



# Mellanox WinOF-2 Release Notes

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Rev 1.90.50015

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## Document Revision History

*Table 1 - Document Revision History*

Release	Date	Description
Rev 1.90.50015	March 12, 2018	Initial release of WinOF-2 version 1.90.50010. This version introduces new changes and new features (see <a href="#">Section 2, “Changes and New Features in Rev 1.90.50015”</a> , on <a href="#">page 9</a> ) and bug fixes (see <a href="#">Section 4, “Bug Fixes History”</a> , on <a href="#">page 13</a> ).

# 1 Overview

These are the release notes of Mellanox WinOF-2 Rev 1.90.50015 Ethernet and InfiniBand drivers.



Please note that WinOF-2 supports ConnectX-4 onwards adapter cards only.

## 1.1 Mellanox WinOF-2 Package Contents

The Mellanox WinOF-2 Rev 1.90.50015 for Windows package contains the following components:

- Ethernet driver
- IPoIB driver
- Network Direct (ND)
- Basic tools
- Performance tools
- Documentation (README file)

## 1.2 Supported Operating System Versions

The following describes the supported operating systems and their roles in a virtualization environment.

**Table 2 - Supported Operating System Versions**

Virtualization Mode	Supported Host OS	Supported Guest OS
None	Windows Server 2012	N/A
	Windows Server 2012 R2	
	Windows Server 2016	
	Windows Server, version 1709 (RS3)	
	Windows 8.1 Client (64 bit only)	
	Windows 10 Client 1709 (64 bit only)	
VMQ	Windows Server 2012	Any supported guest OS for Hyper-V
	Windows Server 2012 R2	
	Windows Server 2016	
	Windows Server, version 1709	

**Table 2 - Supported Operating System Versions**

Virtualization Mode	Supported Host OS	Supported Guest OS
SR-IOV (Ethernet only)	Windows Server 2012 R2	Windows Server 2012 R2
		Windows Server 2016
		Windows Server, version 1709
	Windows Server 2016	Windows Server 2012 R2
		Windows Server 2016
		Windows Server, version 1709
		Windows 10 Client 1709 (64 bit only)
Windows Server, version 1709	Windows Server, version 1709	
SR-IOV Ethernet and InfiniBand	Windows Server 2016	Inbox Ubuntu 16.04.4.13.0-10007
		Inbox CentOS/RHEL 7.4 3.10.0-693.11.1
		Inbox SLES12 SP3 4.4.92-6.18

### 1.3 Certifications

The following describes the driver’s certification status per operating system.

**Table 3 - Certifications**

Operating System	Logo Certification	SDDC Premium Certification
Windows Client 8.1	Certified	N/A
Windows 10 Client 1709	Certified	N/A
Windows Server, version 1709	N/A	N/A
Windows Server 2012	Certified	N/A
Windows Server 2012 R2	Certified	N/A
Windows Server 2016	Certified	Certified



This section is updated in accordance with the certifications obtainment.

## 1.4 Supported Network Adapter Cards

Mellanox Mellanox WinOF-2 User Manual Rev 1.90.50015 supports the following Mellanox network adapter cards:

**Table 4 - Supported Network Adapter Cards**

NICs	Supported Protocol	Supported Link Speed
ConnectX®-4	Ethernet/InfiniBand	10, 25, 40, 50 and 100Gb/s QDR, FDR and EDR
ConnectX®-4 Lx	Ethernet	10, 25, 40, and 50Gb/s
ConnectX®-5/Ex	Ethernet/InfiniBand	10, 25, 40, 50 and 100Gb/s QDR, FDR and EDR

### 1.4.1 Firmware Versions

Mellanox WinOF-2 User Manual Rev 1.90.50015 provides the following firmware for Mellanox NICs:

**Table 5 - Firmware Versions**

NICs	Recommended Firmware Rev.	Additional Firmware Rev. Supported
ConnectX-4®	12.22.1002	12.21.2010 <sup>a</sup>
ConnectX®-4/Lx	14.22.1002	14.21.2010 <sup>a</sup>
ConnectX-5/Ex	16.22.1002	16.21.2010

a. For SR-IOV support, please refer to [Table 8](#).



## 2 Changes and New Features in Rev 1.90.50015

**Table 6 - Changes and New Features in Rev 1.90.50015**

Category	Description
<b>Driver Default Settings Update</b>	<p>WinOF-2 driver v1.90.50000 loads with the wrong default settings. This issue is fixed in WinOF-2 v1.90.50015.</p> <p>In case you have installed WinOF-2 v1.90.50000 driver, to fix the above issue the following can be applied:</p> <ul style="list-style-type: none"> <li>Install WinOF-2 v1.90.50015</li> <li>If you do not want to install the new package, revert to the correct settings:                             <ol style="list-style-type: none"> <li>Delete the following registry key:                                      HKLM\SYSTEM\CurrentControlSet\Services\mlx5\msAzureSetup</li> <li>Restart the driver for changes to take effect.</li> </ol> </li> </ul>
<b>Dump Me Now (DMN)</b>	<p>Added support for DMN to generate dumps and traces for:</p> <ul style="list-style-type: none"> <li>General information</li> <li>QP specifics</li> <li>SR-IOV</li> </ul>
<b>Event Log Messages</b>	<p>Added the following new event log message in case firmware events are reported:</p> <ul style="list-style-type: none"> <li>Transmit engine hang</li> <li>Receive hang</li> </ul> <p><b>Note:</b> The resiliency flow is disabled by default for WinOF-2 v1.90 thus the driver will ignore these events when reported.</p>
<b>Datapath Statistics</b>	<p>Added Mellanox WinOF-2 Receive and Transmit Datapath counters.</p> <p>For further information, see sections <i>Mellanox WinOF-2 Receive Datapath</i> and <i>Mellanox WinOF-2 Transmit Datapath</i> in the User Manual.</p>
<b>Mellanox WinOF-2 Diagnostic Counters</b>	<p>Added the following Mellanox WinOF-2 Diagnostic Counters:</p> <ul style="list-style-type: none"> <li>Droplless Mode Entries</li> <li>Droplless Mode Exits</li> <li>Transmission Engine Hang Events</li> <li>MTT entries used for QP</li> <li>MTT entries used for CQ</li> <li>MTT entries used for EQ</li> <li>MTT entries used for MR</li> <li>CPU MEM-pages (4K) mapped by TPT for QP</li> <li>CPU MEM-pages (4K) mapped by TPT for CQ</li> <li>CPU MEM-pages (4K) mapped by TPT for EQ</li> <li>CPU MEM-pages (4K) mapped by TPT for MR</li> </ul> <p><b>Note:</b> These counters are not counted per VF in the Hypervisor.</p> <p>For further information, see section <i>Mellanox WinOF-2 Diagnostic Counters</i> in the User Manual</p>
<b>Mellanox WinOF-2 VF Diagnostic Counters</b>	<p>Added the following Mellanox WinOF-2 VF Diagnostic Counters:</p> <ul style="list-style-type: none"> <li>Async EQ Overrun</li> <li>Completion EQ Overrun</li> <li>Current Queues Under Processor Handle</li> <li>Total Queues Under Processor Handle</li> <li>Packets Received dropped due to Steering</li> <li>Packets Received dropped due to VPort Down</li> <li>Packets Transmitted dropped due to VPort Down</li> <li>Invalid Commands</li> </ul> <p>For further information, see section <i>Mellanox WinOF-2 VF Diagnostic Counters</i> in the User Manual</p>

**Table 6 - Changes and New Features in Rev 1.90.50015**

Category	Description
<b>Port Diagnostic Database Register (PDDR)</b>	The tool provides troubleshooting and operational information that can assist in debugging physical layer link related issues. For further information, see section <i>Port Diagnostic Database Register (PDDR)</i> in the User Manual.
<b>DSCP</b>	Added DSCP counters per-priority.
<b>Bug fixes</b>	<a href="#">See “Bug Fixes History” on page 13.</a>

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

## 2.1 Unsupported Functionalities/Features

The following are the unsupported functionalities/features in WinOF-2:

- Non-default PKeys in IPoIB
- Sniffer Utility in IPoIB.

### 3 Known Issues

The following table provides a list of known bugs and limitations in regards to this release of WinOF-2. For a list of old Know Issues, please see the WinOF-2 Archived Known Issues file ([WinOF-2\\_Archived\\_Known\\_Issues.pdf](#)).

**Table 7 - Known Issues (Sheet 1 of 2)**

Internal Ref.	Issue
1310086	<b>Description:</b> Multicast packets are passed via to the VM the Hyper-V (even in SR-IOV VMs). As such, the Hyper-V can decide to drop the packets based on its specific policy. <b>Note:</b> This issue is only related to FreeBSD OSes.
	<b>Workaround:</b> N/A
	<b>Keywords:</b> Hyper-V OS
	<b>Detected in version:</b> 1.90
1154447	<b>Description:</b> Adding diagnostic counters to performance monitor might cause counters to get cleared every several seconds.
	<b>Workaround:</b> Change the time period between samples to more than 1 second.
	<b>Keywords:</b> Diagnostic Counters
	<b>Detected in version:</b> 1.90
1309747	<b>Description:</b> The driver loads with a yellow bang when working with machines with more than 256 cores.
	<b>Workaround:</b> Set the standard RSS keys: *RssBaseProcGroup and *RssMaxProcGroup for the Mellanox adapters to: <ul style="list-style-type: none"> <li>• In case the closet NUMA is known, set the keys according to it</li> <li>• otherwise, set the keys to zero</li> </ul> For further information on the standard keys, see: <a href="https://docs.microsoft.com/en-us/windows-hardware/drivers/network/standardized-inf-key-words-for-rss">https://docs.microsoft.com/en-us/windows-hardware/drivers/network/standardized-inf-key-words-for-rss</a>
	<b>Keywords:</b> Driver load
	<b>Detected in version:</b> 1.80
1074589	<b>Description:</b> When PXE boot is using Flexboot, the IPoIB interface is not receiving the reserved address from the DHCP using GUID reservation.
	<b>Workaround:</b> To obtain the reserved address, use a 6-byte MAC address instead of the 8-byte client ID.
	<b>Keywords:</b> PXE boot, IPoIB, Flexboot, DHCP
	<b>Detected in version:</b> 1.80
917747	<b>Description:</b> Running Windows Server 2012 R2 Hypervisor with Windows Server 2016 VM with more than one core CPU causes BSOD.
	<b>Workaround:</b> Run either with one CPU core, or run with different Operating Systems.
	<b>Keywords:</b> SR-IOV
	<b>Detected in version:</b> 1.80

**Table 7 - Known Issues (Sheet 2 of 2)**

Internal Ref.	Issue
1170780	<b>Description:</b> The driver must be restarted in order to switch from RSS to NonRSS mode. Therefore, if a PowerShell command is used on a specific VM to an enabled/disabled VMMQ without restarting the driver, the RSS counters will keep increasing in Perfmon.
	<b>Workaround:</b> Restart the driver to switch to NonRSS mode.
	<b>Keywords:</b> RSS, NonRSS, VMMQ
	<b>Detected in version:</b> 1.80
1149961	<b>Description:</b> In RoCE, the maximum MTU of WinOF-2 (4k) is greater than the maximum MTU of WinOF (2k). As a result, when working with MTU greater than 2k, WinOF and WinOF-2 cannot operate together.
	<b>Workaround:</b> N/A
	<b>Keywords:</b> RoCE, MTU
	<b>Detected in version:</b> 1.80
1145421	<b>Description:</b> In IPoIB SR-IOV setup, in the Hyper-V Manager, the address appears as "SR-IOV enabled" instead of "SR-IOV active". This does not influence any activity or functionality.
	<b>Workaround:</b> N/A
	<b>Keywords:</b> IPoIB SR-IOV setup, Hyper-V
	<b>Detected in version:</b> 1.80
1145421	<b>Description:</b> In the "Network Connections" panel of Virtual Function (VF) in IPoIB SR-IOV setup, the Microsoft adapter may appear in addition to the Mellanox adapter. This does not influence any activity or functionality.
	<b>Workaround:</b> N/A
	<b>Keywords:</b> Network Connections, VF, IPoIB SR-IOV
	<b>Detected in version:</b> 1.80

### 3.1 SR-IOV Support Limitations

The below table summarizes the SR-IOV working limitations, and the driver’s expected behavior in unsupported configurations.

**Table 8 - SR-IOV Support Limitations**

WinOF-2 Version	ConnectX-4 Firmware Ver.	Adapter Mode		
		InfiniBand		Ethernet
		SR-IOV On	SR-IOV Off	SR-IOV On/Off
Earlier versions	Up to 12.16.1020	Driver will fail to load and show "Yellow Bang" in the device manager.		No limitations
1.50 onwards	12.17.2020 onwards (IPoIB supported)	“Yellow Bang” unsupported mode - disable SR-IOV via mlxconfig	OK	No limitations

For further information on how to enable/disable SR-IOV, please refer to the “Single Root I/O Virtualization (SR-IOV)” section in the User Manual.

## 4 Bug Fixes History

Table 9 lists the bugs fixed in this release. For a list of old Bug Fixes, please see WinOF-2 Bug Fixes file ([WinOF-2\\_Archived\\_Bug\\_Fixes.pdf](#)).

**Table 9 - Bug Fixes History (Sheet 1 of 6)**

Internal Ref.	Issue
1230582	<b>Description:</b> The "NDISTest 6.5 - [2 Machine] - Stats" HLK test may fail due to inaccurate statistics caused by the counters caching mechanism in the driver.
	<b>Keywords:</b> HLK test, statistics, caching mechanism
	<b>Detected in version:</b> 1.80.51000
	<b>Fixed in Release:</b> 1.90
1267236	<b>Description:</b> Decreased the maximum value of RemoteCMResponseTimeout to 25 to prevent unexpected machine stucks.
	<b>Keywords:</b> CM, Communication Manager, ND, NS, connection
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
1297621	<b>Description:</b> Updated a wrong value description received when dumping the interface VlanID. The new output is VlanID instead of VlanId.
	<b>Keywords:</b> VlanID
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
1309465	<b>Description:</b> Fixed an issue that caused memory leak due to a race between the driver disabling and new RDMA connection creation.
	<b>Keywords:</b> Memory leak, ND, NDK
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
1224791	<b>Description:</b> Updating the non-default vPort's VM network interface RSS parameter during heavy traffic in vRSS mode could cause the host and non-default vPorts network interfaces to reset, and a momentary disruption in network connectivity.
	<b>Keywords:</b> RSS parameters, vRSS, vPorts
	<b>Detected in version:</b> 1.80.51000
	<b>Fixed in Release:</b> 1.90
1281119	<b>Description:</b> Fixed an issue when using ConnectX-4 Lx adapter cards that caused packets to drop when the send packet is requested with a VLAN tag placed directly in the packet instead of putting in it in the OOB data.
	<b>Keywords:</b> VLAN tag, Send packets, ConnectX-4 Lx
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90

**Table 9 - Bug Fixes History (Sheet 2 of 6)**

Internal Ref.	Issue
1153318	<b>Description:</b> Fixed an issue that caused the driver to fail initialize when adding Wake-on-Lan support dynamically.
	<b>Keywords:</b> iSCSI boot, PXE Boot, Ethernet
	<b>Detected in version:</b> 1.20
	<b>Fixed in Release:</b> 1.90
1276326	<b>Description:</b> Modified the amount of requested MSI-X vectors dependency in the VM when in SR-IOV mode. Now the amount of requested MSI-X vectors depends on RSS configuration only and is no longer limited by the inf file.
	<b>Keywords:</b> MSI-X vectors
	<b>Detected in version:</b> 1.80.51000
	<b>Fixed in Release:</b> 1.90
1184329	<b>Description:</b> Fixed an incorrect device description in the Device Manager menu.
	<b>Keywords:</b> Device Manager, device name
	<b>Detected in version:</b> 1.60
	<b>Fixed in Release:</b> 1.90
1260219	<b>Description:</b> Fixed an issue that caused the firmware upgrade process to fail when upgrading the driver to a newer version.
	<b>Keywords:</b> Driver upgrade/install, firmware upgrade
	<b>Detected in version:</b> 1.80.50000
	<b>Fixed in Release:</b> 1.90
1272781	<b>Description:</b> Fixed an issue that caused the system to ignore the DeviceRxStallWatermark configuration.
	<b>Keywords:</b> DeviceRxStallWatermark
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
1251520	<b>Description:</b> Fixed an issue that caused a miniport reset false alarm due to a command execution starvation.
	<b>Keywords:</b> Miniport reset, command starvation
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
1172031	<b>Description:</b> Fixed an issue that caused the nd_read_bw utility to hang when running on duration mode.
	<b>Keywords:</b> nd_read_bw utility, duration mode
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90

**Table 9 - Bug Fixes History (Sheet 3 of 6)**

Internal Ref.	Issue
1178207	<b>Description:</b> Fixed an issue that caused the device to report more than the supported number of schedule queue.
	<b>Keywords:</b> Virtualization
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
899853	<b>Description:</b> Fixed an issue that prevented the network adapter IP configuration from being reset after uninstalling the driver.
	<b>Keywords:</b> Uninstallation, network adapter configurations, Windows Server 2016, Windows 10
	<b>Detected in version:</b> 1.70
	<b>Fixed in Release:</b> 1.90
1168017	<b>Description:</b> A system crash can occur when working with WinOF-2 and iSCSI boot with IPoIB when using Windows 2016 Server.
	<b>Keywords:</b> iSCSI boot, IPoIB, Windows 2016 Server, system crash
	<b>Detected in version:</b> 1.70
	<b>Fixed in Release:</b> 1.90
1183276	<b>Description:</b> The description of the Send queues priority counter on the performance monitor is incorrect. The correct description can be found in <i>Mellanox WinOF-2 Diagnostics Counters</i> section in the User Manual.
	<b>Keywords:</b> Counters, diagnostics
	<b>Detected in version:</b> 1.80
	<b>Fixed in Release:</b> 1.90
1229780	<b>Description:</b> In some scenarios, since the default LRO/RSC coalescing value is 4K, 100GbE bandwidth cannot be reached.
	<b>Keywords:</b> LRO/RSC registry key
	<b>Detected in version:</b> 1.80.51000
	<b>Fixed in Release:</b> 1.90
1237695	<b>Description:</b> When the VMQ mode is enabled in a virtual switch, the RSS-enabled network adapter supports only 60 VMNICs, in spite of the 124 advertised. Thus, only 60 VMQs for virtual NICs are available and HLK VMQ tests fail.
	<b>Keywords:</b> VMQ, RSS, VMNICs, HLK
	<b>Detected in version:</b> 1.80.51000
	<b>Fixed in Release:</b> 1.90
1238090	<b>Description:</b> Setting the <code>*TransmitBuffers</code> parameter to a value that is not a power of 2 causes a BSOD while sending packets.
	<b>Keywords:</b> BSOD, <code>*TransmitBuffers</code>
	<b>Detected in version:</b> 1.80.51000
	<b>Fixed in Release:</b> 1.90

**Table 9 - Bug Fixes History (Sheet 4 of 6)**

Internal Ref.	Issue
1189216	<b>Description:</b> Removed from the Windows INF file all the device IDs that are not in use.
	<b>Keywords:</b> Windows INF file, device IDs
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80.51000
1230505	<b>Description:</b> Fixed a false alarm that indicated that a send queue was stuck and as a result a miniport reset was performed.
	<b>Keywords:</b> False alarm, send queue, miniport reset
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80.51000
1216315	<b>Description:</b> Fixed a rare case that caused a BSOD when switched from a single RQ to RSS.
	<b>Keywords:</b> BSOD, RQ, RSS
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80.51000
1161812	<b>Description:</b> Fixed certification issues that occurred when running ConnectX-4 Lx at 25Gb/s link speed.
	<b>Keywords:</b> HLK, certification
	<b>Discovered in Release:</b> 1.50
	<b>Fixed in Release:</b> 1.80.51000
1159304	<b>Description:</b> Fixed an issue that caused the firmware to get stuck during VM migration in SR-IOV mode or upon PF driver restart.
	<b>Keywords:</b> VM, SR-IOV, PF driver restart
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80.51000
1135605	<b>Description:</b> Fixed an issue that caused packets to drop on the Windows host when running a Windows host with a Linux host in IPoIB mode, and both of them were configured with the same MTU.
	<b>Keywords:</b> Windows host, Linux host, IPoIB, traffic drop, MTU
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80
1123164	<b>Description:</b> Fixed an issue that could cause a crash when the PF miniport driver did not wait for all previously indicated receive packets to return to the miniport from the VPort.
	<b>Keywords:</b> Virtualization, VmNic
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80



**Table 9 - Bug Fixes History (Sheet 5 of 6)**

Internal Ref.	Issue
1162555	<b>Description:</b> Fixed an issue where the ND provider threw an exception when an invalid parameter was used.
	<b>Keywords:</b> ND RDMA
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80
1110254	<b>Description:</b> Fixed an issue where RSS counters were incorrectly incremented for encapsulated traffic.
	<b>Keywords:</b> RSS counters
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80
1078156	<b>Description:</b> Fixed an issue in the getConnectionData method, where the pcbPrivateData did not return the correct value in case the pPrivateData buffer value was lower than required.
	<b>Keywords:</b> ND
	<b>Discovered in Release:</b> 1.80
	<b>Fixed in Release:</b> 1.80
1074483	<b>Description:</b> Fixed an issue that caused an installation failure when running in modify mode with the ADDLOCAL=All parameter.
	<b>Keywords:</b> Installation
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80
1072356	<b>Description:</b> Removed an incorrect event log message in VMQ NIC switch mode.
	<b>Keywords:</b> Keywords: Event log
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80
1160031	<b>Description:</b> Fixed an high stress issue that caused uncontrolled memory consumption, sporadic miniport device resets and missing send completions that could result in TX Q stuck events.
	<b>Keywords:</b> Keywords: High stress, memory consumption, miniport device resets, send completions
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80
1046283	<b>Description:</b> Fixed an issue where the shortcut to the system snapshot tool was broken and pointed to the wrong folder.
	<b>Keywords:</b> System snapshot tool, broken shortcut, installation
	<b>Discovered in Release:</b> 1.60
	<b>Fixed in Release:</b> 1.80

**Table 9 - Bug Fixes History (Sheet 6 of 6)**

Internal Ref.	Issue
1070241	<b>Description:</b> Moved SR-IOV VF's live migration from Beta level to full support of all flows.
	<b>Keywords:</b> SR-IOV
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80
1076050	<b>Description:</b> Removed a limitation that did not allow both of the following Ethertypes to be enabled at the same time: 0x8906 - Fibre Channel over Ethernet (FCoE) 0x8914 - FCoE Initialization Protocol
	<b>Keywords:</b> Ethertypes, 0x8906, 0x8914
	<b>Discovered in Release:</b> 1.60
	<b>Fixed in Release:</b> 1.80
1097658	<b>Description:</b> Updated the Cnp_dscp changeable values to 0-63, as supported by the firmware.
	<b>Keywords:</b> Cnp_dscp, changeable values
	<b>Discovered in Release:</b> 1.70
	<b>Fixed in Release:</b> 1.80

## 5 Change Log History

**Table 10 - Change Log History**

Feature/Change	Description
<b>Rev.1.80.50000</b>	
Bug fixes	See “Bug Fixes History” on page 13.
<b>Rev.1.80</b>	
SR-IOV	Enabled Windows SR-IOV Enhanced ePoIB (without Secure Connection).
Diagnostics	Added 3 diagnostic counters: <ul style="list-style-type: none"> <li>• Send queues priority counter</li> <li>• Current queues under processor handle counter</li> <li>• Total queues under processor handle counter.</li> </ul>
RDMA	Added the host’s ability to control RDMA per VM when using Windows Server, version 1709. The host can turn RDMA on/off for a specific VM without affecting other VMs.
	Added NDK (Network Direct Kernel) v3 support.
	Enabled by default RDMA in the VF from the host, using the <code>Enablequeues-tRdma</code> registry key.
Performance	Removed the <code>RssMaxProcNumber</code> registry key from the registry, and the "RSS Maximum Processor Number" from the UI.
Installation	Added the ability to upgrade the driver while ND application is running.
Operating Systems	Added support for Windows Server, version 1709.
DPDK	[Beta] Added support for DPDK. DPDK is a set of libraries and optimized NIC drivers for fast packet processing in user space. DPDK provides a framework and common API for high speed networking applications. DPDK runs over Linux of SR-IOV. For more information, see <a href="http://dpdk.org">dpdk.org</a> .
<b>Rev.1.70</b>	
mlxtool	Added the ability to query ND active connection status.
SR-IOV	Added the ability to load the driver on devices configured for SR-IOV and IPoIB, with no SR-IOV support.
ECN	The default values for ECN configuration are now taken from the firmware. It is still possible to configure the ECN parameters from the driver.
Virtualization	Added support for Linux VF over Hyper-V (Windows PF).
Quality of Service	QoS classification of received packets can now consider the DSCP value in addition to the PCP value.
RDMA	Added RDMA transport diagnostic counters.
Event Log	Added an event log in case the server reaches a certain (configurable) high temperature.
Performance	Added threaded DPC support.
<b>Rev.1.60</b>	
General	Added Beta support for ConnectX-5/ConnectX-5 Ex devices

**Table 10 - Change Log History**

Feature/Change	Description
Ethernet	Added Differentiated Services Code Point (DSCP), a mechanism that uses the 6-bit Differentiated Services Field (DS or DSCP field) in the IP header for packet classification.
	Added a resiliency mechanism that stops transmission of pauses from the NIC port if pauses are sent for a long period of time.
	Added the ability to handle packet bursts, while avoiding packet drops that may occur when a large amount of packets is sent in a short period of time.
	Added Head of Queue Lifetime Limit, a feature that enables the system to drop the packets that have been awaiting transmission for a long period of time, preventing the system from hanging.
Diagnostics	Added a new diagnostics counters set with information about RSS traffic spread per core, and new RDMA diagnostic counters.
Virtualization	Added the ability to limit the number of memory pages in the host that are used for contexts of VF resources.
	Extended SR-IOV support for up to 96 VFs per port.
Security	Added an anti-spoofing mechanism for the host driver to configure filters on outgoing traffic.
<b>Rev.1.50</b>	
InfiniBand	Added support for InfiniBand and IPoIB including EDR link speed.
RoCEv2 Congestion Management (RCM)	Switches running ECN will report congestion to the sources using CNP messages. The sources (Host), in turn, react by throttling down their injection rates, thus preventing congestion in the fabric.
DCBX	Added support for Data Center Bridging Exchange Protocol at GA level
Receive Path Activity Monitoring	Monitors the devices status continuously tot when the receive pipeline is stalled for a period longer than a pre-configured timeout.
Performance	Optimized MSI-X interrupt vectors' usage to enable efficient work on machines with high core counts.
Debug-ability	Extended data collected by the system snapshot tool to include QoS configurations.
	Added a counter to detect how many times the link went down and up.
	Added counters for NIC PCIe errors
	Added low level device counters to enable performance analysis.
	Added counters for driver reset.
<b>Rev. 1.45</b>	
The feature below is applicable to all supported Operating System:	
Link Speed	Added to mlx5cmd the capability to query supported link speeds according to the adapter card. Additionally, it enables the user to force set the range of speeds the adapter supports.
The list of features below are applicable to <b>Window Server 2016 OS</b> :	

**Table 10 - Change Log History**

Feature/Change	Description
NDKPI	Added support for NDKPI v2.0 interface.
Virtualization	Added support for RoCE in SR-IOV VM.
	Added support for RoCE in virtualization mode in the hypervisor.
	Added support for “VMMQ” - RSS load-balancing offload in HW for non-SRIOV VMs. <b>Note:</b> RSS for SR-IOV VMs is already available in older versions.
VXLAN Stateless Offload	Added support for send/receive checksum, LSOv2 and VMQ hardware offloads on VXLAN encapsulated frames.
PacketDirect	Added support for PacketDirect Provider Interface (PDPI).
<b>Rev. 1.40</b>	
WPP Traces Extraction	WinOF-2 Mellanox driver automatically dumps trace messages that can be used for debugging issues that have recently occurred on the machine.
MTT Optimization	Hardware resource utilization improvement for RDMA applications that use contiguous memory buffers
Data Center Bridging Exchange (DCBX)	<b>[Beta]</b> DCBX is used by DCB devices to exchange configuration information with directly connected peers. DCBX uses Link Layer Discovery Protocol (LLDP) to exchange parameters between two link peers.
Packet Sniffer	Added to mlx5cmd a command that allows sniffing packets as seen by the device and creating a .pcap file.
<b>Rev. 1.35</b>	
Documentation	Release Notes and User Manual documents were removed from the package. A new README file which includes basic installation instructions, summary of main features and requirements has replaced them.
Operating Systems	Added support for Windows 8.1 Client.
RDMA	Changed the default value of RoCE mode from v1 to v2.
	Added the option to configure the RoCE version per adapter.
	Changed UDP source port calculation according to IB spec.
SR-IOV	SR-IOV is at GA level.
	Added support for SR-IOV mode for Windows VM over Linux KVM hypervisor.
Tools	Added the option to view information of current adapter configuration in the snapshot tool.
	Added mstdump utility to reflect the state of a certain adapter by producing several types of events.
Congestion Control	<b>(At beta level)</b> Added support for Explicit Congestion Notification (ECN) to avoid congestion hot spots and optimize the throughput of the fabric.
QoS	Priority Flow Control (PFC) is at GA level.
	Enhanced Transmission Selection (ETS) is at GA level.
Performance	Improved RDMA latency, RoCE with high scale and cache line alignments.
Utilities	Added support for mlx5cmd utility, which is a generic utility that contains the trace, information and performance tuning utilities.

**Table 10 - Change Log History**

Feature/Change	Description
Wake On LAN	Added the option for a network admin to remotely power on a system or wake it up from sleep mode.
Cables	Added a notification pop-up upon bad cable state in the event viewer.
VF Counters	Added new traffic counters per Virtual Function (VF).
<b>Rev. 1.21</b>	
Virtualization	Single Root I/O Virtualization (SR-IOV) is a technology that allows a physical PCIe device to present itself multiple times through the PCIe bus. <b>Note:</b> SR-IOV is currently at Beta level and is disabled by default in both the driver and the firmware. In order to enable it, please refer to WinOF-2 User Manual at <a href="http://www.mellanox.com">www.mellanox.com</a> .
QoS	Added support for configuring the global pause mode on the two sides (Rx and Tx). This feature is enabled by default.
<b>Rev. 1.20</b>	
NVGRE	Network Virtualization using Generic Routing Encapsulation (NVGRE) is a network virtualization technology that attempts to alleviate the scalability problems associated with large cloud computing deployment.
Ethernet Network	Enhanced Transmission Selection (ETS) provides a common management framework for assignment of bandwidth to frame priorities.
Installation	Added support for downgrade. Note that Rev 1.20 is the older version to which downgrade is possible.
Diagnostics	Added the “mlxstat” tool to WinOF-2 package. mlxstat displays information of Mellanox NIC attributes.
<b>Rev. 1.10 (Beta)</b>	
RDMA	Added support for RoCE through NDSPI and NDKPI
Ethernet	Added QoS support for both global and priority-based flow controls
	Added support for VMQ
	Added support for Receive Side Coalescing (RSC)
UI	Added the following proprietary counters as part of the Performance Monitor: <ul style="list-style-type: none"> <li>• Mellanox WinOF-2 Traffic Counters</li> <li>• Mellanox WinOF-2 QoS Counters</li> </ul>
	Made some fixes in the Device Manager Properties Information tab