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

Rev 10.0100.6440

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Table of Contents

List of Tables	4
Chapter 1 Overview	6
1.1 Supported Devices	6
1.2 Supported Cables and Modules	6
1.2.1 Validated and Supported DDR/SDR Cables	6
1.2.2 Validated and Supported QDR/FDR10 Cables	7
1.2.3 Validated and Supported FDR Cables	8
1.2.4 Validated and Supported EDR Cables	9
1.3 Tested Switches	9
1.3.1 Tested QDR/FDR10 Switches	9
1.3.2 Tested FDR Switches	9
1.3.3 Tested EDR Switches	10
1.4 Tools, Switch Firmware and Driver Software	10
1.5 Revision Compatibility	10
Chapter 2 Supported Features	11
2.1 Firmware Rev 10.0100.6400 Changes and New Feature	11
Chapter 3 Known Issues	12
Chapter 4 Bug Fixes History	13
Chapter 5 Firmware Changes and New Feature History	15
Chapter 6 Unsupported Features and Commands	17
6.1 Unsupported Features	17
6.2 Unsupported Commands	17

List of Tables

Table 1:	Release Update History	5
Table 2:	Supported PSIDs	6
Table 3:	Validated and Supported DDR/SDR Cables	6
Table 4:	Validated and Supported QDR/FDR10 Cable	7
Table 5:	Validated and Supported FDR Cables	8
Table 6:	Validated and Supported EDR Cables	9
Table 7:	Tested QDR/FDR10 Switches	9
Table 8:	Tested FDR Switches	9
Table 9:	Tested EDR Switches	10
Table 10:	Tools, Switch Firmware and Driver Software	10
Table 11:	Firmware Rev 10.0100.6400 Changes and New Feature	11
Table 12:	Known Issues	12
Table 13:	Fixed Bugs List	13
Table 14:	Firmware Changes and New Feature History	15

Release Update History

Table 1 - Release Update History

Release	Date	Description
Rev 10.0100.6440	June 04, 2015	Initial version

1 Overview

These are the release notes for the Connect-IB® adapters firmware, fw-ConnectIB Rev 10.0100.6440. 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 -> 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 10.0100.6440 is tested with the following tools and driver software:

Table 10 - Tools, Switch Firmware and Driver Software

	Supported Version
MLNX_OFED	3.0-x.0.0/2.4-1.0.0
MFT	4.0.0
SwitchX®/SwitchX®-2 Firmware	v9.3.2000
SwitchX-IB™ Firmware	v11.0100.0112
InfiniScale® IV Firmware	v7.4.3000
Linux Inbox Drivers	<ul style="list-style-type: none"> • RHEL5.9 • RHEL5.10 • RHEL5.11 • RHEL5.12 • RHEL6.0 • RHEL6.1 • RHEL6.2 • RHEL6.3 • RHEL6.4 • RHEL6.5 • RHEL6.6 • RHEL7.0 • RHEL7.1 • Ubuntu 12.04 • Ubuntu 14.04 • SLES11.2 • SLES11.3 • SLES12.0

1.5 Revision Compatibility

Firmware fw-ConnectIB Rev 10.0100.6440 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 Supported Features

2.1 Firmware Rev 10.0100.6440 Changes and New Feature

Table 11 - Firmware Rev 10.0100.6440 Changes and New Feature

Category	Description
InfiniBand Network	<ul style="list-style-type: none"> • T10 DIF pipeline Data Integrity Signature off-loading - Beta level • Automatic Path Migration • Congestion Control • Programmable Port/Node GUID
General	<ul style="list-style-type: none"> • Thermal monitoring and protection • Port LEDs indications • Physical Port Counter - Beta level • Q Counter - Beta level • V port commands
MAD	<ul style="list-style-type: none"> • Config space address in MAD management class 0x09

3 Known Issues

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

Table 12 - Known Issues

Index	Issue	Description	Workaround	Scheduled Release (fix)
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	Future Release
2.	MADs	Setting the port to 'sleep' state is not supported.	N/A	Future Release
3.	PCIe	Link width x1 might get Replay Timer Timeout, on speed change.	N/A	Future Release
4.		L1 power state enter requests are ignored by the device.	N/A	Future Release
5.	Miscellaneous	[For customers developing custom low level drivers] The device does not recover if the requested number of pages are not supplied during device initialization.	N/A	Future Release
6.	Quality of Service	On rare occasions, SL to VL modification with functioning QPs results in traffic hangs.	Configure SL2VL during SM initialization	Future Release

4 Bug Fixes History

Table 13 lists the bugs fixed in this release.

Table 13 - Fixed Bugs List

#	Category	Description	Discovered in Release	Fixed in Release
1.	Miscellaneous	Increased the number of regular memory region from 2^{21} to 2^{22} .	10.10.5052	10.0100.6440
2.	DC transport	Fixed health buffer false alarm "irisc stuck" indication when using DC transport.	10.10.5020	10.10.5054
3.		Fixed rare unexpected completion with error on DC QPs.	10.10.5020	10.10.5054
4.	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
5.	Thermal sensors	On very rare occasions, firmware wrongly reported board over-temperature warning.	10.10.5020	10.10.5054
6.	DCT	destroy-DCT command handling may experience delays while the DCT port is down.	10.10.4064	10.10.5020
7.	MAD	Fixed an issue causing diagnostic counters VS-MAD page offset to start at a wrong address.	10.10.4020	10.10.5020
8.	DC transport	Fixed stability issue in the event of no-local-DC-resources	10.10.4020	10.10.4064
9.		Fixed improper handling of multiple DCT errors	10.10.4050	10.10.4064
10.		Fixed bad handling of DC RNR state	10.10.4050	10.10.4064
11.	DC transport	Reduced DCT destroy firmware handling time	10.10.4020	10.10.4050
12.	Ports	Fixed link flapping issue which occurred when LLR was active.	10.10.3000	10.10.4050
13.	PCIe class code of the device	Deprecated code 0x0c0600 was changed to 0x020700 (InfiniBand network adapter)	10.10.3000	10.10.4020
14.	Atomic support	Atomic response endianness is always a big endian	10.10.1000	10.10.3000

Table 13 - Fixed Bugs List

#	Category	Description	Discovered in Release	Fixed in Release
15.	Miscellaneous	[Documentation fix in PRM v2.01, no changes to the firmware code.] 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"> • link down=0x1 • link up=0x4 • link initialized=0x5 • lid change=0x6 • PKEY change=0x7 • GUID change=0x8 • client reregister=0x9 	10.10.1000	10.10.3000
16.	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
17.		Using a <code>min_rnr_nak</code> value of 0x5 will cause failures when creating reliable connection (RC) QPs.	10.10.2000	10.10.3000
18.	DC	On rare occasions DC Initiator completions might be lost.	10.10.2000	10.10.3000
19.	Data Integrity Signature	The following signature rules are not supported (Numbering based on "signature rules table" in PRM): <ul style="list-style-type: none"> • Rule #12: T10 DIF • Rule #13: T10 DIF CS • Rule #14 T10 DIF CS 	10.10.2000	10.10.3000
20.	Quality of Service	VL arbitration configuration does not ensure minimum bandwidth for VL as configured.	10.10.1000	10.10.2000
21.	False alarm report	On very rare occasions, a false firmware "hanged" report is printed in the <code>dmesg</code> .	10.10.1000	10.10.2000
22.	CQ buffer resize	CQ buffer resize not supported	10.10.1000	10.10.2000
23.	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 14 - Firmware Changes and New Feature History

Firmware Version	Description
10.10.5054	<ul style="list-style-type: none"> • Enabled firmware burning (using mstflint) when the driver is down. • Bug Fixes (See Section 4, “Bug Fixes History,” on page 13.)
10.10.5020	<ul style="list-style-type: none"> • Added support for EDR cables (up to FDR speeds). • Added additional InfiniBand spec optional counters • 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. • Bug Fixes See Section 4, “Bug Fixes History,” on page 13.
10.10.4064	<ul style="list-style-type: none"> • Bug Fixes (see Section 4, “Bug Fixes History,” on page 13)
10.10.4050	<ul style="list-style-type: none"> • Suspend to RAM (S3) support • Diagnostic counters vendor-specific MAD support, as defined by VS-MAD spec version 1.2 • Bug Fixes (see Section 4, “Bug Fixes History,” on page 13)
10.10.4020	<ul style="list-style-type: none"> • On Demand Paging (ODP) Memory can now be used without pinning memory beforehand. Supported transports are UD and RC • ODP support is GA for RC RDMA-write, RC send, and UD send. Beta level for • RDMA-read/atomics • Enhanced Atomic Operations to include all PRM atomic operations of 32 bytes or below • Dynamically Connected (DC) transport improvements
10.10.3000	<ul style="list-style-type: none"> • Dynamically Connected (DC) transport (at GA level) • Enabled Atomic Operations. For further information, please refer to the PRM section “Atomic Capabilities” • Added sniffer QP support (Note: Sniffer QP is currently not available in MLNX_OFED v2.2-1.0.0 or the MFT tools package) • Increased the maximum number of InfiniBand partitions to 0x1000
10.10.2000	<ul style="list-style-type: none"> • Dynamically Connected (DC) transport (at Beta level) • CORE-Direct® <ul style="list-style-type: none"> • Provides Collective Off-loading in HCA • Frees CPU to perform computation in parallel with collective operations • T10 DIF Data Integrity Signature off-loading • 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. • User Memory Registration (UMR) • InfiniBand Automatic Path Migration

Table 14 - Firmware Changes and New Feature History

Firmware Version	Description
10.10.1000	<ul style="list-style-type: none">• Initial Release of Connect-IB™• Port speed up to FDR• PCI Express 3.0 x16, with backwards compatibility with v2.0 and v1.1• Dynamically Connected (DC) transport at Alpha level

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)
- SR-IOV
- 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
- NC-SI interface is not enabled in Connect-IB® firmware
- PCIe Function Level Reset (FLR)

6.2 Unsupported Commands

- QUERY_MAD_DEMUX
- SET_MAD_DEMUX
- PAGE_FAULT_RESUME
- ACTIVATE_TRACER
- DEACTIVATE_TRACER