Mellanox ConnectX-4/ConnectX-5 NATIVE ESXi Driver for VMware vSphere 6.7 Release Notes

Rev 4.17.13.8

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Table of Contents

List Of Tables

Release Update History

Table 1 - Release Update History

Release	Date	Description
Rev 4.17.13.8	June 12, 2018	Initial release of this MLNX-NATIVE-ESXi-ConnectX-4/ ConnectX-4 Lx/ConnectX-5 driver version

1 Overview

These are the release notes of Mellanox ConnectX-4/ConnectX-5 NATIVE ESXi Driver for VMware vSphere 6.7. Mellanox ConnectX-4/ConnectX-5 NATIVE ESXi Driver for VMware vSphere 6.7 supports the following uplinks to servers

Table 2 - Supported Uplinks to Servers

Version	OS	Uplink Speed
4.17.13.8	ESXi 6.7	10/25/40/50/100GbE

1.1 Content of MLNX-NATIVE-ESX Driver Package

The MLNX-NATIVE-ESX driver package is distributed as an offline bundle (.zip file) and contains:

- **ESXi 6.7:**

  MLNX-NATIVE-ESX-ConnectX-4-5_4.17.13.8-10EM-670.0.0.4598673.zip - Hypervisor bundle for ESXi 6.7 contains the following kernel modules:

  - nmlx5_core

  - nmlx5_rdma

1.2 Supported HCAs Firmware Versions

MLNX-NATIVE-ESX Rev 4.17.13.8 supports the following Mellanox Ethernet HCA:

Table 3 - Supported HCAs Firmware Versions

HCAs	Recommended Firmware Rev.
ConnectX-4	12.22.1002
ConnectX-4 Lx	14.22.1002
ConnectX-5	16.22.1002
ConnectX-5 Ex	16.22.1002

Please note that older firmware versions were not tested with this release.

For the latest firmware versions, visit:

- http://www.mellanox.com/page/vmware_matrix

  or

- http://www.mellanox.com/supportdownloader/

1.3   Tested Hypervisors in Paravirtualized and SR-IOV Environments

Table 4 - Tested Hypervisors in Paravirtualized and SR-IOV Environments

Tested Hypervisors	HCAs	Operating System
SR-IOV	ConnectX-4/ConnectX-4 Lx ConnectX-5/ConnectX-5 Ex	Windows Server 2012 R2
		RedHat 6.5
		RedHat 6.6
		RedHat 7.0
		RedHat 7.1
		RedHat 7.2
		SLES 11.3
Paravirtualized	ConnectX-4/ConnectX-4 Lx ConnectX-5/ConnectX-5 Ex	Windows Server 2012 R2
		RedHat 6.5
		RedHat 6.6
		RedHat 7.0
		RedHat 7.1
		RedHat 7.2
		SLES 11.3

2   Changes and New Features in Rev 4.17.13.8

Table 5 - Changes and New Features

Feature/Change	Description
Explicit Congestion Notification (ECN)	Explicit Congestion Notification (ECN) is an extension to the Internet Protocol and to the Transmission Control Protocol. ECN allows end-to-end notification of network congestion without dropping packets. To configure ECN behavior, download the nmlxcli tool from the Mellanox site. For further information, refer to the User Manual section *Explicit Congestion Notification (ECN)*.
Dynamic RSS	Improves network performance by allowing OS Load Balancer better RSS RX queue utilization during heavy traffic of the same type. For further information, refer to the User Manual section *Dynamic RSS*.
Multiple RSS Engines	Improves network performance by exposing multiple RSS RX queues to the hypervisor network stack. For further information, refer to the User Manual section *Multiple RSS Engines*.
Packet Capture Utility	Packet Capture utility duplicates all traffic, including RDMA, in its raw Ethernet form (before stripping) to a dedicated "sniffing" QP, and then passes it to an ESX drop capture point. It allows gathering of Ethernet and RoCE bidirectional traffic via pktcap-uw and viewing it using regular Ethernet tools, e.g. Wireshark To enable/disable packet capture, download the nmlxcli tool from the Mellanox site. For further information, refer to the User Manual section Packet Capture Utility.
SR-IOV max_vfs module parameter Type Modification	Changed the type of the SR-IOV max_vfs module parameter from a single integer value to an array of unsigned integers. For further information, refer to the User Manual.
InfiniBand SR-IOV	Enables the creation of InfiniBand virtual functions, allowing the guests to operate over an InfiniBand fabric.
DCBX Negotiation Support for PFC	PFC port configuration can now be auto-negotiated with switches that support the DCBX protocol.
ESXi CLI	Added ESXi CLI support for ESXi 6.7
Adapter Cards	Added support for ConnectX-5/ConnectX-5 Ex adapter cards. **Note:** ConnectX-5/ConnectX-5 Ex cards are currently at beta level.
Geneve Stateless Offload	Geneve network protocol is encapsulated into IP frame (L2 tunneling). Encapsulation is suggested as a means to alter the normal IP routing for datagrams, by delivering them to an intermediate destination that would otherwise not be selected based on the (network part of the) IP Destination Address field in the original IP header.
Remote Direct Memory Access (RDMA)	Remote Direct Memory Access (RDMA) is the remote memory management capability that allows server-to-server data movement directly between application memory without any CPU involvement. **Note:** It is recommended to use RoCE with PFC enabled in driver and network switches. For how to enable PFC in the driver see section *Priority Flow Control (PFC)* in the User Manual.

Table 5 - Changes and New Features

Feature/Change	Description
Set Link Speed	Enables you to set the link speed to a specific link speed supported by ESXi. For further information, see the User Manual section *"Set Link Speed"*.
Priority Flow Control (PFC)	Applies pause functionality to specific classes of traffic on the Ethernet link. For further information, see the User Manual section *"Priority Flow Control (PFC)"*.
NetQ RSS	Allows the user to configure multiple hardware queues backing up the single RX queue. NetQ RSS improves vMotion performance and multiple streams of IPv4/IPv6 TCP/UDP/IPSEC bandwidth over single interface between the Virtual Machines. For further information, see the User Manual section *"NetQ RSS"*.
Default Queue RSS (DRSS)	Allows the user to configure multiple hardware queues backing up the default RX queue. DRSS improves performance for large scale multicast traffic between hypervisors and Virtual Machines interfaces. For further information, see the User Manual section *"Default Queue Receive Side Scaling (DRSS)"*.
SR-IOV	Single Root IO Virtualization (SR-IOV) is a technology that allows a physical PCIe device to present itself multiple times through the PCIe bus.
	Support for up to 8 ConnectX-4 ports and up to 16 VFs. For further information, refer to the User Manual
RX/TX Ring Resize	Allows the network administrator to set new RX\TX ring buffer size.
VXLAN Hardware Stateless Offloads for ConnectX®-4	VXLAN hardware offload enables the traditional offloads to be performed on the encapsulated traffic.
NetDump	Enables a host to transmit diagnostic information via the network to a remote netdump service, which stores it on disk. Network-based coredump collection can be configured in addition to or instead of disk-based core-dump collection.
NetQueue	NetQueue is a performance technology in VMware ESXi that significantly improves performance in Ethernet virtualized environments.
Wake-on-LAN	Allows a network administrator to remotely power on a system or to wake it up from sleep mode
Hardware Offload	• Large Send Offload (TCP Segmentation Offload) • RSS (Device RSS)
Hardware Capabilities	• Multiple Tx/Rx rings • Fixed Pass-Through • Single/Dual port • MSI-X
Ethernet Network	• TX/RX checksum • Auto moderation and Coalescing • VLAN stripping offload

3 Known Issues

The following is a list of general limitations and known issues of the various components of this MLNX-NATIVE-ESX release.

Table 6 - Known Issues (Sheet 1 of 3)

Internal Ref.	Description
1340275	**Description:** ECN tunable parameter `initialAlphaValue` for the Reaction Point protocol cannot be modified.
	Workaround: N/A
	Keywords: nmlx5 ecn nmlxcli
	Discovered in Version: 4.17.13.6
1340255	**Description:** ECN statistic counters `accumulatorsPeriod` and `ecnMarkedRocePackets` display wrong values and cannot be cleared.
	Workaround: N/A
	Keywords: nmlx5 ecn nmlxcli
	Discovered in Version: 4.17.13.6
1191657	**Description:** The maximum value of RSS must be lower than the number of CPU cores.
	Workaround: N/A
	Keywords: RSS
	Discovered in Version: 4.17.13.6
-	**Description:** The hardware can offload only up to 256B of headers.
	Workaround: N/A
	Keywords: Hardware offload
	Discovered in Version: 4.17.13.6
781277	**Description:** The `"esxcli network sriovnic vf stats"` command is not supported. When running this command on a vmknic, a failure message is displayed.
	Workaround: N/A
	Keywords: esxcli SR-IOV
	Discovered in Version: 4.17.13.6
685558	**Description:** There is no traffic between PV and SR-IOV VF connected to different ports on the same HCA.
	Workaround: N/A
	Keywords: PV, SR-IOV VF, HCA
858972	**Description:** Setting the "Allow Guest MTU Change" option in vSphere Client is currently not functional. Although guest MTU changes in SR-IOV are allowed, they do not affect the port's MTU and the guest's MTU remains the same as the PF MTU.
	Workaround: N/A
	Keywords: MTU, SR-IOV

Table 6 - Known Issues (Sheet 2 of 3)

Internal Ref.	Description
1031520	**Description:** When a guest is assigned an IB PCI passthru device or an IB VF, VMware Tools networking information for the guest may be incorrect. This affects how the guest networking information, such as interfaces and their IPs, is displayed in vCenter.
	Workaround: N/A
	Keywords: VMware Tools networking information
1064844	**Description:** nmlxcli tool is not supported on ESXi 5.5.
	Workaround: N/A
	Keywords: nmlxcli, ESXi 5.5
1064883	**Description:** Operations on vmnics which are in passthru mode are not supported.
	Workaround: N/A
	Keywords: vmnics, passthru mode
746100	**Description:** The `'esxcli mellanox uplink link info -u <vmnic_name>'` command reports the 'Auto negotiation' capability always as 'true'.
	Workaround: N/A
	Keywords: 'Auto negotiation' capability
1068621	**Description:** SMP MADs (ibnetdiscover, sminfo, iblinkinfo, smpdump, ibqueryerr, ibdiagnet and smpquery) are not supported on the VFs.
	Workaround: N/A
	Keywords: SMP MADs
-	**Description:** Multicast and IPv6 traffic might be unstable over SR-IOV.
	Workaround: N/A
	Keywords: SR-IOV, IPv6, Multicast
656416	**Description:** Reboot is required after any SR-IOV configuration change.
	Workaround: N/A
	Keywords: SR-IOV
653679	**Description:** Firmware VF configuration must be N+1 (while N is the required VF number). For example: If your configuration requires 10 VFs, the firmware must be set to support 16 VFs (ESXi Limitation).
	Workaround: N/A
	Keywords: VFs
778371	**Description:** Wake-on-LAN does not notify when invalid parameters are provided.
	Workaround: N/A
	Keywords: WoL

Table 6 - Known Issues (Sheet 3 of 3)

Internal Ref.	Description
778572	**Description:** Nested ESXi might not function properly.
	Workaround: N/A
	Keywords: Nested ESXi
765008	**Description:** Device RSS fails to hash traffic to sufficient RX rings with Broadcast traffic.
	Workaround: N/A
	Keywords: RSS, RX rings
852883	**Description:** In stress condition 'Watchdog' may appear, leading to uplink going up and down.
	Workaround: N/A
	Keywords: uplink, watchdog
775668	**Description:** VMs can get Call Trace upon MTU change during heavy traffic.
	Workaround: N/A
	Keywords: VM, MTU, heavy traffic
776274	**Description:** Reloading the driver when the SR-IOV VFs are ON, will result in Purple Screen of Death (PSOD).
	Workaround: N/A
	Keywords: Driver reload
784293	**Description:** VGT traffic over VXLAN interfaces is currently not supported.
	Workaround: N/A
	Keywords: VGT traffic, VXLAN
862168	**Description:** VMs with SR-IOV cannot be powered on when running low on available vectors.
	Workaround: N/A
	Keywords: VM, SR-IOV
777205	**Description:** Occasionally, untagged traffic can pass between VMs with SR-IOV enabled when portgroup is configured for VLAN trunk range.
	Workaround: N/A
	Keywords: VM, SR-IOV, VLAN trunk