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Mellanox Firmware Tools (MFT) Release Notes

Rev 3.7.1

www.mellanox.com

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1 Overview

These are the release notes for Rev 3.7.1 of the **Mellanox Firmware Tools** (MFT).

This release supports the following operating systems: Linux, Windows, VMware ESXi and FreeBSD.
Please see the supported platform table for further details.

The tools functionality is identical in all operating systems unless otherwise noted.

1.1 Package Tools

The following is a list of the available tools in the package, together with a brief description of each tool. The tools apply to single switch systems or adapter cards. The MFT tools do not provide cluster wide functionality.

Table 1 - Mellanox Firmware Tools (MFT) Available Tools (Sheet 1 of 2)

Category	Tool	Description	Package Type
MST Service	mst	Starts/stops the register access driver (Linux and VMware ESXi only) Lists the available mst devices	All
FW Update and Configuration	mlxburn	This tool provides the following functions: • Generating a standard or customized Mellanox firmware image for burning in .bin format • Burning an image to the Flash attached to a Mellanox HCA or switch device • Querying the firmware version loaded on a Mellanox device. • Displaying the Vital Product Data (VPD) of a Mellanox network adapter	Linux Windows FreeBSD
	flint	This tool burns a firmware binary image or an expansion ROM image to the Flash of a Mellanox network adapter/bridge/switch device. It includes query functions to the burnt firmware image and to the binary image file.	All
	mlxfwmanager	The mlxfwmanager is a Mellanox firmware update and query utility. It provides a simple 'single click' firmware update functionality.	Linux Windows VMware ESXi
	mlxconfig	Allows the user to change some of the device configurations without having to create and burn a new firmware.	Linux Windows VMware ESXi
Debug and Diagnostics Utilities	itrace	Extracts and prints trace messages generated by the firmware of a ConnectX family adapter devices.	All
	fwtrace	Extracts and prints trace messages generated by the firmware of a Connect-IB™ family adapter devices.	Linux
	mlxtrace	Dumps trace messages generated by the device hardware.	All

Table 1 - Mellanox Firmware Tools (MFT) Available Tools (Sheet 2 of 2)

Category	Tool	Description	Package Type
	mlxdump	Dumps device internal configuration registers. The dump file can be used by Mellanox Support for hardware troubleshooting.	All
	mlxmcg	Displays the current multicast groups and flow steering rules configured in the device. Target users: Developers of Flow Steering aware applications.	All
	wqdump	Dumps the current QP contexts and Work Queues of a ConnectX®/Connect-IB™ family network adapter	All
	mcra	Reads/writes a single word from/to a device configuration register space	All
	i2c	Generates an i2c transaction using an mtusb usb to i2c adapter or using the device internal i2c compatible master	All
	mlxi2c	Scans the i2c bus Routes the i2c bus of an externally managed InfiniscaleIV/SwitchX system to connect to the switch silicon.	All
	mget_temp	Reads the hardware temperature from Mellanox Technologies devices internal sensors (ConnectX® family adapter cards, Connect-IB™, BridgeX devices, 4th generation switches), and prints the reading in Celsius degrees.	All
	pckt_drop	Corrupts the next transmitted packet from a ConnectX® and Connect-IB™ family adapter port.	All
	mlxuptime	Prints Mellanox devices' up time and measured/configured core clock frequency (at Beta level)	All
	mlxfwreset	Load Firmware after firmware update on ISFU capable devices.(5th generation devices)	Linux
	mlxmdio	Used to read/write MDIO registers (Clause 45) on boards with externally managed PHY	All

Detailed installation instructions along with complete descriptions of the various tools in the package can be found in the *Mellanox Firmware Tools User's Manual, Document no. 2329, Rev 1.90* or later.

1.2 Software Dependencies

1.2.1 Linux Software Dependencies

Table 2 - MFT Software Dependencies on Linux

Software Package	Required Version
Kernel sources	Machine's kernel version
OFED / MLNX_OFED [1, 2]	1.5.0 or higher
Perl	5.6 or later
Python[3]	2.6 and above
lsusb[4]	
rpmbuild	
xz[5]	

1. OFED can be downloaded from http://www.openfabrics.org. Note that installing OFED is *not* required if you wish to install MFT without In-Band capabilities.
2. For the 'mst ib add' command to run, one of the OFED packages "ibutils" or "ibutils2" or "infiniband-diags" should be installed and available in the PATH. (For details on OFED installation, visit http://www.mellanox.com and under OFED.)
3. Required for the mlxmcg tool only.
4. Required for the mtusb device usage.
5. For creating UPMF (update package for Mellanox firmware)

1.2.2 Windows Software Dependencies

Table 3 - MFT Software Dependencies on Windows

Software Package	Required Version
Mellanox WinOF VPI[1]	3.0.0 and later

1. WinOF is required only for In-Band access. The package can be downloaded from www.mellanox.com > Products > Software >InfiniBand /VPI Drivers >Windows SW Drivers.

1.2.3 FreeBSD Software Dependencies

Table 4 - MFT Software Dependencies on FreeBSD

Software Package	Required Version
Perl	For FreeBSD 10.0 (x64): 5.16
	For others: 5.14

In order for the tools in the package to work, bash should be installed in:
`/bin/bash`
In case bash is installed in a different path, you should make a soft link to it in:
`/bin/bash:`
`> ln -s <bash-path> /bin/bash`

1.2.4 VMware ESXi Software Dependencies

Table 5 - MFT Software Dependencies on VMware ESXi

Software Package	Required Version
Python	2.6 and above

1.3 Supported Operating Systems and Platforms

1.3.1 Linux Supported Operating Systems

MFT is supported on the following platforms: x86, x86_64, ppc64, ppc64le, arm, and ppc,

Table 6 - Linux Operating Systems and Platforms

Operating System	Kernels
RedHat EL6	2.6.32-71.el6 (RHEL6)
	2.6.32-131.0.15.el6 (RHEL6 UP1)
	2.6.32-220.el6 (RHEL6 UP2)
	2.6.32-279.el6 (RHEL6 UP3)
	2.6.32_358.el6 (RHEL6 UP4)
	2.6.32-431.el6 (RHEL6 UP5)
RedHat EL7	3.10.28-105.el7 (RHEL 7)
SLES 10	2.6.16.60-0.54.5-smp (SLES 10 SP3)
SLES 11	2.6.27.19-5-default (SLES 11)
	2.6.32.12-0.7-default (SLES 11 UP1)
	3.0.13-0.27-default (SLES 11 UP2)
	3.0.76-0.11-default (SLES 11 UP3)
SLES 12	3.12.22-2-default (SLES 12)
Kernel.org	3.10.28
	3.11.10
	3.12.9
	3.13.1
	3.14.3
	3.15.6
Ubuntu	12.04
	12.04.4
	13.04
	13.10
	14.04

Table 6 - Linux Operating Systems and Platforms

Operating System	Kernels
Debian	6.0.7
	6.0.8
	7.1
	7.2[1]
	7.4
	7.5[1]
	7.6
Fedora	14[1]
	16[1]
	17
	18[1]
	19
	20
Citrix Xenserver	6.1
	6.2
OEL6.2	2.6.32-279.el6
	2.6.32-279.19.1.el6
OEL6.3	2.6.32_279.el6
	2.6.32-279.19.1.el6
	2.6.32-279.22.1.el6
OEL6.4	2.6.32-358.el6
OEL 6.5	3.8.13-16.2.1el6uek

1. Did not pass QA and Verification.

1.3.2 Windows Supported Operating Systems

- Supported Operating Systems and Service Packs:
  - Windows 7 (x64)
  - Windows Server 2012 (x64)
  - Windows Server 2012 R2 (x64)
  - Windows PE 3.0 (x86)
  - Windows PE 3.0 (x64)
  - Windows PE 4.0 (x64)
  - Windows PE 4.0 (x86)
  - Windows PE 5.0 (x64)

- Windows PE 5.0 (x86)
- Windows Server 2008 R2 (x64)
- Windows 8.1 (x64)

1.3.3 FreeBSD Supported Operating Systems

- Supported Operating Systems and Service Packs:
  - FreeBSD 10.0 (x86)
  - FreeBSD 9.1 (x64)
  - FreeBSD 10.0 (x64)

1.3.4 VMware ESXi Supported Operating Systems

- VMware ESXi Supported Operating Systems:
  - ESXi 5.1
  - ESXi 5.5

1.4 Supported Flash Types

MFT supports the following Flash types.

Table 7 - Supported Flash Types

Vendor	Flash Family	Tested P/N
Micron	M25Pxx	M25P16
	M25PXxx	M25PX16
	N25Qxxx	N25Q032
Winbond	W25Xxx[1]	
	W25QxxBV	W25Q32BV
Microchip (SST)	SST25VFxx	SST25VF016B
Spansion	S25FLxxxP[1]	
	S25FL1xxK	S25FL116K
Atmel	AT25DFxxx	AT25DF161
Macronix	MX25L16XXX[1]	

1. Were not tested in QA.

2 Changes and New Features

2.1 Changes in Version 3.7.1

Table 8 - Changes in Version 3.7.1

Component/ Tool	Description
Bug Fixes	See Section 5, “History of Bug Fixes,” on page 27

3 Known Issues

The following table provides a list of known bugs and limitations in regards to this release of the Mellanox Firmware Tools.

Table 9 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed
1.	Burning tools (mlxfwmanager, flint and mlxburn)	Runing burning tools and restarting the driver at the same time may cause the machine to hang	Burning tools lock hardware resources used by the firmware booting	do not run the burning tools while restarting the driver.	Future Release
2.		Forcefully killing burning tool may interrupt subsequent runs of burning tools	If a burning process is killed forcefully (such as: by kill -9 in Linux), subsequent runs of burning tools will not function as they require hardware resources cleanup	Run: "`flint -d <device> -clear_semaphore`" or reboot	Future Release
3.	mlxburn	Slow VPD access for ConnectX®-3	Reading the VPD using the "-vpd_rw" flag or programing the VPD may take up to 5 mins.	N/A	Future release
4.	flint	Long firmware update process in Connect-IB®	The firmware update process in Connect-IB™ may take up to a minute	N/A	Future release
5.		Failure to set GUIDs on Connect-IB	The sg command on Connect-IB fails if the flag - `override_cache_replacement` is not used	Set the GUIDs only when firmware is not active (driver is not loaded) by using the flag - `override_cach_replacement`	N/A
6.		Remote/MTUSB devices do not support parallel access.	Attempting to access Remote/MTUSB device for parallel does not work well.	Avoid working in parallel through those interfaces	Future release
7.	wqdump	On Connect-IB, wqdump does not support WQEs receiving of 1024B	wqdump does not support WQEs receiving of 1024B	N/A	Future release

Table 9 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed
8.	mst	“Mst ib add” may fail when there is a device with zero system GUID in the fabric	The failure occurs when the “mst ib add” uses the ibnetdiscover tool	Run 'mst ib add --discover-tool ibdiagnet'	N/A
9.		“mst ib add” command may add inaccessible in-band devices	When an IB subnet manager is not running in the fabric, some of the ports may be in INIT state. Devices that are accessed via these ports are added to the in-band device list even though they are inaccessible to in-band traffic.	Verify a subnet manager is running and that all the ports are in ACTIVE state	Future release
10.		Lacking MLNX_OFED device name when running `"mst status -v"` in XEN server machines	`"mst status -v"` does not show MLNX_OFED device name (mlx4/mlx5) in XEN server machines. Hence, the MFT tools cannot be run on these devices. Also mlxtrace/ fwtrace on Connect-IB in MEM mode can not work, since it is using these devices.	For mlxtrace/ fwtrace only: Run the tool in FIFO mode instead of MEM. Other tools: N/A	Future release
11.		MFT uninstall may not remove all remote devices	On Windows, mst remote devices added by the ‘mst remote add’ command may still be present after uninstalling MFT.	If you still see old remote devices after installing a new WinMFT, you can either run ‘mst restart’ or remove the devs directory manually (resides under the WinMFT install directory)	Future release
12.		“mst ib add” uses only ibnetdiscover to discover the cluster	“--discover-tool” option is not used to choose the intended tool. The discover tool argument is intended only for parsing purpose, thus the topology file must be specified when using the “--discover-tool”.	N/A	Future release

Table 9 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed
13.		mtusb device is not shown in the MST list sometimes	When i2c-diolan-u2c driver is installed, it takes ownership over the mtusb device and prevents mst to load it, consequently, prevents access to MFT tools	Stop the i2c-diolan-u2c driver.	N/A
14.	Install script	Kernel-mft installation fails in xenserver machine	Xenserver machine does not have an rpmbuild command which is used to recompile the kernel-mft source RPM in installation phase therefore, MFT installation fails.	1. Prepare the kernel-mft RPM in the DDK server of the xenserver installed in your machine by running: " install.sh --rebuild-srpm" 2. Install the kernel-mft binary RPM generated in stage one in the xenserver normal machine by: "rpm -i <kernel-mft binary RPM>" 3. Install MFT by: "install.sh --without-kernel"	
15.	fwtrace	For EMC only: fwtrace does not work with Connect-IB™ devices unless external strings db file is provided.	fwtrace does not work with Connect IB™ devices if `"-f"` option is not provided.	Run the tool with the `"-f <string db file>"` flag	Future release
16.	mlxmcg (formerly mcg)	Running the tool while the steering table is modified is not supported	If the mcg tool is running while steering entries are added or removed from the device, the tool may display warnings in the following format: `"mcg [0x1bff5].next points to non-existing mcg index 0x1b7f5"` And the displayed data may be incorrect.	It is recommended to run the tool when the steering table is in a static mode.	Future release

Table 9 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed
17.	mlxtrace	Running mlxtrace over an mtusb connected to an HCA/NIC in a Windows target machine may cause the target machine to hang	In this mode, mlxtrace may cause memory corruption on the target machine which causes it to hang.	N/A	Future release
18.		[MFT for ESXi] Exiting mlxtrace with CTRL+Z causes the firmware and the tool to hang.	Terminating the tool when running it in MEM mode with CTRL+Z can cause issues to the device and to the firmware.	Do not send CTRL+Z to the tool.	N/A
19.		Performance decreases after running mlxtrace	Mlxtrace activates a hardware component which may lead to decreasing the packet rate of the HCA	Use the flag `--stop_on_exit`	Future release
20.	WinMFT Installation	Downgrading is currently not supported	Downgrading WinMFT to an older version might corrupt the installation dir.	Remove MFT prior to installing any earlier versions of MFT	N/A
21.	mlxfwmanager	mlxfwmanager package and mlxfwmanager_pci may not detect devices in a virtualized environment in Linux.	mlxfwmanager_pci scans a single PCIe device on each bus. In a KVM guest OS multiple PCIe pass-through devices may be mapped to the same bus, thus mlxfwmanager_pci reports “No devices found or specified”.	Two options: • Run the tool from the hypervisor rather than from the guest OS. • Add to the command line “-d bus:dev.fn” of the specified targeted PCI device.	Future release
22.		mlxfwreset sometimes fails to load firmware properly.	On some Connect-IB board types driver fails to load after loading new firmware using mlxfwreset.	Use old update flow (i.e reboot machine)	Future release
23.		mlx_mfa_gen can not create MFA file under directory with whitespace	mlx_mfa_gen fails to calculate CRC when MFA's directory name includes spaces	Do not use spaces in the directory name	Future release
24.		Running Online updates/downloads in parallel may fail	Online firmware update may fail if many processes try to do so in parallel	N/A	Future release

Table 9 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed
25.	mlxfwmanager_pci	Mlxfwmanger_pci fails to detect devices that were passed through from RedHat KVM	mlxfwmanager_pci fails to detect devices in virtual machines of RedHat KVM. <Where the pci address of the device has dev.func != 00.0>	N/A	Future release
26.	mlxfwreset	Mlxfwreset fails when resetting the PCI.	On some machines where the Express capability register address contains hex digit (such as: b0), the mlxfwreset fails due to a parsing issue.	Reboot the machine after firmware upgrade.	Future release
27.		Mlxfwreset does not work in ARM system.	Mlxfwreset fails due to some missing files in ARM machines.	Reboot the machine after burning firmware instead of using mlxfwreset	Future release
28.	General	Accessing device by _cr device does not work in ARM	Accessing the hardware register by mapping its memory is not supported in ARM architecture, thus pci_cr* device will not be shown in MST devices list	Work with pciconf* device	Future Release
29.		On FreeBSD, parallel access to a device from multiple MFT tools is not supported	The tools running in parallel on the same device may interrupt one another, and may cause the device to be in an undefined state.	Avoid parallel Access to device	Future Release
30.		Live-fish device mode is not supported inVMware ESXi 5.5	The MFT driver is not a native VMware driver, thus it can not take ownership of the PCI device in live-fish mode.	N/A	Future Release
31.		MFT tools do not work when the MLNX-OFED ESXi driver is not installed or loaded in VMware ESXi 5.5	The MFT driver is not a native VMware driver, thus it can access the Mellanox PCI device only after the MLNX-OFED ESXi driver marks it as accessible by vmkliunx drivers.	Install and load MLNXOFED ESXi driver (which is part of inbox drivers in ESXi 5.5)	Future Release

Table 9 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed
32.	General	MTUSB, Remote and Inband devices are not supported in FreeBSD and VMware ESXi	MFT does not support MTUSB devices nor remote ETH and IB devices in FreeBSD and VMware ESXi.	N/A	Future Release
33.		Running MFT tools in parallel may not work	MFT tools use the same hardware resources and therefore might interrupt the work of each other.	Avoid running more than one MFT tool at a time with the same device	Future Release
34.		UPMF Generation is not supported in VMware ESXi and FreeBSD	Update Package for Mellanox Firmware cannot be created by using MFT tools for VMware ESXi and FreeBSD	use mlxfwmanager tool and MFA to update firmware	Future Release
35.	mlxfwreset	Running mlxfwmanager_pci with other mft tools in parallel fails	running mlxfwmanager_pci with mft tools in parallel causes read/write corruption and yields unexpected behaivour	Do not run mlxfwmanager_pci in parallel with other MFT tools	Future Release
36.		Some tools are missing in MFT package for PPC-64 platform	Fwtrace and mlxfwreset (for Connect-IB) are missing in the MFT package for PPC	Reboot the machine instead of running mlxfwreset after firmware upgrade	Future Release

37.	mft_uninstall.sh	mft_uninstall fails in some Ubuntu machines	mft_unsinatl uses wrong indication to determine if the installed MFT package is Debian or RPM, therefore it may try to remove `rpm` files in Ubuntu/ Debian where `deb` files are installed	Remove the packages manually:
				`dpkg --purge mft`
				`dpkg --purge kernel-mft-dkms`
					Future Release

38.	All	Stopping/restarting mst service while one tool is running may cause some issues with the device or driver or the tool itself.	While running one of the burning tools or debugging tools, stopping/ restarting the mst service may cause some issues with the device or driver, or can cause the tool to stuck. In case of flint, it can cause locked semaphore. Mlxtrace, can cause driver issues and the tool may stuck.	Avoid stopping mst service while running the tools.	Future Release

4 History of Changes and New Features

4.1 Changes and New Features in Linux

Table 10 - History of Changes and New Features

Version	Component / Tool	Description
3.7.0	mlxfwmanager	Added online firmware update
	mlxburn	Added concurrency support to VPD read
	flint	Added concurrency support to query firmware
	General	Added support for Arm platform and Power8
	mlxfwreset	Firmware reset for Connect-IB
3.6.0	mlxconfig	Added mlxconfig tool for changing non volotaile configuration on device
	Burning Tools	Added support for micron flash in flint and updated production burn flow on Connect-IB
3.5.0	flint/wqdump	Redesigned the flint and wqdump utility to make their look and feel more user friendly
	flint	Added support for brom in Connect-IB®
	mlxmdio	Added support for the mlxmdio utility
	mlxfwmanager	Added support for Connect-IB
3.1.0	General	The MFT package now has 2 installation flavours - standard (default mode) and 'OEM'. The OEM mode provides the following extra functionality: • Tools for creating mlxfwmanager package • Several features for flint that are used in Connect-IB™ production
	Flint	Added support for burning Connect-IB™ via firmware interface. The `'-override_cache_replacement'` flag is not needed. This provides a 'safe' firmware update flow, without the risk of firmware or driver hanging.
	mlxfwmanager	Added support for the mlxfwmanager utility (at Beta level)
	mlxuptime	Added support for the mlxuptime utility (at Beta level)

Version	Component / Tool	Description
3.0.0	General	Added support for Connect-IB™ device (at beta level)
		Added support for ConnectX®-3 Pro device (at beta level)
		Added support for Ubuntu operating system
		Added support for running tools against PCI device [domain]:bus:dev.fn like: 0000:1a:00.0 or 1a:00.0 and devices used by OFED driver like: mlx4_0
	Flint	Added support for new flashes types: N25Q0XX (Micron) and W25Xxx (Winbond)
	mlxdump	Added support for the mlxdump utility (at beta level)
	mlxmcg	Renamed mcg to mlxmcg
	spark	spark was removed from MFT version 3.0.0
3.0.0	Supported Devices	The following adapter cards and switch systems are no longer supported in MFT version 3.0.0: • InfiniHost 4X • InfiniHost III Ex • InfiniHost III Lx 4X • InfiniScale • InfiniScale III
2.7.1a	Added the mcg tool (Beta level)	The mcg tool displays the current multicast groups and flow steering rules configured in the device. **Target users:** Developers of Flow Steering aware applications. This tool dumps the internal steering table which is used by the device to steer Ethernet packets and Multicast IB packets to the correct destination QPs. Each line in the table shows a single filter and a list of destination QPs. Packets that match the filter are steered to the list of destination QPs.
	Removed support for In-band access on OFED 1.4 Infiniband driver	In-band access is supported using OFED 1.5.X and higher
2.7.1	General	Added mlxconfig tool. This tool sets firmware configurations for Mellanox adapters. These configurations are nonvolatile they apply over device reboots. For further details, please run “mlxconfig -h”. The tool is at beta level.
	mget_temp	mget_temp displays a more accurate temperature for ConnectX-2 devices by using chip specific thermal calibration data.
	flint	Added support for Atmel AT25DFxx flash family.
		Cleared error messages displayed when trying to burn firmware image of a diferent device. For example when burning ConnectX-2 firmware image on ConnectX-3 device.
2.7.0a	Bug Fixes	See Section 5, “History of Bug Fixes,” on page 27

Version	Component / Tool	Description
2.7.0	General	Added support for Mellanox ConnectX®-3 and SwitchX™ silicon devices.
		Added Secure host feature which enables ConnectX family devices to block access to its internal hardware registers. The hardware access in this mode is allowed only if a correct 64 bits key is provided (see flint changes). MFT tools cannot run on a device with hardware access disabled. This feature is enabled only with supporting firmware.
		Removed support for Itanium (ia64)
	flint	Added the following commands: • enable/disable access to the hardware • set/change the key used to enable access to the hardware
2.7.0	flint	• The ROM section in the image now contains multiple boot images. Therefore the flint was modified to display information for all of the images in the ROM section. • Added support to display/burn UEFI ROM
		Added support for burning firmware via Command Line interface on SwitchX devices.
	Mlxburn	Added option to add or replace a single keyword in the VPD writable section (-vpd_set_keyword flag).
		Added the option to set a binary VPD field data.
	MFT installation	Added the option `--without-kernel` which allows user to install MFT without the mst kernel.

Version	Component / Tool	Description
2.6.2	MFT installation change	RPM based installation: • Applications are installed using a pre-compiled binary RPM • Kernel modules are distributed as a source RPM and compiled by the installation script • Fast installation process
		Removed prerequisite libraries: expat and zlib-devel.
		The package tools, libraries and headers are now installed under: { prefix }/bin or { prefix }/lib and { prefix }/include dirs. Directory /usr/mst is not created. For example, the “mread”, “mwrite” and “mcra” tools that were previously installed by default under /usr/mst/bin, now are installed under /usr/bin.
		Removed the InfiniScale® and InfiniBridge® tools
		Removed the Infinivision tool set

		Removed the isw tool.
		The isw tool functionality was replaced by the "mlxi2c" tool.
		For example, to scan the devices on the i2c bus, run:
		`> mlxi2c -d <dev> scan`
		instead of
		`> isw -d <dev>`

	flint	Added support for flash type SST25VF016B
		Added support for flash type M25PX16
		Added an option to set the VSD and GUIDs in a binary image file. This is useful for production to prepare images for pre-assembly flash burning. These new commands are supported by Mellanox 4th generation devices.
		Added an option to set the VSD and GUIDs on an already burnt device. These commands (“sg” and “sv”) re-burn the existing image with the given GUIDs or VSD. When the 'sg' command is applied on a device with blank (0xff) GUIDs, it updates the GUIDs without re-burning the image.
	mst	Added support for using ibutils2/ibdiagnet and ibnetdiscover in the 'mst ib add' command
		Removed the _uar, _msix and _ddr devices from the mst device list
	Debug tools	Added support for routing I2C bus to the IS4 device on IS50XX systems
2.6.1	Bug Fixes	See Section 5, “History of Bug Fixes,” on page 27

Version	Component / Tool	Description
2.6.0	MFT installation change	Added the options: --without-image-generation, --disable-dc, and --without-kernel which allow for a partial installation in order to avoid problems with SW dependencies.
		Now allows a non-root user to prepare MFT RPMs
	All	Added Mellanox ConnectX®-2 and BridgeX® support.
	flint	Added a CRC check for the full image
		Support for query/burn of clp-gpxe ROM
		Prevents burning a ConnectX-2 image onto a ConnectX device and vice versa
		Added a logging option to flint
		For the ConnectX device family only: Added commands for an independent burn/read/remove of an Expansion ROM image. *For firmware versions earlier than 2.7.000*: It is possible to read the ROM image, or to replace an already existing ROM image (by the burn command). However, burning a new ROM image in case a previous image did not exist is not possible, nor is it possible to remove an existing ROM image.
	mlxburn	Added the -fw_dir option which looks for a suitable FW file in the given directory
		Support for generating a non-fail-safe image for ConnectX/ConnectX-2, InfiniScale IV, and BridgeX devices
	Debug tools	Updated the mlxi2c utility
		Added the mget_temp utility which reads the temperature of the ConnectX/ConnectX-2, InfiniScale IV, and BridgeX devices

4.2 Changes and New Features in Windows

Table 11 - Changes and New Features in Windows

Version	Component / Tool	Description
3.7.0	mlxfwmanager	Added online firmware update
	mlxburn	Added concurrency support to VPD read
	flint	Added concurrency support to query firmware
	General	Removed support for x86 in Windows
	fwtrace	Added fwtrace tool to windows
3.6.1	mlxconfig	Added mlxconfig tool for changing non volotaile configuration on device
	Burning Tools	Added support for micron flash in flint and updated production burn flow on Connect-IB

Table 11 - Changes and New Features in Windows

Version	Component / Tool	Description
3.5.0	flint/wqdump	Redesigned the flint and wqdump utility to make their look and feel more user friendly
	flint	Added support for brom in Connect-IB®
	mlxfwmanager	Added support for Connect-IB
3.0.0	General	Added support for Connect-IB™ device (at beta level)
		Added support for ConnectX®-3 Pro device
		The package contains only the flint FW update tool. Other debug tools were removed.
	flint	Added support for new flashes types: N25Q0XX (Micron) and W25Xxx (Winbond)
	mlxdump	Added support for the mlxdump utility (at beta level)
	mlxmcg	Renamed mcg to mlxmcg
	spark	spark was removed from MFT version 3.0.0
	Supported Devices	The following adapter cards and switch systems are no longer supported in MFT version 3.0.0: • InfiniHost 4X • InfiniHost III Ex • InfiniHost III Lx 4X • InfiniScale • InfiniScale III
2.7.2b	All	Added support for WinPE 4.0 OS.
2.7.2	General	It is no longer required to run mst start/stop when using WinMFT tools. The service is automatically loaded/unloaded when an MFT tool is running. The mst service installation was removed from the setup.
		Added support for SwitchX® silicon devices.
	flint	Added support for Atmel AT25DFxx flash family.
		Added support for burning firmware via Command Line Interface (CLI) on SwitchX® devices.
	mget_temp	mget_temp displays a more accurate temperature reading for ConnectX®-2 and ConnectX®-3 devices by using the adapter's specific thermal calibration data.

Table 11 - Changes and New Features in Windows

Version	Component / Tool	Description
2.71	General	Added support for Mellanox ConnectX®-3 silicon device.
		Added the I2CBridge (Dimax's Driver for USB to I2C Adapter) as part of the WinMFT installation package. However, the I2CBridge is not installed by default.

	MFT installation change	Removed the isw tool.
		The isw tool functionality was replaced by the "mlxi2c" tool.
		For example, to scan the devices on the i2c bus, run:
		`> mlxi2c -d <dev> scan`
		instead of
		`> isw -d <dev>`

	flint	Added support for flash type SST25VF016B
		Added support for flash type M25PX16
		• The ROM section in the image now contains multiple boot images. Therefore flint was modified to display information for all of the images in the ROM section. • Added support to display/burn UEFI ROM/
		Added an option to set the VSD and GUIDs in a binary image file. This is useful for production to prepare images for pre-assembly flash burning. These new commands are supported by Mellanox 4th generation devices.
		Added an option to set the VSD and GUIDs on an already burnt device. These commands ("sg" and "sv") re-burn the existing image with the given GUIDs or VSD. When the 'sg' command is applied on a device with blank (0xff) GUIDs, it updates the GUIDs without re-burning the image.
	mst	Added support for using ibnetdiscover in the 'mst ib add' command
	mlxburn	Added support for VPD read/write
2.6.0	All	Added Mellanox ConnectX-2 and BridgeX support.

4.3 Changes and New Features in VMware ESXi

Table 12 - Changes and New Features in VMware ESXi

Version	Component / Tool	Description
3.7.0	mlxfwmanager	Added online firmware update
	flint	Added concurrency support to query firmware
3.6.0	mlxconfig	Added mlxconfig tool for changing non volotaile configuration on device
	Burning Tools	Added support for micron flash in flint and updated production burn flow on Connect-IB

Table 12 - Changes and New Features in VMware ESXi

Version	Component / Tool	Description
3.5.1	package content	Added support for the following tools: mst, mlxfwmanager, itrace, mlxtrace, mlxdump, mlxmcg, wqdump, mcra, mget_temp, pckt_drop, mlxuptime
	flint	Added support for ConnectX®-3 Pro
		Redesigned the utility to make its look and feel more user friendly
	mstdump	Added support for ConnectX®-3 Pro
3.5.0	flint/wqdump	Redesigned the flint and wqdump utility to make their look and feel more user friendly
	flint	Added support for brom in Connect-IB®

4.4 Changes and New Features in FreeBSD

Table 13 - Changes and New Features in FreeBSD

Version	Component / Tool	Description
3.7.0	flint	Added concurrency support to query firmware
	mlxburn	Added mlxburn to MFT for FreeBSD
3.6.0	mtserver	Added support for mstserver in FreeBSD
3.5.0	FreeBSD	Added support for FreeBSD operating system (at beta level)

5 History of Bug Fixes

Table 14 lists the history of bugs fixed

Table 14 - History of Fixed Bugs List

Component / Tool	Issue	Discovered in Rev.	Fixed in Rev.
Installation	Kernel installation failed in fbk13 Operating System	3.7.0	3.7.1
Install script and mlxburn	MFT installation failed in PPC64LE when TCL is not installed there	3.7.0	3.7.1
Burning tools	Burning tools may cause machine reboots in some ConnectX cards	3.7.0	3.7.1
Mlxfwmanager	Updating a non-failsafe image is not supported	3.6.0	3.7.0
Mlxfwmanager	Killing an WinMFT process may interrupt subsequent runs of WinMFT tools.	3.6.0	3.7.0
Mlxfwmanager	Mlxfwmanager_pci does not work in VMware	3.6.0	3.7.0
All	MFT supports only one connected MTUSB-1 device at a time.	2.7.2b	3.7.0
mlxuptime	The displayed configured frequency may present wrong results.	3.5.0	3.7.0
mst	mst remote feature does not work when the client machine is windows and the server machine is Linux	3.6.0	3.7.0
mst	Devices in livefish mode in FreeBSD does not appear in mst status	3.6.0	3.7.0
mlxburn	Cannot read vpd when accessing via PCI device in the format: domain:bus:dev.fn	3.1.0	3.7.0
flint	First flint run may fail after Ctrl+C	3.5.0	3.6.0
flint	Flint Connect-IB® burn corrupts the flash when burning a verbatim full flash dump as the firmware image.	3.1.0	3.6.0
flint	Flint Connect-IB® burning using the “-vsd” flag is not functional	3.5.0	3.6.0
flint	Occasionally, CTRL+C causes flint to hang in WinPE OS	2.7.2b	3.6.0
flint	Unexpected behavior when running swreset on flint	2.7.2b	3.6.0
flint	CTRL+C does not clear semaphores	2.7.2b	3.6.0
flint	Connect-IB® burning: Flint supports VSD of up to 128 chars.	3.5.0	3.6.0
flint	wbne command causes endiannes swap	3.5.0	3.6.0
flint	On Windows Power Shell Ctrl+C does not function properly	3.5.0	3.6.0
flint	On FreeBSD, burning new firmware on a device with corrupt empty firmware does not work.	3.5.0	3.6.0

Table 14 - History of Fixed Bugs List

Component / Tool	Issue	Discovered in Rev.	Fixed in Rev.
mst	Occasionally, if a node has a LID set to 0, the ”mst ib add --use-ibdr” command will not add that nodes to the mst device list	3.1.0	3.6.0
mst	On Windows, mst may not show any devices	3.5.0	3.6.0
mlxmcg (formerly mcg)	mlxmcg fails on PPC	3.5.0	3.6.0
itrace	On Windows Ctrl+C does not exit gracefully	3.5.0	3.6.0
All	On Windows Power Shell MFT might not work on mst devices that contain a comma	3.5.0	3.6.0
All	On Windows x64, some tools are 32 bit binaries.	3.5.0	3.6.0
mst	The mst cr device is not functional on VMware VMware ESXi. When running it, the following message is received: `”You cannot access the HW configurations by mt4099_pci_cr0 device in ESXi”`	2.7.1	3.5.1
flint	Running the “sg” (set guids) command on a striped image file containing a large expansion rom image may fail	2.7.1	3.5.1
mst	mst status does not show the mtusb-1 when adding in-band devices	3.0.0	3.5.0
mst	mst shows all devices when connected to Flex10 remotely	3.0.0	3.5.0
mst	mst does not display a message when there is no HCA device connected to the machine	3.0.0	3.5.0
mst	”mst ib add --use-ibdr” may not add all nodes in a cluster when the ports are inactive	3.1.0	3.5.0
mst	mtusb is not supported in Windows 2012	3.0.0	3.5.0
itrace	Running the itrace tool when the driver is not loaded or when the driver failed to load may cause the server to crash.	3.1.0	3.5.0
flint	Setting the GUIDs on an image file which was generated using the “-exp_rom” and “-striped_image” flags fails when the expansion rom size is larger than 400KB. Current rom sizes are much smaller, thus it is not expected to cause an actual issue.	2.6.2	3.5.0
mlxtrace	mlxtrace not functional when using the PCI format device against Connect-IB™	3.1.0	3.5.0
wqdump	CTRL-C stops wqdump but does not clear (release) semaphores	2.6.2	3.5.0
	Running wqdump with ‘-ignore’ ignores only the QPC gateway lock but does not ignore the OB gateway	2.6.2	3.5.0

Table 14 - History of Fixed Bugs List

Component / Tool	Issue	Discovered in Rev.	Fixed in Rev.
mlxburn	Setting an empty keyword is not reported as an error, but will prevernt further using of the vpd_set_keyword flag Setting a keyword value longer than 255 characters is not reported as an error, but may corrupted the vpd	3.0.0	3.1.0
	The flag "-fw_dir" is not supported when burning ConnectX®-3 Pro adapter card	3.0.0	3.1.0
flint	When a read/write operation over mtusb/remote device fails while running flint, flint may crash, hence not handling the error well.	3.0.0	3.1.0
	When trying to burn a FW+ROM that contains a unified product version to a device where the firmware has no product version, the flint tool allows keeping the device ROM instead of burning the new FW+ROM as is.	3.0.0	3.1.0
itrace	Access the trace messages area in host memory may fail when using Mellanox HCA cards without on-board memory (MemFree) running on Red Hat Fedora and OEL OSs. Consequently, the application may crash or no trace messages will be printed.	3.0.0	3.1.0
mlxdump	Activating counter gateways in ConnectX®-3 via an inband device causes firmware to hang (dead lock)	3.0.0	3.1.0
Installation	Installing MFT with a different prefix than /usr, causes mlxmcg, fwtrace and mstdump to not work. On Fedora OS, in addition to the above tools, mst and mlxburn do not work either.	3.0.0	3.1.0
mget_temp	Running mget_temp against ConnectX®-3 Pro even after initializing the diode results in high temperature (e.g. 120)	3.0.0	3.1.0
	On certain boards where the external oscillator is connected only to one port, the other port's thermal sensor will not function.	3.0.0	3.1.0
	On SwitchX-A0, the YU-sensor reports the wrong temperature	3.0.0	3.1.0
mlxmcg (formerly mcg)	Installing MFT with a different prefix than /usr, causes mlxmcg to not work.	3.0.0	3.1.0
fwtrace	Occasionally, the fwtrace executable may stop working and display the following output: `Cannot open self /usr/bin/fwtrace or archive /usr/bin/fwtrace.pkg`	3.0.0	3.1.0
wqdump	wqdump uses certain hardware gateways which are used by the firmware. Thus when it accesses the device via the firmware and owns the hardware gateways, it causes issues for the firmware and does not work.	3.0.0	3.1.0

Table 14 - History of Fixed Bugs List

Component / Tool	Issue	Discovered in Rev.	Fixed in Rev.
Install script	MFT cannot be installed in a path different than the default / usr	2.7.1a	3.0.0
	The installation script fails if OFED v1.4 or older is installed in the machine as it tries to search for non-existing RPMs	2.7.1a	3.0.0
flint	After firmware upgrade or downgrade, the externally managed SwitchX-A1 should be rebooted through power-cycle and not via flint "swreset" command	2.7.1a	3.0.0
mlxburn	The flag "-fw_dir" is not supported when burning ConnectX-3 A1 adapter card	2.7.1a	3.0.0
mst	The uninstall operation leaves device files under /dev/mst	2.7.1a	3.0.0
mlxmcg (formerly mcg)	The tool shows the rules of port 1 in port2 line and vice versa	2.7.1a	3.0.0
mstdump	Running mstdump on a ConnectX®-3 device may cause the firmware to hang.	2.7.0	2.7.1a
flint	Accessing the SwitchX flash by MFT has a bug, while reading on PPC64 platform, therefore the SwitchX cannot be updated via the PPC64 machine	2.7.0a	2.7.1
		2.7.0a	2.7.1
mlxburn	The flag “-fw_dir” is not supported when burning SwitchX devices	2.7.0a	2.7.1
mstdump	Running mstdump on a SwitchX device may cause it to malfunction.	2.7.0a	2.7.1
flint	Burning the firmware into ConnectX®-3 A1 adapter using the MST CR device resulted in failure.	2.6.2	2.7.0a
mst	In-band access is not supported in Windows MFT	2.6.0	2.71
All	No MTUSB-1 support for 64-bit architecture in Windows MFT	2.6.0	2.71
mst ib add	“mst ib add” fails to add in-band devices when the IB driver is newer than MLNX_OFED_LINUX-1.5.3-0	2.7.0	2.7.0a
Mlxi2c	mlxi2c scan fails the first time when using mtusb.	2.6.2	2.7.0
flint	The sg (set guids) command on a VPI device may burn MACs/GUIDs with value 0xff	2.6.2	2.7.0
	If the “`-striped_image`” flag is used in a burn command, image burn will fail or burn a corrupt image.	2.6.2	2.7.0
mst	Occasionally, 'mst restart' locked the flash semaphore	2.6.1	2.6.2
	'mst ib add' added non-Mellanox device to the in-band device list	2.6.1	2.6.2
flint	Typo in flint help description of Expansion ROM read. The flint help display lists the Expansion ROM read command as “rrrom” instead of “rrom”	2.6.0	2.6.1

Table 14 - History of Fixed Bugs List

Component / Tool	Issue	Discovered in Rev.	Fixed in Rev.
mst	In-band access does not work with OFED 1.5	2.6.0	2.6.1