Mellanox Firmware Tools (MFT) Release Notes for Windows

Rev 3.0.0

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1 Overview

These are the release notes for Rev 3.0.0 of the **Mellanox Firmware Tools** (MFT) package for Windows.

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. These tools apply to single Switch Systems or adapter cards.

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

Category	Tool	Description
MST Service	mst	Lists the available mst devices
FW Update	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
	flint	This tool burns a firmware binary image or an expansion ROM image to the Flash Mellanox network adapter/bridge/switch device. It includes query functions to the burnt firmware image and to the binary image file.
Debug and Diagnostics Utilities	itrace	Extracts and prints trace messages generated by the firmware of a ConnectX family adapter devices.
	mlxtrace	Extracts hardware events generated by the device. The dump file can be used by Mellanox Support for hardware troubleshooting purposes.
	mstdump	Dumps device internal configuration registers. The dump file can be used by Mellanox Support for hardware troubleshooting purposes.
	mlxdump	Dumps device internal configuration registers. The dump file can be used by Mellanox Support for hardware troubleshooting. To generate a dump file, run: `"mlxdump -d <device> snapshot -m <full|normal|fast>"` This is a new tool in the MFT package. This tool is in beta state.
	mlxmcg	Displays the current multicast groups and flow steering rules configured in the device. Target users: Developers of Flow Steering aware applications.
	wqdump	Dumps the current QP contexts and Work Queues of a ConnectX®/Connect-IB™ family network adapter
	mcra	Reads/writes a single word from/to a device configuration register space

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

Category	Tool	Description
	i2c	Generates an i2c transaction using an mtusb usb to i2c adapter or using the device internal i2c compatible master
	mlxi2c	• Scans the i2c bus • Routes the i2c bus of an externally managed InfiniscaleIV/SwitchX system to connect to the switch silicon.
	mget_temp	Reads the hardware temperature from Mellanox Technologies devices internal sensors (ConnectX® family adapter cards, Connect-IB™ adapter card, BridgeX devices, 4th generation switches), and prints the reading in Celsius degrees.

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 1.70* or later.

1.2   Software Dependencies

Table 2 - MFT Software Dependencies on Windows

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

a. 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.

1.3   Supported Operating Systems and Platforms

• Supported Operating Systems and Service Packs:

  • Windows Server 2012 (x64)

  • Windows Server 2008 R2 (x64)

  • Windows 7 (x86, x64)

  • Windows Server 2008 (x86, x64)

2 Changes and New Features

2.1 Changes in Version 3.0.0

Table 3 - Changes and New Features in version 3.0.0

Component / Tool	Description
General	Added support for Connect-IB™ device (at beta level)
	Added support for ConnectX®-3 Pro device
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

2.2 Changes in Version 2.7.2

Table 4 - Changes and New Features in Version 2.7.2

Component / Tool	Description
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.
General	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.

2.3   Changes in Version 2.7.1

Table 5 - Changes and New Features in Version 2.7.1

Component / Tool	Description
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

2.4   Changes in Version 2.6.0

Table 6 - Changes and New Features in Version 2.6.0

Component / Tool	Description
All	Added Mellanox ConnectX-2 and BridgeX support.

Table 6 - Changes and New Features in Version 2.6.0

Component / Tool	Description
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-failsafe image for ConnectX®/ConnectX-2, InfiniScale® IV, and BridgeX® devices
mst	Added the command "mst remote add <server>" which provides access to devices on a remote server. To use this feature and be able to access the remote server, the server TCP port must be enabled (i.e., not blocked by the firewall). The default server TCP port is 23108
Debug tools	Updated the mlxi2c utility

3   Bug Fixes

Table 7 lists the bugs fixed in this release.

Table 7 - Fixed Bugs List in Version 3.0.0

	Component / Tool	Issue	Description
1.	mlxburn	The flag "`-fw_dir`" is not supported when burning Con-nectX-3 A1 adapter card.	Fixed
2.		mlxburn fails to find the INI/BIN in a full path such as: C:\tmp due to a bug in parsing Windows paths format.	Fixed

4   Known Issues

Table 8 provides a list of known bugs and limitations in regards to this release of the Mellanox Firmware Tools.

Table 8 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
1.	All	On Windows Server 2008 ONLY: Installing and running MFT tools requires elevated administrator privileges when User Account Control (UAC) is active	On Windows Server 2008, you need to install the MFT MSI with elevated administrator privileges if UAC is activated. To install with elevated administrator privileges, right click over the MSI and select "Run as administrator"		N/A
			On Windows Server 2008, you need to run with elevated administrator privileges if UAC is activated. To open a command shell with elevated administrator privileges: Click start > Programs > Accessories, then right-click over "Command Prompt" and select "Run as administrator".		
2.		Support for multiple MTUSB-1 devices	MFT supports only one connected MTUSB-1 device at a time	N/A	Future release
3.		Killing an Win-MFT process may interrupt subsequent runs of WinMFT tools	Performing a forced close on a tool while it is in the middle of the cleanup process may cause failure of other tools due to leftovers from the interrupted run. Subsequently, the following error is displayed: `-E- Failed to open <device>: No such file or directory`	Run `mst stop force` to clean your system from any leftovers from the interrupted run.	Future release
4.	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

Table 8 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
5.		`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 to a legal value using the `vpd_set_keyword`	Future release
6.	mst	MFT uninstall may not remove all remote devices	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
7.		"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
8.		mst does not display a message when there is no HCA device connected to the machine	If there is no HCA connected to the machine, mst will not notify on the lack of device	N/A	Future release
9.		mst shows all devices when connected to Flex10 remotely	mst shows all devices active and non-functional when adding Flex10 machines' devices remotely by "mst remote add"	N/A	Future release

Table 8 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
10.		"mst ib add" uses only ibnetdis-cover 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 "--dis-cover-tool".	N/A	Future release
11.		mst status does not show the mtusb-1 when adding in-band devices	Occasionally, when adding in-band devices by mst using the "ib add" command, mst status does not show the mtusb-1 device.	Remove the in-band device using the mst ib del command	Future release
12.		mtusb is not sup-ported in Win-dows 2012	Diolan mtusb driver is not sup-ported in Windows 2012	N/A	N/A
13.	flint	Running the "sg" (set guids) com-mand 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
14.		Occasionally, CTRL+C causes flint to hang in WinPE OS	Occasionally, CTRL+C causes flint to hang if the device is in livefish mode and the flint process is interrupted	Reboot the machine	Future release
15.		Unexpected behavior when running swreset on flint	Occasionally, running flint "swreset" on an in-band device may cause it to crash.	N/A	Future release
16.		CTRL+C does not clear sema-phores	When using flint via conf, in-band, mtusb or remote device in Win7 x64/32 or Win2008 x64/32, the CTRL+C signal does not clear (release) the semaphore and the process may hang.	Manually clear (release) the semaphore by running "flint -d <dev> -clear_semaphore"	Future release

Table 8 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
17.		The "clear_semaphore" command may crash when run in parallel	When running the "-clear_semaphore" command with the "burn" command in parallel, the command crashes.	N/A	Future release
18.		flint may crash when connectivity over mtusb/remote device is disconnected	When a read/write operation over mtusb/remote device fails while running flint, flint may crash, hence not handling the error well.	N/A	Future release
19.		First flint run may fail after Ctrl+c	If a flint process that queries/burns the firmware is stopped by CTRL+C, the next run of flint may fail and the following error message is displayed: MFE_NO_FLASH_DETECTED	Re-run flint when you get such error	Future release
20.		The machine may hang when reading from address -1 in flash	The machine may hang when trying to read from address -1 when running: "flint -d <dev> rw -1"	Avoid reading from -1	Future release
21.	wqdump	The wb flag is supported only in ConnectX devices	wqdump hangs when running it with the "wb" flag in devices other than ConnectX	Do not use the wb flag in devices other than ConnectX	Future release
22.		Dumping wqes may cause wqdump to hang	Occasionally, when dumping wqes for QPs: 0,1,2,3 wqdump crashes when parsing the WQes	N/A	Future release
23.		CTRL+C does not clear semaphores	CTRL+C stops wqdump but does not clear (release) semaphores	If you pressed CTRL-C, restart the driver to clear the semaphores	Future release
24.		wqdump cannot work with in-band devices	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.	Do not run wqdump with in-band devices	Future release
25.		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

Table 8 - Known Bugs and Limitations

	Tool	Issue	Description	Workaround	To be Fixed on
26.	mft_cleanup	mft_cleanup srcipt fails to run in Windows 2012 machine	Failed to run the mft_cleanup script during Windows 2012 startup	Remove the script from Windows startup list. If needed, run it manually.	Future release
27.	Mget_temp	One thermal reports an unreasonable temperature	On certain boards where the external oscillator is connected only to one port, the other port's thermal sensor will not function.	NA	Future Release
28.	mlxmcg (formerly 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
29.		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
30.		mlxmcg cannot handle bad PCI access	mlxmcg shows wrong results when a problem occurs in reading hardware registers via PCI, instead of failing the operation and sending the appropriate message	NA	Future Release
31.		mlxmcg does not support 64Byte rules	mlxmcg does not support 64Byte rules in ConnectX®-3 Pro	NA	Future Release
32.	Installation	Updating MFT requires removing old MFT package	The MFT MSI doesn't support modfinying different version automatically	Remove old MFT and then re-install new package	Future release

5 History of Bug Fixes

5.1 Fixed Bugs in version 2.7.2

The current release has no bugs fixed.

5.2 Fixed Bugs in version 2.7.1

Table 9 lists the bugs fixed in this release.

Table 9 - Fixed Bugs List in Version 2.7.1

	Component / Tool	Issue	Description
1.	mst	In-band access is not supported in the current release	Fixed
2.	All	No MTUSB-1 support for 64-bit architecture	Fixed by the MTUSB-1 provider

5.3 Fixed Bugs in version 2.6.0

Table 10 lists the bugs fixed in this release.

Table 10 - Fixed Bugs List in Version 2.6.0

	Component / Tool	Issue	Description
1.	mlxburn	-nofs_img flag does not take effect for ConnectX image generation	Fixed
2.	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.
3.	flint/mlxburn	An active flint operation does not respond to user interrupts (CTRL-C	Fixed
4.	mst	WinMFT Cleanup script that runs upon computer start-up may hang on Windows 200	Fixed