Release Notes

NVIDIA Firmware Tools (MSTFLINT) Documentation v4.28

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These are the release notes for mstflint. mstflint supports Linux operating system. Please see the supported platform table for further details.

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

1 Release Notes Update History

Revision	Date	Description
4.28.0-92	May 7, 2024	Initial release of this Release Notes version.

2 General Information

2.1 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.

Category	Tool	Description	Operating System
Firmware Update and Configuration	mstflint	This tool burns a firmware binary image or an expansion ROM image to the Flash of a network adapter/switch device. It includes query functions to the burnt firmware image and to the binary image file.	Linux FreeBSD
	mstconfig	Allows the user to change some of the device configurations without having to create and burn a new firmware.	Linux FreeBSD
	mstfwmanager	The mstwmanager is a 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.	Linux FreeBSD
	mstarchive	The mstarchive tool allows the user to create a file with the mfa2 extension. The new file contains several binary files of a given firmware for different adapter cards.	Linux FreeBSD
Debug and Diagnostics Utilities	mstregdump	Dumps device internal configuration data.	Linux FreeBSD
	mstmcra	Reads/writes a single word from/to a device configuration register space	Linux FreeBSD
	mstvpd	Reads PCI device VPD	Linux FreeBSD

Category	Tool	Description	Operating System
	mstfwreset	Load Firmware after firmware update on ISFU capable devices.(5th generation devices)	Linux FreeBSD
	mstfwtrace	Extracts and prints trace messages generated by the firmware of 5th generation devices. This tool supports secure firmware flow only.	Linux FreeBSD
	mstreg	Exposes supported access registers, and allows users to obtain information regarding the registers fields and attributes, and to set and get data with specific register.	Linux FreeBSD
	mstlink	Displays and configures port related data at the physical layer.	Linux FreeBSD
	mstresourcedump	Extracts and prints data segments generated by the firmware.	Linux
	mstresourcepars e	Parses and prints data segments content.	Linux

Detailed installation instructions along with complete descriptions of the various tools in the package can be found in the Firmware Tools User Manual.

2.2 Dependencies

2.2.1 Flags Dependencies

Configure Flag	Dependencies	Additional Tools Installed
enalbe-dc	zlib	

Configure Flag	Dependencies	Additional Tools Installed
enable-fw-mgr	curl, zlib, lzma	mstarchive, mstfwmanager
enable-adb-generic-tools	expat	mstlink, mstreg
enable-xml2	libxml2, xml2	
enable-inband	infiniband-diags*	
enable-cs	Openssl >= 1.0.2K	

2.3 mstflint Supported Operating Systems and Platforms

mstflint is supported on the following platforms:

Table Legend:

+ (Green)	Supported and tested
** (Orange)	Supported but not tested
*** Blue	Partially tested

Supported Operating Systems and Platforms

OS	Platform	Status
RHEL 7.2	x86_64	+
RHEL 7.4	x86_64	+
RHEL 7.4	PPC64	+
RHEL 7.4	PPC64LE	+
RHEL 7.5 Alt - Community	ARM	**

OS	Platform	Status
RHEL 7.6 Alt - Community	ARM	+
RHEL 7.6	PPC64 (Power 9)	+
RHEL 7.6	x86_64	+
RHEL 7.7	x86_64	+
RHEL 7.8	x86_64	+
RHEL 7.9	x86_64	+
RHEL 7.9	PPC64	**
RHEL 7.9	PPC64LE	+
RHEL 8	ARM	**
RHEL 8	PPC64LE	**
RHEL 8	x86_64	+
RHEL 8.1	PPC64LE	**
RHEL 8.1	x86_64	+
RHEL 8.2	x86_64	+
RHEL 8.2	PPC64LE	**
RHEL 8.3	PPC64LE	**
RHEL 8.3	x86_64	+
RHEL 8.4	PPC64LE	**

OS	Platform	Status
RHEL 8.4	x86_64	+
RHEL 8.5	PPC64LE	**
RHEL 8.5	x86_64	+
RHEL 8.6	x86_64	+
RHEL 8.6	PPC64LE	**
RHEL 8.7	x86_64	**
RHEL 8.7	PPC64LE	+
RHEL 8.8	x86_64	+
RHEL 8.8	PPC64LE	**
RHEL 8.8	ARM64	+
RHEL 8.9 - Beta	x86_64	**
RHEL 8.9 - Beta	PPC64LE	+
RHEL 8.9 - Beta	ARM64	**
RHEL 9.0	x86_64	+
RHEL 9.0	PPC64LE	+
RHEL 9.1	x86_64	**
RHEL 9.1	PPC64LE	+
RHEL 9.2	x86_64	+

OS	Platform	Status
RHEL 9.2	PPC64LE	+
RHEL 9.2	ARM64	+
RHEL 9.3	x86_64	+
RHEL 9.3	PPC64LE	+
RHEL 9.3	ARM64	+
Centos Stream v8 - Community	x86_64	**
Centos Stream v8 - Community	PPC64LE	**
Centos Stream v9 - Community	x86_64	+
Centos Stream v9 - Community	PPC64LE	**
OEL 7.9	x86_64	+
OEL 8.4	x86_64	+
OEL 8.6	x86_64	+
OEL 8.7	x86_64	+
OEL 8.8	x86_64	**
OEL 9.0	x86_64	+
OEL 9.1	x86_64	**
OEL 9.2	x86_64	+
Fedora 32 - Community	X86_64	+

OS	Platform	Status
Fedora 35 - Community	X86_64	**
Sles12 SP2 - Community	PPC64LE	**
Sles12 SP2 - Community	x86_64	**
Sles12 SP3 - Community	x86_64	**
Sles12 SP3 - Community	ppc64LE	**
Sles12 SP4 - Community	ARM64	**
Sles12 SP4 - Community	PPC64LE	**
Sles12 SP4 - Community	x86_64	**
Sles12 SP5	ARM64	**
Sles12 SP5	x86_64	+
Sles12 SP5	PPC64LE	**
Sles15 SP2	x86_64	**
Sles15 SP2- Community	PPC64LE	**
Sles15 SP3	PPC64LE	**
Sles15 SP3	x86_64	+
Sles15 SP4	PPC64LE	+
Sles15 SP4	x86_64	+
Sles15 SP5	PPC64LE	+

OS	Platform	Status
Sles15 SP5	x86_64	+
EulerOS V2.0 SP9 - Community	x86_64	**
EulerOS V2.0 SP10 - Community	x86_64	+
EulerOS V2.0 SP11	x86_64	+
EulerOS V2.0 SP12	x86_64	**
EulerOS V2.0 SP12	ARM64	+
OpenEuler 20.3 SP1 - Community	x86_64	**
OpenEuler 20.3 SP3	x86_64	+
OpenEuler 22.3 LTS	x86_64	+
Ubuntu 16.04 - Community	x86_64	**
Ubuntu 16.04 - Community	PPC64LE	+
Ubuntu 18.04	x86_64	+
Ubuntu 18.04	PPC64LE	+
Ubuntu 18.04	ARM64	+
Ubuntu 20.04	PPC64LE	+
Ubuntu 20.04	ARM64	+
Ubuntu 20.04	x86_64	+
Ubuntu 22.04	x86_64	+

OS	Platform	Status
Ubuntu 23.04	x86_64	+
BCLinux 21.10 SP2	x86_64	+
BCLinux 21.10 SP2	ARM	+
Debian 9.13	x86_64	+
Debian 10.8	x86_64	+
Debian 10.9	x86_64	+
Debian 10.13	x86_64	+
Debian 10.13	ARM	**
Debian 11.3	Arm	+
Debian 11.3	x86_64	+
Debian 12.1	x86_64	+
Debian 12.1	ARM	+
Citrix server 8.2	x86_64	+
Anolis 8.4 - Community	x86_64	**
Anolis 8.6	x86_64	+
Anolis 8.6	ARM	+
Korg 6.5	x86_64	+
Korg 6.5	ARM	**

OS	Platform	Status
OpenSUSE 15.3 - Community	x86_64	**
Photon 3.0 - Community	x86_64	**
Xen 7.1.2	x86_64	+
CTYunOS3	x86_64	+
CTYunOS3	ppc64le	**
Alma 8.5	x86_64	**
KylinOS v10 SP2	x86_64	+
KylinOS v10 SP3	x86_64	+
KylinOS v10 SP3	ARM	**
Allinux 3.2	x86_64	+
Allinux 3.2	ppc64le	+
DriveOS 6.0.5.0	x86_64	+
DriveOS 6.0.5.0	ARM	+
UOS v20 1021e	x86_64	+
UOS v20 1021e	ARM	**
UOS v20 1040d	x86_64	+
FreeBSD 13.0-STABLE	x86_64	+
	aarch64	+

OS	Platform	Status
FreeBSD 14.0-STABLE	aarch64	+
FreeBSD 14-CURRENT	x86_64	+
SONiC 202211_1	64 Bit	+
MLNX-OS 3.11.2000	64 Bit	+
Cumulus 5.6	64 Bit	**
NV-OS 25.01.2500	64 Bit	**
DVS 4.6.2000	64 Bit	+

2.4 Supported Flash Types

mstflint supports the following Flash types.

Vendor	Flash Family	Tested P/N
Winbond	W25QxxBV	W25Q32FVSSIG
		W25Q32FVSSIGS
		W25Q32FVSSIGT
		W25Q128FVSIGS
	W25Qxxx	W25Q256JVBIMT
		W25Q128JVSIQ
Macronicx	MX25L16xxx	MX25L12845GM2I-08G
	MX25Lxxx	MX25L25645GXDI-08G

Vendor	Flash Family	Tested P/N
Micron	N25Q0xxx	MT25QL128ABA1ESE-0SIT
ISSI	IS25LPxxx	IS25LP128-JBLE SPA# U1323A
	IS25WPxxx	IS25WP256E-RHLE
Cypress	S25FL256L	S25FL256LDPBHV023
		S25FL128SAGMFVG00
Gigadevice		GD25LB256EBFRY
		GD25B256DFIGR

2.5 Supported Interface Cards (NICs)

With respect to mstflint, NVIDIA 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:

IC Group	IC Device

Group II/5th Generation	• Adapter Cards:
	  • NVIDIA BlueField-3
	  • NVIDIA BlueField-2
	  • NVIDIA BlueField
	  • NVIDIA ConnectX-7
	  • NVIDIA ConnectX-6 Lx
	  • NVIDIA ConnectX-6 Dx
	  • NVIDIA ConnectX-6
	  • NVIDIA ConnectX-5
	  • NVIDIA ConnectX-4 Lx
	  • NVIDIA ConnectX-4
	  • NVIDIA Connect-IB
	• Switch Systems:
	  • NVIDIA Quantum-2
	  • NVIDIA Quantum
	  • NVIDIA Spectrum-3
	  • NVIDIA Spectrum-2
	  • NVIDIA Spectrum
	  • NVIDIA Switch-IB 2
	  • NVIDIA Switch-IB

Group I/4th Generation	• Adapter Cards:
	  • NVIDIA ConnectX-3
	  • NVIDIA ConnectX-3 Pro
	• Switch Systems:
	  • NVIDIA SwitchX-2

2.6 Supported Adapter Cards Firmware Versions

MFT supports the following NVIDIA® network adapter cards:

Adapter Card	Bundled Firmware Version
BlueField®-3	32.40.1000
BlueField®-2	24.40.1000

ConnectX-7	28.40.1000
ConnectX-6 Lx	26.40.1000
ConnectX-6 Dx	22.40.1000
ConnectX-6	20.40.1000

The following are the supported **legacy HCAs** and firmware versions:

HCAs	Firmware Version	FlexBoot Version	UEFI Version
NVIDIA ConnectX-5 / NVIDIA ConnectX-5 Ex	16.35.3006	3.6.901	14.29.14
NVIDIA BlueField	18.33.1048	3.6.502	14.26.17
ConnectX-4 Lx	14.32.1010		14.25.17
ConnectX-4	12.28.2006	3.6.102	14.22.14
ConnectX-3/ConnectX-3 Pro	2.42.5000	3.4.752	N/A

To download the firmware binaries, please visit Firmware Downloads[1].

2.7 Supported Switch Systems Software

The following are the Supported Switch Systems Software.

Switch Software	Version
MLNX-OS	3.11.1000
SONIC	202211_1

1 https://network.nvidia.com/support/firmware/firmware-downloads/

Switch Software	Version
Cumulus	5.6
DVS	4.6.1000
NV_OS	25.01.2000

3 Changes and New Features

Component/ Tool	Description	Operating System
Rev. 4.28		
General	Added support for flint query to display the port GUID, node GUID, system GUID, and allocated GUID for devices that are part of a multi-asic system.	All
	Expanded the MCC register to include more informative error messages which are relevant for module upgrade flows.	All
	Upgraded full OS.	All
	Added support for new flag "-s" which allows the user to determine which I2C secondary address to use when running mget_temp tool.	All
	Added an error message stating that the image/device is encrypting and breaking the flow.	All
	Added support in mlxtrace and fwtrace tools to read events in ArcusE.	All
mlxlink	Disabled physical state in optic cables.	All
mlxfwreset	The mlxfwreset tool might fail when using PPC64LE on the RH 8.7 operating system.	All
	Changed the default firmware reset to level 3 from level 4 for PCIe devices. To load new configurations, either execute mlxfwreset level 4 or initiate a cold boot.	All

4 mstflint Bug Fixes in this Version

No new bug fixes were introudced in this version. For a list of old Bug Fixes, please see mstflint Bug Fixes History[2].

2 https://confluence.nvidia.com/display/MSTFLINTREV/mstflint+Bug+Fixes+History

5 mstflint Known Issues

The following table provides a list of known issues and limitations of mstflint. For a list of old Known Issues, please see Archived Known Issues[3] file.

Internal Ref. No.	Issue
3886315	**Description:** '--sync 0' argument must be specified when resetting or shutting down the Arm.
	Workaround: N/A
	Keywords: mlxfwreset, sync 0, ARM
	Discovered in Version: 4.28.0-92
3872303	**Description:** Activation of MMS4X00-NS transceivers may fail with rc=8 following multiple "Activating burned FW image..." prints.
	Workaround: Reset the Switch/HCA to activate the new firmware on the cable.
	Keywords: MMS4X00-NS
	Discovered in Version: 4.28.0-92
3641618	**Description:** Running a command triggers the following error message: `/lib/libgcc_s.so`[4]`.1: version GCC_4.5.0 required by /usr/local/lib/gcc12/libstdc++.so.6 not found`
	Workaround: Run the following command: `export LD_LIBRARY_PATH=/usr/local/lib/gcc12:$LD_LIBRARY_PATH`

3 http://www.mellanox.com/pdf/MFT/MFT_Archived_Known_Issues.pdf
4 http://libgcc_s.so

Internal Ref. No.	Issue
	Keywords: libstd, gcc, mft, libgcc
	Discovered in Version: 4.26.0
3446066	**Description:** When using ConnectX-7 and later cards, the link should be fully down (not in polling state) for the loopback configuration can be applied.
	Workaround: N/A
	Keywords: mstlink
	Discovered in Version: 4.23.0
3418112	**Description:** Loading a new firmware may require running mlxfwreset, and in some cases rebooting or initiating a power-cycle.
	Workaround: N/A
	Keywords: mstfwreset
	Discovered in Version: 4.24.0
3292150	**Description:** The mstfwreset tool does not support Cedar system.
	Workaround: N/A
	Keywords: mstfwreset, Cedar, ConnectX-7
	Discovered in Version: 4.23.0
3188577	**Description:** Some firmware scratchpad registers have been moved to a different location. Therefore, if you use your own utility to dump mstregdumps, you must update your CSV file with the latest CSV, CSV2 files that are included in the MFT package. Otherwise, the mstregdumps device will not retrieve the firmware version, and the FAEs will not be able to use NVIDIA internal tools to debug the error.

Internal Ref. No.	Issue
	Workaround: N/A
	Keywords: CSV, mstregdump
	Discovered in Version: 4.22.0
2829041	**Description:** Running mstlink on LID devices when the OpenSM is not enabled, can cause the machine to hang.
	Workaround: To resolve the issue, run the following: 1. opensm & (Press 'Enter') 2. mst restart; 3. mst ib add; 4. mst status; 5. Get the correct LID device from "InBand" devices
	Keywords: mstlink, LID, InBand, OpenSM
	Discovered in Version: 4.20.0
2823492	**Description:** mstfwreset is not supported on DPU with GPU boards.
	Workaround: N/A
	Keywords: mstfwreset
	Discovered in Version: 4.18.0
2715716	**Description:** mstfwreset is not supported on secure-boot host devices.
	Workaround: N/A
	Keywords: mstfwreset
	Discovered in Version: 4.18.0

Internal Ref. No.	Issue
2752916	**Description:** The information of the IB/ETH protocols should not be stored on the same CSV file. Doing so will result in a mismatch on the columns of CSV file.
	Workaround: N/A
	Keywords: mstlink
	Discovered in Version: 4.18.0
2838222	**Description:** mstfwreset is not supported on kernel 3.10.0-1062.el7.x86_64 due to a kernel bug that leads to 'rescan' PCI operation to take a few minutes.
	Workaround: N/A
	Keywords: mstfwreset
	Discovered in Version: 4.18.0
2670833	**Description:** Burning firmware using DMA might fail on virtual FreeBSD machines.
	Workaround: N/A
	Keywords: Firmware burning, DMA, FreeBS, VM
	Discovered in Version: 4.17.0
2484780	**Description:** Configuring TX/RX_rate to 200GbE in test mode fails.
	Workaround: To work with the new speeds specify the number of lanes as shown below: • 100G_1X/200G_2X/400G_4X/800G_8X for NDR speeds • 50G_1X/100G_2X/200G_4X/400G_4X for HDR speeds
	Keywords: 200GbE, Tx/Rx
	Discovered in Version: 4.17.0

Internal Ref. No.	Issue
2208845/2099263	**Description:** mstlink does not support test mode for 50GE-KR4 speed.
	Workaround: N/A
	Keywords: mstlink
	Discovered in Version: 4.16.0
2001890	**Description:** The argparse module is installed by default in Python versions =>2.7 and >=3.2. In case an older Python version is used, the argparse module is not installed by default and therefore must be manually installed.
	Workaround: N/A
	Keywords: Python, argparse module
	Discovered in Version: 4.13.3-2
1923665	**Description:** Force Mode does not work when using mstlink in ConnectX-6 InfiniBand adapter cards.
	Workaround: N/A
	Keywords: mstlink, Force Mode, ConnectX-6 IB
	Discovered in Version: 4.13.3-2
1431471	**Description:** In ConnectX-5 adapter cards, the time-stamp capability using mstflint, is supported only on the device using the "-d" flag, and not on the binary using the "-i" flag.
	Workaround: Use the “-d” flag to set the time-stamp.
	Keywords: mstflint
	Discovered in Version: 4.11.0

Internal Ref. No.	Issue
1442454	**Description:** Occasionally, when running mstfwreset over a Multi-Host device, the driver remains down if the mstfwreset operation fails.
	Workaround: N/A
	Keywords: mstfwreset
	Discovered in Version: 4.11.0