



Mellanox ConnectX-4/ConnectX-5 NATIVE ESXi Driver for VMware vSphere 6.5 Release Notes

Rev 4.16.14.2

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Release Update History

Table 1 - Release Update History

Release	Date	Description
Rev 4.16.14.2	July 29, 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 6.5. Mellanox ConnectX-4/ConnectX-5 NATIVE ESXi Driver for VMware vSphere 6.5 supports the following uplinks to servers

Table 2 - Supported Uplinks to Servers

Version	OS	Uplink Speed
4.16.14.2	ESXi 6.5	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 6.5:**
MLNX-NATIVE-ESX-ConnectX-4-5_4.16.14.2-10EM-650.0.0.4598673.zip - Hypervisor bundle for ESXi 6.5 contains the following kernel modules:
 - nmlx5_core
 - nmlx5_rdma

1.2 Supported HCAs Firmware Versions

MLNX-NATIVE-ESX Rev 4.16.14.2 supports the following Mellanox Ethernet HCA:

Table 3 - Supported HCAs Firmware Versions

HCAs	Recommended Firmware Rev.	Additional Firmware Rev.
ConnectX-4	12.23.1020	12.22.1002
ConnectX-4 Lx	14.23.1020	14.22.1002
ConnectX-5	16.23.1020	16.22.1002
ConnectX-5 Ex	16.23.1020	16.22.1002

For the latest firmware versions, visit:

- http://www.mellanox.com/page/products_dyn?product_family=29

1.3 Tested Hypervisors in Paravirtualized and SR-IOV Environments

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

Tested Hypervisors	HCAs	Guest Operating System
SR-IOV	ConnectX-4/ConnectX-4 Lx ConnectX-5/ConnectX-5 Ex	Windows Server 2012 R2
		Windows Server 2016 DC
		RedHat 6.6
		RedHat 6.7
		RedHat 6.8
		RedHat 7.0
		RedHat 7.1
		RedHat 7.2
		RedHat 7.3
		RedHat 7.4
		RedHat 7.5
		SLES 11.3
		SLES 12
		SLES 12.1
		SLES 12.2
		SLES 12.3
		SLES 12.4
Paravirtualized ^a (Ethernet Only)	ConnectX-4/ConnectX-4 Lx ConnectX-5/ConnectX-5 Ex	Windows Server 2012 R2
		RedHat 7.2
		RedHat 7.5

a. Paravirtualized RDMA is only tested Linux OSes.

2 Changes and New Features in Rev 4.16.14.2

Table 5 - Changes and New Features

Feature/Change	Description
Virtualization	Removed a VF driver limitation. Now the driver can support the maximum number of VFs supported by the firmware.
Bug Fixes	See Section 4, “Bug Fixes History”, on page 12

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
1446060	Description: Although the max_vfs module parameter range is "0-128", due to firmware limitations, the following are the supported VFs per single port: <ul style="list-style-type: none"> • ConnectX-4: up to 127 • ConnectX-5: up to 63
	Workaround: N/A
	Keywords: SR-IOV, VFs per port
	Discovered in Version: 4.16.14.2
1340275	Description: ECN tunable parameter initialAlphaValue for the Reaction Point protocol cannot be modified.
	Workaround: N/A
	Keywords: nmlx5 ecn nmlxcli
	Discovered in Version: 4.16.13.5
1340255	Description: ECN statistic counters accumulatorsPeriod and ecnMarkedRoc-packets display wrong values and cannot be cleared.
	Workaround: N/A
	Keywords: nmlx5 ecn nmlxcli
	Discovered in Version: 4.16.13.5
-	Description: The hardware can offload only up to 256B of headers.
	Workaround: N/A
	Keywords: Hardware offload
	Discovered in Version: 4.16.10.3
781277	Description: The "esxcli network sriovnic vf stats" command is not supported. When running this command on a vmknics, a failure message is displayed.
	Workaround: N/A
	Keywords: esxcli SR-IOV
	Discovered in Version: 4.6.10.3
685558	Description: There is no traffic between PV and SR-IOV VF connected to different ports on the same HCA. This issue is applicable to ESXi 6.5 & ESXi 6.5 UP1. The issue is solved in ESXi 6.5 UP2.
	Workaround: N/A
	Keywords: PV, SR-IOV VF, HCA

Table 6 - Known Issues (Sheet 2 of 3)

Internal Ref.	Description
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
-	Description: Geneve options length support is limited to 56B. Received packets with options length bigger than 56B are dropped.
	WA: N/A
	Keywords: Geneve
910292	Description: Running with ConnectX-4/ConnectX-4 Lx older firmware versions, might result in the following internal firmware errors: <ul style="list-style-type: none"> • Device health compromised • synd 0x1: firmware internal error • extSync 0x94ee
	Workaround: Upgrade your firmware to the latest version 12.17.2020/14.17.2020
	Keywords: Firmware
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
1072640	Description: ESXi v4.16.10.3 cannot updated from v4.16.8.8 (GA) or from the Inbox driver using the "esxcli software vib update" command.
	Workaround: To update it, run the "esxcli software vib install" command.
	Keywords: Driver update
1068621	Description: SMP MADs (ibnetdiscover, sminfo, iblinkinfo, smpdump, ibqueryerr, ibdiagnet and smpquery) are not supported on the VFs.
	Workaround: N/A
	Keywords: SMP MADs
778371	Description: Wake-on-LAN does not notify when invalid parameters are provided.
	Workaround: N/A
	Keywords: WoL
778572	Description: Nested ESXi might not function properly.
	Workaround: N/A
	Keywords: Nested ESXi

Table 6 - Known Issues (Sheet 3 of 3)

Internal Ref.	Description
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
784293	Description: VGT traffic over VXLAN interfaces is currently not supported.
	Workaround: N/A
	Keywords: VGT traffic, VXLAN

4 Bug Fixes History

Table 7 lists the bugs fixed in this release.

Table 7 - Fixed Bugs List

Internal Ref.	Description
1358381	Description: Fixed an issue that prevented ESXi from being discovered via the CDP protocol on ConnectX-4 Lx adapter cards.
	Keywords: CDP protocol, ConnectX-4 Lx
	Discovered in Release: 4.16.12.12
	Fixed in Release: 4.16.14.2
1253564	Description: Disabled multicast loopback to avoid a scenario that prevented MAC learning in some configurations.
	Keywords: MAC, multicast loopback
	Discovered in Release: 4.16.12.12
	Fixed in Release: 4.16.13.5
958154	Description: NetQ RSS for encapsulated traffic is currently not supported. Encapsulated traffic (VXLAN/Geneve) directed to NetQ RSS queue will not be distributed through all queues' channels, thus will not utilize the RSS feature.
	Note: It is highly recommended to avoid requesting RSS for encapsulated interfaces, i.e. refrain from defining the following in the VM configuration file: <iface_name>.pnictFeatures=4
	Keywords: NetQ RSS, encapsulated traffic
	Discovered in Release: 4.16.8.8
	Fixed in Release: 4.16.12.12
698142/637104	Description: Traffic loss of large packets might occur after MTU change.
	Keywords: MTU, Traffic loss
	Discovered in Release: 4.16.7.8
	Fixed in Release: 4.16.10.3
846359	Description: Fixed an issue which caused the adapter card to get stuck in Down state after setting the ring size to 8192.
	Keywords: Ring size
	Discovered in Release: 4.16.7.8
	Fixed in Release: 4.16.8.8

5 Change Log History

Table 8 - Change Log History (Sheet 1 of 3)

Feature/Change	Description
Rev. 4.16.13.5	
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 <i>Explicit Congestion Notification (ECN)</i> .
Bug Fixes	<ul style="list-style-type: none"> See Section 4, “Bug Fixes History”, on page 12
Rev. 4.16.12.12	
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.
Bug Fixes	See Section 4, “Bug Fixes History”, on page 12
Rev. 4.16.10.3	
InfiniBand SR-IOV	Enables the creation of InfiniBand virtual functions, allowing the guests to operate over an InfiniBand fabric.
ESXi CLI	Added ESXi CLI support for ESXi 6.5
Rev. 4.16.7.8	
Adapter Cards	Added support for ConnectX-5/ConnectX-5 Ex adapter cards. Note: ConnectX-5/ConnectX-5 Ex cards are currently at beta level.
Rev. 4.16.7.8	
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.

Table 8 - Change Log History (Sheet 2 of 3)

Feature/Change	Description
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 <i>Priority Flow Control (PFC)</i> in the User Manual.
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 “ <i>Set Link Speed</i> ”.
Priority Flow Control (PFC)	Applies pause functionality to specific classes of traffic on the Ethernet link. For further information, see the User Manual section “ <i>Priority Flow Control (PFC)</i> ”.
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 “ <i>NetQ RSS</i> ”.
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 “ <i>Default Queue Receive Side Scaling (DRSS)</i> ”.
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 core-dump collection can be configured in addition to or instead of disk-based coredump 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	<ul style="list-style-type: none"> • Large Send Offload (TCP Segmentation Offload) • RSS (Device RSS)
Hardware Capabilities	<ul style="list-style-type: none"> • Multiple Tx/Rx rings • Fixed Pass-Through • Single/Dual port • MSI-X

Table 8 - Change Log History (Sheet 3 of 3)

Feature/Change	Description
Ethernet Network	<ul style="list-style-type: none">• TX/RX checksum• Auto moderation and Coalescing• VLAN stripping offload