NVIDIA ConnectX-5 Adapter Cards Firmware Release Notes v16.31.2006

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1 Release Notes Update History

Revision	Date	Description
16.31.2006	September 19, 2022	Initial release of this Release Notes version, This version introduces Changes and New Features and Bug Fixes.

2 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.

2.1 Firmware Download

Please visit www.mellanox.com → Support → Support → Firmware Download

2.2 Document Revision History

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

3 Firmware Compatible Products

The chapter contains the following sections:

These are the release notes for the NVIDIA® ConnectX®-5 adapters firmware Rev 16.31.2006. This firmware supports the following protocols:

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

3.1 Supported Devices

This firmware supports the devices and protocols listed below:

Device Part Number	PSID	Device Name	FlexBoot	UEFI x86	UEFI ARM	Enable/ disable exprom Feature
MCX512A-ACUT	MT_0000000425	ConnectX®-5 EN network interface card, 10/25GbE dual-port SFP28, PCIe3.0 x8, UEFI Enabled (x86/ ARM), tall bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX512A-ADAT	MT_0000000361	ConnectX®-5 Ex EN network interface card, 25GbE dual-port SFP28, PCIe3.0/4.0 x8, tall bracket	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX562A-ACAB	MT_0000000241	ConnectX®-5 EN network interface card for OCP 3.0, with host management, 25GbE Dual-port SFP28, PCIe3.0 x16, Thumbscrew (Pull Tab) bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX566A-CDAB	MT_0000000242	ConnectX®-5 Ex EN network interface card for OCP 3.0, with host management, 100GbE Dual-port QSFP28, PCIe4.0 x16, Internal Lock bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX545B-CCUN	MT_0000000419	ConnectX®-5 EN network interface card for OCP2.0, Type 1, with host management, 100GbE, single-port QSFP28, PCIe3.0 x16, UEFI Enabled, no bracket	Present (Enabled)	Present (Enabled)	Not Present	Exists
MCX542B-ACUN	MT_0000000427	ConnectX®-5 EN network interface card for OCP2.0, Type 1, with host management, 25GbE dual-port SFP28, PCIe3.0 x8, UEFI Enabled (x86/ARM), no bracket Halogen free	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists

Device Part Number	PSID	Device Name	FlexBoot	UEFI x86	UEFI ARM	Enable/ disable exprom Feature
MCX512F-ACHT	MT_0000000416	ConnectX®-5 EN network interface card, with host management, 25GbE Dual-port SFP28, PCIe3.0 x16, UEFI Enabled, tall bracket	Present (Enabled)	Present (Enabled)	Not Present	Exists
MCX545A-CCUN	MT_0000000418	ConnectX®-5 EN network interface card for OCP2.0, Type 2, with host management, 100GbE, single-port QSFP28, PCIe3.0 x16, UEFI Enabled, no bracket	Present (Enabled)	Present (Enabled)	Not Present	Exists
MCX516A-CCHT	MT_0000000417	ConnectX®-5 EN network interface card, with host management 100GbE dual-port QSFP28, PCIe3.0 x16, UEFI Enabled, tall bracket	Present (Enabled)	Present (Enabled)	Not Present	Exists
MCX566A-CCAI	MT_0000000348	ConnectX®-5 EN network interface card for OCP 3.0, with host management,100GbE Dual-port QSFP28, PCIe3.0 x16, Internal Lock bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX512A-ACAT	MT_0000000080	ConnectX®-5 EN network interface card, 10/25GbE dual-port SFP28, PCIe3.0 x8, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX515A-CCAT	MT_0000000011	ConnectX-5 EN network interface card, 100GbE single-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX515A-GCAT	MT_0000000087	ConnectX®-5 EN network interface card, 50GbE single-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX516A-BDAT	MT_0000000123	ConnectX®-5 Ex EN network interface card, 40GbE dual-port QSFP28, PCIe 4.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX516A-CCAT	MT_0000000012	ConnectX-5 EN network interface card, 100GbE dual-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX516A-CDAT	MT_0000000013	ConnectX-5 Ex EN network interface card, 100GbE dual-port QSFP28, PCIe4.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX546A-BCAN	MT_0000000069	ConnectX®-5 EN network interface card for OCP, 40GbE dual-port QSFP28, PCIe3.0 x16, no bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists

Device Part Number	PSID	Device Name	FlexBoot	UEFI x86	UEFI ARM	Enable/ disable exprom Feature
MCX546A-CDAN	MT_0000000058	ConnectX-5 Ex network interface card for OCP; 100GbE dual-port QSFP28; PCIe4.0 x16; no bracket; ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX545A-CCAN	MT_0000000157	ConnectX-5 EN network interface card for OCP 100GbE; single-port QSFP28; PCIe3.0 x16; no bracket; ROHS R6;	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX512F-ACAT	MT_0000000183	ConnectX®-5 EN network interface card, 25GbE Dual-port SFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX511F-ACAT	MT_0000000182	ConnectX-5 EN network interface card; 25GbE single-port SFP28; PCIe4.0 x16; ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX542B-ACAN	MT_0000000248	ConnectX-5 EN network interface card for OCP; with host management; 25GbE dual-port SFP28; PCIe3.0 x8; no bracket; ROHS R6 Halogen free	Present (Enabled)	Present (Enabled)	Not Present	Exists
MCX542A-ACAN	MT_0000000167	ConnectX®-5 EN network interface card for OCP, with host management, 25GbE dual-port SFP28, PCIe3.0 x16, no bracket, ROHS R6 Halogen free	Present (Enabled)	Present (Disabled)	Not Present	Not Present
MCX516A-GCAT	MT_0000000090	ConnectX®-5 EN network interface card, 50GbE dual-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX553Q-ECAS	MT_0000000309	ConnectX®-5 VPI adapter card with Multi-Host, EDR IB (100Gb/s) and 100GbE, Single-port QSFP28, PCIe3.0 x4 on board, external connectors to 3x auxiliary cards?, Short bracket	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX545A-ECAN	MT_0000000077	ConnectX®-5 VPI network interface card for OCP EDR IB (100Gb/s) and 100GbE, single-port QSFP28, PCIe3.0 x16, no bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX545B-ECAN	MT_0000000207	ConnectX-5 VPI network interface card for OCP; with host management; EDR IB (100Gb/s) and 100GbE; single-port QSFP28; PCIe3.0 x16; no bracket; 8mm Heat Sink; ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists

Device Part Number	PSID	Device Name	FlexBoot	UEFI x86	UEFI ARM	Enable/ disable exprom Feature
MCX555A-ECAT	MT_0000000010	ConnectX-5 VPI adapter card, EDR IB (100Gb/s) and 100GbE, single- port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX556A-ECAT	MT_0000000008	ConnectX-5 VPI adapter card, EDR IB (100Gb/s) and 100GbE, dual-port QSFP28, PCIe3.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX556A-EDAT	MT_0000000009	ConnectX-5 Ex VPI adapter card, EDR IB (100Gb/s) and 100GbE, dual-port QSFP28, PCIe4.0 x16, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX556M-ECAT-S25	MT_0000000023	ConnectX®-5 VPI adapter card with Multi-Host Socket Direct supporting dual-socket server, EDR IB (100Gb/ s) and 100GbE, dual-port QSFP28, 2x PCIe3.0 x8, 25cm harness, tall bracket, ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX546A-EDAN	MT_0000000135	ConnectX-5 VPI network interface card for OCP; EDR IB (100Gb/s) and 100GbE dual-port QSFP28; PCIe4.0 x16; no bracket; ROHS R6	Present (Enabled)	Present (Disabled)	Not Present	Exists
MNV303212A-ADLT	MT_0000000158	Innova-2 Flex Open for Application Acceleration, dual-port SFP28, 25GbE, KU15P, 8GB, No Crypto, PCI4.0 x8, HHHL, active heat sink, tall bracket	Present (Enabled)	Present (Disabled)	Not Present	Exists
MCX566M-GDAI	MT_0000000262	ConnectX®-5 Ex EN network interface card for OCP 3.0 with Multi-Host, with host management, 50GbE Dual-port QSFP28, PCIe 4.0/3.0 x16, Internal Lock bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX515A-CCUT	MT_0000000519	ConnectX®-5 EN network interface card, 100GbE single-port QSFP28, PCIe3.0 x16, UEFI Enabled (ARM, x86), tall bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX556A-ECUT	MT_0000000504	ConnectX®-5 VPI adapter card, EDR IB (100Gb/s) and 100GbE, dual-port QSFP28, PCIe3.0 x16, UEFI enabled, tall bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX565M-CDAI	MT_0000000347	ConnectX®-5 Ex EN network interface card for OCP 3.0, with Multi-Host and host management, 100GbE Single-port QSFP28, PCIe4.0 x16, Internal Lock bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists

Device Part Number	PSID	Device Name	FlexBoot	UEFI x86	UEFI ARM	Enable/ disable exprom Feature
MCX565A-CCAB	MT_0000000585	ConnectX-5 EN network interface card for OCP 3.0; with host management; 100GbE Single-port QSFP28; PCIe3.0 x16; Thumbscrew (Pull Tab) bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX545M-ECAN	MT_0000000093	ConnectX-5 VPI network interface card for OCP with Multi-Host; EDR IB (100Gb/s) and 100GbE; single-port QSFP28; PCIe3.0 x16; no bracket; ROHS R6; Halogen free	Present (Enabled)	Present (Enabled)	Not Present	Exists
MCX545B-GCUN	MT_0000000681	ConnectX-5 EN network interface card for OCP2.0, Type 1, with host management, 50GbE, single-port QSFP28, PCIe3.0 x16, UEFI Enabled, no bracket	Present (Enabled)	Present (Enabled)	Present (Enabled)	Exists
MCX514A-GCHT	MT_0000000679	ConnectX-5 EN network interface card; with host management; 40/50GbE Dual-port QSFP28; PCIe3.0 x8				
MCX513A-GCHT	MT_0000000678	ConnectX-5 EN network interface card; with host management; 40/50GbE Single-port QSFP28; PCIe3.0 x8;				

3.2 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
ConnectX-5 Firmware	16.31.2006 / 16.31.1014 / 16.30.1004
MLNX_OFED	5.4-2.4.1.3 / 5.4-1.0.3.0 / 5.3-1.0.0.1 **Note:** For the list of the supported Operating Systems, please refer to the driver's Release Notes.
MLNX_EN (MLNX_OFED based code)	5.4-1.0.3.0 / 5.3-1.0.0.1 / 5.2-2.2.0.0 **Note:** For the list of the supported Operating Systems, please refer to the driver's Release Notes.
WinOF-2	2.72.50000 / 2.70.50000 / 2.60.50000 **Note:** For the list of the supported Operating Systems, please refer to the driver's Release Notes.
MFT	4.17.2 / 4.17.0 / 4.16.3 **Note:** For the list of the supported Operating Systems, please refer to the driver's Release Notes.

	Supported Version
FlexBoot	3.6.404 **Note:** Please be aware that not all firmware binaries contain FlexBoot or UEFI, support may vary between cards.
UEFI	14.24.15 **Note:** Please be aware that not all firmware binaries contain FlexBoot or UEFI, support may vary between cards.
MLNX-OS	3.9.0900 onwards
Onyx	3.9.0900 onwards
NVIDIA Quantum™ Firmware	27.2008.2102 onwards
SwitchX-IB™ Firmware	11.2008.2102 onwards
SwitchX-IB 2 Firmware	15.2008.2102 onwards

3.3 Supported Mellanox 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.

3.3.1 Validated and Supported QDR Cables

Speed	Cable OPN	Description
QDR	MC2206125-007	NVIDIA passive copper cable, IB QDR, 40Gb/s, QSFP,7m

3.3.2 Validated and Supported FDR10 Cables

Speed	Cable OPN	Description
FDR10	MC2206128-004	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 4m
FDR10	MC2206128-005	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 5m
FDR10	MC2206130-001	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 1m
FDR10	MC2206130-002	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 2m
FDR10	MC2206130-003	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 3m
FDR10	MC2206130-00A	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 0.5m
FDR10	MC2206310-003	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 3m

Speed	Cable OPN	Description
FDR10	MC2206310-005	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 5m
FDR10	MC2206310-010	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 10m
FDR10	MC2206310-015	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 15m
FDR10	MC2206310-020	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 20m
FDR10	MC2206310-030	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 30m
FDR10	MC2206310-050	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 50m
FDR10	MC2206310-100	NVIDIA active fiber cable, IB QDR/FDR10, 40Gb/s, QSFP, 100m
FDR10	MC2210411-SR4E	NVIDIA optical module, 40Gb/s, QSFP, MPO, 850nm, up to 300m

3.3.3 Validated and Supported FDR Cables

Speed	Cable OPN	Description
FDR	MC2207126-004	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 4m
FDR	MC2207128-003	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 3m
FDR	MC2207128-0A2	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2.5m
FDR	MC2207130-001	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1m
FDR	MC2207130-002	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2m
FDR	MC2207130-00A	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 0.5m
FDR	MC2207130-0A1	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1.5m
FDR	MC220731V-003	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 3m
FDR	MC220731V-005	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 5m
FDR	MC220731V-007	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 7m
FDR	MC220731V-010	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 10m
FDR	MC220731V-012	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 12m
FDR	MC220731V-015	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 15m

Speed	Cable OPN	Description
FDR	MC220731V-020	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 20m
FDR	MC220731V-025	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 25m
FDR	MC220731V-030	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 30m
FDR	MC220731V-040	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 40m
FDR	MC220731V-050	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 50m
FDR	MC220731V-075	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 75m
FDR	MC220731V-100	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 100m
FDR	MCP1700-F001C	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1m, Red Pulltab
FDR	MCP1700-F001D	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1m, Yellow Pulltab
FDR	MCP1700-F002C	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2m, Red Pulltab
FDR	MCP1700-F002D	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2m, Yellow Pulltab
FDR	MCP1700-F003C	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 3m, Red Pulltab
FDR	MCP1700-F003D	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 3m, Yellow Pulltab
FDR	MCP170L-F001	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 1m
FDR	MCP170L-F002	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 2m
FDR	MCP170L-F003	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 3m
FDR	MCP170L-F00A	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 0.5m
FDR	MCP170L-F01A	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 1.5m
FDR	MMA1B00-F030D	NVIDIA transceiver, FDR, QSFP+, MPO, 850nm, SR4, up to 30m, DDMI
FDR	MC2210511-LR4	NVIDIA optical module, 40Gb/s, QSFP, LC-LC, 1310nm, LR4 up to 10km

3.3.4 Validated and Supported EDR / 100Gb/s Cables

Speed	Cable OPN	Description
EDR	MCP1600-E001	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 1m 30AWG
EDR	MCP1600-E001E30	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 1m, Black, 30AWG
EDR	MCP1600-E002	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 2m 28AWG
EDR	MCP1600-E002E30	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 2m, Black, 30AWG
EDR	MCP1600-E003	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 3m 26AWG
EDR	MCP1600-E003E26	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 3m, Black, 26AWG
EDR	MCP1600-E004E26	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 4m, Black, 26AWG
EDR	MCP1600-E005E26	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 5m, Black, 26AWG
EDR	MCP1600-E00A	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 0.5m 30AWG
EDR	MCP1600-E00AE30	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 0.5m, Black, 30AWG
EDR	MCP1600-E00BE30	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 0.75m, Black, 30AWG
EDR	MCP1600-E01A	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 1.5m 30AWG
EDR	MCP1600-E01AE30	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 1.5m, Black, 30AWG
EDR	MCP1600-E01BE30	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 1.25m, Black, 30AWG
EDR	MCP1600-E02A	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 2.5m 26AWG
EDR	MCP1600-E02AE26	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP28, 2.5m, Black, 26AWG
EDR	MFA1A00-E001	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 1m
EDR	MFA1A00-E003	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 3m
EDR	MFA1A00-E005	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 5m
EDR	MFA1A00-E010	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 10m
EDR	MFA1A00-E015	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 15m
EDR	MFA1A00-E020	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 20m
EDR	MFA1A00-E030	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 30m
EDR	MFA1A00-E050	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 50m

Speed	Cable OPN	Description
EDR	MFA1A00-E100	NVIDIA active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 100m
EDR	MMA1B00-E100	NVIDIA transceiver, IB EDR, up to 100Gb/s, QSFP28, MPO, 850nm, SR4, up to 100m
EDR	MFA1A00-E003-TG	NVIDIA customized active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 3m
EDR	MFA1A00-E005-TG	NVIDIA customized active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 5m
EDR	MFA1A00-E010-TG	NVIDIA customized active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 10m
EDR	MFA1A00-E015-TG	NVIDIA customized active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 15m
EDR	MFA1A00-E020-TG	NVIDIA customized active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 20m
EDR	MFA1A00-E030-TG	NVIDIA customized active fiber cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 30m
EDR	MMA1L10-CR	NVIDIA Optical Transceiver, 100GbE, 100Gb/s, QSFP28, LC-LC, 1310nm, LR4 up to 10km
EDR	MMA1L30-CM	NVIDIA Optical Module, 100GbE, 100Gb/s, QSFP28, LC-LC, 1310nm, CWDM4, up to 2km *Supported in cable hardware generations 1 and 2.
EDR	MMS1C10-CM	NVIDIA Active Optical Module, 100Gb/s, QSFP, MPO, 1310nm, PSM4, up to 500m

⚠ EDR links raise with RS-FEC.

3.3.5 Validated and Supported HDR / 200Gb/s Cables

Speed	Cable OPN	Description
HDR	MCP7H50-H001R30	NVIDIA passive copper hybrid cable, IB HDR 200Gb/s to 2x100Gb/s, QSFP56 to 2xQSFP56, LSZH, colored, 1m, 30AWG
HDR	MCP7H50-H002R26	NVIDIA passive copper hybrid cable, IB HDR 200Gb/s to 2x100Gb/s, QSFP56 to 2xQSFP56, LSZH, colored, 2m, 26AWG
HDR	MCP7H50-H01AR30	NVIDIA passive copper hybrid cable, IB HDR 200Gb/s to 2x100Gb/s, QSFP56 to 2xQSFP56, LSZH, colored, 1.5m, 30AWG
HDR	MMA1T00-HS	NVIDIA transceiver, HDR, QSFP56, MPO, 850nm, SR4, up to 100m
HDR	MCA7J50-H003R	NVIDIA Active copper hybrid cable, IB HDR 200Gb/s to 2xHDR100 100Gb/s, QSFP56 to 2xQSFP56, 3m, colored
HDR	MCA7J50-H004R	NVIDIA Active copper hybrid cable, IB HDR 200Gb/s to 2xHDR100 100Gb/s, QSFP56 to 2xQSFP56, 4m, colored
HDR	MCA7J50-H005R	NVIDIA Active copper hybrid cable, IB HDR 200Gb/s to 2xHDR100 100Gb/s, QSFP56 to 2xQSFP56, 5m, colored

HDR links raise with RS-FEC.

3.3.6 Validated and Supported 1GbE Cables

Speed	Cable OPN	Description
1GbE	MC3208011-SX	NVIDIA Optical module, ETH 1GbE, 1Gb/s, SFP, LC-LC, SX 850nm, up to 500m
1GbE	MC3208411-T	NVIDIA module, ETH 1GbE, 1Gb/s, SFP, Base-T, up to 100m

3.3.7 Validated and Supported 10GbE Cables

Speed	Cable OPN	Description
10GE	MFM1T02A-LR	NVIDIA SFP+ optical module for 10GBASE-LR
10GE	MFM1T02A-SR	NVIDIA SFP+ optical module for 10GBASE-SR
10GE	MAM1Q00A-QSA	NVIDIA cable module, ETH 10GbE, 40Gb/s to 10Gb/s, QSFP to SFP+
10GE	MC2309124-005	NVIDIA passive copper hybrid cable, ETH 10GbE, 10Gb/s, QSFP to SFP+, 5m
10GE	MC2309124-007	NVIDIA passive copper hybrid cable, ETH 10GbE, 10Gb/s, QSFP to SFP+, 7m
10GE	MC2309130-001	NVIDIA passive copper hybrid cable, ETH 10GbE, 10Gb/s, QSFP to SFP+, 1m
10GE	MC2309130-002	NVIDIA passive copper hybrid cable, ETH 10GbE, 10Gb/s, QSFP to SFP+, 2m
10GE	MC2309130-003	NVIDIA passive copper hybrid cable, ETH 10GbE, 10Gb/s, QSFP to SFP+, 3m
10GE	MC2309130-00A	NVIDIA passive copper hybrid cable, ETH 10GbE, 10Gb/s, QSFP to SFP+, 0.5m
10GE	MC3309124-004	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 4m
10GE	MC3309124-005	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 5m
10GE	MC3309124-006	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 6m
10GE	MC3309124-007	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 7m
10GE	MC3309130-001	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 1m
10GE	MC3309130-002	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 2m
10GE	MC3309130-003	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 3m

Speed	Cable OPN	Description
10GE	MC3309130-00A	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 0.5m
10GE	MC3309130-0A1	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 1.5m
10GE	MC3309130-0A2	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 2.5m
10GE	MCP2100-X001B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 1m, Blue Pulltab, Connector Label
10GE	MCP2100-X002B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 2m, Blue Pulltab, Connector Label
10GE	MCP2100-X003B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 3m, Blue Pulltab, Connector Label
10GE	MCP2101-X001B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 1m, Green Pulltab, Connector Label
10GE	MCP2104-X001B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 1m, Black Pulltab, Connector Label
10GE	MCP2104-X002B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 2m, Black Pulltab, Connector Label
10GE	MCP2104-X003B	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 3m, Black Pulltab, Connector Label
10GE	MCP2104-X01AB	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 1.5m, Black Pulltab, Connector Label
10GE	MCP2104-X02AB	NVIDIA passive copper cable, ETH 10GbE, 10Gb/s, SFP+, 2.5m, Black Pulltab, Connector Label

3.3.8 Validated and Supported 25GbE Cables

⚠ The 25GbE cables can be supported only when connected to the MAM1Q00A-QSA28 module.

Speed	Cable OPN	Description
25GbE	MAM1Q00A-QSA28	NVIDIA cable module, ETH 25GbE, 100Gb/s to 25Gb/s, QSFP28 to SFP28
25GbE	MCP2M00-A001	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1m, 30AWG
25GbE	MCP2M00-A001E30N	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1m, Black, 30AWG, CA-N
25GbE	MCP2M00-A002	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2m, 30AWG
25GbE	MCP2M00-A002E30N	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2m, Black, 30AWG, CA-N
25GbE	MCP2M00-A003E26N	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 3m, Black, 26AWG, CA-N
25GbE	MCP2M00-A003E30L	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 3m, Black, 30AWG, CA-L

Speed	Cable OPN	Description
25GbE	MCP2M00-A004E26L	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 4m, Black, 26AWG, CA-L
25GbE	MCP2M00-A005E26L	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 5m, Black, 26AWG, CA-L
25GbE	MCP2M00-A00A	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 0.5m, 30AWG
25GbE	MCP2M00-A00AE30N	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 0.5m, Black, 30AWG, CA-N
25GbE	MCP2M00-A01AE30N	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 1.5m, Black, 30AWG, CA-N
25GbE	MCP2M00-A02AE26N	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2.5m, Black, 26AWG, CA-N
25GbE	MCP2M00-A02AE30L	NVIDIA Passive Copper cable, ETH, up to 25Gb/s, SFP28, 2.5m, Black, 30AWG, CA-L
25GbE	MFA2P10-A003	NVIDIA active optical cable 25GbE, SFP28, 3m
25GbE	MFA2P10-A005	NVIDIA active optical cable 25GbE, SFP28, 5m
25GbE	MFA2P10-A007	NVIDIA active optical cable 25GbE, SFP28, 7m
25GbE	MFA2P10-A010	NVIDIA active optical cable 25GbE, SFP28, 10m
25GbE	MFA2P10-A015	NVIDIA active optical cable 25GbE, SFP28, 15m
25GbE	MFA2P10-A020	NVIDIA active optical cable 25GbE, SFP28, 20m
25GbE	MFA2P10-A030	NVIDIA active optical cable 25GbE, SFP28, 30m
25GbE	MFA2P10-A050	NVIDIA active optical cable 25GbE, SFP28, 50m
25GbE	MMA2P00-AS	NVIDIA transceiver, 25GbE, SFP28, LC-LC, 850nm, SR, up to 100m
25GbE	SFP25G-AOC10M-TG	NVIDIA customized active optical cable 25GbE, SFP28, 10m, Aqua
25GbE	SFP25G-AOC30M-TG	NVIDIA customized active optical cable 25GbE, SFP28, 30m, Aqua
25GbE	SFP25G-AOC07M-TG	NVIDIA customized active optical cable 25GbE, SFP28, 7m, Aqua
25GbE	SFP25G-AOC05M-TG	NVIDIA customized active optical cable 25GbE, SFP28, 5m, Aqua
25GbE	SFP25G-AOC03M-TG	NVIDIA customized active optical cable 25GbE, SFP28, 3m, Aqua
25GbE	SFP25G-AOC20M-TG	NVIDIA customized active optical cable 25GbE, SFP28, 20m, Aqua
25GbE	MMA2P00-AS_FF	NVIDIA transceiver, 25GbE, SFP28, LC-LC, 850nm, SR, up to 100m
25GbE	MMA2P00-AS-SP	NVIDIA transceiver, 25GbE, SFP28, LC-LC, 850nm, SR, up to 100m, single package
25GbE	MMA2L20-AR	NVIDIA optical transceiver, 25GbE, 25Gb/s, SFP28, LC-LC, 1310nm, LR up to 10km

3.3.9 Validated and Supported 40GbE Cables

Speed	Cable OPN	Description
40GE	MC2206128-004	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 4m

Speed	Cable OPN	Description
40GE	MC2206128-005	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 5m
40GE	MC2206130-001	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 1m
40GE	MC2206130-002	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 2m
40GE	MC2206130-003	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 3m
40GE	MC2206130-00A	NVIDIA passive copper cable, VPI, up to 40Gb/s, QSFP, 0.5m
40GE	MC2210126-004	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 4m
40GE	MC2210126-005	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 5m
40GE	MC2210128-003	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 3m
40GE	MC2210130-001	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 1m
40GE	MC2210130-002	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 2m
40GE	MC2210310-003	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 3m
40GE	MC2210310-005	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 5m
40GE	MC2210310-010	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 10m
40GE	MC2210310-015	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 15m
40GE	MC2210310-020	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 20m
40GE	MC2210310-030	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 30m
40GE	MC2210310-050	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 50m
40GE	MC2210310-100	NVIDIA active fiber cable, ETH 40GbE, 40Gb/s, QSFP, 100m
40GE	MC2210411-SR4E	NVIDIA optical module, 40Gb/s, QSFP, MPO, 850nm, up to 300m
40GE	MC2609125-005	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 5m
40GE	MC2609130-001	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 1m
40GE	MC2609130-003	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 3m
40GE	MCP1700-B001E	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 1m, Black Pulltab

Speed	Cable OPN	Description
40GE	MCP1700-B002E	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 2m, Black Pulltab
40GE	MCP1700-B003E	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 3m, Black Pulltab
40GE	MCP1700-B01AE	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 1.5m, Black Pulltab
40GE	MCP1700-B02AE	NVIDIA passive copper cable, ETH 40GbE, 40Gb/s, QSFP, 2.5m, Black Pulltab
40GE	MMA1B00-B150D	NVIDIA transceiver, 40GbE, QSFP+, MPO, 850nm, SR4, up to 150m, DDMI
40GE	MCP7900-X01AA	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 1.5m, Blue Pulltab, customized label
40GE	MCP7904-X002A	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 2m, Black Pulltab, customized label
40GE	MCP7904-X003A	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 3m, Black Pulltab, customized label
40GE	MCP7904-X01AA	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 1.5m, Black Pulltab, customized label
40GE	MCP7904-X02AA	NVIDIA passive copper hybrid cable, ETH 40GbE to 4x10GbE, QSFP to 4xSFP+, 2.5m, Black Pulltab, customized label
40GE	MC2210511-LR4	NVIDIA Optical Module 40Gb/s FDR 10 QSFP LC-LC 1310nm LR4 up to 10km
40GE	MC6709309-005	NVIDIA passive fiber hybrid cable, MPO to 8xLC, 5m
40GE	MC6709309-010	NVIDIA passive fiber hybrid cable, MPO to 8xLC, 10m
40GE	MC6709309-020	NVIDIA passive fiber hybrid cable, MPO to 8xLC, 20m
40GE	MC6709309-030	NVIDIA passive fiber hybrid cable, MPO to 8xLC, 30m

3.3.10 Validated and Supported 56GbE Cables

⚠ The 56GbE cables are used to raise 40GbE link speed as the 56GbE speed is not supported.

Speed	Cable OPN	Description
56GE	MC2207126-004	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 4m
56GE	MC2207128-003	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 3m
56GE	MC2207128-0A2	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2.5m

Speed	Cable OPN	Description
56GE	MC2207130-001	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1m
56GE	MC2207130-002	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2m
56GE	MC2207130-00A	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 0.5m
56GE	MC2207130-0A1	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1.5m
56GE	MC220731V-003	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 3m
56GE	MC220731V-005	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 5m
56GE	MC220731V-010	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 10m
56GE	MC220731V-015	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 15m
56GE	MC220731V-020	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 20m
56GE	MC220731V-025	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 25m
56GE	MC220731V-030	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 30m
56GE	MC220731V-040	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 40m
56GE	MC220731V-050	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 50m
56GE	MC220731V-075	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 75m
56GE	MC220731V-100	NVIDIA active fiber cable, VPI, up to 56Gb/s, QSFP, 100m
56GE	MCP1700-F001C	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1m, Red Pulltab
56GE	MCP1700-F001D	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 1m, Yellow Pulltab
56GE	MCP1700-F002C	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2m, Red Pulltab
56GE	MCP1700-F002D	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 2m, Yellow Pulltab
56GE	MCP1700-F003C	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 3m, Red Pulltab
56GE	MCP1700-F003D	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, 3m, Yellow Pulltab
56GE	MCP170L-F001	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 1m
56GE	MCP170L-F002	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 2m

Speed	Cable OPN	Description
56GE	MCP170L-F003	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 3m
56GE	MCP170L-F00A	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 0.5m
56GE	MCP170L-F01A	NVIDIA passive copper cable, VPI, up to 56Gb/s, QSFP, LSZH, 1.5m

3.3.11 Validated and Supported 100GbE Cables

Speed	Cable OPN	Description
100GbE	MCP1600-C001	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 1m 30AWG
100GbE	MCP1600-C001E30N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 1m, Black, 30AWG, CA-N
100GbE	MCP1600-C002	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 2m 30AWG
100GbE	MCP1600-C002E30N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 2m, Black, 30AWG, CA-N
100GbE	MCP1600-C003	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 3m 28AWG
100GbE	MCP1600-C003E26N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 3m, Black, 26AWG, CA-N
100GbE	MCP1600-C003E30L	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 3m, Black, 30AWG, CA-L
100GbE	MCP1600-C005E26L	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 5m, Black, 26AWG, CA-L
100GbE	MCP1600-C00A	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 0.5m 30AWG
100GbE	MCP1600-C00AE30N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 0.5m, Black, 30AWG, CA-N
100GbE	MCP1600-C00BE30N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 0.75m, Black, 30AWG, CA-N
100GbE	MCP1600-C01A	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 1.5m 30AWG
100GbE	MCP1600-C01AE30N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 1.5m, Black, 30AWG, CA-N
100GbE	MCP1600-C02A	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 2.5m 30AWG
100GbE	MCP1600-C02AE26N	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 2.5m, Black, 26AWG, CA-N
100GbE	MCP1600-C02AE30L	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28,2.5m, Black, 30AWG, CA-L
100GbE	MCP1600-C03A	NVIDIA Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP, PVC, 3.5m 26AWG
100GbE	MCP1600-E001	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 1m 30AWG

Speed	Cable OPN	Description
100GbE	MCP1600-E002	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 2m 28AWG
100GbE	MCP1600-E003	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 3m 26AWG
100GbE	MCP1600-E01A	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 1.5m 30AWG
100GbE	MCP1600-E02A	NVIDIA Passive Copper cable, IB EDR, up to 100Gb/s, QSFP, LSZH, 2.5m 26AWG
100GbE	MCP7F00-A001R	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, colored pulltabs, 1m, 30AWG
100GbE	MCP7F00-A001R30N	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 1m, Colored, 30AWG, CA-N
100GbE	MCP7F00-A002R	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, colored pulltabs, 2m, 30AWG
100GbE	MCP7F00-A002R30N	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 2m, Colored, 30AWG, CA-N
100GbE	MCP7F00-A003R26N	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 3m, Colored, 26AWG, CA-N
100GbE	MCP7F00-A003R30L	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 3m, Colored, 30AWG, CA-L
100GbE	MCP7F00-A005R26L	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 5m, Colored, 26AWG, CA-L
100GbE	MCP7F00-A01AR	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, colored pulltabs,1.5m, 30AWG
100GbE	MCP7F00-A01AR30N	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 1.5m, Colored, 30AWG, CA-N
100GbE	MCP7F00-A02AR26N	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 2.5m, Colored, 26AWG, CA-N
100GbE	MCP7F00-A02AR30L	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 2.5m, Colored, 30AWG, CA-L
100GbE	MCP7F00-A02ARLZ	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 2.5m, LSZH, Colored, 28AWG
100GbE	MCP7F00-A03AR26L	NVIDIA passive copper hybrid cable, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 3.5m, Colored, 26AWG, CA-L
100GbE	MCP7H00-G001	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 1m, 30AWG
100GbE	MCP7H00-G001R	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, colored pulltabs, 1m, 30AWG
100GbE	MCP7H00-G001R30N	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 1m, Colored, 30AWG, CA-N
100GbE	MCP7H00-G002R	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, colored pulltabs, 2m, 30AWG
100GbE	MCP7H00-G002R30N	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 2m, Colored, 30AWG, CA-N

Speed	Cable OPN	Description
100GbE	MCP7H00-G003R	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, colored pulltabs, 3m, 28AWG
100GbE	MCP7H00-G003R26N	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 3m, Colored, 26AWG, CA-N
100GbE	MCP7H00-G003R30L	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 3m, Colored, 30AWG, CA-L
100GbE	MCP7H00-G004R26L	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 4m, Colored, 26AWG, CA-L
100GbE	MCP7H00-G01AR	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, colored pulltabs, 1.5m, 30AWG
100GbE	MCP7H00-G01AR30N	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 1.5m, Colored, 30AWG, CA-N
100GbE	MCP7H00-G02AR	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, colored pulltabs, 2.5m, 30AWG
100GbE	MCP7H00-G02AR26N	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 2.5m, Colored, 26AWG, CA-N
100GbE	MCP7H00-G02AR30L	NVIDIA passive copper hybrid cable, ETH 100Gb/s to 2x50Gb/s, QSFP28 to 2xQSFP28, 2.5m, Colored, 30AWG, CA-L
100GbE	MFA1A00-C003	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 3m
100GbE	MFA1A00-C005	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 5m
100GbE	MFA1A00-C010	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 10m
100GbE	MFA1A00-C015	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 15m
100GbE	MFA1A00-C020	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 20m
100GbE	MFA1A00-C030	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 30m
100GbE	MFA1A00-C050	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 50m
100GbE	MFA1A00-C100	NVIDIA active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 100m
100GbE	MFA7A20-C003	NVIDIA active fiber hybrid solution, ETH 100GbE to 2x50GbE, QSFP28 to 2xQSFP28, 3m
100GbE	MFA7A20-C005	NVIDIA active fiber hybrid solution, ETH 100GbE to 2x50GbE, QSFP28 to 2xQSFP28, 5m
100GbE	MFA7A20-C010	NVIDIA active fiber hybrid solution, ETH 100GbE to 2x50GbE, QSFP28 to 2xQSFP28, 10m
100GbE	MFA7A20-C020	NVIDIA active fiber hybrid solution, ETH 100GbE to 2x50GbE, QSFP28 to 2xQSFP28, 20m
100GbE	MFA7A50-C003	NVIDIA active fiber hybrid solution, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 3m
100GbE	MFA7A50-C005	NVIDIA active fiber hybrid solution, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 5m
100GbE	MFA7A50-C010	NVIDIA active fiber hybrid solution, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 10m
100GbE	MFA7A50-C015	NVIDIA active fiber hybrid solution, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 15m

Speed	Cable OPN	Description
100GbE	MFA7A50-C020	NVIDIA active fiber hybrid solution, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 20m
100GbE	MFA7A50-C030	NVIDIA active fiber hybrid solution, ETH 100GbE to 4x25GbE, QSFP28 to 4xSFP28, 30m
100GbE	MMA1B00-C100D	NVIDIA transceiver, 100GbE, QSFP28, MPO, 850nm, SR4, up to 100m, DDMI
100GbE	MMA1L10-CR	NVIDIA optical transceiver, 100GbE, QSFP28, LC-LC, 1310nm, LR4 up to 10km **Note:** Only revision A2 and above.
100GbE	MFA1A00-C001-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 1m
100GbE	MFA1A00-C002-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP28, LSZH, 2m
100GbE	MFA1A00-C003-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 3m
100GbE	MFA1A00-C005-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 5m
100GbE	MFA1A00-C007-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP28, LSZH, 7m
100GbE	MFA1A00-C010-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 10m
100GbE	MFA1A00-C015-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 15m
100GbE	MFA1A00-C020-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 20m
100GbE	MFA1A00-C030-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 30m
100GbE	MFA1A00-C050-TG	NVIDIA customized active fiber cable, ETH 100GbE, 100Gb/s, QSFP, LSZH, 50m
100GbE	MMA1L30-CM	NVIDIA optical module, 100GbE, 100Gb/s, QSFP28, LC-LC, 1310nm, CWDM4, up to 2km
100GbE	MMS1C10-CM	NVIDIA active optical module, 100Gb/s, QSFP, MPO, 1310nm, PSM4, up to 500m

3.3.12 Validated and Supported 200GbE Cables

Speed	Cable OPN	Description
200GE	MCP1650-V001E30	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 1m, black pulltab, 30AWG
200GE	MCP1650-V002E26	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 2m, black pulltab, 26AWG
200GE	MCP1650-V003E26	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 3m, black pulltab, 26AWG
200GE	MCP1650-V00AE30	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 0.5m, black pulltab, 30AWG

Speed	Cable OPN	Description
200GE	MCP1650-V01AE30	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 1.5m, black pulltab, 30AWG
200GE	MCP1650-V02AE26	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 2.5m, black pulltab, 26AWG
200GE	MCP1650-V00AE30	NVIDIA Passive Copper cable, 200GbE, 200Gb/s, QSFP56, LSZH, 0.5m, black pulltab, 30AWG

3.4 Supported 3rd Party Cables and Modules

Speed	Cable OPN	Description
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-5M	Arista 10GBASE-CR SFP+ Cable 5 Meter
10GbE	FTLX1471D3BCL-ME	10GBASE-LR SFP+ 1310nm 10km DOM Transceiver Module
10GbE	FTLX8571D3BCL-ME	10gb SFP 850nm Optic Transceiver
10GbE	L45593-D178-B50	QSFP-4SFP10G-CU5M
10GbE	SFP-10G-SR	Cisco 10GBASE-SR SFP+ transceiver module for MMF, 850-nm wavelength, LC duplex connector
10GbE	SFP-H10GB-ACU10M	Cisco 10GBASE-CR1 Active Copper Cable 10-meter
10GbE	SFP-H10GB-ACU7M	Cisco 10GBASE-CR1 Active Copper Cable 7-meter
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-CU4M	Cisco 10GBASE-CR1 Copper Cable 4-meter
10GbE	SFP-H10GB-CU5M	Cisco 5-m 10G SFP+ Twinax cable assembly, passive
25GbE	SFP-25G-AOC5M	Cisco 25GBASE-AOC Active Optical Cable 5-meter
25GbE	SFP-25G-AOC7M	Cisco 25GBASE-AOC Active Optical Cable 7-meter
25GbE	SFP-H25G-CU1M	25GBASE-CR1 Copper Cable 1-meter
25GbE	SFP-H25G-CU2.5M	Cisco 25GBASE-CR1 Copper Cable 2.5-meter
25GbE	SFP-H25G-CU2M	25GBASE-CR1 Copper Cable 2-meter
25GbE	SFP-H25G-CU3M	Cisco 25GBASE-CR1 Copper Cable 3-meter
25GbE	SFP-H25G-CU4M	Cisco 25GBASE-CR1 Copper Cable 4-meter
40GbE	2231254-2	PASSIVE COPPER CABLE ETH 40GBE QSFP 3M
40GbE	QSFP-40G-SR4	Cisco 40GBASE-SR4, 4 lanes, 850 nm MMF

Speed	Cable OPN	Description
40GbE	QSFP-40G-SR-BD	Cisco 40GBASE-SR-BiDi, duplex MMF
40GbE	QSFP-4SFP10G-CU5M	PASSIVE COPPER SPLITTER CABLE ETH 40GBE TO 4X10GBE 5M
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
40GbE	QSFP-H40G-CU5M	PASSIVE COPPER CABLE ETH 40GBE QSFP 5M
56GbE	FTL414QB2N-E5	Finisar FTL414QB2N-E5 56Gb 850nm 100m QSFP+ Transceiver Module ARK
100GbE	CAB-Q-Q-100GbE-3M	Passive 3 meter , QSFP+ to QSFP+ QSFP100 TWINAX 103.125Gbps-CR4
100GbE	FTLF8519P3BTL-N1	1000BASE-SX and 2G Fibre Channel (2GFC) 500m Industrial Temperature SFP Optical Transceiver
100GbE	QSFP-100G-AOC5M	Cisco 100GBASE QSFP Active Optical Cables 5-meter
100GbE	QSFP-100G-AOC7M	Cisco 100GBASE QSFP Active Optical Cables 7-meter
100GbE	QSFP-100G-CU3M	Cisco 100GBASE-CR4 Passive Copper Cable 3-meter
100GbE	QSFP-100G-CU5M	Cisco 100GBASE-CR4 Passive Copper Cable 5-meter
100GbE	QSFP-100G-SR4-S	Cisco 100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF
100GbE	QSFP-40/100-SRBD	Cisco 100G and 40GBASE SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF
100GbE	SO-QSFP28-LR4	QSFP28, 100GBase, 1310nm, SM, DDM, 10km, LC
100GbE	TR-FC13L-N00	100G QSFP28 Optical Transceivers, QSFP28 LR4 (10km)
100GbE	FTLC9152RGPL	100G 100M QSFP28 SWDM4 OPT TRANS

3.5 Tested Switches

3.5.1 Tested FDR Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
FDR	SwitchX-2	MSX6036F-1SFS	36 QSFP+ port Unmanaged FDR InfiniBand Switch Systems	Mellanox

3.5.2 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	NVIDIA
EDR	Switch-IB	MSB7700-XXX	36-port Managed EDR 100Gb/s InfiniBand Switch Systems	NVIDIA
EDR	Switch-IB 2	MSB7800-XXX	36-port Managed EDR 100Gb/s InfiniBand Switch Systems	NVIDIA

3.5.3 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
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

3.5.4 Tested 100GbE Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
100GbE	Spectrum-3	MSN4600-XXXX	64-port Non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum-2	MSN3700C-XXXX	32-port Non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum-2	MSN3420-XXXX	48 SFP + 12 QSFP ports Non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum	MSN2410-XXXX	48-port 25GbE + 8-port 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum	MSN2700-XXXX	32-port Non-blocking 100GbE Open Ethernet Switch System	NVIDIA
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
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

3.6 PRM Revision Compatibility

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

- Mellanox Adapters Programmer's Reference Manual (PRM), Rev 0.53 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.

4 Changes and New Features

4.1 Important Notes

Security Hardening Enhancements: This release contains important reliability improvements and security hardening enhancements. Mellanox recommends upgrading your devices firmware to this release to improve the devices' firmware security and reliability.

When upgrading or changing the configuration on multi-host adapter cards, for the changes to take effect, PCIe restart must be simultaneously sent from both hosts (servers).

To do so, perform the following:

1. Shut down the server with the auxiliary card.
2. Shut down the server with the primary card.
3. Bring back the server with the primary card.
4. Bring back the server with the auxiliary card.

SR-IOV - Virtual Functions (VF) per Port - The maximum Virtual Functions (VF) per port is 127. For further information, see RoCE Limitations.

It is recommended to enable the "above 4G decoding" BIOS setting for features that require a large amount of PCIe resources (e.g., SR-IOV with numerous VFs, PCIe Emulated Switch, Large BAR Requests).

4.2 Changes and New Feature in this Firmware Version

Feature/Change	Description
16.31.2500	
Bug Fixes	See *Bug Fixes in this Firmware Version* section.

4.3 Unsupported Features and Commands

4.3.1 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

4.3.2 Unsupported Commands

- QUERY_MAD_DEMUX
- SET_MAD_DEMUX
- CREATE_RQ - MEMORY_RQ_RMP
- MODIFY_LAG_ASYNC_EVENT

5 Bug Fixes in this Firmware Version

For a list of old Bug Fixes, please see Bug Fixes History.

Internal Ref.	Issue
2748449	**Description:** Altered the GetInventory NC-SI command to not report leading 0xf in firmware version when it starts with 0.
	Keywords: NC-SI, GetInventory, leading 0, FW version
	Discovered in Version: 16.31.1014
	Fixed in Release: 16.31.2006
2684634	**Description:** Fixed PCIe lane margining capability issues.
	Keywords: PCIe lane margining
	Discovered in Version: 16.31.1014
	Fixed in Release: 16.31.2006
2716208	**Description:** Fixed an issue related to the sl2vl mad that caused a few msec hiccup in the transmission on an InfiniBand network when the SM sent the sl2vl mad to a node in the cluster.
	Keywords: Sl2vl change, traffic, transmission, cluster
	Discovered in Version: 16.31.1014
	Fixed in Release: 16.31.2006

6 Known Issues

For a list of older versions' Known Issues that are not listed in this chapter, please refer to the relevant firmware versions Release Notes in https://docs.mellanox.com/category/adapterfw.

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	127	64	64	127	127

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	127	127	127

Known Issues

Internal Ref.	Issue
2622688	**Description:** Software steering on multi-port devices requires performing cfg. on top of the multi-port function and not the affiliated single-port function.
	Workaround: N/A
	Keywords: Software steering, multi-port devices
	Discovered in Version: 16.29.2002
2684071	**Description:** Changing the default host chaining buffer size or WQE size (HOST_CHAINING_DESCRIPTORS, HOST_CHAINING_TOTAL_BUFFER_SIZE) using NVconfig might result in driver initialization failure.
	Workaround: N/A
	Keywords: Host chaining
	Discovered in Version: 16.29.2002
2445341	**Description:** Changing the TX tap setting using the SLTP PRM register function, is currently not functional.
	Workaround: N/A
	Keywords: TX tap settings, SLTP PRM register
	Discovered in Version: 16.29.2002

Internal Ref.	Issue
2411542	**Description:** Multi-APP QoS is not supported when LAG is configured.
	Workaround:
	Keywords: Multi-APP QoS, LAG
	Discovered in Version: 16.29.1016
2378593	**Description:** Sub 1sec firmware update (fast reset flow) is not supported when updating from previous releases to the current one. Doing so may cause network disconnection events.
	Workaround: Use full reset flow for firmware upgrade/downgrade.
	Keywords: Sub 1sec firmware update
	Discovered in Version: 16.29.1016
2396506	**Description:** On systems with high PCIe latency (2us or above), lower bandwidth may be experienced.
	Workaround: If such issue is observed: 1. Enable ZTT to overcome the high latency. Run: `mlxconfig -d <mst device> set ZERO_TOUCH_TUNING_ENABLE=1` 2. Reset or power cycle the firmware for change to take effect
	Keywords: Performance, ZTT
	Discovered in Version: 16.29.1016

2213356	**Description:** The following are the Steering Dump limitations:
	• Requires passing the version (FW/Stelib/MFT) and device type to stelib
	• Re-format is not supported
	• Advanced multi-port feature is not supported – LAG/ROCE_AFFILIATION/MPFS_LB/ESW_LB (only traffic vhca <-> wire)
	• Packet types supported:
	  ◦ Layer 2 Eth
	  ◦ Layer 3 IPv4/Ipv6/Grh
	  ◦ Layer 4 TCP/UDP/Bth/GreV0/GreV1
	  ◦ Tunneling VXLAN/Geneve/GREv0/Mpls
	• FlexParser protocols are not supported (e.g AliVxlan/VxlanGpe etc..).
	• Compiles only on x86

	Workaround: N/A
	Keywords: Steering Bump
	Discovered in Version: 16.29.1016
2365322	**Description:** When configuring adapter card's Level Scheduling, a QoS tree leaf (QUEUE_GROUP) configured with default rate_limit and default bw_share, may not obey the QoS restrictions imposed by any of the leaf's ancestors.
	Workaround: To prevent such a case, configure at least one of the following QoS attributes of a leaf: `max_average_bw` or `bw_share`
	Keywords: QoS
	Discovered in Version: 16.29.1016
2325629	**Description:** Occasionally, Tag Matching RNDV and NVME emulation may hang.
	Workaround: N/A
	Keywords: Tag Matching

Internal Ref.	Issue
	Discovered in Version: 16.29.1016
2301593	**Description:** Congestion Control may not work properly if the card supports two ports and each PF for each port is not raised at the same time.
	Workaround: N/A
	Keywords: Congestion Control
	Discovered in Version: 16.29.1016
2245422	**Description:** When MKEY_BY_NAME is enabled by NVCONFIG and a large number of VFs are configured, VM restart (VF/PF FLR) will take longer than when MKEY_BY_NAME is disabled
	Workaround: N/A
	Keywords: SR-IOV
	Discovered in Version: 16.28.1002
2204520	**Description:** When a cable module is plugged in but the Fiber is not connected, the link down counter may increase.
	Workaround: N/A
	Keywords: Cables, link down
	Discovered in Version: 16.28.1002
2109187	**Description:** CRC errors are observed when connecting between FPGA and ConnectX-5 using 3rd party cables.
	Workaround: N/A
	Keywords: CRC
	Discovered in Version: 16.27.2008
2064538	**Description:** When working with an NVME offload QP that is created with a unaligned page size (page_offset != 0), the QP moves to an error state on the first posted WQE.
	Workaround: Create an NVME offload QP with page an aligned size (page_offset = 0).
	Keywords: NVMF offload, unaligned page size
	Discovered in Version: 16.27.2008
2093458	**Description:** Flow Metering capability is not functional in firmware v16.27.1016.
	Workaround: To use Flow Metering, use older firmware versions.
	Keywords: Flow Metering
	Discovered in Version: 16.27.1016
2080512	**Description:** Running VF lag with TTL WA (ESWITCH_IPV4_TTL_MODIFY_ENABLE = 1) may cause performance degradation.
	Workaround: To bypass this issue, configure the following using mlxconfig: • ESWITCH_HAIRPIN_DESCRIPTORS[0..7]=11 • ESWITCH_HAIRPIN_TOT_BUFFER_SIZE[0..7]=17
	Keywords: mlxconfig, VF Lag
	Discovered in Version: 16.27.1016
2071210	**Description:** mlxconfig query for the BOOT_INTERRUPT_DIS TLV shows a wrong value in the "current value" field.

Internal Ref.	Issue
	Workaround: Use "next boot" indication to see the right value.
	Keywords: mlxconfig
	Discovered in Version: 16.27.1016
2058677	**Description:** In Socket Direct supported cards, after performing mlxfwreset, the expansion ROM register might be writable on all hosts for less than 1 second.
	Workaround: N/A
	Keywords: Expansion ROM, Socket Direct
	Discovered in Version: 16.27.1016
2057653	**Description:** quota_exceeded_command and invalid_command counters do not function properly. In this firmware version, the quota_exceeded_command counter's value always remains 0, whereas the invalid_command counter increases only for some Ethernet commands failure events.
	Workaround: N/A
	Keywords: quota_exceeded_command, invalid_command, vnic_env counters
	Discovered in Version: 16.27.1016
1930619	**Description:** PF_BAR2 and ATS cannot be enabled together, i.e. when PF_BAR2 is enabled, ATS cannot be enabled too.
	Workaround: N/A
	Keywords: ATS, SF, BAR2, Multi GVMI
	Discovered in Version: 16.26.1040
-	**Description:** In rare cases, following a server powerup, a fatal error (device's health compromised) message might appear with ext_synd 0x8d1d. The error will be accompanied by a failure to use mlxconfig and in some cases flash burning tools.
	Workaround: N/A
	Keywords: mlxconfig, flash tool, ext_synd 0x8d1d
	Discovered in Version: 16.26.1040
1888306	**Description:** Occasionally, a BlueScreen might occur when using mlxfwreset for Socket Direct devices on Windows.
	Workaround: N/A
	Keywords: mlxfwreset, Socket Direct
	Discovered in Version: 16.26.1040
1919403	**Description:** Hardware arbitration is currently disabled in OCP3.0 cards. It will be supported on future releases for the same hardware.
	Workaround: N/A
	Keywords: Hardware arbitration, OCP3.0
	Discovered in Version: 16.26.1040

Internal Ref.	Issue
1836465	**Description:** When using the hairpin feature, and using VLAN strip or using the "modify esw vport context" command, the packets can have an incorrect VLAN header. Meaning, using VLAN push/pop may not work properly when using vport context VLAN. The features that may be affected by this and not work properly are: • Host chaining • Mirroring in FDB • TTL modify in FDB • VGT+
	Workaround: N/A
	Keywords: E-switch vport context, VLAN
	Discovered in Version: 16.26.1040
1842278	**Description:** DC LAG can function only in case there is a single PF per port without any active VFs.
	Workaround: N/A
	Keywords: DC LAG
	Discovered in Version: 16.26.1040
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: 16.26.1040
1797493	**Description:** Firmware asserts may occur when setting the PF_BAR2_SIZE value higher than the maximum supported size (maximum PF_BAR2_SIZE is 4 for .
	Workaround: Configure within limits (NIC PF_BAR_SIZE <= 4).
	Keywords: Multi-GVMI, Sub-Function, SFs, BAR2
	Discovered in Version: 16.26.1040
1761271	**Description:** CWDM4 AOM cable is currently not supported.
	Workaround: N/A
	Keywords: Modules/Cables
	Discovered in Version: 16.26.1040
1762142	**Description:** PF / ECPF FLR does not clear all its dependent sub-functions. QUERY_ESW_FUNCTIONS and ALLOC/DEALLOC_SF commands might fail / show allocated SFs after PF FLR.
	Workaround: Perform a graceful shutdown, and not an FLR.
	Keywords: Multi-GVMI, SF, Sub-Functions, FLR
	Discovered in Version: 16.25.1020
1768814/1772474	**Description:** Due to hardware limitation, REG_C cannot be passed over loopback when the FDB action is forwarded to multiple destinations.
	Workaround: N/A
	Keywords: Connection-Tracking
	Discovered in Version: 16.25.1020

Internal Ref.	Issue
1770736	**Description:** When a PF or ECPF with many VFs (SR-IOV), and/or SFs (Multi-GVMI) triggers an FLR, PCIe completion timeout might occur.
	Workaround: Increase the PCIe completion timeout.
	Keywords: Multi-GVMI, SR-IOV, Sub-Function, Virtual Function, PF FLR
	Discovered in Version: 16.25.1020
1716334	**Description:** When mlxconfig.PF_BAR2_EN is enabled, configuring more than 255 PCI functions will raise an assert.
	Workaround: When working with BAR2, configure SR-IOV to align to the 255 PCI functions limitation. mlxconfig.NUM_OF_VFS controls the number of configured SR-IOV VFs. e.g.: • Smart NICs: 2 External Host PFs, 2 ARM ECPFs, 125 VFs per PF. • Non-smart NICs: 2 External Host PFs, 126 VFs per PF
	Keywords: Multi-GVMI, PF_BAR2_EN, Sub-Functions, SR-IOV, VFs
	Discovered in Version: 16.25.1020
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: 16.25.1020
1749691	**Description:** On rare occasions, when using Socket-Direct devices, inband burning through the external port might fail.
	Workaround: N/A
	Keywords: Socket-Direct, inband burning
	Discovered in Version: 16.25.1020
1689186	**Description:** Changing priority to TC map during traffic might cause packet drops.
	Workaround: N/A
	Keywords: QoS
	Discovered in Version: 16.25.1020
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: 16.25.1020
1558250	**Description:** eSwitch owner may receive NIC_VPORT_CONTEXT events from vPorts that are not necessarily armed using the nic vport context arm_change_even tbit.
	Workaround: N/A
	Keywords: Port event, NODNIC
-	**Description:** In Ethernet mode, at 10/40GbE speeds, only NO-FEC in Force mode is supported. Other user configurations are overridden.
	Workaround: N/A

Internal Ref.	Issue
	Keywords: Ethernet, 10GbE, 40GbE, RS-FEC
	Discovered in Version: 16.25.1020
1574876	**Description:** DC RoCE LAG is functional only if the router posts VRRP address as the source MAC.
	Workaround: N/A
	Keywords: DC RoCE LAG
	Discovered in Version: 16.25.1020
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: 16.25.1020
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: 16.24.1000
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: 16.24.1000
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: 16.24.1000
1523577	**Description:** When modifying the TTL in the NIC RX, the CQE checksum is not recalculated automatically. The limitation is indicated by the ttl_checksum_correction bit. If the ttl_checksum_correction=0, the capability is not functioning properly.
	Workaround: N/A
	Keywords: multi_prio_sq, VF
	Discovered in Version: 16.24.1000
1414290	**Description:** When getting an inline scatter CQE on IB striding RQ, the stride index in the CQE will be zero.
	Workaround: N/A
	Keywords: Scatter CQE
	Discovered in Version: 16.24.1000

Internal Ref.	Issue
1475490	**Description:** Reboot is not supported on any host during the PLDM firmware burning process.
	Workaround: N/A
	Keywords: PLDM
	Discovered in Version: 16.23.1020
1332714/1345824	**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: 16.23.1020
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: 16.23.1020
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: 
	Workaround: N/A
	Keywords: Steering Encapsulation / Decapsulation
	Discovered in Version: 16.23.1020
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: 16.24.1000
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: 16.23.1020
1504073	**Description:** When using ConnectX-5 with LRO over PPC systems there might be backpressure to the NIC due to delayed PCI writes operations. In this case bandwidth might drop from line-rate to ~35Gb/s. Packet loss or pause frames might also be observed.
	Workaround: Look for an indication of PCI back pressure ("outbound_pci_stalled_wr" counter in ethtools advancing). Disabling LRO helps reduce the back pressure and its effects.
	Keywords: Flow Control, LRO
	Discovered in Version: 16.23.1020

1178792	**Description**: Host Chaining Limitations:
	• Single MAC address per port is supported
	• Both ports should be configured to Ethernet when host chaining is enabled
	• The following capabilities cannot function when host chaining is enabled:
	  ◦ SR-IOV
	  ◦ DSCP
	  ◦ NODNIC
	  ◦ Load balancing
	  ◦ LAG
	  ◦ Dual Port RoCE (multi port vHCA)

	Workaround: N/A
	Keywords: Host Chaining
	Discovered in Version: 16.22.1002
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: 16.22.1002
1190753	**Description:** When a dual-port VHCA sends a RoCE packet on its non-native port. and the packet arrives to its affiliated vport FDB, a mismatch might happen on the rules that match the packet source vport.
	Workaround: N/A
	Keywords: RoCE, vport FDB
	Discovered in Version: 16.22.1002
1306342	**Description:** Signature-accessing WQEs sent locally to the NVMeF target QPs that encounter signature errors, will not send a SIGERR CQE.
	Workaround: N/A
	Keywords: Signature-accessing WQEs, NVMeF target
	Discovered in Version: 16.22.1002
1059975	**Description:** NVMeF limitation: • Transaction size - up to 128KB per IO (non-inline) • Support up to 16K connections • Support single namespace per drive • Staging buffer size must be at least 16MB in order to allow SRQ size of 64 entries
	Workaround: N/A

Internal Ref.	Issue
	Keywords: NVMeF
	Discovered in Version: 16.22.1010
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: 16.21.1000
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: 16.21.1000
1171013	**Description:** Signature Handover Operations is not supported when FPP (Function-Per-Port) mode is disabled.
	Workaround: N/A
	Keywords: Signature Handover Operations, FPP
	Discovered in Version: 16.21.1000

7 PreBoot Drivers (FlexBoot/UEFI)

7.1 FlexBoot Changes and New Features

For further information, please refer to the FlexBoot Release Notes.

7.2 UEFI Changes and Major New Features

For further information, please refer to the UEFI Release Notes.

8 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_CONF	HOST_CHAINING_MODE		0x8
	HOST_CHAINING_DESCRIPTORS		
	HOST_CHAINING_TOTAL_BUFFER_SIZE		
NV_FLEX_PARS_CONF	FLEX_PARSER_PROFILE_ENABLE		0xe
	FLEX_IPV4_OVER_VXLAN_PORT		
NV_ROCE_1_5_CONF	ROCE_NEXT_PROTOCOL		0x10
NV_INTERNAL_RESOURCE_CONF	ESWITCH_HAIRPIN_DESCRIPTORS		0x13
	ESWITCH_HAIRPIN_TOT_BUFFER_SIZE		
NV_GLOBAL_PCI_CONF	NON_PREFETCHABLE_PF_BAR		0x80
	NUM_OF_VFS		
	SRIOV_EN		
	PF_LOG_BAR_SIZE		
	VF_LOG_BAR_SIZE		
	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_GLOBAL_MASK	ece_disable_mask		0x116
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		
	log_max_outstandng_wqe		
	NV_config.sr_enable (ConnectX-6 Dx and above)		
NV_IB_DC_CONF	LOG_DCR_HASH_TABLE_SIZE		0x190

Configuration	mlxconfig Parameter Name	Class	TLV ID
	DCR_LIFO_SIZE		
NV_VPI_LINK_TYPE	LINK_TYPE	PHYSICAL_PORT (2)	0x12
NV_ROCE_CC	ROCE_CC_PRIO_MASK		0x107
	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		
	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

Configuration	mlxconfig Parameter Name	Class	TLV ID
	NUM_OF_TC		
	NUM_OF_PFC		
NV_MPFS_CONF	DUP_MAC_ACTION		0x196
	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		
	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		

9 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
16.31.1014	
NIC Scheduling	NIC scheduling feature support has been disabled for non-privileged functions.
Using NC-SI Commands for Debugging PCI Link Failures	Implemented a new NC-SI command `get_debug_info` to get mstdump via the NC-SI protocol to debug a device if the PCI link fails for any given reason.
Enable/Disable RDMA via the UEFI HII System Settings	Added support for Enabling/Disabling NIC and RDMA (port/partition) via the UEFI HII system settings. **Note:** Values set in this option only take effect when is Ethernet mode.
Increased the Maximum Number of MSIX per VF	Increased the maximum number of MSIX per VF to 127. Note that increasing the number of MSIX per VF (NUM_VF_MSIX) affects the configured number of VFs (NUM_OF_VFS). The firmware may reduce the configured number of MSIX per VF and/or the number of VFs with respect to maximum number of MSIX vectors supported by the device (MAX_TOTAL_MSIX).
Asymmetrical MSIX Configuration	This feature allows the device to be configured with a different number of MSIX vectors per physical PCI functions. To use this feature, please follow these steps: 1. Clear NUM_PF_MSIX_VALID to disable global symmetrical MSIX configuration. 2. Set PF_NUM_PF_MSIX_VALID to enable asymmetrical per Physical Function MSIX configuration. 3. Configure PF_NUM_PF_MSIX **per physical PCI function**. **Notes:** • When using this configuration, NUM_PF_MSIX (the symmetrical MSIX configuration field) will be ignored by the firmware although it will be present in the mlxconfig query. • The asymmetrical MSIX configuration and the legacy symmetrical MSIX configuration are mutually exclusive. When both are enabled, the firmware will work according to the symmetrical MSIX configuration. • Step #3 should be done on each of the physical PCI functions, otherwise, the device will use default configurations.
RDMA, NC-SI	Added support for RDMA partitioning and RDMA counters in IB mode.
Adaptive Routing (AR): multi_path, data_in_order	Added a new bit ("data_in_order") to query the QP and allow a process/library to detect when the AR is enabled.
flex_parser for GENEVE Hardware Offload and ICMP	Added a new flex parser to support GENEVE hardware offload and ICMP.

Non-Page-Supplier-FLR	When the non-page-supplier-FLR funcion is initiated, the firmware triggers a page event to the page supplier to indicate that all pages should be returned for the FLR function. Pages are returned by the driver to the kernel without issuing the MANAGE_PAGES commands to the firmare.
User Memory (UMEM)	Enabled UID 0 to create resources with UMEM.
Native IB Packets	Added support for receiving and sending native IB packets from/to the software (including all headers) via raw IBL2 QPs.
InfiniBand Packet Steering	Added support for RX RDMA NIC flow table on an IB port. Now the software can steer native IB packets to raw IB receive queues according to the DLID and the DQPN.
Bug Fixes	See Bug Fixes section.
16.30.1004	
RoCE, Lossy, slow_restart_idle	Removed triggering unexpected internal CNPs for RoCE Lossy slow_restart_idle feature.
Performance: Steering	Added support for a new NV config mode `“icm_cache_mode_large_scale_steering”` that enables less cache misses and improves performance for cases when working with many steering rules. This capability is enabled using the mlxconfig parameter `"ICM_CACHE_MODE"`.
VF/VF-group rate-limiting	This new capability enables VF/VF-group rate-limiting while per-host rate-limiter is also applied.
NvConfig: Sub-Functions	This new capability enables asymmetric Sub-Function configuration. It expands the asymmetric Sub-Function configuration to support asymmetric configurations between all PFs, and provides Sub-Function scalability and asymmetric NV configurations.
Bug Fixes	See Bug Fixes section.
16.29.2002	
Reserved QPN	**[Beta]** This capability allows the software to reserve a QPN that can be used to establish connection performed over RDMA_CM, and provide the software a unique QP number. Since RDMA_CM does not support DC, by using CREATE_QPN_RESERVED_OBJECT the software can reserve a QPN value from the firmware's managed QP number namespace range. This allows multiple software processes to hold a unique QPN value instead of using UD-QPs.
Bug Fixes	See Bug Fixes section.
16.29.1016	
Multi-Application QoS per QP	Added the option to allow applications to build their own QoS tree over the NIC hierarchy by connecting QPs to responder/ requestor Queue Groups.
InfiniBand Support in RDE	Added "InfiniBand" properties set to the Network Device Function Redfish object.

HW Support for Flow Metering	Added HW support for Flow Metering to utilize Advanced Steering Operation (ASO). HW Flow Meter allows higher scale, more accuracy, and better performance compare to the FW Flow Metering.
HW Offloads Enablement on VF	Added trust level for VFs. Once the VF is trusted, it will get a set of trusted capabilities.
Mini CQE Formats	Added 2 new Mini CQE formats: • Responder Mini CQE With Flow Tag Layout • Responder Mini CQE With l3_l4_info Layout
Enabling Adaptive-Routing (AR) for the Right SL via UCX	UCX can now enable AR by exposing Out-Of-Ordering bitmask per SL with `"ooo_per_sl"` field in the HCA_VPORT context. It can be also queried by running the `QUERY_HCA_VPORT_CONTEXT` command.
Connection Hashing	Added support for steering DP hash flow groups.
Ethernet wqe_too_small Mode	Added a new counter per vPort that counts the number of packets that reached the Ethernet RQ but cannot fit into the WQE due to their large size. Additionally, we added the option to control if such packet will cause “CQE with Error” or “CQE_MOCK”.
PCIe	PCIe Rx modifications to prevent the adapter cards from disappearing from the system.
Access Registries	`ignore_flow_level` is now enabled by the TRUST LEVEL access registry.
Counters	Added support for the `cq_overrun` counter. The counter represents the number of times CQs enter an error state due to overflow that occur when the device tries to post a CQE into a full CQ buffer.
Pause Frames from VFs	**[Beta]** Enabled the capability to allow Virtual Functions to send Pause Frames packets.
Auto-Sensing	Enabled 10/25GbE auto-sensing with 3rd party when using 10/25GbE optical cables.
Steering Dump	Hardware steering dump output used for debugging and troubleshooting. Please see Known Issue 2213356 for its limitations.
16.28.2006	
Sub Function (SF) BAR Size	Increased the minimum Sub Function (SF) BAR size from 128KB to 256KB. Due to the larger SF BAR size, for the same PF BAR2 size, which can be queried/modified by LOG_PF_BAR2_SIZE NV config, the firmware will support half of the SFs. To maintain the same amount of supported SFs, software needs to increase the LOG_PF_BAR2_SIZE NV config value by 1.
VXLAN Extension Header	This feature enables the user to define their own VXLAN extensions for the VXLAN header. The last byte of the VXLAN header is used as a length value for the private extension headers that comes after the VXLAN headers. This VXLAN extension header is supported when the "flex_parser_profile_6_supported" parameter is configured.

GPUDirect in Virtualized Environment	Enabled a direct access to ATS from the NIC to GPU buffers using PCIe peer-to-peer transactions. To enable this capability, the “p2p_ordering_mode” parameter was added to the NV_PCI_CONF configuration. **Note:** When SECURE_ALL or SECURE_TRUST is configured, ATS and RO must be set identically. When SECURE_NONE is configured, ATS and RO may be set independently as the current firmware behavior allows.
Non-Volatile Configurations	Added a new Non-Volatile Configuration parameter to control VL15 buffer size (VL15_BUFFER_SIZE). **Note:** VL15 buffer size enlargement will decrease all other VLs buffers size.
NC-SI	Added a new NC-SI command (get_device_id) to report a unique device identifier.
NC-SI	Added new NC-SI commands (`get_lldp_nb, set_lldp_nb`) to query the current status of LLDP and to enable/disable it.
ROCE ACCL	Split the SlowRestart ROCE_ACCL into the following: • `slow-restart` - used to reduce rate on retransmission events • `slow-restart-after-idle` - used to reduce rate before first transmission after >1s without transmitting
ROCE ACCL	Enabled TX PSN window size configuration using LOG_TX_PSN_WINDOW NVconfig parameter. **Note:** Due to hardware limitations, `max log_tx_psn_win` value can be set 9.
Bug Fixes	See Bug Fixes.
16.28.1002	
Flow Sampling and Mirroring	Added support for flow sampling and mirroring with an associated capable software.
Hardware Tag Matching	Increased the maximum XRQ number to 512.
Non-Volatile Configurations (NVCONFIG)	Added the following new mlxconfig parameters to the Non-Volatile Configurations section. • `log_max_outstandng_wqe` • `ece_disable_mask`
NC-SI 1.2 New Commands	Implemented the following new commands from NS-SI 1.2 specification: • Get IB Link Status • Get IB Statistics • Get PF Assignment
Resourcedump	Added the following segments, as appeared in the PRM, to the Resource Dump: • PRM_QUERY_QP • PRM_QUERY_CQ • PRM_QUERY_MKEY • QUERY_VNIC_ENV
Bug Fixes	See Bug Fixes.

10 Bug Fixes History

⚠ This section includes history of bug fixes of 3 major releases back. For older releases history, please refer to the relevant firmware versions Release Notes in https://docs.mellanox.com/category/adapterfw.

Internal Ref.	Issue
2450264	**Description:** Fixed an issue that caused TX PRBS not to change after reconfiguring it. Now all PRBS mode are enabled in test mode.
	Keywords: PRBS
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2603793	**Description:** Fixed an assert that was caused when trying to open 1024 functions on the device. The maximum number of functions is 1023.
	Keywords: Max GVMI, sub-functions
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2648336	**Description:** Disabled the CNP counter “rp_cnp_ignored " (triggered by OOS (out-of-sequence)) when all ports are IB. **Note:** For mixed IB/ETH scenario, the behavior depends on the RoCE configuration, the counter on the IB port may still increase but will not affect the regular use.
	Keywords: CNP counter, IB
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2667272	**Description:** Fixed the TMP421 sensor temperature reporting.
	Keywords: Sensor temperature
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2641734	**Description:** Fixed the rate select mechanism in QSFP modules.
	Keywords: Cables
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2600783	**Description:** Fixed classification issues for "Passive" cables to be more robust.
	Keywords: Cables
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2574322	**Description:** Fixed an issue that occasionally caused some performance issues related to RC QPs using E2E-credits (not connected to SRQ and doing send/receive traffic) when the ROCE_ACCL tx_window was enabled.
	Keywords: Bandwidth, performance

Internal Ref.	Issue
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2391109	**Description:** Fixed an issue that caused a fatal error, and eventually resulted in the HCA hanging when a packet was larger than a strided receive WQE that was being scattered.
	Keywords: Strided RQ, MTU
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2569999	**Description:** Fixed a rare issue that caused RX pipe to hang.
	Keywords: RX pipe
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2621704	**Description:** Fixed the resource number size (a 64 bit number) to avoid a scenario where it overwrote it with a 32 bit number and erased the high bits when de-allocating the resource number. In this scenario, when two resource numbers had identical low 32 bits, and because the high bits were cleared, it resulted in the same idx. Consequently, when two idxes were identical, then it freed the same idx twice.
	Keywords: Resource number size, free_4k page
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2619161	**Description:** Initialized the rate table in the static configuration so it will be configured at the link-not-up scenarios.
	Keywords: RoCE, static configuration, rate table
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2589430	**Description:** CRT_DCR with index larger than 1 << 21 can collide with the CRT_SW_RESERVED address.
	Keywords: DCR
	Discovered in Version: 16.30.1004
	Fixed in Release: 16.31.1014
2565218	**Description:** Fixed an issue that caused the TX queue to hang when the VF rate limiter was set and it was leaded as NODNIC.
	Keywords: NODNIC
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.31.1014
2799269	**Description:** Tunnel Atomics is not functional when using UMR.
	Keywords: UMR, Tunneled Atomic
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.30.1004

Internal Ref.	Issue
2507096	**Description:** Removed the option to create unnecessary internal CNP operation for the Lossy ADP retransmission feature.
	Keywords: RoCE, Lossy, Adp_retrans
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.30.1004
2444837	**Description:** Set the cap to 0 for high index functions to avoid too many parallel VF NODNIC functions.
	Keywords: NODNIC, VF, ETH PXE
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.30.1004
2455041	**Description:** Fixed an issue that prevented PF from sending out packets. A new trigger (every ~1sec) was added to trigger the VQoS algorithm to run full iteration on all the VQoS tree.
	Keywords: PF, packets, VQoS
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.30.1004
2403654	**Description:** Increased the default number of outstanding read bytes on the PCIe link for PCIe Gen4 devices when working in PCIe Gen3 servers. This will enable the NIC to maximize the PCIe link and achieve maximum bandwidth.
	Keywords: PCIe, performance
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.29.2002
2339971	**Description:** Fixed an issue that prevented MCAM from reporting support for MFBA, MFBE, MFPA registry keys although they were available through the CMDIF interface.
	Keywords: MCAM
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.29.2002
2410395	**Description:** Fixed an issue that prevented a SFP28 cable from linking up in a 25GbE speed.
	Keywords: Cables
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.29.2002
2385117	**Description:** Modified the calculation of NUM_VF_MSIX to take into account NVME, Virtio Net/Blk, HotPlug PFs & VFs. Since max_total_msix is the maximum number used for all PFs and VFs (Port, NVME. Virtio Net/Blk, HotPlug), if there are not enough MSIX for all the devices, the number of port VF MSIX may be lowered (less than NUM_VF_MSIX) in order to not exceed the max_total_msix. **Note:** In case of compatibility issues with ab old driver requiring more than 4 MSI-X, you should consider lowering number of PFs/VFs on any of the configurable functions (NVME. Virtio Net/Blk).
	Keywords: MSIX
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.29.2002

Internal Ref.	Issue
2385117	**Description:** Added protection for decapsulated packets with invalid IP (bad length). Such packets are now discarded in the hardware.
	Keywords: Decap ip_bad_length
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.29.2002
2392225	**Description:** When PER_PF_NUM_SF=1 (per PF configurations are used for SFs), if the number of SFs configured for a PF is 0 (PF_TOTAL_SF=0), than the firmware wrongly opens BAR2 with size 128KB.
	Keywords: BAR2, Sub-functions, SF
	Discovered in Version: 16.29.1016
	Fixed in Release: 16.29.2002
1911080	**Description:** Fixed a rare race condition that caused an erroneous write to the firmware image during certain power-down scenarios. This resulted in firmware being recognized as corrupted and prevented the adapter card from being recognized by the system due to missing valid Flash images.
	Keywords: Flash images, firmware corruption
	Discovered in Version: 16.24.1000
	Fixed in Release: Unable to render include or excerpt-include. Could not retrieve page.
2360496	**Description:** Changed the default value of DCQCN's NP parameter min_time_between_cnps to 4 on all devices to support larger scalability of cluster.
	Keywords: RoCE, Congestion control, DCQCN
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016
2200824	**Description:** Fixed an issue that prevented VXLAN packets with svlan/cvlan tag from being matched.
	Keywords: VXLAN
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016
2355328	**Description:** Fixed an issue that caused the `eth_wqe_too_small` counter to count ODP page faults.
	Keywords: Counters
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016
2245422	**Description:** When MKEY_BY_NAME is enabled by NVCONFIG and a large number of VFs are configured, VM restart (VF/PF FLR) will take longer than when MKEY_BY_NAME is disabled.
	Keywords: SR-IOV
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016

Internal Ref.	Issue
2282225/2241765	**Description:** Fixed an issue that resulted in low performance after enabling the RoCE Accelerator capability. **Note:** The fix is available when all ports are set as Ethernet.
	Keywords: Performance, RoCE
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016
2252559	**Description:** On rare cases, a fatal error related to errors from the PCI transport layer might be reported during FLR.
	Keywords: FLR, PCI transport layer, errors
	Discovered in Version: 16.26.1040
	Fixed in Release: 16.29.1016
2127946	**Description:** Fixed the chassis manager calculation for Multi-Host and Socket-Direct adapter cards to allow running NC-SI commands by the chassis manager BMC. Now the chassis manager is count as BMC with index 0, regardless of how many BMC there are.
	Keywords: Chassis manager, BMC
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016
2321713	**Description:** Fixed an issue that caused caused the device to go to dead IRISC as one of the firmware semaphores could not be released when a speed change or port state change was triggered.
	Keywords: IRISC, firmware semaphore,
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.29.1016
1979562	**Description:** Fixed an issue that prevented the DHCP from assigning IPv6 address to the BMC during the initialization phase.
	Keywords: DHCP, IPv6 address, BMC
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.28.2006
2215104	**Description:** Updated the following Mellanox OEM NC-SI commands to fix an issue that caused the "Port swap" capability not to function properly: • Get Temperature • Get Module Serial Data • Set Module Serial Data
	Keywords: Port swap
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.28.2006
2080917	**Description:** Fixed and issue that resulted in driver startup failure when working in pass-through mode and dual port devices.
	Keywords: Pass-through mode, dual port devices
	Discovered in Version: 16.28.1002
	Fixed in Release: 16.28.2006

Internal Ref.	Issue
2108543	**Description:** Enabled Bar configuration bytewise by applying the write_en bitmask.
	Keywords: Bytewise BAR Programming
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2089896	**Description:** Fixed an issue in the UC traffic, that prevented out-of-sequence packets at a responder from being counted.
	Keywords: Out-of-Sequence Counters
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2119975	**Description:** Fixed low PXE performance while using the VSC to trigger the send_ring_doorbells.
	Keywords: NODNIC, DOORBELL
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2127535	**Description:** Updated multi_prio_sq is as following: • SmartNIC: ECPF only • Multi host/Single Host: support for PFs. VFs should also be enabled unless explicitly disabled by the PF • UID = 0 only
	Keywords: multi_prio_sq
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2065624	**Description:** Fixed an issue related to counting CNP packets.
	Keywords: CNP packets
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2149674	**Description:** Fixed an issue that caused packets to get stuck when the Rate Limiter was enabled.
	Keywords: Rate Limiter
	Discovered in Version: 16.27.6008
	Fixed in Release: 16.28.1002
2100377	**Description:** Fixed a rare issue related to MCTP pass-through packet that caused the PCI boot sequence to fail if sent when the PCI link was not ready.
	Keywords: MCTP pass-through packet
	Discovered in Version: 16.27.1016
	Fixed in Release: 16.28.1002
2181246	**Description:** Fixed an issue related to iRISC processor internal cache mechanisms that caused context corruption.
	Keywords: iRISC processor
	Discovered in Version: 16.27.1016

Internal Ref.	Issue
	Fixed in Release: 16.28.1002
2108543	**Description:** Enabled Bar configuration bytewise by applying the write_en bitmask.
	Keywords: Bytewise BAR Programming
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
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	Keywords: multi_prio_sq
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2065624	**Description:** Fixed an issue related to counting CNP packets.
	Keywords: CNP packets
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2119135	**Description:** Fixed an issue that cause fragmented IP packets to drop.
	Keywords: Fragmented IP packet
	Discovered in Version: 16.27.2008
	Fixed in Release: 16.28.1002
2165169	**Description:** Added the option to use the unicast MAC from the NC-SI cmd Set MAC Address to establish OS to BMC passthrough.
	Keywords: OS to BMC passthrough
	Discovered in Version: 16.27.1016
	Fixed in Release: 16.28.1002
2169365	**Description:** Fixed an issue that caused PortCounters.PortRcvErr / PPCNT.infiniband_counters.PortRcvErr not to report port icrc errors.
	Keywords: InfiniBand, ICRC, PortRcvErr, PortCounters

Internal Ref.	Issue
	Discovered in Version: 16.27.1016
	Fixed in Release: 16.28.1002
2136952	**Description:** Fixed an issue that caused PCI atomic over ETH to be posted as regular atomic operations.
	Keywords: PCI Atomic, ETH
	Discovered in Version: 16.27.4000
	Fixed in Release: 16.28.1002

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