



# Mellanox FlexBoot for ConnectX<sup>®</sup>-4 / ConnectX<sup>®</sup>-4 Lx / ConnectX<sup>®</sup>-5 and Connect-IB<sup>®</sup> Release Notes

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Rev 3.5.110

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## Release Update History

*Table 1 - Release Update History*

Release	Date	Description
Rev 3.5.110	April 12, 2017	Initial release of this FlexBoot version for ConnectX-4/ConnectX-4 Lx/ConnectX-5/ConnectX-5 Ex adapter 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-5	16.19.1200
ConnectX-4 Lx EN	14.18.2000
ConnectX-4	12.18.2000
Connect-IB (OEM cards only)	10.16.1020

For the complete list of supported cards, please refer to ConnectX-4 Lx EN/ConnectX-4 EN and ConnectX-5 web pages at [www.mellanox.com](http://www.mellanox.com).

## 1.2 Supported Tools (MFT)

**Table 3 - Supported Tools (MFT)**

Tools	Version
MFT (Mellanox Firmware Tools)	4.6.0

## 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

**Table 4 - Supported Operating Systems**

OSs	Version
RHEL	7.2
RHEL	7.3
SLES	11.3
SLES	11.4
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)



**Table 5 - Tested Platforms**

Vendor	Type of server	Bios Version
Lenovo	3550 M5	1.20 TCE108IUS (17/12/2015)

## 2 Changes and New Features in Rev 3.5.110

*Table 6 - Changes and New Features*

Category	Description
<b>Networking</b>	Ethernet only: The MTU value is set to 1500 upon driver's bring up.

### 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
-	<p><b>Description:</b> Several BIOS vendors have limited boot-vector space and may not display FlexBoot in their boot menu.</p> <p><b>WA:</b> Disable the embedded NIC boot agent in BIOS</p> <p><b>Keywords:</b> BIOS</p>
-	<p><b>Description:</b> In several BIOS, the server might hang during FlexBoot booting due to wrong configuration of the PMM.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> BIOS</p>
-	<p><b>Description:</b> Only EBX, ESI, DS, ES registers can be saved in Boot Entry.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> BIOS</p>
-	<p><b>Description:</b> 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.</p> <p><b>WA:</b> Follow the instructions described in the FlexBoot UM for the proper iSCSI boot/install</p> <p><b>Keywords:</b> BIOS</p>
673114/821899	<p><b>Description:</b> FlexBoot banner might not be shown in some BIOSes.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> BIOS</p>
-	<p><b>Description:</b> In some cases, PXE boot will not work if the client was given only the file-name without next-server (siaddr).</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>
-	<p><b>Description:</b> PXE boot after iSCSI boot with static configuration is currently not supported.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>

**Table 7 - Known Issues**

Internal Ref.	Description
-	<p><b>Description:</b> Boot over VLAN with IB port is currently not supported.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>
-	<p><b>Description:</b> 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.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>
-	<p><b>Description:</b> Chain-loading gPXE stack may result in undesirable behavior.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>
647143	<p><b>Description:</b> Executing a partial boot loop while only downloading the NBP and selecting localboot is unsupported and may cause undefined behavior.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>
670421	<p><b>Description:</b> Using filename for PXE boot with rootpath for hooking an iSCSI target (to install) is not supported when the PXE boot loader uses UNDI API, since all traffic must get to the boot loader.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> PXE Boot</p>
-	<p><b>Description:</b> iSCSI over IB is not tested.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> iSCSI</p>
-	<p><b>Description:</b> iSCSI over DCB is not supported.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> iSCSI</p>
-	<p><b>Description:</b> 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.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> iSCSI</p>

**Table 7 - Known Issues**

Internal Ref.	Description
-	<p><b>Description:</b> Boot retries is currently not functional when booting from iSCSI.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> iSCSI</p>
655800	<p><b>Description:</b> IPv6 is not supported.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> iSCSI</p>
-	<p><b>Description:</b> Boot menu is displayed as READ ONLY if the HCA card does not support flash configuration.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> User Interface</p>
-	<p><b>Description:</b> FlexBoot Boot Menu will not be visible in serial output.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> User Interface</p>
-	<p><b>Description:</b> Large Receive Offload (LRO) and iSCSI may not interoperate due to a bug in current Linux kernel distributions.</p> <p><b>WA:</b> 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).</p> <p><b>Keywords:</b> Networking</p>
-	<p><b>Description:</b> FlexBoot supports only 2K MTU.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> Networking</p>
-	<p><b>Description:</b> 56Gb/s is currently not supported.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> Link Speed</p>
-	<p><b>Description:</b> Setting the number of Virtual Functions higher than the machine's memory capability may cause memory issues and system instability.</p> <p><b>WA:</b> N/A</p> <p><b>Keywords:</b> Virtualization</p>

**Table 7 - Known Issues**

Internal Ref.	Description
-	<b>Description:</b> SLAM, FTP, HTTPS and SRP are currently not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> Protocols
-	<b>Description:</b> Occasionally, using the Spanning Tree Protocol (STP) in the switches may cause packet drops and boot failure in the system.
	<b>WA:</b> Enable the "edgemode" if disabled on the switch, or use either portfast or edgemode functionality on the switch ports connected to the NICs.
	<b>Keywords:</b> Protocols
-	<b>Description:</b> FCoE, BCV are not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> Protocols
655800	<b>Description:</b> IPv6 can only run if a RADVD service is running in the network.
	<b>WA:</b> N/A
	<b>Keywords:</b> Protocols
-	<b>Description:</b> IPv6 over IB is not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> Protocols
655800	<b>Description:</b> IPv6 over WDS is not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> Protocols
655800	<b>Description:</b> Enabling IPv6 first and then IPv4 is currently not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> Protocols
841198	<b>Description:</b> FlexBoot fails to boot when the following occurs: <ul style="list-style-type: none"> <li>• Boot priority is set to iSCSI</li> <li>• The iSCSI TCP/IP parameters via DHCP is disabled</li> <li>• iSCSI boot fails or iSCSI boot to target configuration is set to disable</li> </ul>
	<b>WA:</b> N/A
	<b>Keywords:</b> PXE boot, iSCSI

**Table 7 - Known Issues**

Internal Ref.	Description
843377/849223	<b>Description:</b> 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.
	<b>WA:</b> N/A
	<b>Keywords:</b> Physical MAC, Boot menu
656001	<b>Description:</b> Booting from WDS and Windows DHCP server when only Option 66 is enabled (without Option 67), is not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> DHCP
776057	<b>Description:</b> Citrix PVS boot is not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> Citrix PVS boot
689460	<b>Description:</b> FlexBoot uses system UUID to generate the client DUID-UUID as per RFC 6355, the data conveyed with DHCPv6 Code 1 (Option ID).
	<b>WA:</b> N/A
	<b>Keywords:</b> DUID-UUID
928217	<b>Description:</b> Installing ESXi 6.5/6.0 on iSCSI target is currently not supported.
	<b>WA:</b> N/A
	<b>Keywords:</b> ESXi 6.5/6.0, iSCSI target
689460	<b>Description:</b> To use the DHCP server to identify ipxe requests when using undionly.kpxe or ipxe.pxe when booting over IB requires special configuration. (see the Workaround below).
	<p><b>WA:</b> Add to the DHCP host declaration the MAC identification alongside the option 61 DUID.</p> <p>For example:</p> <pre> host ib-client1 { option dhcp-client-identifier = ff:00:00:00:00:00:02:00:00:02:c9:00:&lt;Port-GUID&gt; ; hardware ethernet &lt;Port-MAC&gt; ; fixed-address &lt;IPoIB Address&gt; ; filename "ipxe.pxe" ; if exists user-class and option user-class = "iPXE" { filename "pxelinux.0" ; } } </pre>
	<b>Keywords:</b> undionly.kpxe or ipxe.pxe

## 4 Bug Fixes History

**Table 8 - Fixed Bugs List**

Internal Ref.	Description
843209	<b>Description:</b> Fixed and issue which cause the link not to raise in the second port which is set as IB when the first port is ETH in PXE.
	<b>Keywords:</b> Link up, Ports
	<b>Discovered in Release:</b> 3.4.903
	<b>Fixed in Release:</b> 3.5.109
847950	<b>Description:</b> Fixed wrong default value of Boot-To-Target in FlexBoot configuration.
	<b>Keywords:</b> Boot-To-Target, FlexBoot configuration
	<b>Discovered in Release:</b> 3.4.719
	<b>Fixed in Release:</b> 3.4.903
691148	<b>Description:</b> When connecting a pre-configured port with VLAN to an IB fabric, the port runs as Ethernet port with the VLAN tag.
	<b>Keywords:</b> VLAN, Port Management
	<b>Discovered in Release:</b> 3.4.719
	<b>Fixed in Release:</b> 3.4.903
792432	<b>Description:</b> Booting PXE using Grub2.X over HP G9/G8 servers results in system hang.
	<b>Keywords:</b> PXE boot, Grub2.X, HP G9/G8
	<b>Discovered in Release:</b> 3.4.719
	<b>Fixed in Release:</b> 3.4.903
690792	<b>Description:</b> If the PMM fails to allocate memory, the system hangs since FlexBoot cannot load from the expansion ROM.
	<b>Keywords:</b> PMM, expansion ROM
	<b>Discovered in Release:</b> 3.4.719
	<b>Fixed in Release:</b> 3.4.812



**Table 8 - Fixed Bugs List**

Internal Ref.	Description
697291	<b>Description:</b> In ConnectX-4, the PXE boot time measurement over TFTP Ethernet is 1:30 min for image size of 1GB, TFTP InfiniBand is 1:20 min, and iSCSI boot time measurement is 8 seconds for image size of 25 MB.
	<b>Keywords:</b> PXE Boot
	<b>Discovered in Release:</b> 3.4.719
	<b>Fixed in Release:</b> 3.4.812
689068	<b>Description:</b> In hybrid BIOSes, if the BIOS loads legacy driver without closing the UEFI driver, the legacy driver fails to load.
	<b>Keywords:</b> BIOS, legacy mode
	<b>Discovered in Release:</b> 3.4.719
	<b>Fixed in Release:</b> 3.4.812
634794	<b>Description:</b> Enabled 'boot_pci_busdevfn' initialization when booting from UNDI loader.
	<b>Keywords:</b> UNDI loader
	<b>Discovered in Release:</b> 3.4.650
	<b>Fixed in Release:</b> 3.4.719
-	<b>Description:</b> Removed the instruction that enabled write-protected section modifications after POST.
	<b>Keywords:</b> PXE Boot
	<b>Discovered in Release:</b> 3.4.650
	<b>Fixed in Release:</b> 3.4.719

## 5 Changes and New Feature History

**Table 9 - Changes and New Feature History**

Release	Changes
<b>Rev. 3.5.109</b>	
<b>FlexBoot UI</b>	Added support for "Undi network wait timeout"
	Enhanced FlexBoot/firmware debug capability using Flexboot UI
<b>Performance</b>	Performance enhancements in Ethernet mode
<b>Upstream sync</b>	Synced the source with iPXE (upstream sync)
<b>Rev. 3.4.903</b>	
<b>iSCSI re-imaging</b>	Enables the user to install a new image on active iSCSI target
<b>FlexBoot UI</b>	Added new configuration for network link type for supported cards (ConnectX-4 VPI cards)
	Enabled boot configuration menu in ConnectX-4 when the physical port is IB
<b>Booting</b>	Enabled booting with non-default Pkey in ConnectX-4 when the physical port is IB
<b>Link Status</b>	Removed link status line printout at boot time
<b>Boot Menu</b>	Changed the Bus:Device:Function format in boot menu, from PCI-Bus:Dev.Func to 0000:Bus:Dev.Func
<b>Upstream sync</b>	Synced the source with iPXE (upstream sync)
<b>Rev. 3.4.812</b>	
<b>FlexBoot UI</b>	Added debug prints option in the FlexBoot boot menu. For further information, please refer to FlexBoot and UEFI User Manual.
<b>System Diagnosis</b>	Added the ability to diagnose problems in released ROMs by enabling the debug log levels for specific modules. <b>Note:</b> This ability should be used only when debug session is needed.
<b>Interrupts</b>	Added support for ConnectX-4/ConnectX-4 Lx interrupts
<b>Upstream sync</b>	Synced the source with iPXE (upstream sync)
<b>Rev. 3.4.719</b>	
<b>IPv6</b>	Added IPv6 support
<b>x64 Architecture</b>	Added x64 architecture support in ConnectX-4 and Connect-IB adapter cards

**Table 9 - Changes and New Feature History**

Release	Changes
<b>SHELL CLI</b>	<p>Removed support for the following SHELL CLI commands:</p> <ul style="list-style-type: none"> <li>• Non-volatile option storage commands</li> <li>• SAN boot commands</li> <li>• Menu commands</li> <li>• Login command</li> <li>• Sync command</li> <li>• DNS resolving command</li> <li>• Time commands</li> <li>• Image crypto digest commands</li> <li>• Loopback testing commands</li> <li>• VLAN commands</li> <li>• PXE commands</li> <li>• Reboot command</li> </ul> <p>For further information, please refer to: <a href="http://ipxe.org/cmd">http://ipxe.org/cmd</a></p>
<b>Upstream sync</b>	Synced the source with iPXE (upstream sync)
<b>Rev. 3.4.650</b>	
<b>Image size</b>	Added support for .mrom images larger than 128kB
<b>Adapter Cards</b>	Added support for ConnectX-4 EN and ConnectX-4 Lx EN
<b>Flat real mode</b>	Moved to flat real mode when calling INT 1a,b101 to avoid BIOSes issues
<b>Spanning Tree Protocol</b>	Added support for detecting Spanning Tree Protocol non-forwarding ports (RSTP/MSTP)
<b>Upstream sync</b>	Synced the source with iPXE (upstream sync)