Mellanox FlexBoot for ConnectX®-3 /ConnectX®-3 Pro Release Notes

Rev 3.4.752

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Release Update History

Table 1 - Release Update History

Release	Date	Description
Rev 3.4.752	October 19, 2017	Initial release of this FlexBoot version for ConnectX-3/ConnectX-3 Proadapter cards.

1 Overview

These are the release notes for "Mellanox FlexBoot", the software for Boot over Mellanox Technologies adapter devices supporting VPI. FlexBoot enables booting kernels or operating systems (OS) from remote servers in compliance with the PXE specification.

This package is based on the open source project iPXE available at http://www.ipxe.org.

1.1 Supported Adapter Cards and Firmware

Table 2 - Supported Adapter Cards and Firmware

Adapter Cards	Firmware Version
ConnectX-3 Pro	2.42.5000
ConnectX-3	2.42.5000

1.2 Supported Tools (MFT)

Table 3 - Supported Tools (MFT)

Tools	Version
MFT (Mellanox Firmware Tools)	4.7.0

1.3 Supported Operating Systems

All the Operating Systems below expect for RedHat 7.3 are supported in Ethernet protocol only. RedHat 7.3 is supported in both InfiniBand and Ethernet protocol.

Table 4 - Supported Operating Systems

OSs	Version
ESXi	5.5
ESXi	6.0
ESXi	6.5
RHEL	6.4
RHEL	6.6
RHEL	7.0
RHEL	7.1
RHEL	7.2
RHEL	7.3
SLES	11.3
SLES	11.4

Table 4 - Supported Operating Systems

OSs	Version
SLES	12
SLES	12.1
SLES	12.2
Ubuntu	14.04
Ubuntu	15.4
Ubuntu	16.04
Ubuntu	16.10
Windows Server	2012
Windows Server	2012 R2
Windows Server	2016

1.4 Tested Platforms

Table 5 - Tested Platforms

Vendor	Type of server	Bios Version
DELL	Dell PowerEdge R730xd 13G	2.3.4
DELL	Dell PowerEdge R630 13G	2.3.4
DELL	Dell PowerEdge R640 14G	0.3.6
DELL	Dell PowerEdge C6320p	1.1.3
Quanta	Yesomity	F20_3A12 / F20_3A09
Quanta	Leopard	AVA_3B08
Supermicro	SuperMicro	X9DRW V3.2
Dell	PowerEdgeR820	1.6.6
HPE	ProLiant DL180 Gen9	U20 v2.20 (05/05/2016)
HPE	ProLiant XL730f Gen9	U18 v1.50 (08/04/2015)
HPE	ProLiant DL380 Gen9	P89 v2.20 (06/02/2016)
HPE	ProLiant XL260a Gen9	U24 v1.00 (05/18/2016)
HPE	ProLiant DL160 Gen9	U20 v2.20 (05/05/2016)
HPE	ProLiant DL360 Gen10	U32 v1.00 (12/31/2016)
Lenovo	3650 M5	2.10 TCE124M (23/06/2016)
Lenovo	3650 M5	1.20 TCE108IUS (17/12/2015)
Lenovo	3550 M5	1.20 TCE108IUS (17/12/2015)

2 Changes and New Features in Rev 3.4.746

Table 6 - Changes and New Features

Category	Description
Secure Firmware Update	Added support for Secure Firmware Update
FlexBoot Boot	Enabled booting Grub 2.02 over IB
SOL	Disabled SOL by default

3 Known Issues

The following is a list of general limitations and known issues of the various components of this FlexBoot release.

Table 7 - Known Issues

Internal Ref.	Description
-	**Description:** Several BIOS vendors have limited boot-vector space and may not display FlexBoot in their boot menu.
	WA: Disable the embedded NIC boot agent in BIOS
	Keywords: BIOS
-	**Description:** In several BIOS, the server might hang during FlexBoot booting due to wrong configuration of the PMM.
	WA: N/A
	Keywords: BIOS
-	**Description:** Only EBX, ESI, DS, ES registers can be saved in Boot Entry.
	WA: N/A
	Keywords: BIOS
-	**Description:** If a client returned control to the BIOS after a successful connection to an iSCSI target (but did not boot from it), then, unexpected behavior may occur.
	WA: Follow the instructions described in the FlexBoot UM for the proper iSCSI boot/install
	Keywords: BIOS
673114/821899	**Description:** FlexBoot banner might not be shown in some BIOSes.
	WA: N/A
	Keywords: BIOS
-	**Description:** Firmware 2.30.3000 and below does not support booting over Ethernet with VPI adapter cards when using QSFP cables (40GE, hybrid cables).
	WA: N/A
	Keywords: PXE Boot
-	**Description:** Booting from WDS running on Windows 2008 R2 in InfiniBand mode, is currently not supported due to compatibility issues between FlexBoot 3.4.142 and Mellanox WinOF v4.40 and below.
	WA: N/A
	Keywords: PXE Boot

Table 7 - Known Issues

Internal Ref.	Description
-	**Description:** In some cases, PXE boot will not work if the client was given only the file-name without next-server (siaddr).
	WA: N/A
	Keywords: PXE Boot
-	**Description:** PXE boot after iSCSI boot with static configuration is currently not supported.
	WA: N/A
	Keywords: PXE Boot
-	**Description:** Boot over VLAN with IB port is currently not supported.
	WA: N/A
	Keywords: PXE Boot
-	**Description:** Some faulty boot loaders do not close the underlying UNDI device which may result in unexpected behavior and possible system crash after the OS starts to load.
	WA: N/A
	Keywords: PXE Boot
-	**Description:** Chain-loading gPXE stack may result in undesirable behavior.
	WA: N/A
	Keywords: PXE Boot
647143	**Description:** Executing a partial boot loop while only downloading the NBP and selecting localboot is unsupported and may cause undefined behavior.
	WA: N/A
	Keywords: PXE Boot
670421	**Description:** Since only a single Boot Entry Vector (BEV) per PCI Physical Function is supported, disabling the first port causes the second port to disappear as well.
	WA: N/A
	Keywords: PXE Boot
-	**Description:** iSCSI over IB is not tested.
	WA: N/A
	Keywords: iSCSI

Table 7 - Known Issues

Internal Ref.	Description
-	**Description:** iSCSI over DCB is not supported.
	WA: N/A
	Keywords: iSCSI
-	**Description:** FlexBoot supports only a single active iSCSI connection. Thus, when iSCSI-boot via Port 1 succeeds to connect but fails to boot, it will fail to connect via Port 2.
	WA: N/A
	Keywords: iSCSI
-	**Description:** Boot retries is currently not functional when booting from iSCSI.
	WA: N/A
	Keywords: iSCSI
655800	**Description:** IPv6 is not supported.
	WA: N/A
	Keywords: iSCSI
-	**Description:** Boot menu is displayed as READ ONLY if the HCA card does not support flash configuration.
	WA: N/A
	Keywords: User Interface
-	**Description:** FlexBoot Boot Menu will not be visible in serial output.
	WA: N/A
	Keywords: User Interface
-	**Description:** Large Receive Offload (LRO) and iSCSI may not interoperate due to a bug in current Linux kernel distributions.
	WA: Disable LRO in the IPoIB module when using iSCSI. See the Mellanox FlexBoot user's manual for details under the Diskless Machines chapter (InfiniBand Ports).
	Keywords: Networking
-	**Description:** FlexBoot supports only 2K MTU.
	WA: N/A
	Keywords: Networking

Table 7 - Known Issues

Internal Ref.	Description
-	**Description:** 56Gb/s is currently not supported.
	WA: N/A
	Keywords: Link Speed
-	**Description:** Setting the number of Virtual Functions higher than the machine's memory capability may cause memory issues and system instability.
	WA: N/A
	Keywords: Virtualization
-	**Description:** SLAM, FTP, HTTPS and SRP are currently not supported.
	WA: N/A
	Keywords: Protocols
-	**Description:** Occasionally, using the Spanning Tree Protocol (STP) in the switches may cause packet drops and boot failure in the system.
	WA: Enable the "edgemode" if disabled on the switch, or use either portfast or edgemode functionality on the switch ports connected to the NICs.
	Keywords: Protocols
-	**Description:** FCoE, BCV are not supported.
	WA: N/A
	Keywords: Protocols
655800	**Description:** IPv6 can only run if a RADVD service is running in the network.
	WA: N/A
	Keywords: Protocols
-	**Description:** IPv6 over IB is not supported.
	WA: N/A
	Keywords: Protocols
655800	**Description:** IPv6 over WDS is not supported.
	WA: N/A
	Keywords: Protocols
655800	**Description:** Enabling IPv6 first and then IPv4 is currently not supported.
	WA: N/A
	Keywords: Protocols

Table 7 - Known Issues

Internal Ref.	Description
841198	**Description:** FlexBoot fails to boot when the following occurs: • Boot priority is set to iSCSI • The iSCSI TCP/IP parameters via DHCP is disabled • iSCSI boot fails or iSCSI boot to target configuration is set to disable
	WA: N/A
	Keywords: PXE boot, iSCSI
843377/849223	**Description:** The physical MAC assigned via the boot menu is displayed as zeroes instead of the set MAC when ConnectX-4 VPI adapter card is configured as InfiniBand.
	WA: N/A
	Keywords: Physical MAC, Boot menu
656001	**Description:** Booting from WDS and Windows DHCP server when only Option 66 is enabled (without Option 67), is not supported.
	WA: N/A
	Keywords: DHCP
776057	**Description:** Citrix PVS boot is not supported.
	WA: N/A
	Keywords: Citrix PVS boot
689460	**Description:** FlexBoot uses system UUID to generate the client DUID-UUID as per RFC 6355, the data conveyed with DHCPv6 Code 1 (Option ID).
	WA: N/A
	Keywords: DUID-UUID
928217	**Description:** Installing ESXi 6.5/6.0 on iSCSI target is currently not supported.
	WA: N/A
	Keywords: ESXi 6.5/6.0, iSCSI target

Table 7 - Known Issues

Internal Ref.	Description
689460	**Description:** To use the DHCP server to identify ipxe requests when using `undi-only.kpxe` or `ipxe.pxe` when booting over IB requires special configuration. (see the Workaround below).

	WA: Add to the DHCP host declaration the MAC identification alongside the option 61 DUID.
	 For example:
	 ```host ib-client1 {```
	 ```option dhcp-client-identifier =```
	 ```ff:00:00:00:00:00:02:00:00:02:c9:00:<Port-GUID> ;```
	 ```hardware ethernet <Port-MAC> ;```
	 ```fixed-address <IPoIB Address> ;```
	 ```filename "ipxe.pxe" ;```
	 ```if exists user-class and option user-class = "iPXE" { filename```
	 ```"pxelinux.0" ; }```
	 ```}```

	Keywords: undionly.kpxe or ipxe.pxe

4 Bug Fixes History

Table 8 - Fixed Bugs List

Internal Ref.	Description
1007346	**Description:** Fixed a boot failure that occurred when FlexBoot allocated memory area straddles the 2GB boundary.
	Keywords: PXE Boot
	Discovered in Release: 3.4.746
	Fixed in Release: 3.4.752
634794	**Description:** Enabled 'boot_pci_busdevfn' initialization when booting from UNDI loader.
	Keywords: UNDI loader
	Discovered in Release: 3.4.648
	Fixed in Release: 3.4.718
-	**Description:** Fixed HTTP boot over IPoIB
	Keywords: IPoIB
	Discovered in Release: 3.4.521
	Fixed in Release: 3.4.468
-	**Description:** Fixed BEV posting issue in hybrid BIOS
	Keywords: Hybrid BIOS
	Discovered in Release: 3.4.521
	Fixed in Release: 3.4.468
-	**Description:** Fixed transmission of IPoIB multicast packets as broadcasts
	Keywords: IPoIB multicast packets
	Discovered in Release: 3.4.521
	Fixed in Release: 3.4.468
-	**Description:** Fixed HTTP download over IPoIB
	Keywords: IPoIB
	Discovered in Release: 3.4.306
	Fixed in Release: 3.4.521

Table 8 - Fixed Bugs List

Internal Ref.	Description
-	**Description:** Fixed completion with error handling process
	Keywords: Code completion
	Discovered in Release: 3.4.306
	Fixed in Release: 3.4.521
-	**Description:** Fixed an issue for TLV with length 0
	Keywords: TLV, Non-Volatile Configuration
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed an issue related to sync VLAN IRQ operation with trunk IRQ operation
	Keywords: VLAN IRQ operation
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed an issue which enabled a netdevice (VLAN) to open/close twice
	Keywords: VLAN
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed an issue which prevented the iSCSI initiator's name from being received from HII
	Keywords: HII, iSCSI initiator
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed an issue related to dual port adapters; occasionally, booting from the second port resulted in TFTP download failure when the first port was already linked up with DHCP, and has received a TFTP address
	Keywords: TFTP, DHCP, dual port adapters
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306

Table 8 - Fixed Bugs List

Internal Ref.	Description
-	**Description:** Fixed an issue which caused PXE boot failure when using a filename if iSCSI rootpath is set.
	Keywords: PXE boot
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed an issue which prevented the device to PXE boot from the 2nd port if first port was already downloaded.
	Keywords: PXE boot
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed compilation issue.
	Keywords: Code Compilation
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed a broken VLAN issue.
	Keywords: VLAN
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed a retry issue when the value is infinite.
	Keywords: General
	Discovered in Release: 3.4.225
	Fixed in Release: 3.4.306
-	**Description:** Fixed "Impossible to PXE boot from 2nd port if first port already downloaded." issue.
	Keywords: PXE boot
	Discovered in Release: 3.4.000
	Fixed in Release: 3.4.225

Table 8 - Fixed Bugs List

Internal Ref.	Description
-	**Description:** Fixed "no more network devices" issues.
	Keywords: network devices
	Discovered in Release: 3.0.000
	Fixed in Release: 3.4.000

5 Changes and New Feature History

Table 9 - Changes and New Feature History

Release	Changes
Rev. 3.4.746	
Networking	Ethernet only: The MTU value is set to 1500 upon driver's bring up.
SHELL CLI Commands	Added support for the following SHELL CLI commands: • Non-volatile option storage commands • SAN boot commands • Menu commands • Login command • Sync command • DNS resolving command • Time commands • Image crypto digest commands • Loopback testing commands • VLAN commands • PXE commands • Reboot command For further information, please refer to: http://ipxe.org/cmd
Boot Menu	Deprecated the option "rom enable" bit.
iSCSI re-imaging	Now the user can install a new image on an active ISCSI target
Interrupts	Enabled interrupt support.
Banner time	Set default banner timeout to 4.
Link Status	Removed link status line printout at boot time.
UNDI network open wait time configuration	When Network Boot Program (NBP) uses UNDI, the user can configure the awaiting time (up to 30 seconds) that is needed to raise a link.
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.4.718	
IPv6	**[Beta]** Added IPv6 support
SHELL CLI	Removed support for the following SHELL CLI commands: • Non-volatile option storage commands • SAN boot commands • Menu commands • Login command • Sync command • DNS resolving command • Time commands • Image crypto digest commands • Loopback testing commands • VLAN commands • PXE commands • Reboot command For further information, please refer to: http://ipxe.org/cmd
Upstream sync	Synced the source with iPXE (upstream sync)

Table 9 - Changes and New Feature History

Release	Changes
Rev. 3.4.648	
Image size	Added support for .mrom images larger than 128kB
Adapter Cards	Added support for ConnectX-4 EN and ConnectX-4 Lx EN
Flat real mode	Moved to flat real mode when calling INT 1a,b101 to avoid BIOSes issues
Spanning Tree Protocol	Added support for detecting Spanning Tree Protocol non-forwarding ports (RSTP/MSTP)
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.4.521	
• Added iSCSI CHAP and mutual CHAP configuration • Added the GRH size when allocating receive buffer for IPoIB • Updated VLAN netdevice's settings with all the trunk's iSCSI required settings • Updated the port event handling process • Enabled console output in Debug mode • Disabled the serial output • Disabled the banner in BEV execution • Disabled function 0x04 (in int21) when serial console is disabled • Preserved COM port settings	
Rev. 3.4.460	

Table 9 - Changes and New Feature History

Release	Changes
• Boot Menu support: Added new FlexBoot GUI. The device can now be configured in the POST stage • Non-volatile memory read/write support • Configurable URI boot retry and delay between retries • Configurable iSCSI settings using DHCP/NVM • Added new interface in order to update the registered devices on the PXE stage • Enabled ConnectX Ethernet adapter cards family to work with interrupts • Enabled PXE to work in promiscuous VLAN mode (configurable through the INI) • Synced version with ipxe.org: Now the latest code in iPXE is used • Added boot priority capability: iSCSI vs PXE and fallback in case one fails • Updated the Proxy DHCP request method for non-existing option 54. ProxyDHCP request is sent to port 67 with broadcast IP address if the server identifier in option 54 is zero. Packets with source port different than BOOTPS_PORT and PXE_PORT are filtered by the PROXY • SHELL CLI is currently supported on ConnectX-3 and ConnectX-3 Pro adapter cards only • Both the GUID and the MAC are printed on the screen when the port link layer is set as InfiniBand • PROXYDHCP and PXEBS settings are saved under netdevice settings • rootpath/filename/nextserver are now fetched from the netdevice settings • The cached DHCP packet are received only if working with the same net device. When pxelinux.0 receives the cached DHCP packet from the UNDI API, it constructs a new (fake) packet for the current net device.   • If the process is stopped and then restarted and booted from the next boot device which serves as the second port in the HCA, a new (fake) DHCP packet is not constructed. The previous packet which includes all the information of the first port (IP, MAC, Netmask, etc...) is used.   • If an old (fake) DHCP packet is discovered, its chaddr is compared to the chaddr in the pxe_netdev, if not similar, a new (fake) DHCP packet is created. • PXE shutdown is called if int22 with function 0x000C is called. • The server's IP address in DHCP server replies is now checked before checking the reply type. This will ignore NACK replies from servers which already were ignored by the client. In case of 2 DHCP servers in the same subnet, the client will eventually choose one of them, by sending the DHCP REQUEST with 'DHCP Server Identifier' (option 54) filled with the requested server's IP address. • Changed DHCP discover timeouts to comply with PXE spec
Rev. 3.4.306

Table 9 - Changes and New Feature History

Release	Changes
	• Added validation script for the released ROMs • Added the option to always keep SAN hook to enable WIN install on iSCSI target • Added compilation flag around the flash readout • Added URI Boot retry. Default retries = 0 • Added Unmap MPT command in teardown • Added support for HII ISCSI configuration • Added 64-bit PCI BAR support (Large bar) • Added the option added for running PXE with promiscuous VLAN • Re-added COMBOOT image support by default • Enabled pages-function handling in Connect-IB initialization stage to work according to the PRM • Applied additional patches from ipxe.org • Updated the window even if ACK does not acknowledge new data • Modified the error print to debug print • Modified the printed string when initializing devices • Modified the error print. Added additional information to make the output more user-friendly • Changed the size of the domain name array to 0xfd • Disabled the waiting period for link up on trunk-net-device when VLAN is enabled on port • Removed unsupported EQ event in Connect-IB
Rev. 3.4.225	
	• Added additional information to the error print output • Added compilation flag around the flash readout • Added URI Boot retry. Default retries = 0 • Added Unmap MPT command in teardown • Added 64-bit PCI BAR support • Added an option for running PXE with promiscuous VLAN • Added support for HII iSCSI configuration • Enlarged the mailbox size to 4kb • Enlarged the number of WQE to 64 (from 4) • Enabled multiple DHCP offers to be received before proceeding to request state • Changed the size of the domain name array to 0xfd • Changed error print to debug print • Changed printed string when initializing devices • Kept the SAN connection permanently open to enable Windows install on iSCSI target even when the iSCSI target is empty • Readded COMBOOT image support by default • Prevented a netdevice (VLAN) from opening/closing twice • Removed unsupported EQ event in Connect-IB • Disabled the waiting time for link up on trunk net device when VLAN is enabled on a port
Rev. 3.4.142	
	• Enabled firmware to handle the link state with the Subnet Manager • Updated the DHCP class code to NONE • Added flash access capability for reading software-to-software configurations • Enabled DHCP validation of MAC address and XID for a unique tuple • Improved randomness algorithm for DHCP XID
Rev. 3.4.000	

Table 9 - Changes and New Feature History

Release	Changes
• Increased the number of the supported systems • Added the ability to merge the PXE image with the UFI image	
Rev. 3.3.420	
• Increased DHCP timeout	
Rev. 3.3.400	
• Added ConnectX-3 support • Increased the number of the supported systems • All iPXE features are now part of the ROM image • Support multiple functions (Flex10) • Added support for Link Aggregation Control Protocol (LACP) • Added ifenable/ifdisable network interface command • Improved reliability	
Rev. 3.3.000	
• Initial Release	