



Mellanox WinOF-2 Release Notes

Rev 1.80



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Release Update History

Table 1 - Release Update History

Release	Date	Description
1.80	November 7, 2017	Added: <ul style="list-style-type: none">• Bug fix #1135605 to 4 “Bug Fixes History,” on page 14. Updated: <ul style="list-style-type: none">• Bug fix #1160031 in 4 “Bug Fixes History,” on page 14.
	November 5, 2017	First release of this WinOF-2 version.

1 Overview

These are the release notes for the release of Mellanox WinOF-2 Rev 1.80 Ethernet and Infini-Band drivers.



Please note that WinOF-2 does not support ConnectX-3/ConnectX-3 Pro adapter cards.

1.1 Mellanox WinOF-2 Package Contents

The Mellanox WinOF-2 Rev 1.80 for Windows package contains the following components:

- Ethernet driver
- IPoIB driver
- 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
Native	Windows Server 2012	N/A
	Windows Server 2012 R2	
	Windows Server 2016	
	Windows Server, version 1709	
	Windows 8.1 Client (64 bit only)	
	Windows 10 Client (64 bit only)	
	Windows 10 Client 1703	
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	<ul style="list-style-type: none"> Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Windows 8.1 Client (64 bit only) Windows 10 Client (64 bit only) Windows 10 Client 1703 Ubuntu 16.04 kernel 4.4.0-77.98
	Windows Server 2016	
	Windows Server, version 1709	
SR-IOV Ethernet Linux	MLNX_OFED 3.3 and above	Windows Server 2016

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 Client 10	Certified	N/A
Windows 10 Client 1703	Certified	N/A
Windows Server, version 1709	N/A	N/A
Windows Server 2008R2	Certified	N/A
Windows Server 2012	Certified	N/A
Windows Server 2012R2	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 Rev 1.80 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, FDR10, 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, FDR10, FDR and EDR

1.4.1 Firmware Versions

Mellanox WinOF-2 Rev 1.80 provides the following firmware for Mellanox NICs:

Table 5 - Firmware Versions

NICs	Recommended Firmware Rev.	Additional Firmware Rev. Supported
ConnectX-4®	12.21.1000	12.20.1010 ^a
ConnectX®-4/Lx	14.21.1000	14.20.1010 ^a
ConnectX-5/Ex	16.21.1000	16.20.1010

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

2 Changes and New Features in Rev 1.80



This package version is 1.80.18500. The package contains driver version 1.80.18500.

Table 6 - Changes and New Features in Rev 1.80

Category	Description
SR-IOV	Enabled Windows SR-IOV Enhanced eIPoIB (without Secure Connection).
Diagnostics	Added 3 diagnostic counters: <ul style="list-style-type: none"> • Send queues priority counter • Current queues under processor handle counter • Total queues under processor handle counter.
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 dpdk.org .
Bug fixes	See "Bug Fixes History" on page 14.

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

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 3)

Internal Ref.	Issue
917747	Description: Running Windows Server 2012 R2 Hypervisor with Windows Server 2016 VM with more than one core CPU causes BSOD.
	Workaround: Run either with one CPU core, or run with different Operating Systems.
	Keywords: SR-IOV
	Detected in version: 1.80
1183276	Description: 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.
	Workaround: N/A
	Keywords: Counters, diagnostics
	Detected in version: 1.80
1170780	Description: 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.
	Workaround: Restart the driver to switch to NonRSS mode.
	Keywords: RSS, NonRSS, VMMQ
	Detected in version: 1.80
1149961	Description: 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.
	Workaround: N/A
	Keywords: RoCE, MTU
	Detected in version: 1.80
1145421	Description: 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.
	Workaround: N/A
	Keywords: IPoIB SR-IOV setup, Hyper-V
	Detected in version: 1.80

Table 7 - Known Issues (Sheet 2 of 3)

Internal Ref.	Issue
1145421	Description: 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.
	Workaround: N/A
	Keywords: Network Connections, VF, IPoIB SR-IOV
	Detected in version: 1.80
1121688	Description: Mellanox WinOF-2 Device Diagnostics and Mellanox WinOF-2 PCI Device Diagnostics counters in Perfmon are available only on the adapter that was initialized first, which is the counters' owner. In case both adapters are viewed in Perfmon: 1. The owner will receive correct values, while the second adapter will only receive zeros. 2. If the owner goes down, the ownership will move to the second adapter.
	Workaround: N/A
	Keywords: WinOF-2 Device Diagnostics, Mellanox WinOF-2 PCI Device Diagnostics, Perfmon, ownership
	Detected in version: 1.70.0.1
961251	Description: On a dual port device, when the first port is IPoIB and the second port is Ethernet, the device will not start over iSCSI and Windows 2012 in the Ethernet port.
	Workaround: N/A
	Keywords: IPoIB port, Ethernet port, iSCSI, Windows 2012
	Detected in version: 1.70
1000390	Description: Configuring a different RoCE mode between VF and PF is not supported
	Workaround: N/A
	Keywords: RoCE, VF, PF
	Detected in version: 1.70
917856	Description: All folders under %PROGRAMFILES%Mellanox\MLNX_WINOF2 are deleted in case of upgrade failure. The old driver remains, and no connectivity loss should occur. The issue occurs only when the upgrade fails after the old version was removed.
	Workaround: Following the upgrade failure, reinstall the new package folder.
	Keywords: Installation, setup, missing folders
	Detected in version: 1.70
969531	Description: Quality of Service supports up to 27 VFs per port in single port devices, and up to 13 VFs per port in dual port devices.
	Workaround: N/A
	Keywords: QoS, VmQoS, ETS, DCBX
	Detected in version: 1.70

Table 7 - Known Issues (Sheet 3 of 3)

Internal Ref.	Issue
1168017	Description: A system crash can occur when working with WinOF-2 and iSCSI boot with IPoIB when using Windows 2016 Server.
	Workaround: N/A
	Keywords: iSCSI boot, IPoIB, Windows 2016 Server, system crash
	Detected in version: 1.70
915981	Description: On IPoIB adapters, the network adapter and task manager network counters count all port traffic when only non-RDMA traffic should be shown.
	Workaround: N/A
	Keywords: IPoIB, counters, RDMA
	Detected in version: 1.60
939227	Description: When upgrading from WinOF-2 1.50 to 1.60 or later, the MAC address used for the IPoIB interface changes.
	Workaround: N/A
	Keywords: IPoIB, MAC address
	Detected in version: 1.60
928999	Description: When installing a new driver, driver version queries via WMI may not be up-to-date, due to information caching in the WMI service.
	Workaround: Stop and restart the WMI service, running the following CMD commands: net stop winmgmt net start winmgmt
	Keywords: Driver version queries, WMI, information caching
	Detected in version: 1.60
964973	Description: SRQ limit event is not supported in the ND and NDK RDMA programming interfaces.
	Workaround: N/A
	Keywords: SRQ, ND, NDK RDMA
	Detected in version: 1.60
954496 / 966409	Description: Windows Server 2016 Switch Embedded Teaming (SET) does not work in SR-IOV mode.
	Workaround: N/A
	Keywords: SET, 2016, SR-IOV
	Detected in version: 1.60
900928	Description: The packet sniffer is currently not supported in InfiniBand mode.
	Workaround: N/A
	Keywords: InfiniBand, packet sniffer
	Detected in version: 1.50

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 5)

Internal Ref.	Issue
1135605	Description: Fixed an issue that could cause packets 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.
	Keywords: Windows host, Linux host, IPoIB, traffic drop, MTU
	Discovered in Release: 1.70
	Fixed in Release: 1.80
1123164	Description: 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.
	Keywords: Virtualization, VmNic
	Discovered in Release: 1.70
	Fixed in Release: 1.80
1162555	Description: Fixed an issue where the ND provider threw an exception when an invalid parameter was used.
	Keywords: ND RDMA
	Discovered in Release: 1.80
	Fixed in Release: 1.80
1110254	Description: Fixed an issue where RSS counters were incorrectly incremented for encapsulated traffic.
	Keywords: RSS counters
	Discovered in Release: 1.80
	Fixed in Release: 1.80
1078156	Description: 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.
	Keywords: ND
	Discovered in Release: 1.80
	Fixed in Release: 1.80
1074483	Description: Fixed an issue that caused an installation failure when running in modify mode with the ADDLOCAL=All parameter.
	Keywords: Installation
	Discovered in Release: 1.70
	Fixed in Release: 1.80

Table 9 - Bug Fixes History (Sheet 2 of 5)

Internal Ref.	Issue
1072356	Description: Removed an incorrect event log message in VMQ NIC switch mode.
	Keywords: Keywords: Event log
	Discovered in Release: 1.70
	Fixed in Release: 1.80
1160031	Description: 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.
	Keywords: Keywords: High stress, memory consumption, miniport device resets, send completions
	Discovered in Release: 1.70
	Fixed in Release: 1.80
1046283	Description: Fixed an issue where the shortcut to the system snapshot tool was broken and pointed to the wrong folder.
	Keywords: System snapshot tool, broken shortcut, installation
	Discovered in Release: 1.60
	Fixed in Release: 1.80
1070241	Description: Moved SR-IOV VF's live migration from Beta level to full support of all flows.
	Keywords: SR-IOV
	Discovered in Release: 1.70
	Fixed in Release: 1.80
1076050	Description: 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
	Keywords: Ethertypes, 0x8906, 0x8914
	Discovered in Release: 1.60
	Fixed in Release: 1.80
1097658	Description: Updated the Cnp_dscp changeable values to 0-63, as supported by the firm-ware.
	Keywords: Cnp_dscp, changeable values
	Discovered in Release: 1.70
	Fixed in Release: 1.80

Table 9 - Bug Fixes History (Sheet 3 of 5)

Internal Ref.	Issue
1091022	Description: Fixed an issue where high memory utilization and fake transmit stuck detection could occur in times of heavy outgoing traffic, due to completion queue starvation.
	Keywords: high memory utilization, transmit stuck, completion queue starvation
	Discovered in Release: 1.60
	Fixed in Release: 1.70 FUR 1
1093185	Description: Fixed an issue where observing RSS statistics counters during RSS base processor change could cause a driver crash.
	Keywords: RSS statistics counters, RSS base processor, driver crash
	Discovered in Release: 1.70
	Fixed in Release: 1.70 FUR 1
958895	Description: Fixed an issue where traffic counters were not updated between two consequential reads, in case they were read more than once within 100ms.
	Keywords: Traffic counters
	Discovered in Release: 1.70
	Fixed in Release: 1.70 FUR 1
969892	Description: Fixed the issue where driver required auto-negotiation by default. This could cause link connectivity problems with devices that do not support auto-negotiation.
	Keywords: Link connectivity, "SavedLinkSpeedValue"
	Discovered in Release: 1.45
	Fixed in Release: 1.70
945026 / 960950	Description: SR-IOV VFs drivers are not removed correctly in case of live migration or host driver restart.
	Keywords: SR-IOV, VFs drivers, live migration, host driver restart
	Detected in version: 1.60
	Fixed in Release: 1.70
953622	Description: Running the mlx5cmd -sniffer tool with more than 8 command line arguments results in failure.
	Keywords: mlx5cmd -sniffer
	Detected in version: 1.60
	Fixed in Release: 1.70
964137	Description: The installation/uninstallation process fails in case the event viewer is open and the mlx5.sys is locked.
	Keywords: Installation, uninstallation, event viewer, mlx5.sys
	Detected in version: 1.60
	Fixed in Release: 1.70

Table 9 - Bug Fixes History (Sheet 4 of 5)

Internal Ref.	Issue
1072611	Description: Fixed a BSOD issue when opening RSS counters on perfmon while the machine had only one RSS core that was different from 0.
	Keywords: RSS, counters
	Discovered in Release: 1.60
	Fixed in Release: 1.70
960900	Description: Fixed the traffic counter name from "Packets Received Discarded" to "Packets Received Discarded - No Receive WQEs", as it counts only packets that were dropped due to a lack of receive WQEs.
	Keywords: traffic counter, Receive WQE
	Discovered in Release: 1.70
	Fixed in Release: 1.70
964551	Description: Fixed an issue where the WinOF-2 driver was not loaded on an adapter with an enabled SR-IOV, when the port mode was set to InfiniBand. An error message appeared, stating that the firmware does not support IPoIB.
	Keywords: SR-IOV, IPoIB
	Discovered in Release: 1.60
	Fixed in Release: 1.70
962960	Description: Fixed an issue were in InfiniBand mode, non-default prefix was not supported.
	Keywords: InfiniBand, not-default prefix
	Discovered in Release: 1.60
	Fixed in Release: 1.70
960941	Description: Fixed an issue that caused the command line parsing of mlx5cmd -sniffer to fail when many arguments were provided.
	Keywords: mlx5cmd -sniffer
	Discovered in Release: 1.60
	Fixed in Release: 1.70
969764	Description: Fixed an issue that could cause the values of the "Minor Stall Watermark Reached" and "Critical Stall Watermark Reached" pause resiliency counters to be reported as zero in some cases, regardless of the real values.
	Keywords: "Minor Stall Watermark Reached", "Critical Stall Watermark Reached"
	Discovered in Release: 1.60
	Fixed in Release: 1.70
1048938	Description: Fixed an issue that could cause an installation failure when installing the same package twice with the following argument: ADDLOCAL=All.
	Keywords: Installation
	Discovered in Release: 1.60.51000
	Fixed in Release: 1.60.53000

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

Internal Ref.	Issue
951130	Description: Fixed an issue which caused driver unload failure and blue screen with code 9F, when shutting down a machine while NDK traffic is running.
	Keywords: RDMA, unload, blue screen, shutdown, NDK
	Discovered in Release: 1.60
	Fixed in Release: 1.60
926267	Description: Fixed an issue which caused VLAN tagging to not operate on ConnectX-5 family devices.
	Keywords: VLAN tagging, ConnectX-5
	Discovered in Release: 1.50
	Fixed in Release: 1.60
903536	Description: Fixed an issue where Environment variables were added only to the current user and not to all users
	Keywords: Environment variables
	Discovered in Release: 1.50
	Fixed in Release: 1.60
704364	Description: Fixed an issue which caused a failure to remove ND providers upon uninstal- lation of the driver.
	Keywords: Uninstallation, ND providers
	Discovered in Release: 1.35
	Fixed in Release: 1.60

5 Change Log History

Table 10 - Change Log History

Feature/Change	Description
Rev.1.70	
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.
Rev.1.60	
General	Added Beta support for ConnectX-5/ConnectX-5 Ex devices
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.
Rev.1.50	
InfiniBand	Added support for InfiniBand and IPoIB including EDR link speed.

Table 10 - Change Log History

Feature/Change	Description
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.
Rev. 1.45	
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 Window Server 2016 OS :	
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. Note: 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).
Rev. 1.40	
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

Table 10 - Change Log History

Feature/Change	Description
Data Center Bridging Exchange (DCBX)	[Beta] 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.
Rev. 1.35	
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	(At beta level) 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.
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).
Rev. 1.21	
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. Note: 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 www.mellanox.com .

Table 10 - Change Log History

Feature/Change	Description
QoS	Added support for configuring the global pause mode on the two sides (Rx and Tx). This feature is enabled by default.
Rev. 1.20	
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.
Rev. 1.10 (Beta)	
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"> • Mellanox WinOF-2 Traffic Counters • Mellanox WinOF-2 QoS Counters
	Made some fixes in the Device Manager Properties Information tab