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Mellanox ConnectX®-4 Firmware Release Notes

Rev 12.12.1100

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Release Update History

Table 1 - Release Update History

Release	Date	Description
	September 10, 2015	Initial version of this release

1 Overview

These are the release notes for the ConnectX®-4 adapters firmware Rev 12.12.1100. This firmware supports the following protocols:

- InfiniBand - SDR, QDR, FDR, EDR
- Ethernet - 10GigE, 25GigE, 40GigE, 50GigE and 100GigE
- 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 (Sheet 1 of 2)

Device Part Number	PSID	Device Name
MCX413A-BCAT	MT_2120110027	ConnectX®-4 EN network interface card, 40GbE single-port QSFP28, PCIe3.0 x8, tall bracket, ROHS R6
MCX413A-GCAT	MT_2600110035	ConnectX®-4 EN network interface card, 50GbE single-port QSFP28, PCIe3.0 x8, tall bracket, ROHS R6
MCX414A-BCAT	MT_2130110027	ConnectX®-4 EN network interface card, 40GbE dual-port QSFP28, PCIe3.0 x8, tall bracket, ROHS R6
MCX414A-GCAT	MT_2610110035	ConnectX®-4 EN network interface card, 50GbE single-port QSFP28, PCIe3.0 x8, tall bracket, ROHS R6
MCX415A-BCAT	MT_2120111027	ConnectX®-4 EN network interface card, 40GbE single-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6
MCX415A-CCAT	MT_2140110033	ConnectX®-4 EN network interface card, 100GbE single-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6
MCX415A-GCAT	MT_2120110035	ConnectX®-4 EN network interface card; 50GbE single-port QSFP28; PCIe3.0 x16; ROHS R6
MCX416A-BCAT	MT_2130111027	ConnectX®-4 EN network interface card, 40GbE dual-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6
MCX416A-CCAT	MT_2150110033	ConnectX®-4 EN network interface card, 100GbE dual-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R
MCX416A-GCAT	MT_2130110035	ConnectX®-4 EN network interface card; 50GbE dual-port QSFP28; PCIe3.0 x16; ROHS R6
MCX453A-FCAT	MT_2160110021	ConnectX®-4 VPI adapter card, FDR IB 40GbE, single-port QSFP28, PCIe3.0 x8, tall bracket, ROHS R6
MCX454A-FCAT	MT_2170110021	ConnectX®-4 VPI adapter card, FDR IB and 40GbE, dual-port QSFP28, PCIe3.0 x8, tall bracket, ROHS R6
MCX455A-ECAT	MT_2180110032	ConnectX®-4 VPI adapter card, EDR IB (100Gb/s) and 100GbE, single-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6

Table 2 - Supported PSIDs (Sheet 2 of 2)

Device Part Number	PSID	Device Name
MCX455A-FCAT	MT_2160111021	ConnectX®-4 VPI adapter card, FDR IB and 40GbE, single-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6
MCX456A-FCAT	MT_2170111021	ConnectX®-4 VPI adapter card, FDR IB and 40GbE, dual-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6
MCX456A-ECAT	MT_2190110032	ConnectX®-4 VPI adapter card, EDR IB (100Gb/s) and 100GbE, dual-port QSFP28, 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 10/40GbE Cables

Table 3 - Validated and Supported 10/40GbE Cables

Speed	Cable OPN #	Description
40GB/S	MC2210128-003	MELLANOX PASSIVE COPPER CABLE ETH 40GBE 40GB/S QSFP 3M
40GB/S	MC2210130-001	MELLANOX PASSIVE COPPER CABLE ETH 40GBE 40GB/S QSFP 1M
40GB/S	MC2210130-002	MELLANOX PASSIVE COPPER CABLE ETH 40GBE 40GB/S QSFP 2M
40GB/S	MC2210310-XXX	MELLANOX ACTIVE FIBER CABLE ETH 40GBE 40GB/S QSFP from 3M up to 100M
40GB/S	MC2210411-SR4L	MELLANOX OPTICAL MODULE 40GB/S QSFP MPO 850NM UP TO 30M
10GB/S	MC2309124-004	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S QSFP TO SFP+ 4M
10GB/S	MC2309124-005	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S QSFP TO SFP+ 5M
10GB/S	MC2309130-001	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S QSFP TO SFP+ 1M
10GB/S	MC2309130-002	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S QSFP TO SFP+ 2M
10GB/S	MC2309130-003	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S QSFP TO SFP+ 3M
10GB/S	MC2309130-00A	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S QSFP TO SFP+ 0.5M

Table 3 - Validated and Supported 10/40GbE Cables

Speed	Cable OPN #	Description
10GB/S	MC2609125-004	MELLANOX PASSIVE COPPER HYBRID CABLE ETH 40GBE TO 4X10GBE QSFP TO 4X SFP+ 4M
10GB/S	MC2609125-005	MELLANOX PASSIVE COPPER HYBRID CABLE ETH 40GBE TO 4X10GBE QSFP TO 4X SFP+ 5M
10GB/S	MC2609130-001	MELLANOX PASSIVE COPPER HYBRID CABLE ETH 40GBE TO 4X10GBE QSFP TO 4X SFP+ 1M
10GB/S	MC2609130-002	MELLANOX PASSIVE COPPER HYBRID CABLE ETH 40GBE TO 4X10GBE QSFP TO 4X SFP+ 2M
10GB/S	MC2609130-003	MELLANOX PASSIVE COPPER HYBRID CABLE ETH 40GBE TO 4X10GBE QSFP TO 4X SFP+ 3M
10GB/S	MC2609130-0A1	MELLANOX PASSIVE COPPER HYBRID CABLE ETH 40GBE TO 4X10GBE QSFP TO 4X SFP+ 1.5M
10GB/S	MC3309124-004	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 4M
10GB/S	MC3309124-005	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 5M
10GB/S	MC3309130-001	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 1M
10GB/S	MC3309130-002	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 2M
10GB/S	MC3309130-003	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 3M
10GB/S	MC3309130-00A	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 0.5M
10GB/S	MC3309130-0A1	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 1.5M
10GB/S	MC3309130-0A2	MELLANOX PASSIVE COPPER CABLE ETH 10GBE 10GB/S SFP+ 2.5M
10GB/S	MFM1T02A-SR	MELLANOX OPTICAL MODULE ETH 10GBE 10GB/S SFP+ LC-LC 850NM SR UP TO 300M
10GB/S	MFM1T02A-LR	MELLANOX OPTICAL MODULE ETH 10GBE 10GB/S SFP+ LC-LC 1310NM LR UP TO 10KM
10GB/S	Cisco SFP-H10GB-CU1M	Cisco SFP+ cable
10GB/S	Cisco SFP-H10GB-CU3M	Cisco SFP+ cable
10GB/S	Cisco SFP-H10GB-CU5M	Cisco SFP+ cable
40GB/S	QSFP-H40G-CU1M	Cisco QSFP 40GbE cable
40GB/S	QSFP-H40G-CU3M	Cisco QSFP 40GbE cable
40GB/S	QSFP-H40G-CU5M	Cisco QSFP 40GbE cable
10GB/S	MC2309124-007	QSFP-4SFP10G

Table 3 - Validated and Supported 10/40GbE Cables

Speed	Cable OPN #	Description
40GB/S	QSFP-40G-SR4	CISCO 40G QSFP Module
10GB/S	SFP-10G-SR	CISCO 10GBASE-SR SFP Module
N/A	MAM1Q00A-QSA	MELLANOX QSFP TO SFP+ ADAPTER

1.2.2 Validated and Supported 25GbE Cables

Table 4 - Validated and Supported 10/40GbE Cables

Speed	Cable OPN #	Description
25GB/S	MCP2M00-A001	Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1m
25GB/S	MCP2M00-A01A	Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1.5m
25GB/S	MCP2M00-A002	Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2m
25GB/S	MCP2M00-A02A	Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2.5m
25GB/S	MCP2M00-A003	Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 3m

1.2.3 Validated and Supported QDR/FDR10 Cables

Table 5 - Validated and Supported QDR/FDR10 Cable

Speed	Cable OPN #	Description
QDR	MC2206125-007	MELLANOX PASSIVE COPPER CABLE IB QDR 40GB/S QSFP 7M
QDR	MC2206126-006	MELLANOX PASSIVE COPPER CABLE IB QDR 40GB/S QSFP 6M
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-XXX	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP from 3M up to 100M
FDR10	MC2206310-300	MELLANOX ACTIVE FIBER CABLE IB QDR/FDR10 40GB/S QSFP 300M
FDR10	MC2210411-SR4	MELLANOX OPTICAL MODULE 40GB/S QSFP MPO 850NM UP TO 100M

Table 5 - Validated and Supported QDR/FDR10 Cable

Speed	Cable OPN #	Description
FDR10	MC2210411-SR4E	MELLANOX OPTICAL MODULE 40GB/S QSFP MPO 850NM UP TO 300M
FDR10	MFS4R12CB-XXX	MELLANOX ACTIVE FIBER CABLE VPI UP TO 40GB/S QSFP from 3M up to 100M

1.2.4 Validated and Supported FDR Cables

Table 6 - Validated and Supported FDR Cables

Speed	Cable OPN #	Description
FDR	MC2207126-004	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 4M
FDR	MC2207128-003	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 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 PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 2M
FDR	MC2207130-00A	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 0.5M
FDR	MC2207130-0A1	MELLANOX PASSIVE COPPER CABLE VPI UP TO 56GB/S QSFP 1.5M
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	MC2207312-050	MELLANOX ACTIVE FIBER CABLE VPI UP TO 56GB/S QSFP from 3M up to 300M
FDR	MC2207310-100	MELLANOX ACTIVE FIBER CABLE VPI UP TO 56GB/S QSFP from 3M up to 100M
FDR	MC2207411-SR4L	MELLANOX OPTICAL MODULE IB FDR 56GB/S QSFP MPO 850NM UP TO 30M

1.2.5 Validated and Supported EDR Cables

Table 7 - Validated and Supported EDR Cables

Speed	Cable OPN #	Description
100GB/S	MCP1600-C00A	MELLANOX PASSIVE COPPER CABLE ETH 100GBE 100GBS QSFP LSZH 0.5M
100GB/S	MCP1600-C001	MELLANOX PASSIVE COPPER CABLE ETH 100GBE 100GBS QSFP LSZH 1M
100GB/S	MCP1600-C002	MELLANOX PASSIVE COPPER CABLE ETH 100GBE 100GBS QSFP LSZH 2M
100GB/S	MCP1600-C003	MELLANOX PASSIVE COPPER CABLE ETH 100GBE 100GBS QSFP LSZH 3M
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 SDR Switches

Table 8 - Tested SDR Switches

Speed	Switch Family	OPN # / Name	Description
SDR	N/A	F-X430060	24-port SDR-Switch

1.3.2 Tested QDR Switches

Table 9 - Tested QDR Switches

Speed	Switch Family	OPN # / Name	Description
QDR	N/A	QLogic 12300	36-Port 40Gb QDR Infiniband Switch, Management Module, Dual Power
QDR	InfiniScale® IV	IS5025Q-1SFC	36-port 40Gb/s InfiniBand Switch Systems
QDR	InfiniScale® IV	Switch 4036	Grid Director™ 4036E

1.3.3 Tested 10/40GbE Switches

Table 10 - Tested 10/40GbE Switches

Speed	Switch Family	OPN # / Name	Description
10/40GbE	N/A	3064	48-port 10Gb/40Gb Switch
10/40GbE	N/A	7050Q	16-port 40Gb Switch
10/40GbE	N/A	7050S	48-port 10Gb/40Gb Switch
10GbE	SwitchX®	SX1016X-1BFR	64-Port 10GbE Switch System
10GbE	N/A	5548	Cisco 10GB ETH switch
10GbE	N/A	G8264	BNT 10/40GB ETH switch
10GbE	N/A	QFX3500	Juniper 10/40GB ETH switch
10GbE	N/A	S4810P-AC	48-port 10Gb/40Gb Switch
40GbE	SwitchX®	SX1036B-1BFR	36-Port 40/56GbE Switch System
40GbE	N/A	3132Q	Cisco 40GB ETH switch
40GbE	N/A	7050QX	32-port 40Gb Switch
40GbE	N/A	G8316	BNT 40GB RackSwitch G8316
40GbE	N/A	S6000	32-port 40Gb Switch

1.3.4 Tested FDR Switches

Table 11 - Tested FDR Switches

Speed	Switch Family	OPN # / Name	Description
FDR	SwitchX®-2	SX6710-FB2F2	36-port 56Gb/s InfiniBand/VPI Switch Systems
FDR	SwitchX®	SX6018F-1SFR	18-port 56Gb/s InfiniBand/VPI Switch Systems

1.3.5 Tested EDR Switches

Table 12 - 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 12.12.1100 is tested with the following tools, SwitchX® firmware, and driver software:

Table 13 - Tools, Switch Firmware and Driver Software

	Supported Version
MLNX_OFED	3.1-1.0.0/3.0-2.0.0
MLNX_EN (MLNX_OFED based code)	3.1-1.0.0/3.0-2.0.0
WinOF-2	1.20
MFT	4.1.0
SwitchX®/SwitchX®-2 Firmware	v9.3.3180
SwitchX-IB™ Firmware	v11.0200.0114
InfiniScale® V Firmware	v7.4.3000/v7.4.2200
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
Windows Inbox Drivers	<ul style="list-style-type: none"> • Windows Server 2016 (Beta)

1.5 Supported FlexBoot

Firmware Rev 12.12.1100 supports the following FlexBoot:

Table 14 - Supported FlexBoot, UEFI and CLP

	Supported Version
FlexBoot	3.4.650

1.6 Revision Compatibility

Firmware Rev 12.12.1100 complies with the following programmer's reference manual:

- *ConnectX Programmer's Reference Manual (PRM), Rev 0.28 or later*, which has Command Interface Revision 0x3. 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 12.12.1100

Table 15 - Firmware Rev 12.12.1100 Changes and New Feature

Category	Description
Phy	<ul style="list-style-type: none">• Reduced the port link-up time when negotiating according to Clause 73 (DME).

3 Known Issues

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

Table 16 - Known Issues

Index	Issue	Description	Workaround
1.	Link	FDR10 is currently not supported	-
2.		Bit error rate is not optimal on QDR links	-
3.	Interoperability	To raise links with platforms based on the following ICs, comply with the following firmware version requirements: <ul style="list-style-type: none"> • Connect-IB® - 10.10.4000 • Switch-IB™ - 11.200.120 (or MLNX-OS 3.4.3050) • ConnectX®-3 - 2.32.5100 • SwitchX® - 9.2.7300 (or MLNX-OS 3.3.5006) 	-
4.		If QDR is not enabled for the switch's InfiniBand Port Speed while connected to ConnectX-3/ConnectX-3Pro or Connect-IB® FDR adapters or to SwitchX® / SwitchX-2 FDR switches, links will rise at SDR or DDR (even if FDR is enabled)	Enable QDR (in addition to FDR) when connecting to peer ports running at FDR
5.	Cables	Qualified EDR cables currently work with EDR networks (EDR devices, Switch®-IB and ConnectX®-4) only.	-
6.	PCI	PCIe capability "Device S/N" returns false value.	-
7.		When the link is Gen2, entering or exiting L1 state may cause bad CRC or DLLP indication.	-
8.		Configuration space power management capability PME_EN cannot be set.	-

Table 16 - Known Issues

Index	Issue	Description	Workaround
9.	Virtualization	Function (PF/VF) TX port counters are not supported.	-
10.		[For customers developing custom low level drivers] 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.
11.		PF driver must work with pages event queue.	-
12.		[For customers developing custom low level drivers] VNodeInfo and VPortGuidInfo virtualization Attributes MADs are not supported.	-
13.		[For customers developing custom low level drivers] The value of <code>log_max_ra_res_qp</code> in <code>set_hca_cap</code> command should be the same in all functions.	-
14.		SR-IOV Ethernet supports up to 18 VFs per port only.	-
15.		Privileged Vport egress traffic is not blocked when Vport is not active.	-
16.		Any local (internal) loopbacked packet is counted by the Vport counters, although Vport counters should count only traffic that crosses the Vport.	-
17.		Vport number in virtual trap might be reported incorrectly	-
18.		Miscellaneous	PF direct pass-through is not supported (since PF FLR is not supported).
19.	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: <pre># 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</pre>	Choose one of the options below to upgrade firmware: <ul style="list-style-type: none"> • Upgrade to the latest MFT version (4.1.0) • Type "y" after the note flint provides • Run flint with the "-force" flag

Table 16 - Known Issues

Index	Issue	Description	Workaround
20.	Ethernet Network	Traffic that is loopbacked due to QP.force_loopback being equaled to 1, is steered to the PF.	-
21.	Port Link	A low link speed issue occurs when connecting a ConnectX®-4 EDR adapter card with a QDR InfiniScale® IV based switch. The link is raised as DDR.	-
22.	Temperature	A minimum of 200 LFM is required in order to cool the MCX4411A-ACAN adapter card.	-
23.	Firmware reset tool	mlxfwreset does not function properly in old MFT versions after upgrading the firmware image.	Upgrade MFT to the latest release or use reboot/power cycle after upgrading firmware.
24.	Windows Inbox Drivers	Windows Server 2016 Inbox driver cannot work with this firmware version	Use WinOF-2 v1.20 out-of-box driver.
25.	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

4 Bug Fixes History

Table 17 lists the bugs fixed in this release.

Table 17 - Fixed Bugs List

Index	Issue	Description	Discovered in Release	Fixed in Release
1.	Cables	Removed request for Forward Error Correction (FEC) on copper cables of 2m or shorter. In order to work with Switch-IB without FEC, a minimum firmware version of 11.0200.0120 is required	12.1100.6630	12.12.0780
2.	LEDs	Fixed a LED issue in adapter cards with bi-color LEDs. The LEDs were activated simultaneously due to a firmware issue.	12.1100.6630	12.12.0780
3.	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	12.12.0780
4.	Phy Management	Fixed a Phy manager PCS event handling when the port's next state was disable.	12.1100.6630	12.12.0780
5.	MADs	Fixed an issue that caused invalid data returned by EyeOpening MAD.	12.0100.6440	12.12.0780
6.	Ethernet Network	Fixed a system call trace event on ConnectX-4 OCP mezz card	12.0100.6440	12.12.0780
7.	Diagnostic Tools	Fixed an issue which caused hardware fatal error when running ibdump.	12.0100.6440	12.12.0780
8.	Virtualization	Reduced the VF ICM footprint for VFs.	12.0100.6440	12.1100.6630

5 Firmware Changes and New Feature History

Table 18 - Firmware Changes and New Feature History

Firmware Version	Category	Description
12.12.0780	Ethernet Network	<ul style="list-style-type: none"> • Large Receive Offload (LRO) • Large Send Offload (LSO) • Receive Side Scaling (RSS) • Global Pause • RoCEv1.0/RoCEv2.0 • Flow Steering • Sniffer Ethernet • Rate Limiter (at Beta level) • Multi packet WQE • Minimal Bandwidth Guarantee (ETS) • Explicit Congestion Notification (ECN) • Priority Flow Control (PFC)
	PCI	<ul style="list-style-type: none"> • PCIe Function Level Reset (FLR) • Power Management L2/L3 flow support
	PRM	<ul style="list-style-type: none"> • Self Loopback support • Transport Domain support • CQ2EQ remapping • Added support for the following commands: <ul style="list-style-type: none"> • MODIFY/QUERY_ESW_VPORT_CONTEXT • QUERY/MODIFY_CONG_STATUS • QUERY/MODIFY_CONG_PARAMS • QUERY_CONG_STATISTICS • ADD/DELETE_VXLAN_UDP_DPORT
	Virtualization	<ul style="list-style-type: none"> • VXLAN/NVGRE Stateless offload In this release, this feature is supported through Windows ONLY • SR-IOV EN (at Beta level)
	Performance	<ul style="list-style-type: none"> • CQE zipping
	InfiniBand Network	<ul style="list-style-type: none"> • Dynamically Connected (DC) transport
	Misc	<ul style="list-style-type: none"> • Wake-on-Lane/Standby • FlexBoot/UEFI support
	Non-Volatile Configuration	<ul style="list-style-type: none"> • Non-Volatile Configuration (NVConfig). For the complete list, please refer to Section 8, on page 26.
	Port management	<ul style="list-style-type: none"> • Enabled port management. Now one port can be set as Ethernet and one as InfiniBand.

Table 18 - Firmware Changes and New Feature History

Firmware Version	Category	Description
12.1100.6630	Virtualization	<ul style="list-style-type: none"> Added support for SR-IOV Added support for MADs Virtualization Attributes according to <code>ib_virt_annex_v17</code>
	PRM	<ul style="list-style-type: none"> Updated virtualization command set according to PRM 0.26
	Configuration tools	<ul style="list-style-type: none"> Enabled SR-IOV, <code>NUM_VFS</code> and <code>INT_LOG_MAX_PAYLOAD_SIZE</code> configuration via the <code>mlxconfig</code> tool
12.0100.6440	All	<ul style="list-style-type: none"> Initial Release of ConnectX®-4 adapter cards
	Port Speed	<ul style="list-style-type: none"> InfiniBand port speed up to EDR Ethernet port speed up to 100GigE
	Virtualization	<ul style="list-style-type: none"> Function per port
	InfiniBand Network	<ul style="list-style-type: none"> Dynamically Connected transport Unreliable Datagram Connection transport Atomic Operation 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 pipeline Data Integrity Signature off-loading (at beta level) User Memory Registration (UMR) Automatic Path Migration On Demand Paging (ODP) - Memory can now be used without pinning memory beforehand. Congestion Control Shrink Address Vectors for RC and UD Programmable Port/Node GUID
	Ethernet Network	<p>Note: All the Ethernet features listed below are at Beta level.</p> <ul style="list-style-type: none"> Large Receive Offload (LRO) Large Send Offload (LSO) Receive Side Scaling (RSS) Global Pause RoCEv1/RoCEv2. RoCE is supported only in Reliable Connection (RC) transport Flow Steering

Table 18 - Firmware Changes and New Feature History

Firmware Version	Category	Description
12.0100.6440 (cont.)	General	<ul style="list-style-type: none"> • Thermal monitoring and protection • Port LEDs indications • NVConfig Tool • Suspend to RAM (S3) support • Diagnostic counters vendor-specific MAD support, as defined by VS-MAD spec version 1.2 • Physical Port Counter - Beta level • Q Counter - Beta level • Firmware burning (using mstflint) when the driver is down • CPLD field upgrade • V Port commands
	Host management	<ul style="list-style-type: none"> • NC-SI over RMII support
	MAD	<ul style="list-style-type: none"> • Config space address in MAD management class 0x09

6 FlexBoot Changes and New Features

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

Table 19 - FlexBoot Changes and New Feature

Version	Description
Rev 3.4.650	<ul style="list-style-type: none">• Added support for .mrom images larger than 128kB• Added support for ConnectX-4 EN and ConnectX-4 Lx EN• Synced the source with iPXE (upstream sync)• Moved to flat real mode when calling INT 1a,b101 to avoid BIOSes issues• Added support for detecting Spanning Tree Protocol non-forwarding ports (RSTP/MSTP)

7 Unsupported Features and Commands

7.1 Unsupported Features

The following advanced feature are unsupported in the current firmware version:

- Service types not supported:
 - SyncUMR
 - Mellanox transport
 - PTP
 - RAW IPv6
 - PTP (IEEE 1588)
- 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
- SM is not supported on VFs
- DC is not supported in: SR-IOV, and RoCE

7.2 Unsupported Commands

- QUERY_MAD_DEMUX
- SET_MAD_DEMUX
- PAGE_FAULT_RESUME
- ACTIVATE_TRACER
- DEACTIVATE_TRACER
- ACCESS_REG_SPACE
- ACCESS_REG_SPACE_DWORD
- ACTIVATE/DEACTIVATE_TRACER
- QUERY/MODIFY_SCHED_QUEUE
- CREATE_RQ - MEMORY_RQ_RMP

8 Supported Non-Volatile Configurations

Table 20 - Per-physical Port Settings

Name	Parameter Index
VPI settings	0x12
RoCE CC	0x107
RoCE CC ECN	0x108

Table 21 - Global Settings

Name	Parameter Index
PCI settings	0x80
PCI setting capabilities	0x81
TPT settings	0x82
TPT capabilities	0x83
Option ROM ini	0x100
Option ROM capabilities	0x101

Table 22 - Per host/function Settings

Name	Parameter Index
Wake-on-LAN	0x10