ConnectX-4 Adapter Cards Firmware Release Notes

Rev. 12.26.6000

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Release Notes Update History

Revision	Date	Description
12.26.6000	December 31, 2019	Initial release of this Release Notes version, This version introduces Changes and New Features and Bug Fixes.

Overview

Firmware which is added at the time of manufacturing, is used to run user programs on the device and can be thought of as the software that allows hardware to run. Embedded firmware is used to control the functions of various hardware devices and systems, much like a computer's operating system (OS) controls the function of software applications. Firmware may be written into read-only memory (ROM), erasable programmable read-only memory (EPROM) or flash memory.

Firmware Download

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Document Revision History

A list of the changes made to this document are provided in Document Revision History.

1 Firmware Compatible Products

These are the release notes for the ConnectX®-4 adapters firmware Rev 12.26.6000. This firmware supports the following protocols:

- InfiniBand - SDR, QDR, FDR10, FDR, EDR
- Ethernet - 1GbE, 10GbE, 25GbE, 40GbE, 50GbE, 56GbE[1], 100GbE
- PCI Express 3.0, supporting backwards compatibility for v2.0 and v1.1

[1]. 56GbE 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.

1.1 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.

1.1.1 Validated and Supported QDR 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

1.1.2 Validated and Supported FDR10 Cables

Speed	Cable OPN #	Description
FDR10	MC2206128-004	Mellanox Passive Copper Cable VPI UP TO 40GB/S QSFP 4M
FDR10	MC2206128-005	Mellanox Passive Copper Cable VPI UP TO 40GB/S QSFP 5M
FDR10	MC2206130-001	Mellanox Passive Copper Cable VPI UP TO 40GB/S QSFP 1M
FDR10	MC2206130-002	Mellanox Passive Copper Cable VPI UP TO 40GB/S QSFP 2M
FDR10	MC2206130-003	Mellanox Passive Copper Cable VPI UP TO 40GB/S QSFP 3M
FDR10	MC2206130-00A	Mellanox Passive Copper Cable VPI UP TO 40GB/S QSFP 0.5M
FDR10	MC2206310-XXX	Mellanox Active Fiber Cable IB QDR/FDR10 40GB/S QSFP from 3M up to 100M

Speed	Cable OPN #	Description
FDR10	MFS4R12CB-XXX	Mellanox Active Fiber Cable VPI UP TO 40GB/S QSFP from 3M up to 100M

1.1.3 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	MC2207130-001	Mellanox® Passive Copper Cable, VPI, up to 56Gb/s, QSFP, 1m
FDR	MC2207130-00A	Mellanox® Passive Copper Cable, VPI, up to 56Gb/s, QSFP, 0.5m
FDR	MC2207310-003	Mellanox® Active Fiber Cable, VPI, up to 56Gb/s, QSFP, 3m
FDR	MC2207310-010	Mellanox® Active Fiber Cable, VPI, up to 56Gb/s, QSFP, 10m
FDR	MC2207310-015	Mellanox® Active Fiber Cable, VPI, up to 56Gb/s, QSFP, 15m
FDR	MC2207310-100	Mellanox® Active Fiber Cable, VPI, up to 56Gb/s, QSFP, 100m
FDR	MC2207312-XXX	Mellanox® Active Fiber Cable, VPI, up to 56Gb/s, QSFP, up to 100m
FDR	MC220731V-XXX	Mellanox® Active Fiber cable, VPI, up to 56Gb/s, QSFP, up to 100m
FDR	MC2207411-SR4L	Mellanox® Optical Module, VPI, up to 56Gb/s, QSFP, MPO, 850nm, up to 30m

1.1.4 Validated and Supported EDR / 100Gb/s Cables

Speed	Cable OPN #	Description
EDR	MCP1600-E001	Mellanox Passive Copper Cable VPI 100Gb/s QSFP LSZH 1M
EDR	MCP1600-E002	Mellanox Passive Copper Cable VPI 100Gb/s QSFP LSZH 2M
EDR	MCP1600-E003	Mellanox Passive Copper Cable VPI 100GB/S QSFP LSZH 3M
EDR	MCP1600-E004A26	Mellanox® Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 4m, Blue, 26AWG
EDR	MCP1600-E005	Mellanox Passive Copper Cable VPI 100GB/S QSFP LSZH 5M
EDR	MCP1600-E00A	Mellanox Passive Copper Cable VPI 100Gb/s QSFP LSZH 0.5M
EDR	MCP1600-E01A	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
EDR	MCP1OPT-E002	Mellanox® Passive Copper cable, VPI, up to 100Gb/s, QSFP, LSZH, 2m
EDR	MFA1A00-E005	Mellanox Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 5m
EDR	MFA1A00-E006	Mellanox Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 6m
EDR	MFA1A00-E010	Mellanox Active Fiber Cable, VPI, up to 100Gb/s, QSFP, 10m
EDR	MFA1A00-E015	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

Speed	Cable OPN #	Description
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
EDR	MMA1B00-E100	Mellanox® Transceiver, IB EDR, up to 100Gb/s, QSFP28, MPO, 850nm, up to 100m
EDR	MMA1L30-CM	Mellanox® optical module, 100Gb/s, QSFP28, LC-LC, 1310nm, CWDM4, up to 2km

1.1.5 Validated and Supported HDR / 200Gb/s Cables

Speed	Cable OPN #	Description
HDR	MCP1650-H001E30	Mellanox® Passive Copper cable, IB HDR, up to 200Gb/s, QSFP28, PVC, 1m, white pultab, 30AWG
HDR	MCP1650-H002E26	Mellanox Passive Copper Cable, IB HDR, up to 200GB/S, QSFP56, LSZH, 2M, black pultab, 26AWG
HDR	MCP1650-H003E26	Mellanox® Passive Copper cable, IB HDR, up to 200Gb/s, QSFP56, LSZH, 3m, black pulltab, 26AWG
HDR	MCP1650-H00AE30	Mellanox Passive Copper Cable, IB HDR, up to 200Gb/s, QSFP56, LSZH, 0.5M, black pultab, 30AWG
HDR	MCP1650-H01AE30	Mellanox® Passive Copper cable, IB HDR, up to 200Gb/s, QSFP28, PVC, 1.5m, white pultab, 30AWG
HDR	MCP1650-H01AE30	Mellanox Passive Copper Cable, IB HDR, up to 200Gb/s, QSFP56, LSZH, 1.5M, black pultab, 30AWG
HDR	MCP1650-H02AE26	Mellanox® Passive Copper cable, IB HDR, up to 200Gb/s, QSFP28, PVC, 2.5m, white pultab, 26AWG

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Speed	Cable OPN #	Description
HDR	MCP7H50-H003R26	Mellanox® passive copper hybrid cable, IB HDR 200Gb/s to 2x100Gb/s, QSFP56 to 2xQSFP56, LSZH, colored, 3m, 26AWG
HDR	MCP7H50-H01AR30	Mellanox® passive copper hybrid cable, IB HDR 200Gb/s to 2x100Gb/s, QSFP56 to 2xQSFP56, LSZH, colored, 1.5m, 30AWG

⚠ HDR links raise with RS-FEC.

1.1.6 Validated and Supported 1GbE Cables

Speed	Cable OPN #	Description
1GB/S	MC3208411-T	Mellanox® module, ETH 1GbE, 1Gb/s, SFP, Base-T, up to 100m

1.1.7 Validated and Supported 10GbE Cables

Speed	Cable OPN #	Description
10GbE	1-2053783-2	SFP-H10GB-SU3M
10GbE	44X1371-N31295E	10G Amphenol Copper 7m cable
10GbE	BN-QS-SP-CBL-5M	40G QSFP+ to 4xSFP+ DAC Breakout Direct Attach Cable 5m
10GbE	BN-QS-SP-CBL-5M	40G QSFP+ to 4xSFP+ DAC Breakout Direct Attach Cable 5m
10GbE	CAB-SFP-SFP-1M	Arista 10GBASE-CR SFP+ Cable 1 Meter
10GbE	CAB-SFP-SFP-3M	Arista 10GBASE-CR SFP+ Cable 3 Meter
10GbE	CAB-SFP-SFP-3M	Arista Compatible 10G SFP+ Passive Cable 3m
10GbE	CAB-SFP-SFP-5M	Arista 10GBASE-CR SFP+ Cable 5 Meter
10GbE	FTLX1471D3BCL-ME	10GBASE-LR SFP+ 1310nm 10km DOM Transceiver Module

Speed	Cable OPN #	Description
10GbE	L45593-D178-B50	QSFP-4SFP10G-CU5M
10GbE	SFP-10GB-SR	Cisco SFP+ 10GB SR optic module
10GbE	MC2309124-004	Mellanox Passive Copper Cable ETH 10GBE 10GB/S QSFP TO SFP+ 4M
10GbE	MC2309124-005	Mellanox Passive Copper Cable ETH 10GBE 10GB/S QSFP TO SFP+ 5M
10GbE	MC2309130-001	Mellanox Passive Copper Cable ETH 10GBE 10GB/S QSFP TO SFP+ 1M
10GbE	MC2309130-002	Mellanox Passive Copper Cable ETH 10GBE 10GB/S QSFP TO SFP+ 2M
10GbE	MC2309130-003	Mellanox Passive Copper Cable ETH 10GBE 10GB/S QSFP TO SFP+ 3M
10GbE	MC2309130-00A	Mellanox Passive Copper Cable ETH 10GBE 10GB/S QSFP TO SFP+ 0.5M
10GbE	MC2609125-004	Mellanox Passive Copper Hybrid Cable ETH 40GbE TO 4X10GBE QSFP TO 4X SFP+ 4M
10GbE	MC2609125-005	Mellanox Passive Copper Hybrid Cable ETH 40GbE TO 4X10GBE QSFP TO 4X SFP+ 5M
10GbE	MC2609130-001	Mellanox Passive Copper Hybrid Cable ETH 40GbE TO 4X10GBE QSFP TO 4X SFP+ 1M
10GbE	MC2609130-002	Mellanox Passive Copper Hybrid Cable ETH 40GbE TO 4X10GBE QSFP TO 4X SFP+ 2M
10GbE	MC2609130-003	Mellanox Passive Copper Hybrid Cable ETH 40GbE TO 4X10GBE QSFP TO 4X SFP+ 3M

Speed	Cable OPN #	Description
10GbE	MC2609130-0A1	Mellanox Passive Copper Hybrid Cable ETH 40GbE TO 4X10GBE QSFP TO 4X SFP+ 1.5M
10GbE	MC3309124-004	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 4M
10GbE	MC3309124-005	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 5M
10GbE	MC3309124-006	Mellanox® Passive Copper Cable, ETH 10GbE, 10Gb/s, SFP+, 6m
10GbE	MC3309124-007	Mellanox® Passive Copper Cable, ETH 10GbE, 10Gb/s, SFP+, 7m
10GbE	MC3309130-001	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 1M
10GbE	MC3309130-002	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 2M
10GbE	MC3309130-003	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 3M
10GbE	MC3309130-004	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 4M
10GbE	MC3309130-005	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 5M
10GbE	MC3309130-006	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 6M
10GbE	MC3309130-007	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 7M
10GbE	MC3309130-00A	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 0.5M
10GbE	MC3309130-0A1	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 1.5M
10GbE	MC3309130-0A2	Mellanox Passive Copper Cable ETH 10GBE 10GB/S SFP+ 2.5M

Speed	Cable OPN #	Description
10GbE	SFP-10G-SR	Cisco 10GBASE-SR SFP+ transceiver module for MMF, 850-nm wavelength, LC duplex connector
10GbE	SFP-H10GB-CU1M	Cisco 1-m 10G SFP+ Twinax cable assembly, passive
10GbE	SFP-H10GB-CU3M	Cisco 3-m 10G SFP+ Twinax cable assembly, passive
10GbE	SFP-H10GB-CU5M	Cisco 5-m 10G SFP+ Twinax cable assembly, passive
10GbE	1-2053783-3	038-003-697, QSFP/QSFP, 100 OHM

1.1.8 Validated and Supported 25GbE Cables

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

Speed	Cable OPN #	Description
25GbE	MCP7F00-A001	Mellanox Passive Copper Hybrid cable ETH 100GbE to 4X25GBS QSFP28 to 4XSFP28 1M
25GbE	MCP7F00-A002	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 4X25GBS QSFP28 TO 4XSFP28 2M
25GbE	MCP7F00-A003	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 4X25GBS QSFP28 TO 4XSFP28 3M
25GbE	MCP7F00-A003-AM	Mellanox® passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 3M 30AWG
25GbE	MCP7F00-A005AM	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 4X25GBS QSFP28 to 4XSFP28 5M
25GbE	MCP7F00-A01A	Mellanox Passive Copper Hybrid Cable ETH 100GbE to 4X25GBS QSFP28 to 4XSFP28 1.5M
25GbE	MCP7F00-A02A	Mellanox Passive Copper Hybrid Cable ETH 100GbE to 4X25GBS QSFP28 to 4XSFP28 2.5M

Speed	Cable OPN #	Description
25GbE	MFM1T02A-SR-P	Mellanox® Optical Module ETH 10GbE 10GB/S SFP+ LC-LC 850NM SR up to 300M
25GbE	SFP-H25G-CU1M	25GBASE-CR1 Copper Cable 1-meter
25GbE	SFP-H25G-CU2M	25GBASE-CR1 Copper Cable 2-meter

1.1.9 Validated and Supported 40GbE Cables

Speed	Cable OPN #	Description
40GbE	QAOC-40G4F1A25-C	CISCO-DELTA 25m 40GbE AOC
40GbE	AFBR-79EBPZ-CS2	QSFP-40G-SR-BD
40GbE	BN-QS-QS-CBL-5M	40G QSFP+ DAC Direct Attach Cable 5m
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
40GbE	MC2210126-004	Mellanox® Passive Copper Cable, ETH 40GbE, 40GbE, QSFP, 4m
40GbE	MC2210126-005	Mellanox® Passive Copper Cable, ETH 40GbE, 40GbE, QSFP, 5m
40GbE	MC2210128-003	Mellanox Passive Copper Cable ETH 40GbE 40GbE QSFP 3M
40GbE	MC2210130-001	Mellanox Passive Copper Cable ETH 40GbE 40GbE QSFP 1M
40GbE	MC2210130-002	Mellanox Passive Copper Cable ETH 40GbE 40GbE QSFP 2M
40GbE	MC2210130-00A	Mellanox® Passive Copper Cable, ETH 40GbE, 40GbE, QSFP, 0.5m

Speed	Cable OPN #	Description
40GbE	MC2210130-00B	Mellanox® Passive Copper Cable, ETH 40GbE, 40GbE, QSFP, 0.75m
40GbE	MC2210310-XXX	Mellanox Active Fiber Cable ETH 40GbE 40GbE QSFP from 3M up to 100M
40GbE	MC2210411-SR4	Mellanox Optical Module 40GbE QSFP MPO 850NM UP TO 100M
40GbE	MC2210411-SR4E	Mellanox Optical Module 40GbE QSFP MPO 850NM UP TO 300M
40GbE	MC2210411-SR4L	Mellanox Optical Module 40GbE QSFP MPO 850NM UP TO 30M
40GbE	MC2210511-LR4	Mellanox® optical module, IB FDR10, 40GbE, QSFP, LC-LC, 1310nm, LR4 up to 10km
40GbE	QSFP-40G-SR-BD	Cisco 40GBASE-SR-BiDi, duplex MMF
40GbE	QSFP-40G-SR4	Cisco 40GBASE-SR4, 4 lanes, 850 nm MMF
40GbE	QSFP-H40G-ACU10M	Cisco 40GBASE-CR4 QSFP direct-attach copper cable, 10-meter, active
40GbE	QSFP-H40G-AOC10M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 10-meter

1.1.10 Validated and Supported 50GbE Cables

Speed	Cable OPN #	Description
50GbE	MCP7H00-G001	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 2X50GBS QSFP28 TO 2XQSFP28 1M
50GbE	MCP7H00-G002	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 2X50GBS QSFP28 TO 2XQSFP28 2M

Speed	Cable OPN #	Description
50GbE	MCP7H00-G003	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 2X50GBS QSFP28 TO 2XQSFP28 3M
50GbE	MCP7H00-G01A	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 2X50GBS QSFP28 TO 2XQSFP28 1.5M
50GbE	MCP7H00-G02A	Mellanox Passive Copper Hybrid Cable ETH 100GbE TO 2X50GBS QSFP28 TO 2XQSFP28 2.5M

1.1.11 Validated and Supported 100GbE Cables

Speed	Cable OPN #	Description
100GbE	10137498-2005LF	HPE 100GbE 2m copper cable
100GbE	10137498-2010LF	HPE 100GbE 4m copper cable
100GbE	AFBR-89CDDZ	QSFP28 Pluggable, Parallel Fiber-Optics Module 100 Gigabit Ethernet 850nm SR4, MMF, MPO Connector
100GbE	CAB-Q-Q-100GbE-3M	Passive 3 meter , QSFP+ to QSFP+ QSFP100 TWINAX 103.125Gbps-CR4
100GbE	FCBN425QE1C10-C1	100GbE Quadwire® QSFP28 Active Optical Cable 10M
100GbE	MCP1600-C001	Mellanox Passive Copper Cable ETH 100GbE 100GBS QSFP LSZH 1M
100GbE	MCP1600-C002	Mellanox Passive Copper Cable ETH 100GbE 100GBS QSFP LSZH 2M
100GbE	MCP1600-C003	Mellanox Passive Copper Cable ETH 100GbE 100GBS QSFP LSZH 3M
100GbE	MCP1600-C005AM	Mellanox® Passive Copper cable, ETH 100GbE, 100GbE, QSFP, 5m, 26AWG

Speed	Cable OPN #	Description
100GbE	MCP1600-C005E26L	Mellanox® Passive Copper cable, ETH 100GbE, 100GbE, QSFP28, 5m, Black, 26AWG, CA-L
100GbE	MCP1600-C00A	Mellanox Passive Copper Cable ETH 100GbE 100GBS QSFP LSZH 0.5M
100GbE	MCP1600-C01A	Mellanox® Passive Copper cable, ETH 100GbE, 100GbE, QSFP, LSZH, 1.5m
100GbE	MCP1600-C02A	Mellanox® Passive Copper cable, ETH 100GbE, 100GbE, QSFP, LSZH, 2.5m
100GbE	MCP1600-C03A	Mellanox® Passive Copper cable, ETH 100GbE, 100GbE, QSFP, PVC, 3.5m 26AWG
100GbE	MCP7F00-A005R26L	Mellanox® passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 5m, Colored, 26AWG, CA-L
100GbE	MCP7H00-G005R26L	Mellanox® passive copper hybrid cable, ETH 100GbE to 2x50GbE, QSFP28 to 2xQSFP28, 5m, Colored, 26AWG, CA-L
100GbE	MFA1A00-C003	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 3m
100GbE	MFA1A00-C005	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 5m
100GbE	MFA1A00-C010	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 10m
100GbE	MFA1A00-C015	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 15m
100GbE	MFA1A00-C020	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 20m
100GbE	MFA1A00-C030	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 30m

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Speed	Cable OPN #	Description
100GbE	MFA1A00-C050	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 50m
100GbE	MFA1A00-C100	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 100m
100GbE	MFA7A20-C020	Mellanox® active fiber hybrid solution, ETH 100GbE to 2x50GbE, QSFP28 to 2xQSFP28, 20m
100GbE	MFS1200-C005	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 5m
100GbE	MFS1200-C010	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 10m
100GbE	MFS1200-C015	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 15m
100GbE	MFS1200-C020	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 20m
100GbE	MFS1200-C030	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 30m
100GbE	MFS1200-C050	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 50m
100GbE	MFS1200-C100	Mellanox® Active Fiber Cable, ETH 100GbE, 100GbE, QSFP, LSZH, 100m
100GbE	MMA1B00-C100_B	Mellanox® transceiver, up to 100GbE, QSFP28, MPO, 850nm, up to 100m OM3
100GbE	MMA1B00-C100D	Mellanox® Transceiver, 100GbE, QSFP28, MPO, 850nm, up to 100m
100GbE	MMA1L30-CM	Mellanox® optical module, 100GbE, 100Gb/s, QSFP28, LC-LC, 1310nm, CWDM4, up to 2km

Speed	Cable OPN #	Description
100GbE	MMS1C00-C500	Mellanox® transceiver, 100GbE, QSFP28, MPO, 1550nm PSM4, up to 2km
100GbE	MMS1C00-C500	Mellanox® transceiver, 100GbE, QSFP28, MPO, 1550nm PSM4, up to 2km
100GbE	MMS1C00-CM	Mellanox® transceiver, 100GbE, QSFP28, MPO, 1550nm PSM4, up to 2km for internal use only
100GbE	MMS1C00-CM	Mellanox® transceiver, 100GbE, QSFP28, MPO, 1550nm PSM4, up to 2km
100GbE	MMS1C10-CM	Mellanox® active optical module, 100GbE, QSFP, MPO, 1310nm, PSM4
100GbE	MMS1C10-CM	Mellanox® active optical module, 100Gb/s, QSFP, MPO, 1310nm, PSM4

1.1.12 Validated and Supported 200GbE Cables

Speed	Cable OPN #	Description
200GbE	MCP1650-V001E30	Mellanox® Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 1m, black pultab, 30AWG
200GbE	MCP1650-V002E26	Mellanox® Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 2m, black pultab, 26AWG
200GbE	MCP1650-V003E26	Mellanox® Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 3m, black pultab, 26AWG
200GbE	MCP1650-V00AE30	Mellanox® Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 0.5m, black pultab, 30AWG
200GbE	MCP1650-V02AE26	Mellanox® Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 2.5m, black pultab, 26AWG
200GbE	MCP7H50-V003R26	Mellanox® Passive Copper hybrid cable, 200GbE 200Gb/s to 2x100Gb/s, QSFP56 to 2xQSFP56, colored, 3m, 26AWG

1.2 Tested Switches

1.2.1 Tested EDR / 100Gb/s Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
EDR	Switch-IB	MSB7790-XXX	36-port Unmanaged EDR 100Gb/s InfiniBand Switch Systems	Mellanox
EDR	Switch-IB	MSB7700-XXX	36-port Managed EDR 100Gb/s InfiniBand Switch Systems	Mellanox
EDR	Switch-IB 2	MSB7800-XXX	36-port Managed EDR 100Gb/s InfiniBand Switch Systems	Mellanox

1.2.2 Tested 10/40GbE Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
10GbE	N/A	5548UP	32x 10GbE SFP+ Switch System	Cisco
10/40GbE	N/A	7050Q	16 x 40GbE QSFP+ Switch System	Arista
10/40GbE	N/A	7050S	48x 10GbE SFP+ and 4 x 40GbE QSFP+ Switch System	Arista
10/40GbE	N/A	G8264	48x 10GbE SFP+ and 4 x 40GbE QSFP+ Switch System	Lenovo
10/40GbE	N/A	QFX3500	48x 10GbE SFP+ and 4 x 40GbE QSFP+ Switch System	Juniper
10/40GbE	N/A	S4810P-AC	48x 10GbE SFP+ and 4 x 40GbE QSFP+ Switch System	Force10
10/40GbE	N/A	3064	48x 10GbE SFP+ and 4 x 40GbE QSFP+ Switch System	Cisco
10/40GbE	N/A	8164F	48x 10GbE SFP+ and 2 x 40GbE QSFP+ Switch System	Dell

Speed	Switch Silicon	OPN # / Name	Description	Vendor
10/40GbE	N/A	S5000	48x 10GbE SFP+ and 4 x 40GbE QSFP+ Switch System	Dell
10/40GbE	N/A	3132Q	4x 10GbE SFP+ and 32 x 40GbE QSFP+ Switch System	Cisco
40GbE	N/A	7050QX	32x 40GbE QSFP+ Switch System	Arista
40GbE	N/A	G8316	16x 40GbE QSFP+ Switch System	Lenovo
40GbE	N/A	S6000	32x 40GbE QSFP+ Switch System	Dell

1.2.3 Tested 100GbE Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
100GbE	Spectrum	MSN2410-XXXX	48-port 25GbE + 8-port 100GbE Open Ethernet Switch System	Mellanox
100GbE	Spectrum	MSN2700-XXXX	32-port Non-blocking 100GbE Open Ethernet Switch System	Mellanox
100GbE	Spectrum	MSN2740-XXXX	32-port Non-blocking 100GbE Open Ethernet Switch System	Mellanox
100GbE	N/A	QFX5200-32C-32	32-port 100GbE Ethernet Switch System	Juniper
100GbE	N/A	S6820-56HF	48 SFP+ + 8 QSFP Ports 100GbE Switch Ethernet	H3C
100GbE	N/A	CE6860-1-48S8CQ-EI	Huawei 100GbE Ethernet switch	Huawei
100GbE	N/A	7060CX-32S	32-port 100GbE Ethernet Switch System	Arista

Speed	Switch Silicon	OPN # / Name	Description	Vendor
100GbE	N/A	3232C	32-port 100GbE Ethernet Switch System	Cisco
100GbE	N/A	N9K-C9236C	36-port 100GbE Ethernet Switch System	Cisco
100GbE	N/A	93180YC-EX	48-port 25GbE + 6-port 100GbE Ethernet Switch System	Cisco
100GbE	N/A	T7032-IX7	32-port 100GbE Ethernet Switch System	Quanta

1.3 Tools, Switch Firmware and Driver Software

The following are the drivers' software, tools, switch/HCA firmware versions tested that you can upgrade from or downgrade to when using this firmware version:

	Supported Version
MLNX_OFED	4.7-3.2.9.0 / 4.7-1.0.0.1 / 4.6-1.0.1.1
MLNX_EN (MLNX_OFED based code)	4.7-3.2.9.0 / 4.7-1.0.0.1 / 4.6-1.0.1.1
WinOF-2	2.30 / 2.20 / 2.10
MFT	4.13.3 / 4.13.0 / 4.12.0
MLNX-OS	3.8.2102
Onyx	3.8.2102
ConnectX-4 Firmware	12.26.1040 / 12.25.1020
SwitchX-IB™ Firmware	11.2000.2626
SwitchX-IB 2 Firmware	15.2000.2626

	Supported Version
Linux Inbox Drivers	• RH7.6 • Ubuntu 16.04.05
Windows Inbox Drivers	• Windows 2012 • Windows 2012 R2 • Windows 2016

1.4 Supported FlexBoot, UEFI

> ⚠️ Please be aware that not all firmware binaries contain FlexBoot or UEFI, support may vary between cards. For further information see Supported Devices.

This firmware version is compiled with the following expansion ROMs and versions:

Expansion ROM	Supported Version
FlexBoot	3.5.805
UEFI	14.19.17

1.5 PRM Revision Compatibility

This firmware version complies with the following Programmer's Reference Manual:

• Mellanox Adapters Programmer's Reference Manual (PRM), Rev 0.47 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

2.1 Changes and New Feature in this Firmware Version

Feature/Change	Description
Rev. 12.26.6000	
ECN	[Alpha] ECN is now automatically copied from the inner header to the outer header, unless defined otherwise in the SW steering. To disable this feature, need to write to the NV_SW_OFFLOAD_CONFIG file.
Link Down Counter	The `eth_link_down_counter` now counts logical link downs as well.
Bug Fixes	See Bug Fixes History.

2.2 Unsupported Features and Commands

2.2.1 Unsupported Features

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

- The following service types:
    - SyncUMR
    - Mellanox transport
    - RAW IPv6
- INT-A not supported for EQs only MSI-X
- PCI VPD write flow (RO flow supported)
- Streaming Receive Queue (STRQ) and collapsed CQ
- Subnet Manager (SM) on VFs
- RoCE LAG in Multi-Host/Socket-Direct

- DC in Multi-Host, SR-IOV, and Ethernet (RoCE)
- RoCE LAG for VFs
- Mutlihost Ethernet

2.2.2 Unsupported Commands

- QUERY_MAD_DEMUX
- SET_MAD_DEMUX
- CREATE_RQ - MEMORY_RQ_RMP
- MODIFY_LAG_ASYNC_EVENT

3 Known Issues

The following table describes known issues in this firmware release and possible workarounds.For a list of old firmware Know Issues, please see ConnectX-4 Firmware Archived Known Issues file.

Ethernet Rate Limit per VF in RoCE Mode Limitations

Dual Port Device				Single Port Device	
w/o LAG (TOTAL_VFS>32)		With LAG (TOTAL_VFS<32)		w/o LAG	
w/o QoS	Full QoS	w/o QoS	Full QoS	w/o QoS	Full QoS
127	45	32	20	127	100

Ethernet Rate Limit per VF in InfiniBand Mode Limitations

Dual Port Device		Single Port Device	
w/o LAG		w/o LAG	
w/o QoS	Full QoS	w/o QoS	Full QoS
127	26	127	55

Known Issues History

Internal Ref.	Issue
1938614	**Description:** Due to the string DB not being updated after Live-Patch, the tracer cannot function after Live-Patch.
	Workaround: N/A
	Keywords: Live-Patch, LFWP, mlxfwreset, strings
	Discovered in Version: 12.26.1040
1840289	**Description:** Since Packet Pacing enforce max_tc value is "1", features that require multiple TCs will not be active when this mode is available.
	Workaround: N/A
	Keywords: Packet Pacing

Internal Ref.	Issue
	Discovered in Version: 12.26.1040
1796628	**Description:** Due to performance considerations, unicast loopback traffic will go through the NIC SX tables, and multicast loopback traffic will skip the NIC SX tables.
	Workaround: N/A
	Keywords: Performance, unicast loopback traffic, multicast loopback traffic
	Discovered in Version: 12.26.1040
1754253	**Description:** Firmware downgrade followed by mlxfwreset/mstfwreset action may cause sideband management connection issues.
	Workaround: Reset the BMC
	Keywords: mlxfwreset/mstfwreset
	Discovered in Version: 12.25.1020
1699214	**Description:** NODNIC VF is partially tested. It is fully tested only in ConnectX-5 adapter cards.
	Workaround: N/A
	Keywords: NODNIC VF
	Discovered in Version: 12.25.1020
1689186	**Description:** Changing priority to TC map during traffic might cause packet drops.
	Workaround: N/A
	Keywords: QoS
	Discovered in Version: 12.25.1020

Internal Ref.	Issue
1604699	**Description:** Ethernet RFC 2819 counter ether_stats_oversize_pkts and Ethernet IEEE 802.3 counter a_frame_too_long_errors share the same resource. Clearing each of them will affect the other.
	Workaround: N/A
	Keywords: Counters
	Discovered in Version: 12.25.1020
-	**Description:** In Ethernet mode, at 10/40GbE speeds, only NO-FEC in Force mode is supported. Other user configurations are overridden.
	Workaround: N/A
	Keywords: Ethernet, 10GbE, 40GbE, RS-FEC
	Discovered in Version: 12.25.1020
1498399	**Description:** If the XRC switches between SRQ/RMPs while there is an outstanding ODP on the responder XRC QP, a CQE with an error might be generated (that is not a PFAULT abort).
	Workaround: N/A
	Keywords: XRC SRQ/RMP ODP
	Discovered in Version: 12.25.1020
1546401	**Description:** vport_tc and para_vport_tc are not supported in this version.
	Workaround: N/A
	Keywords: SR-IOV vport_tc and para_vport_tc
	Discovered in Version: 12.24.1000

Internal Ref.	Issue
1546492	**Description:** Executing the update_lid command while the IB port sniffer utility is active can stop the utility.
	Workaround: N/A
	Keywords: IB Sniffer
	Discovered in Version: 12.24.1000
1537898	**Description:** Initializing a function while the IB port sniffer utility is active can stop the utility.
	Workaround: N/A
	Keywords: IB Sniffer
	Discovered in Version: 12.24.1000
1332714	**Description:** The maximum "read" size of MTRC_STDB is limited to 272 Bytes.
	Workaround: Set the MTRC_STDB.read_size to the maximum value of 0x110=272 Bytes
	Keywords: Access register, MTRC_STDB, tracer to dmesg, fwtrace to dmesg
	Discovered in Version: 12.23.1020
1408994	**Description:** FTE with both forward (FWD) and encapsulation (ENCAP) actions is not supported in the SX NIC Flow Table.
	Workaround: N/A
	Keywords: SX NIC Flow Table
	Discovered in Version: 12.23.1020

Internal Ref.	Issue

1350794	**Description:** Encapsulation / Decapsulation support in steering has the following limitations:
	
	• Encapsulation / Decapsulation can be open on the FDB only if all VFs are non active.
	• Encapsulation / Decapsulation supports single mode only: FDB / NIC. Opening tables of both types is not supported.
	• Encapsulation / Decapsulation per device support:
	
	<pre> NIC FDB
	ConnectX-4 encap NO YES non-MH
	              decap NO NO
	ConnectX-4 Lx encap NO YES non-MH
	              decap NO YES
	ConnectX-5 encap YES YES
	              decap YES YES</pre>

	Workaround: N/A
	Keywords: Steering Encapsulation / Decapsulation
	Discovered in Version: 12.23.1020
1027553	**Description:** While using e-switch vport sVLAN stripping, the RX steering values on the sVLAN might not be accurate.
	Workaround: N/A
	Keywords: e-sw vport sVLAN stripping, RX steering
	Discovered in Version: 12.24.1000
1799917	**Description:** Untagged CVLAN packets in the Steering Flow Tables do not match the SVLAN tagged packets.
	Workaround: N/A
	Keywords: Steering Flow Tables, CVLAN/SVLAN packets

Internal Ref.	Issue
	Discovered in Version: 12.23.1020
1355883	**Description:** Running the QUERY_VPORT_COUNTER command with clear bit results in discard counters being reset.
	Workaround: N/A
	Keywords: Discard counters
	Discovered in Version: 12.22.1002
1277762	**Description:** An Ethernet multicast loopback packet is not counted (even if it is not a local loopback packet) when running the nic_receive_steering_discard command.
	Workaround: N/A
	Keywords: Ethernet multicast loopback packet
	Discovered in Version: 12.22.1002
1114610	**Description:** During DC CNAK stress tests, DC CNAK timeout (CNAK drops) might occur.
	Workaround: N/A
	Keywords: DC CNAK
	Discovered in Version: 12.22.1002
1047184	**Description:** RDMA resq_local_length_error and resp_remote_invalid_request counters do not function properly.
	Workaround: N/A
	Keywords: RDMA counters

Internal Ref.	Issue
	Discovered in Version: 12.21.1000
1168594	**Description:** RoCE Dual Port Mode (a.k.a Multi-Port vHCA: MPV) is not supported in Multi-Host setups.
	Workaround: N/A
	Keywords: Multi-Port vHCA, Multi-Host
	Discovered in Version: 12.21.1000
1072337	**Description:** If a packet is modified in e-sw flow steering, the SX sniffer Flow Table (of the VF) will see the sniffed packet after the modification.
	Workaround: N/A
	Keywords: SX sniffer Flow Table
	Discovered in Version: 12.21.1000

https://www.ikea.com/us/en/customer-service/product-support/app-gateway/getting-started-and-how-to-use-pubce3e6297

4 Bug Fixes History

The table below lists the bugs fixed in this release. For a list of old firmware Bug Fixes, please see ConnectX-4 Firmware Archived Bug Fixes file.

Internal Ref.	Issue
1973826	**Description:** Fixed an issue that cause the firmware to hang when an FLR occurred at the same time as the teardown. As a result, the teardown flow took a lock, and never released it because it was being aborted by an FLR.
	Keywords: FLR, teardown
	Discovered in Version: 12.26.1040
	Fixed in Release: 12.26.6000
1929850	**Description:** Creating an NVMoF offloaded target while running the LFWP flow may cause the device to become unstable.
	Keywords: Live Firmware Patch, LFWP, NVME
	Discovered in Version: 12.26.1040
	Fixed in Release: 12.26.4010
1778343	**Description:** Fixed an issue that caused IPoIB not to function when there were DC CNAK QPs active.
	Keywords: IPoIB
	Discovered in Version: 12.25.1020
	Fixed in Release: 12.26.1040
1803791	**Description:** On rare occasions, when firmware coalesce Host stuck events occur, a async event might be delayed to be reported, and not be triggered until the next time the PCIe hangs on one of the hosts.
	Keywords: PCIe Error Notification
	Discovered in Version: 12.25.1020

Internal Ref.	Issue
	Fixed in Release: 12.26.1040
1824111	**Description:** Renamed the GMP Mellanox Vendor Specific External Capability mask enum from IsDiagnosticCountersSupported to IsDiagnosticDataSupported.
	Keywords: GMP Mellanox Vendor Specific External Capability mask DiagnosticData
	Discovered in Version: 12.25.1020
	Fixed in Release: 12.26.1040
1822787	**Description:** Fixed an issue that caused a function to misbehave when a PCIe TLP was set with a poisoned indication.
	Keywords: PCIe TLP
	Discovered in Version: 12.25.1020
	Fixed in Release: 12.26.1040
1771921	**Description:** Fixed an issue that prevented users with non-port owner privilege from using the "read DCBX access registry key" EGID_DCBX_APP/REGID_DCBX_PARAM.
	Keywords: DCBX
	Discovered in Version: 12.24.1000
	Fixed in Release: 12.25.1020
1615586	**Description:** Fixed a rare issue that caused the QP to falsely transition into the error state as a result of handling duplicate read/atomic request followed by memory key invalidation.
	Keywords: CQE
	Discovered in Version: 12.24.1000

Internal Ref.	Issue
	Fixed in Release: 12.25.1020
1678824	**Description:** Fixed an issue that prevented the user to enable the port after disabling it in the VF NODNIC.
	Keywords: VF NODNIC
	Discovered in Version: 12.24.1000
	Fixed in Release: 12.25.1020
1606289	**Description:** Enlarged the number of modify fields to 16 to avoid IPv6 header rewrite failure.
	Keywords: IPv6 header rewrite
	Discovered in Version: 12.24.1000
	Fixed in Release: 12.25.1020
1627973	**Description:** Fixed an issue that prevented IB QP counters for Acks/Responses from working as a results the NACK/OOS counters shown as zero.
	Keywords: IB QP counters for Acks/Responses
	Discovered in Version: 12.24.1000
	Fixed in Release: 12.25.1020
1501744	**Description:** Fixed a false signature error reported by the firmware during retransmissions.
	Keywords: False signature error
	Discovered in Version: 12.18.1000
	Fixed in Release: 12.24.1000

Internal Ref.	Issue
1547318	**Description:** Fixed an issue that prevented the system from counting multicast/broadcast traffic on the ETH unicast vport counter when the driver did not specify the MAC address in the FTE match criteria of the Flow Table Entry in the eswitch's FDB table.
	Keywords: Multicast/broadcast traffic
	Discovered in Version: 12.23.1020
	Fixed in Release: 12.24.1000
1284452/ 1282926	**Description:** Fixed an issue that caused the mlxconfig tool to present all possible expansion ROM images, instead of presenting only the existing images.
	Keywords: mlxconfig
	Discovered in Version: 12.22.1002
	Fixed in Release: 12.24.1000
1424873	**Description:** Modifying VMQoS rate limiter parameters during traffic might cause transmission failure.
	Keywords: VMQoS, rate limiter
	Discovered in Version: 12.22.1002
	Fixed in Release: 12.24.1000
1475993	**Description:** Aligned the default tuning type in PHY TEST MODE to the device protocol.
	Keywords: PHY
	Discovered in Version: 12.23.1020
	Fixed in Release: 12.24.1000

Internal Ref.	Issue
1403211	**Description:** When a device is operating in Safe Mode state, and the user issues the mlxfwreset command, the device might fail to come-up correctly after the reset. **Note:** Do not run mlxfwreset when operating in a Safe Mode state.
	Keywords: mlxfwreset
	Discovered in Version: 12.23.1020
	Fixed in Release: 12.24.1000
1431772	**Description:** Fixed an issue that caused the max_qp_retry_freq_exceeded counter (including a CQE with error syndrome 0x97, and the QP moving to error state) to be activated only after exceeding the NIC Vport context max_qp_retry_limit, and not when reaching it.
	Keywords: max_qp_retry_freq_exceeded
	Discovered in Version: 12.22.1002
	Fixed in Release: 12.24.1000
1295606	**Description:** Fixed an issue related to PCIe "Surprise link down" event reporting capability.
	Keywords: PCIe
	Discovered in Version: 12.22.1002
	Fixed in Release: 12.24.1000
1434863	**Description:** Fixed an issue that resulted in the link partner experiencing false active linkup when plugging in a base-T cable to a closed port.
	Keywords: Interfaces
	Discovered in Version: 12.22.1002

Internal Ref.	Issue
	Fixed in Release: 12.24.1000
1424873	**Description:** Modifying VMQoS rate limiter parameters during traffic might cause transmission failure.
	Keywords: VMQoS, rate limiter
	Discovered in Version: 12.22.1002
	Fixed in Release: 12.24.1000

5 PreBoot Drivers (FlexBoot/UEFI)

5.1 FlexBoot Changes and New Features

For further information, please refer to the [FlexBoot Release Notes](#).

5.2 UEFI Changes and Major New Features

For further information, please refer to the [UEFI Release Notes](#).

6 Supported Non-Volatile Configurations

Configuration	mlxconfig Parameter Name	Class	TLV ID
NV_MEMIC_CONF	MEMIC_BAR_SIZE	GLOBAL (0)	0x6
	MEMIC_SIZE_LIMIT		
NV_HOST_CHAINING_CO NF	HOST_CHAINING_MODE		0x8
	HOST_CHAINING_DESCRIPTOR S		
	HOST_CHAINING_TOTAL_BUFF ER_SIZE		
NV_FLEX_PARS_CONF	FLEX_PARSER_PROFILE_ENAB LE		0xe
	FLEX_IPV4_OVER_VXLAN_POR T		
NV_ROCE_1_5_CONF	ROCE_NEXT_PROTOCOL		0x10
NV_INTERNAL_RESOURC E_CONF	ESWITCH_HAIRPIN_DESCRIPTO RS		0x13
	ESWITCH_HAIRPIN_TOT_BUFF ER_SIZE		
NV_GLOBAL_PCI_CONF	NON_PREFETCHABLE_PF_BAR		0x80
	NUM_OF_VFS		
	SRIOV_EN		
	PF_LOG_BAR_SIZE		
	VF_LOG_BAR_SIZE		

Configuration	mlxconfig Parameter Name	Class	TLV ID
	NUM_PF_MSIX		
	NUM_VF_MSIX		
NV_TPT_CONF	INT_LOG_MAX_PAYLOAD_SIZE		0x82
NV_POWER_CONF	SW_RECOVERY_ON_ERRORS		0x88
	RESET_WITH_HOST_ON_ERRORS		
	ADVANCED_POWER_SETTINGS		
NV_SW_OFFLOAD_CONFIG	CQE_COMPRESSION		0x10a
	IP_OVER_VXLAN_EN		
	PCI_ATOMIC_MODE		
	LRO_LOG_TIMEOUT0		
	LRO_LOG_TIMEOUT1		
	LRO_LOG_TIMEOUT2		
	LRO_LOG_TIMEOUT3		
NV_IB_DC_CONF	LOG_DCR_HASH_TABLE_SIZE		0x190
	DCR_LIFO_SIZE		
NV_VPI_LINK_TYPE	LINK_TYPE	PHYSICAL_PORT (2)	0x12
NV_ROCE_CC	ROCE_CC_PRIO_MASK		0x107

Configuration	mlxconfig Parameter Name	Class	TLV ID
	ROCE_CC_ALGORITHM		
NV_ROCE_CC_ECN	CLAMP_TGT_RATE_AFTER_TIME_INC		0x108
	CLAMP_TGT_RATE		
	RPG_TIME_RESET		
	RPG_BYTE_RESET		
	RPG_THRESHOLD		
	RPG_MAX_RATE		
	RPG_AI_RATE		
	RPG_HAI_RATE		
	RPG_GD		
	RPG_MIN_DEC_FAC		
	RPG_MIN_RATE		
	RATE_TO_SET_ON_FIRST_CNP		
	DCE_TCP_G		
	DCE_TCP_RTT		
	RATE_REDUCE_MONITOR_PERIOD		
	INITIAL_ALPHA_VALUE		

Configuration	mlxconfig Parameter Name	Class	TLV ID
	MIN_TIME_BETWEEN_CNPS		
	CNP_802P_PRIO		
	CNP_DSCP		
NV_LLDP_NB_CONF	LLDP_NB_DCBX		0x10a
	LLDP_NB_RX_MODE		
	LLDP_NB_TX_MODE		
NV_LLDP_NB_DCBX	DCBX_IEEE		0x18e
	DCBX_CEE		
	DCBX_WILLING		
NV_KEEP_LINK_UP	KEEP_ETH_LINK_UP		0x190
	KEEP_IB_LINK_UP		
	KEEP_LINK_UP_ON_BOOT		
	KEEP_LINK_UP_ON_STANDBY		
NV_QOS_CONF	NUM_OF_VL		0x192
	NUM_OF_TC		
	NUM_OF_PFC		
NV_MPFS_CONF	DUP_MAC_ACTION		0x196

Configuration	mlxconfig Parameter Name	Class	TLV ID
	SRIOV_IB_ROUTING_MODE		
	IB_ROUTING_MODE		
NV_HCA_CONF	PCI_WR_ORDERING	HOST-FUNCTION (3)	0x112
	MULTI_PORT_VHCA_EN		
NV_EXTERNAL_PORT_CTRL	PORT_OWNER		0x192
	ALLOW_RD_COUNTERS		
	RENEG_ON_CHANGE		
	TRACER_ENABLE		
NV_ROM_BOOT_CONF2	IP_VER		0x195
	BOOT_UNDI_NETWORK_WAIT		
NV_ROM_UEFI_CONF	UEFI_HII_EN		0x196
NV_ROM_UEFI_DEBUG_LEVEL	BOOT_DBG_LOG		0x206
	UEFI_LOGS		
NV_ROM_BOOT_CONF1	BOOT_VLAN		0x221
	LEGACY_BOOT_PROTOCOL		
	BOOT_RETRY_CNT		
	BOOT_LACP_DIS		

Configuration	mlxconfig Parameter Name	Class	TLV ID
	BOOT_VLAN_EN		
NV_ROM_IB_BOOT_CONF	BOOT_PKEY		0x222
NV_PCI_CONF	ADVANCED_PCI_SETTINGS	HOST (7)	0x80
SAFE_MODE_CONF	SAFE_MODE_THRESHOLD		0x82
	SAFE_MODE_ENABLE		

7 Firmware Changes and New Feature History

⚠ This section includes history of changes and new feature of 3 major releases back. For older releases history, please refer to the relevant firmware versions.

Feature/Change	Description
Rev. 12.26.4012	
Globally Disable RoCE through MST	Enables the user to globally disable RoCE on init by writing to the access register NCFG_REG.
Zero-Touch RoCE (ZTR) Slow Start	Enabled Zero-Touch RoCE (ZTR) slow start capability for responder flows.
Resource Dump	Extracts and prints data segments generated by the firmware.
Bug Fixes	See [Bug Fixes History](#).
Rev. 12.26.1040	
ICMD and Diagnostic Counters	Enabled the firmware by using the ICMD commands to deal with diagnostic counters similar to cmdif. They can be called via the vsec space. The counters' values are returned only via the tracer. The ICMD Query Caps indicate support and expose the list of the supported counters.
User Context Object (DEVX)	This is a containerized sandbox per user, to access PRM command securely by using General Object commands, UMEM and UCTX contexts. The allowed functionalities of this capability depend on the user permissions. The following functionalities are still managed by the Kernel: • Resource cleaning • UCTX stamping • Blocking the physical address and IRQ from these UCTX
DEVX Support for Asynchronous Events	Added support for reporting the supported affiliated and unaffiliated asynchronous events to DEVX users through the command interface.
Zero-Touch-RoCE Counters	Zero-Touch-RoCE counters are now available to the user for debuggability purposes when using the Zero-Touch-RoCE feature.
Security Hardening Enhancements	This release contains important reliability improvements and security hardening enhancements. Mellanox recommends upgrading your device firmware to this release to improve the device firmware security and reliability.

Bug Fixes	See [Bug Fixes History](#).
Rev. 12.25.1020	
VSC Security	VSC security includes the mechanisms which will prevent a reasonable host from affecting other hosts from using VSC.
ODP support for SRQ & XRC	Added support for send opcode operations targeting a SRQ/RMP with the receive WQEs using ODP memory. In case the receive WQE receives an ODP, the device will generate ODP notifications (EQE) and PFAULT will abort CQEs. **Note:** It is recommended to prefetch the memory used by the receive WQEs to reduce ODP occurrence as these have significant latencies and will cause a performance degradation.
Auto-Sensing when using 25/10GbE Optical Modules	This new capability accelerates the network to auto-sense the port speed and use it when using a 25/10GbE optical module. Meaning, if the used module is 25GbE but the port is a 10GbE port, the speed used for that network will be 10GbE.
Package ID	Enabled Package ID configuration using server strap according OCP 3.0.
DPDK UIO	This capability provides a solution for improving user space drivers development, generic user space IO device services.
mlxconfig	Renamed the BOOT_RETRY_CNT1 parameter to BOOT_RETRY_CNT.
Reduced Firmware Upgrade Time	Reduced firmware upgrade time using mlxfwreset tool to ~3 seconds. Using this capability requires enabling PARTIAL_RESET_EN in mlxconfig and using MFT version 4.12.0 and up. The "PARTIAL" refers to not resetting the port modules (which is not mandatory for firmware upgrades). **Note:** Currently this capability only supports firmware upgrade and downgrades to firmware versions newer than XX.25.1020.
Bug Fixes	See [Bug Fixes History](#).
Rev. 12.24.1000	
Layer 3 Encapsulation	Added support for an additional layer (Layer 3) of packet processing at the hypervisor level that enables adding and removing protocol headers (e.g., the MAC address is removed during encapsulation, and added during decapsulation) for the encapsulated traffic.

e-switch Steering Rule	Enabled e-switch steering rule in the NIC without matching it with the Directional MACs (DMAC) protocol. Now the rule is only according to the MC/UC bit.
IB Sniffer Tool	The IB Sniffer utility provides the user the ability to capture the e- switch traffic directly to a hypervisor queue.
Transmission Histogram Counters	Added support for the transmission histogram counter set as part of the Ethernet extended group counters.
Events Generation by the Hardware upon Counter Incrementation	Enabled the hardware to generate an event upon counter incrementation, in order to reduce an overhead from the software from reading rarely updated counters such as error counters.
NODNIC Connectivity	Enables NOIDNIC connectivity to the network through the e-switch and not directly to the physical port.
QP and Mkey Values	Enabled setting the QP and the Mkey values by the software upon these resources creation.
PCIe Atomic	Enabled advanced PCIe atomic operations. The HCA will perform PCIe atomic operations as a requestor towards the host memory when receiving compatible atomic messages from the network, and according to the configuration of NV_SW_OFFLOAD_CONFIG pci_atomic_mode field and the PCI AtomicOp Requester Enable bit in the Device Control 2 register.
TIR Destination from the FDB	Enabled a single TIR destination from the FDB.
WRED	Changed the WRED default mode to OFF for Multi-Host adapter cards.
TX Steering Rule on in WQE Ethernet Segment	Added support for TX steering rule on flow_table_metadata in WQE Ethernet segment.
L3 Encapsulation/Decapsulation in the Reformat Context Allocation	Added L3 encapsulation/decapsulation support in the reformat context allocation. • L3 encapsulation removes L2 headers and adds generic L3 tunnel encapsulation. • L3 decapsulation removes the generic L3 tunnel decapsulation and L2 header.

Flow Steering Header Modification	Added support for flow steering header modification (header rewrite) for IPv4 TTL header for loopback traffic (VF-VF/VF-PF). **Note:** TTL modification for traffic from the network is currently not supported.
Teardown: Fast Mode	**[Developers only]** Moved the fast teardown HCA cap bit to offset 0x1c. 4:1.
Virtual Functions/QoS	Enabled Virtual Functions to read QPDPM/QPDP/QPTS.
Message vs. Payload based flow control QP Configuration	Added support for requester QP packet based on E2E credits mode. The new flow control supports HCA-to-switch RDMA traffic packet-based End-2-End.
Multi PCI RDMA IB	This capability enables the user to expose two PCI/IB devices per network port.
Steering	Enabled a single TIR destination from the FDB. **Note:** TTL modification in the FDB for traffic from the network is currently not supported.
Bug Fixes	See Bug Fixes History.