



# Mellanox ConnectX<sup>®</sup>-4 Firmware Release Notes

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Rev 12.20.1030

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## Release Update History

*Table 1 - Release Update History*

| Release        | Date            | Description                               |
|----------------|-----------------|-------------------------------------------|
| Rev 12.20.1030 | August 15, 2017 | Initial version of this firmware release. |

# 1 Overview

These are the release notes for the ConnectX®-4 adapters firmware Rev 12.20.1030. This firmware supports the following protocols:

- InfiniBand - SDR, QDR, FDR10, FDR, EDR
- Ethernet - 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, 56GigE<sup>1</sup> 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 Devices**

| Device Part Number | PSID          | Device Name                                                                 | Compiled with FlexBoot | Compiled with UEFI <sup>a</sup> |
|--------------------|---------------|-----------------------------------------------------------------------------|------------------------|---------------------------------|
| SN37A18739         | LNV0000000006 | Lenovo ThinkSystem Mellanox ConnectX-4 PCIe FDR 1-Port QSFP VPI Adapter     | Yes                    | No                              |
| SN30L27795         | LNV2170110021 | Lenovo ThinkSystem ConnectX®-4 PCIe FDR 2-Port QSFP VPI Adapter by Mellanox | Yes                    | Yes                             |
| 00KH925            | LNV2180110032 | Lenovo ConnectX-4 EDR IB VPI Single-port x16 PCIe 3.0 HCA                   | Yes                    | Yes                             |
| 00MM962            | LNV2190110032 | Mellanox ConnectX®-4 2x100GbE / EDR IB QSFP28 VPI Adapter                   | Yes                    | Yes                             |

- a. If you need to compile your adapter card with an UEFI expansion ROM, please contact Mellanox Support (support@mellanox.com)

## 1.2 Supported Cables and Modules

Please refer to the LinkX™ Cables and Transceivers web page

(<http://www.mellanox.com/products/interconnect/cables-configurator.php>) for the list of supported cables.

### 1.2.1 Validated and Supported 1GbE Cables

**Table 3 - Validated and Supported 1GbE Cables**

| Speed | Cable OPN #  | Description                        |
|-------|--------------|------------------------------------|
| 1GB/S | MC3208011-SX | Mellanox Optical module, SX, 850nm |
| 1GB/S | MC3208411-T  | Mellanox optical module, Base-T    |

1. 56 GbE is a Mellanox propriety link speed and can be achieved while connecting a Mellanox adapter cards to Mellanox SX10XX switch series or connecting a Mellanox adapter card to another Mellanox adapter card.

## 1.2.2 Validated and Supported 10/40GbE Cables

**Table 4 - Validated and Supported 10/40GbE Cables**

| Speed  | Cable OPN #    | Description                                                                     |
|--------|----------------|---------------------------------------------------------------------------------|
| 10GB/S | CAB-SFP-SFP-1M | Arista 10GBASE-CR SFP+ Cable 1 Meter                                            |
| 10GB/S | CAB-SFP-SFP-3M | Arista 10GBASE-CR SFP+ Cable 3 Meter                                            |
| 10GB/S | CAB-SFP-SFP-5M | Arista 10GBASE-CR SFP+ Cable 5 Meter                                            |
| NA     | MAM1Q00A-QSA   | Mellanox® cable module, ETH 10GbE, 40Gb/s to 10Gb/s, QSFP to SFP+               |
| NA     | MAM1Q00A-QSA28 | Mellanox® cable module, ETH 25GbE, 100Gb/s to 25Gb/s, QSFP28 to SFP28           |
| 40GB/S | MC2210126-004  | Mellanox® Passive Copper Cable, ETH 40GbE, 40Gb/s, QSFP, 4m                     |
| 40GB/S | MC2210126-005  | Mellanox® Passive Copper Cable, ETH 40GbE, 40Gb/s, QSFP, 5m                     |
| 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 | MC2210130-00A  | Mellanox® Passive Copper Cable, ETH 40GbE, 40Gb/s, QSFP, 0.5m                   |
| 40GB/S | MC2210130-00B  | Mellanox® Passive Copper Cable, ETH 40GbE, 40Gb/s, QSFP, 0.75m                  |
| 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                         |
| 40GB/S | MC2210511-LR4  | Mellanox® optical module, IB FDR10, 40Gb/s, QSFP, LC-LC, 1310nm, LR4 up to 10km |
| 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                |
| 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    |

**Table 4 - Validated and Supported 10/40GbE Cables**

| Speed  | Cable OPN #      | Description                                                                              |
|--------|------------------|------------------------------------------------------------------------------------------|
| 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 | MC3309124-006    | Mellanox® Passive Copper Cable, ETH 10GbE, 10Gb/s, SFP+, 6m                              |
| 10GB/S | MC3309124-007    | Mellanox® Passive Copper Cable, ETH 10GbE, 10Gb/s, SFP+, 7m                              |
| 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-LR-F    | Mellanox Optical Module ETH 10GBE 10GB/S SFP+ LC-LC 1310NM LR UP TO 10KM                 |
| 10GB/S | MFM1T02A-SR-F    | Mellanox Optical Module ETH 10GBE 10GB/S SFP+ LC-LC 850NM SR UP TO 300M                  |
| 40GB/S | QSFP-40G-SR-BD   | Cisco 40GBASE-SR-BiDi, duplex MMF                                                        |
| 40GB/S | QSFP-40G-SR4     | Cisco 40GBASE-SR4, 4 lanes, 850 nm MMF                                                   |
| 40GB/S | QSFP-H40G-ACU10M | Cisco 40GBASE-CR4 QSFP direct-attach copper cable, 10-meter, active                      |
| 40GB/S | QSFP-H40G-AOC10M | Cisco 40GBASE-AOC QSFP direct-attach Active Optical Cable, 10-meter                      |
| 40GB/S | QSFP-H40G-CU1M   | Cisco 40GBASE-CR4 QSFP direct-attach copper cable, 1-meter, passive                      |
| 40GB/S | QSFP-H40G-CU3M   | Cisco 40GBASE-CR4 QSFP direct-attach copper cable, 3-meter, passive                      |
| 40GB/S | QSFP-H40G-CU5M   | Cisco 40GBASE-CR4 QSFP direct-attach copper cable, 5-meter, passive                      |
| 10GB/S | SFP-10G-SR       | Cisco 10GBASE-SR SFP+ transceiver module for MMF, 850-nm wavelength, LC duplex connector |
| 10GB/S | SFP-H10GB-CU1M   | Cisco 1-m 10G SFP+ Twinax cable assembly, passive                                        |
| 10GB/S | SFP-H10GB-CU3M   | Cisco 3-m 10G SFP+ Twinax cable assembly, passive                                        |
| 10GB/S | SFP-H10GB-CU5M   | Cisco 5-m 10G SFP+ Twinax cable assembly, passive                                        |

## 1.2.3 Validated and Supported 25GbE Cables



The 25GbE cables can be supported in ConnectX-4 adapter cards only when connected to the MAM1Q00A-QSA28 module.

**Table 5 - Validated and Supported 25GbE Cables**

| Speed  | Cable OPN #     | Description                                                                               |
|--------|-----------------|-------------------------------------------------------------------------------------------|
| 25GB/S | MCP2M00-A001    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1m                              |
| 25GB/S | MCP2M00-A002    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2m                              |
| 25GB/S | MCP2M00-A003    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 3m                              |
| 25GB/S | MCP2M00-A003AP  | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 3m, 26AWG                       |
| 25GB/S | MCP2M00-A00A    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 0.5m                            |
| 25GB/S | MCP2M00-A01A    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1.5m                            |
| 25GB/S | MCP2M00-A01A    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1.5m                            |
| 25GB/S | MCP2M00-A02A    | Mellanox® Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2.5m                            |
| 25GB/S | MCP7F00-A001    | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 4X25GBS QSFP28 TO 4XSFP28 1M           |
| 25GB/S | MCP7F00-A002    | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 4X25GBS QSFP28 TO 4XSFP28 2M           |
| 25GB/S | MCP7F00-A003    | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 4X25GBS QSFP28 TO 4XSFP28 3M           |
| 25GB/S | MCP7F00-A003-AM | Mellanox® passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 3M 30AWG |
| 25GB/S | MCP7F00-A005AM  | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 4X25GBS QSFP28 to 4XSFP28 5M           |
| 25GB/S | MCP7F00-A01A    | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 4X25GBS QSFP28 to 4XSFP28 1.5M         |
| 25GB/S | MCP7F00-A02A    | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 4X25GBS QSFP28 to 4XSFP28 2.5M         |
| 25GB/S | SFP-H25G-CU1M   | 25GBASE-CR1 Copper Cable 1-meter                                                          |
| 25GB/S | SFP-H25G-CU2M   | 25GBASE-CR1 Copper Cable 2-meter                                                          |
| 25GB/S | SFP-H25G-CU3M   | 25GBASE-CR1 Copper Cable 3-meter                                                          |
| 25GB/S | MMA2P00-AS      | Mellanox® transceiver, 25GbE, SFP28, LC-LC, 850nm, SR, up to 100m                         |
| 25GB/S | FTLF8536P4BCL   | Finisar SFP+ transceivers 25Gb/s                                                          |
| 25GB/S | MFA2P10-Axxx    | Mellanox® active optical cable 25GbE, SFP28, up to 100m                                   |
| 25GB/S | LTF8507-PC07    | Hisense active fiber cable, 25GbE                                                         |

## 1.2.4 Validated and Supported QDR/FDR10 Cables

**Table 6 - Validated and Supported QDR/FDR10 Cables**

| 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 | 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-XXX  | Mellanox Active Fiber Cable VPI UP TO 40GB/S QSFP from 3M up to 100M    |

## 1.2.5 Validated and Supported 50Gbs Cables

**Table 7 - Validated and Supported 50Gbs Cables**

| Speed | Cable OPN #  | Description                                                                        |
|-------|--------------|------------------------------------------------------------------------------------|
| 50GE  | MCP7H00-G001 | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 2X50GBS QSFP28 TO 2XQSFP28 1M   |
| 50GE  | MCP7H00-G002 | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 2X50GBS QSFP28 TO 2XQSFP28 2M   |
| 50GE  | MCP7H00-G003 | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 2X50GBS QSFP28 TO 2XQSFP28 3M   |
| 50GE  | MCP7H00-G01A | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 2X50GBS QSFP28 TO 2XQSFP28 1.5M |
| 50GE  | MCP7H00-G02A | Mellanox Passive Copper Hybrid Cable ETH 100GBE TO 2X50GBS QSFP28 TO 2XQSFP28 2.5M |

## 1.2.6 Validated and Supported FDR Cables

**Table 8 - 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 |

**Table 8 - Validated and Supported FDR Cables**

| Speed | Cable OPN #    | Description                                                          |
|-------|----------------|----------------------------------------------------------------------|
| 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   | MC2207310-100  | Mellanox Active Fiber Cable VPI UP TO 56GB/S QSFP from 3M up to 100M |
| FDR   | MC2207310-XXX  | Mellanox Active Fiber Cable VPI UP TO 56GB/S QSFP from 3M up to 100M |
| FDR   | MC2207312-XXX  | Mellanox Active Fiber Cable VPI UP TO 56GB/S QSFP from 3M up to 300M |
| FDR   | MC220731V-XXX  | Mellanox® Active Fiber Cable, VPI, up to 56Gb/s, QSFP, up to 100m    |
| FDR   | MC2207411-SR4L | Mellanox Optical Module IB FDR 56GB/S QSFP MPO 850NM UP TO 30M       |
| FDR   | MCP170L-F001   | Mellanox® Passive Copper Cable, VPI, up to 56Gb/s, QSFP, LSZH, 1m    |
| FDR   | MCP170L-F002   | Mellanox® Passive Copper Cable, VPI, up to 56Gb/s, QSFP, LSZH, 2m    |
| FDR   | MCP170L-F003   | Mellanox® Passive Copper Cable, VPI, up to 56Gb/s, QSFP, LSZH, 3m    |

## 1.2.7 Validated and Supported EDR/100GB/s Cables

**Table 9 - Validated and Supported EDR/100GB/s Cables**

| Speed   | Cable OPN #               | Description                                                           |
|---------|---------------------------|-----------------------------------------------------------------------|
| 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          |
| 100GB/S | MCP1600-C00A              | Mellanox Passive Copper Cable ETH 100GBE 100GBS QSFP LSZH 0.5M        |
| 100GE   | MCP1600-C01A              | Mellanox® Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 1.5m |
| 100GE   | MCP1600-C02A              | Mellanox® Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 2.5m |
| EDR     | MCP1600-E001 <sup>a</sup> | Mellanox Passive Copper Cable VPI 100GB/S QSFP LSZH 1M                |
| EDR     | MCP1600-E002 <sup>a</sup> | 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 <sup>a</sup> | Mellanox Passive Copper Cable VPI 100GB/S QSFP LSZH 0.5M              |
| EDR     | MCP1600-E01A <sup>a</sup> | Mellanox® Passive Copper cable, VPI, up to 100Gb/s, QSFP, LSZH, 1.5m  |
| EDR     | MCP1600-E02A              | Mellanox® Passive Copper cable, VPI, up to 100Gb/s, QSFP, LSZH, 2.5m  |
| 100GB/S | MFA1A00-C005              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 5m     |
| 100GB/S | MFA1A00-C010              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 10m    |
| 100GB/S | MFA1A00-C015              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 15m    |
| 100GB/S | MFA1A00-C020              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 20m    |
| 100GB/S | MFA1A00-C030              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 30m    |

**Table 9 - Validated and Supported EDR/100GB/s Cables**

| Speed   | Cable OPN #               | Description                                                                  |
|---------|---------------------------|------------------------------------------------------------------------------|
| 100GB/S | MFA1A00-C050              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 50m           |
| 100GB/S | MFA1A00-C100              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 100m          |
| EDR     | MFA1A00-E005 <sup>a</sup> | MELLANOX Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 5m                    |
| EDR     | MFA1A00-E010 <sup>a</sup> | MELLANOX Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 10m                   |
| EDR     | MFA1A00-E015 <sup>a</sup> | MELLANOX Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 15m                   |
| EDR     | MFA1A00-E020              | MELLANOX Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 20m                   |
| EDR     | MFA1A00-E030              | MELLANOX Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 30m                   |
| 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                  |
| 100GB/S | MFS1200-C005              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 5m            |
| 100GB/S | MFS1200-C010              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 10m           |
| 100GB/S | MFS1200-C015              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 15m           |
| 100GB/S | MFS1200-C020              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 20m           |
| 100GB/S | MFS1200-C030              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 30m           |
| 100GB/S | MFS1200-C050              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 50m           |
| 100GB/S | MFS1200-C100              | Mellanox® Active Fiber Cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 100m          |
| 100GB/S | MMS1C00-C500              | Mellanox® transceiver, 100GbE, QSFP28, MPO, 1550nm PSM4, up to 2km           |
| EDR     | MFS1200-E005              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 5m          |
| EDR     | MFS1200-E010              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 10m         |
| EDR     | MFS1200-E015              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 15m         |
| EDR     | MFS1200-E020              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 20m         |
| EDR     | MFS1200-E030              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 30m         |
| EDR     | MFS1200-E050              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 50m         |
| EDR     | MFS1200-E100              | Mellanox® Active Fiber Cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 100m        |
| 100GB/S | MMA1B00-C100D             | Mellanox® Transceiver, 100GbE, QSFP28, MPO, 850nm, up to 100m                |
| EDR     | MMA1B00-E100              | Mellanox® Transceiver, IB EDR, up to 100Gb/s, QSFP28, MPO, 850nm, up to 100m |
| 100GB/S | QSFP-100G-AOC10M          | Cisco 100GBase QSFP Active Optical Cable, 10-meter                           |
| 100GB/S | MMS1C00-C500              | Mellanox® transceiver, 100GbE, QSFP28, MPO, 1550nm PSM4, up to 2km           |

a. Forward Error Correction (FEC) is deactivated on this cable.

## 1.3 Tested Switches

### 1.3.1 Tested QDR Switches

**Table 10 - Tested QDR Switches**

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

### 1.3.2 Tested 10/40GbE Switches

**Table 11 - Tested 10/40GbE Switches**

| Speed    | Switch Silicon | OPN # / Name | Description                    | Vendor   |
|----------|----------------|--------------|--------------------------------|----------|
| 10/40GbE | N/A            | 3064         | 48-port 10Gb/40Gb Switch       | Cisco    |
| 10GbE    | N/A            | 5548         | Cisco 10GB ETH switch          | Cisco    |
| 40GbE    | N/A            | 3132Q        | Cisco 40GB ETH switch          | Cisco    |
| 10/40GbE | N/A            | 7050Q        | 16-port 40Gb Switch            | Arista   |
| 40GbE    | N/A            | 7050QX       | 32-port 40Gb Switch            | Arista   |
| 10/40GbE | N/A            | 7050S        | 48-port 10Gb/40Gb Switch       | Arista   |
| 10GbE    | N/A            | G8264        | BNT 10/40GB ETH switch         | BNT      |
| 40GbE    | N/A            | G8316        | BNT 40GB RackSwitch G8316      | BNT      |
| 10GbE    | N/A            | QFX3500      | Juniper 10/40GB ETH switch     | Juniper  |
| 10GbE    | N/A            | S4810P-AC    | 48-port 10Gb/40Gb Switch       | Force10  |
| 40GbE    | N/A            | S6000        | 32-port 40Gb Switch            | Dell     |
| 10GbE    | SwitchX®       | SX1016X-1BFR | 64-Port 10GbE Switch System    | Mellanox |
| 40GbE    | SwitchX®       | SX1036B-1BFR | 36-Port 40/56GbE Switch System | Mellanox |

### 1.3.3 Tested FDR Switches

**Table 12 - Tested FDR Switches**

| Speed | Switch Silicon | OPN # / Name | Description                                  | Vendor   |
|-------|----------------|--------------|----------------------------------------------|----------|
| FDR   | SwitchX®       | SX6018F-1SFR | 18-port 56Gb/s InfiniBand/VPI Switch Systems | Mellanox |
| FDR   | SwitchX®       | SX6036F-1BFR | 36-port 56Gb/s InfiniBand/VPI Switch Systems | Mellanox |
| FDR   | SwitchX®       | SX6506       | 108-Port 56Gb/s InfiniBand Director Switch   | Mellanox |
| FDR   | SwitchX®-2     | SX6710-FB2F2 | 36-port 56Gb/s InfiniBand/VPI Switch Systems | Mellanox |

### 1.3.4 Tested 100GbE/EDR Switches

**Table 13 - Tested 100GbE/EDR Switches**

| Speed   | Switch Silicon | OPN # / Name | Description                                                                                        | Vendor   |
|---------|----------------|--------------|----------------------------------------------------------------------------------------------------|----------|
| 100Gb/s | N/A            | 7060CX       | 32-port 100Gb Switch                                                                               | Arista   |
| 100Gb/s | N/A            | 93180YC-EX   | 48 x 10/25-Gbps fiber ports and 6 x 40/100-Gbps Quad Small Form-Factor Pluggable 28 (QSFP28) ports | Cisco    |
| 100Gb/s | N/A            | C3232C       | High-Density, 100 Gigabit Ethernet Switch                                                          | Cisco    |
| 100Gb/s | N/A            | CE8860-4C-EI | 24x10GE (SFP+) or 25GE (SFP28) and 2x100GE switch                                                  | Huawei   |
| EDR     | Switch-IB      | SB7790-EB2F  | 36-port EDR 100Gb/s InfiniBand Switch Systems                                                      | Mellanox |
| EDR     | Switch-IB 2    | SB7800-ES2R  | 36-port Non-blocking Managed EDR 100Gb/s Infini-Band Smart Switch                                  | Mellanox |
| 100GbE  | Spectrum       | SN2410-CB2F  | 48-port 25GbE + 8-port 100GbE Open Ethernet ToR Switch System                                      | Mellanox |
| 100GbE  | Spectrum       | SN2700-CS2R  | 32-port Non-blocking 100GbE Open Ethernet Spine Switch System                                      | Mellanox |

## 1.4 Tools, Switch Firmware and Driver Software

Firmware Rev 12.20.1030 is tested with the following tools, Switch firmware, and driver software:

**Table 14 - Tools, Switch Firmware and Driver Software**

|                                | Supported Version                                                                                                                                           |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MLNX_OFED                      | 4.1-1.0.2.0/4.0-1.0.1.0                                                                                                                                     |
| MLNX_EN (MLNX_OFED based code) | 4.1-1.0.2.0/4.0-1.0.1.0                                                                                                                                     |
| WinOF-2                        | 1.70/1.60                                                                                                                                                   |
| MFT                            | 4.7.0/4.6.0                                                                                                                                                 |
| VMware                         | <ul style="list-style-type: none"> <li>ESXi 6.5 v4.16.10.3</li> <li>ESXi 6.0 v4.15.10.3</li> <li>ESXi 5.5 v4.5.10.3</li> </ul>                              |
| MLNX-OS                        | <ul style="list-style-type: none"> <li>SwitchX: 3.6.3004</li> <li>Switch-IB: 3.6.3004</li> <li>Switch-IB 2: 3.6.3004</li> <li>Spectrum: 3.6.3004</li> </ul> |
| SwitchX®/SwitchX®-2 Firmware   | 9.4.2160                                                                                                                                                    |
| Spectrum™ Firmware             | 13.1130.0130                                                                                                                                                |
| SwitchX-IB™ Firmware           | 11.1300.0126                                                                                                                                                |
| SwitchX-IB 2 Firmware          | 15.1300.0126                                                                                                                                                |
| InfiniScale® V Firmware        | 7.4.3000/v7.4.2200                                                                                                                                          |

**Table 14 - Tools, Switch Firmware and Driver Software**

|                       | Supported Version                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linux Inbox Drivers   | <ul style="list-style-type: none"> <li>• Ubuntu 14.04.3</li> <li>• Ubuntu 14.04.4</li> <li>• Ubuntu 15.04</li> <li>• Ubuntu 15.10</li> <li>• Ubuntu 16.04</li> <li>• Ubuntu 16.04.1</li> <li>• Ubuntu 16.10</li> <li>• SLES12</li> <li>• SLES12.1</li> <li>• SLES12.2</li> <li>• RHEL6.6</li> <li>• RHEL6.7</li> <li>• RHEL6.8</li> <li>• RHEL7.1</li> <li>• RHEL7.2</li> <li>• RHEL7.3</li> </ul> |
| Windows Inbox Drivers | Windows Server 2016                                                                                                                                                                                                                                                                                                                                                                                |

## 1.5 Supported FlexBoot, UEFI



Please be aware that not all firmware binaries contain FlexBoot (support may vary between cards, see [Section 1.1, “Supported Devices”, on page 6](#)).

Firmware Rev 12.20.1030 supports the following FlexBoot:

**Table 15 - Supported FlexBoot, UEFI**

| Expansion ROM | Supported Version |
|---------------|-------------------|
| FlexBoot      | 3.5.210           |
| UEFI          | 14.12.24          |

## 1.6 Revision Compatibility

Firmware Rev 12.20.1030 complies with the following programmer’s reference manual:

- *Mellanox Adapters Programmer’s Reference Manual (PRM), Rev 0.44 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 12.20.1030

*Table 16 - Changes and New Features in Rev 12.20.1030*

| Feature/Change        | Description                                                                               |
|-----------------------|-------------------------------------------------------------------------------------------|
| <b>Virtualization</b> | <b>[Beta]</b> Set the number of VF's value to 8 and enabled SR-IOV for VPI adapter cards. |
| <b>Bug Fixes</b>      | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                            |

### 3 Known Issues

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

For a list of old firmware Known Issues, please see ConnectX4 Firmware Archived Known Issues file ([http://www.mellanox.com/pdf/firmware/ConnectX4-Firmware\\_Archived\\_Known\\_Issues\\_v1.0.pdf](http://www.mellanox.com/pdf/firmware/ConnectX4-Firmware_Archived_Known_Issues_v1.0.pdf))

**Table 17 - Known Issues (Sheet 1 of 7)**

| Internal Ref.   | Issue                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1063904         | Description: Messages with mkey signature on offset > 4GB are not supported.                                                                                                                           |
|                 | <b>Workaround:</b> N/A                                                                                                                                                                                 |
|                 | <b>Keywords:</b> Signature retransmission                                                                                                                                                              |
|                 | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                               |
| 1063148         | Description: Pause duration: Physical port counters count in 512bits quantas, instead of microseconds.                                                                                                 |
|                 | <b>Workaround:</b> To normalize the counter, do not change the speed:<br><code>counter_value_in_microsec = current_counter_value * 512 / port_speed</code>                                             |
|                 | <b>Keywords:</b> Pause duration, Physical port counters                                                                                                                                                |
|                 | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                               |
| 1054335/1054671 | Description: When using UD RoCE multicast traffic over SR-IOV, packets are scattered to all the attached QPs in the e-sw (PF and its VFs) and not only on the vport that is specified in the e-se FDB. |
|                 | <b>Workaround:</b> N/A                                                                                                                                                                                 |
|                 | <b>Keywords:</b> UD RoCE multicast traffic, SR-IOV                                                                                                                                                     |
|                 | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                               |
| 1048128         | Description: Using ECN with RDMA Read, backpressure on the NIC side may cause low percentage of pauses.                                                                                                |
|                 | <b>Workaround:</b> N/A                                                                                                                                                                                 |
|                 | <b>Keywords:</b> ECN, RDMA                                                                                                                                                                             |
|                 | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                               |
| 1046427/1047180 | Description: ECN does not function as expected when the number of QPs > ~500 per host.                                                                                                                 |
|                 | <b>Workaround:</b> N/A                                                                                                                                                                                 |
|                 | <b>Keywords:</b> ECN                                                                                                                                                                                   |
|                 | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                               |
| 1031744         | Description: Same flow counter cannot be used on different table types.                                                                                                                                |
|                 | <b>Workaround:</b> N/A                                                                                                                                                                                 |
|                 | <b>Keywords:</b> Flow counter                                                                                                                                                                          |
|                 | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                               |

**Table 17 - Known Issues (Sheet 2 of 7)**

| Internal Ref. | Issue                                                                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1009067       | Description: In case of an ip_protocol match (on UDP/TCP) related to fragmented packet, the l4_-type match might be missed when the hardware steering does not see the L4 headers.                                           |
|               | <b>Workaround:</b> Add to the driver ip_frag match for all steering rules that use ip_protocol match.                                                                                                                        |
|               | <b>Keywords:</b> ip_protocol match, L4 headers                                                                                                                                                                               |
|               | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                                                     |
| 743242        | Description: SR-IOV min & max rate limiter can only support up to 64 VFs per port.                                                                                                                                           |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> SR-IOV min & max rate limiter                                                                                                                                                                               |
|               | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                                                     |
| 979364        | Description: Changing SL2VL (QTCT commands in ETH or SL2VL mad in IB) during traffic may cause the chip to hang.                                                                                                             |
|               | <b>Workaround:</b> Run SL2VL commands before running traffic.                                                                                                                                                                |
|               | <b>Keywords:</b> SL2VL, traffic                                                                                                                                                                                              |
|               | <b>Discovered in Version:</b> 12.18.1000                                                                                                                                                                                     |
| 966364        | Description: [Ethernet] TX queue rate limit may sometimes exceed the rate that was set by the user by up to 10%.                                                                                                             |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> TX queue rate limit                                                                                                                                                                                         |
|               | <b>Discovered in Version:</b> 12.20.1010                                                                                                                                                                                     |
| 964783        | Description: Querying Vport/eSwitch that are not set to FOLLOW using the max_tx_speed command, returns information as if the FOLLOW mode is enabled.                                                                         |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> max_tx_speed, Vport/eSwitch                                                                                                                                                                                 |
| 963540        | Description: Enabling the s-vlan strip on a vport for which the user configured an s-vlan match on its Flow Steering tables, results in the corruption of the steering on that specific vport.                               |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> s-vlan strip, vport, Flow Steering                                                                                                                                                                          |
| 963473        | Description: When running min_avg_bw and max_avg_bw together, and when configuring a high proportion for min_avg_bw between vports (for example: 1:40, 1:100), the vport with the lowest proportion will get high deviation. |
|               | <b>Workaround:</b> Set one TC not to be mapped by any user priority.<br>For example (TC7 is not mapped):<br><code>mlnx_qos -i &lt;network interface&gt; -p 0,1,2,3,4,5,6,6</code>                                            |
|               | <b>Keywords:</b> Performance                                                                                                                                                                                                 |

**Table 17 - Known Issues (Sheet 3 of 7)**

| Internal Ref. | Issue                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 959464        | Description: When the Max Rate Limiter is enabled and a Teardown/FLR is issued upon the last gvmi with <code>max_rate_limiter</code> enabled Teardown/FLR, the hardware remains enabled ( <code>rate_limiter_en = 1</code> ).<br>** "max rate limiter enabled" = at least 1 (per chip). <code>create/modify_scheduling_elemnt</code> command has been issued by the driver, with <code>max_average_bw != 0</code> . |
|               | <b>Workaround:</b> Set a default rate ( <code>modify_scheduling_element.max_average_bw=0</code> ), or destroy all the scheduling elements on the chip prior to issuing a Teardown/FLR                                                                                                                                                                                                                               |
|               | <b>Keywords:</b> Teardown/FLR, Max Rate Limiter                                                                                                                                                                                                                                                                                                                                                                     |
| 955595        | <b>Description:</b> Under the <code>DUP_MAC_ACTION==LAST_CFG</code> configuration (default), the first duplicated MAC address in the MPFS is prioritized instead of the last address.                                                                                                                                                                                                                               |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> MAC address, MPFS                                                                                                                                                                                                                                                                                                                                                                                  |
| 955061        | Description: Occasionally, when the link is up at a speed of 1GbE, data traffic will not go through.                                                                                                                                                                                                                                                                                                                |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> Link speed, 1GbE                                                                                                                                                                                                                                                                                                                                                                                   |
| 949485        | Description: TX doorbell via UAR and CQ doorbell via UAR are currently not supported in Multi-Host devices.                                                                                                                                                                                                                                                                                                         |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> TX doorbell, CQ doorbell, Multi-Host, UAR                                                                                                                                                                                                                                                                                                                                                          |
| 946800        | Description: PXE booting in RedHat 7.3 is currently not supported.                                                                                                                                                                                                                                                                                                                                                  |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> PXE, RedHat 7.3                                                                                                                                                                                                                                                                                                                                                                                    |
| 941203        | Description: Occasionally, mapping 2 SLs to a single VL results in bad results in BW allocation for both SLs.                                                                                                                                                                                                                                                                                                       |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> SLs to VL mapping, BW allocation                                                                                                                                                                                                                                                                                                                                                                   |
| 938322        | Description: Performance issues occur when running <code>min_avg_bw</code> and <code>max_avg_bw</code> together. The issue starts when configuring high proportion for <code>min_avg_bw</code> between vports. For example: 1:40, 1:100: the vport with the low proportion will get high deviation.                                                                                                                 |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> Performance                                                                                                                                                                                                                                                                                                                                                                                        |
| 935581        | Description: When SR-IOV is enabled, some multicast traffic might be lost if another vport that a listening on the same multicast GID is down.                                                                                                                                                                                                                                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> Multicast traffic, vport                                                                                                                                                                                                                                                                                                                                                                           |
| 929267        | Description: Copper cables 3m and above are not supported vs. SX1024 switch system.                                                                                                                                                                                                                                                                                                                                 |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> Cables                                                                                                                                                                                                                                                                                                                                                                                             |

**Table 17 - Known Issues (Sheet 4 of 7)**

| Internal Ref. | Issue                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 911628        | Description: Host rate limiter values are statically configured and do not change when changing the port speed.                                                                                                       |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> Rate limiter                                                                                                                                                                                         |
| 898603        | Description: If multiple processes in RX RDMA Flow Table are used, vport counters may be counted more than once.                                                                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> vport counters                                                                                                                                                                                       |
| 877646        | <b>Description:</b> In IB virtualization, transmitted vport counter cannot count traffic between functions on the same phy port.                                                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> vport counter                                                                                                                                                                                        |
| 877646        | <b>Description:</b> The e-sw uplink state can affect the traffic only if the driver determines a root Flow Table for the e-sw FDB.                                                                                    |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> FDB, e-sw uplink state                                                                                                                                                                               |
| 864200        | <b>Description:</b> Running the <code>modify_scheduling_context</code> command does not include checking whether the scheduling element was created or not.                                                           |
|               | <b>Workaround:</b> Do not modify non-existing elements                                                                                                                                                                |
|               | <b>Keywords:</b> SR-IOV Rate Limiter                                                                                                                                                                                  |
| 854805/864202 | <b>Description:</b> Setting/modifying the <code>max_average_bw</code> rate for a function, or setting speeds over the maximum supported speed (as indicated in INI) may result in inaccurate rates, and in an assert. |
|               | <b>Workaround:</b> Set the <code>max_avergae_bw</code> in <code>scheduling_context</code> commands to equal or less than the supported wire speed.                                                                    |
|               | <b>Keywords:</b> Bandwidth rate, speed                                                                                                                                                                                |
| 854206/856355 | <b>Description:</b> If the vport state is DOWN and a packet is sent in the local loopback, the <code>sx_sniffer</code> tool will not function.                                                                        |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> <code>sx_sniffer</code> , vport                                                                                                                                                                      |
| 827444        | <b>Description:</b> FDR link can raise with symbol errors on optic EDR cable longer than 30M.                                                                                                                         |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> FDR link, EDR cable                                                                                                                                                                                  |
| 824525        | Description: The first duplicated MAC address in the MPFS is prioritized (instead of the last address) under the <code>DUP_MAC_ACTION==LAST_CFG</code> configuration (default).                                       |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                |
|               | <b>Keywords:</b> Duplicated MAC address                                                                                                                                                                               |

**Table 17 - Known Issues (Sheet 5 of 7)**

| Internal Ref.               | Issue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 783742                      | <b>Description:</b> In order to raise 50GbE link when using ConnectX-4 firmware v12.16.1006 or newer, the following conditions must be met: <ul style="list-style-type: none"> <li>The minimum ConnectX-4 firmware version should be 12.16.1006</li> <li>The minimum ConnectX-4 Lx firmware version should be 14.16.1006</li> <li>The minimum MLNX-OS version should be 3.6.1000 (firmware v13.1100.0026)</li> </ul>                                                                                                                                        |
|                             | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                             | <b>Keywords:</b> MLNX-OS, 50G link                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 776830/778257               | <b>Description:</b> Performing warm reboot during firmware image burning in VPI/IB devices configured with IB port protocol, might cause the device to disappear from the PCIe.                                                                                                                                                                                                                                                                                                                                                                             |
|                             | <b>Workaround:</b> Power Cycle the server (cold reboot). Once a cold reboot is performed, the device will reboot with the previous image that was already burned.                                                                                                                                                                                                                                                                                                                                                                                           |
|                             | <b>Keywords:</b> Warm reboot, firmware image burning, VPI/IB devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 770824                      | <b>Description:</b> Pressing the Power Down button resets the server and does not initiate the Standby flow (as init 0 does). As a result, both ports are up due to <code>keep_link_up</code> , which opens the port when the firmware is loaded.                                                                                                                                                                                                                                                                                                           |
|                             | <b>Workaround:</b> Use init 0 to start the Standby flow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                             | <b>Keywords:</b> Warm/cold reboot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 758803                      | <b>Description:</b> The firmware and the hardware do not reset the physical link upon <code>CPort-State=down</code> .<br>According to the IB Specification, MANAGEMENT STATE CHANGE COMMANDS: “ <i>CPort-State... when phy_link=up and CPortState=down, the state machine will transition to the Link-Down state which will reset other link state machines. Since phy_link=up, this will be followed by a transition to the LinkInitialize state. Thus a command to change link port state to down provides a way to re-initialize the link layer...</i> ” |
|                             | <b>Workaround:</b> In order to re-train the physical link, sendbug <code>PortInfo.physical_port_state = POLLING</code> is required.                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                             | <b>Keywords:</b> Physical link, CPortState=down                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 756872/769604/850198        | <b>Description:</b> Flow Counter is supported only for FTE that does not include a <code>flow_tag</code> or for FTE that have TIR as a destination.                                                                                                                                                                                                                                                                                                                                                                                                         |
|                             | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                             | <b>Keywords:</b> Flow Counter, FTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 756871/770208/850199        | <b>Description:</b> Using Flow Counters in the FDB Flow Table causes the transmitted IB traffic vport counters not to function properly.                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                             | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                             | <b>Keywords:</b> Flow Counter, FDB Flow Table, vport counters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 756870/769605/850199/850208 | <b>Description:</b> Using Flow Counters in the FDB Flow Table may harm vport counters' clearing functionality.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                             | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                             | <b>Keywords:</b> Flow Counter, FDB Flow Table, vport counters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Table 17 - Known Issues (Sheet 6 of 7)**

| Internal Ref. | Issue                                                                                                                                                                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 754914        | <b>Description:</b> When e-switch FDB is not created, the VF functional loopback traffic is send to vport 0 (PF).                                                                                                                                                                   |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> e-switch FDB, vport, SR-IOV                                                                                                                                                                                                                                        |
| 748292        | <b>Description:</b> When a steering rule in the e-sw FDB includes an encap action and an external port as destination, a transmitted multicast packet that matches the rule is sent to the wire and the loopback and the locally looped back packet will also have an encap header. |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> FDB, multicast packet                                                                                                                                                                                                                                              |
| 747967        | <b>Description:</b> Burning firmware on the same device in parallel from multiple interfaces (e.g. PCIe and MTUSB) is not supported.                                                                                                                                                |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> PCIe, MTUSB, burning in parallel                                                                                                                                                                                                                                   |
| 747961        | <b>Description:</b> Force loopback in the QPC in virtualized environment (Multi-Host or SR-IOV) is not supported.                                                                                                                                                                   |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> Force loopback, Multi-Host, SR-IOV                                                                                                                                                                                                                                 |
| 693832        | <b>Description:</b> In an InfiniBand SR-IOV setups, traffic should contain GRH (GID index) if the grh_required bit is set in the query_hca_vport_context command.<br><b>Note:</b> In this case, traffic without GRH will be forwarded to vport0 ("Host0")                           |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> SR-IOV setups, GRH                                                                                                                                                                                                                                                 |
| 693832        | <b>Description:</b> In virtualized (SR-IOV/Multi-Host/Socket Direct) setups OpenSM should be configured as follow (opensm.conf):<br><ul style="list-style-type: none"> <li>virt_enable should be 2</li> <li><b>[Recommended]</b> Enable Qos: qos TRUE</li> </ul>                    |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> SR-IOV/Multi-Host/Socket Direct, OpenSM                                                                                                                                                                                                                            |
| 691754        | <b>Description:</b> end_padding_mode is required in CREATE_QP and not in INIT_2_RTR command as defined in the PRM                                                                                                                                                                   |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> end_padding_mode, PRM                                                                                                                                                                                                                                              |
| 691490        | <b>Description:</b> LR4 cable events are sent although the port is up                                                                                                                                                                                                               |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                              |
|               | <b>Keywords:</b> Management                                                                                                                                                                                                                                                         |
| 691387/691415 | <b>Description:</b> In a Multi-Host/Socket Direct setup, when running a single TCP stream, you might experience sub optimal throughput.                                                                                                                                             |
|               | <b>Workaround:</b> Use multiple streams to reach optimal results                                                                                                                                                                                                                    |
|               | <b>Keywords:</b> Multi-Host/Socket Direct setup, Performance, TCP stream                                                                                                                                                                                                            |

**Table 17 - Known Issues (Sheet 7 of 7)**

| Internal Ref. | Issue                                                                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 690890        | <b>Description:</b> Updating a non-volatile configuration of port type TLV more than 50 times might cause system to hang.                                                                                                    |
|               | <b>Workaround:</b> Run <code>mlxconfig reset</code> after every 50 consecutive updates of port type TLV.                                                                                                                     |
|               | <b>Keywords:</b> Non-volatile configuration, TLV                                                                                                                                                                             |
| 686032        | <b>Description:</b> While transmitting a packet from a NODNIC interface to BMC (on the same phy port) the packet will be duplicated and will be transmitted to the wire too (in addition to the packet that arrived to BMC). |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> NODNIC interface, BMC                                                                                                                                                                                       |
| 685062        | <b>Description:</b> Multi-Host InfiniBand: OpenSM is supported over host0 only and the <code>MAD_IFC</code> usage is limited to host0 only.                                                                                  |
|               | <b>Workaround:</b> Activate OpenSM and the MFT tools via host0                                                                                                                                                               |
|               | <b>Keywords:</b> Multi-Host InfiniBand                                                                                                                                                                                       |
| 682518        | <b>Description:</b> Interoperability issue between ConnectX-4 or ConnectX-4 Lx adapter cards and ConnectX-2 adapter card when trying to raise a 10GbE link.                                                                  |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> Interoperability                                                                                                                                                                                            |
| 648914        | <b>Description:</b> /651063/1066193 Some 10GbE cables are not SFF-8472 compliant. "SFP+ Cable Technology" bits are cleared.                                                                                                  |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> 10GbE cables, SFP+                                                                                                                                                                                          |
| 600534        | <b>Description:</b> Configuration of space power management capability <code>PME_EN</code> cannot be set, thus preventing the driver from activating the wake signal.                                                        |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> PCIe                                                                                                                                                                                                        |
| 599810/601485 | <b>Description:</b> <code>mlxfwreset</code> does not function properly in old MFT versions after upgrading the firmware image.                                                                                               |
|               | <b>Workaround:</b> Upgrade MFT to the latest release or use <code>reboot/power cycle</code> after upgrading firmware.                                                                                                        |
|               | <b>Keywords:</b> Firmware Tool                                                                                                                                                                                               |
| 572150        | <b>Description:</b> A low link speed issue occurs when connecting a ConnectX®-4 EDR adapter card with a QDR InfiniScale® IV based switch using a copper cable longer than 3M. The link is raised as DDR.                     |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                       |
|               | <b>Keywords:</b> Link Speed, QDR, DDR                                                                                                                                                                                        |

## 4 Bug Fixes History

Table 18 lists the bugs fixed in this release.

**Table 18 - Bug Fixes History (Sheet 1 of 15)**

| Internal Ref. | Issue                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1090723       | Description: Fixed an issue that wrongly reported the maximum temperature in a setup as the current temperature regardless of the actual temperature.             |
|               | <b>Keywords:</b> Temperature                                                                                                                                      |
|               | <b>Discovered in Release:</b> 12.20.1010                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1030                                                                                                                               |
| 1090566       | Description: Fixed an issue that caused the adapter cards not to send an event after a temperature recovery incident after running PLDM thermal.                  |
|               | <b>Keywords:</b> PLDM thermal, temperature                                                                                                                        |
|               | <b>Discovered in Release:</b> 12.20.1010                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1030                                                                                                                               |
| 1060650       | Description: Fixed a link issue on Intel 10GbE Optical module PN: R8H2F, Y3KJN.                                                                                   |
|               | <b>Keywords:</b> Intel 10GbE Optical module                                                                                                                       |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                               |
| 1040099       | Description: Fixed an issue that caused the link to raise as DDR instead of QDR after firmware reset when connected to switch 4036.                               |
|               | <b>Keywords:</b> QDR, DDR                                                                                                                                         |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                               |
| 1052064       | Description: Fixed an issue that caused the device to hang upon warm reboot.                                                                                      |
|               | <b>Keywords:</b> Warm reboot                                                                                                                                      |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                               |
| 1047533       | Description: Fixed an issue that caused the TX traffic not to send packets when using VF index (ARI) bigger than 127.                                             |
|               | <b>Keywords:</b> VFs                                                                                                                                              |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                               |
| 1009614       | Description: Fixed a scaling issue with more than 1k QPs for ECN by moving from per QP caching to per IP to allow better scale with number of host in the fabric. |
|               | <b>Keywords:</b> Performance                                                                                                                                      |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                          |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                               |

**Table 18 - Bug Fixes History (Sheet 2 of 15)**

| Internal Ref. | Issue                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1041108       | Description: Enabled firmware resync of the internal clocks after getting out of the standby mode to prevent PTP time sync from getting out of sync after system warm-rebooted due to system getting into a low-power (standby) mode.      |
|               | <b>Keywords:</b> PTP time sync, standby mode                                                                                                                                                                                               |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |
| 1047693       | Description: When running RoCE over VRRP, enabled the device to receive RoCE packet with different source MAC than the original RoCE packet's destination MAC, to allow routing between different subnets.                                 |
|               | <b>Keywords:</b> RoCE over VRRP, Destination MAC                                                                                                                                                                                           |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |
| 1050234       | Description: Fixed an issued that caused LLDP not to enable PFC configuration currently when DCBX transitioning flow control configurations was set from Global Pause to PFC.                                                              |
|               | <b>Keywords:</b> RoCE Lossy & ECN                                                                                                                                                                                                          |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |
| 1063449       | Description: Fixed an issue that caused TX to get stuck when a link fail-over occurred in LAG and the firmware switched between the two ports. Additional credits reset flow were added when the firmware moved between different port,vl. |
|               | <b>Keywords:</b> TX, LAG                                                                                                                                                                                                                   |
|               | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |
| 1047533       | Description: Rephrased and improved external troubleshoot messages in PDDR register.                                                                                                                                                       |
|               | <b>Keywords:</b> PDDR register                                                                                                                                                                                                             |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |
| 999261        | Description: Improved SR-IOV performance.                                                                                                                                                                                                  |
|               | <b>Keywords:</b> SR-IOV                                                                                                                                                                                                                    |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |
| 954822        | Description: The ipoib_enhanced_offloads indication in the HCA capabilities reports 0 while SRIOV_EN=1.                                                                                                                                    |
|               | <b>Keywords:</b> SR-IOV, IPoIB Offloads                                                                                                                                                                                                    |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                   |
|               | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                        |

**Table 18 - Bug Fixes History (Sheet 3 of 15)**

| Internal Ref.                  | Issue                                                                                                                                                                                                                                                                                                            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1002884                        | <b>Description:</b> Fixed an issue that prevented ibdump from functioning properly on Connect-X-4 second port.                                                                                                                                                                                                   |
|                                | <b>Keywords:</b> ibdump                                                                                                                                                                                                                                                                                          |
|                                | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |
| 981598                         | <b>Description:</b> Fixed an issue on an ETH port with SR-IOV enabled that prevented packets from reaching the BMC (failure in steering loopback resolution) if the BMC addresses were configured after VF initialization, and the VF was trying to send traffic to the BMC (that located on the same phy port). |
|                                | <b>Keywords:</b> BMC, SR-IOV, packets                                                                                                                                                                                                                                                                            |
|                                | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |
| 906144                         | <b>Description:</b> Fixed an issue which caused the rate limiter not to function when setting a rate to tc 7.                                                                                                                                                                                                    |
|                                | <b>Keywords:</b> QOS - ETH - rate limit per TC                                                                                                                                                                                                                                                                   |
|                                | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |
| 893261                         | <b>Description:</b> Fixed the PCIe TX glitch during Recovery.Speed state of the link training to PCIe Gen3.                                                                                                                                                                                                      |
|                                | <b>Keywords:</b> PCIe TX glitch                                                                                                                                                                                                                                                                                  |
|                                | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |
| 1002190                        | <b>Description:</b> Fixed an issue related to the PortRcvDataVLExtended/PortXmitDataVLExtended parameter that caused the counters' value to be reported in octets instead of dwrods.                                                                                                                             |
|                                | <b>Keywords:</b> Counters                                                                                                                                                                                                                                                                                        |
|                                | <b>Discovered in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |
| 1025741/<br>781339/<br>1050373 | <b>Description:</b> QP ULP modes 0 and 1 cannot be assigned to the same Multicast group.                                                                                                                                                                                                                         |
|                                | <b>Keywords:</b> Multicast Group (MCG), QPs                                                                                                                                                                                                                                                                      |
|                                | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |
| 913451                         | <b>Description:</b> Fixed an issue in standby (WoL) modes only that caused the actual current consumption in 1.2V rail to be higher by<33mA than the advertised values although the total IC consumption is as advertised.                                                                                       |
|                                | <b>Keywords:</b> Standby (WoL) modes, current consumption                                                                                                                                                                                                                                                        |
|                                | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                         |
|                                | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                              |

**Table 18 - Bug Fixes History (Sheet 4 of 15)**

| Internal Ref.     | Issue                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 852744            | <b>Description:</b> Mapping an SL to VL 15 is currently not supported. Trying to do so, will cause a health buffer fatal internal error report.                                                                                                                                                                                                                                                                         |
|                   | <b>Keywords:</b> SL to VL mapping                                                                                                                                                                                                                                                                                                                                                                                       |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.20.1010                                                                                                                                                                                                                                                                                                                                                                                     |
| 902828/<br>915047 | <b>Description:</b> When using a firmware based LLDP/DCBX software based, LLDP tools (such as lldp-tool in Linux) should be disabled.<br>When intending to use software based LLDP, firmware LLDP must be disabled by using mlxconfig.<br>Using both the LLDP software and the firmware based LLDP will result in an unexpected results. This applies to both Physical Functions (Bare Metal OS) and Virtual Functions. |
|                   | <b>Keywords:</b> LLDP/DCBX                                                                                                                                                                                                                                                                                                                                                                                              |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                                                                                                                                     |
| 759571/<br>759655 | <b>Description:</b> Modifying the encap_id of FTE is not supported.                                                                                                                                                                                                                                                                                                                                                     |
|                   | <b>Keywords:</b> encap_id, FTE                                                                                                                                                                                                                                                                                                                                                                                          |
|                   | <b>Discovered in Release:</b> 12.16.1020                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                                                                                                                                     |
| 966472            | <b>Description:</b> Fixed an issue which caused bi-directional traffic 10% BW degradation in Multi-Host.                                                                                                                                                                                                                                                                                                                |
|                   | <b>Keywords:</b> Performance                                                                                                                                                                                                                                                                                                                                                                                            |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                                                                                                                                     |
| 959369            | <b>Description:</b> Increased the CQE zipping aggressive mode timer to 9000.                                                                                                                                                                                                                                                                                                                                            |
|                   | <b>Keywords:</b> Performance                                                                                                                                                                                                                                                                                                                                                                                            |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                                                                                                                                     |
| 962901            | <b>Description:</b> Moving IPoIB enhanced QP to ERR or RST state results in the corruption of the service_type and pm_state in the QPC.                                                                                                                                                                                                                                                                                 |
|                   | <b>Keywords:</b> IPoIB enhanced QP                                                                                                                                                                                                                                                                                                                                                                                      |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                                                                                                                                     |
| 961194            | <b>Description:</b> Attaching RoCE IPv4 QPs to MCG when the vport state is set to toggle (DOWN/UP), prevents the QPs that are listed on that MCG from receiving any traffic.                                                                                                                                                                                                                                            |
|                   | <b>Keywords:</b> RoCE IPv4 QPs                                                                                                                                                                                                                                                                                                                                                                                          |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.18.2000                                                                                                                                                                                                                                                                                                                                                                                     |

**Table 18 - Bug Fixes History (Sheet 5 of 15)**

| Internal Ref. | Issue                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------|
| 655688        | <b>Description:</b> When arming SRQ for limit event, the device might issue an event with <code>context_index=0</code> .           |
|               | <b>Keywords:</b> RoCE                                                                                                              |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| 949458        | <b>Description:</b> Occasionally, when moving UD QP from error state to RTS, the QP re-enters the error state.                     |
|               | <b>Keywords:</b> UD QP, Error state, RTS                                                                                           |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| 928872        | <b>Description:</b> When performing Pkey check for IPoIB enhanced traffic, the Pkey membership bit is ignored.                     |
|               | <b>Keywords:</b> Pkeys                                                                                                             |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| 862480        | <b>Description:</b> Stopping the Rate Limiter while traffic is being transmitted might cause the adapter card to hang.             |
|               | <b>Keywords:</b> Rate Limiter                                                                                                      |
|               | <b>Discovered in Release:</b> 12.17.1010                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| 597718        | <b>Description:</b> Privileged Vport egress traffic is not blocked when Vport is not active                                        |
|               | <b>Keywords:</b> Virtualization                                                                                                    |
|               | <b>Discovered in Release:</b> 12.12.1100                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| -             | <b>Description:</b> PF direct pass-through is not supported in InfiniBand (since PF FLR is not supported)                          |
|               | <b>Keywords:</b> PF direct pass-through, InfiniBand                                                                                |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| 959527        | <b>Description:</b> Missing invalidation upon <code>Set()</code> .pkey leads to bad Pkey checks.                                   |
|               | <b>Keywords:</b> Pkeys, PortInfo.LID                                                                                               |
|               | <b>Discovered in Release:</b> 12.18.1000                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.2000                                                                                                |
| 919526        | <b>Description:</b> Fixed an issue which caused the HCA mad response to contain the incoming packet Pkey and not the matched Pkey. |
|               | <b>Keywords:</b> Pkey                                                                                                              |
|               | <b>Discovered in Release:</b> 12.17.2020                                                                                           |
|               | <b>Fixed in Release:</b> 12.18.1000                                                                                                |

**Table 18 - Bug Fixes History (Sheet 6 of 15)**

| Internal Ref.     | Issue                                                                                                                                                                                                                             |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 963653/<br>961833 | <b>Description:</b> Diagnostic counters are not reset when enabled with on_demand mode.                                                                                                                                           |
|                   | <b>Keywords:</b> on_demand mode, Diagnostic counters                                                                                                                                                                              |
|                   | <b>Discovered in Release:</b> 12.18.1000                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.1000                                                                                                                                                                                                  |
| 920552            | <b>Description:</b> Modified PCIe Tx configuration.                                                                                                                                                                               |
|                   | <b>Keywords:</b> PCIe TX                                                                                                                                                                                                          |
|                   | <b>Discovered in Release:</b> 12.17.2020                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |
| 943484            | <b>Description:</b> Fixed an issue that prevented the software to set ECN parameters (min_rate, max_rate, rate_to_set_on_first_cnp) to values >32768.                                                                             |
|                   | <b>Keywords:</b> RoCE Lossy, ECN                                                                                                                                                                                                  |
|                   | <b>Discovered in Release:</b> 12.17.2020                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |
| 876275            | <b>Description:</b> Fixed an issue which caused the link speed to raise as DDR when connected with certain copper cables to devices supporting up to QDR speed.                                                                   |
|                   | <b>Keywords:</b> DDR, QDR                                                                                                                                                                                                         |
|                   | <b>Discovered in Release:</b> 12.17.2020                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |
| 886357            | <b>Description:</b> Fixed an issue which prevented physical counters from resetting. Now the physical counters are reset on first driver start.                                                                                   |
|                   | <b>Keywords:</b> Physical counters                                                                                                                                                                                                |
|                   | <b>Discovered in Release:</b> 12.17.2020                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |
|                   | <b>Description:</b> Fixed possible negotiation issues with 3rd parties.                                                                                                                                                           |
|                   | <b>Keywords:</b> Link negotiation                                                                                                                                                                                                 |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |
| 827444            | <b>Description:</b> Fixed a rare issue which caused FDR/56GbE link to raise with errors.                                                                                                                                          |
|                   | <b>Keywords:</b> Link speed                                                                                                                                                                                                       |
|                   | <b>Discovered in Release:</b> 12.16.1020                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |
| 867367/<br>867787 | <b>Description:</b> Fixed an issue which caused scheduling_context.element_type to be taken into consideration with performing verifications, when running the modify_scheduling_context command, although the field is reserved. |
|                   | <b>Keywords:</b> SR-IOV Rate Limiter                                                                                                                                                                                              |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                          |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                               |

**Table 18 - Bug Fixes History (Sheet 7 of 15)**

| Internal Ref.     | Issue                                                                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 865373/<br>865820 | <b>Description:</b> Fixed an issue which caused the eSwitch max_average_bw ref counter to decrement in TEARDOWN_HCA/ FLR VF regardless of the max_average_bw value set, although the ref counter design was to increment on every max_average_bw != 0 (limited). |
|                   | <b>Keywords:</b> Bandwidth rate, VFs, TEARDOWN_HCA/ FLR VF                                                                                                                                                                                                       |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.18.1000                                                                                                                                                                                                                              |
| 866181            | <b>Description:</b> Fixed an issue which caused system fail when enabled SR-IOV.                                                                                                                                                                                 |
|                   | <b>Keywords:</b> SR-IOV                                                                                                                                                                                                                                          |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |
| 883830            | <b>Description:</b> Fixed the NC-SI "set" Flow Control so it could always report "unsupported command" when operating the smb. bus.                                                                                                                              |
|                   | <b>Keywords:</b> NC-SI "set" Flow Control                                                                                                                                                                                                                        |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |
| 855533            | <b>Description:</b> Fixed ODP flow issues that caused occasional fatal error reporting and RX hanging.                                                                                                                                                           |
|                   | <b>Keywords:</b> ODP flow                                                                                                                                                                                                                                        |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |
| 860574/<br>860716 | <b>Description:</b> Fixed performance issues to improve Packet Pacing performance.                                                                                                                                                                               |
|                   | <b>Keywords:</b> Performance, Packet Pacing                                                                                                                                                                                                                      |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |
| 883834            | <b>Description:</b> Information is now received per channel port instead of the lowest port which received LLDP.                                                                                                                                                 |
|                   | <b>Keywords:</b> LLDP                                                                                                                                                                                                                                            |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |
| 883834            | <b>Description:</b> Changed the maximum TLV size per each TLV to 28B instead of 32B.                                                                                                                                                                             |
|                   | <b>Keywords:</b> TLV size                                                                                                                                                                                                                                        |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |
| 883834            | <b>Description:</b> Fixed an issue which added a header to the packet which already contained header and data.                                                                                                                                                   |
|                   | <b>Keywords:</b> Packet headers                                                                                                                                                                                                                                  |
|                   | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                                                                                              |

**Table 18 - Bug Fixes History (Sheet 8 of 15)**

| Internal Ref. | Issue                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 883834        | <b>Description:</b> Enabled LLDP by default in the ini after adding the MCTP command.                                                                                                  |
|               | <b>Keywords:</b> LLDP, MCTP command                                                                                                                                                    |
|               | <b>Discovered in Release:</b> 12.17.1010                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.2020                                                                                                                                                    |
| 826702        | <b>Description:</b> Fixed an issue which caused RX to hang when a UDP packet with destination port of RoCE v2 arrived and the data matched the DC transport service.                   |
|               | <b>Keywords:</b> RoCE v2, DC Transport, UDP, RX                                                                                                                                        |
|               | <b>Discovered in Release:</b> 12.16.1010                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |
| 802148        | <b>Description:</b> Fixed an issue which caused the link not to come up when the port was toggled in a rapid frequency.                                                                |
|               | <b>Keywords:</b> Link up                                                                                                                                                               |
|               | <b>Discovered in Release:</b> 12.16.1010                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |
| 736528        | <b>Description:</b> On rare occasions during UEFI boot cycles system got stuck while WinPE is loaded. (OS WinPE, system DL160).                                                        |
|               | <b>Keywords:</b> WinPE OS, UEFI boot cycles                                                                                                                                            |
|               | <b>Discovered in Release:</b> 12.16.1010                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |
| 689471        | <b>Description:</b> Single FTE that catches both untagged and prio-tagged packets (by giving an FTE with match_value.vlan_tag = 0 and match_value.vid = 0) is currently not supported. |
|               | <b>Keywords:</b> Ethernet Network                                                                                                                                                      |
|               | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |
| -             | <b>Description:</b> Flashing the firmware requires server reboot.<br>Firmware cannot be flashed twice without server reboot after first flashing                                       |
|               | <b>Keywords:</b> Upgrading/Downgrading                                                                                                                                                 |
|               | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |
| 828608        | <b>Description:</b> Fixed an issue causing bubbles to appear as symbol errors when link raised FDR 1x.                                                                                 |
|               | <b>Keywords:</b> FDR 1x                                                                                                                                                                |
|               | <b>Discovered in Release:</b> 12.16.1010                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |
| 677359        | <b>Description:</b> When Clause 74 Fire-Code FEC is active, and there are FC corrected errors, both the FC_correctable counter and the FC_uncorrectable counter are increment.         |
|               | <b>Keywords:</b> Clause 74 Fire-Code FEC, Counters                                                                                                                                     |
|               | <b>Discovered in Release:</b> 12.16.1010                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                                    |

**Table 18 - Bug Fixes History (Sheet 9 of 15)**

| Internal Ref.     | Issue                                                                                                                                                                            |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 687113            | <b>Description:</b> Some Port Control Register do not return to the default value after the last port owner host restarts the driver.                                            |
|                   | <b>Keywords:</b> PRM                                                                                                                                                             |
|                   | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 827579/<br>826702 | <b>Description:</b> Fixed an issue which caused RX to hang when the UDP packet had a reserved UDP destination port.                                                              |
|                   | <b>Key Words:</b> UDP packet, RX                                                                                                                                                 |
|                   | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 835735            | <b>Description:</b> Fixed DMAC reporting mapping per host.                                                                                                                       |
|                   | <b>Key Words:</b> DMAC reporting                                                                                                                                                 |
|                   | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 846520            | <b>Description:</b> Fixed an EEH error from PCI which caused firmware to hang.                                                                                                   |
|                   | <b>Key Words:</b> EEH error                                                                                                                                                      |
|                   | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 857644            | <b>Description:</b> Fixed the default value of the PCIe target_link_speed to Gen3 in link control2.                                                                              |
|                   | <b>Key Words:</b> PCIe, Link Speed                                                                                                                                               |
|                   | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 783733/<br>774373 | <b>Description:</b> Fixed an issue which prevented LEDs from blinking when the traffic was less than 0.1% of the link speed.                                                     |
|                   | <b>Key Words:</b> LEDs, Blink, Link Speed                                                                                                                                        |
|                   | <b>Discovered in Release:</b> 12.14.1006                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 689503/<br>688670 | <b>Description:</b> Fixed an issues which occasionally caused the driver to hang during unload on some VLs when configuring the SM with a VL weight 0 and running traffic on it. |
|                   | <b>Keywords:</b> VL, SM                                                                                                                                                          |
|                   | <b>Discovered in Release:</b> 12.14.1100                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |
| 781039            | <b>Description:</b> A server getting into a Standby mode while Packet-Pacing is enabled might cause firmware to hang and driver call-trace.                                      |
|                   | <b>Keywords:</b> Packet-Pacing                                                                                                                                                   |
|                   | <b>Discovered in Release:</b> 12.14.1020                                                                                                                                         |
|                   | <b>Fixed in Release:</b> 12.17.1010                                                                                                                                              |

**Table 18 - Bug Fixes History (Sheet 10 of 15)**

| Internal Ref. | Issue                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 753349        | <b>Description:</b> Fixed an issue which caused unexpected QoS functionality in case of multiple sources to single destination traffic transmission. |
|               | <b>Key Words:</b> QoS                                                                                                                                |
|               | <b>Discovered in Release:</b> 12.14.1020                                                                                                             |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                  |
| 801374        | <b>Description:</b> Fixed an issue which occasionally caused the RX traffic to hang in DC when received a PCI error on WQE fetch.                    |
|               | <b>Key Words:</b> RX traffic, DC                                                                                                                     |
|               | <b>Discovered in Release:</b> 12.14.1020                                                                                                             |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                  |
| 773110        | <b>Description:</b> Fixed OOB connection issue during Intel's ITP inject errors test.                                                                |
|               | <b>Keywords:</b> OOB, ITP inject errors test                                                                                                         |
|               | <b>Discovered in Release:</b> 14.14.2036                                                                                                             |
|               | <b>Fixed in Release:</b> 12.17.1010                                                                                                                  |
| 773724        | <b>Description:</b> Modified PCIe settings.                                                                                                          |
|               | <b>Key Words:</b> PCIe                                                                                                                               |
|               | <b>Discovered in Release:</b> 12.14.1006                                                                                                             |
|               | <b>Fixed in Release:</b> 12.16.1020                                                                                                                  |
| 670185        | <b>Description:</b> Added protection from IOPX thermal diode destabilization to prevent UEFI IPv6 PXE boot failure on ConnectX-4 Lx 25GE OCP card.   |
|               | <b>Key Words:</b> UEFI, OCP card                                                                                                                     |
|               | <b>Discovered in Release:</b> 12.14.2036                                                                                                             |
|               | <b>Fixed in Release:</b> 12.16.1006                                                                                                                  |
| 780651        | <b>Description:</b> Fixed an issue causing single port devices to query and write Physical Port TLVs to Port 2.                                      |
|               | <b>Keywords:</b> Physical Port TLVs, single port device                                                                                              |
|               | <b>Discovered in Release:</b> 12.14.2036                                                                                                             |
|               | <b>Fixed in Release:</b> 12.16.1006                                                                                                                  |
| 752392        | <b>Description:</b> Enabled mlxfwreset to work using the PCIe Secondary Bus Reset.                                                                   |
|               | <b>Keywords:</b> mlxfwreset                                                                                                                          |
|               | <b>Discovered in Release:</b> 12.14.2036                                                                                                             |
|               | <b>Fixed in Release:</b> 12.16.1006                                                                                                                  |
| 775393        | <b>Description:</b> Fixed an issue causing link flapping as a result, incorrect link settings.                                                       |
|               | <b>Keywords:</b> Link flapping, link settings                                                                                                        |
|               | <b>Discovered in Release:</b> 12.14.2036                                                                                                             |
|               | <b>Fixed in Release:</b> 12.16.1006                                                                                                                  |

**Table 18 - Bug Fixes History (Sheet 11 of 15)**

| Internal Ref.                | Issue                                                                                                                     |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 756570                       | <b>Description:</b> Fixed an issue causing wrong alignment markers to be used when running 50G with Clause91 FEC enabled. |
|                              | <b>Keywords:</b> Clause91 FEC, 50G                                                                                        |
|                              | <b>Discovered in Release:</b> 12.14.2036                                                                                  |
|                              | <b>Fixed in Release:</b> 12.16.1006                                                                                       |
| 767281                       | <b>Description:</b> Reduced the default BAR size for VF (SR-IOV) from 5 (32 MB) to 1 (2MB).                               |
|                              | <b>Keywords:</b> BAR size for VF (SR-IOV)                                                                                 |
|                              | <b>Discovered in Release:</b> 12.14.2036                                                                                  |
|                              | <b>Fixed in Release:</b> 12.16.1006                                                                                       |
| 735159/<br>747595/<br>752533 | <b>Description:</b> Added legacy interrupts support in FlexBoot.                                                          |
|                              | <b>Keywords:</b> Interrupts, PXE                                                                                          |
|                              | <b>Discovered in Release:</b> 12.14.2036                                                                                  |
|                              | <b>Fixed in Release:</b> 12.16.1006                                                                                       |
| 752343                       | <b>Description:</b> Modified the TX configuration to support EMI crossing margins in 16Ghz                                |
|                              | <b>Keywords:</b> TX configuration, EMI                                                                                    |
|                              | <b>Discovered in Release:</b> 12.14.2036                                                                                  |
|                              | <b>Fixed in Release:</b> 12.16.1006                                                                                       |
| 691194                       | <b>Description:</b> In some cases, a Bit Error Rate is not optimal on 10G/40G links.                                      |
|                              | <b>Keywords:</b> 10G/40G links, Bit Error Rate                                                                            |
|                              | <b>Discovered in Release:</b> 12.14.1100                                                                                  |
|                              | <b>Fixed in Release:</b> 12.14.2036                                                                                       |
| 689788                       | <b>Description:</b> Instability of Link Training Flow occurs during 100G Auto-Negotiation.                                |
|                              | <b>Keywords:</b> Link Training Flow, Auto-Negotiation                                                                     |
|                              | <b>Discovered in Release:</b> 12.14.1100                                                                                  |
|                              | <b>Fixed in Release:</b> 12.14.2036                                                                                       |
| 684496                       | <b>Description:</b> Fixed a rare issue which caused the command to hang when moved the QP to RESET and back to RTS.       |
|                              | <b>Keywords:</b> QP, RTS                                                                                                  |
|                              | <b>Discovered in Release:</b> 12.14.1100                                                                                  |
|                              | <b>Fixed in Release:</b> 12.14.2036                                                                                       |
| 665089                       | <b>Description:</b> Improved RDMA READ bandwidth under packet lost scenario.                                              |
|                              | <b>Keywords:</b> RDMA READ bandwidth                                                                                      |
|                              | <b>Discovered in Release:</b> 12.14.1100                                                                                  |
|                              | <b>Fixed in Release:</b> 12.14.2036                                                                                       |

**Table 18 - Bug Fixes History (Sheet 12 of 15)**

| Internal Ref. | Issue                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 736195        | <b>Description:</b> Added support for pnat = 1 in HCA <code>access_reg</code> command as required by the <code>ibdiag-net</code> tool.                      |
|               | <b>Keywords:</b> <code>access_reg</code> command, <code>ibdiagnet</code>                                                                                    |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |
| 696486        | <b>Description:</b> Increased the steering hash tables static size from 128 to a maximum of 32K entries.                                                    |
|               | <b>Keywords:</b> Steering hash tables static size                                                                                                           |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |
| 691649        | <b>Description:</b> Prevented miscalculation of module temperature when using 100Gb/s cables (OPN: MFA1A00-Cxxx for 100GbE and MFA1A00-Exxx for IB EDR).    |
|               | <b>Keywords:</b> 100Gb/s cables                                                                                                                             |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |
| 687096        | <b>Description:</b> Fixed an issue which caused the device to hang when resetting <code>qkey/pkey</code> violation counter via <code>port_info mad</code> . |
|               | <b>Keywords:</b> <code>qkey/pkey</code> violation counter, <code>port_info mad</code>                                                                       |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |
| 693446        | <b>Description:</b> Reduced one hop for Unicast RX steering, steering pipes balancing.                                                                      |
|               | <b>Keywords:</b> Ethernet Steering performance                                                                                                              |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |
| 690614        | <b>Description:</b> Non-volatile configuration of Port Type TLV more than 50 times might cause system hang.                                                 |
|               | <b>Keywords:</b> Non-volatile configuration, Port Type TLV                                                                                                  |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |
| 691043        | <b>Description:</b> Enabled RoCE IPv4 Multicast prevents MCG command from failing when an IPv4 is mapped to an IPv6 address.                                |
|               | <b>Keywords:</b> RoCE IPv4 Multicast                                                                                                                        |
|               | <b>Discovered in Release:</b> 12.14.1100                                                                                                                    |
|               | <b>Fixed in Release:</b> 12.14.2036                                                                                                                         |

**Table 18 - Bug Fixes History (Sheet 13 of 15)**

| Internal Ref.     | Issue                                                                                                                                                                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 649696/<br>690681 | <b>Description:</b> If the PF driver or the tool (e.g. ethtool) use PAOS DOWN command (e.g. by ifconfig down or ip link set down), loopback traffic is blocked for all functions on this port (PF<->VFs / VF<->VF)                                                      |
|                   | In Multi-Host loopback, the traffic will be blocked once the firmware receives the PAOS down command from all PFs. However, the loopback traffic will not be blocked when the port is down due to the physical link (for example: cable plugged out, switch port down). |
|                   | <b>Keywords:</b> Multi-Host loopback                                                                                                                                                                                                                                    |
|                   | <b>Discovered in Release:</b> 12.14.1100<br><b>Fixed in Release:</b> 12.14.2036                                                                                                                                                                                         |
| 659307            | <b>Description:</b> Fixed a 25G and 50G link issue when Clause 91 RS FEC was active.                                                                                                                                                                                    |
|                   | <b>Keywords:</b> 25G and 50G link, Clause 91 RS FEC                                                                                                                                                                                                                     |
|                   | <b>Discovered in Release:</b> 12.12.1100                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                     |
| 676877            | <b>Description:</b> Added a missing invalidation of eSwitch cache upon FLR which caused the upcoming driver load to either fail or not to be able to transmit.                                                                                                          |
|                   | <b>Keywords:</b> Packet Transmit, FLR                                                                                                                                                                                                                                   |
|                   | <b>Discovered in Release:</b> 12.12.1240                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                     |
| 668221            | <b>Description:</b> Fixed an issue which prevented Vport counters from counting local loopback packets. Packets now are filter by the self-loopback prevention.                                                                                                         |
|                   | <b>Keywords:</b> Vport, local loopback packets                                                                                                                                                                                                                          |
|                   | <b>Discovered in Release:</b> 12.12.1240                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                     |
| 667288            | <b>Description:</b> Reported INTx as unsupported to allow PFs Passthrough on PowerKVM.                                                                                                                                                                                  |
|                   | <b>Keywords:</b> Passthrough, PowerKVM                                                                                                                                                                                                                                  |
|                   | <b>Discovered in Release:</b> 12.12.1100                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                     |
| 596637            | <b>Description:</b> SR-IOV Ethernet supports up to 18 VFs per port only.                                                                                                                                                                                                |
|                   | <b>Keywords:</b> Virtualization                                                                                                                                                                                                                                         |
|                   | <b>Discovered in Release:</b> 12.12.1240                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                     |
| 591240            | <b>Description:</b> Fixed and incident what allowed local (internal) loopbacked packets to be counted by the Vport counters, although Vport counters should count only traffic that crosses the Vport.                                                                  |
|                   | <b>Keywords:</b> Virtualization                                                                                                                                                                                                                                         |
|                   | <b>Discovered in Release:</b> 12.12.1240                                                                                                                                                                                                                                |
|                   | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                     |

**Table 18 - Bug Fixes History (Sheet 14 of 15)**

| Internal Ref. | Issue                                                                                                                                                                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 664558        | <b>Description:</b> Fixed an issue preventing driver loading or TX traffic sending upon reboot, after ungraceful driver unload.                                                                                                                                                                                                                        |
|               | <b>Keywords:</b> Driver Load                                                                                                                                                                                                                                                                                                                           |
|               | <b>Discovered in Release:</b> 12.12.1240                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                                                                                                    |
| 657680        | <b>Description:</b> Fixed casting of BMC MAC before steering API.                                                                                                                                                                                                                                                                                      |
|               | <b>Keywords:</b> BMC, Steering API                                                                                                                                                                                                                                                                                                                     |
|               | <b>Discovered in Release:</b> 12.12.1240                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                                                                                                    |
| 614403        | <b>Description:</b> Fixed the PCI write flow to take into consideration the PCI MTU. This fix eliminates the need for NOPs in the flow, which resulted from PPC larger PCI MTU.<br>The single queue limitation for READ is due to a hardware limitation of the number of READ request in a given time.                                                 |
|               | <b>Keywords:</b> PCI MTU                                                                                                                                                                                                                                                                                                                               |
|               | <b>Discovered in Release:</b> 12.12.1100                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                                                                                                    |
| 630327        | <b>Description:</b> Fixed a case that caused FlexBoot to not work as expected with systems that run with "large bar" enabled (Above 4G Decoding) over Connect-IB or ConnectX-4 HCAs.                                                                                                                                                                   |
|               | <b>Keywords:</b> FlexBoot, 4G Decoding                                                                                                                                                                                                                                                                                                                 |
|               | <b>Discovered in Release:</b> 12.12.1100                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.14.1100                                                                                                                                                                                                                                                                                                                    |
| 629563        | <b>Description:</b> Fixed an over-subscription on the RX buffer when Flow Control was not enabled which caused the RX pipe to hang.                                                                                                                                                                                                                    |
|               | <b>Keywords:</b> Flow Control                                                                                                                                                                                                                                                                                                                          |
|               | <b>Discovered in Release:</b> 12.12.0780                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.12.1240                                                                                                                                                                                                                                                                                                                    |
| 631225        | <b>Description:</b> Fixed an issue causing the firmware to hang when running ibdiagnet. The received DiagData MAD included the following values:<br><ul style="list-style-type: none"> <li>• Clear_all = 1</li> <li>• PageNum = 0</li> <li>• Port_select = 0</li> </ul> To prevent the firmware from hanging, a port check was added to Set() as well. |
|               | <b>Keywords:</b> ibdiagnet                                                                                                                                                                                                                                                                                                                             |
|               | <b>Discovered in Release:</b> 12.12.1100                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.12.1240                                                                                                                                                                                                                                                                                                                    |
| 638024        | <b>Description:</b> Fixed an issue causing Port 2's GPIO present to be mapped to the wrong value in ConnectX-4 EN 50GbE single-port adapter card OPN MCX414A-GCAT                                                                                                                                                                                      |
|               | <b>Keywords:</b> Port Link                                                                                                                                                                                                                                                                                                                             |
|               | <b>Discovered in Release:</b> 12.12.1100                                                                                                                                                                                                                                                                                                               |
|               | <b>Fixed in Release:</b> 12.12.1240                                                                                                                                                                                                                                                                                                                    |

**Table 18 - Bug Fixes History (Sheet 15 of 15)**

| Internal Ref. | Issue                                                                                                                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -             | <p><b>Description:</b> 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</p> <p><b>Keywords:</b> Cables</p> <p><b>Discovered in Release:</b> 12.1100.6630</p> <p><b>Fixed in Release:</b> 12.12.0780</p> |
| 565905        | <p><b>Description:</b> Fixed a LED issue in adapter cards with bi-color LEDs. The LEDs were activated simultaneously due to a firmware issue.</p> <p><b>Keywords:</b> LEDs</p> <p><b>Discovered in Release:</b> 12.1100.6630</p> <p><b>Fixed in Release:</b> 12.12.0780</p>                                                                      |
| -             | <p><b>Description:</b> Fixed an FDR10 incorrect speed indication reported due to the usage of a translation function from the hardware speed to the PRM speed twice.</p> <p><b>Keywords:</b> Port Link</p> <p><b>Discovered in Release:</b> 12.1100.6440</p> <p><b>Fixed in Release:</b> 12.12.0780</p>                                          |
| 592712        | <p><b>Description:</b> Fixed a Phy manager PCS event handling when the port's next state was disable.</p> <p><b>Keywords:</b> Phy Management</p> <p><b>Discovered in Release:</b> 12.1100.6630</p> <p><b>Fixed in Release:</b> 12.12.0780</p>                                                                                                    |
| 561387        | <p><b>Description:</b> Fixed an issue that caused invalid data returned by EyeOpening MAD.</p> <p><b>Keywords:</b> MADs</p> <p><b>Discovered in Release:</b> 12.1100.6440</p> <p><b>Fixed in Release:</b> 12.12.0780</p>                                                                                                                         |
| 552595        | <p><b>Description:</b> Fixed a system call trace event on ConnectX-4 OCP mezz card</p> <p><b>Keywords:</b> Ethernet Network</p> <p><b>Discovered in Release:</b> 12.1100.6440</p> <p><b>Fixed in Release:</b> 12.12.0780</p>                                                                                                                     |
| 552462        | <p><b>Description:</b> Fixed an issue which caused hardware fatal error when running ibdump.</p> <p><b>Keywords:</b> Diagnostic Tools</p> <p><b>Discovered in Release:</b> 12.1100.6440</p> <p><b>Fixed in Release:</b> 12.12.0780</p>                                                                                                           |
| 552227        | <p><b>Description:</b> Reduced the VF ICM footprint for VFs.</p> <p><b>Keywords:</b> Virtualization</p> <p><b>Discovered in Release:</b> 12.1100.6440</p> <p><b>Fixed in Release:</b> 12.1100.6630</p>                                                                                                                                           |

## 5 Firmware Changes and New Feature History

**Table 19 - Firmware Changes and New Feature History (Sheet 1 of 8)**

| Feature/Change                                          | Description                                                                                                                                                                                                            |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DSCP</b>                                             | Added trust level for QoS prioritization according to the DSCP or PCP.                                                                                                                                                 |
|                                                         | <b>[Beta]</b> Added ingress buffer management for: <ul style="list-style-type: none"> <li>ingress traffic mapping to a buffer according to priority</li> <li>buffers sizes and lossless parameters</li> </ul>          |
| <b>Secured Firmware Updates</b>                         | <b>[Beta]</b> Secure Firmware Updates provides devices with the ability to verify digital signatures of new firmware binaries, in order to ensure that only officially approved versions are installed on the devices. |
| <b>Multi-Host/Socket Direct Routing to be LID based</b> | <b>[InfiniBand only]</b> Changed the Multi-Host/Socket Direct routing to be LID based instead of GID based. Thus, GRH/GID index is not required.<br><b>Note:</b> This feature requires SM 4.8.1 and above.             |
| <b>Relaxed Ordering</b>                                 | <b>[Beta]</b> Added support for relaxed ordering write in memory keys.                                                                                                                                                 |
| <b>RDMA Counters</b>                                    | Enhanced RDMA counter                                                                                                                                                                                                  |
| TLV for PCI class code                                  | Added 2 new per Host TLVs (see <a href="#">Table 26, “Per host Settings,” on page 57</a> )                                                                                                                             |
| Fast Teardown                                           | Enables fast unloading driver by using Teardown HCA with op_mode=1 (panic mode).<br>For further information, refer to the PRM.                                                                                         |
| IPoIB Virtualization                                    | Added support for enhanced IPoIB (QP.ulp == 2) in virtualized system (SR-IOV / Multi-Host / Socket Direct)                                                                                                             |
| <b>SFP Power Flow Improvement (level 2,1)</b>           | Added support for SFP power class.                                                                                                                                                                                     |
| <b>10GBaseT module</b>                                  | Added support for 10GBaseT modules.                                                                                                                                                                                    |
| Bug Fixes                                               | See <a href="#">Section 4, “Bug Fixes History,” on page 24</a>                                                                                                                                                         |
| <b>Rev. 12.18.2000</b>                                  |                                                                                                                                                                                                                        |
| Bug Fixes                                               | See <a href="#">Section 4, “Bug Fixes History,” on page 24</a>                                                                                                                                                         |
| <b>Rev. 12.18.1000</b>                                  |                                                                                                                                                                                                                        |
| <b>RX Loss (BaseT link down indication)</b>             | Added logical link indication in SFP to BaseT modules and disabled logical link when peer port is down.                                                                                                                |
| <b>SFP Rate</b>                                         | Added support for 10GbE in 25GbE SFP optical modules                                                                                                                                                                   |
| <b>PDDR</b>                                             | Enables mlxlink tool to collect data on the PHY link status and provides link down reasons and additional link related information.                                                                                    |
| <b>KR Tx Response</b>                                   | Enabled TX configuration response and movement during Link Training in Ethernet.                                                                                                                                       |
| <b>Phy Test mode</b>                                    | Added support at lane rate of 12.89Gb.                                                                                                                                                                                 |
| Head of Queue (HoQ) per TC                              | Limits the amount of time a packet may head a Traffic Class (TC) transmission queue, without being transmitted. Stale packets are discarded.<br>Active by default for TCs adhering to link level flow control          |

**Table 19 - Firmware Changes and New Feature History (Sheet 2 of 8)**

| Feature/Change                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User Access Region (UAR) 4KB Granularity Allocation | UAR page size currently is set to 4KB and not according to what the system page size determines.                                                                                                                                                                                                                                                                                                                                                                                                   |
| No Driver NIC (NODNIC) Performance Improvement      | Improved performance of: <ul style="list-style-type: none"> <li>• Doorbell from User Access Region (UAR)</li> <li>• Clear interrupt from User Access Region (UAR)</li> </ul>                                                                                                                                                                                                                                                                                                                       |
| Counters                                            | Added support for additional transport counters.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| On Demand Paging (ODP) DC                           | Added ODP support for DC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Scatter to CQE on Sender for DC                     | Enabled scatter-to-CQE for sent packets for DC.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| CQ modify                                           | Enabled moderation period modification in CQ modify command.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| VMQ: Rate limit per function                        | <b>[Beta]</b> Added support for minimum/maximum rate limit per vport in SR-IOV.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Network traffic between UEFI-Shell and OS           | Enabled network traffic between UEFI-Shell and OS.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| non-RDMA capable VFs                                | Enabled the PF to force disable RoCE for its VFs.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| PRM: Access Registers                               | Added 2 new access registers: <ul style="list-style-type: none"> <li>• Management Capabilities Mask Register</li> <li>• Ports Capabilities Mask Register Fields</li> </ul> For further information, please refer to the PRM.                                                                                                                                                                                                                                                                       |
| Loopback Enabled/Disabled                           | Enabled VNIC the control to enable/disable its local loopback traffic.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| RDMA RX Flow Table                                  | Added the option to open a receive RDMA Flow Table and to forward RoCE traffic to some destination QP.                                                                                                                                                                                                                                                                                                                                                                                             |
| Bug Fixes                                           | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Rev. 12.17.2020                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| GENEVE & IP-in-IP Stateless Off-load                | <b>[Beta]</b> Added support for IP-in-IP and GENEVE network protocols encapsulated into IP frame (L2 tunneling).<br>Encapsulation is suggested as a means to alter the normal IP routing for data-grams, by delivering them to an intermediate destination that would otherwise not be selected based on the (network part of the) IP Destination Address field in the original IP header.<br><b>Note:</b> For driver support, please see the Release Notes/User Manual of the relevant OS driver. |
| Bug Fixes                                           | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Rev. 12.17.1010                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Multi-Host LID Base Routing                         | Added support for Multi-Host LID base routing.<br>This feature requires a new OpenSM (v4.7.1 and above which comes with MLNX_OFED 3.3-2.0.0.0) with the following attributes: <ul style="list-style-type: none"> <li>• qos TRUE</li> <li>• lmc 2 (if there is no quad host in the fabric, you can set the lmc to 1)</li> <li>• virt_enabled 2</li> </ul> <b>Note:</b> Multi-Host LID base routing can be configured by the INI only. The default is 0                                              |

**Table 19 - Firmware Changes and New Feature History (Sheet 3 of 8)**

| Feature/Change                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resilient RoCE                                                | Resilient RoCE is the ability to send RoCE traffic over a lossy network (a network without flow control enabled), without the need to enable flow control on the network.<br>The ability is accomplished by enabling ECN on both the Switch and the Host.                                                                                                                                                                                                                                                                                                                                       |
| Multi-Host L3/L4 Classification                               | Enables load balancing in the Multi PF Switch layer (MPFS) based on the L3/L4 headers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| InfiniBand Multi-Host Isolation                               | Enabled isolation between separate Hosts using the same HCA. All the Hosts can be rebooted, the driver can be stopped and the FLR signal can be sent independently.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>95 Virtual Functions (VF) per Port</b>                     | Increased the number of VFs from 64 to 95 per Physical Function (PF).<br><b>Note:</b> When increasing the number of VFs, the following limitations must be taken into consideration:<br><br>$\text{server\_total\_bar\_size} \geq (\text{num\_pfs}) * (2\log\_pf\_uar\_bar\_size + 2\log\_vf\_uar\_bar\_size * \text{total\_vfs})$ $\text{server\_total\_msix} \geq (\text{num\_pfs}) * (\text{num\_pf\_msix} + \text{num\_vfs\_msix} * \text{total\_vfs})$<br><b>Note:</b> For the maximum number of VFs supported by your driver, please refer to your drivers' Release Notes or User Manual. |
| QoS per VFs                                                   | <b>[InfiniBand Only]</b> Added support for multiple VLs in SR-IOV/multihost environments.<br><b>Note:</b> The number of VLs can be configured by the NVCONFIG. The default VL number is 4 VLs.                                                                                                                                                                                                                                                                                                                                                                                                  |
| InfiniBand Rate Limit per QP (static rate)                    | Added support for QP Rate Limit in InfiniBand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| HCA Port Flap Counter                                         | Added support for Port Flap Counter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Fixed Buffer Size (KSM)                                       | Limits the buffer size for all entries to improve performance.<br>KSM is used when associating Key Length My Virtual Address (KLMs) with fixed memory size.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| NULL Mkey                                                     | This entry (null_mkey) is use to indicate non-present KLM/KSM entries. When accessing is, it causes the device to generate page fault event.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Out-of-Band Online Firmware Update: Firmware Update over PLDM | PLDM firmware burning is based on the DMTF spec DSP0267 (draft 9). The feature enables upgrading firmware and expansion ROM images using the PLDM protocol over MCTP (over PCIe). By doing so, a supporting BMC can query and upgrade the firmware without using OS based tools.                                                                                                                                                                                                                                                                                                                |
| New Group in Ports Performance Counters (PPCNT)               | Added a new physical layer statistics counters group. The new group includes BER counters, FEC error correction, clear time, and additional physical layer counters.<br>For further information, please refer to the <a href="#">Ethernet Adapters Programming Manual (PRM)</a> .                                                                                                                                                                                                                                                                                                               |
| Permanent Link Up Mode                                        | Enables the user to set a certain link up state for an unlimited period of time. This mode has 3 states: <ul style="list-style-type: none"> <li>Aux power (standby)</li> <li>Reboot/boot/driver unloaded - the server is active and no driver is up</li> <li>Driver is up - at least one driver is up (the time between init HCA and teardown or FLR)</li> </ul>                                                                                                                                                                                                                                |

**Table 19 - Firmware Changes and New Feature History (Sheet 4 of 8)**

| Feature/Change                                 | Description                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No Driver NIC (NODNIC) Performance Improvement | Added support for Doorbell from User Access Region (UAR).                                                                                                                                                                                                                                                                                              |
| SR-IOV: Rate Limit Per Function                | <b>[Beta]</b> Added support for maximum rate limit per function in SR-IOV.                                                                                                                                                                                                                                                                             |
| Firmware Resiliency: Suppress Pauses           | Allows the user to configure the adapter card to stop sending pauses after x when the receive port is unavailable (in a hang state).                                                                                                                                                                                                                   |
| Performance Back-pressure Counters             | <b>[Beta]</b> Added support for new performance counters.                                                                                                                                                                                                                                                                                              |
| Data Center Bridging Exchange (DCBX)           | DCBX is used by DCB devices to exchange configuration information with directly connected peers. DCBX uses Link Layer Discovery Protocol (LLDP) to exchange parameters between two link peers.<br>For further information, please refer to the PRM.                                                                                                    |
| Access Register: Default Values Revert         | Allows network port registers to revert to their default values when the driver is restarted or the host is rebooted.                                                                                                                                                                                                                                  |
| Link up Modes                                  | Added additional network link up modes. The new modes decide when to keep the network link up.<br>The new modes are: <ul style="list-style-type: none"> <li>• keep_eth_link_up</li> <li>• keep_ib_link_up</li> <li>• keep_link_up_on_boot</li> <li>• keep_link_up_on_standby</li> </ul>                                                                |
| Bug Fixes                                      | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                                                                                                                                                                                                                                                                                         |
| Rev. 12.16.1020                                |                                                                                                                                                                                                                                                                                                                                                        |
| Bug Fixes                                      | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                                                                                                                                                                                                                                                                                         |
| Rev. 12.16.1006                                |                                                                                                                                                                                                                                                                                                                                                        |
| <b>Explicit Congestion Notification (ECN)</b>  | <b>[Beta]</b> Explicit Congestion Notification (ECN) is an extension to the Internet Protocol and to the Transmission Control Protocol. ECN allows end-to-end notification of network congestion without dropping packets.                                                                                                                             |
| <b>64 VFs per port</b>                         | Increased the number of VFs from 32 to 64 per PF.<br><b>Note:</b> When increasing the number of VFs, the following limitations must be taken into consideration:<br><pre>server_total_bar_size &gt;= (num_pfs)*(2log_pf_uar_bar_size + 2log_vf_uar_bar_size*total_vfs) server_total_msix &gt;= (num_pfs)*(num_pf_msix + num_vfs_msix *total_vfs)</pre> |
| <b>RoCE Link Aggregation (RoCE LAG)</b>        | <b>[Beta]</b> RoCE Link Aggregation provides failover and link aggregation capabilities. In this mode, only one IB port, that represents the two physical ports, is exposed to the application layer.<br>For further information, please refer to the PRM.                                                                                             |

**Table 19 - Firmware Changes and New Feature History (Sheet 5 of 8)**

| Feature/Change                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OVS Offload</b>                                                | Mellanox Accelerated Switching And Packet Processing (ASAP <sup>2</sup> ) Direct technology allows to offload OVS by handling OVS data-plane in Mellanox ConnectX-4 / ConnectX-4 Lx NIC hardware (Mellanox Embedded Switch or eSwitch) while maintaining OVS control-plane unmodified. The current actions supported by ASAP <sup>2</sup> Direct include packet parsing and matching, forward, drop along with VLAN push/pop or VXLAN encap/decap and HW based packet/byte flow statistics. |
| <b>Virtual Extensible LAN (VXLAN) encapsulation/decapsulation</b> | Virtual Extensible LAN (VXLAN) is a network virtualization technology that improves scalability problems associated with large cloud computing deployments. It tunnels Ethernet frames within Ethernet + IP + UDP frames. Mellanox implements VXLAN encapsulation and decapsulation in the hardware.                                                                                                                                                                                        |
| <b>Data Center Bridging Exchange (DCBX)</b>                       | <b>[Beta]</b> DCBX is used by DCB devices to exchange configuration information with directly connected peers. DCBX uses Link Layer Discovery Protocol (LLDP) to exchange parameters between two link peers. For further information, please refer to the PRM.                                                                                                                                                                                                                              |
| <b>FCS no scatter / FCS check</b>                                 | Enables the user to control whether or not to scatter Frame Check Sequence (FCS) or to check FCS functionality.                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Packet Pacing</b>                                              | <b>[Beta]</b> Send Queues (SQ/ Send queue of QP) may be individually rate limited, thus, allowing granular rate control over specific SW-defined flows. A rate-limited flow is allowed to transmit a few packets before its transmission rate is evaluated, and the next packet is scheduled for transmission accordingly.                                                                                                                                                                  |
| <b>PRBS Patterns Generation and Tuning</b>                        | A new PHY test mode in which the device can generate different PRBS patterns for SerDes tuning purpose. For further information, please refer to PRM registers: PPAOS, PPTT, PPRT.                                                                                                                                                                                                                                                                                                          |
| <b>Management Controller Transport Protocol (MCTP) over PCI</b>   | Added support for MCTP host management over PCI                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>OCBB / OCSD support after mlxfwreset</b>                       | Added support for OCBB/OCSD memory pointers restoration after mlxfwreset                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MCTP media migration</b>                                       | Added support for MCTP media migration between SMBUS and PCI                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Cables</b>                                                     | Removed the RX amplitude configuration on some cable types                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Bug Fixes                                                         | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Rev. 12.14.2036</b>                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| IPoIB checksum and LSO offload                                    | Added IPoIB checksum and LSO offload support                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Scatter FCS in RQ                                                 | Enables software to scatter or strip FCS in RQ.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bug Fixes                                                         | See <a href="#">Section 4, “Bug Fixes History”, on page 24</a>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Rev. 12.14.1100</b>                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Table 19 - Firmware Changes and New Feature History (Sheet 6 of 8)**

| Feature/Change                                          | Description                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CQE Time Stamping                                       | Keeps track of the creation of a packet. A time-stamping service supports assertions of proof that a datum existed before a particular time.                                                                                                                                                                                        |
| Priority Flow Control (PFC)                             | Applies pause functionality to specific classes of traffic on the Ethernet link.                                                                                                                                                                                                                                                    |
| RDMA retransmission counters                            | Custom port counters provide the user a clear indication about RDMA send/receive statistics and errors.                                                                                                                                                                                                                             |
| Link Layer Discovery Protocol (LLDP)                    | The Link Layer Discovery Protocol (LLDP) is a vendor-neutral Link Layer protocol in the Internet Protocol Suite used by network devices for advertising their identity, capabilities, and neighbors on a IEEE 802 LAN. The protocol is formally defined in IEEE 802.1AB.                                                            |
| 1GbE and 56GbE Link Speed                               | ConnectX-4adapters now support 1Gb/s and 56GbE Ethernet connectivity in addition to 10GigE, 25GigE, 40GigE, 50GigE, and 100GigE                                                                                                                                                                                                     |
| Flow Steering Counters                                  | Provides a clear indication of Flow Steering statistics and errors.                                                                                                                                                                                                                                                                 |
| WQE Inline Header                                       | The minimal amount of packet headers inlined in the WQE's Eth Segment.                                                                                                                                                                                                                                                              |
| table-miss Flow                                         | A flow table may include a table-miss flow entry, which renders all Match Fields wildcards. If a packet does not match a flow entry in a flow table, this is a table miss. The behavior on a table miss depends on the table configuration. A table-miss flow entry in the flow table may specify how to process unmatched packets. |
| Multi-Host InfiniBand                                   | Enables connecting multiple compute or storage hosts into a single interconnect adapter by separating the adapter PCIe interface into multiple and independent PCIe interfaces.                                                                                                                                                     |
| SR-IOV (EN eSwitch & RoCE)                              | Single Root IO Virtualization (SR-IOV) is a technology that allows a physical PCIe device to present itself multiple times through the PCIe bus.                                                                                                                                                                                    |
| Vector Calculation/<br>Erasure Coding Offload           | Uses the HCA for offloading erasure coding calculations.                                                                                                                                                                                                                                                                            |
| Firmware Image Time Stamping for Multi-Host Environment | Enables the administrator to add a timestamp to the firmware they want to upgrade to avoid situations where one host tries to upgrade the firmware and another tries to downgrade; which may lead to two or more unnecessary server reboots.<br>For further information, please refer to <a href="#">MFT User Manual</a> .          |
| Link params modification via access registers           | The change includes the following:<br>1. Changed port configuration which required link re-training (such as speed)<br>2. PAOS down<br>3. PAOS up<br>This change, will cause the link to toggle and new configurations to take effect.                                                                                              |
| Checksum Calculation on Image/<br>Device                | Flint utility allows performing an MD5 checksum on the non-persistent sections of the firmware image.<br>For further information, please refer to <a href="#">MFT User Manual</a> .                                                                                                                                                 |
| Rev. 12.12.1240                                         |                                                                                                                                                                                                                                                                                                                                     |
| Bug Fixes                                               | See <a href="#">Section 4, "Bug Fixes History", on page 24</a>                                                                                                                                                                                                                                                                      |
| Rev. 12.12.1100                                         |                                                                                                                                                                                                                                                                                                                                     |
| Port Link                                               | Reduced the port link-up time when negotiating according to Clause 73 (DME)                                                                                                                                                                                                                                                         |

**Table 19 - Firmware Changes and New Feature History (Sheet 7 of 8)**

| Feature/Change             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rev. 12.12.0780</b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| PCI                        | <ul style="list-style-type: none"> <li>PCIe Function Level Reset (FLR)</li> <li>Power Management L2/L3 flow support</li> </ul>                                                                                                                                                                                                                                                                                                                        |
| Ethernet Network           | <ul style="list-style-type: none"> <li>Large Receive Offload (LRO)</li> <li>Large Send Offload (LSO)</li> <li>Receive Side Scaling (RSS)</li> <li>Global Pause</li> <li>RoCEv1.0/RoCEv2.0</li> <li>Flow Steering</li> <li>Sniffer Ethernet</li> <li>Rate Limiter (at Beta level)</li> <li>Multi packet WQE</li> <li>Minimal Bandwidth Guarantee (ETS)</li> <li>Explicit Congestion Notification (ECN)</li> <li>Priority Flow Control (PFC)</li> </ul> |
| PRM                        | <ul style="list-style-type: none"> <li>Self Loopback support</li> <li>Transport Domain support</li> <li>CQ2EQ remapping</li> <li>Added support for the following commands: <ul style="list-style-type: none"> <li>MODIFY/QUERY_ESW_VPORT_CONTEXT</li> <li>QUERY/MODIFY_CONG_STATUS</li> <li>QUERY/MODIFY_CONG_PARAMS</li> <li>QUERY_CONG_STATISTICS</li> <li>ADD/DELETE_VXLAN_UDP_DPORT</li> </ul> </li> </ul>                                        |
| Virtualization             | <ul style="list-style-type: none"> <li>VXLAN/NVGRE Stateless offload</li> <li>In this release, this feature is supported through Windows ONLY</li> <li>SR-IOV EN (at Beta level)</li> </ul>                                                                                                                                                                                                                                                           |
| Performance                | <ul style="list-style-type: none"> <li>CQE zipping</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                         |
| InfiniBand Network         | <ul style="list-style-type: none"> <li>Dynamically Connected (DC) transport</li> </ul>                                                                                                                                                                                                                                                                                                                                                                |
| Misc                       | <ul style="list-style-type: none"> <li>Wake-on-Lane/Standby</li> <li>FlexBoot/UEFI support</li> </ul>                                                                                                                                                                                                                                                                                                                                                 |
| Non-Volatile Configuration | <ul style="list-style-type: none"> <li>Non-Volatile Configuration (NVConfig). For the complete list, please refer to <a href="#">Section 8, on page 57</a>.</li> </ul>                                                                                                                                                                                                                                                                                |
| Port management            | <ul style="list-style-type: none"> <li>Enabled port management. Now one port can be set as Ethernet and one as InfiniBand.</li> </ul>                                                                                                                                                                                                                                                                                                                 |
| <b>Rev. 12.1100.6630</b>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Virtualization             | <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> </ul>                                                                                                                                                                                                                                                                                   |
| PRM                        | <ul style="list-style-type: none"> <li>Updated virtualization command set according to PRM 0.26</li> </ul>                                                                                                                                                                                                                                                                                                                                            |
| Configuration tools        | <ul style="list-style-type: none"> <li>Enabled SR-IOV, NUM_VFS and INT_LOG_MAX_PAYLOAD_SIZE configuration via the mlxconfig tool</li> </ul>                                                                                                                                                                                                                                                                                                           |

**Table 19 - Firmware Changes and New Feature History (Sheet 8 of 8)**

| Feature/Change           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rev. 12.0100.6440</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| All                      | <ul style="list-style-type: none"> <li>Initial Release of ConnectX®-4 adapter cards</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Port Speed               | <ul style="list-style-type: none"> <li>InfiniBand port speed up to EDR</li> <li>Ethernet port speed up to 100GigE</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Virtualization           | <ul style="list-style-type: none"> <li>Function per port</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| InfiniBand Network       | <ul style="list-style-type: none"> <li>Dynamically Connected transport</li> <li>Unreliable Datagram Connection transport</li> <li>Atomic Operation</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 pipeline Data Integrity Signature off-loading (at beta level)</li> <li>User Memory Registration (UMR)</li> <li>Automatic Path Migration</li> <li>On Demand Paging (ODP) - Memory can now be used without pinning memory beforehand.</li> <li>Congestion Control</li> <li>Shrink Address Vectors for RC and UD</li> <li>Programmable Port/Node GUID</li> </ul> |
| Ethernet Network         | <p><b>Note:</b> All the Ethernet features listed below are at Beta level.</p> <ul style="list-style-type: none"> <li>Large Receive Offload (LRO)</li> <li>Large Send Offload (LSO)</li> <li>Receive Side Scaling (RSS)</li> <li>Global Pause</li> <li>RoCEv1/RoCEv2.</li> </ul> <p>RoCE is supported only in Reliable Connection (RC) transport</p> <ul style="list-style-type: none"> <li>Flow Steering</li> </ul>                                                                                                                                                                                                                                                                                                                |
| General                  | <ul style="list-style-type: none"> <li>Thermal monitoring and protection</li> <li>Port LEDs indications</li> <li>NVConfig Tool</li> <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>Physical Port Counter - Beta level</li> <li>Q Counter - Beta level</li> <li>Firmware burning (using mstflint) when the driver is down</li> <li>CPLD field upgrade</li> <li>V Port commands</li> </ul>                                                                                                                                                                                                                                                 |
| Host management          | <ul style="list-style-type: none"> <li>NC-SI over RMI support</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| MAD                      | <ul style="list-style-type: none"> <li>Config space address in MAD management class 0x09</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## 6 FlexBoot Changes and New Features

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

**Table 20 - FlexBoot Changes and New Features (Sheet 1 of 2)**

| Version               | Description                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rev. 3.5.210</b>   |                                                                                                                                                                                               |
| Promiscuous VLAN mode | Added support for promiscuous VLAN mode.                                                                                                                                                      |
| MTU                   | <b>[InfiniBand]</b> Added support for configurable MTU.                                                                                                                                       |
| Expansion ROM version | Enabled expansion ROM (exp_rom) version exposition according to the new specification (e.g. expose ARCH in flint tool).                                                                       |
| FlexBoot UI           | Added a FlexBoot menu support for NV_POWER_CONF. Now power consumption configuration is supported from the FlexBoot menu.                                                                     |
|                       | Enhanced FlexBoot/firmware debug capability using Flexboot UI. Added the reg_dump option to the panic_behavior configuration in the FlexBoot menu                                             |
| Upstream sync         | Synced the source with iPXE (upstream sync)                                                                                                                                                   |
| <b>Rev. 3.5.110</b>   |                                                                                                                                                                                               |
| Networking            | Ethernet only: The MTU value is set to 1500 upon driver's bring up.                                                                                                                           |
| <b>Rev. 3.5.109</b>   |                                                                                                                                                                                               |
| Performance           | Performance enhancements in Ethernet mode                                                                                                                                                     |
| FlexBoot UI           | Added support for "Undi network wait timeout"                                                                                                                                                 |
|                       | Enhanced FlexBoot/firmware debug capability using Flexboot UI                                                                                                                                 |
| Upstream sync         | Synced the source with iPXE (upstream sync)                                                                                                                                                   |
| <b>Rev. 3.4.903</b>   |                                                                                                                                                                                               |
| iSCSI re-imaging      | Enables the user to install a new image on active iSCSI target                                                                                                                                |
| FlexBoot UI           | Added new configuration for network link type for supported cards (ConnectX-4 VPI cards)                                                                                                      |
|                       | Enabled boot configuration menu in ConnectX-4 when the physical port is IB                                                                                                                    |
| Booting               | Enabled booting with non-default Pkey in ConnectX-4 when the physical port is IB                                                                                                              |
| Link Status           | Removed link status line printout at boot time                                                                                                                                                |
| Boot Menu             | Changed the Bus:Device:Function format in boot menu, from PCI - Bus:Dev.Func to 0000:Bus:Dev.Func                                                                                             |
| Upstream sync         | Synced the source with iPXE (upstream sync)                                                                                                                                                   |
| <b>Rev. 3.4.812</b>   |                                                                                                                                                                                               |
| FlexBoot UI           | Added debug prints option in the FlexBoot boot menu. For further information, please refer to FlexBoot and UEFI User Manual.                                                                  |
| System Diagnosis      | Added the ability to diagnose problems in released ROMs by enabling the debug log levels for specific modules.<br><b>Note:</b> This ability should be used only when debug session is needed. |
| Interrupts            | Added support for ConnectX-4/ConnectX-4 Lx interrupts                                                                                                                                         |

**Table 20 - FlexBoot Changes and New Features (Sheet 2 of 2)**

| Version                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Upstream sync          | Synced the source with iPXE (upstream sync)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Rev. 3.4.719</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| IPv6                   | Added IPv6 support                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| x64 Architecture       | Added x64 architecture support in ConnectX-4 and Connect-IB adapter cards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SHELL CLI              | <p>Removed support for the following SHELL CLI commands:</p> <ul style="list-style-type: none"> <li>• Non-volatile option storage commands</li> <li>• SAN boot commands</li> <li>• Menu commands</li> <li>• Login command</li> <li>• Sync command</li> <li>• DNS resolving command</li> <li>• Time commands</li> <li>• Image crypto digest commands</li> <li>• Loopback testing commands</li> <li>• VLAN commands</li> <li>• PXE commands</li> <li>• Reboot command</li> </ul> <p>For further information, please refer to: <a href="http://ipxe.org/cmd">http://ipxe.org/cmd</a></p> |
| Upstream sync          | Synced the source with iPXE (upstream sync)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Rev. 3.4.650</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Image size             | Added support for .mrom images larger than 128kB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Adapter Cards          | Added support for ConnectX-4 EN and ConnectX-4 Lx EN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Flat real mode         | Moved to flat real mode when calling INT 1a,b101 to avoid BIOSes issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Spanning Tree Protocol | Added support for detecting Spanning Tree Protocol non-forwarding ports (RSTP/MSTP)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Upstream sync          | Synced the source with iPXE (upstream sync)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## 6.1 FlexBoot Known Issues

**Table 21 - FlexBoot Known Issues**

| Internal Ref. | Description                                                                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -             | <b>Description:</b> Several BIOS vendors have limited boot-vector space and may not display FlexBoot in their boot menu.                                                       |
|               | <b>Workaround:</b> Disable the embedded NIC boot agent in BIOS                                                                                                                 |
|               | <b>Keywords:</b> BIOS                                                                                                                                                          |
| -             | <b>Description:</b> In several BIOS, the server might hang during FlexBoot booting due to wrong configuration of the PMM.                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                         |
|               | <b>Keywords:</b> BIOS                                                                                                                                                          |
| -             | <b>Description:</b> Only EBX, ESI, DS, ES registers can be saved in Boot Entry.                                                                                                |
|               | <b>Workaround:</b> N/A                                                                                                                                                         |
|               | <b>Keywords:</b> BIOS                                                                                                                                                          |
| -             | <b>Description:</b> If a client returned control to the BIOS after a successful connection to an iSCSI target (but did not boot from it), then, unexpected behavior may occur. |
|               | <b>Workaround:</b> Follow the instructions described in the FlexBoot UM for the proper iSCSI boot/install                                                                      |
|               | <b>Keywords:</b> BIOS                                                                                                                                                          |
| 673114/821899 | <b>Description:</b> FlexBoot banner might not be shown in some BIOSes.                                                                                                         |
|               | <b>Workaround:</b> N/A                                                                                                                                                         |
|               | <b>Keywords:</b> BIOS                                                                                                                                                          |
| -             | <b>Description:</b> In some cases, PXE boot will not work if the client was given only the file-name without next-server (siaddr).                                             |
|               | <b>Workaround:</b> N/A                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                      |
| -             | <b>Description:</b> PXE boot after iSCSI boot with static configuration is currently not supported.                                                                            |
|               | <b>Workaround:</b> N/A                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                      |
| -             | <b>Description:</b> Boot over VLAN with IB port is currently not supported.                                                                                                    |
|               | <b>Workaround:</b> N/A                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                      |

**Table 21 - FlexBoot Known Issues**

| Internal Ref. | Description                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -             | <b>Description:</b> Some faulty boot loaders do not close the underlying UNDI device which may result in unexpected behavior and possible system crash after the OS starts to load.                            |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                                                      |
| -             | <b>Description:</b> Chain-loading gPXE stack is not supported.                                                                                                                                                 |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                                                      |
| 647143        | <b>Description:</b> Executing a partial boot loop while only downloading the NBP and selecting localboot is unsupported and may cause undefined behavior.                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                                                      |
| 670421        | <b>Description:</b> Using filename for PXE boot with rootpath for hooking an iSCSI target (to install) is not supported when the PXE boot loader uses UNDI API, since all traffic must get to the boot loader. |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> PXE Boot                                                                                                                                                                                      |
| -             | <b>Description:</b> iSCSI over IB is not tested.                                                                                                                                                               |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> iSCSI                                                                                                                                                                                         |
| -             | <b>Description:</b> iSCSI over DCB is not supported.                                                                                                                                                           |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> iSCSI                                                                                                                                                                                         |
| -             | <b>Description:</b> FlexBoot supports only a single active iSCSI connection. Thus, when iSCSI-boot via Port 1 succeeds to connect but fails to boot, it will fail to connect via Port 2.                       |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> iSCSI                                                                                                                                                                                         |
| -             | <b>Description:</b> Boot retries is currently not functional when booting from iSCSI.                                                                                                                          |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> iSCSI                                                                                                                                                                                         |
| 655800        | <b>Description:</b> iSCSI over IPv6 is not supported.                                                                                                                                                          |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                         |
|               | <b>Keywords:</b> iSCSI                                                                                                                                                                                         |

**Table 21 - FlexBoot Known Issues**

| Internal Ref. | Description                                                                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -             | <b>Description:</b> Boot menu is displayed as READ ONLY if the HCA card does not support flash configuration.                                                                        |
|               | <b>Workaround:</b> N/A                                                                                                                                                               |
|               | <b>Keywords:</b> User Interface                                                                                                                                                      |
| -             | <b>Description:</b> FlexBoot Boot Menu will not be visible in serial output.                                                                                                         |
|               | <b>Workaround:</b> N/A                                                                                                                                                               |
|               | <b>Keywords:</b> User Interface                                                                                                                                                      |
| -             | <b>Description:</b> Large Receive Offload (LRO) and iSCSI may not interoperate due to a bug in current Linux kernel distributions.                                                   |
|               | <b>Workaround:</b> Disable LRO in the IPoIB module when using iSCSI.<br>See the Mellanox FlexBoot user's manual for details under the Diskless Machines chapter (Infini-Band Ports). |
|               | <b>Keywords:</b> Networking                                                                                                                                                          |
| -             | <b>Description:</b> 56Gb/s is currently not supported.                                                                                                                               |
|               | <b>Workaround:</b> N/A                                                                                                                                                               |
|               | <b>Keywords:</b> Link Speed                                                                                                                                                          |
| -             | <b>Description:</b> Setting the number of Virtual Functions higher than the machine's memory capability may cause memory issues and system instability.                              |
|               | <b>Workaround:</b> N/A                                                                                                                                                               |
|               | <b>Keywords:</b> Virtualization                                                                                                                                                      |
| -             | <b>Description:</b> SLAM, FTP, HTTPS and SRP are currently not supported.                                                                                                            |
|               | <b>Workaround:</b> N/A                                                                                                                                                               |
|               | <b>Keywords:</b> Protocols                                                                                                                                                           |
| -             | <b>Description:</b> Occasionally, using the Spanning Tree Protocol (STP) in the switches may cause packet drops and boot failure in the system.                                      |
|               | <b>Workaround:</b> Enable the "edgemode" if disabled on the switch, or use either portfast or edgemode functionality on the switch ports connected to the NICs.                      |
|               | <b>Keywords:</b> Protocols                                                                                                                                                           |
| -             | <b>Description:</b> FCoE, BCV are not supported.                                                                                                                                     |
|               | <b>Workaround:</b> N/A                                                                                                                                                               |
|               | <b>Keywords:</b> Protocols                                                                                                                                                           |

**Table 21 - FlexBoot Known Issues**

| Internal Ref. | Description                                                                                                                                                                                                                                                                                             |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 655800        | <b>Description:</b> IPv6 can only run if a RADVD service is running in the network.                                                                                                                                                                                                                     |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> Protocols                                                                                                                                                                                                                                                                              |
| -             | <b>Description:</b> IPv6 over IB is not supported.                                                                                                                                                                                                                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> Protocols                                                                                                                                                                                                                                                                              |
| 655800        | <b>Description:</b> Enabling IPv6 first and then IPv4 is currently not supported.                                                                                                                                                                                                                       |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> Protocols                                                                                                                                                                                                                                                                              |
| 841198        | <b>Description:</b> FlexBoot fails to boot when the following occurs: <ul style="list-style-type: none"> <li>• Boot priority is set to iSCSI</li> <li>• The iSCSI TCP/IP parameters via DHCP is disabled</li> <li>• iSCSI boot fails or iSCSI boot to target configuration is set to disable</li> </ul> |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> PXE boot, iSCSI                                                                                                                                                                                                                                                                        |
| 843377/849223 | <b>Description:</b> The physical MAC assigned via the boot menu is displayed as zeroes instead of the set MAC when ConnectX-4 VPI adapter card is configured as InfiniBand.                                                                                                                             |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> Physical MAC, Boot menu                                                                                                                                                                                                                                                                |
| 656001        | <b>Description:</b> Booting from WDS and Windows DHCP server when only Option 66 is enabled (without Option 67), is not supported.                                                                                                                                                                      |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> DHCP                                                                                                                                                                                                                                                                                   |
| 776057        | <b>Description:</b> Citrix PVS boot is not supported.                                                                                                                                                                                                                                                   |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> Citrix PVS boot                                                                                                                                                                                                                                                                        |
| 689460        | <b>Description:</b> FlexBoot uses system UUID to generate the client DUID-UUID as per RFC 6355, the data conveyed with DHCPv6 Code 1 (Option ID).                                                                                                                                                       |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> DUID-UUID                                                                                                                                                                                                                                                                              |
| 928217        | <b>Description:</b> Installing ESXi 6.5/6.0 on iSCSI target is currently not supported.                                                                                                                                                                                                                 |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                  |
|               | <b>Keywords:</b> ESXi 6.5/6.0, iSCSI target                                                                                                                                                                                                                                                             |

**Table 21 - FlexBoot Known Issues**

| Internal Ref. | Description                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 689460        | <b>Description:</b> To use the DHCP server to identify ipxe requests when using <code>undionly.kpxe</code> or <code>ipxe.pxe</code> when booting over IB requires special configuration. (see the Workaround below).                                                                                                                                                                                                                                  |
|               | <b>Workaround:</b> Add to the DHCP host declaration the MAC identification alongside the option 61 DUID.<br>For example:<br><pre>host ib-client1 {   option dhcp-client-identifier =     ff:00:00:00:00:00:02:00:00:02:c9:00:&lt;Port-GUID&gt; ;   hardware ethernet &lt;Port-MAC&gt; ;   fixed-address &lt;IPoIB Address&gt; ;   filename "ipxe.pxe" ;   if exists user-class and option user-class = "iPXE" { filename     "pxelinux.0" ; } }</pre> |
|               | <b>Keywords:</b> undionly.kpxe or ipxe.pxe                                                                                                                                                                                                                                                                                                                                                                                                            |
| 928217        | <b>Description:</b> Due to interoperability issue between the ESXi installer and the lpxelinux boot-loader, when trying to install ESXi 6.5 on iSCSI target using lpxelinux.0 as a bootloader, a PSOD occurs.                                                                                                                                                                                                                                         |
|               | <b>Workaround:</b> Use FlexBoot (or iPXE) to load mboot.c32 directly instead of pxelinux.0 using the script below:<br><pre>#!ipxe   set base /nfs/Esxi-6.5_INBOX   chain \${base}/mboot.c32 -c \${base}/boot.cfg BOOTIF=01-     \${mac:hexhyp}</pre> <p>where the "set base ..." specifies a suitable absolute path.</p> <b>Note:</b> iPXE does not need an absolute path, however, mboot.c32 requires it.                                            |
|               | <b>Keywords:</b> mboot.c32, PSOD,                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 976878        | <b>Description:</b> When using bootloader grub2 to boot WDS, if the WDS boot fails, an RSOD might appear.                                                                                                                                                                                                                                                                                                                                             |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                |
|               | <b>Keywords:</b> Bootloader grub2, WDS, RSOD                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1072419       | <b>Description:</b> The FlexBoot DHCP loops indefinitely when it continuously gets NACK on the DHCP requests On some setups, it might also cause an RSOD after a a continues looping.                                                                                                                                                                                                                                                                 |
|               | <b>Workaround:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                |
|               | <b>Keywords:</b> Bootloader grub2, WDS, RSOD                                                                                                                                                                                                                                                                                                                                                                                                          |

## 6.2 FlexBoot Bug Fixes History

**Table 22 - FlexBoot Bug Fixes History (Sheet 1 of 2)**

| Version | Issue                                                                                                                                                                                                                     |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 843209  | <b>Description:</b> Fixed and issue which cause the link not to raise in the second port which is set as IB when the first port is ETH in PXE.                                                                            |
|         | <b>Keywords:</b> Link up, Ports                                                                                                                                                                                           |
|         | <b>Discovered in Release:</b> 3.4.903                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.5.109                                                                                                                                                                                          |
| 847950  | <b>Description:</b> Fixed wrong default value of Boot-To-Target in FlexBoot configuration.                                                                                                                                |
|         | <b>Keywords:</b> Boot-To-Target, FlexBoot configuration                                                                                                                                                                   |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.4.903                                                                                                                                                                                          |
| 691148  | <b>Description:</b> When connecting a pre-configured port with VLAN to an IB fabric, the port runs as Ethernet port with the VLAN tag.                                                                                    |
|         | <b>Keywords:</b> VLAN, Port Management                                                                                                                                                                                    |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.4.903                                                                                                                                                                                          |
| 792432  | <b>Description:</b> Booting PXE using Grub2.X over HP G9/G8 servers results in system hang.                                                                                                                               |
|         | <b>Keywords:</b> PXE boot, Grub2.X, HP G9/G8                                                                                                                                                                              |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.4.903                                                                                                                                                                                          |
| 737512  | <b>Description:</b> If the client gets "PXE boot menu" when contacting the DHCP, it will PXE boot first regardless of the boot priority.                                                                                  |
|         | <b>Keywords:</b> iSCSI, DHCP                                                                                                                                                                                              |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.4.812                                                                                                                                                                                          |
| 690792  | <b>Description:</b> If the PMM fails to allocate memory, the system hangs since FlexBoot cannot load from the expansion ROM.                                                                                              |
|         | <b>Keywords:</b> PMM, expansion ROM                                                                                                                                                                                       |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.4.812                                                                                                                                                                                          |
| 697291  | <b>Description:</b> In ConnectX-4, the PXE boot time measurement over TFTP Ethernet is 1:30 min for image size of 1GB, TFTP InfiniBand is 1:20 min, and iSCSI boot time measurement is 8 seconds for image size of 25 MB. |
|         | <b>Keywords:</b> PXE Boot                                                                                                                                                                                                 |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                                                                                                     |
|         | <b>Fixed in Release:</b> 3.4.812                                                                                                                                                                                          |

**Table 22 - FlexBoot Bug Fixes History (Sheet 2 of 2)**

| Version | Issue                                                                                                                                   |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 689068  | <b>Description:</b> In hybrid BIOSes, if the BIOS loads legacy driver without closing the UEFI driver, the legacy driver fails to load. |
|         | <b>Keywords:</b> BIOS, legacy mode                                                                                                      |
|         | <b>Discovered in Release:</b> 3.4.719                                                                                                   |
|         | <b>Fixed in Release:</b> 3.4.812                                                                                                        |
| 634794  | <b>Description:</b> Enabled 'boot_pci_busdevfn' initialization when booting from UNDI loader.                                           |
|         | <b>Keywords:</b> UNDI loader                                                                                                            |
|         | <b>Discovered in Release:</b> 3.4.650                                                                                                   |
|         | <b>Fixed in Release:</b> 3.4.719                                                                                                        |
| -       | <b>Description:</b> Removed the instruction that enabled write-protected section modifications after POST.                              |
|         | <b>Keywords:</b> PXE Boot                                                                                                               |
|         | <b>Discovered in Release:</b> 3.4.650                                                                                                   |
|         | <b>Fixed in Release:</b> 3.4.719                                                                                                        |

## 7 Unsupported Features and Commands

### 7.1 Unsupported Features

The following advanced features 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)
- SM is not supported on VFs
- DC is not supported in: Multi-Host, SR-IOV, and Ethernet (RoCE)
- RoCE LAG for VFs and Multi-Host/Socket-Direct are not supported in RoCE LAG
- QoS per VFs feature is supported up to 14 VFs per PF in dual port device with 8 VLs.
- Multihost Ethernet

### 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
- MODIFY\_LAG\_ASYNC\_EVENT

## 8 Supported Non-Volatile Configurations

**Table 23 - Per-physical Port Settings**

| Name            | Parameter Index |
|-----------------|-----------------|
| VPI settings    | 0x12            |
| RoCE CC         | 0x107           |
| RoCE CC ECN     | 0x108           |
| LLDP_NB_DCBX    | 0x18E           |
| NV_QOS_CONF     | 0x192           |
| NV_QOS_CAP      | 0x193           |
| NV_KEEP_LINK_UP | 0x190           |

**Table 24 - 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           |
| NV_SW_OFFLOAD_CONF       | 0x10A           |
| NV_PACKET_PACING         | 0x10C           |

**Table 25 - Per host/function Settings**

| Name          | Parameter Index |
|---------------|-----------------|
| Wake-on-LAN   | 0x10            |
| External Port | 0x192           |

**Table 26 - Per host Settings**

| Name        | Parameter Index |
|-------------|-----------------|
| NV_PCI_CONF | 0x80            |
| NV_PCI_CAP  | 0x81            |