Mellanox Firmware Tools (MFT) for Linux Release Notes

Rev 2.7.1a

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www.mellanox.com

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Table of Contents

List of Tables

1 Overview

These are the release notes for Rev 2.7.1a of the **Mellanox Firmware Tools** (MFT) package for Linux. The release notes include:

1.1 Package Tools

The following is a list of the available tools in the package, together with a brief description of what each tool performs. The tools apply to single Switch Systems or adapter cards, but not to clusters.

Table 1 - Mellanox Firmware Tools (MFT) Available Tools

mlxburn	This tool provides the following functions: • Generation of a standard or customized Mellanox firmware image for burning in .bin (binary) or .img format • Burning an image to the Flash/EEPROM attached to a Mellanox HCA or switch device • Querying the firmware version loaded on an Mellanox network adapter • Displaying the VPD (Vital Product Data) of an Mellanox network adapter
flint	This tool burns a firmware binary image or an expansion ROM image to the Flash device of a Mellanox network adapter/bridge/switch device. It includes query functions to the burnt firmware image and to the binary image file.
spark	This tool burns a firmware *binary* image to the EEPROM(s) attached to an InfiniScaleIII® switch device. It includes query functions to the burnt firmware image and to the binary image file. The tool accesses the EEPROM and/or switch device via an I2C-compatible interface or via vendor-specific MADs over the InfiniBand fabric (In-Band tool).
Debug utilities	A set of debug utilities (e.g., itrace, mstdump, mlxi2c, and i2c)

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 1.40* or later.

1.2 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

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.)

1.3 Supported Operating Systems and Platforms

MFT is supported on the following platforms: x86, x86_64, ppc64.

Table 3 - Linux Operating Systems and Platforms

Operating System	Kernels
RedHat EL5	2.6.18-194.el5 (RHEL5 UP5)
	2.6.18-238.el5 (RHEL5 UP6)
	2.6.18-274.el5 (RHEL5 UP7)
	2.6.18-308.el5 (RHEL5 UP8)
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)
SLES10	2.6.16.60-0.84.1-smp (SLES10 SP4)
SLES11	2.6.27.19-5-default
	2.6.32.12-0.7-default (SLES11 SP1)
	3.0.13-0.27-default (SLES11 SP2)
Kernel.org [1]	2.6.35 and 2.6.36

1. OSes that are not tested

2 Changes and New Features

2.1 Changes in Version 2.7.1a

Table 4 - Changes and New Features in version 2.7.1a

Component / Tool	Description
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

2.2 Changes in Version 2.7.1

Table 5 - Changes and New Features in version 2.7.1

Component / Tool	Description
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.

2.3 Changes in Version 2.7.0a

This release includes bug fixes only.

2.4 Changes in Version 2.7.0

Table 6 - Changes and New Features in version 2.7.0

Component / Tool	Description
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
	• 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.

2.5 Changes in Version 2.6.2

Table 7 - Changes and New Features in version 2.6.2

Component / Tool	Description
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 Changes in Version 2.6.1

MTF version 2.6.1 includes bug fixes only.

2.7 Changes in Version 2.6.0

Table 8 - Changes and New Features in version 2.6.0

Component / Tool	Description
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

3 Bug Fixes

Table 9 lists the bugs fixed in this release.

Table 9 - Fixed Bugs List in version 2.7.1a

Component / Tool	Issue	Description
mstdump	Running mstdump on a ConnectX®-3 device may cause the firmware to hang.	Fixed

4 Known Issues

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

Table 10 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
1.	Install script	"--prefix" installation flag is not supported	MFT cannot be installed in a path different than the default /usr	N/A	Future release
2.		Installation fails when OFED 1.4 is installed	The installation script fails if OFED v1.4 or older is installed in the machine as it tries to search for non-existing RPMs	Change the names of the user space RPM as follow: • `RPMS/mft-2.7.1a-1.x86_64.rpm` **to** • `RPMS/mft-2.7.1a-1_ofed14.x86_64.rpm` • `RPMS/mft-2.7.1a-1.x86.rpm` **to** • `RPMS/mft-2.7.1a-1_ofed14.x86.rpm` • `RPMS/mft-2.7.1a-1.ppc64.rpm` **to** • `RPMS/mft-2.7.1a-1_ofed14.ppc64.rpm`	Future release

Table 10 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
3	flint / mlxburn	Burning / querying via an MTUSB-1 may take up to 35 minutes	When running mlxburn/ flint via an MTUSB-1 device, a burn/query command may take up to 12 minutes to complete without any messages displayed. This is mainly due to an extensive firmware image query that runs by default.	Use `-qq` flag to perform a quick query and `-no_flash_verify` to perform a quick burn. Please note, `-no_flash_verify` does not verify if the image is burnt.	N/A
4		Burning an image to a ConnectX® adapter in Flash recovery mode may fail	On some host machines (that use PCIe spread spectrum), the tool may not be able to recognize the ConnectX device's PCI CONF0 or the image burn may not complete successfully. Note: This is not an issue for ConnectX-2 devices.	Use the MTUSB-1 connection to burn the image	N/A
5	flint	Running the "sg" (set guids) command on a striped image file containing a large expansion rom image may fail	Setting the GUIDs on an image file which was generated using the "-exp_rom" and "-striped_image" flags will fail 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.	N/A	Future release
6		SwitchX-A1 unmanaged reboot through the power-cycle	After firmware upgrade or downgrade, the unmanaged SwitchX-A1 should be rebooted through the power-cycle and not via swreset.	N/A	Future release
7	spark	Parallel in-band tool runs with an HCA or with a non-existing LID(s) may hang the driver and the tool	Parallel tool runs which target multiple devices and mistakenly include non-*InfiniScale III* LIDs may hang spark and the driver	Reboot the machine and rerun with correct LIDs	N/A

Table 10 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
8	itrace	No support for host memory access on Mem-Free adapter cards with Red Hat OS	For Mellanox HCA cards without on-board memory (MemFree) with a Red Hat OS running, attempts to access the trace messages area in host memory may fail. Consequently, the application may crash or no trace messages will be printed without any error message	Use the "--nomap" flag for MemFree cards with Red Hat OS	N/A
9	wqdump	Flag '-dump ICM' may produce a large file	Running wqdump with '-dump ICM' option may produce a large file	N/A	Future release
10		CTRL-C does not clear semaphores	CTRL-C stops wqdump but does not clear (release) semaphores	Restart the driver to clear the semaphores	Future release
11		Support for '-ignore' is not complete	Running wqdump with '-ignore' ignores only the QPC gateway lock but does not ignore the OB gateway	N/A	Future release
12	mlxburn	vpd_set_keyword : Setting a keyword value that is either empty or longer than 255 characters	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	Do not set an empty keyword. If you already set an empty keyword, You can set the empty keyword again using the vpd_set_keyword	Future release
13		Running multiple VPD access commands in parallel	Running multiple VPD access commands in parallel on the same device may cause the commands to fail. VPD access commands should be run one at a time.	N/A	Future release
14		"-fw_dir" flag issues when burning ConnectX-3 A1 adapter card	The flag "-fw_dir" is not supported when burning ConnectX-3 A1 adapter card.	Specify the firmware file by using the flag "-fw" instead of "-fw_dir"	Future release

Table 10 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
15	Mst	Mst driver module remains loaded when uninstalling MFT	The uninstall operation leaves device files under /dev/mst	Run mst stop before uninstall	Future release
16		“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
17		“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
18	mcg	Parallel execution is not supported	When multiple instances of the mcg tool are running in parallel, 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.	Avoid running mcg in parallel	Future release
19		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
20		Port rules mismatch	The tool shows the rules of port 1 in port2 line and vice versa	N/A	Future release

5 History of Bug Fixes

5.1 Fixed Bugs in version 2.7.1

Table 11 lists the bugs fixed in this release.

Table 11 - Fixed Bugs List in version 2.7.1

Component / Tool	Issue	Description
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	Fixed
mlxburn	The flag "-fw_dir" is not supported when burning SwitchX devices	Fixed
mstdump	Running mstdump on a SwitchX device may cause it to malfunction.	Fixed
All	Tools in x86 machines display N/A in the svn version field instead of displaying the svn version .	Fixed

5.2 Fixed Bugs in version 2.7.0a

Table 12 lists the bugs fixed in this release.

Table 12 - Fixed Bugs List in version 2.7.0a

Component / Tool	Issue	Description
flint	Burning the firmware into ConnectX®-3 A1 adapter using the MST CR device resulted in failure.	Fixed
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	Fixed

5.3 Fixed Bugs in version 2.7.0

Table 13 lists the bugs fixed in this release.

Table 13 - Fixed Bugs List in version 2.7.0

Component / Tool	Issue	Description
Mlxi2c	mlxi2c scan fails the first time when using mtusb.	Fixed
flint	The sg (set guids) command on a VPI device may burn MACs/GUIDs with value 0xff	Fixed
	If the "`-striped_image`" flag is used in a burn command, image burn will fail or burn a corrupt image.	Fixed

5.4 Fixed Bugs in version 2.6.2

Table 14 lists the bugs fixed in this release.

Table 14 - Fixed Bugs List in version 2.6.2

Component / Tool	Issue	Description
mst	Occasionally, 'mst restart' locked the flash semaphore	Fixed
	'mst ib add' added non-Mellanox device to the in-band device list	Fixed

5.5 Fixed Bugs in version 2.6.1

Table 15 lists the bugs fixed in this release.

Table 15 - Fixed Bugs List in version 2.6.1

Component / Tool	Issue	Description
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”
mst	In-band access does not work with OFED 1.5	Fixed

5.6 Fixed Bugs in Version 2.6.0

Table 16 - Fixed Bugs in version 2.6.0

Component / Tool	Issue	Description
mlxburn	Bad exit status upon a successful query operation	When running mlxburn with a -query flag, it may return an exit value of 1 for a successful operation.
	-nofs_img flag does not take effect for ConnectX image generation	Fixed
flint	Image with blank GUIDs is treated as a valid image by the flint -v run (verify)	Mellanox devices cannot boot from an image including blank GUIDs. In this new release, flint -v will indicate an error.
	Locked HCA Flash semaphore when IB driver is down	Fixed by OFED 1.4
mst	mst status sometimes displays the same device twice on hosts with multiple HCAs	Fixed
	mst ib add allows specifying a non-existing ib device	Fixed