



MSTFLINT Package - Firmware Burning and Diagnostics Tools Release Notes

Rev 4.8.0

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Release Update History

Table 1 - Release Update History

Release	Date	Description
Rev 4.8.0	November 1, 2017	Initial release of this mstflint version

1 Overview

These are the release notes for Rev 4.8.0 of the mstflint.

This release supports the following operating systems: Linux. 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 mstflint tools do not provide cluster wide functionality.

Table 2 - mstflint Available Tools

Category	Tool	Description
Firmware Update and Configuration	mstflint	This tool burns a firmware binary image or an expansion ROM image to the Flash of a Mellanox network adapter/switch device. It includes query functions to the burnt firmware image and to the binary image file.
	mstconfig	Allows the user to change some of the device configurations without having to create and burn a new firmware.
	mstfwmanager	The mstfwmanager is a Mellanox firmware update and query utility. It provides a simple 'single click' firmware update functionality. Note: The same tool with embedded firmware binaries is released separately and is named mlxup.
Debug and Diagnostics Utilities	mstregdump	Dumps device internal configuration data.
	mstmra	Reads/writes a single word from/to a device configuration register space
	mstvdp	Reads PCI device VPD
	mstfwreset	Load Firmware after firmware update on ISFU capable devices.(5th generation devices)

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*.

1.2 Supported Operating Systems and Platforms

mstflint is supported on the following platforms:

Table 3 - Supported Operating Systems and Platforms

OS	Architecture
RHEL6.3	x86_64
RHEL 6.6	X86_64
RHEL6.8	x86_64
RHEL6.9	x86_64, PPC64
RHEL7.2	x86_64, PPC64, PPC64LE
RHEL7.3	x86_64, PPC64, PPC64LE, Arm
RHEL7.4	x86_64, PPC64LE
RHEL7.4 ALT (Pegas)	PPC64LE
OEL 6.8	X86_64(U EK)
OEL 7.2	x86_64
OEL 7.3	x86_64(U EK)
Fedora 20	X86_64
Fedora 24	x86_64
Fedora 25	X86_64
Fedora 26	X86_64
Sles11 SP1	X86_64
Sles11 SP3	x86_64
Sles11 SP4	x86_64, PPC64
Sles12 SP2	x86_64, PPC64LE
Sles12 SP3	x86_64, PPC64LE
EulerOS V2.0 SP2	X86_64 (Huawei)
Ubuntu 14.04	x86_64, PPC64LE
Ubuntu 16.04.02	x86_64, PPC64LE
Ubuntu 16.04.03	x86_64, PPC64LE
Ubuntu 16.04 Bandera	Arm
Ubuntu 16.10	x86_64, PPC64LE
Ubuntu 17.04	x86_64, PPC64LE
Ubuntu 17.10	X86_64 (beta ?)
Debian 8.7 (kernel 4.1)	x86_64
Debian 8.7 (kernel 4.4)	x86_64
Debian 8.7	x86_64
Debian 9 (kernel 4.9)	X86_64

Table 3 - Supported Operating Systems and Platforms

OS	Architecture
XenServer 7.1	x86_64
XenServer 7.2	X86_64
Kernel.org 4.10 - 4.13	x86_64
CoreOS kernel 4.11	x86_64

1.3 Supported Flash Types

mstflint supports the following Flash types.

Table 4 - Supported Flash Types

Vendor	Flash Family	Tested P/N
Micron	M25Pxx	M25P16
	M25Pxxx	M25PX16
	N25Qxxx	N25Q032
Winbond	W25QxxBV	W25Q32BV
Spansion	S25FL11xx	S25FL116K
Atmel	AT25DFxxx	AT25DF161

1.4 Supported Mellanox ICs

With respect to mstflint, Mellanox IC devices are divided into two groups: Group I and Group II (4th generation and 5th generation, respectively). The ICs are listed in the following table:

Table 5 - Mellanox IC Devices

IC Group	IC Device
Group I/4th Generation	<ul style="list-style-type: none"> • ConnectX®-3 • ConnectX®-3 Pro • SwitchX® • SwitchX®-2
Group II/5th Generation	<ul style="list-style-type: none"> • Connect-IB® • ConnectX®-4 • ConnectX®-4 Lx • ConnectX®-5 • ConnectX®-5 Ex • Innova IPsec • Innova Flex • Switch-IB™ • Switch-IB™ 2 • Spectrum™

2 Changes and New Features in Rev 4.8.0

Table 6 - Changes and New Features in Rev 4.8.0

Component/ Tool	Description	Operating System
mstfwmanager	Ported the tool mxfwmanager from MFT. To enable this component, you need to set the configuration with the following flag: '--enable-fw-mgr'. Note: This feature requires the following multiple libraries to be installed: <ul style="list-style-type: none"> • cURL • LibXML • OpenSSL • zLIB • Boost 	All
mstconfig	Added support for hardware timestamp in ConnectX-3/ConnectX-3 Pro devices.	All
	Added the following mstconfig configuration parameters: <ul style="list-style-type: none"> • MULTI_PORT_VHCA_EN • BOOT_LACP_DIS • IP_OVER_VXLAN_PORT • IP_OVER_VXLAN_EN • UEFI_HII_EN • IB_ROUTING_MODE_P1 • IB_ROUTING_MODE_P2 • SRIOV_IB_ROUTING_MODE_P1 • SRIOV_IB_ROUTING_MODE_P2 	All
mstfwreset	Reloads the new firmware to the device.	Linux
Secure Firmware Update	Added support for Secure Firmware Update in ConnectX-5/ConnectX-5 Ex.	All
	Added support for setting forbidden versions.	All

For further information, please refer to the MFT User Manual.

3 Known Issues

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

Table 7 - Known Issues and Limitations (Sheet 1 of 4)

Internal Ref.	Issue
1161073	Description: Running mstfwreset on Multi-Host or Socket-Direct NICs may not function properly without server reboot.
	Workaround: Reboot the server to load the firmware.
	Keywords: mstfwreset, Multi-Host, Socket-Direct
	Discovered in Version: 4.8.0
1163425	Description: Running mstfwreset on ConnectX-5 Socket-Direct adapter cards on Windows OS is currently not functional.
	Workaround: Reboot the server
	Keywords: mstfwreset, ConnectX-5 Socket-Direct
	Discovered in Version: 4.8.0
941167	Description: Running mstfwreset on Connect-IB on PowerPC setup on SLES OS, may result in mstfwreset failure.
	Workaround: To reload the firmware, reboot the server.
	Keywords: mstfwreset
	Discovered in Version: 4.6.0
927526	Description: When running the mstconfig query after mstconfig reset, the mstconfig query does not show the correct configuration that should be loaded upon the next boot.
	Workaround: To view the default configuration (under the Default column) run: mstconfig -d <device> -e query.
	Keywords: mstconfig
	Discovered in Version: 4.6.0
855416	Description: Running mstfwreset on an Arm server with Ubuntu 16.04, may result in machine hanging.
	Workaround: Reboot the server in order to load the firmware
	Keywords: mstfwreset
	Discovered in Version: 4.5.0
594755/ 786715/ 787204	Description: mstfwreset is not functional in FreeBSD 9.1.
	Workaround: Reboot the machine after firmware upgrade.
	Keywords: mstfwreset
	Discovered in Version: 4.3.0

Table 7 - Known Issues and Limitations (Sheet 2 of 4)

Internal Ref.	Issue
692397	<p>Description: On ConnectX-3/ConnectX-3 Pro adapter cards, when burning a new firmware image that does not contain an expansion ROM on a flash that contains firmware and expansion ROM, the burning tool will save the expansion ROM in the flash.</p> <p>Workaround: This issue can be avoided by:</p> <ol style="list-style-type: none"> 1. Removing the ROM from the flash before the FW update process by running the following mstflint command: <code>mstflint -d <dev> --allow_rom_change drom</code> 2. Adding the <code>--use_image_rom</code> flag to the mstflint FW update command <p>Keywords: Firmware Burning Tools</p> <p>Discovered in Version: 4.3.0</p>
676412/ 680752	<p>Description: Aggressive killing of a tool that is locking the vendor specific semaphore (in ConnectX-4/ConnectX-4 Lx devices) will leave the semaphore locked, and any tool will get stuck waiting for semaphore.</p> <p>Workaround: Run: <code>mstmkra -c <pci device></code></p> <p>Keywords: General</p> <p>Discovered in Version: 4.3.0</p>
669272	<p>Description: mstfwmanager self-extractor tool will not work properly in ESXi machines if there is no mlx driver or MST installed on the machine.</p> <p>Workaround: Install the driver and the mst that matches the machine, then run the tool.</p> <p>Keywords: mstfwmanager</p> <p>Discovered in Version: 4.3.0</p>
607508/ 692254/ 607509	<p>Description: Wrong localization settings in the operating system cause some tools to fail with error: <code>locale::facet::_S_create_c_locale name not valid</code></p> <p>Workaround: Run: <code>export LC_ALL=C</code></p> <p>Keywords: General</p> <p>Discovered in Version: 4.3.0</p>
592673/ 667402	<p>Description: PCI access in PowerPC machines is up to 10 times slower than other platforms, therefore, there are performance issues on all tools running on PowerPC machines.</p> <p>Workaround: N/A</p> <p>Keywords: General</p> <p>Discovered in Version: 4.2.0</p>
589929	<p>Description: mstfwreset is not supported in VMware.</p> <p>Workaround: N/A</p> <p>Keywords: mstfwreset</p> <p>Discovered in Version: 4.4.0</p>

Table 7 - Known Issues and Limitations (Sheet 3 of 4)

Internal Ref.	Issue
576287	<p>Description: When burning firmware with old MFT tools, the firmware version comparison might not work correctly and might return a prompt that the old firmware is newer. This is due to changes in firmware version format.</p> <p>Workaround: When prompted, press "y" to force update, or add the following flag to the command line: flint: <code>-y --yes</code> mlxburn: <code>-force</code> mstfwmanager: <code>-f --force</code></p> <p>Keywords: Firmware Burning Tools</p> <p>Discovered in Version: 3.1.0</p>
543840	<p>Description: When attempting to reset a pass-through device on a VM, the reset will fail because mstfwreset fails to locate the PCI bridge for the specified device.</p> <p>Workaround: To load the firmware, reboot the machine</p> <p>Keywords: mstfwreset</p> <p>Discovered in Version: 4.0.0</p>
540073	<p>Description: Attempt to burn firmware while specifying the <code>-use_fw</code> flag fails as firmware does not support write operation on this flash.</p> <p>Workaround: Do not use the <code>-use_fw</code> flag for burn operations.</p> <p>Keywords: mstflint</p> <p>Discovered in Version: 4.0.0</p>
534010/ 647911	<p>Description: mstconfig allows setting port parameters for both ports from a single function on ConnectX-4. This poses a security issue since a certain physical function is able to change port parameters for all ports regardless of its designated port.</p> <p>Workaround: N/A</p> <p>Keywords: mstconfig</p> <p>Discovered in Version: 4.0.0</p>
409212/ 408374	<p>Description: Attempting to access Remote/MTUSB device for parallel does not work well.</p> <p>Workaround: Avoid working in parallel through these interfaces.</p> <p>Keywords: mstflint</p> <p>Discovered in Version: 3.7.0</p>
326763	<p>Description: The <code>sg</code> command on Connect-IB™, Switch-IB™, ConnectX®-4, and ConnectX®-4 Lx fails if the <code>-override_cache_replacement</code> flag is not used.</p> <p>Workaround: Set the GUIDs only when firmware is not active (driver is not loaded) by using the flag <code>-override_cach_replacement</code></p> <p>Keywords: mstflint</p> <p>Discovered in Version: 3.5.0</p>

Table 7 - Known Issues and Limitations (Sheet 4 of 4)

Internal Ref.	Issue
207320/ 933032	<p>Description: Tools that run in parallel on the same device may interrupt one another, and may cause the device to be in an undefined state.</p> <p>Workaround: Avoid running more than a single tool at a time with the same device</p> <p>Keywords: General</p> <p>Discovered in Version: 3.4.0</p>
221201	<p>Description: The firmware update process in Connect-IB™, Switch-IB™, ConnectX®-4, ConnectX®-4 Lx and ConnectX®-5 and may take up to two minutes.</p> <p>Workaround: N/A</p> <p>Keywords: mstflint</p> <p>Discovered in Version: 3.4.0</p>
-	<p>Description: Running MFT tools on ConnectX-4/ConnectX-4 Lx on a Windows machine with PCI Gen1 or Gen2 causes machine to hang when Network adapted is disabled.</p> <p>For Example: Running mstfwreset on ConnectX-4/ConnectX-4 Lx on the aforementioned server causes the machine to hang since disabling the network adapter is a part of the reset flow.</p> <p>Workaround: Enabled the network adapter before using any of the tools. For loading the firmware, reboot the server.</p> <p>Keywords: General</p>
-	<p>Description: Firmware burn will fail due to invalid/old timestamp on ConnectX-4/ConnectX-4 Lx devices running these firmware versions: 12.14.0060/14.14.0060, or 12.14.0074/14.14.0075</p> <p>Workaround: Use mstflint v4.1.0 to upgrade/downgrade the firmware version.</p> <p>Keywords: Firmware Burning Tools</p>
-	<p>Description: For mstfwreset to work on PowerPC, the minimum firmware version that must be installed on the device is:</p> <ul style="list-style-type: none"> • ConnectX-5: 12.18.1000 • ConnectX-4: 12.16.1004 • ConnectX-4 Lx: 14.16.1004 • ConnectIB: 10.16.1004 <p>Workaround: N/A</p> <p>Keywords: mstfwreset</p>

4 Bug Fixes History

Table 8 lists the history of bugs fixed. For a list of old Bug Fixes, please see MFT Archived Bug Fixes file (http://www.mellanox.com/pdf/MFT/MFT_Archived_Bug_Fixes.pdf)

Table 8 - Bug Fixes History (Sheet 1 of 2)

Internal Ref.	Issue
	Fixed in Release: 4.8.0
	Fixed in Release: 4.8.0
1064918/ 1069102	Description: mstfwreset does not load the firmware properly on a Socket-Direct card.
	Keywords: mstfwreset
	Discovered in Release: 4.7.0
	Fixed in Release: 4.8.0
1097425	Description: mstfwmanager does not handle Socket Direct adapters correctly.
	Keywords: mstfwmanager
	Discovered in Release: 4.7.0
	Fixed in Release: 4.8.0
907531	Description: mstfwreset is not functional on MultiHost and Socket Direct NICs.
	Keywords: mstfwreset
	Discovered in Release: 4.6.0
	Fixed in Release: 4.7.0
969322/ 969566	Description: mstfwreset may fail to reset the device on Ubuntu PPC64LE systems when multiple kernels are installed.
	Keywords: kernel module, mstfwreset, Ubuntu PPC64LE
	Discovered in Release: 4.6.0
	Fixed in Release: 4.7.0
795226/ 795657/ 862607	Description: Occasionally, MFT tools (driver mode) do not function after running mstfwreset in PowerPC machines.
	Keywords: mstfwreset
	Discovered in Release: 4.4.0
	Fixed in Release: 4.6.0
795756/ 795916	Description: mstfwreset disables and enables all Mellanox devices' Network Interfaces when resetting the firmware on a device that at least one of its network interfaces is up.
	Keywords: mstfwreset
	Discovered in Release: 4.4.0
	Fixed in Release: 4.5.0

Table 8 - Bug Fixes History (Sheet 2 of 2)

Internal Ref.	Issue
795479/ 795521	Description: Running mstfwreset against OEM devices may enter the device to a undefined state.
	Keywords: mstfwreset
	Discovered in Release: 4.4.0
	Fixed in Release: 4.5.0

5 History of Changes and New Features

Table 9 - History of Changes and New Features

Component / Tool	Description	Operating System
Rev. 4.7.0		
MST driver Microsoft certification	MST driver Microsoft certification allows running tools in extended secure boot environment.	Windows
Secure Firmware Update	Added support for Secure Firmware Update in ConnectX-4 and ConnectX-4 Lx.	Linux
Build	Added a new flag to configure '--enable-openssl' which will enable all the openssl features in the tools, like the CheckSum, and sign images	Linux
mstflint	Added sign command for secured images. This feature is available only if the package was configured and compiled with '--enable-openssl'.	Linux
	Added a flag to enforce working in a non-secure mode, if available (according to security type).	
	Added expansion ROM CPU architecture to the flint query when the expansion ROM is available.	All
mstconfig	Added new mstconfig TLVs.	All
	Added support for generating and applying TLV configuration files.	All
Rev. 4.6.0		
Adapter Cards	Added support for ConnectX-5/ConnectX-5 Ex adapter cards. Note: ConnectX-5/ConnectX-5 Ex adapter cards are currently at Beta level.	All
mstconfig	Added an option to query active (current) configurations in mlx-config.	All
	Added new parameters in VPI settings configuration: XFI_MODE, PHY_TYPE, FORCE_MODE	
	Added a new parameter to the PCI configuration NON_PREFETCHABLE_PF_BAR	
Rev. 4.5.0		
General	Added support for Innova IPsec 4 Lx EN /Innova Flex 4 Lx EN	Linux
mstconfig	Enabled mlxconfig to work with a database that describes the meta data of the TLVs configuration of fifth generation devices.	All
	Added the following configuration TLVs to mlxconfig: <ul style="list-style-type: none"> • MPFS • KEEP LINK UP • SW OFFLOAD CONF 	All

Component / Tool	Description	Operating System
mstflint	Added support for viewing and changing OEMs' device flash parameters using an IB device when using flint.	All
Rev. 4.4.0		
mstconfig	Added the following new configurations: <ul style="list-style-type: none"> • Number of TCs • Number of VLs • Enable DCBX in CEE mode • Enable DCBX in IEEE mode • Allow the NIC to accept DCBX configuration from the remote peer • Enable DCBX • Enable the internal LLDP client • Select which LLDP TLV will be generated by the NIC 	All
General	Added support for all tools to work when the MST driver is not installed	Linux
mstregmcra	Added support for clearing VSEC PCI semaphore by the mstregmcra tool. The new capability can be used after killing a tool forcefully without clearing the semaphores. Supported devices: ConnectX-4, ConnectX-4 Lx and Connect-IB	All
mstconfig	Added a backup command in mstconfig which allows user to save backup of the non-volatile configurations in a RAW file. This file can be set on the device by using the <code>set_raw</code> command	All
Rev. 4.3.0		
General	Added support for Spectrum device.	All
	Added support for Switch-IB 2 device.	All
	4th generation and 5th generation IC devices are now also named Group I ICs and Group II ICs, respectively.	N/A
mstconfig	Added support for setting some of the parameters in textual values in addition to numerical values.	All
	Added new configurations: <ul style="list-style-type: none"> • The PF log bar size • The VF log bar size • The number of PF MSIX • The number of VF MSIX • port owner • Allow RD counters • IP protocol used by flexboot 	All
	Added the option to display the configuration's default values.	All
mstflint	Added support to calculate checksum on selected sections in the firmware image.	All
	Added the option to attach a timestamp to the firmware image.	All

Component / Tool	Description	Operating System
Burning Tools	Improved firmware burn performance in livefish mode on 5th generation devices.	All
	Added the ability to show the running firmware version in case it does not match with the burnt firmware version on the flash. This case generally occurs after firmware upgrade and before firmware reload.	All

