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

Rev 10.10.5020

Last Updated: February 2015

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Release Update History

Table 1 - Release Update History

Release	Date	Description
10.10.5020	February 2015	Added bug fix # 7 to Section 4, "Bug Fixes History" , on page 13
	January 2015	Initial version

1 Overview

These are the release notes for the Connect-IB® adapters firmware, fw-ConnectIB Rev 10.10.5020. 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. For the most updated list of adapter cards supported, visit the firmware download pages via <http://www.mellanox.com>.



Please contact your Mellanox local FAE for firmware updates to pre-production cards not on this list.

Table 2 - Supported PSIDs

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

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 Tested Cables and Modules

Table 3 - Tested Cables and Modules

Speed	OPN #	Description
DDR	MC1204128-005	MT PASSIVE COPPER CABLE 4X CX4 TO QSFP 20GB/S 28AWG 5M
DDR	MC1204130-001	MT PASSIVE COPPER CABLE 4X CX4 TO QSFP 20GB/S 30AWG 1M
DDR	MC1204130-003	MT PASSIVE COPPER CABLE 4X CX4 TO QSFP 20GB/S 30AWG 3M
SDR	MC1104130-001	MT PASSIVE COPPER CABLE 4X CX4 20GB/S 30AWG 1M
SDR	MC1104130-003	MT PASSIVE COPPER CABLE 4X CX4 20GB/S 30AWG 3M
QDR	MC2206310-300	MT ACTIVE FIBER CABLE 4X QSFP 40GB/S 200M
QDR	MC2206125-007	MT PASSIVE COPPER CABLE 4X QSFP 40GB/S 25AWG 7M
QDR	MC2206126-006	MT PASSIVE COPPER CABLE 4X QSFP 40GB/S 26AWG 6M
QDR	MC1204128-005	MT PASSIVE COPPER CABLE 4X CX4 TO QSFP 20GB/S 28AWG 5M
QDR/FDR10/ 40GE	MC2206310-030-T	MT ACTIVE FIBER CABLE 4X QSFP 40GB/S 30M
QDR / FDR10/ 40G	MC2206310-100-T	MT ACTIVE FIBER CABLE 4X QSFP 40GB/S 100M
QDR/FDR10/ 40GE	MC2206310-030-F	MT ACTIVE FIBER CABLE 4X QSFP 40GB/S 30M
QDR / FDR10/ 40G	MC2206310-100-F	MT ACTIVE FIBER CABLE 4X QSFP 40GB/S 100M
QDR / FDR10/ 40GE	MFS4R12CB-100	MT ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP 100M
QDR / FDR10	MC2206128-005	MT PASSIVE COPPER CABLE 4X QSFP 40GB/S 28AWG 5M
QDR / FDR10	MC2206130-003	MT PASSIVE COPPER CABLE 4X QSFP 40GB/S 30AWG 3M
QDR / FDR10	MC2206130-00A	MT PASSIVE COPPER CABLE 4X QSFP 40GB/S 30AWG 0.5M
QDR / FDR10/ 40GE	MC2210411-SR4 -T	Mellanox Optical Module 40Gb/S QSFP LC-LC 850NM LR4. Up To 100M

Table 3 - Tested Cables and Modules

Speed	OPN #	Description
QDR / FDR10/ 40GE	MC2210411-SR4 -F	Mellanox Optical Module 40Gb/S QSFP LC-LC 850NM LR4. Up To 100M
QDR	MFM4R12C-QDR	40GB/S INFINIBAND QSFP OPTICAL MODULE IN SINGLE BOX
FDR; 56G VPI	MC2207130-00A	MT PASSIVE COPPER CABLE 4X QSFP 56GB/S 30AWG 0.5M
FDR; 56G VPI	MC2207130-002	MT PASSIVE COPPER CABLE 4X QSFP 56GB/S 30AWG 2M
FDR; 56G VPI	MC2207128-003	MT PASSIVE COPPER CABLE 4X QSFP 56GB/S 28AWG 3M
FDR; 56G VPI	MC2207126-004*	MT PASSIVE COPPER CABLE 4X QSFP 56GB/S 28AWG 4M
FDR; 56 VPI	MC2207312-003	MT ACTIVE FIBER CABLE VPI IB FDR (56GB/S) AND ETH 40GBE QSFP 3M
FDR; 56G VPI	MC2207310-030-E	MT ACTIVE FIBER CABLE 4X QSFP 56GB/S 30M
FDR; 56G VPI	MC2207312-100	MT ACTIVE FIBER CABLE 4X QSFP 56GB/S 100M
FDR; 56G VPI	MC2207310-100-E	MT ACTIVE FIBER CABLE 4X QSFP 56GB/S 100M
FDR; 56G VPI	MC2207310-030-F	MT ACTIVE FIBER CABLE 4X QSFP 56GB/S 30M
FDR; 56G VPI	MC2207310-100-F	MT ACTIVE FIBER CABLE 4X QSFP 56GB/S 100M
IB FDR	MC220731V-003	Mellanox Active Fiber IB QSFP 3M
IB FDR	MC220731V-100	Mellanox Active Fiber IB QSFP 100M
PCC 100G ECLIPSE	MCP1600-E001-V	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 1M
PCC 100G ECLIPSE	MCP1600-E002-V	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 2M
PCC 100G ECLIPSE	MCP1600-E003-V	MELLANOX PASSIVE COPPER CABLE VPI 100GB/S QSFP LSZH 3M
EDR; 100G VPI	MFA1A00-E005	MELLANOX ACTIVE FIBER CABLE VPI UP TO 100GB/S QSFP 5M
EDR; 100G VPI	MFA1A00-E100	MELLANOX ACTIVE FIBER CABLE VPI UP TO 100GB/S QSFP 100M

1.3 Tested Switches

Table 4 - Tested Switches

Speed	OPN # /Name	Description
IB SDR	F-X430060	24-port SDR-Switch

Table 4 - Tested Switches

Speed	OPN # /Name	Description
IB QDR	QLogic 12300	36-Port 40Gb QDR Infiniband Switch, Management Module, Dual Power
IB QDR	MIS5025Q-1SFC	InfiniScale® IV QDR InfiniBand Switch, 36 QSFP ports, 1 Power Supply, Unmanaged, PSU side to connector side airflow, Standard depth, Rail Kit and RoHS5
IB QDR	QDR-Switch 4036	InfiniScale® IV QDR Mellanox Grid Director 4036 36-Port QDR InfiniBand Switch Part ID: VLT-30011
IB FDR	MSX6036F-1BFR	SwitchX™ based FDR InfiniBand Switch, 36 QSFP ports, 1 Power Supply, Short depth, Managed, PSU side to Connector side airflow, Rail Kit and RoHS6
IB FDR	MSX6018F-1SFR	SwitchX® based FDR InfiniBand Switch, 18 QSFP ports, 1 Power Supply, Standard depth, Managed, PSU side to Connector side airflow, Rail Kit and RoHS6
IB FDR10	MSX6025T-1SFR	SwitchX™ based FDR10 Infiniband Switch, 36 QSFP ports, 1 Power Supply, Standard depth, Unmanaged, PSU side to Connector side airflow, Rail Kit and RoHS6
IB EDR	MSB7790-EB2F	SwitchX™ based EDR InfiniBand Switch, 36 QSFP ports, non-blocking switching capacity of 7.2Tbps, 2 Power Supplies (AC), Short depth, Unmanaged, P2C airflow, Rail Kit, RoHS6
IB FDR	648311-B21	HP BLc 4X FDR IB Switch
IB QDR	489184-B21	HP BLc 4X QDR IB Switch

1.4 Tools and Driver Software

Firmware Rev 10.10.5020 is tested with the following tools and driver software:

- Driver versions:
 - MLNX_OFED 2.2-1.0.0 and higher (For new features, required driver version is 2.4-1.0.0)
- MFT for Linux version: 3.8.0 and higher
- PXE version 3.4.460 and higher

1.5 Revision Compatibility

Firmware fw-ConnectIB Rev 10.10.5020 complies with the following programmer's reference manual:

- *ConnectIB Programmer's Reference Manual (PRM), Rev 2.05 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 10.10.5020 Changes and New Feature

Table 5 - Firmware Rev 10.10.5020 Changes and New Feature

Category	Description
EDR Cables	Added support for EDR cables (up to FDR speeds).
Counters	Added additional InfiniBand spec optional counters
Resource Allocation	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.

3 Known Issues

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

Table 6 - 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 8 lists the bugs fixed in this release.

Table 7 - Fixed Bugs List

#	Category	Description	Discovered in Release	Fixed in Release
1.	DCT	destroy-DCT command handling may experience delays while the DCT port is down.	10.10.4064	10.10.5020
2.	MAD	Fixed an issue causing diagnostic counters VS-MAD page offset to start at a wrong address.	10.10.4020	10.10.5020
3.	DC transport	Fixed stability issue in the event of no-local-DC-resources	10.10.4020	10.10.4064
4.		Fixed improper handling of multiple DCT errors	10.10.4050	10.10.4064
5.		Fixed bad handling of DC RNR state	10.10.4050	10.10.4064
6.	DC transport	Reduced DCT destroy firmware handling time	10.10.4020	10.10.4050
7.	Ports	Fixed link flapping issue which occurred when LLR was active.	10.10.3000	10.10.4050
8.	PCIe class code of the device	Deprecated code 0x0c0600 was changed to 0x020700 (InfiniBand network adapter)	10.10.3000	10.10.4020
9.	Atomic support	Atomic response endianness is always a big endian	10.10.1000	10.10.3000
10.	Miscellaneous	<p>[Documentation fix in PRM v2.01, no changes to the firmware code.]</p> <p>Port asynchronous events documentation are different from the PRM. All port events have a type value of 0x9.</p> <p>The following subtype values are used for the following events:</p> <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
11.	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
12.		Using a min_rnr_nak value of 0x5 will cause failures when creating reliable connection (RC) QPs.	10.10.2000	10.10.3000
13.	DC	On rare occasions DC Initiator completions might be lost.	10.10.2000	10.10.3000

Table 7 - Fixed Bugs List

#	Category	Description	Discovered in Release	Fixed in Release
14.	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
15.	Quality of Service	VL arbitration configuration does not ensure minimum bandwidth for VL as configured.	10.10.1000	10.10.2000
16.	False alarm report	On very rare occasions, a false firmware "hanged" report is printed in the dmesg.	10.10.1000	10.10.2000
17.	CQ buffer resize	CQ buffer resize not supported	10.10.1000	10.10.2000
18.	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 8 - Firmware Changes and New Feature History

Firmware Version	Description
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-loading¹ 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
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

1. For further information, please refer to MLNX_OFED Release Notes.

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

7 Flexboot Changes and New Features

For further information, please refer to FlexBoot Release Notes
(www.mellanox.com > Software > InfiniBand/VPI Drivers > FlexBoot).

Table 9 - FlexBoot Changes and New Feature

Version	Description
Rev 3.4.460	<ul style="list-style-type: none"> • Boot Menu support: Added new FlexBoot GUI. The device can now be configured in the POST stage. • Non volatile memory read/write support • Configurable URI boot retry and delay between retries • Configurable iSCSI settings using DHCP/NVM • Added new interface in order to update the registered devices on the PXE stage • Enabled ConnectX Ethernet adapter cards family to work with interrupts • Enabled PXE to work in promiscuous VLAN mode (configurable through the INI) • Synced version with ipxe.org: Now the latest code in iPXE is used • Added boot priority capability: iSCSI vs PXE and fallback incase one fails • Updated the Proxy DHCP request method for non-existing option 54. ProxyDHCP request is sent to port 67 with broadcast IP address if the server identifier in option 54 is zero. Packets with source port different than BOOTPS_PORT and PXE_PORT are filtered by the PROXY • SHELL CLI is currently supported on ConnectX-3 and ConnectX-3 Pro adapter cards only • Both the GUID and the MAC are printed on the screen when the port link layer is set as InfiniBand • PROXYDHCP and PXEBS settings are saved under netdevice settings • rootpath/filename/nextserver are now fetched from the netdevice settings • The cached DHCP packet are received only if working with the same net device. When pxelinux.0 receives the cached DHCP packet from the UNDI API, it constructs a new (fake) packet for the current net device. If the process is stopped and then restarted and booted from the next boot device which serves as the second port in the HCA, a new (fake) DHCP packet is not constructed. The previous packet which includes all the information of the first port (IP, MAC, Netmask, etc...) is used. If an old (fake) DHCP packet is discovered, its chaddr is compared to the chaddr in the pxe_netdev, if not similar, a new (fake) DHCP packet is created. • PXE shutdown is called if int22 with function 0x000C is called. • The server's IP address in DHCP server replies is now checked before checking the reply type. This will ignore NACK replies from servers which already were ignored by the client. In case of 2 DHCP servers in the same subnet, the client will eventually choose one of them, by sending the DHCP REQUEST with 'DHCP Server Identifier' (option 54) filled with the requested server's IP address. • Changed DHCP discover timeouts to comply with PXE spec

Table 9 - FlexBoot Changes and New Feature

Version	Description
Rev 3.4.306	<ul style="list-style-type: none"> • Added validation script for the released ROMs • Added the option to always keep SAN hook to enable WIN install on iSCSI target • Added compilation flag around the flash readout. • Added URI Boot retry. Default retries = 0. • Added Unmap MPT command in teardown. • Added support for HII iSCSI configuration. • Added 64-bit PCI BAR support (Large bar). • Added the option added for running PXE with promiscuous VLAN. • Re-added COMBOOT image support by default. • Enabled pages-function handling in Connect-IB initialization stage to work according to the PRM. • Applied additional patches from ipxe.org • Updated the window even if ACK does not acknowledge new data. • Modified the error print to debug print. • Modified the printed string when initializing devices. • Modified the error print. Added additional information to make the output more user-friendly. • Changed the size of the domain name array to 0xfd. • Disabled the waiting period for link up on trunk-net-device when VLAN is enabled on port. • Removed unsupported EQ event in Connect-IB® • Fixed an issue for TLV with length 0. • Fixed an issue related to sync VLAN IRQ operation with trunk IRQ operation. • Fixed an issue which enabled a netdevice (VLAN) to open/close twice. • Fixed an issue which prevented the iSCSI initiator's name from being received from HII. • Fixed an issue related to dual port adapters; occasionally, booting from the second port resulted in TFTP download failure when the first port was already linked up with DHCP, and has received a TFTP address. • Fixed an issue which caused PXE boot failure when using a filename if iSCSI rootpath is set. • Fixed an issue which prevented the device to PXE boot from the 2nd port if first port was already downloaded. • Fixed compilation issue. • Fixed a broken VLAN issue. • Fixed a retry issue when the value is infinite.

Table 9 - FlexBoot Changes and New Feature

Version	Description
Rev 3.4.225	<ul style="list-style-type: none"> • Added additional information to the error print output • Added compilation flag around the flash readout • Added URI Boot retry. Default retries = 0 • Added Unmap MPT command in teardown • Added an option for running PXE with promiscuous VLAN • Enlarged the mailbox size to 4kb • Enlarged the number of WQE to 64 (from 4) • Enabled multiple DHCP offers to be received before proceeding to request state • Changed the size of the domain name array to 0xfd • Changed error print to debug print • Changed printed string when initializing devices • Kept the SAN connection permanently open to enable Windows install on iSCSI target even when the iSCSI target is empty • Re-added COMBOOT image support by default • Prevented a netdevice (VLAN) from opening/closing twice • Removed unsupported EQ event in Connect-IB® • Disabled the waiting time for link up on trunk net device when VLAN is enabled on a port • Fixed sync VLAN IRQ operation with trunk IRQ operation • Fixed an issue caused in dual port adapters, when the first port was already linked up with DHCP, and had received a TFTP address. Booting from the second port resulted in TFTP download failure. • Fixed retry issue when the value is infinite • Fixed a PXE boot failure issue occurred when using a filename when iSCSI rootpath is set • Fixed "Impossible to PXE boot from 2nd port if first port already downloaded." issue • Fixed compilation issue • Fixed broken VLAN support issues • Enlarged the mailbox size to 4kb • Enlarged the number of WQE to 64 (from 4) • Enabled multiple DHCP offers to be received before proceeding to request state • Fixed memory corruption issues • Added additional WQ