



Mellanox OFED for Linux Release Notes

Rev 4.3-1.0.1.0



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Release Update History

Release	Date	Description
Rev 4.3-1.0.1.0	March 28, 2018	Added support for installing MLNX_OFED over platform PPC64 of RHEL 7.4 operating system (see Table 1).
	March 12, 2018	Added support for installing MLNX_OFED over platform x86_64 of SLES 12 SP2 operating system (see Table 1).
	March 8, 2018	Added bug fix #1247458 to Table 10 , “ Bug Fixes History ,” on page 28.
	March 1, 2018	Initial release of this version.

1 Overview

These are the release notes of MLNX_OFED for Linux Driver, Rev 4.3-1.0.1.0 which operates across all Mellanox network adapter solutions supporting the following uplinks to servers:

Uplink/HCAs	Driver Name	Uplink Speed
ConnectX®-3/ ConnectX®-3 Pro	mlx4	<ul style="list-style-type: none"> InfiniBand: SDR, QDR, FDR10, FDR Ethernet: 10GigE, 40GigE and 56GigE^a
ConnectX®-4	mlx5	<ul style="list-style-type: none"> InfiniBand: SDR, QDR, FDR, FDR10, EDR Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, 56GigE^a, and 100GigE
ConnectX®-4 Lx		<ul style="list-style-type: none"> Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, and 50GigE
ConnectX®-5		<ul style="list-style-type: none"> InfiniBand: SDR, QDR, FDR, FDR10, EDR Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, and 100GigE
ConnectX®-5 Ex		<ul style="list-style-type: none"> InfiniBand: SDR, QDR, FDR, FDR10, EDR Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, and 100GigE
Innova™ IPsec EN		<ul style="list-style-type: none"> Ethernet: 10GigE, 40GigE
Connect-IB®		<ul style="list-style-type: none"> InfiniBand: SDR, QDR, FDR10, FDR

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

1.1 Content of Mellanox OFED for Linux

Mellanox OFED for Linux software contains the following components:

Components	Description
OpenFabrics core and ULPs	<ul style="list-style-type: none"> InfiniBand and Ethernet HCA drivers (mlx4, mlx5) core Upper Layer Protocols: IPoIB, SRP Initiator, iSER Initiator and Target, NVMeoF Host and Target
OpenFabrics utilities	<ul style="list-style-type: none"> OpenSM: IB Subnet Manager with Mellanox proprietary Adaptive Routing Diagnostic tools Performance tests SSA (SLES12): libopensmssa plugin for OpenSM, ibssa, ibacm
MPI	<ul style="list-style-type: none"> Open MPI stack supporting the InfiniBand interface MPI benchmark tests (OSU benchmarks, Intel MPI benchmarks, Presta)
PGAS	<ul style="list-style-type: none"> HPC-X OpenSHMEM supporting InfiniBand, MXM and FCA

Components	Description
HPC Acceleration packages	<ul style="list-style-type: none"> • Mellanox MXM (p2p transport library acceleration over InfiniBand) • Mellanox FCA (MPI/PGAS collective operations acceleration library over InfiniBand) • KNEM, Linux kernel module enabling high-performance intra-node MPI/PGAS communication for large messages
Extra packages	<ul style="list-style-type: none"> • ibutils2 • ibdump • MFT
Sources of all software modules (under conditions mentioned in the modules' LICENSE files) except for MFT, OpenSM plugins, ibutils2, and ibdump	
Documentation	

1.2 Supported Platforms and Operating Systems

The following are the supported OSs in MLNX_OFED Rev 4.3-1.0.1.0:

Table 1 - Supported Platforms and Operating Systems

Operating System	Platform
RHEL6.3/CentOS6.3	x86_64
RHEL6.5/CentOS6.5	x86_64
RHEL6.6/CentOS6.6	x86_64
RHEL6.7/CentOS6.7	x86_64
RHEL6.8/CentOS6.8	x86_64
RHEL6.9/CentOS6.9	x86_64/PPC64 (Power7)
RHEL7.2/CentOS7.2	x86_64/PPC64 (Power8)/PPC64LE (Power8)
RHEL7.3/CentOS7.3	x86_64/PPC64 (Power8)/PPC64LE (Power8)
RHEL7.4/CentOS7.4	x86_64/PPC64LE (Power8)/PPC64
RHEL7.4 ALT (Pegas 1.0)	Arm (Qualcomm)
RHEL7.5 ALT (Pegas 1.1)	PPC64LE (Power9)
Debian 8.5	x86_64
Debian 8.7	x86_64
Debian 8.9	x86_64
Debian 9.0 Kernel 4.9	x86_64
Debian 9.1	x86_64
Fedora 20	x86_64

Table 1 - Supported Platforms and Operating Systems

Operating System	Platform
Fedora 27	x86_64
OL 6.8	x86_64
OL 7.2	x86_64
OL 7.3	x86_64
OL 7.4	x86_64
SLES11 SP3	x86_64
SLES11 SP4	x86_64/PPC64 (Power7)
SLES12 SP2	x86_64/PPC64LE (Power8)
SLES12 SP3	x86_64/PPC64LE (Power8)
Ubuntu 16.04.03	x86_64/PPC64LE (Power8)
Ubuntu 16.04.04	x86_64/PPC64LE (Power8)
Ubuntu 17.10	x86_64/PPC64LE (Power8)
Ubuntu 18.04 (Alpha)	x86_64
Kernels 4.14-4.15	x86_64
EulerOS 2.0 SP2	Arm
EulerOS 2.0 SP3	x86_64
WindRiver 6.0	x86_64



32 bit platforms are no longer supported in MLNX_OFED.



For RPM based distributions, if you wish to install OFED on a different kernel, you need to create a new ISO image, using `mlnx_add_kernel_support.sh` script. See the MLNX_OFED User Manual for instructions.



Upgrading MLNX_OFED on your cluster requires upgrading all of its nodes to the newest version as well.

1.2.1 Supported Non-Linux Virtual Machines

The following are the supported non-Linux Virtual Machines in MLNX_OFED Rev 4.3-1.0.1.0:

Table 2 - Supported Non-Linux VMs

HCA	Windows Virtual Machine Type	WinOF version	Protocol
ConnectX-3	Windows 2012 R2 DC	MLNX_VPI 5.46	IPoIB, ETH
ConnectX-3Pro	Windows 2016 DC	MLNX_VPI 5.46	IPoIB, ETH
ConnectX-4	Windows 2012 R2 DC	MLNX_WinOF2 1.90	IB, IPoIB, ETH
ConnectX-4 Lx	Windows 2016 DC	MLNX_WinOF2 1.90	IB, IPoIB, ETH

1.2.2 Tested Hypervisors in Paravirtualized and SR-IOV Environments

Table 3 - Tested Hypervisors in Paravirtualized and SR-IOV Environments

Tested Hypervisors	HCAs	Operating System
SR-IOV	ConnectX-3/ ConnectX-3 Pro	RHEL 7.3 KVM
		RHEL 7.4 KVM
		Ubuntu 16.04.04 KVM
		RHEL 6.9 KVM
		RHEL 7.2 KVM
		WindRiver 6.0
	ConnectX-4	RHEL 7.3 KVM
		RHEL 7.4 KVM
		Ubuntu 16.04.04 KVM
		RHEL 6.9 KVM
		RHEL 7.2 KVM
	ConnectX-4 Lx	WindRiver 6.0
		RHEL 7.2 KVM
		RHEL 6.9 KVM
	ConnectX-5	Ubuntu 16.04.04 KVM
		RHEL 6.9 KVM
		RHEL 7.4 KVM
		WindRiver 6.0
		RHEL 7.5 ALT (Pegas 1.1) PPC64LE (Power9) KVM

Table 3 - Tested Hypervisors in Paravirtualized and SR-IOV Environments

Tested Hypervisors	HCAs	Operating System
Paravirtualized	ConnectX-3 Pro	RHEL7.3 PPC KVM
		RHEL7.4 PPC KVM
		Ubuntu 16.04.04 PPC KVM
	ConnectX-4	RHEL7.3 PPC KVM
		RHEL7.4 PPC KVM
		Ubuntu 16.04.04 PPC KVM
	ConnectX-4 Lx	RHEL7.3 PPC KVM
		RHEL7.4 PPC KVM
	ConnectX-5	RHEL 7.5 ALT (Pegas 1.1) PPC64LE (Power9) KVM

1.3 Hardware and Software Requirements

The following are the hardware and software requirements of MLNX_OFED Rev 4.3-1.0.1.0.

- Linux operating system
- Administrator privileges on your machine(s)
- Disk Space: 1GB

For the OFED Distribution to compile on your machine, some software packages of your operating system (OS) distribution are required.

To install the additional packages, run the following commands per OS:

Operating System	Required Packages Installation Command
RHEL/OL/Fedora	<code>yum install perl pciutils python gcc-gfortran libxml2-python tcsh libnl.i686 libnl expat glib2 tcl libstdc++ bc tk gtk2 atk cairo numactl pkgconfig ethtool lsof</code>
SLES 11 SP3	<code>zypper install perl pciutils python libnl-32bit libxml2-python tcsh libstdc++43 libnl expat glib2 tcl bc tk libcurl4 gtk2 atk cairo pkg-config ethtool lsof</code>
SLES 12	<code>zypper install pkg-config expat libstdc++6 libglib-2_0-0 lib-gtk-2_0-0 tcl libcairo2 tcsh python bc pciutils libatk-1_0-0 tk python-libxml2 lsof libnl3-200 ethtool lsof</code>
Ubuntu/Debian	<code>apt-get install perl dpkg autotools-dev autoconf libtool automake1.10 automake m4 dkms debhelper tcl tcl8.4 chrpath swig graphviz tcl-dev tcl8.4-dev tk-dev tk8.4-dev bison flex dpatch zlib1g-dev curl libcurl4-gnutls-dev python-libxml2 libvirt-bin libvirt0 libnl-dev libglib2.0-dev libgfortran3 automake m4 pkg-config libnuma logrotate ethtool lsof</code>

Operating System	Required Packages Installation Command
Debian 8	<pre>apt-get install libnl-3-200 automake debhelper curl dkms logrotate libglib2.0-0 python-libxml2 graphviz tk tcl libvirt- bin coreutils pkg-config autotools-dev flex autoconf pciutils quilt module-init-tools libvirt0 libstdc++6 dpkg libgfortran3 procps lsof libltdl-dev gcc dpatch chrpath grep m4 gfortran bison libnl-route-3-200 swig perl make ethtool lsof</pre>

1.4 Supported HCAs Firmware Versions

MLNX_OFED Rev 4.3-1.0.1.0 supports the following Mellanox network adapter cards firmware versions:

Table 4 - Supported HCAs Firmware Versions

HCA	Recommended Firmware Rev.	Additional Firmware Rev. Supported
ConnectX®-3	2.42.5000	2.40.7000
ConnectX®-3 Pro	2.42.5000	2.40.7000
ConnectX®-4	12.22.1002	12.21.2010
ConnectX®-4 Lx	14.22.1002	14.21.2010
ConnectX®-5	16.22.1002	16.21.2010
ConnectX®-5 Ex	16.22.1002	16.21.2010
Innova IPsec EN	14.22.1002	14.21.2010
Connect-IB®	10.16.1200	10.16.1020

For the official firmware versions, please see:

http://www.mellanox.com/content/pages.php?pg=firmware_download

1.5 Compatibility Matrix

MLNX_OFED Rev 4.3-1.0.1.0 is compatible with the following:

Table 5 - Compatibility Matrix

Mellanox Product	Description/Version
MLNX-OS®	MSX6036 w/w MLNX-OS® version 3.6.4006 ^a
Grid Director™	4036 w/w Grid Director™ version 3.9.1-985
Unified Fabric Manager (UFM®)	v5.10
MXM	v3.7
HCOLL ^b	v4.0
Open MPI	v3.1.x

- MLNX_OFED Rev 4.3-1.0.1.0 was tested with this switch. However, additional switches may be supported as well.
- HCOLL is now the default FCA version used in HPC-X, starting from HPC-X v1.8. This version replaces FCA v2.x.

1.6 RDMA CM and RoCE Modes

1.6.1 RoCE Modes Matrix

The following is RoCE modes matrix:

Table 6 - RoCE Modes Matrix

Software Stack / Inbox Distribution	RoCEv1 (IP Based GIDs) Supported as of Version		RoCEv2 Supported as of Version		RoCEv1 & RoCEv2 (RoCE per GID) Supported as of Version
	ConnectX-3/ ConnectX-3 Pro	ConnectX-4/ ConnectX-4 Lx/ ConnectX-5/ ConnectX-5 Ex ^a	ConnectX-3 Pro	ConnectX-4/ ConnectX-4 Lx/ ConnectX-5/ ConnectX-5 Ex ^a	ConnectX-3 Pro/ConnectX-4/ ConnectX-4 Lx/ConnectX-5/ ConnectX-5 Ex ^a
MLNX_OFED	2.1-x.x.x	3.0-x.x.x	2.3-x.x.x	3.0-x.x.x	3.0-x.x.x
Kernel.org	3.14	4.4	4.4	4.4	4.4
RHEL	6.6, 7.0	-	-	-	-
SLES	12	-	-	-	-
Ubuntu	14.04.4, 16.04, 15.10	-	-	-	-

a. Note that support for ConnectX-5 and ConnectX-5 Ex adapter cards in MLNX_OFED starts from v4.0.

1.6.2 RDMA CM Default RoCE Mode

The default RoCE mode on which RDMA CM runs is RoCEv2 instead of RoCEv1, starting from MLNX_OFED v4.1. RDMA_CM session requires both the client and server sides to support the same RoCE mode. Otherwise, the client will fail to connect to the server.

For further information, refer to [RDMA CM and RoCE Version Defaults](#) Community post.

2 Changes and New Features in Rev 4.3-1.0.1.0

The following are the changes and/or new features that have been added to this version of MLNX_OFED.

Table 7 - Changes and New Features in Rev 4.3-1.0.1.0

HCA's	Feature/Change	Description
ConnectX-5	Multi-Packet Work Request (WR)	Added support for the following multi-packet WR related verbs for control path: <ul style="list-style-type: none"> • <code>ibv_exp_query_device</code> • <code>ibv_exp_create_srq</code> For further information on the use of these verbs, please refer to the Verbs man page.
	Coherent Accelerator Processor Interface (CAPI) [beta]	Added support for CAPI, an interface that enables ConnectX-5 adapter cards to provide the best performance for Power and OpenPower based platforms.
	Tunneled Atomic	Added support for RDMA atomic commands offload so that when an RDMA Write operation is issued, the payload indicates which atomic operation to perform, instead of being written to the Memory Region (MR).
	Packet Pacing	Added support for the following advanced burst control parameters: <ul style="list-style-type: none"> • max_burst_sz - for indicating the maximal burst size of packets • typical_pkt_sz - for improving the accuracy of the rate limiter
	Erasur Coding Offload verbs	Added support for erasure coding offload software verbs (encode/decode/update API) supporting a number of redundancy blocks (m) greater than 4.
ConnectX-4/ ConnectX-4 Lx/ ConnectX-5	Virtual MAC	Removed support for Virtual MAC feature.
	RoCE LAG	Added out of box RoCE LAG support for RHEL 7.2 and RHEL 6.9.
	Dropped Counters	Added a new counter <code>rx_steer_missed_packets</code> which provides the number of packets that were received by the NIC, yet were discarded/dropped since they did not match any flow in the NIC steering flow table.
		Added the ability for SR-IOV counter <code>rx_dropped</code> to count the number of packets that were dropped while vport was down.
Relaxed Ordering (RSYNC)	Added support for RSYNC feature to ensure correct ordering of memory operations between the GPU and HCA.	
mlx5 Driver	Reset Flow	Added support for triggering software reset for firmware/driver recovery. When fatal errors occur, firmware can be reset and driver reloaded.

Table 7 - Changes and New Features in Rev 4.3-1.0.1.0

HCA's	Feature/Change	Description
ConnectX-4 Lx/ ConnectX-5	Striding RQ with HW Time-Stamping	Added the option to retrieve the HW timestamp when polling for completions from a completion queue that is attached to a multi-packet RQ (Striding RQ).
All	Bug Fixes	See Section 4, "Bug Fixes History" , on page 28.

For additional information on the new features, please refer to MLNX_OFED User Manual.

2.1 API Changes in MLNX_OFED



Note that the following APIs are deprecated and replaced with the new APIs as of MLNX_OFED version 4.0, as listed in the table below.

Table 8 - API Changes

Feature	Type	Current API	New API
Rereg MR	Verb	ibv_exp_rereg_mr	ibv_rereg_mr
Memory Window	Verb	ibv_exp_bind_mw	ibv_bind_mw
	Structure	ibv_exp_send_wr -> bind_mw	ibv_send_wr -> bind_mw
		IBV_EXP_WR_SEND_WITH_INV	IBV_WR_SEND_WITH_INV
		IBV_EXP_WR_LOCAL_INV	IBV_WR_LOCAL_INV
	Capability	IBV_EXP_WR_BIND_MW	IBV_WR_BIND_MW
		IBV_EXP_DEVICE_MEM_WINDOW	IBV_DEVICE_MEM_WINDOW
Completion	IBV_EXP_WC_WITH_INV	IBV_WC_WITH_INV	

2.2 Unsupported Functionalities/Features/HCA's

The following are the unsupported functionalities/features/HCA's in MLNX_OFED:

- ConnectX®-2 Adapter Card
- Ethernet IP over InfiniBand (eIPoIB)
- Relational Database Service (RDS)
- Ethernet over InfiniBand (EoIB) - mlx4_vnic
- Ethernet IP over InfiniBand (EIPoIB)
- mthca InfiniBand driver

3 Known Issues

The following is a list of general limitations and known issues of the various components of this Mellanox OFED for Linux release.

For the list of old known issues, please refer to Mellanox OFED Archived Known Issues file at: http://www.mellanox.com/pdf/prod_software/MLNX_OFED_Archived_Known_Issues.pdf

Table 9 - Known Issues

Internal Reference Number	Issue
-	<p>Description: NVMeoF Target Offload is not supported on Ubuntu 18.04 (at alpha level).</p> <p>Workaround: N/A</p> <p>Keywords: NVMeoF Target Offload; Ubuntu</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1241056	<p>Description: When working with ConnectX-4/ConnectX-5 HCAs on PPC systems with Hardware LRO and Adaptive Rx support, bandwidth drops from full wire speed (FWS) to ~60Gb/s.</p> <p>Workaround: Make sure to disable Adaptive Rx when enabling Hardware LRO: <code>ethtool -C <interface> adaptive-rx off</code> <code>ethtool -C <interface> rx-usecs 8 rx-frames 128</code></p> <p>Keywords: Hardware LRO, Adaptive Rx, PPC</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1318251	<p>Description: When bringing mlx4/mlx5 devices up or down, a call trace in <code>nvme_rdma_remove_one</code> or <code>nvmet_rdma_remove_one</code> may occur.</p> <p>Workaround: This is a false alarm that can be ignored.</p> <p>Keywords: NVMeoF, mlx4, mlx5, call trace</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1090612	<p>Description: NVMeoF protocol does not support LBA format with non-zero metadata size. Therefore, NVMe namespace configured to LBA format with metadata size bigger than 0 will cause Enhanced Error Handling (EEH) in PowerPC systems.</p> <p>Workaround: Configure the NVMe namespace to use LBA format with zero sized metadata.</p> <p>Keywords: NVMeoF, PowerPC, EEH</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1243581	<p>Description: In switchdev mode, the IB device exposed does not support MADs. As a result, tools such as <code>ibstat</code> that work with MADs will not function properly.</p> <p>Workaround: N/A</p> <p>Keywords: switchdev, IB representors, mlx5, MADs</p> <p>Discovered in Release: 4.3-1.0.1.0</p>

Table 9 - Known Issues

Internal Reference Number	Issue
1309621	Description: In switchdev mode default configuration, stateless offloads/steering based on inner headers is not supported.
	Workaround: To enable stateless offloads/steering based on inner headers, disable encap by running: devlink dev eswitch show pci/0000:83:00.1 encap disable Or, in case devlink is not supported by the kernel, run: echo none > /sys/kernel/debug/mlx5/<BDF>/compat/encap
	Note: This is a hardware-related limitation.
	Keywords: switchdev, stateless offload, steering
	Discovered in Release: 4.3-1.0.1.0
1268718	Description: ConnectX-5 supports up to 62 IB representors. When attempting to move to switchdev mode where more than 62 VFs are initialized, the call will fail with the following error message: “devlink answers: Invalid argument”
	Workaround: N/A
	Keywords: ConnectX-5, IB representors
	Discovered in Release: 4.3-1.0.1.0
1275082	Description: When setting a non-default IPv6 link local address or an address that is not based on the device MAC, connection establishments over RoCEv2 might fail.
	Workaround: N/A
	Keywords: IPV6, RoCE, link local address
	Discovered in Release: 4.3-1.0.1.0
1307336	Description: In RoCE LAG mode, when running <code>ibdev2netdev -v</code> , the port state of the second port of the <code>mlx4_0</code> IB device will read “NA” since this IB device does not have a second port.
	Workaround: N/A
	Keywords: mlx4, RoCE LAG, ibdev2netdev, bonding
	Discovered in Release: 4.3-1.0.1.0
1316654	Description: PKEY interface receives PTP delay requests without a time-stamp.
	Workaround: Run <code>ptp4l</code> over the parent interface.
	Keywords: PKEY, PTP
	Discovered in Release: 4.3-1.0.1.0
1296355	Description: Number of MSI-X that can be allocated for VFs and PFs in total is limited to 2300 on Power9 platforms.
	Workaround: N/A
	Keywords: MSI-X, VF, PF, PPC, SR-IOV
	Discovered in Release: 4.3-1.0.1.0

Table 9 - Known Issues

Internal Reference Number	Issue
1294934	<p>Description: Firmware reset might cause Enhanced Error Handling (EEH) on Power7 platforms.</p> <p>Workaround: N/A</p> <p>Keywords: EEH, PPC</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1259293	<p>Description: On Fedora 20 operating systems, driver load fails with an error message such as: “[185.262460] kmem_cache_sanity_check (fs_ft-es_0000:00:06.0): Cache name already exists.” This is caused by SLUB allocators grouping multiple slab kmem_cache_create into one slab cache alias to save memory and increase cache hotness. This results in the slab name to be considered stale.</p> <p>Workaround: Upgrade the kernel version to kernel-3.19.8-100.fc20.x86_64. Note that after rebooting to the new kernel, you will need to rebuild MLNX_OFED against the new kernel version.</p> <p>Keywords: Fedora, driver load</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1264359	<p>Description: When running perfest (ib_send_bw, ib_write_bw, etc.) in rdma-cm mode, the resp_cqe_error counter under /sys/class/infiniband/mlx5_0/ports/1/hw_counters/resp_cqe_error might increase. This behavior is expected and it is a result of receive WQEs that were not consumed.</p> <p>Workaround: N/A</p> <p>Keywords: perfest, RDMA CM, mlx5</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1294575	<p>Description: Traffic may hang while working in IPoIB SR-IOV environment.</p> <p>Workaround: N/A</p> <p>Keywords: IPoIB, SR-IOV</p> <p>Discovered in Release: 4.3-1.0.1.0</p>
1227577	<p>Description: Due to Enhanced IPoIB’s lack of priority-based flow control, PTP accuracy may adversely be affected by heavy TCP traffic.</p> <p>Workaround: N/A</p> <p>Keywords: Enhanced IPoIB, PTP</p> <p>Discovered in Release: 4.3-1.0.1.0</p>

Table 9 - Known Issues

Internal Reference Number	Issue
1264956	Description: Configuring SR-IOV after disabling RoCE LAG using sysfs (/sys/bus/pci/drivers/mlx5_core/<bdf>/roce_lag_enable) might result in RoCE LAG being enabled again in case SR-IOV configuration fails.
	Workaround: Make sure to disable RoCE LAG once again.
	Keywords: RoCE LAG, SR-IOV
	Discovered in Release: 4.3-1.0.1.0
1263043	Description: On RHEL7.4, due to an OS issue introduced in kmod package version 20-15.el7_4.6, parsing the depmod configuration files will fail, resulting in either of the following issues: <ul style="list-style-type: none"> • Driver restart failure prompting an error message, such as: “ERROR: Module mlx5_core belong to kernel which is not a part of MLNX_OFED, skipping...” • nvmet_rdma kernel module dysfunction, despite installing MLNX_OFED using the "--with-nvme" option. An error message, such as: “nvmet_rdma: unknown parameter 'offload_mem_start' ignored” will be seen in dmesg output
	Workaround: Go to RedHat webpage to upgrade the kmod package version.
	Keywords: driver restart, kmod, kmp, nvme, nvmet_rdma
	Discovered in Release: 4.2-1.2.0.0
1229160	Description: Changing IPoIB Tx/Rx ring size dynamically using ethtool is not permitted.
	Workaround: Use the send_queue_size/recv_queue_size module parameters to change the Tx/Rx ring size.
	Keywords: IPoIB, queue size
	Discovered in Release: 4.2-1.2.0.0
1214477	Description: On vRedHat 7.2 operating systems, when Network Manager is enabled, IPoIB interfaces may not get an IPv6 address due to an issue in the Network Manager.
	Workaround: Disable Network Manager or upgrade its version.
	Keywords: Network Manager, IPoIB, IPv6
	Discovered in Release: 4.2-1.2.0.0

Table 9 - Known Issues

Internal Reference Number	Issue
-	<p>Description: Packet Size (Actual Packet MTU) limitation for IPsec offload on Innova IPsec adapter cards: The current offload implementation does not support IP fragmentation. The original packet size should be such that it does not exceed the interface's MTU size after the ESP transformation (encryption of the original IP packet which increases its length) and the headers (outer IP header) are added:</p> <ul style="list-style-type: none"> • Inner IP packet size \leq I/F MTU - ESP additions (20) - outer_IP (20) - fragmentation issue reserved length (56) • Inner IP packet size \leq I/F MTU - 96 <p>This mostly affects forwarded traffic into smaller MTU, as well as UDP traffic. TCP does PMTU discovery by default and clamps the MSS accordingly.</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, MTU</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
-	<p>Description: No LLC/SNAP support on Innova IPsec adapter cards.</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, LLC/SNAP</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
-	<p>Description: No support for FEC on Innova IPsec adapter cards. When using switches, there may be a need to change its configuration.</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, FEC</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
955929	<p>Description: Heavy traffic may cause SYN flooding when using Innova IPsec adapter cards.</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, SYN flooding</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
-	<p>Description: Priority Based Flow Control is not supported on Innova IPsec adapter cards.</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, Priority Based Flow Control</p> <p>Discovered in Release: 4.2-1.0.0.0</p>

Table 9 - Known Issues

Internal Reference Number	Issue
-	<p>Description: Pause configuration is not supported when using Innova IPsec adapter cards. Default pause is global pause (enabled).</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, Global pause</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1045097	<p>Description: Connecting and disconnecting a cable several times may cause a link up failure when using Innova IPsec adapter cards.</p> <p>Workaround: N/A</p> <p>Keywords: Innova IPsec, Cable, link up</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
-	<p>Description: On Innova IPsec adapter cards, supported MTU is between 512 and 2012 bytes. Setting MTU values outside this range might fail or might cause traffic loss.</p> <p>Workaround: Set MTU between 512 and 2012 bytes.</p> <p>Keywords: Innova IPsec, MTU</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1177196	<p>Description: If OpenSM version is 4.8.1 and below, the IB interfaces link remains Down while the "SRIOV_IB_ROUTING_MODE_P1=1" and "SRIOV_IB_ROUTING_MODE_P2=1" flags are enabled in the HCA.</p> <p>Workaround: N/A</p> <p>Keywords: OpenSM, SR-IOV, IB link</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1118530	<p>Description: On kernel versions 4.10-4.13, when resetting sriov_numvfs to 0 on PowerPC systems, the following dmesg warning will appear: mlx5_core <BDF>: can't update enabled VF BAR0</p> <p>Workaround: Reboot the system to reset sriov_numvfs value.</p> <p>Keywords: SR-IOV, numvfs</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1125184	<p>Description: In old kernel versions, such as Ubuntu 14.04 and RedHat 7.1, VXLAN interface does not reply to ARP requests for a MAC address that exists in its own ARP table. This issue was fixed in the following newer kernel versions: Ubuntu 16.04 and RedHat 7.3.</p> <p>Workaround: N/A</p> <p>Keywords: ARP, VXLAN</p> <p>Discovered in Release: 4.2-1.0.0.0</p>

Table 9 - Known Issues

Internal Reference Number	Issue
1171764	<p>Description: Connecting multiple ports on the same server to the same subnet (IP/IB) will cause all interfaces connected to that subnet to respond to ARP requests. As a result, wrong ARP replies might be received when trying to resolve IP addresses.</p> <p>Workaround: Run the following to make sure only the interface with the requested IP address responds to the ARP request: <code>sysctl -w net.ipv4.conf.all.arp_ignore=1</code></p> <p>Keywords: IPoIB, librdmacm, ARP</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1134323	<p>Description: When using kernel versions older than version 4.7 with IOMMU enabled, performance degradations and logical issues (such as soft lockup) might occur upon high load of traffic. This is caused due to the fact that IOMMU IOVA allocations are centralized, requiring many synchronization operations and high locking overhead amongst CPUs.</p> <p>Workaround: Use kernel v4.7 or above, or a backported kernel that includes the following patches:</p> <ul style="list-style-type: none"> • 2aac630429d9 iommu/vt-d: change intel-iommu to use IOVA frame numbers • 9257b4a206fc iommu/iova: introduce per-cpu caching to iova allocation • 22e2f9fa63b0 iommu/vt-d: Use per-cpu IOVA caching <p>Keywords: IOMMU, soft lockup</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1135738	<p>Description: On 64k page size setups, DMA memory might run out when trying to increase the ring size/number of channels.</p> <p>Workaround: Reduce the ring size/number of channels.</p> <p>Keywords: DMA, 64K page</p> <p>Discovered in Release: 4.2-1.0.0.0</p>
1159650	<p>Description: When configuring VF VST, VLAN-tagged outgoing packets will be dropped in case of ConnectX-4 HCAs. In case of ConnectX-5 HCAs, VLAN-tagged outgoing packets will have another VLAN tag inserted.</p> <p>Workaround: N/A</p> <p>Keywords: VST</p> <p>Discovered in Release: 4.2-1.0.0.0</p>

Table 9 - Known Issues

Internal Reference Number	Issue
1157770	Description: On Passthrough/VM machines with relatively old QEMU and libvirt, CMD timeout might occur upon driver load. After timeout, no other commands will be completed and all driver operations will be stuck.
	Workaround: Upgrade the QEMU and libvirt on the KVM server. Tested with (Ubuntu 16.10) are the following versions: <ul style="list-style-type: none"> • libvirt 2.1.0 • QEMU 2.6.1
	Keywords: QEMU
	Discovered in Release: 4.2-1.0.0.0
1147703	Description: Using dm-multipath for High Availability on top of NVMeoF block devices must be done with “directio” path checker.
	Workaround: N/A
	Keywords: NVMeoF
	Discovered in Release: 4.2-1.0.0.0
1152408	Description: RedHat v7.3 PPCLE and v7.4 PPCLE operating systems do not support KVM qemu out of the box. The following error message will appear when attempting to run virt-install to create new VMs: Cant find qemu-kvm package to install
	Workaround: Acquire the following rpms from the beta version of 7.4ALT to 7.3/7.4 PPCLE (in the same order): <ul style="list-style-type: none"> • qemu-img-el7a.ppc64le.rpm • qemu-kvm-common-el7a.ppc64le.rpm • qemu-kvm-el7a.ppc64le.rpm
	Keywords: Virtualization, PPC, Power8, KVM, RedHat, PPC64LE
	Discovered in Release: 4.2-1.0.0.0
1012719	Description: A soft lockup in the CQ polling flow might occur when running very high stress on the GSI QP (RDMA-CM applications). This is a transient situation from which the driver will later recover.
	Workaround: N/A
	Keywords: RDMA-CM, GSI QP, CQ
	Discovered in Release: 4.2-1.0.0.0
1062940	Description: When running Network Manger on devices on which Enhanced IPoIB is enabled, CONNECTED_MODE can only be set to NO/AUTO. Setting it to YES will prevent the interface from being configured.
	Workaround: N/A
	Keywords: Enhanced IPoIB, network manager, connected_mode
	Discovered in Release: 4.2-1.0.0.0

Table 9 - Known Issues

Internal Reference Number	Issue
1078630	Description: When working in RoCE LAG over kernel v3.10, a kernel crash might occur when unloading the driver as the Network Manager is running.
	Workaround: Stop the Network Manager before unloading the driver and start it back once the driver unload is complete.
	Keywords: RoCE LAG, network manager
	Discovered in Release: 4.2-1.0.0.0
1149557	Description: When setting VGT+, the maximal number of allowed VLAN IDs presented in the sysfs is 813 (up to the first 813).
	Workaround: N/A
	Keywords: VGT+
	Discovered in Release: 4.2-1.0.0.0
1122619	Description: On Arm setups, DMA memory resource is limited due to a default CMA limitation.
	Workaround: Increase the CMA limitation or cancel its use, using the kernel's CMD line parameters: <ul style="list-style-type: none"> • Add the parameter <code>cma=256M</code> to increase the CMA limit to 256MB • Add the parameter <code>cma=0</code> to disable the use of CMA
	Keywords: IPoIB, CMA
	Discovered in Release: 4.2-1.0.0.0
1146837	Description: On SLES11 SP1 operating system, IPoIB interface renaming process may fail due to a broken udev rule, leaving interfaces with names like <code>ib0_rename</code> .
	Workaround: <ol style="list-style-type: none"> 1. Open the udev conf file <code>"/etc/udev/rules.d/70-persistent-net.rules"</code>, and remove such lines as <code>SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", =="" , NAME=="eth0"</code>. 2. Reload the driver stack.
	Keywords: IPoIB
	Discovered in Release: 4.2-1.0.0.0
965591	Description: Lustre support is limited to versions 2.9 and 2.10.
	Workaround: N/A
	Keywords: Lustre
	Discovered in Release: 4.1-1.0.2.0

Table 9 - Known Issues

Internal Reference Number	Issue
-	<p>Description: NVMeoF support is available for the following:</p> <ul style="list-style-type: none"> • SLES 12.3 and above • RHEL 7.2 and above (Host side only) • RHEL 7.4 and above (Host and Target side) • OS with distribution/custom kernel >= 4.8.x <p>Workaround: N/A</p> <p>Keywords: NVMeoF Host/Target</p>
995665/1165919	<p>Description: In kernels below v4.13, connection between NVMeoF host and target cannot be established in a hyper-threaded system with more than 1 socket.</p> <p>Workaround: On the host side, connect to NVMeoF subsystem using <code>--nr-io-queues <num_queues></code> flag. Note that <code>num_queues</code> must be lower or equal to <code>num_sockets</code> multiplied with <code>num_cores_per_socket</code>.</p> <p>Keywords: NVMeoF</p>
1039346	<p>Description: Enabling multiple namespaces per subsystem while using NVMeoF target offload is not supported.</p> <p>Workaround: To enable more than one namespace, create a subsystem for each one.</p> <p>Keywords: NVMeoF Target Offload, namespace</p>
1072347	<p>Description: <code>Ethtool -i <ibx></code> displays incorrect driver name for devices with enhanced IPoIB support.</p> <p>Workaround: N/A</p> <p>Keywords: Enhanced IPoIB, Ethtool</p>
1071457	<p>Description: PKEY-related limitations in enhanced IPoIB:</p> <ul style="list-style-type: none"> • Since the parent interface <code>ib<x></code> and the child interface <code>ib<x>.yyyy</code> share the same receive resources, the parent interface's MTU cannot be less than the child interface's MTU • Interface counters and Ethtool control are not supported on child interfaces • Parent interface should be in UP state to enable child interface to receive traffic <p>Workaround: N/A</p> <p>Keywords: PKEY, Enhanced IPoIB, MTU, Ethtool, Interface Counters</p>
1059451	<p>Description: When Enhanced IPoIB is enabled, the following module parameters will not be functional:</p> <ul style="list-style-type: none"> • <code>send_queue_size</code> • <code>recv_queue_size</code> • <code>max_nonsrq_conn_qp</code> <p>Workaround: N/A</p> <p>Keywords: Enhance IPoIB</p>

Table 9 - Known Issues

Internal Reference Number	Issue
1030301	Description: Creating virtual functions on a device that is in LAG mode will destroy the LAG configuration. The bonding device over the Ethernet NICs will continue to work as expected.
	Workaround: N/A
	Keywords: LAG, SR-IOV
1047616	Description: When node GUID of a device is set to zero (0000:0000:0000:0000), RDMA_CM user space application may crash.
	Workaround: Set node GUID to a nonzero value.
	Keywords: RDMA_CM
1061298	Description: Since enhanced IPoIB does not support connected mode on RedHat operating systems, when using network manager and enhanced IPoIB capable devices, CONNECTED_MODE must be set to NO/AUTO. Setting CONNECTED_MODE to yes will cause the interface to not be configured.
	Workaround: N/A
	Keywords: Enhanced IPoIB
1068215	Description: When enhanced IPoIB mode is enabled, ring size limit is 8k. When it is disabled, ring size limit is decreased to 4k.
	Workaround: N/A
	Keywords: Enhanced IPoIB
1051701	Description: New versions of iproute which support new kernel features may misbehave on old kernels that do not support these new features.
	Workaround: N/A
	Keywords: iproute
1007830	Description: When working on Xenserver hypervisor with SR-IOV enabled on it, make sure the following instructions are applied: <ol style="list-style-type: none"> 1. Right after enabling SR-IOV, unbind all driver instances of the virtual functions from their PCI slots. 2. It is not allowed to unbind PF driver instance while having active VFs.
	Workaround: N/A
	Keywords: SR-IOV
1008583	Description: A soft lockup in the CQ polling flow might occur when running very high stress on the GSI QP (RDMA-CM applications). This is a transient situation and the driver recovers from it after a while.
	Workaround: N/A
	Keywords: RDMA-CM

Table 9 - Known Issues

Internal Reference Number	Issue
1007356	Description: Creating a PKEY interface using “ip link” is not supported.
	Workaround: Use sysfs to create a PKEY interface.
	Keywords: IPoIB, PKEY
1000197	Description: Displaying multicast groups using sysfs may not show all the entries on Fedora 23 OS.
	Workaround: N/A
	Keywords: IPoIB
1010148	Description: Upgrading from MLNX_OFED v3.x to v4.x using yum and apt-get repositories fails.
	Workaround: Remove MLNX_OFED v3.x using the <code>ofed_uninstall.sh</code> script, and only then install MLNX_OFED v4.x as usual.
	Keywords: Installation
1005786	Description: When using ConnectX-5 adapter cards, the following error might be printed to dmesg, indicating temporary lack of DMA pages: <pre> mlx5_core ... give_pages:289:(pid x): Y pages alloc time exceeded the max permitted duration mlx5_core ... page_notify_fail:263:(pid x): Page alloca- tion failure notification on func_id(z) sent to fw mlx5_core ... pages_work_handler:471:(pid x): give fail - 12" </pre>
	Example: This might happen when trying to open more than 64 VFs per port.
	Workaround: N/A
	Keywords: mlx5_core, DMA
1008066/ 1009004	Description: Performing some operations on the user end during reboot might cause call trace/panic, due to bugs found in the Linux kernel. For example: Running <code>get_vf_stats</code> (via iptool) during reboot.
	Workaround: N/A
	Keywords: mlx5_core, reboot
1009488	Description: Mounting MLNX_OFED to a path that contains special characters, such as parenthesis or spaces is not supported. For example, when mounting MLNX_OFED to “/media/CDROM(vcd)”, installation will fail and the following error message will be displayed: <pre> # cd /media/CDROM\ (vcd\) / # ./mlnxofedinstall sh: 1: Syntax error: "(" unexpected </pre>
	Workaround: N/A
	Keywords: Installation

Table 9 - Known Issues

Internal Reference Number	Issue
982144	Description: When offload traffic sniffer is on, the bandwidth could decrease up to 50%.
	Workaround: N/A
	Keywords: Offload Traffic Sniffer
981045	Description: On kernels below v4.2, when removing a bonding module with devices different from ARPHRD_ETHER, a call trace may be received.
	Workaround: Remove the bond in the following order: Remove the slaves, delete the bond, and only then remove the bonding module.
	Keywords: Bonding
980066/981314	Description: Soft RoCE does not support Extended Reliable Connection (XRC).
	Workaround: N/A
	Keywords: Soft RoCE, XRC
982534	Description: In ConnectX-3, when using a server with page size of 64K, the UAR BAR will become too small. This may cause one of the following issues: <ol style="list-style-type: none"> 1. mlx4_core driver does not load. 2. The mlx4_core driver does load, but calls to <code>ibv_open_device</code> may return ENOMEM errors.
	Workaround: <ol style="list-style-type: none"> 1. Add the following parameter in the firmware's ini file under [HCA] section: <code>log2_uar_bar_megabytes = 7</code> 2. Re-burn the firmware with the new ini file.
	Keywords: PPC
981362	Description: On several OSs, setting a number of TC is not supported via the <code>tc</code> tool.
	Workaround: Set the number of TC via the <code>/sys/class/net/<interface>/qos/tc_num</code> sysfs file.
	Keywords: Ethernet, TC
980257	Description: An issue in InfiniBand bond interfaces may cause memory corruption in Ubuntu v14.04 and v14.10 OSs. The memory corruption happens when attempting to reload the driver while the bond is up with InfiniBand slaves.
	Workaround: Delete the bond before restarting the driver.
	Keywords: Bonding, IPoIB
980034/981311	Description: Soft RoCE counters located under <code>/sys/class/infiniband/<rx-ib>/ports/1/counters/</code> directory are not supported.
	Workaround: N/A
	Keywords: Soft RoCE

Table 9 - Known Issues

Internal Reference Number	Issue
979907	<p>Description: Only the following two experimental verbs are supported for Soft RoCE:</p> <ul style="list-style-type: none"> • <code>ibv_exp_query_device</code> • <code>ibv_exp_poll_cq</code>. <p>Workaround: N/A</p> <p>Keywords: Soft RoCE</p>
979457	<p>Description: When setting IOMMU=ON, a severe performance degradation may occur due to a bug in IOMMU.</p> <p>Workaround: Make sure the following patches are found in your kernel:</p> <ul style="list-style-type: none"> • <code>iommu/vt-d: Fix PASID table allocation</code> • <code>iommu/vt-d: Fix IOMMU lookup for SR-IOV Virtual Functions</code> <p>Note: These patches are already available in Ubuntu 16.04.02 and 17.04 OSs.</p> <p>Keywords: Performance, IOMMU</p>
977852	<p>Description: <code>rdma_cm</code> running over IB ports does not support UD QPs on ConnectX-3 adapter cards.</p> <p>Workaround: N/A</p> <p>Keywords: SR-IOV, RDMA CM</p>
955113/977990	<p>Description: In RoCE LAG over ConnectX-4 adapter cards, the script <code>ibdev2netdev</code> may show a wrong port state for the bonded device. This means that although the IB device/port <code>mlx5_bond_0/1</code> is up (as seen in <code>ibstat</code>), <code>ibdev2netdev</code> may report that it is down.</p> <p>Workaround: N/A</p> <p>Keywords: RoCE, LAG, bonding</p>

4 Bug Fixes History

This table lists the bugs fixed in this release.

For the list of old bug fixes, please refer to MLNX_OFED Archived Bug Fixes file at: http://www.mellanox.com/pdf/prod_software/MLNX_OFED_Archived_Bug_Fixes.pdf

Table 10 - Bug Fixes History

Internal Ref	Issue
1181815	Description: Fixed an issue where 4K UD packets were dropped when working with 4K MTU on mlx4 devices.
	Keywords: mlx4, 4K MTU, UD
	Discovered in Release: 4.2-1.2.0.0
	Fixed in Release: 4.3-1.0.1.0
1247458	Description: Added support for VLAN Tag (VST) creation on RedHat v7.4 with new iproute2 packages (iptool).
	Keywords: SR-IOV, VST, RedHat
	Discovered in Release: 4.2-1.2.0.0
	Fixed in Release: 4.3-1.0.1.0
1229554	Description: Enabled RDMA CM to honor incoming requests coming from ports of different devices.
	Keywords: RDMA CM
	Discovered in Release: 4.2-1.0.0.0
	Fixed in Release: 4.3-1.0.1.0
1262257	Description: Fixed an issue where sending Work Requests (WRs) with multiple entries where the first entry is less than 18 bytes used to fail.
	Keywords: ConnectX-5; libibverbs; Raw QP
	Discovered in Release: 4.2-1.2.0.0
	Fixed in Release: 4.3-1.0.1.0
1249358/1261023	Description: Fixed the issue of when the interface was down, ethtool counters ceased to increase. As a result, RoCE traffic counters were not always counted.
	Keywords: Ethtool counters, mlx5
	Discovered in Release: 4.2-1.2.0.0
	Fixed in Release: 4.3-1.0.1.0
1244509	Description: Fixed compilation errors of MLNX_OFED over kernel when CONFIG_PTP_1588_CLOCK parameter was not set.
	Keywords: PTP, mlx5e
	Discovered in Release: 4.2-1.2.0.0
	Fixed in Release: 4.3-1.0.1.0

Table 10 - Bug Fixes History

Internal Ref	Issue
1266802	Description: Fixed an issue where the system used to hang when trying to allocate multiple device memory buffers from different processes simultaneously.
	Keywords: Device memory programming
	Discovered in Release: 4.2-1.0.0.0
	Fixed in Release: 4.3-1.0.1.0
1120424	Description: Fixed incorrect SGE number of RSS QP.
	Keywords: RSS, SGE
	Discovered in Release: 4.1-1.0.2.0
	Fixed in Release: 4.2-1.0.0.0
1078887	Description: Fixed an issue where post_list and CQ_mod features in perftest did not function when running the --run_indefinitely flag.
	Keywords: perftest, --run_indefinitely
	Discovered in Release: 4.2-1.0.1.0
	Fixed in Release: 4.2-1.2.0.0
1186260	Description: Fixed the issue where CNP counters exposed under /sys/class/infiniband/mlx5_bond_0/ports/1/hw_counters/ did not aggregate both physical functions when working in RoCE LAG mode.
	Keywords: RoCE, LAG, ECN, Congestion Counters
	Discovered in Release: 4.2-1.0.1.0
	Fixed in Release: 4.2-1.2.0.0
1178129	Description: Fixed an issue that prevented Windows virtual machines running over MLNX_OFED Linux hypervisors from operating ConnectX-3 IB ports. When such failures occurred, the following message (or similar) appeared in the Linux HV message log when users attempted to start up a Windows VM running a ConnectX-3 VF: “mlx4_core 0000:81:00.0: vhc command 0x1a slave:1 in_param 0x793000 in_mod=0x210 op_mod=0x0 failed with error:0, status -22”
	Keywords: SR-IOV, RDMA, VM, KVM, Windows
	Discovered in Release: 4.2-1.0.1.0
	Fixed in Release: 4.2-1.2.0.0
1192374	Description: Fixed wrong calculation of max_device_ctx capability in ConnectX-4, ConnectX-4 Lx, and ConnectX-5 HCAs.
	Keywords: ibv_exp_query_device, max_device_ctx mlx5
	Discovered in Release: 4.2-1.0.1.0
	Fixed in Release: 4.2-1.2.0.0

Table 10 - Bug Fixes History

Internal Ref	Issue
1084791	Description: Fixed the issue where occasionally, after reboot, rpm commands used to fail and create a core file, with messages such as “Bus error (core dumped)”, causing the openibd service to fail to start.
	Keywords: rpm, openibd
	Discovered in Release: 3.4-2.0.0.0
	Fixed in Release: 4.2-1.0.0.0
960642/960653	Description: Added support for <code>min_tx_rate</code> and <code>max_tx_rate</code> limit per virtual function ConnectX-5 and ConnectX-5 Ex adapter cards.
	Keywords: SR-IOV, mlx5
	Discovered in Release: 4.0-1.0.1.0
	Fixed in Release: 4.2-1.0.0.0
866072/869183	Description: Fixed the issue where RoCE v2 multicast traffic using RDMA-CM with IPv4 address was not received.
	Keywords: RoCE
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.2-1.0.0.0
1163835	Description: Fixed an issue where <code>ethtool -P</code> output was 00:00:00:00:00:00 when using old kernels.
	Keywords: ethtool, Permanent MAC address, mlx4, mlx5
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.2-1.0.0.0
1067158	Description: Replaced a few “GPL only” legacy libibverbs functions with upstream implementation that conforms with libibverbs GPL/BSD dual license model.
	Keywords: libibverbs, license
	Discovered in Release: 4.1-1.0.2.0
	Fixed in Release: 4.2-1.0.0.0
1119377	Description: Fixed an issue where ACCESS_REG command failure used to appear upon RoCE Multihost driver restart in dmesg. Such an error message looked as follows: <pre>mlx5_core 0000:01:00.0: mlx5_cmd_check:705:(pid 20037): ACCESS_REG(0x805) op_mod(0x0) failed, status bad parameter(0x3), syndrome (0x15c356)</pre>
	Keywords: RoCE, multihost, mlx5
	Discovered in Release: 4.1-1.0.2.0
	Fixed in Release: 4.2-1.0.0.0

Table 10 - Bug Fixes History

Internal Ref	Issue
1122937	Description: Fixed an issue where concurrent client requests got corrupted when working in persistent server mode due to a race condition on the server side.
	Keywords: librdmacm, rping
	Discovered in Release: 4.1-1.0.2.0
	Fixed in Release: 4.2-1.0.0.0
1102158	Description: Fixed an issue where client side did not exit gracefully in RTT mode when the server side was not reachable.
	Keywords: librdmacm, rping
	Discovered in Release: 4.1-1.0.2.0
	Fixed in Release: 4.2-1.0.0.0
1038933	Description: Fixed a backport issue where IPv6 procedures were called while they were not supported in the underlying kernel.
	Keywords: iw_cm
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
1064722	Description: Added log debug prints when changing HW configuration via DCB. To enable log debug prints, run: <code>ethtool -s <devname> msglvl hw on/off</code>
	Keywords: DCB, msglvl
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
1013076	Description: Fixed the issue where reassembly of packets larger than 64k might have failed when ipfrag threshold was low. This issue was present only on RHEL 6.3, 6.4, 6.5, and Ubuntu 12.04. This packet drop could be seen from the netstat tool, indicated by the “packet reassembles failed” counter.
	Keywords: IPoIB, Packet Fragmentation
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
1022251	Description: Fixed SKB memory leak issue that was introduced in kernel 4.11, and added warning messages to the Soft RoCE driver for easy detection of future SKB leaks.
	Keywords: Soft RoCE
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0

Table 10 - Bug Fixes History

Internal Ref	Issue
1044546	Description: Fixed the issue where a kernel crash used to occur when RXe device was coupled with a virtual (dummy) device.
	Keywords: Soft RoCE
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
1047617	Description: Fixed the issue where a race condition in the RoCE GID cache used to cause for the loss of IP-based GIDs.
	Keywords: RoCE, GID
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
1006768	Description: Fixed the issue where an rdma_cm connection between a client and a server that were on the same host was not possible when working over VLAN interfaces.
	Keywords: RDMACM
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
801807	Description: Fixed an issue where RDMACM connection used to fail upon high connection rate accompanied with the error message: RDMA_CM_EVENT_UNREACHABLE.
	Keywords: RDMACM
	Discovered in Release: 3.0-2.0.1
	Fixed in Release: 4.1-1.0.2.0
869768	Description: Fixed the issue where SR-IOV was not supported in systems with a page size greater than 16KB.
	Keywords: SR-IOV, mlx5, PPC
	Discovered in Release: 4.0-2.0.0.1
	Fixed in Release: 4.1-1.0.2.0
1155972	Description: Fixed mlx4 kernel crash upon server shutdown due to NULL pointer dereference.
	Keywords: mlx4, shutdown
	Discovered in Release: 3.3-1.0.4.0
	Fixed in Release: 4.0-2.0.0.1

Table 10 - Bug Fixes History

Internal Ref	Issue
919545	Description: Fixed the issue of when the Kernel becomes out of memory upon driver start, it could crash on SLES 12 SP2.
	Keywords: mlx_5 Eth Driver
	Discovered in Release: 3.4-2.0.0.0
	Fixed in Release: 4.0-2.0.0.1
970668	Description: Fixed the issue where very high stress on DC QP transport might have triggered NMI messages on specific servers.
	Keywords: mlx5 Driver
	Discovered in Release: 4.0-1.0.1.0
	Fixed in Release: 4.0-2.0.0.1
966134	Description: Allowed Ethernet VFs to open Raw Ethernet QPs even if RoCE is not supported for the VF.
	Keywords: mlx4_ib
	Discovered in Release: 3.0-1.0.1
	Fixed in Release: 4.0-2.0.0.1
864063	Description: Fixed the issue of when Spoof-check may have been turned on for MAC address 00:00:00:00:00:00.
	Keywords: mlx4
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-2.0.0.1
869209	Description: Fixed an issue that caused TCP packets to be received in an out of order manner when Large Receive Offload (LRO) is on.
	Keywords: mlx5_en
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 4.0-2.0.0.1
913319	Description: Fixed the issue of low performance when creating many address handles.
	Keywords: libibverbs
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-1.0.1.0
912897	Description: Added debug prints to <code>ib_umem_get</code> function to fix lack of error indication when this function fails.
	Keywords: InfiniBand
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-1.0.1.0

Table 10 - Bug Fixes History

Internal Ref	Issue
945887	Description: [ConnectX-3] Fixed the issue where multicast traffic over Raw Ethernet QP on virtual functions were received on the same QP (loopback).
	Keywords: SR-IOV
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-1.0.1.0
920292	Description: Fixed three issues in libmlx5 that were found by NVIDIA in the patches that are part of MLNX_OFED v3.4: <ol style="list-style-type: none"> 1. <code>mlx5_exp_peer_commit_qp</code> returns number of entries = 4 instead of 3. 2. Peer capability check is wrong - should fail the check when there is neither NOR nor GEQ support. 3. Missing break in <code>mlx5_exp_peer_peek_cq</code>. There is now fallthrough in the <code>IBV_EXP_PEER_PEEK_ABSOLUTE</code> case.
	Keywords: libmlx5
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-1.0.1.0
890285	Description: Fixed the issue where memory allocation for CQ buffers used to fail when increasing the RX ring size.
	Keywords: <code>mlx5_core</code>
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-1.0.1.0
867094	Description: Fixed the issue where MLNX_OFED used to fail to load on 4K page Arm architecture.
	Keywords: Arm
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 4.0-1.0.1.0

5 Change Log History

Table 11 - Change Log History

Category	Description
HCA: ConnectX-4/ConnectX-4 Lx/ConnectX-5	
4.2-1.2.0.0	
DSCP Trust Mode	Added support for automatically setting the number of TC to 8 when the Trust state is changed to DSCP.
Receive Buffer	Added xon and xoff columns to the Receive Buffer configuration display.
4.2-1.0.0.0	
HCA: mlx5 Driver	
Physical Address Memory Allocation	Added support to register a specific physical address range.
HCA: Innova IPsec EN	
Innova IPsec Adapter Cards	Added support for Mellanox Innova IPsec EN adapter card, that provides security acceleration for IPsec-enabled networks.
HCA: ConnectX-4/ConnectX-4 Lx/ConnectX-5	
Precision Time Protocol (PTP)	Added support for PTP feature over PKEY interfaces. This feature allows for accurate synchronization between the distributed entities over the network. The synchronization is based on symmetric Round Trip Time (RTT) between the master and slave devices, and is enabled by default.
1PPS Time Synchronization	Added support for One Pulse Per Second (1PPS) over IPoIB interfaces.
Virtual MAC	Added support for Virtual MAC feature, which allows users to add up to 4 virtual MACs (VMACs) per VF. All traffic that is destined to the VMAC will be forwarded to the relevant VF instead of PF. All traffic going out from the VF with source MAC equal to VMAC will go to the wire also when Spoof Check is enabled. For further information, please refer to “Virtual MAC” section in MLNX_OFED User Manual.
Receive Buffer	Added the option to change receive buffer size and cable length. Changing cable length will adjust the receive buffer's xon and xoff thresholds. For further information, please refer to “Receive Buffer” section in MLNX_OFED User Manual.
GRE Tunnel Offloads	Added support for the following GRE tunnel offloads: <ul style="list-style-type: none"> • TSO over GRE tunnels • Checksum offloads over GRE tunnels • RSS spread for GRE packets
NVMeoF	Added support for the host side (RDMA initiator) in RedHat 7.2 and above.
Dropless Receive Queue (RQ)	Added support for the driver to notify the FW when SW receive queues are overloaded.

Table 11 - Change Log History

Category	Description
PFC Storm Prevention	Added support for configuring PFC stall prevention in cases where the device unexpectedly becomes unresponsive for a long period of time. PFC stall prevention disables flow control mechanisms when the device is stalled for a period longer than the default pre-configured timeout. Users now have the ability to change the default timeout by moving to auto mode. For further information, please refer to “PFC Stall Prevention” section in MLNX_OFED User Manual.
Force DSCP	Added support for this feature that enables setting a global traffic_class value for all RC QPs.
HCAs: ConnectX-5	
Q-in-Q	Added support for Q-in-Q VST feature in ConnectX-5 adapter cards family.
Device Memory Programming [beta]	Added support for on-chip memory allocation and usage in send/receive and RDMA operations at beta level.
Virtual Guest Tagging (VGT+)	Added support for VGT+ in ConnectX-4/ConnectX-5 HCAs. This feature is an advanced mode of Virtual Guest Tagging (VGT), in which a VF is allowed to tag its own packets as in VGT, but is still subject to an administrative VLAN trunk policy. The policy determines which VLAN IDs are allowed to be transmitted or received. The policy does not determine the user priority, which is left unchanged. For further information, please refer to “Virtual Guest Tagging (VGT+)” section in MLNX_OFED User Manual.
Tag Matching Offload	Added support for hardware Tag Matching offload with Dynamically Connected Transport (DCT).
HCAs: ConnectX-3/ConnectX-3 Pro	
Shared Memory Region (MR)	Removed support for Shared MR feature on ConnectX-3/ConnectX-3 Pro adapter cards. As a result of this change, the following API/flags should not be used: <ul style="list-style-type: none"> ibv_exp_reg_shared_mr access shared flags for ibv_exp_reg_mr (IBV_EXP_ACCESS_SHARED_MR_XXX)
HCAs: All	
CRDUMP	Added support for the driver to take an automatic snapshot of the device’s CR-Space in cases of critical failures. For further information, please refer to “CRDUMP” section in MLNX_OFED User Manual.
Upstream Libraries	Added the option to install upstream libraries (based on upstream rdma-core) for DPDK users only. For further information, please refer to “Installing Upstream rdma-core Libraries” section in MLNX_OFED User Manual.
DiSNI	Added the option to install libdisni package as part of MLNX_OFED. For further information, please refer to section “Installing libdisni Package” in MLNX_OFED User Manual.

Table 11 - Change Log History

Category	Description
Service Scripts	Added the ability to disable the ‘stop’ option in the openibd service script, by setting ALLOW_STOP=no in /etc/infiniband/openib.conf. Starting from the next release, ‘stop’ option will be disabled by default, and in order to enable it, ALLOW_STOP should be set to ‘yes’ in the conf file, or force-stop should be run.
4.1-1.0.2.0	
HCAs: mlx5 Driver	
RoCE Diagnostics and ECN Counters	Added support for additional RoCE diagnostics and ECN congestion counters under /sys/class/infiniband/mlx5_0/ports/1/hw_counters/ directory. For further information, refer to the Understanding mlx5 Linux Counters and Status Parameters Community post.
rx-fcs Offload (eth-tool)	Added support for rx-fcs ethtool offload configuration. Normally, the FCS of the packet will be truncated by the ASIC hardware before sending it to the application socket buffer (skb). Ethtool allows to set the rx-fcs not to be truncated, but to pass it to the application for analysis. For more information and usage, refer to Understanding ethtool rx-fcs for mlx5 Drivers Community post.
DSCP Trust Mode	Added the option to enable PFC based on the DSCP value. Using this solution, VLAN headers will no longer be mandatory for use. For further information, refer to the HowTo Configure Trust Mode on Mellanox Adapters Community post.
RoCE ECN Parameters	ECN parameters have been moved to the following directory: /sys/kernel/debug/mlx5/<PCI BUS>/cc_params/ For more information, refer to the HowTo Configure DCQCN (RoCE CC) for ConnectX-4 (Linux) Community post.
Flow Steering Dump Tool	Added support for mlx_fs_dump, which is a python tool that prints the steering rules in a readable manner.
Secure Firmware Updates	Firmware binaries embedded in MLNX_OFED package now support Secure Firmware Updates. This feature provides devices with the ability to verify digital signatures of new firmware binaries, in order to ensure that only officially approved versions are installed on the devices. For further information on this feature, refer to Mellanox Firmware Tools (MFT) User Manual.
Enhanced IPoIB	Added support for Enhanced IPoIB feature, which enables better utilization of features supported in ConnectX-4 adapter cards, by optimizing IPoIB data path and thus, reaching peak performance in both bandwidth and latency. Enhanced IPoIB is enabled by default.
PeerDirect	Added the ability to open a device and create a context while giving PCI peer attributes such as name and ID. For further details, refer to the PeerDirect Programming Community post.

Table 11 - Change Log History

Category	Description
Probed VFs	Added the ability to disable probed VFs on the hypervisor. For further information, see HowTo Configure and Probe VFs on mlx5 Drivers Community post.
Local Loopback	Improved performance by rendering Local loopback (unicast and multicast) disabled by mlx5 driver by default while local loopback is not in use. The mlx5 driver keeps track of the number of transport domains that are opened by user-space applications. If there is more than one user-space transport domain open, local loopback will automatically be enabled.
1PPS Time Synchronization (at alpha level)	Added support for One Pulse Per Second (1PPS), which is a time synchronization feature that allows the adapter to send or receive 1 pulse per second on a dedicated pin on the adapter card. For further information on this feature, refer to the HowTo Test 1PPS on Mellanox Adapters Community post.
Precision Time Protocol (PTP)	Added support for PTP feature in IPoIB offloaded devices. This feature allows for accurate synchronization between the distributed entities over the network. The synchronization is based on symmetric Round Trip Time (RTT) between the master and slave devices. The feature is enabled by default. For further information, refer to Running Linux PTP with ConnectX-4 Community post.
Fast Driver Unload	Added support for fast driver teardown in shutdown and kexec flows.
HCAs: ConnectX-5/ConnectX-5 Ex	
NVMeoF Target Offload	Added support for NVMe over fabrics (NVMeoF) offload, an implementation of the new NVMeoF standard target (server) side in hardware. For further information on NVMeoF Target Offload, refer to HowTo Configure NVMeoF Target Offload .
MPI Tag Matching	Added support for offloading MPI tag matching to HCA.
HCAs: All	
RDMA CM	Changed the default RoCE mode on which RDMA CM runs to RoCEv2 instead of RoCEv1. RDMA_CM session requires both the client and server sides to support the same RoCE mode. Otherwise, the client will fail to connect to the server. For further information, refer to RDMA CM and RoCE Version Defaults Community post.
Lustre	Added support for Lustre file system open-source project.
4.0-2.0.2.0	
Operating Systems	Added support for Ubuntu v17.04.
4.0-2.0.0.1	
PCIe Error Counting	[ConnectX-4/ConnectX-4 Lx] Added the ability to expose physical layer statistical counters to ethtool.

Table 11 - Change Log History

Category	Description
Multiprotocol Label Switching (MPLS) Tagged Packets Classification	[ConnectX-4/ConnectX-4 Lx] Enabled packet flow steering rules with IPv4/IPv6 classification (for raw packet QP (DPDK) only) to work on IPv4/IPv6 over MPLS (Ethertype 0x8847 and 0x8848) encapsulated packets.
RoCE VFs	[ConnectX-4/ConnectX-4 Lx] Added the ability to enable/disable RoCE on VFs.
RoCE LAG	[ConnectX-4/ConnectX-4 Lx] Added support for RoCE over LAG interface.
Standard ethtool	[ConnectX-4/ConnectX-4 Lx] Added support for flow steering and rx-all mode.
SR-IOV Bandwidth Share for Ethernet/ RoCE (beta)	[ConnectX-4/ConnectX-4 Lx] Added the ability to guarantee the minimum rate of a certain VF in SR-IOV mode.
Adapter Cards	Added support for ConnectX-5 and ConnectX-5 Ex HCAs.
DSCP ConfigFS Control for RDMA-CM QPs	Added the ability to configure ToS/DSCP for RDMA-CM QPs only.
Soft RoCE (beta)	Add software implementation of RoCE that allows RoCE to run on any Ethernet network adapter whether it offers hardware acceleration or not.
NVMe over Fabrics (NVMeoF)	NVMeoF related module installation has been disabled by default. In order to enable it, add the "--with-nvmf" installation option to the "mlnxofedinstall" script.
NFS over RDMA (NFSoRDMA)	Removed support for NFSoRDMA drivers. These drivers are no longer provided along with the MLNX_OFED package.
3.4-2.0.0.0	
NVMeoF	Added support for NVMeoF in host/target systems over RDMA.
3.4-1.0.0.0	
VST Q-in-Q	[ConnectX®-3/ConnectX®-3 Pro] Added support for Q-in-Q encapsulation per VF in Linux (VST) for ConnectX-3 Pro adapter cards.
Package Content	[ConnectX®-3/ConnectX®-3 Pro] SR-IOV enabled firmware binaries for ConnectX-3 has been removed from MLNX_OFED package (the installation flag "--enable-sriov" has been deprecated). To configure SR-IOV, please use the "mlxconfig" or "mstconfig" utilities.
	[ConnectX®-3/ConnectX®-3 Pro] MLNX_OFED repository metadata files has been moved to the folder holding the binary packages (named "RPMS" in rpm based OS, and "DEBS" in Debian based OS). Please update your repository configuration file accordingly (refer to the MLNX_OFED User Manual for more details about setting up MLNX_OFED as a repository).

Table 11 - Change Log History

Category	Description
Raw Ethernet Programming	<p>[ConnectX®-4/ConnectX®-4 Lx] Added new APIs for enhanced raw Ethernet programming:</p> <ul style="list-style-type: none"> • Packet Pacing • TCP Segmentation Offload (TSO) • ToS based steering • Flow ID based steering (beta) • VxLAN based steering (beta) <p>For further information, refer to the “Programming” section in OFED User Manual.</p>
Enhanced PCIe Error Recovery	<p>[ConnectX®-4/ConnectX®-4 Lx] Enhanced PCIe error recovery by adding the following behaviors to the flow:</p> <ul style="list-style-type: none"> • In case SR-IOV is enabled during the recovery process, it will not get automatically disabled and will require the administrator that enabled it to disable it. • When the driver goes down, VF PCI function will not be removed. • Ethernet interface attributes (MTU, state, ring size, etc...) will be recovered after the error recovery stage is completed. • The net device kernel layer will not be aware of any ongoing PCI error recovery process.
SR-IOV Max Rate Limit Ethernet/RoCE (beta level)	<p>[ConnectX®-4/ConnectX®-4 Lx] Added the ability to rate-limit traffic per Virtual Function in SR-IOV mode.</p>
Dynamically tuned Interrupt Moderation (DIM)	<p>[ConnectX®-4/ConnectX®-4 Lx] Added support for dynamically controlling the interrupts per channel to ensure maximum packet rate with minimum interrupt rate. This feature is enabled by default.</p>
Dump Configuration	<p>[ConnectX®-4/ConnectX®-4 Lx] Added support for dump configuration which helps dumping driver and firmware configuration using ethtool. It creates a backup of the configuration files into a specified dump file.</p>
Ethernet Counters	<p>[ConnectX®-4/ConnectX®-4 Lx] Updated the list of counters the can be retrieved via ethtool for mlx5 driver, changed counters names and added new counters.</p>
Mellanox PeerDirect Async (beta level)	<p>[ConnectX®-3/ConnectX®-3 Pro/ConnectX®-4/ConnectX®-4 Lx] The experimental PeerDirect Async APIs have been changed to make the implementation of peer clients simpler. Note the following:</p> <ul style="list-style-type: none"> • These changes are not backward compatible. • The code adds CQ polling support for peer devices that do not support the NOR operation, replacing it with a GEQ operation. <p>To see the API changes, refer to the man page.</p>
ABI Incompatibility	<p>[ConnectX®-3/ConnectX®-3 Pro/ConnectX®-4/ConnectX®-4 Lx] Added the ability to fix the issue of preventing the load of MLNX_EN modules when a new kernel is not compatible with these modules.</p>

Table 11 - Change Log History

Category	Description
Mellanox Scalable Hierarchical Aggregation Protocol (SHARP™)	<p>[Connect-IB/ConnectX®-3/ConnectX®-3 Pro/ConnectX®-4] IB only: This technology improves the performance of MPI operation by offloading collective operations from the CPU and dispatching to the switch network, and eliminating the need to send data multiple times between endpoints. This approach decreases the amount of data traversing the network as aggregation nodes are reached, and dramatically reduces the MPI operation time. For further information on SHARP and its configuration, see SHARP Deployment Guide.</p>
3.3-1.0.0.0	
VF MAC Address Anti-Spoofing	[ConnectX-4/ConnectX-4 Lx] Also known as MAC spoof-check, the VF MAC Address Anti-Spoofing prevents malicious VFs from faking their MAC addresses.
VF All-multi Mode	[ConnectX-4/ConnectX-4 Lx] Added support for the VF to enter all-multi RX mode, meaning that in addition to the traffic originally targeted to the VF, it will receive all the multicast traffic sent from/to the other functions on the same physical port. Note: Only privileged/trusted VFs can enter the all-multi RX mode.
VF Promiscuous Mode	[ConnectX-4/ConnectX-4 Lx] Added support for the VF to enter promiscuous RX mode, meaning that in addition to the traffic originally targeted to the VF, it will receive the unmatched traffic and all the multicast traffic that reaches the physical port. The unmatched traffic is any traffic's DMAC that does not match any of the VFs' or PFs' MAC addresses. Note: Only privileged/trusted VFs can enter the promiscuous RX mode.
Privileged VF	[ConnectX-4/ConnectX-4 Lx] Added support for determining privileged/trusted VFs so security sensitive features can be enabled for these VFs, such as entering promiscuous and all-multi RX modes.
DCBX	[ConnectX-4/ConnectX-4 Lx] Added support for standard DCBX CEE API.
Per Priority Counters	[ConnectX-4/ConnectX-4 Lx] Exposed performance counters per priority.
IB Error Counters	[ConnectX-4/ConnectX-4 Lx] Exposed IB sysfs error counters for mlx5 driver.
Accelerated Receive Flow Steering (aRFS)	[ConnectX-4/ConnectX-4 Lx] Boosts the speed of RFS by adding hardware assistance. RFS is an in-kernel-logic responsible for load balancing between CPUs by attaching flows to CPUs that are used by flow's owner applications.
Packet Pacing for UDP/TCP	[ConnectX-4/ConnectX-4 Lx] Performs rate limit per UDP/TCP connection.
OFED Scripts	Renamed the UP name that appears in mlnx_perf report to "TC", as the mlnx_perf script counts the packets and calculates the bandwidth on rings that belong to the same Traffic Class (TC).
Physical Memory Allocation	Added support for Physical Address Memory Region (PA-MR) which allows managing physical memory used for posting send and receive requests.
MAD Congestion Control	Added an SA MAD congestion control mechanism that is configurable using sysfs entries.
IB Router	Added the ability to send traffic between two or more subnets.

Table 11 - Change Log History

Category	Description
PeerDirect Async	Mellanox PeerDirect Async™ sub-system gives peer hardware devices, such as GPU cards, and dedicated AS accelerators the ability to take control over HCA in critical path offloading CPU.
Physical MR	Allows the user to use physical addresses instead of virtual addresses in critical path. Thus enhances performance since there is no need in addresses translation.
RoCE v1 (Layer 2) Compatibility	Added the option to connect between nodes running MLNX_OFED and nodes running RoCE with Layer 2 GID format.
3.2-2.0.0.0	
API Changes	<ul style="list-style-type: none"> • Support FCS scattering for Raw Packet QPs and WQs. • Indication of L4 packet type on the receive side completions • Support CVLAN insertion for WQs
IPoIB	<ul style="list-style-type: none"> • Added support for the following IPoIB UD QP offloads: <ul style="list-style-type: none"> • RX check summing (AKA RX csu) • Large Send Offloads (AKA LSO) <p>To see the new IPoIB UD mode, run: "ethtool -k <interface>"</p>
3.2-1.0.1.1	
Striding WQE User Space	Striding RQ is a receive queue comprised of work queue elements (i.e. WQEs) with receive buffer pointers, where multiple packets are written to the same buffers pointed to by a single WQE.
VXLAN Hardware Stateless Offloads	[ConnectX-4 / ConnectX-4 Lx] Provides scalability and security challenges solutions.
Priority Flow Control (PFC)	[ConnectX-4 / ConnectX-4 Lx] Applies pause functionality to specific classes of traffic on the Ethernet link.
Offloaded Traffic Sniffer/TCP Dump	[ConnectX-4 / ConnectX-4 Lx] Allows bypass kernel traffic (such as, RoCE, VMA, DPDK) to be captured by existing packet analyzer such as tcpdump.
Ethernet Time Stamping	[ConnectX-4 / ConnectX-4 Lx] Keeps track of the creation of a packet. A time-stamping service supports assertions of proof that a datum existed before a particular time.
Custom RoCE Counters	[ConnectX-4 / ConnectX-4 Lx] Provide a clear indication on RDMA send/receive statistics and errors.
LED Beaconing	[ConnectX-4 / ConnectX-4 Lx] Enables visual identification of the port by LED blinking.
Enhanced Transmission Selection standard (ETS)	[ConnectX-4 / ConnectX-4 Lx] Exploits the time periods in which the offered load of a particular Traffic Class (TC) is less than its minimum allocated bandwidth.
VLAN Stripping in Linux Verbs	[ConnectX-4 / ConnectX-4 Lx] Adds access to the device's ability to offload the Customer VLAN (cVLAN) header stripping from an incoming packet.
iSER: Remote invalidation support (target and initiator)	[ConnectX-4 / ConnectX-4 Lx] Improves performance by enabling the hardware to perform implicit memory region invalidation.

Table 11 - Change Log History

Category	Description
iSER: Zero-Copy ImmediateData	[ConnectX-4 / ConnectX-4 Lx] Reduces the latency of small writes by avoiding an extra memory copy in the iSER target stack.
iSER: Indirect Memory Registration	[ConnectX-4 / ConnectX-4 Lx] Uses ConnectX®-4 adapter card's Indirect Memory Registration capabilities to avoid bounce buffer strategy implementation and to reduce the latency of highly unaligned vectored IO operations, and also in cases of BIO merging.
Vector Calculation/ Erasure coding off-load	[ConnectX-4 / ConnectX-4 Lx] Uses the HCA for offloading erasure coding calculations.
Virtual Guest Tagging (VGT+)	[ConnectX-3 / ConnectX-3 Pro] VGT+ is an advanced mode of Virtual Guest Tagging (VGT), in which a VF is allowed to tag its own packets as in VGT, but is still subject to an administrative VLAN trunk policy.
Link Aggregation for Virtual Functions	[ConnectX-3 / ConnectX-3 Pro] Protects a VM with an attached ConnectX-3 VF from VF port failure, when VFs are present and RoCE Link Aggregation is configured in the Hypervisor.
3.1-1.0.3	
User Access Region (UAR)	Allows the ConnectX-3 driver to operate on PPC machines without requiring a change to the MMIO area size.
CQE Compression	Saves PCIe bandwidth by compressing a few CQEs into a smaller amount of bytes on PCIe
Bug fixes	See Section 4, "Bug Fixes History" , on page 28
3.1-1.0.0	
Wake-on-LAN (WOL)	Wake-on-LAN (WOL) is a technology that allows a network professional to remotely power on a computer or to wake it up from sleep mode.
Hardware Accelerated 802.1ad VLAN (Q-in-Q Tunneling)	Q-in-Q tunneling allows the user to create a Layer 2 Ethernet connection between two servers. The user can segregate a different VLAN traffic on a link or bundle different VLANs into a single VLAN.
ConnectX-4 ECN	ECN in ConnectX-4 enables end-to-end congestions notifications between two end-points when a congestion occurs, and works over Layer 3.
RSS Verbs Support for ConnectX-4 HCAs	Receive Side Scaling (RSS) technology allows spreading incoming traffic between different receive descriptor queues. Assigning each queue to different CPU cores allows better load balancing of the incoming traffic and improve performance.
Minimal Bandwidth Guarantee (ETS)	The amount of bandwidth (BW) left on the wire may be split among other TCs according to a minimal guarantee policy.
SR-IOV Ethernet	SR-IOV Ethernet at Beta level
3.0-2.0.1	
Virtualization	Added support for SR-IOV for ConnectX-4/Connect-IB adapter cards.
3.0-1.0.1	

Table 11 - Change Log History

Category	Description
HCAs	Added support for ConnectX®-4 Single/Dual-Port Adapter supporting up to 100Gb/s.
RoCE per GUID	RoCE per GUID provides the ability to use different RoCE versions/modes simultaneously.
RoCE Link Aggregation (RoCE LAG): ConnectX-3/ConnectX-3 Pro only	RoCE Link Aggregation (available in kernel 4.0 only) provides failover and link aggregation capabilities for mlx4 device physical ports. In this mode, only one IB port that represents the two physical ports, is exposed to the application layer.
Resource Domain Experimental Verbs	Resource domain is a verb object which may be associated with QP and/or CQ objects on creation to enhance data-path performance.
Alias GUID Support in InfiniBand	Enables the <code>query_guid</code> verb to return the admin desired value instead of the value that was approved by the SM, to prevent a case where the SM is unreachable or a response is delayed, or if the VF is probed into a VM before their GUID is registered with the SM.
Denial Of Service (DOS) MAD Prevention	Denial Of Service MAD prevention is achieved by assigning a threshold for each agent's RX. Agent's RX threshold provides a protection mechanism to the host memory by limiting the agents' RX with a threshold.
QoS per VF (Rate Limit per VF)	Virtualized QoS per VF, (supported in ConnectX-3/ConnectX-3 Pro adapter cards only with firmware v2.33.5100 and above), limits the chosen VFs' throughput rate limitations (Maximum throughput). The granularity of the rate limitation is 1Mbits.
Ignore Frame Check Sequence (FCS) Errors	Upon receiving packets, the packets go through a checksum validation process for the FCS field. If the validation fails, the received packets are dropped. Using this feature, enables you to choose whether or not to drop the frames in case the FCS is wrong and use the FCS field for other info.
Sockets Direct Protocol (SDP)	Sockets Direct Protocol (SDP) is a byte-stream transport protocol that provides TCP stream semantics. and utilizes InfiniBand's advanced protocol offload capabilities.
Scalable Subnet Administration (SSA)	The Scalable Subnet Administration (SSA) solves Subnet Administrator (SA) scalability problems for Infiniband clusters. It distributes the needed data to perform the path-record-calculation needed for a node to connect to another node, and caches these locally in the compute (client) nodes. SSA ^a requires AF_IB address family support (3.12.28-4 kernel and later).
SR-IOV in ConnectX-3 cards	Changed the Alias GUID support behavior in InfiniBand.
LLR max retransmission rate	Added LLR max retransmission rate as specified in Vendor Specific MAD V1.1, Table 110 - PortLLRStatistics MAD Description ibdiagnet presents the LLR max_retransmission_rate counter as part of the PM_INFO in db_csv file.

Table 11 - Change Log History

Category	Description
Experimental Verbs	<p>Added the following verbs:</p> <ul style="list-style-type: none"> • <code>ibv_exp_create_res_domain</code> • <code>ibv_exp_destroy_res_domain</code> • <code>ibv_exp_query_intf</code> • <code>ibv_exp_release_intf</code> <p>Added the following interface families:</p> <ul style="list-style-type: none"> • <code>ibv_exp_qp_burst_family</code> • <code>ibv_exp_cq_family</code>
2.4-1.0.4	
Bug Fixes	See “Bug Fixes History” on page 28.
2.4-1.0.0	
mlx4_en net-device Ethtool	Added support for Ethtool speed control and advertised link mode.
	Added ethtool txvlan control for setting ON/OFF hardware TX VLAN insertion: <code>ethtool -k txvlan [on/off]</code>
	Ethtool report on port parameters improvements.
	Ethernet TX packet rate improvements.
RoCE	RoCE uses now all available EQs and not only the 3 legacy EQs.
InfiniBand	IRQ affinity hints are now set when working in InfiniBand mode.
Virtualization	VXLAN fixes and performance improvements.
libmlx4 & libmlx5	Improved message rate of short messages.
libmlx5	Added ConnectX®-4 device (4114) to the list of supported devices (<code>hca_table</code>),
Storage	Added iSER Target driver.
Ethernet net-device	New adaptive interrupt moderation scheme to improve CPU utilization.
	RSS support of fragmented IP datagram.
Connect-IB Virtual Function	Added Connect-IB Virtual Function to the list of supported devices.
2.3-2.0.5	
mlx5_core	<p>Added the following files under <code>/sys/class/infiniband/mlx5_0/mr_cache/</code>:</p> <ul style="list-style-type: none"> • <code>rel_timeout</code>: Defines the minimum allowed time between the last MR creation to the first MR released from the cache. When <code>rel_timeout = -1</code>, MRs are not released from the cache • <code>rel_imm</code>: Triggers the immediate release of excess MRs from the cache when set to 1. When all excess MRs are released from the cache, <code>rel_imm</code> is reset back to 0.
Bug Fixes	See “Bug Fixes History” on page 28.
2.3-2.0.1	
Bug Fixes	See “Bug Fixes History” on page 28.

Table 11 - Change Log History

Category	Description
2.3-2.0.0	
Connect-IB	Added Suspend to RAM (S3).
Reset Flow	Added Enhanced Error Handling for PCI (EEH), a recovery strategy for I/O errors that occur on the PCI bus.
Register Contiguous Pages	Added the option to ask for a specific address when the register memory is using contiguous page.
mlx5_core	Moved the <code>mr_cache</code> subtree from <code>debugfs</code> to <code>mlx5_ib</code> while preserving all its semantics.
InfiniBand Utilities	Updated the <code>ibutils</code> package. Added to the <code>ibdiagnet</code> tool the " <code>ibdiagnet2.mlnx_cntrs</code> " option to enable reading of Mellanox diagnostic counters.
Bug Fixes	See "Bug Fixes History" on page 28.
2.3-1.0.1	
Ethernet	Added support for arbitrary UDP port for VXLAN. From upstream 3.15-rc1 and onward, it is possible to use arbitrary UDP port for VXLAN. This feature requires firmware version 2.32.5100 or higher. Additionally, the following kernel configuration option <code>CONFIG_MLX4_EN_VXLAN=y</code> must be enabled.
	<code>MLNX_OFED</code> no longer changes the OS <code>sysctl</code> TCP parameters.
	Added Explicit Congestion Notification (ECN) support
	Added Flow Steering: A0 simplified steering support
	Added RoCE v2 support
OpenSM	Added Routing Chains support with Minhop/UPDN/FTree/DOR/Torus-2QoS
	Added double failover elimination. When the Master SM is turned down for some reason, the Standby SM takes ownership over the fabric and remains the Master SM even when the old Master SM is brought up, to avoid any unnecessary re-registrations in the fabric. To enable this feature, set the " <code>master_sm_priority</code> " parameter to be greater than the " <code>sm_priority</code> " parameter in all SMs in the fabric. Once the Standby SM becomes the Master SM, its priority becomes equal to the " <code>master_sm_priority</code> ". So that additional SM handover is avoided. Default value of the <code>master_sm_priority</code> is 14. To disable this feature, set the " <code>master_sm_priority</code> " in <code>opensm.conf</code> to 0.
	Added credit-loop free unicast/multicast updn/ftree routing
	Added multithreaded Minhop/UPDN/DOR routing
RoCE	Added IP routable RoCE modes. For further information, please refer to the <code>MLNX_OFED</code> User Manual.
Installation	Added <code>apt-get</code> installation support.

Table 11 - Change Log History

Category	Description
InfiniBand Network	Added Secure host to enable the device to protect itself and the subnet from malicious software.
	Added User-Mode Memory Registration (UMR) to enable the usage of RDMA operations and to scatter the data at the remote side through the definition of appropriate memory keys on the remote side.
	Added On-Demand-Paging (ODP), a technique to alleviate much of the shortcomings of memory registration.
	Added Masked Atomics operation support
	Added Checksum offload for packets without L4 header support
	Added Memory re-registration to allow the user to change attributes of the memory region.
Resiliency	Added Reset Flow for ConnectX®-3 (+SR-IOV) support.
SR-IOV	Added Virtual Guest Tagging (VGT+), an advanced mode of Virtual Guest Tagging (VGT), in which a VF is allowed to tag its own packets as in VGT, but is still subject to an administrative VLAN trunk policy.
Ethtool	Added Cable EEPROM reporting support
	Disable/Enable ethernet RX VLAN tag striping offload via ethtool
	128 Byte Completion Queue Entry (CQE)
Non-Linux Virtual Machines	Added Windows Virtual Machine over Linux KVM Hypervisor (SR-IOV with InfiniBand only) support
2.2-1.0.1	
Reset Flow	Reset Flow is not activated by default. It is controlled by the <code>mlx4_core'internal_err_reset'</code> module parameter.
mlnxofedinstall	32-bit libraries are no longer installed by default on 64-bit OS. To install 32-bit libraries use the <code>'--with-32bit'</code> installation parameter.
openibd	Added pre/post start/stop scripts support. For further information, please refer to section <i>“openibd Script”</i> in the MLNX_OFED User Manual.
InfiniBand Core	Asymmetric MSI-X vectors allocation for the SR-IOV hypervisor and guest instead of allocating 4 default MSI-X vectors. The maximum number of MSI-X vectors is <code>num_cpu</code> for port ConnectX®-3 has 1024 MSI-X vectors, 28 MSI-X vectors are reserved. <ul style="list-style-type: none"> Physical Function - gets the number of MSI-X vectors according to the <code>pf_msix_table_size</code> (multiple of 4 - 1) INI parameter Virtual Functions – the remaining MSI-X vectors are spread equally between all VFs, according to the <code>num_vfs</code> <code>mlx4_core</code> module parameter

Table 11 - Change Log History

Category	Description
Ethernet	Ethernet VXLAN support for kernels 3.12.10 or higher
	Power Management Quality of Service: when the traffic is active, the Power Management QoS is enabled by disabling the CPU states for maximum performance.
	Ethernet PTP Hardware Clock support on kernels/OSes that support it
Verbs	Added additional experimental verbs interface. This interface exposes new features which are not integrated yet in to the upstream libverbs. The Experimental API is an extended API therefor, it is backward compatible, meaning old application are not required to be recompiled to use MLNX-OFED v2.2-1.0.1.
Performance	Out of the box performance improvements: <ul style="list-style-type: none"> • Use of affinity hints (based on NUMA node of the device) to indicate the IRQ balancer daemon on the optimal IRQ affinity • Improvement in buffers allocation schema (based on the hint above) • Improvement in the adaptive interrupt moderation algorithm
2.1-1.0.6	
IB Core	Added allocation success verification process to <code>ib_alloc_device</code> .
dapl	dapl is recompiled with no FCA support.
openibd	Added the ability to bring up child interfaces even if the parent's <code>ifcfg</code> file is not configured.
libmlx4	Unmapped the <code>hca_clock_page</code> parameter from <code>mlx4_unit_context</code> .
scsi_transport_srp	<code>scsi_transport_srp</code> cannot be cleared up when <code>rport</code> reconnecting fails.
mlnxofedinstall	Added support for the following parameters: <ul style="list-style-type: none"> • <code>'--umad-dev-na'</code> • <code>'--without-<package>'</code>
Content Packages Updates	The following packages were updated: <ul style="list-style-type: none"> • <code>bupc</code> to v2.2-407 • <code>mstflint</code> to v3.5.0-1.1.g76e4acf • <code>perftest</code> to v2.0-0.76.gbf9a463 • <code>hcoll</code> to v2.0.472-1 • <code>Openmpi</code> to v1.6.5-440ad47 • <code>dapl</code> to v2.0.40
2.1-1.0.0	
EoIB	EoIB is supported only in SLES11SP2 and RHEL6.4.
eIPoIB	eIPoIB is currently at GA level.
Connect-IB®	Added the ability to resize CQs.
IPoIB	Reusing DMA mapped SKB buffers: Performance improvements when IOMMU is enabled.

Table 11 - Change Log History

Category	Description
mlnx_en	Added reporting autonegotiation support.
	Added Transmit Packet Steering (XPS) support.
	Added reporting 56Gbit/s link speed support.
	Added Low Latency Socket (LLS) support.
	Added check for dma_mapping errors.
eIPoIB	Added non-virtual environment support.
2.0-3.0.0	
Operating Systems	Additional OS support: <ul style="list-style-type: none"> • SLES11SP3 • Fedora16, Fedora17
Hardware	Added Connect-IB™ support
Installation	Added ability to install MLNX_OFED with SR-IOV support.
	Added Yum installation support
EoIB	EoIB (at beta level) is supported only in SLES11SP2 and RHEL6.4
mlx4_core	Modified module parameters to associate configuration values with specific PCI devices identified by their bus/device/function value format
mlx4_en	Reusing DMA mapped buffers: major performance improvements when IOMMU is enabled
	Added Port level QoS support
IPoIB	Reduced memory consumption
	Limited the number TX and RX queues to 16
	Default IPoIB mode is set to work in Datagram, except for Connect-IB™ adapter card which uses IPoIB with Connected mode as default.
Storage	iSER (at GA level)
2.0-2.0.5	
Virtualization	SR-IOV for both Ethernet and InfiniBand (at Beta level)
Ethernet Network	RoCE over SR-IOV (at Beta level)
	eIPoIB to enable IPoIB in a Para-Virtualized environment (at Alpha level)
	Ethernet Performance Enhancements (NUMA related and others) for 10G and 40G
	Ethernet Time Stamping (at Beta level)
	Flow Steering for Ethernet and InfiniBand. (at Beta level)
	Raw Eth QPs: <ul style="list-style-type: none"> • Checksum TX/RX • Flow Steering

Table 11 - Change Log History

Category	Description
InfiniBand Network	Contiguous pages: <ul style="list-style-type: none"> • Internal memory allocation improvements • Register shared memory • Control objects (QPs, CQs)
Installation	YUM update support
VMA	OFED_VMA integration to a single branch
Storage	iSER (at Beta level) and SRP
Operating Systems	Errata Kernel upgrade support
API	VERSION query API: library and headers
Counters	64bit wide counters (port xmit/recv data/packets unicast/mcast)

a. SSA is tested on SLES 12 only (x86-64 architecture).