



MLNX_EN for Linux Release Notes

Rev 4.2-1.0.1.0

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Mellanox Technologies
350 Oakmead Parkway Suite 100
Sunnyvale, CA 94085
U.S.A.
www.mellanox.com
Tel: (408) 970-3400
Fax: (408) 970-3403

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Release Update History

Release	Date	Description
Rev 4.2-1.0.1.0	November 15, 2017	Initial release of this version.

1 Overview

These are the release notes of MLNX_EN for Linux Driver, Rev 4.2-1.0.1.0 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"> Ethernet: 10GigE, 40GigE and 56GigE^a
ConnectX®-4	mlx5	<ul style="list-style-type: none"> 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"> Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, and 100GigE
ConnectX®-5 Ex		<ul style="list-style-type: none"> Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, and 100GigE
Innova™ IPsec EN		Ethernet: 10GigE, 40GigE

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 Supported Platforms and Operating Systems

The following are the supported OSs in MLNX_EN Rev 4.2-1.0.1.0 :

Table 1 - Supported Platforms and Operating Systems

Operating System	Platform
RHEL6.3/CentOS6.3	x86_64
RHEL6.6/CentOS6.6	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)
CentOS7.3 with Kernel 4.9 for NVME-oF	Armv8(AMD) for Softiron
RHEL7.3/CentOS7.3	x86_64/PPC64 (Power8)/PPC64LE (Power8)
RHEL7.4/CentOS7.4	x86_64/PPC64LE (Power8)
Debian 8.7	x86_64
Debian 8.7 Kernel 4.1	x86_64
Debian 8.7 Kernel 4.4	x86_64
Debian 9.0	x86_64
Fedora 20	x86_64
Fedora 25	x86_64

Table 1 - Supported Platforms and Operating Systems

Operating System	Platform
Fedora 26	x86_64
OL 6.8	x86_64
OL 7.3	x86_64
SLES11 SP3	x86_64
SLES11 SP4	x86_64/PPC64 (Power 7)
SLES12 SP2	x86_64/PPC64 (Power 8)
SLES12 SP3	x86_64/PPC64 (Power8)
Ubuntu 14.04	x86_64
Ubuntu 16.04 with Kernel 4.9 - Bandera for Arm	Armv8 (Qualcomm) [beta]
Ubuntu 16.04.02	x86_64/PPC64LE (Power8)
Ubuntu 16.04.03	x86_64/PPC64LE (Power8)
Ubuntu 16.10	x86_64/PPC64LE (Power 8)
Ubuntu 17.04	x86_64/PPC64LE (Power 8)
Kernels 4.10-4.13	x86_64
CoreOS Kernel 4.11	x86_64
XenServer 7.2	x86_64



32 bit platforms are no longer supported in MLNX_EN

1.1.1 Tested Hypervisors in Paravirtualized and SR-IOV Environments

Table 2 - Tested Hypervisors in Paravirtualized and SR-IOV Environments

Tested Hypervisors	HCAs	Operating System
SR-IOV	ConnectX-3/ ConnectX-3 Pro	RHEL6.9/CentOS6.9 KVM
		RHEL7.2/CentOS7.2 KVM
		RHEL7.3/CentOS7.3 KVM
		RHEL7.4/CentOS7.4 KVM
		Ubuntu 16.04.03 KVM
	ConnectX-4	RHEL6.9/CentOS6.9 KVM
		RHEL7.2/CentOS7.2 KVM
		RHEL7.3/CentOS7.3 KVM
		RHEL7.4/CentOS7.4 KVM
		Ubuntu 16.04.03 KVM
		Ubuntu 17.04 KVM
		XenServer 7.2
	ConnectX-4 Lx	RHEL6.9/CentOS6.9 KVM
		RHEL7.2/CentOS7.2 KVM
		RHEL7.3/CentOS7.3 KVM
		Ubuntu 14.04 KVM
		Ubuntu 16.04.03 KVM
		Ubuntu 17.04 PPC KVM
		XenServer 7.2
	ConnectX-5	RHEL6.9/CentOS6.9 KVM
		RHEL7.2/CentOS7.2 KVM
RHEL7.3/CentOS7.3 KVM		
RHEL7.4/CentOS7.4 KVM		
Ubuntu 16.04.03 KVM		

Table 2 - Tested Hypervisors in Paravirtualized and SR-IOV Environments

Tested Hypervisors	HCAs	Operating System	
Paravirtualized	ConnectX-3	RHEL7.3/CentOS7.3 KVM	
	ConnectX-3 Pro	Ubuntu 16.04.03 KVM	
	ConnectX-4		RHEL7.3/CentOS7.3 PPC KVM
			RHEL7.4/CentOS7.4 PPC KVM
			Ubuntu 16.04.03 KVM
			Ubuntu 16.04.03 PPC KVM
	ConnectX-4 Lx		Ubuntu 16.04.03 KVM
			Ubuntu 16.04.03 PPC KVM
	ConnectX-5		RHEL7.3/CentOS7.3 PPC KVM
			RHEL7.4/CentOS7.4 PPC KVM

1.2 Supported HCAs Firmware Versions

MLNX_EN Rev 4.2-1.0.1.0 supports the following Mellanox network adapter cards firmware versions:

Table 3 - 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	12.21.1000	12.20.1010
ConnectX®-4 Lx	14.21.1000	14.20.1010
ConnectX®-5	16.21.1000	16.20.1010
ConnectX®-5 Ex	16.21.1000	16.20.1010

For the official firmware versions, please see:

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

2 Changes and New Features in Rev 4.2-1.0.1.0

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

Table 4 - Changes and New Features in Rev 4.2-1.0.1.0

HCA's	Feature/Change	Description
mlx5 Driver	Physical Address Memory Allocation	Added support to register a specific physical address range.
Innova IPsec EN	Innova IPsec Adapter Cards	Added support for Mellanox Innova IPsec EN adapter card, that provides security acceleration for IPsec-enabled networks.
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.
	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_EN 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_EN 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 Red-Hat 7.2 and above.
	Droplless Receive Queue (RQ)	Added support for the driver to notify the FW when SW receive queues are overloaded.

Table 4 - Changes and New Features in Rev 4.2-1.0.1.0

HCA's	Feature/Change	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_EN User Manual.
ConnectX-5	Q-in-Q	Added support for Q-in-Q VST feature in ConnectX-5 adapter cards family.
	Virtual Guest Tagging (VGT+)	Added support for VGT+ in ConnectX-4/ConnectX-5 HCA's. This feature is s 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_EN User Manual.
	Tag Matching Offload	Added support for hardware Tag Matching offload with Dynamically Connected Transport (DCT).
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_EN User Manual.
	Bug Fixes	See Section 4, “Bug Fixes History”, on page 31 .

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

2.1 Unsupported Functionalities/Features/HCA's

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

- ConnectX®-2 Adapter Card

3 Known Issues

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

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

Table 5 - Known Issues

Internal Reference Number	Issue
-	<p>Description: SR-IOV mode over Windows VM is only supported over InfiniBand/Ethernet ConnectX-4/ConnectX-5 adapter cards family.</p> <p>Workaround: N/A</p> <p>Keywords: SR-IOV, VM</p> <p>Discovered in Release: 4.2-1.0.1.0</p>
-	<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: 4.2-1.0.1.0</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: 4.2-1.0.1.0</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: 4.2-1.0.1.0</p>

Table 5 - Known Issues

Internal Reference Number	Issue
955929	Description: Heavy traffic may cause SYN flooding when using Innova IPsec adapter cards.
	Workaround: N/A
	Keywords: Innova IPsec, SYN flooding
	Discovered in Release: 4.2-1.0.1.0
-	Description: Priority Based Flow Control is not supported on Innova IPsec adapter cards.
	Workaround: N/A
	Keywords: Innova IPsec, Priority Based Flow Control
	Discovered in Release: 4.2-1.0.1.0
-	Description: Pause configuration is not supported when using Innova IPsec adapter cards. Default pause is global pause (enabled).
	Workaround: N/A
	Keywords: Innova IPsec, Global pause
	Discovered in Release: 4.2-1.0.1.0
1045097	Description: Connecting and disconnecting a cable several times may cause a link up failure when using Innova IPsec adapter cards.
	Workaround: N/A
	Keywords: Innova IPsec, Cable, link up
	Discovered in Release: 4.2-1.0.1.0
-	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.
	Workaround: Set MTU between 512 and 2012 bytes
	Keywords: Innova IPsec, MTU
	Discovered in Release: 4.2-1.0.1.0
1118530	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
	Workaround: Reboot the system to reset sriov_numvfs value.
	Keywords: SR-IOV, numvfs
	Discovered in Release: 4.2-1.0.1.0

Table 5 - Known Issues

Internal Reference Number	Issue
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: 4.2-1.0.1.0</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 ioiva allocation • 22e2f9fa63b0 iommu/vt-d: Use per-cpu IOVA caching
	<p>Keywords: IOMMU, soft lockup</p>
	<p>Discovered in Release: 4.2-1.0.1.0</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: 4.2-1.0.1.0</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: 4.2-1.0.1.0</p>

Table 5 - 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: 4.2-1.0.1.0
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: 4.2-1.0.1.0
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: 4.2-1.0.1.0
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 after which the driver will recover from.
	Workaround: N/A
	Keywords: RDMA-CM, GSI QP, CQ
	Discovered in Release: 4.2-1.0.1.0
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: 4.2-1.0.1.0

Table 5 - Known Issues

Internal Reference Number	Issue
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: 4.2-1.0.1.0
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
-	Description: iSER Target currently supports the following OSs (distribution kernel) only: <ul style="list-style-type: none"> • RHEL 7.2/7.3 • SLES 12.1/12.2 • Ubuntu 14.04/15.04/16.04/16.10
	Workaround: N/A
	Keywords: iSER Target
995665	Description: Connection between NVMeoF host and target cannot be established in a hyper-threaded system with more than 64 CPUs on the NVMeoF host side.
	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> .
	Keywords: NVMeoF
1039346	Description: Enabling multiple namespaces per subsystem while using NVMeoF target offload is not supported.
	Workaround: To enable more than one namespace, create a subsystem for each one.
	Keywords: NVMeoF Target Offload, namespace
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

Table 5 - Known Issues

Internal Reference Number	Issue
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
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 allocation 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
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 <code>iptool</code>) during reboot.
	Workaround: N/A
	Keywords: mlx5_core, reboot
1009488	Description: Mounting MLNX_EN to a path that contains special characters, such as parenthesis or spaces is not supported. For example, when mounting MLNX_EN to <code>"/media/CDROM(vcd)"/</code> , installation will fail and the following error message will be displayed: <pre> # cd /media/CDROM\(vcd\) / # ./install sh: 1: Syntax error: "(" unexpected </pre>
	Workaround: N/A
	Keywords: Installation

Table 5 - 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
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 tc tool.
	Workaround: Set the number of TC via the <code>/sys/class/net/<interface>/qos/tc_num</code> sysfs file.
	Keywords: Ethernet, TC
979457	Description: When setting IOMMU=ON, a severe performance degradation may occur due to a bug in IOMMU.
	Workaround: Make sure the following patches are found in your kernel: <ul style="list-style-type: none"> • iommu/vt-d: Fix PASID table allocation • iommu/vt-d: Fix IOMMU lookup for SR-IOV Virtual Functions Note: These patches are already available in Ubuntu 16.04.02 and 17.04 OSs.
	Keywords: Performance, IOMMU
942161	Description: On some kernels, there might be an issue in csum calculations of tunneled packets when the driver sets CHECKSUM_COMPLETE for the packet. This might print csum error messages to the dmesg log file.
	Workaround: Make sure your kernel version includes this fix.
	Keywords: Ethernet, checksum, tunneling
931574	Description: When using a kernel with Generic Receive Offload (GRO) support, UDP performance results will reveal degradation in comparison to the UDP performance results in MLNX_EN v1.5.x.
	Workaround: Turn off the GRO feature to get better UDP performance. Run: <pre>#ethtool -K <interface> gro off</pre>
	Keywords: GRO, UDP, performance

Table 5 - Known Issues

Internal Reference Number	Issue
920707	Description: In SLES12 SP2, you may get a memory low warning at the netlink layer when configuring a large number of VFs.
	Workaround: N/A
	Keywords: SR-IOV, SLES12
969467	Description: On SLES PPC64, the removal of packages with names starting with kernel-mft-mlnx might fail with such an error: "Error: package kernel-mft-mlnx-kmp-default seems to contain modules for multiple kernel versions"
	Workaround: Use the following command to remove the kernel-mft packages: <code>rpm -e --noscripts \$(rpm -qa grep kernel-mft-mlnx)</code>
	Keywords: Installation
918880	Description: The driver version shown in modinfo and ethtool outputs is 3.4-1.0.6 instead of 3.4-2.0.0.
	Workaround: N/A
	Keywords: Installation
690799	Description: OpenSM package removal fails with the following error on Ubuntu12.04: Removing opensm ... /sbin/insserv: No such file or directory
	Workaround: 1. Create the missing link by running this command: # <code>ln -s /usr/lib/insserv/insserv /sbin/insserv</code> 2. Remove the package.
	Keywords: Installation
764204	Description: Weak Updates (KMP) support is broken on RHEL PPC64LE with errata kernels. MLNX_EN installation will pass, but no links will be created under the weak-updates directory for the new kernel. Therefore, the driver load will fail.
	Workaround: <ul style="list-style-type: none"> As of MLNX_EN v3.3, use the <code>mlnx_add_kernel_support.sh</code> script, or simply provide the <code>--add-kernel-support</code> flag to <code>mlnxofedinstall</code> script. Update the <code>kmod</code> package using the following link: https://rhn.redhat.com/errata/RHBA-2016-1832.html
	Keywords: Installation

Table 5 - Known Issues

Internal Reference Number	Issue
785119	<p>Description: When upgrading ConnectX-4/ConnectX-4 Lx firmware version from v12/14.14.2036 to a newer one (for example:12/14.16.1xxx), power cycle is necessary to enable working in Pass-Through mode. Using mlxfwreset instead of power cycle will print messages similar to the following when Passing-Through the device to Virtual Machine: "-device vfio-pci,host=04:00.0,id=host-dev0,bus=pci.0,addr=0x7: vfio: Error: Failed to setup INTx fd: No such device 2016-05-22T06:46:39.164786Z qemu-kvm: -device vfio-pci,host=04:00.0,id=host-dev0,bus=pci.0,addr=0x7: Device initialization failed."</p> <p>Workaround: N/A</p> <p>Keywords: Installation</p>
677998	<p>Description: False alarm errors may be printed to dmesg.</p> <p>Workaround: N/A</p> <p>Keywords: Driver Start</p>
967356	<p>Description: [Ethernet]</p> <ul style="list-style-type: none"> • Bare-metal ConnectX-4/ConnectX-4 Lx might suffer up to 15, degradation in some scenarios due to higher CPU utilization. • PPC: ConnectX-4 might suffer up to 20, degradation in some scenarios. <p>Workaround: N/A</p> <p>Keywords: Performance</p>
956071	<p>Description: [mlx5] OOB TCP performance for small message sizes may suffer from lower BW than expected.</p> <p>Workaround: Disable adaptive-rx and set higher static moderation: ethtool -C <interface> adaptive-rx off rx-frames 128 rx-usecs 128</p> <p>Keywords: Performance</p>
765777	<p>Description: Low VxLAN throughput due to broken GRO offload in most kernels older than kernel v4.6.</p> <p>Workaround: Use kernel version 4.6 or above.</p> <p>Keywords: Performance</p>
414827	<p>Description: Out-of-the-box throughput performance in Ubuntu14.04 is not optimal and may achieve results below the line rate in 40GE link speed.</p> <p>Workaround: For additional performance tuning, please refer to Performance Tuning Guide.</p> <p>Keywords: Performance</p>

Table 5 - Known Issues

Internal Reference Number	Issue
417751	Description: Performance degradation might occur when bonding Ethernet interfaces.
	Workaround: N/A
	Keywords: Performance
656415	Description: In RHEL7.0, when the irqbalance service is started or restarted, it incorrectly re-balances the IRQs, including the banned ones.
	Workaround: N/A
	Keywords: Performance
651322	Description: In RH7.0/RH7.1, performance issue with ConnectX-4 cards over 100GbE link might occur when the process of forwarding the packets between the ports, which is done by the kernel, fib_table_lookup() function is called. For further information, please refer to: http://comments.gmane.org/gmane.linux.network/344243
	Workaround: Use RH7.2 to avoid such performance issues.
	Keywords: Performance
754646	Description: The default RX coalescing values yield to high CPU utilization when using VXLAN on VMs over PV.
	Workaround: Increase the RX microseconds and frames coalescing parameters for a better utilization using the ethtool -C command.
	Keywords: Performance
783496	Description: When using a VF over RH7.X KVM, low throughput is expected.
	Workaround: Install the following packages using the link below: <ul style="list-style-type: none"> • qemu-img-1.5.3-105.el7_2.1.bz1299846.0.x86_64.rpm • qemu-kvm-1.5.3-105.el7_2.1.bz1299846.0.x86_64.rpm • qemu-kvm-common-1.5.3-105.el7_2.1.bz1299846.0.x86_64.rpm http://people.redhat.com/~alwillia/bz1299846/
	Keywords: Performance
860311	Description: An allocation of high-order page in mlx5e_alloc_striding_rx_wqe fails with a call-trace.
	Workaround: No action is required on users end. A fragmented fallback flow will handle this failure.
	Keywords: mlx5 Driver
435583	Description: EEH events that arrive while the mlx5 driver is loading may cause the driver to hang.
	Workaround: N/A
	Keywords: mlx5 Driver

Table 5 - Known Issues

Internal Reference Number	Issue
434570	Description: The mlx5 driver can handle up to 5 EEH events per hour.
	Workaround: If more events are received, cold reboot the machine.
	Keywords: mlx5 Driver
554120	Description: When working with Connect-IB firmware v10.10.5054, the following message would appear in driver start. command failed, status bad system state(0x4), syndrome 0x408b33 The message can be safely ignored.
	Workaround: Upgrade Connect-IB firmware to the latest available version.
	Keywords: mlx5 Driver
538843	Description: Bonding active-backup mode does not function properly.
	Workaround: N/A
	Keywords: mlx5 Driver
-	Description: Rate, speed and width using IB sysfs/tools are available in RoCE mode in ConnectX-4 only after port physical speed configuration is done.
	Workaround: N/A
	Keywords: mlx5 Driver
563022	Description: ConnectX-4 port GIDs table shows a duplicated RoCE v2 default GID.
	Workaround: N/A
	Keywords: mlx5 Driver
947542	Description: mlx5 hardware offload is supported when setting up to 4 VxLAN ports (one of these ports must be 4789). When attempting to set more VxLAN ports, these ports will still be supported, but a failure message will appear in the dmesg.
	Workaround: N/A
	Keywords: Ethernet
964991	Description: TX queue rate limit may sometimes exceed the rate that was set by the user by up to 10,.
	Workaround: N/A
	Keywords: Ethernet
911693	Description: In ConnectX-4 Lx and above, the minimal RX ring size is changed to 512, as a result of fundamental changes in receive flow structures.
	Workaround: N/A
	Keywords: Ethernet

Table 5 - Known Issues

Internal Reference Number	Issue
948312	<p>Description: [ConnectX-3 Pro] To enable/disable rx-vlan-stag-hw-parse by ethtool, rxvlan should be enabled/disabled accordingly (ethtool -K rxvlan on/off).</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
894547	<p>Description: On SLES12 SP1 and SLES12 SP2, invalid udev rules might cause Ethernet interfaces renaming to fail, leaving some interfaces with names such as renameXY.</p> <p>Workaround: Modify the udev rules inside the /etc/udev/rules.d/70-persistent-net.rules file, such that every rule is unique to the target interface.</p> <p>For further details, refer to the Ethernet Related Issues table under the Troubleshooting section in MLNX_EN User Manual.</p> <p>Keywords: Ethernet</p>
754709	<p>Description: mlx5 Ethernet auto-negotiation related issues:</p> <ol style="list-style-type: none"> 1. The command <code>ethtool -s eth4 speed 25000 autoneg on</code> is not a valid ethtool command. Speed 25000 should not be passed in when autoneg is on. Instead, use advertised 0x100000000. 2. ethtool version older than v4.6 does not report neither supported or advertised new speeds, such as 25G, 100G. 3. When setting auto negotiation with an ethtool version older than v4.6, or a kernel version with no <code>set_link_ksettings/get_link_ksettings</code> API, advertised speed will be ignored, and the device will try to reach the highest supported speed available end-to-end. 4. When using an ethtool version of 4.6 or newer, and a kernel version with <code>set_link_ksettings/get_link_ksettings</code> API, users can set an advertised speed only for ones which are part of <code>include/uapi/linux/ethtool.h</code> file. 5. New speeds (25G, 50G, 100G) will be shown in Supported/Advertised fields of ethtool, only if known to this ethtool version. Auto negotiation for those speeds might work, depending on the kernel's advertised information. 6. Upon power cycle, all supported speeds will be copied to Advertised field. <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
843306	<p>Description: [ConnectX-4/ConnectX-4 Lx] When configuring ETS, bandwidth values are limited between 1-100, and 0 is an invalid value.</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
704750	<p>Description: [ConnectX-4/ConnectX-4 Lx] First ICMP6 packet may be lost as a result of first IP fragment loss when packets size is significantly bigger than MTU.</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>

Table 5 - Known Issues

Internal Reference Number	Issue
433366	<p>Description: Reboot might hang in SR-IOV when using the <code>probe_vf</code> parameter with many Virtual Functions. The following message is logged in the kernel log: "waiting for eth to become free. Usage count =1"</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
539117	<p>Description: On SLES12, the bonding interface over Mellanox Ethernet slave interfaces does not get IP address after reboot.</p> <p>Workaround:</p> <ol style="list-style-type: none"> 1. Set "STARTMODE=hotplug" in the bonding slave's ifcfg files. More details can be found in the SUSE documentations page: https://www.suse.com/documentation/sles-12/book_sle_admin/?page=/documentation/sles-12/book_sle_admin/data/sec_bond.html 2. Enable the nanny service to support hot-plugging: Open the "/etc/wicked/common.xml" file. Change: "<use-nanny>>false</use-nanny>" to "<use-nanny>>true</use-nanny>" 3. Run: # <code>systemctl restart wickedd.service wicked</code> <p>Keywords: Ethernet</p>
989042	<p>Description: <code>ethtool -x</code> command will not function on relatively old kernels that do not support <code>get/set_rxfh*</code> callbacks.</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
516136	<p>Description: Ethertype proto 0x806 not supported by <code>ethtool</code></p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
592229	<p>Description: When NC-SI is ON, the ports MTU cannot be set to lower than 1500.</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
600242	<p>Description: GRO is not functional when using VXLAN in ConnectX-3 adapter cards.</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>
596075	<p>Description: <code>ethtool -X</code>: The driver supports only the 'equal' mode and cannot be set by using weight flags.</p> <p>Workaround: N/A</p> <p>Keywords: Ethernet</p>

Table 5 - Known Issues

Internal Reference Number	Issue
600752	Description: Q-in-Q infrastructure in the kernel is supported only in kernel version 3.10 and up.
	Workaround: N/A
	Keywords: Ethernet
596537	Description: When SLES11 SP4 is used as a DHCP client over ConnectX-3 or ConnectX-3 adapters, it might fail to get an IP from the DHCP server.
	Workaround: N/A
	Keywords: Ethernet
560575	Description: When using a hardware that has Time Stamping enabled, the system time might be higher than the expected variance.
	Workaround: N/A
	Keywords: Ethernet
597758	Description: In Q-in-Q, ping failed when sending traffic with package size > 1468
	Workaround: N/A
	Keywords: Ethernet
665131	Description: Call trace may occur when configuring VXLAN or under high traffic stress.
	Workaround: N/A
	Keywords: Ethernet
685069/689607	Description: ethtool header does not currently support the link speeds of 25/50/100. Therefore, these speeds cannot be seen as advertised/supported.
	Workaround: N/A
	Keywords: Ethernet
835239	Description: While running Q-in-Q packets with stag offloading, tcpdump/wireshark on host may show svlan ethertype as 0x8100 instead of 0x88A8.
	Workaround: Check the wire or a switch between the hosts, the wireshark will show 0x88A8 ethertype as expected.
	Keywords: Ethernet
954924/954994	Description: Accelerated Receive Flow Steering (aRFS) does not work properly with more than 50 streams. Thus, packets are not forwarded based on the location of the application consuming the packet.
	Workaround: N/A
	Keywords: Flow Steering

Table 5 - Known Issues

Internal Reference Number	Issue
516136	Description: Setting ARP flow rules through ethtool is not allowed.
	Workaround: N/A
	Keywords: Flow Steering
448981	Description: QoS default settings are not returned after configuring QoS.
	Workaround: N/A
	Keywords: Quality of Service
940345	Description: In ConnectX-3, when the virtual function (VF) runs on a MLNX_EN version that is below v4.0, and the physical function runs on MLNX_EN v4.0 and higher, hardware counters in the VF will be set to zero and will not progress.
	Workaround: N/A
	Keywords: Ethernet Performance Counters
683370	Description: iSER small read IO (< 8k) performance degrades compared to previous versions. iSER performs memory registration for each IO and avoids sending a global memory key to the target. Sending the global memory key to the wire should only be done in a trusted environment and is not recommended to use over the Internet protocol.
	Workaround: Set module param <code>always_register=N</code> <code>\$ modprobe ib_iser always_register=N</code>
	Keywords: iSER Initiator
858628	Description: PCI error handling is not supported during driver reload. This might cause a kernel panic or calltrace.
	Workaround: N/A
	Keywords: SR-IOV
860385	Description: Creating 127 VFs may cause kernel panic in SLES11 SP4 KVM with Kernel 3.0.101-63 because of a IOMMU kernel bug.
	Workaround: N/A
	Keywords: SR-IOV
795697	Description: [mlx4] While spoof-check filters the incoming traffic to a VM, when this feature is disabled, traffic still does not reach the VM.
	Workaround: The driver must be restarted for the disablement of the feature to take effect and all traffic to be reached to the VM.
	Keywords: SR-IOV

Table 5 - Known Issues

Internal Reference Number	Issue
784940	Description: Currently, the firmware cannot process many page requests in parallel as the driver processes page requests serially. Therefore, enabling/disabling a large number of VFs will often cause an driver slowdown.
	Workaround: N/A
	Keywords: SR-IOV
784954	Description: When SR-IOV is disabled, the VF driver receives <code>pci_err_detected</code> event and a teardown flow will be started. During the teardown flow, all firmware commands will fail because the function is already deleted.
	Workaround: N/A
	Keywords: SR-IOV
819595	Description: [ConnectX-3 Pro] In case a VF is set to VST mode on the same port following QinQ configuration, that VF will insert C-VLAN not only to untagged packets, but also to tagged packets. The packets that are tagged twice will be dropped by the switch or by the destination host since they have two C-VLANs.
	Workaround: N/A
	Keywords: SR-IOV
775944	Description: Bonding VFs on the same physical port using bonding mode 0 requires configuration of <code>fail_over_mac=1</code> .
	Workaround: N/A
	Keywords: SR-IOV
381764	Description: <code>mlx4_port1_mtu</code> sysfs entry shows a wrong MTU number in the VM.
	Workaround: N/A
	Keywords: SR-IOV
385750/378528	Description: When working with a bonding device to enslave the Ethernet devices in active-backup mode and failover MAC policy in a Virtual Machine (VM), establishment of RoCE connections may fail.
	Workaround: Unload the module <code>mlx4_ib</code> and reload it in the VM.
	Keywords: SR-IOV
392172	Description: When detaching a VF without shutting down the driver from a VM and reattaching it to another VM with the same IP address for the Mellanox NIC, RoCE connections will fail
	Workaround: Shut down the driver in the VM before detaching the VF.
	Keywords: SR-IOV

Table 5 - Known Issues

Internal Reference Number	Issue
506512	Description: Setting 1 Mbit/s rate limit on Virtual Functions (Qos Per VF feature) may cause TX queue transmit timeout.
	Workaround: N/A
	Keywords: SR-IOV
567908	Description: Attaching a VF to a VM before unbinding it from the hypervisor and then attempting to destroy the VM, may cause the system to hang for a few minutes.
	Workaround: N/A
	Keywords: SR-IOV
601749	Description: Since the guest MAC addresses are configured to be all zeroes by default, in ConnectX-4 the administrator must explicitly set the VFs MAC addresses. otherwise the Guest VM will see MAC zero and traffic is not passed.
	Workaround: N/A
	Keywords: SR-IOV
649366	Description: Restarting the PF (Hypervisor) driver while Virtual Functions are assigned is not allowed in RH7 and above due to a <code>vfiopci</code> bug.
	Workaround: N/A
	Keywords: SR-IOV
639046	Description: Due to an issue with SR-IOV loopback, prevention "Duplicate IPv6 detected" are seen in the VF driver.
	Workaround: N/A
	Keywords: SR-IOV
655410	Description: [ConnectX-4/Connect-IB] Failed to enable SR-IOV due to errors in PCI or BIOS.
	Workaround: 1. Add <code>pci=realloc=on</code> to the grub command line. 2. Add more memory to the server. 3. Upgrade BIOS version.
	Keywords: SR-IOV
651119	Description: Kernel panic may occur while running IPv6 UDP on SR-IOV ConnectX-4 environment
	Workaround: N/A
	Keywords: SR-IOV
669910	Description: Bind/Unbind over ConnectX-4 Hypervisor may cause system lockup.
	Workaround: N/A
	Keywords: SR-IOV

Table 5 - Known Issues

Internal Reference Number	Issue
650458	Description: Occasionally, IPv6 might not function properly and cause lockup on SR-IOV ConnectX-4 environment.
	Workaround: N/A
	Keywords: SR-IOV
688551	Description: In ConnectX-3 adapter cards, the extended counter <code>port_rcv_data_64</code> on the VF may not be updated in some flows.
	Workaround: N/A
	Keywords: SR-IOV
690656/690674	Description: When the physical link is down, any traffic from the PF to any VF on the same port will be dropped.
	Workaround: N/A
	Keywords: SR-IOV
691661	Description: When in LAG mode and the Virtual Functions are present (VF LAG), the IP address given to the bonding interface (in the hypervisor) cannot be used for RoCE as well.
	Workaround: Probe one of the VFs in the hypervisor and use for RoCE.
	Keywords: SR-IOV
691661	Description: Ethernet SR-IOV in ConnectX-4 requires firmware version 12.14.1100 and higher
	Workaround: N/A
	Keywords: SR-IOV
737434	Description: VF vport statistics are not cleared upon <code>ifconfig</code> up/down.
	Workaround: N/A
	Keywords: SR-IOV
738464	Description: In SLES11 SP4, user cannot open all VFs announced in <code>sriov_totalvfs</code> . However he can set the <code>num_vfs</code> up to maximum <code>sriov_totalvfs-1</code> vfs.
	Workaround: N/A
	Keywords: SR-IOV
784127	Description: While disabling SR-IOV, all firmware teardown flow commands are expected to fail and error messages will be reported in the <code>dmesg</code> .
	Workaround: N/A
	Keywords: SR-IOV

Table 5 - Known Issues

Internal Reference Number	Issue
784146	Description: Creating/destroying as many as 64 VFs may sometimes take longer time than usual on some setups.
	Workaround: N/A
	Keywords: SR-IOV
766105	Description: Due to a bug in some QEMU versions, interrupts do not function properly for Virtual Functions. This causes the driver initialization to fail, and such error message will be printed: "mlx4_core 0000:0b:00.0: command 0x31 timed out (go bit not cleared) mlx4_core 0000:0b:00.0: NOP command failed to generate interrupt (IRQ 57), aborting".
	Workaround: Upgrade to the latest version of QEMU in the hypervisor.
	Keywords: SR-IOV
413372	Description: SR-IOV non persistent configuration (such as VGT, VST, Host assigned GUIDs, and QP0-enabled VFs) may be lost upon Reset Flow.
	Workaround: Reset Admin configuration post Reset Flow
	Keywords: Reset Flow
856033	Description: The following PCIe bus error on Qualcomm Arm processor might appear when mapping a large number of DMA addresses: AER: Corrected error received: id=0000 PCIe Bus Error: severity=Corrected, type=Transaction Layer, id=0000(Receiver ID) device [17cb:0400] error status/mask=00002000/00004000 [13] Advisory Non-Fatal mlx5_warn:mlx5_0:dump_cqe:257:(pid 0): dump error cqe 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 12007806 25000063 8728c8d3
	Workaround: Edit the kernel parameters (in grub) and add qiommu.identity_map_qiommu=PCIE0_MMU,PCIE4_MMU (The bus numbers depend on the ConnectX-4 slot.) Reboot the server.
	Keywords: General
552870/548518	Description: On rare occasions, under extremely heavy MAD traffic, MAD (Management Datagram) storms might cause soft-lockups in the UMAD layer.
	Workaround: N/A
	Keywords: General

Table 5 - Known Issues

Internal Reference Number	Issue
663434	Description: On ConnectX-4/ConnectX-4 Lx, when running "lspci" in RH7.0/7.1, the device information is displayed incorrect or the device is unnamed.
	Workaround: Run <code>update-pciids</code>
	Keywords: General
767016	Description: Resetting hardware counters after netdev goes up can break statistics scripts.
	Workaround: N/A
	Keywords: General
781382	Description: The number of local ports that rdma_cm ID can bind to is limited. This limitation depends on the OS dynamics.
	Workaround: Modify the range of available ports for binding, run: <code>sysctl net.ipv4.ip_local_port_range="MIN MAX"</code> The MIN and MAX values can range from 0 to 65535.
	Note: Modifying the range also affects the range of available ports for socket applications (TCP/IP) even though the pool is not mutual between the RDMA stack and the TCP/IP stack.
	Keywords: Connection Manager (CM)
387061	Description: <code>mlx4_core</code> can allocate up to 64 MSI-X vectors, an MSI-X vector per CPU.
	Workaround: N/A
	Keywords: Resources Limitation
553657	Description: Registering a large amount of Memory Regions (MR) may fail because of DMA mapping issues on RHEL 7.0.
	Workaround: N/A
	Keywords: Resources Limitation

4 Bug Fixes History

This table lists the bugs fixed in this release.

For the list of old bug fixes, please refer to Mellanox OFED Archived Bug Fixes file at:

http://www.mellanox.com/pdf/prod_software/MLNX_EN_Archived_Bug_Fixes.pdf

Table 6 - 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: 4.2-1.0.1.0
960642/960653	Description: Added support for min_tx_rate and max_tx_rate 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: 4.2-1.0.1.0
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: 4.2-1.0.1.0
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: 4.2-1.0.1.0
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: 4.2-1.0.1.0

Table 6 - Bug Fixes History

Internal Ref	Issue
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: 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)
	Keywords: RoCE, multihost, mlx5
	Discovered in Release: 4.1-1.0.2.0
	Fixed in Release: 4.2-1.0.1.0
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: 4.2-1.0.1.0
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: 4.2-1.0.1.0
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
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 6 - 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
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

Table 6 - Bug Fixes History

Internal Ref	Issue
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
890285	Description: Fixed the issue where memory allocation for CQ buffers used to fail when increasing the RX ring size.
	Keywords: mlx5_core
	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_EN 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
873538	Description: Fixed the issue where biosdavename running on Redhat 6.x with MLNX_EN may show the same name to ConnectX-3 Eth port 1 and ConnectX-3 Eth port 2.
	Keywords: biosdavename
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 3.4-2.0.0.0
876419	Description: Fixed the issue where kernel panic was observed on openibd stop as a result of querying non-existent bond slave.
	Keywords: mlx4_en
	Discovered in Release: 3.3-2.0.0.0
	Fixed in Release: 3.4-2.0.0.0
868665	Description: Fixed the issue where kernel panic in mlx4_en_get_phys_port_id may occur during server reboot.
	Keywords: mlx4_en
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-2.0.0.0

Table 6 - Bug Fixes History

Internal Ref	Issue
882227	Description: Fixed the issue of when EEH was injected and the mlx4 tear down code was called, the eqs were not released, causing a page fault.
	Keywords: mlx4_en
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 3.4-2.0.0.0
887348	Description: Fixed the issue of when prof_sel was invalid, mlx5_core failed upon debug print.
	Keywords: mlx5_core
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 3.4-2.0.0.0
898161	Description: Fixed the issue where a compilation error in kernels of v4.6 or above used to occur due to a large stack size in the get_numa_phys_mask function.
	Keywords: mlx5_core
	Discovered in Release: 3.4-1.0.0.0
	Fixed in Release: 3.4-2.0.0.0
854344	Description: Fixed the issue where mlnx_affinity script on RHEL/CentOS7.x host did not disable or enable irqbalancer.
	Keywords: irqbalancer
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3
824736	Description: Fixed wrong skprio2UP mapping by removing it and its scripts, such as tc_wrap, from the driver. This mapping should now be done using the kernel's set_egress_map commands. Note: Only for RDMACM over old kernels, the original skprio2UP mapping in tc_wrap remains valid as these kernels do not support set_egress_map.
	Keywords: QoS
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3
826686	Description: Fixed the issue where server reboot could get stuck because of kernel panic in mlx4_en_get_drvinfo() that is called from asynchronous event handler.
	Keywords: mlx4_en
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3

Table 6 - Bug Fixes History

Internal Ref	Issue
824130	Description: Fixed the issue where ethtool self test used to fail on interrupt test after timeout if mlx4_ib module was not loaded.
	Keywords: mlx4_en
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3
786720	Description: Fixed a crash that used to occur when trying to bring the interface up in a kernel that did not support accelerated RFS (aRFS).
	Keywords: mlx5 driver
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3
781747	Description: Fixed the issue of when attempting to disable SR-IOV while there are any VF netdevs open, the operation would fail and the driver would hang.
	Keywords: SR-IOV
	Discovered in Release: 3.3-1.0.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3
568602	Description: Fixed the issue of when repeating change of the mlx5_num_vfs value from 0 to non-zero might have caused kernel panic in the PF driver.
	Keywords: SR-IOV
	Discovered in Release: 3.0-2.0.0
	Fixed in Release: 3.4-1.0.0.03.4-1.0.0.3

5 Change Log History

Table 7 - Change Log History

Category	Description
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 <code>/sys/class/infiniband/mlx5_0/ports/1/hw_counters/</code> 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: <code>/sys/kernel/debug/mlx5/<PCI BUS>/cc_params/</code> For more information, refer to the HowTo Configure DCQCN (RoCE CC) for ConnectX-4 (Linux) Community post.
Flow Steering Dump Tool	Added support for <code>mlx_fs_dump</code> , which is a python tool that prints the steering rules in a readable manner.
Secure Firmware Updates	Firmware binaries embedded in <code>MLNX_EN</code> 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.
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.
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.

Table 7 - Change Log History

Category	Description
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.
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 .
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.
4.0-2.0.0.1	
PCIe Error Counting	[ConnectX-4/ConnectX-4 Lx] Added the ability to expose physical layer statistical counters to ethtool.
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.
NFS over RDMA (NFSoRDMA)	Removed support for NFSoRDMA drivers. These drivers are no longer provided along with the MLNX_EN package.
3.4-1.0.0.3	

Table 7 - Change Log History

Category	Description
Installation	[ConnectX®-3/ConnectX®-3 Pro/ConnectX®-4/ConnectX®-4 Lx] Installation script was renamed from install.sh to install.
	[ConnectX®-3/ConnectX®-3 Pro/ConnectX®-4/ConnectX®-4 Lx] The package is now shipped with pre-built binary RPMs per OS distribution. By default, the package will install drivers supporting Ethernet only. In addition, the package will include the following new installation options: <ul style="list-style-type: none"> • Full VMA support which can be installed using the installation option "--vma". • Infrastructure to run DPDK using the installation option "--dpdk". Notes: <ul style="list-style-type: none"> • DPDK itself is not included in the package. Users would still need to install DPDK separately after the MLNX_EN installation is completed. • RoCE support can be enabled by installing the VMA package. For further information, please refer to the Installation section in the User Manual.
	The package can be set as a local yum/apt-get repository. Refer to the User Manual for the updated installation instructions.
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_EN package (the installation flag "--enable-sriov" has been deprecated). To configure SR-IOV, please use the "mlxconfig" or "mstconfig" utilities.
Enhanced PCIe Error Recovery	[ConnectX®-4/ConnectX®-4 Lx] Enhanced PCIe error recovery by adding the following behaviors to the flow: <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)	[ConnectX®-4/ConnectX®-4 Lx] Added the ability to rate-limit traffic per Virtual Function in SR-IOV mode.
Dynamically tuned Interrupt Moderation (DIM)	[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.
Dump Configuration	[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.
Ethernet Counters	[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.

Table 7 - Change Log History

Category	Description
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.
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).
3.2-1.0.1.1	
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.
LED Beacons	[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.

Table 7 - Change Log History

Category	Description
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.
3.1-1.0.4	
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.
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
3.0-1.0.1	
NICs	Added support for ConnectX@-4 Single/Dual-Port Adapter supporting up to 100Gb/s.
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.
Ethtool	Updated ethtool to incorporate ConnectX@-4 adapter card functionalities.
2.3-2.0.1	
Bug Fixes	See “Bug Fixes History” on page 31.
Reset Flow	Added support for Enhanced Error Handling for PCI (EEH), a recovery strategy for I/O errors that occur on the PCI bus.
2.3-1.0.0	
Ethernet	<p>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.</p> <p>MLNX_EN no longer changes the OS sysctl TCP parameters.</p>
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.

Table 7 - 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
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
2.0-3.0.0	
Operating Systems	Additional OS support: <ul style="list-style-type: none"> • SLES11SP3 • Fedora16, Fedora17
Hardware	Added ConnectX@-3 Pro support
1.5.10	
General	See Section 4, “Bug Fixes History”, on page 31.
1.5.9	
Operating Systems	Added support for kernel.org 3.5
Performance	Improved latency by optimizing RX repost mechanism
1.5.8.3	
Operating Systems	Added support for RHEL6.3
1.5.8.2	
Operating Systems	Added support for new kernels: 3.1, 3.2, 3.3
1.5.8.2	
Performance	Moved to interrupt mode to handle TX completions
	Added IRQ affinity control scripts (please see README file for more details)
	Optimized Numa aware memory allocations
	Optimized interrupt usage for TX/RX completions
Installation	Added KMP compliant installation process
Linux Tools	Added support for Ethtool
1.5.7.2	
Operating Systems	Added support for new OS's:
	RHEL6.2
	RHEL5.8
	SLES11SP2

Table 7 - Change Log History

Category	Description
Performance	Added recording RX queue for GRO packets
	Added the usage of Toeplitz hash function for RSS calculation
Reports/Statistics	Enabled RXHASH report on supported systems
1.5.7	
Operating Systems	Added support for new OS's:
	RHEL6.1
	RHEL5.5
	RHEL5.7
	kernel.org (2.6.37, 2.6.38, 2.6.39, 3.0)
RHEL6.1 KVM	
Performance	Improved performance on PPC systems (Using GRO where LRO is not efficient)
	Added IPv6 support to LRO
	Incremented number of TX and RX queues
	Enabled NAPI usage at any given time
	Enabled TX completions spread among multiple MSI-X vectors
	Improved small packets packet rate
	Added 40GigE support (including Ethtool report)
	Added NUMA support
Added general performance improvements	
1.5.6	
Operating Systems	Added support for new OS's:
	RHEL6.0
	RHEL5.6
	SLES11SP1
kernel.org (2.6.35, 2.6.36)	
Performance	Added blue flame support for kernels > 2.6.28 (improves TX latency by 0.4 usec)
	Added RX acceleration feature that supports recvmmsg and recvmmsg system calls. See MLNX_EN_Linux_README for further details.
	Added option to use interrupts for TX completion (polling is the default)
	Added option to disable NAPI (enabled by default)
	Added support for control number of RX rings from module parameter
	Added interrupt vector per each RX ring. See /proc/interrupts
	Adaptive moderation improvements
Added system tuning option to achieve better performance (idle loop polling)	

Table 7 - Change Log History

Category	Description
Linux Tools	Added hardware revision report via Ethtool
Multicast Filtering	Added exact match multicast filtering
Driver Load	Link is brought up upon driver load
1.5.1.3	
Operating Systems	Added support for new OS's:
	RHEL5.5
	kernel.org (2.6.16 - 2.6.32)
Performance	Added UDP RSS support (on ConnectX-2 HW only)
	Improved VLAN tagging performance
Linux Tools	Ethtool -e support