speed up to FDR</li> <li>• PCI Express 3.0 x16, with backwards compatibility with v2.0 and v1.1</li> <li>• Dynamically Connected (DC) transport at Alpha level</li> </ul>

## 6 Unsupported Features and Commands

### 6.1 Unsupported Features

The following advanced feature as described in Connect-IB® PRM Rev 2.01 are unsupported in the current firmware version:

- Service types not supported:
  - SyncUMR
  - Mellanox transport
  - PTP
  - RAW IPv6
  - PTP (ieee 1588)
- Connect-IB® currently supports only a single physical function model
- INT-A not supported for EQs only MSI-X
- PCI VPD write flow (RO flow supported)
- Streaming receive queue (STRQ) and collapsed CQ
- Precise clock synchronization over the network (IEEE 1588)
- Data integrity validation of control structures
- PCIe Function Level Reset (FLR)
- SM is not supported on VFs

### 6.2 Unsupported Commands

- QUERY\_MAD\_DEMUX
- SET\_MAD\_DEMUX
- PAGE\_FAULT\_RESUME
- ACTIVATE\_TRACER
- DEACTIVATE\_TRACER

## 7 Supported Non-Volatile Configurations

**Table 14 - Global Settings**

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