



NVIDIA Networking Server-Side Documentation of Flexboot v3.9.101 & UEFI v14.41.14 (February 2026 GA Release)

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Overview

NVIDIA® PreBoot drivers are a multiprotocol remote boot technology that support remote Boot over InfiniBand (BoIB) and over Ethernet.

Using Virtual Protocol Interconnect (VPI) technologies available in NVIDIA® ConnectX® adapters, PreBoot drivers give IT Managers' the choice to boot from a remote storage target (iSCSI target) or a LAN target (Ethernet Remote Boot Server) using a single ROM image on ConnectX products.

FlexBoot is based on the open source project iPXE available at <http://www.ipxe.org>.

PreBoot drivers first initialize the adapter device, senses the port protocol – Ethernet or InfiniBand, and brings up the port. Then it connects to a DHCP server to obtain its assigned IP address and network parameters, and also to obtain the source location of the kernel/OS to boot from. The DHCP server instructs the PreBoot drivers to access the kernel/OS through a TFTP server, an iSCSI target, or some other service.

Software Downloads

- **FlexBoot:** Please visit [FlexBoot](#) page
- **UEFI:** Please visit the [UEFI](#) webpage

Document Revision History

A list of the changes made to this document are provided in [User Manual Revision History](#).

Release Notes Revision History

Revision	Date	Description
Flexboot 3.9.101 & UEFI 14.41.14	March 01, 2026	Initial release of this Release Notes version.

Compatible Products

Adapter Card	Bundled Firmware Version
ConnectX-9	82.48.1000
ConnectX-8	40.48.1000
BlueField®-3	32.48.1000
BlueField®-2	24.48.1000
ConnectX-7	28.48.1000
ConnectX-6 Lx	26.48.1000
ConnectX-6 Dx	22.48.1000

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

HCAs	Firmware Version	FlexBoot Version	UEFI Version
NVIDIA ConnectX-5 / NVIDIA ConnectX-5 Ex	16.35.4030	3.6.902	14.29.15
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

FlexBoot Operating Systems

Note

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.

OSes	Version	ETH	IB
RHEL	8.5/6	+	+
RHEL OEL	7.6	+	
RHEL	7.9	+	+
RHEL	7.7	+	+
RHEL_ALT	8.4	+	+
RHEL_ALT	8.6	+	+
SLES	12.4/5	+	
SLES	15.2/3	+	
Centos	7.6	+	
Windows Server	2019	+	+
Windows Server	2016	+	+
Windows Server	2022	+	+

UEFI Package Contents

UEFI packages contain UEFI rom files per device type.

Supported Tools (MFT)

Tools	Version
MFT	4.35.0-159

Release Notes

- [Changes and New Features - FlexBoot](#)
- [Changes and New Features - UEFI](#)
- [Bug Fixes in this Version - FlexBoot](#)
- [Bug Fixes in this Version - UEFI](#)
- [Known Issues - FlexBoot](#)
- [Known Issues - UEFI](#)
- [UEFI Verification](#)

Changes and New Features - FlexBoot

For a list of old Changes and Features, please see [Changes and New Features History](#) .

Category	Description
Rev 3.9.101	
General	Added support for ConnectX-9 SuperNic.
	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .

Changes and New Features - UEFI

For a list of old Changes and Features, please see [Changes and New Features History](#).

Category	Description
Rev 14.41.14	

Category	Description
General	Added support for ConnectX-9 SuperNic.
	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
	Added support for Microsoft OptionRom certificate 2023 CA.

Installed UEFI APIs (Protocols)

The following are the lists of UEFI APIs (protocols) installed over UEFI:

Driver handle	<ul style="list-style-type: none"> • EFI Component name Protocol • EFI Component name 2 Protocol • EFI Diagnostics Protocol • EFI Diagnostics 2 Protocol • EFI Driver Health Protocol
PCI controller handle	<ul style="list-style-type: none"> • EFI Driver binding protocol (driver start, stop, supported) installed by system UEFI on handle
Port handle (child handle to PCI controller handle, one handle per port)	<ul style="list-style-type: none"> • EFI Device Path Protocol • EFI Network Interface Identifier Protocol (UNDI)

Bug Fixes in this Version - FlexBoot

There are no new bug fixes in this version. For a list of old bug fixes, please see [Bug Fixes History](#).

Bug Fixes in this Version - UEFI

There are no new bug fixes in this version. For a list of old bug fixes, please see [Bug Fixes History](#) .

Known Issues - FlexBoot

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

Internal Ref.	Description
2244450	Description: Chain-loading boot-loaders that work with interrupts fail to boot on ConnectX-6 Lx OCP adapter cards.
	Workaround: Disable the legacy interrupts using mlxconfig. For further information refer to MFT User Manual (https://docs.mellanox.com/category/mft).
	Keywords: Chain-loading, boot
	Discovered in Version: 3.6.204
-	Description: PXE boot will not function if the adapter card is connected to a NVIDIA Quantum based switch over an HDR fiber optical cable or a copper splitter because EDR and SDR speeds will not function.
	Workaround: Set <code>KEEP_LINK_UP_ON_BOOT</code> configuration to enable via mlxconfig. For further information please contact Support.
	Keywords: IB, Link Speed , Link Down, SDR , optical cable
	Discovered in Version: 3.5.901
1422604	Description: The FlexBoot TFTP enters an infinite loop when it tries to resolve the server name by a DNS request, and the DNS server dose not response to the request.
	Workaround: Terminate the TFTP process by pressing Ctrl + C
	Keywords: Boot, TFTP, DNS
	Discovered in Version: 3.5.504
1295727	Description: In Secure Host mode, the Ctrl + B option will be “read only”, changes will not be applied and may cause unknown behavior.
	Workaround: N/A
	Keywords: Secure Host mode, Ctrl + B option
	Discovered in Version: 3.5.403

Internal Ref.	Description
1066544	Description: Chain-loading boot-loaders that works with interrupts fails to boot on multi- host adapter cards.
	Workaround: N/A
	Keywords: Chain-loading, boot
	Discovered in Version: 3.5.403
1755286	Description: Port speed may change to SDR spontaneously, without a clear reason for devices that operates in Multi-Host mode and for devices that operates in Single-Host mode with "keep_ib_link_up" configuration at "1".
	Workaround: <ol style="list-style-type: none"> 1. Power-cycle the server. 2. Disable the physical link. 3. Enable the physical link to load the default link speed. 4. Keep the "keep_ib_link_up" bit at 0 in NVconfig to make sure the port is raised with the correct speed.
	Keywords: SDR, Multi-Host, Single-Host, port speed
	Discovered in Version: 3.5.305
1149467	Description: Chain-loading "ipxe.pxe" and "undionly.kpxe" over InfiniBand is currently not supported when using DHCP client identification based on InfiniBand 32-bit Prefix+GUID (as with FlexBoot).
	Workaround: N/A
	Keywords: FlexBoot, chainload, InfiniBand, undionly.kpxe, ipxe.pxe
	Discovered in Version: 3.5.305
841198	Description: FlexBoot fails to boot when the following occurs: <ul style="list-style-type: none"> • 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
	Workaround: N/A
	Keywords: PXE boot, iSCSI

Internal Ref.	Description
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.
	Workaround: 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.
	Workaround: N/A
	Keywords: DHCP
776057	Description: Citrix PVS boot is not supported.
	Workaround: 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).
	Workaround: N/A
	Keywords: DUID-UUID
928217	Description: Installing ESXi 6.5/6.0 on iSCSI target is currently not supported.
	Workaround: N/A
	Keywords: ESXi 6.5/6.0, iSCSI target

Internal Ref.	Description
-	<p>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).</p> <p>Workaround: Add to the DHCP host declaration the MAC identification alongside the option 61 DUID. For example: <pre>host ib-client1 { option dhcp-client-identifier = ff: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" ; } }</pre></p> <p>Keywords: undionly.kpxe or ipxe.pxe</p>
-	<p>Description: Due to interoperability issue between the ESXi installer and the lpxelinux bootloader, when trying to install ESXi 6.5 on iSCSI target using lpxelinux.0 as a bootloader, a PSOD occurs.</p> <p>Workaround: Use FlexBoot (or iPXE) to load mboot.c32 directly instead of pxelinux.0 using the script below: <pre>#!ipxe set base /nfs/Esxi-6.5_INBOX chain \${base}/mboot.c32 -c \${base}/boot.cfg BOOTIF=01- \${mac:hexhyp}</pre> where the "set base ..." specifies a suitable absolute path. Note: iPXE does not need an absolute path, however, mboot.c32 requires it.</p> <p>Keywords: mboot.c32, PSOD,</p>
976878	<p>Description: When using bootloader grub2 to boot WDS, if the WDS boot fails, an RSOD might appear.</p> <p>Workaround: N/A</p> <p>Keywords: Bootloader grub2, WDS, RSOD</p>
-	<p>Description: Several BIOS vendors have limited boot-vector space and may not display FlexBoot in their boot menu.</p> <p>Workaround: Disable the embedded NIC boot agent in BIOS</p> <p>Keywords: BIOS</p>

Internal Ref.	Description
-	<p>Description: In several BIOS, the server might hang during FlexBoot booting due to wrong configuration of the PMM.</p> <p>Workaround: N/A</p> <p>Keywords: BIOS</p>
-	<p>Description: Only EBX, ESI, DS, ES registers can be saved in Boot Entry.</p> <p>Workaround: N/A</p> <p>Keywords: BIOS</p>
-	<p>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.</p> <p>Workaround: Follow the instructions described in the FlexBoot UM for the proper iSCSI boot/install</p> <p>Keywords: BIOS</p>
673114/821899	<p>Description: FlexBoot banner might not be shown in some BIOSes.</p> <p>Workaround: N/A</p> <p>Keywords: BIOS</p>
-	<p>Description: In some cases, PXE boot will not work if the client was given only the file- name without next-server (siaddr).</p> <p>Workaround: N/A</p> <p>Keywords: PXE Boot</p>
-	<p>Description: PXE boot after iSCSI boot with static configuration is currently not supported.</p> <p>Workaround: N/A</p> <p>Keywords: PXE Boot</p>
-	<p>Description: Boot over VLAN with IB port is currently not supported.</p> <p>Workaround: N/A</p> <p>Keywords: PXE Boot</p>

Internal Ref.	Description
-	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.
	Workaround: N/A
	Keywords: PXE Boot
-	Description: Chain-loading gPXE stack is not supported.
	Workaround: 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.
	Workaround: N/A
	Keywords: PXE Boot
670421	Description: 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.
	Workaround: N/A
	Keywords: PXE Boot
-	Description: iSCSI over IB is not tested.
	Workaround: N/A
	Keywords: iSCSI
-	Description: iSCSI over DCB is not supported.
	Workaround: 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.
	Workaround: N/A
	Keywords: iSCSI

Internal Ref.	Description
-	Description: Boot retries is currently not functional when booting from iSCSI.
	Workaround: N/A
	Keywords: iSCSI
655800	Description: iSCSI over IPv6 is not supported.
	Workaround: N/A
	Keywords: iSCSI
-	Description: Boot menu is displayed as READ ONLY if the HCA card does not support flash configuration.
	Workaround: N/A
	Keywords: User Interface
-	Description: FlexBoot Boot Menu will not be visible in serial output.
	Workaround: N/A
	Keywords: User Interface
-	Description: Large Receive Offload (LRO) and iSCSI may not interoperate due to a bug in current Linux kernel distributions.
	Workaround: 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: Setting the number of Virtual Functions higher than the machine's memory capability may cause memory issues and system instability.
	Workaround: N/A
	Keywords: Virtualization
-	Description: SLAM, FTP, HTTPS and SRP are currently not supported.
	Workaround: N/A
	Keywords: Protocols

Internal Ref.	Description
-	Description: Occasionally, using the Spanning Tree Protocol (STP) in the switches may cause packet drops and boot failure in the system.
	Workaround: 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
655800	Description: IPv6 can only run if a RADVD service is running in the network.
	Workaround: N/A
	Keywords: Protocols
-	Description: IPv6 over IB is not supported.
	Workaround: N/A
	Keywords: Protocols
655800	Description: Enabling IPv6 first and then IPv4 is currently not supported.
	Workaround: N/A
	Keywords: Protocols

Known Issues - UEFI

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

Internal Ref.	Description
4681273	Description: UCM is not supported for ConnectX-8 and above.
	Workaround: N/A
	Keywords: UCM, ConnectX-8
	Discovered in Version: 14.40.10

Internal Ref.	Description
4196499	Description: UEFI Firmware Management Protocol is not supported for ConnectX-8.
	Workaround: N/A
	Keywords: UEFI, FMP
	Discovered in Version: 14.36.21
3639809	Description: SAN boot fails with the latest iPXE version.
	Workaround: N/A
	Keywords: SAN boot, iPXE
	Discovered in Version: 14.32.12
2680852	Description: NVMe UEFI driver is not supported on Dell R720 BIOS version 2.9.0 as the BIOS does not support reporting valid Device Handle from EfiLoadedImagePortocol and always returns NULL.
	Workaround: N/A
	Keywords: DELL R720, NVME UEFI
	Discovered in Version: 14.24.13 (20.1.3 UEFI NVMe)
2581408	Description: On a BlueField device operating in Embedded CPU mode, PXE driver will fail to boot as long as the Arm side is not fully loaded and the OVS bridge is not configured.
	Workaround: Configure the UEFI BIOS to perform boot retries in order to wait for the Arm to come up. If the BIOS does not support retries, perform a warm reboot on the host side and reboot via the device when the Arm is up and the OVS bridge is configured.
	Keywords: Embedded CPU, PXE, UEFI, Arm
	Discovered in Version: 14.23.17

Internal Ref.	Description
2353780	<p>Description: In BlueField-2 x86 host side, the UEFI driver of the Virtio Net emulation device will not be loaded and the Virtio Net UEFI device will not be visible as a boot option before the Virtio-Net Controller on the Arm side is started.</p>
	<p>Workaround: Start the Virtio-Net controller on the Arm side and then run warm reboot on the host side to load the Virtio-Net UEFI driver.</p>
	<p>Keywords: Virito-Net, UEFI, boot</p>
	<p>Discovered in Version: 14.20.19</p>
2232461	<p>Description: A mismatch in NumberVFAdvertised between the HII and the mlxconfig because in HII, the minimum value is set to 1 and in some adapter cards its value is set to 0 by the mlxconfig. Note: When setting this attribute by mlxconfig to 0, the HII will not show it, but instead it will show the default value.</p>
	<p>Workaround: N/A</p>
	<p>Keywords: NumberVFAdvertised, HII, Mlxconfig</p>
	<p>Discovered in Version: 14.20.19</p>
-	<p>Description: PXE boot will not function if the adapter card is connected to a Mellanox Quantum™ based switch over an HDR fiber optical cable or a copper splitter because EDR and SDR speeds will not function.</p>
	<p>Workaround: Set <code>KEEP_LINK_UP_ON_BOOT</code> configuration to enable via mlxconfig. For further information please contact Mellanox Support.</p>
	<p>Keywords: IB, Link Speed , Link Down, SDR , optical cable</p>
	<p>Discovered in Version: 14.20.19</p>
1714094	<p>Description: The IB link will appear as disconnected in HII menu as long as the BIOS has not initialize the UNDI protocol which is necessary to query for the IB link status.</p>
	<p>Workaround: N/A</p>
	<p>Keywords: HII, Link Status, IB mode</p>
	<p>Discovered in Version: 14.18.19</p>

Internal Ref.	Description
1295727	Description: In Secure Host mode, the Hii protocol will be “read only”, changes will not be applied and it may cause unknown behavior.
	Workaround: N/A
	Keywords: Secure Host mode, Hii protocol
	Discovered in Version: 14.15.19
798073	Description: UEFI driver is not supported on Supermicro X9DEW (BIOS version 3.0c).
	Workaround: N/A
	Keywords: BIOS, Supermicro X9DEW
-	Description: Burning the UEFI driver will remove the Flexboot driver (Legacy BIOS driver) from the firmware.
	Workaround: As of firmware ConnecX-4/Lx/5 v12/14/16.22.1002, UEFI is pre-compiled for various adapter cards and can be enabled using mlxconfig. For the full list of OPNs supporting this new capability, see firmware Release Notes.
	Keywords: UEFI burning, Flexboot

Internal Ref.	Description
3568696	<p>Description: On BlueField-3 devices that operate on IB mode using firmware version 32.38.1002, when configuring the devices to NIC mode, the ARM side gets stuck with exception and causes the drivers (OS/PXE) on the host side to fail.</p>
	<p>Workaround: To avoid this issue, when configuring a BlueField-3 device to NIC mode, add the following configuration:</p> <ul style="list-style-type: none"> If you configure NIC mode from the ARM side, please disable UEFI_HII_EN from the ARM side through the following CMD: <pre>mlxconfig -d <device> set UEFI_HII_EN=0</pre> If you configure NIC mode from the Host side, please follow the further instructions below to avoid the issue : <ol style="list-style-type: none"> 1. Create a raw file that contains the following 2 lines: <pre>MLNX_RAW_TLV_FILE 0x82000204 0x03040196 0x00000000 0x00000000</pre> 2. Use the following CMD from the host side: <pre>mstconfig/mlxconfig -d <device> -f <raw file> set_raw</pre>
	<p>Keywords: NIC mode, BlueField-3</p>
	<p>Discovered in Version: 14.30.13</p>
2680852	<p>Description: NVMe UEFI driver is not supported on Dell R720 BIOS version 2.9.0 as the BIOS does not support reporting valid Device Handle from EfiLoadedImagePortocol and always returns NULL.</p>
	<p>Workaround: N/A</p>
	<p>Keywords: DELL R720, NVME UEFI</p>
	<p>Discovered in Version: 14.24.13 (20.1.3 UEFI NVMe)</p>

Internal Ref.	Description
2581408	<p>Description: On a BlueField device operating in Embedded CPU mode, PXE driver will fail to boot as long as the Arm side is not fully loaded and the OVS bridge is not configured.</p>
	<p>Workaround: Configure the UEFI BIOS to perform boot retries in order to wait for the Arm to come up. If the BIOS does not support retries, perform a warm reboot on the host side and reboot via the device when the Arm is up and the OVS bridge is configured.</p>
	<p>Keywords: Embedded CPU, PXE, UEFI, Arm</p>
	<p>Discovered in Version: 14.23.17</p>
2353780	<p>Description: In BlueField-2 x86 host side, the UEFI driver of the Virtio Net emulation device will not be loaded and the Virtio Net UEFI device will not be visible as a boot option before the Virtio-Net Controller on the Arm side is started.</p>
	<p>Workaround: Start the Virtio-Net controller on the Arm side and then run warm reboot on the host side to load the Virtio-Net UEFI driver.</p>
	<p>Keywords: Virito-Net, UEFI, boot</p>
	<p>Discovered in Version: 14.20.19</p>
2232461	<p>Description: A mismatch in NumberVFAdvertised between the HII and the mlxconfig because in HII, the minimum value is set to 1 and in some adapter cards its value is set to 0 by the mlxconfig. Note: When setting this attribute by mlxconfig to 0, the HII will not show it, but instead it will show the default value.</p>
	<p>Workaround: N/A</p>
	<p>Keywords: NumberVFAdvertised, HII, Mlxconfig</p>
	<p>Discovered in Version: 14.20.19</p>
-	<p>Description: PXE boot will not function if the adapter card is connected to a Mellanox Quantum™ based switch over an HDR fiber optical cable or a copper splitter because EDR and SDR speeds will not function.</p>
	<p>Workaround: Set <code>KEEP_LINK_UP_ON_BOOT</code> configuration to enable via mlxconfig. For further information please contact Mellanox Support.</p>
	<p>Keywords: IB, Link Speed , Link Down, SDR , optical cable</p>
	<p>Discovered in Version: 14.20.19</p>

Internal Ref.	Description
1714094	Description: The IB link will appear as disconnected in HII menu as long as the BIOS has not initialize the UNDI protocol which is necessary to query for the IB link status.
	Workaround: N/A
	Keywords: HII, Link Status, IB mode
	Discovered in Version: 14.18.19
1295727	Description: In Secure Host mode, the Hii protocol will be “read only”, changes will not be applied and it may cause unknown behavior.
	Workaround: N/A
	Keywords: Secure Host mode, Hii protocol
	Discovered in Version: 14.15.19
798073	Description: UEFI driver is not supported on Supermicro X9DEW (BIOS version 3.0c).
	Workaround: N/A
	Keywords: BIOS, Supermicro X9DEW
-	Description: UEFI InfiniBand is not supported on the Arm side.
	Workaround: N/A
	Keywords: BlueField-2 / BlueField- Embedded CPU Mode in InfiniBand
-	Description: Burning the UEFI driver will remove the Flexboot driver (Legacy BIOS driver) from the firmware.
	Workaround: As of firmware ConnecX-4/Lx/5 v12/14/16.22.1002, UEFI is pre-compiled for various adapter cards and can be enabled using mlxconfig. For the full list of OPNs supporting this new capability, see firmware Release Notes.
	Keywords: UEFI burning, Flexboot

UEFI Verification

This version of the UEFI passed UEFI SCT version 2.4B.

SCT Known Issues

- DriverModelTest\AdapterInformationProtocolTest 5.5.11.1.2
- DriverModelTest\AdapterInformationProtocolTest 5.5.11.3.2
- NetworkSupportTest\SimpleNetworkProtocolTest 5.11.1.8.3

PreBoot Drivers Environment

The document contains the following sections:

- [Preparing the DHCP Server in Linux](#)
- [Subnet Manager – OpenSM](#)
- [Diskless Machines](#)

Preparing the DHCP Server in Linux

When the boot session starts, the PXE firmware attempts to bring up an adapter network link (port). If it succeeds to bring up a connected link, the PXE firmware communicates with the DHCP server. The DHCP server assigns an IP address to the PXE client and provides it with the location of the boot program.

Case I: InfiniBand Ports

Installing DHCP

PreBoot drivers require that the DHCP server runs on a machine which supports IP over IB. Prior to installing DHCP, make sure that MLNX_OFED is already installed on your DHCP server – see www.mellanox.com.

ISC DHCP of versions above 3.1.3 have native support for IPoIB clients. If using DHCP v3.1.3, the provided patch must be deployed. Newer versions do not require patching.

To download and install other supported DHCP server versions, please download MLNX_OFED driver from www.mellanox.com → Products → InfiniBand/VPI Drivers → Linux SW/Drivers and refer to docs/dhcp/README.

Standard DHCP fields holding MAC addresses are not large enough to contain an IPoIB hardware address. To overcome this problem, DHCP over InfiniBand messages convey a client identifier field (in DHCP option 61) used to identify the DHCP session. This client identifier field can be used to associate an IP address with a client identifier value, such

that the DHCP server will grant the same IP address to any client that conveys this client identifier.

Note

In the DHCP discover packets, Flexboot sends "hlen" 6 rather than 0. "chaddr" will be the ethernet mac address rather than zeros.

In the DHCP server, the GUID in the client identifier can still be used to identify clients.

Configuring the DHCP Server

For ConnectX Family Devices

When a FlexBoot client boots, it sends the DHCP server various information including its DHCP client identifier. This identifier is used to distinguish between the various DHCP sessions. The value of the client identifier is composed of a prefix — ff:00:00:00:00:00:02:00:00:02:c9:00 — and an 8-byte port GUID (all separated by colons and represented in hexadecimal digits).

Extracting the Port GUID – Method I

1. Start mst.

```
host1# mst start
```

```
host1# mst status
```

2. The following MFT commands assume that the MFT package has been installed on the client machine. Obtain the Port GUID using the device name. The device name will be of the form: /dev/mst/ mt<dev_id>_pci{_cr0|conf0}.

```
flint -d <MST_DEVICE_NAME> q
```

Assuming FlexBoot is connected via Port 1, then the Port GUID is 00:02:c9:03:00:00:10:39

Extracting the Port GUID – Method II

An alternative method for obtaining the port GUID involves booting the client machine via Flex-Boot. This requires having a Subnet Manager running on one of the machines in the InfiniBand subnet. The 8 bytes can be captured from the boot session as shown in the figure below.

```
MLNX FlexBoot 3.4.454 (PCI 07:00.0) starting execution...ok
MLNX FlexBoot 3.4.454 initialising devices...
Initialising completed.

Mellanox FlexBoot v3.4.454
iPXE 1.0.0+ (53438) -- Open Source Network Boot Firmware -- http://ipxe.org
Features: ULAN HTTP iSCSI DNS TFTP bzImage COMBOOT ELF MBOOT PXE PXEXT Menu

net0: GUID f4:52:14:03:00:6e:ea:f1 - MAC f4:52:14:6e:ea:f1
Using ConnectX3-Pro on PCI07:00.0 (open)
  [Link:down, TX:0 TXE:0 RX:0 RXE:0]
  [Link status: The socket is not connected (http://ipxe.org/38136001)]
Waiting for link-up on net0..._
```

Placing Client Identifiers in /etc/dhcpd.conf

The following is an excerpt of an /etc/dhcpd.conf example file showing the format of a client machine representation for the DHCP server:

```
host host1 {
  next-server 11.4.3.7; filename "pxelinux.0"; fixed-address 11.4.3.130;
  option dhcp-client-identifier =
  ff:00:00:00:00:00:02:00:00:02:c9:00:00:02:c9:03:00:0c:78:11;
}
```

If the "DHCP Client-Id HW Type IB" is enabled (see [Ethernet NIC Configuration](#)), place the following in the /etc/dhcpd.conf file:

```
host host1 {
next-server 11.4.3.7; filename "pxelinux.0"; fixed-address 11.4.3.130;
option dhcp-client-identifier = 20:00:02:c9:03:00:0c:78:11;
}
```

Running the DHCP Server

Note

This section is applicable only when the Initiator's IP address is empty.

For the DHCP server to provide configuration records for clients, an appropriate configuration file needs to be created. By default, the DHCP server looks for a configuration file called `dhcpd.conf` under `/etc`. You can either edit this file or create a new one and provide its full path to the DHCP server using the `-cf` flag. See a file example at `docs/dhcpd.conf` of this package.

The DHCP server must run on a machine which has loaded the IPoIB module.

```
dhcpd <IB network interface name> -d
```

Example:

```
host1# dhcpd ib0 -d
```

Adding Device Driver Support in Linux Kernels/Initrd

i Note

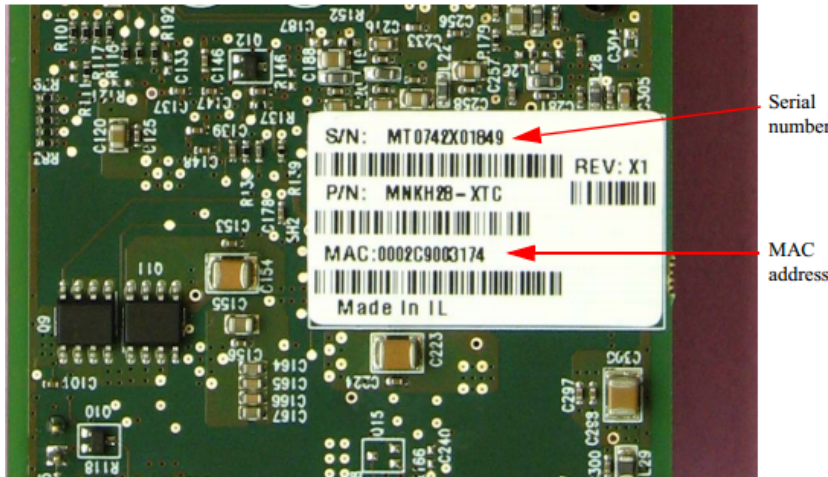
A DHCP client can be used if you need to prepare a diskless machine with an IB driver. See Step 11 under Example: Adding an IB Driver to initrd (Linux).

Case II: Ethernet Ports

When a FlexBoot client boots, it sends the DHCP server various information, including its DHCP hardware Ethernet address (MAC). The MAC address is 6 bytes long, and it is used to distinguish between the various DHCP sessions.

Extracting the MAC Address – Method I

All Ethernet NICs have a label on the printed side of the adapter card that has the card serial number and the card MAC address.



Extracting the MAC Address – Method II – FlexBoot Only

The six bytes of MAC address can be captured from the display upon the boot of the ConnectX device session as shown in the figure below.

```
FlexBoot v3.4.903
Features: DNS HTTP iSCSI TFTP ULAN ELF MBOOT PXE bzImage COMBOOT Menu PXEXT
net0: e4:1d:2d:a1:c2:9c
Using ConnectX-4 on 0000:00:03:0 (open)
[Link:up, TX:0 TXE:0 RX:0 RXE:0]
```

Extracting the MAC Address – Method III

1. Start mst.

```
host1# mst start
host1# mst status
```

The following MFT commands assume that the MFT package has been installed on the client machine.

2. Obtain the MAC using the device name.

The device name will be of the form: `/dev/mst/mt<dev_id>_pci{[_cr0|conf0]}`.

```
flint -d <MST_DEVICE_NAME> q
```

Assuming that FlexBoot is connected via Port 1, then the MAC address is `00:02:c9:0c:7c:11`.

Placing MAC Addresses in `/etc/dhcpd.conf`

The following is an excerpt of a `/etc/dhcpd.conf` example file showing the format of representing a client machine for the DHCP server running on a Linux machine.

```
host host1 {
  next-server 11.4.3.7; filename "pxelinux.0"; fixed-address 11.4.3.130;
  hardware ethernet 00:02:c9:0c:78:12;
}
```

Subnet Manager – OpenSM

Note

This section applies to ports configured as InfiniBand only.

FlexBoot requires a Subnet Manager to be running on one of the machines in the IB network. OpenSM is part of the MLNX_OFED software package and can be used to accomplish this. Note that OpenSM may be run on the same host running the DHCP server but it is not mandatory. For large InfiniBand clusters (> 100 nodes), it is recommended to use OpenSM caching. For further information, please refer to the MLNX_OFED User Manual.

Diskless Machines

FlexBoot supports booting diskless machines.

Note

The following configuration instructions apply only to operation systems which do not include an inbox driver, and should be skipped in case an OS with an inbox driver is used.

To enable using an IB/ETH driver, the initrd image must include a device driver module and be configured to load that driver. This can be achieved by adding the device driver module into the initrd image and loading it.

The 'initrd' image of some Linux distributions such as SuSE Linux Enterprise Server and Red Hat Enterprise Linux, cannot be edited prior or during the installation process.

If you need to install Linux distributions over Flexboot, please replace your 'initrd'

images with the images found at: www.mellanox.com → Products → InfiniBand/VPI Drivers → FlexBoot (Download Tab).

All OSes which does not include inbox driver should do the following.

OSes which include the inbox driver should skip these configurations

InfiniBand Ports

The IB driver requires loading the following modules in the specified order:

- `ib_addr.ko`
- `ib_core.ko`
- `ib_mad.ko`
- `ib_sa.ko`
- `ib_cm.ko`
- `ib_uverbs.ko`
- `ib_ucm.ko`
- `ib_umad.ko`
- `iw_cm.ko`
- `rdma_cm.ko`
- `rdma_ucm.ko`
- `mlx4_core.ko`
- `mlx4_ib.ko`
- `ib_mthca.ko`
- `ipoib_helper.ko` – this module is *not* required for all OS kernels. Please check the release notes.
- `ib_ipoib.ko`

Example: Adding an IB Driver to initrd (Linux)

Prerequisites

- The FlexBoot image is already programmed on the HCA card

- The DHCP server is installed, configured and connected to the client machine
- An initrd file.
- To add an IB driver into initrd, you need to copy the IB modules to the diskless image. Your machine needs to be pre-installed with a MLNX_OFED for Linux ISO image (available for download from www.mellanox.com → Products → InfiniBand/VPI Drivers → Linux SW/ Drivers) that is appropriate for the kernel version the diskless image will run.

The remainder of this section assumes that MLNX_OFED has been installed on your machine.

Adding the IB Driver to the initrd File

Note

The following procedure modifies critical files used in the boot procedure. It must be executed by users with expertise in the boot process. Improper application of this procedure may prevent the diskless machine from booting.

1. Back up your current initrd file.
2. Make a new working directory and change to it.

```
host1$ mkdir /tmp/initrd_ib  
host1$ cd /tmp/initrd_ib
```

3. Extract the initrd.

```
host1$ gzip -dc <initrd image> | cpio -id  
The initrd files are now located at: /tmp/initrd_ib
```

4. Create a directory for the InfiniBand modules and copy them.

```
host1$ mkdir -p /tmp/initrd_ib/lib/modules/ib
host1$ cd /lib/modules/`uname -r`/updates/kernel/drivers
host1$ cp infiniband/core/ib_addr.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_core.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_mad.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_sa.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_cm.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_uverbs.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_ucm.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/ib_umad.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/iw_cm.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/rdma_cm.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/core/rdma_ucm.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp net/mlx4/mlx4_core.ko /tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/hw/mlx4/mlx4_ib.ko
/tmp/initrd_ib/lib/modules/ib host1$ cp
infiniband/hw/mthca/ib_mthca.ko /tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/ulp/ipoib/ipoib_helper.ko
/tmp/initrd_ib/lib/modules/ib
host1$ cp infiniband/ulp/ipoib/ib_ipoib.ko
/tmp/initrd_ib/lib/modules/ib
```

5. Load the IPv6 module. If you do not have it in your initrd, add it using the following command.

```
host1$ cp /lib/modules/`uname -r`/kernel/net/ipv6/ipv6.ko  
/tmp/initrd_ib/lib/modules
```

6. Load the modules using the insmod executable. If you do not have it in your initrd, add it using the following command.

```
host1$ cp /sbin/insmod /tmp/initrd_ib/sbin/
```

7. **[Optional]** Give your IB device a static IP address.

```
host1$ cp /sbin/ifconfig /tmp/initrd_ib/sbin
```

8. [Optional] Obtain an IP address for the IB device through DHCP. Copy the DHCP client which was compiled specifically to support IB.

To continue with this step, DHCP client needs to be already installed on the machine you are working with.

Copy the DHCP client file and all the relevant files as described below.

```
host1# cp <path to DHCP client>/dhclient /tmp/initrd_ib/sbin
host1# cp <path to DHCP client>/dhclient-script
/tmp/initrd_ib/sbin
host1# mkdir -p /tmp/initrd_ib/var/state/dhcp
host1# touch /tmp/initrd_ib/var/state/dhcp/dhclient.leases
host1# cp /bin/uname /tmp/initrd_ib/bin
host1# cp /usr/bin/expr /tmp/initrd_ib/bin
host1# cp /sbin/ifconfig /tmp/initrd_ib/bin
host1# cp /bin/hostname /tmp/initrd_ib/bin
```

9. Create a configuration file for the DHCP client and place it under `/tmp/initrd_ib/sbin`.

Example of the `dclient.conf`

```
The value indicates a hexadecimal number
For a ConnectX® device interface "ib0" {send dhcp-client-
identifier
ff:00:00:00:00:02:00:00:02:c9:00:00:02:c9:03:00:00:10:39;
}
```

10. Add the commands for loading the copied modules into the file `init` at the point you wish the IB driver to be loaded.

Please pay attention to the following commands order (for loading modules) as it is critical.

Loading "ipoib_helper.ko" is not required for all OS kernels.

```
echo "loading ipv6"  
/sbin/insmod /lib/modules/ipv6.ko echo "loading IB driver"  
/sbin/insmod /lib/modules/ib/ib_addr.ko  
/sbin/insmod /lib/modules/ib/ib_core.ko  
/sbin/insmod /lib/modules/ib/ib_mad.ko  
/sbin/insmod /lib/modules/ib/ib_sa.ko  
/sbin/insmod /lib/modules/ib/ib_cm.ko  
/sbin/insmod /lib/modules/ib/ib_uverbs.ko  
/sbin/insmod /lib/modules/ib/ib_ucm.ko  
/sbin/insmod /lib/modules/ib/ib_umad.ko  
/sbin/insmod /lib/modules/ib/iw_cm.ko  
/sbin/insmod /lib/modules/ib/rdma_cm.ko  
/sbin/insmod /lib/modules/ib/rdma_ucm.ko  
/sbin/insmod /lib/modules/ib/mlx4_core.ko  
/sbin/insmod /lib/modules/ib/mlx4_ib.ko  
/sbin/insmod /lib/modules/ib/ib_mthca.ko
```

In case of interoperability issues between iSCSI and Large Receive Offload (LRO), set the "ib_ipoib.ko lro" to "0" to disable LRO.

```
/sbin/insmod /lib/modules/ib/ib_ipoib.ko lro=0
```

11. Assign an IP address to the IB device. Add either a call to `ifconfig` or to the DHCP client in the init file after loading the modules. If you want to use the DHCP client, then you need to add a call to the DHCP client in the init file after loading the IB modules.

For example:

```
/sbin/dhclient -cf /sbin/dhclient.conf ib1
```

12. Save the init file.

13. Close initrd.

```
host1$ cd /tmp/initrd_ib  
host1$ find ./ | cpio -H newc -o > /tmp/new_initrd_ib.img  
host1$ gzip /tmp/new_init_ib.img
```

14. Copy the modified initrd (including the IB driver) which is located at/tmp/new_init_ib.img.gz and rename it properly.

15. Back up your current initrd file.

16. Make a new working directory and change to it.

17. Extract the initrd image.

18. Create a directory for the ConnectX EN modules and copy them.

19. Load the modules using the insmod executable. If you do not have it in your initrd, add it using the following command.

20. Give your Ethernet device a static IP address.

21. Add the commands for loading the copied modules into the file init at the point you wish the Ethernet driver to be loaded.

22. Assign an IP address to the ConnectX IB network interface.

23. Save the init file.

24. Close initrd.

25. Copy the modified initrd (including the Ethernet driver) which is located at/tmp/new_init_en.img.gz and rename it properly.

Ethernet Ports

The Ethernet driver requires loading the following modules in the specified order – see the example below:

- mlx4_core.ko
- mlx4_en.ko

Example: Adding an Ethernet Driver to initrd (Linux)

Prerequisites

- The FlexBoot image is already programmed on the adapter card.
- The DHCP server is installed, configured and connected to the client machine.
- An initrd file.
- To add an Ethernet driver into initrd, you need to copy the Ethernet modules to the diskless image. Your machine needs to be pre-installed with a *MLNX_EN Linux Driver* (available for download from www.mellanox.com □ Products □ Ethernet Drivers) that is appropriate for the kernel version the diskless image will run.

Adding the Ethernet Driver to the initrd File

The following procedure modifies critical files used in the boot procedure. It must be executed by users with expertise in the boot process. Improper application of this procedure may prevent the diskless machine from booting.

1. Back up your current initrd file.
2. Make a new working directory and change to it.

```
host1$ mkdir /tmp/initrd_en  
host1$ cd /tmp/initrd_en
```

3. Extract the initrd image.

```
host1$ gzip -dc <initrd image> | cpio -id  
The initrd files can be located at: /tmp/initrd_en
```

4. Create a directory for the ConnectX EN modules and copy them.

```
host1$ mkdir -p /tmp/initrd_en/lib/modules/mlnx_en
host1$ cd /lib/modules/`uname -r`/updates/kernel/drivers
host1$ cp net/mlx4/mlx4_core.ko
/tmp/initrd_en/lib/modules/mlnx_en
host1$ cp net/mlx4/mlx4_en.ko
/tmp/initrd_en/lib/modules/mlnx_en
```

5. Load the modules using the insmod executable. If you do not have it in your initrd, add it using the following command.

```
host1$ cp /sbin/insmod /tmp/initrd_en/sbin/
```

6. **[Optional]** Give your Ethernet device a static IP address.

```
host1$ cp /sbin/ifconfig /tmp/initrd_en/sbin
```

7. Add the commands for loading the copied modules into the file init at the point you wish the Ethernet driver to be loaded.

Please pay attention to the following commands order (for loading modules) as it is critical.

```
echo "loading Mellanox ConnectX EN driver"
/sbin/insmod lib/modules/mlnx_en/mlx4_core.ko
/sbin/insmod lib/modules/mlnx_en/mlx4_en.ko
```

8. Assign an IP address to the ConnectX EB network interface.

9. Save the init file.

10. Close initrd.

```
host1$ cd /tmp/initrd_en
host1$ find ./ | cpio -H newc -o > /tmp/new_initrd_en.img
host1$ gzip /tmp/new_init_en.img
```

11. Copy the modified initrd (including the Ethernet driver) which is located at/tmp/new_init_en.img.gz and rename it properly.

12. Back up your current initrd file.

13. Make a new working directory and change to it.

14. Extract the initrd image.

15. Create a directory for the ConnectX EN modules and copy them.

16. Load the modules using the insmod executable. If you do not have it in your initrd, add it using the following command.

17. Give your Ethernet device a static IP address.

18. Add the commands for loading the copied modules into the file init at the point you wish the Ethernet driver to be loaded.

19. Assign an IP address to the ConnectX EN network interface.

20. Save the init file.

21. Close initrd.

22. Copy the modified initrd (including the Ethernet driver) which is located at/tmp/new_init_en.img.gz and rename it properly.

User Manual Revision History

Revision	Date	Description
Flexboot 3.9.101 & UEFI 14.41.14	March 01, 2026	No changes to the User Manual.
Flexboot 3.8.201 & UEFI 14.40.10	November 10, 2025	No changes to the User Manual.
Flexboot 3.8.100 & UEFI 14.39.13	August 08, 2025	No changes to the User Manual.
Flexboot 3.7.500 & UEFI 14.38.16	May 08, 2025	Updated: <ul style="list-style-type: none">• HII Main Configuration Page
Flexboot 3.7.500 & UEFI 14.37.14	January 31, 2025	No changes to the User Manual.
Flexboot v3.7.500 & UEFI v14.36.21	December 24, 2024	No changes to the User Manual.
Flexboot v3.7.500 & UEFI v14.36.21 LTS	December 05, 2024	No changes to the User Manual.
Flexboot v3.7.500 & UEFI v14.36.16	November 05, 2024	No changes to the User Manual.

Revision	Date	Description
Flexboot v3.7.500 & UEFI v14.35.15	August 14, 2024	No changes to the User Manual.
Flexboot v3.7.400 & UEFI v14.34.12	May 08, 2024	No changes to the User Manual.
22	February 8, 2024	No changes to the User Manual.
21	December 11, 2023	Updated HII Main Configuration Page .
20	November 5, 2023	Updated "Supported Adapter Cards and Firmware" under NVIDIA Networking Server-Side Documentation of Flexboot v3.9.101 & UEFI v14.41.14 .
19	August 10, 2023	Updated: <ul style="list-style-type: none"> • BlueField External Host Priv Configuration • BlueField Internal CPU Configuration
18	April 30, 2023	Updated: <ul style="list-style-type: none"> • Supported Adapter Devices and Firmware • Configuring the DHCP Server • Ethernet NIC Configuration • InfiniBand NIC Configuration • HII NIC Configuration • Flexboot ipxe.pxe Chainloading
17	January 31, 2023	No changes to the User Manual.
16	November 30, 2022	Added "Management PF" as a new setting under HII VMware Configuration . The version has been changed due to firmware versions updates. See, NVIDIA PreBoot Drivers (FlexBoot & UEFI) .

Revision	Date	Description
15	October 31, 2022	<p>Added the following new sections:</p> <ul style="list-style-type: none"> • HII VMware Configuration • VMware Distributed Services Engine (DPU)
14	July 31, 2022	<p>Added RT PPS ENABLED ONPOWERUP to the following sections:</p> <ul style="list-style-type: none"> • System Setup • HII Power Configuration
13.0	November 30, 2021	<p>Added the following few sections:</p> <ul style="list-style-type: none"> • Cross Signed CA URI & Trust CA fingerprint in the .NIC Configuration v13 • How to use HTTPs and Private Root Certificate Trust
12.0	June 30, 2021	<p>Added the following few sections:</p> <ul style="list-style-type: none"> • NIC + RDMA Mode (in the Partition N Configuration) • NIC + RDMA Mode (in the system Setup)

Revision	Date	Description
11.0	December 31, 2020	<p>Added the following new sections:</p> <ul style="list-style-type: none"> • BlueField / BlueField-2 Embedded CPU Mode in InfiniBand • .Flexboot ipxe.pxe Chainloading v11 <p>Added the following new sections in the FlexBoot System Settings:</p> <ul style="list-style-type: none"> • Flow Control Setting • Port GUID • Node GUID • Virtual Node GUID • Permit Total Port Shutdown • IPv6 Default Gateway • IPv6 Address • IPv6 Primary DNS • IPv6 Prefix Length <p>Added the following new sections in the HII System Settings:</p> <ul style="list-style-type: none"> • IPv6 Address • IPv4/IPv6 Support • IPv6 Default Gateway • IPv6 Address • IPv6 Primary DNS • IPv6 Prefix Length • IPv6 Address
10.0	July 02, 2020	<ul style="list-style-type: none"> • Removed: InfiniBand Mode Only (see Main Configuration section) • Updated: .HII NIC Configuration v11
9.0	February 29, 2020	<ul style="list-style-type: none"> • Added: Virtual Node GUID (InfiniBand Mode Only) (see Main Configuration section) • Updated: .HII NIC Configuration v11 • Removed: Virtual Port GUID (InfiniBand Mode Only)

Revision	Date	Description
8.0	September 26, 2019	<ul style="list-style-type: none"> • Added the following sections: <ul style="list-style-type: none"> ◦ SNAPI Operation ◦ Node GUID ◦ Port GUID ◦ Virtual Port GUID ◦ Socket Direct Operation
7.0	April 30, 2019	<ul style="list-style-type: none"> • Added the following section: <ul style="list-style-type: none"> ◦ NIC Partitioning Configuration
6.0	November 29, 2018	<ul style="list-style-type: none"> • Added the following new sections: <ul style="list-style-type: none"> ◦ General Settings ◦ Pci Settings ◦ Expansion Rom Uefi Arm ◦ Expansion Rom Uefi X86

Revision	Date	Description
5.0	July 05th, 20018	<ul style="list-style-type: none"> • Added the following sections: <ul style="list-style-type: none"> ◦ Link Speed (FlexBoot related configuration) ◦ Link Speed (UEFI related configuration) ◦ Updated the following FlexBoot sections: <ul style="list-style-type: none"> ◦ Legacy Boot Protocol ◦ IPv4 Address ◦ IPv4 Primary DNS ◦ IPv4 Default Gateway ◦ iSCSI Name ◦ Subnet Mask ◦ Boot LUN ◦ iSCSI Name ◦ IP Address ◦ TCP Port • Updated the following UEFI sections: <ul style="list-style-type: none"> ◦ Legacy Boot Protocol ◦ Virtual LAN Mode ◦ IPv4 Address ◦ IPv4 Primary DNS ◦ IPv4 Default Gateway ◦ iSCSI Name ◦ Subnet Mask ◦ Boot LUN ◦ iSCSI Name ◦ IP Address ◦ TCP Port

Release Notes History

Changes and New Feature History - FlexBoot

Category	Changes
Rev 3.8.201	
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
Rev 3.8.100	
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
Rev 3.7.400	
Link Status	FlexBoot PXE driver will report logical link status instead of physical link status. This impacts the Bluefield devices as follows: As long as the OVS on the ARM side is ready, the FlexBoot driver on the Host will report the link status is up even if the physical link status is down.
Rev 3.7.300	
General	Added support for booting with FlexBoot on legacy mode on BlueField-2 and BlueField-3 when the device is operating on NIC mode and the Link Type is InfiniBand.
Rev 3.7.201	
General	Added support for device booting with FlexBoot on legacy mode when using BlueField-3 external on Enhanced NIC mode.
Adapter Cards	Added support for NVIDIA BlueField-3 DPU devices at GA level.

Category	Changes
FlexBoot UI	Added a new setting "Boot Legacy Interrupt" in the NIC Configuration menu used to enable/disable interrupt support for boot legacy mode. For further information, refer to the PreBoot User Manual.
	Added a new setting "Dhcp Client-Id HW Type IB" in the NIC Configuration menu used to enable/disable sending DHCP client-id option (61) with IB Type + GUID instead full prefix + GUID. For further information, refer to the PreBoot User Manual.
	Added a new setting "DHCP HW Type IB" in the NIC Configuration menu user to enable/disable sending DHCP IB discover packets with HW Type IB and HW address GUID instead MAC. For further information, refer to the PreBoot User Manual.
Rev 3.6.901	
Link Speed/InfiniBand	Updated the Flexboot driver to boot with the highest link speed on InfiniBand mode (instead of configuring it to SDR) on devices that operate on Multi-Host mode and on devices that operate with keep_link_up enabled.
General	Updated firmware versions. For the firmware versions supported see, Overview .
Rev 3.6.805	
General	Updated firmware versions.
Rev 3.6.804	
FlexBoot UI	Added support for exposing the NDR link speed in the Ctrl +B menu.
Rev 3.6.700	
FlexBoot UI	Added a new setting to enable/disable RT_PPS_ENABLED_ONPOWERUP. For further information, refer to the PreBoot Drivers User Manual.
Rev 3.6.502	
General	Added support for NVIDIA® ConnectX®-7 adapter cards. ConnectX-7 has the same feature set as ConnectX-6 adapter card. For the list of the ConnectX-6 firmware features, please see ConnectX-6 Firmware Release Notes .

Category	Changes
FlexBoot UI	Added support for "Cross-Signed CA URI" and "Trust CA fingerprint" new settings for NIC Configuration. For further information, refer to the PreBoot Drivers User Manual.
iSCSI Authentication	Added support for setting the iSCSI authentication settings via IPXE script (not only via Flexboot UI).
Rev 3.6.403	
FlexBoot UI	Added support for "RDMA NIC mode" new setting to the Flexboot menu. For further information, refer to the PreBoot Drivers User Manual.
NVIDIA® BlueField®	Added support for boot over Virtio Net emulation hotplug/static device in legacy boot environment . For further information, refer to the NVIDIA BlueField User Manual .
Rev 3.6.301	
VirtioNet/VirtioBlk Exprom	Added support for Enabling/Disabling UEFI X86 VirtioNet/VirtioBlk Exprom in Flexboot using the Ctrl+B menu.
Rev 3.6.204	
Adapter Cards	Added support for BlueField 2 adapters cards at GA level.
iSCSI	Added support for iSCSI boot over IPv6.
FlexBoot UI	Added new settings for IPv6 in iSCSI Initiator/General section in Ctrl B menu. For further information refer to the PreBoot Drivers User Manual.
FlexBoot UI	Added "Permit Total Shutdown" new setting to the FlexBoot boot menu. For further information refer to the PreBoot Drivers User Manual.
FlexBoot UI	Added "Flow Control" new setting to the FlexBoot boot menu. For further information refer to the PreBoot Drivers User Manual.

Category	Changes
HTTPS	<p>Added support for HTTPS protocol by default. Flexboot now will contain only a single trusted root certificate (the “iPXE root CA” certificate). To use a standard SSL certificate issued by a public CA (such as Verisign), iPXE must be able to download a cross-signed certificate to complete the chain of trust up to the “iPXE root CA” certificate. These cross-signed certificates are downloaded automatically when needed from http://ca.ipxe.org/auto.</p> <p>For more info please see full description on https://ipxe.org/crypto and https://ipxe.org/cfg/crosscert</p>
Bug Fixes	Bug Fixes
Rev 3.6.102	
General	This version of FlexBoot does not have any changes. The version was increased due to the release of a new firmware version.
Rev 3.6.204	
Adapter Cards	Added support for ConnectX-6 Lx adapter cards.
Adapter Cards	[Beta] Added support for BlueField 2 adapters cards.
FlexBoot UI	<p>Exposed the following settings for both IB/ETH mode :</p> <ul style="list-style-type: none"> • Mac Address • Virtual Mac Address • Port Guid Address • Node Guid Address • Virtual Node Guid Address <p>For further information refer to PreBoot Drivers User Manual.</p>
Rev 3.5.901	
Adapter Cards	Added support for ConnectX-6 Dx adapter cards.
FlexBoot Legacy Interrupt	<p>Added the ability to enable/disable the received indication using the Legacy Interrupt option.</p> <p>For further information refer to MFT User Manual.</p>
FlexBoot UI	<p>Added Virtual Node GUID settings to FlexBoot menu and removed Virtual Port GUID setting.</p> <p>For further information refer to PreBoot Drivers User Manual.</p>
Rev 3.5.803	

Category	Changes
FlexBoot UI	Added Port GUID, Node GUID and Virtual Port GUID new settings to the FlexBoot boot menu for devices that operate in IB mode. For further information refer to PreBoot Drivers User Manual.
FlexBoot UI	Added "SNAPI Operation" new setting to the FlexBoot boot menu. For further information refer to PreBoot Drivers User Manual.
Rev. 3.5.701	
FlexBoot UI	Added NIC Partitions Configuration settings in Flexboot boot menu for devices that operate in Socket-Direct mode . For further information please refer to FlexBoot and UEFI User Manual.
Rev. 3.5.603	
Adapter Cards	Added support for ConnectX-6 ready adapter cards. For further information, contact Mellanox Support.
Enable/Disable UEFI X86, UEFI ARM Exprom using Ctrl+B	Added support to Enable/Disable UEFI X86, UEFI Arm Exprom in FlexBoot using the Ctrl+B menu.
Rev. 3.5.504	
FlexBoot UI	<p>Added “PXE boot without fail-over to iSCSI” and “iSCSI boot without fail-over to PXE boot” options for legacy_boot_protocol configuration. For further information, refer to Mellanox PreBoot Drivers User Manual.</p> <p>Enabled PXE to expose the current link speed of the system when in ETH mode.</p>
Rev. 3.5.403	

Category	Changes
Enable/Disable FlexBoot in EXPROM via mlxconfig	<p>Added PXE support to additional ConnectX-4/ConnectX-4 Lx/ConnectX-5 adapter cards.</p> <p>Note: Not all cards are compiled with FlexBoot. For the full list of the OPNs compiled with FlexBoot, please refer to the firmware Release Notes</p> <p>Enabling/Disabling FlexBoot in ConnectX-4/ConnectX-4 Lx/ConnectX-5 in EXPROM is done via mlxconfig.</p> <p>The default value is:</p> <ul style="list-style-type: none"> • FLEXBOOT enable <p>Note: The value above can be set only in adapter cards that support this capability.</p> <p>For further information on how to enable/disable UEFI, refer to section Enabling/Disabling FlexBoot/UEFI in EXPROM via mlxconfig in the Mellanox PreBoot Drivers (FlexBoot & UEFI) User Manual.</p>
VLAN Priority	Set the default VLAN priority to 0.
Link Aggregation Control Protocol (LACP)	LACP support is disabled by default. It can be enabled via mlxconfig.
Rev. 3.5.305	
PXE Boot	Added ESC option as an abort key during PXE boot process.
FlexBoot Link Aggregation Control Protocol (LACP)	Added the ability to enable/disable FlexBoot LACP via mlxconfig.
Serial Console	Removed Serial Console support in the ConnectX-4 Lx adapter card.
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.5.210	
Promiscuous VLAN mode	Added support for promiscuous VLAN mode.
MTU	[InfiniBand] Added support for configurable MTU.
Expansion ROM version	Enabled expansion ROM (<i>exp_rom</i>) version exposition according to the new specification (e.g. expose ARCH in flint tool).

Category	Changes
FlexBoot UI	Added a FlexBoot menu support for <i>NV_POWER_CONF</i> . Now power consumption configuration is supported from the FlexBoot menu.
	Enhanced FlexBoot/firmware debug capability using Flexboot UI. Added the <i>reg_dump</i> option to the <i>panic_behavior</i> configuration in the FlexBoot menu
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.5.11	
Networking	Ethernet only: The MTU value is set to 1500 upon driver's bring up.
Rev. 3.5.109	
FlexBoot UI	Added support for "Undi network wait timeout"
	Enhanced FlexBoot/firmware debug capability using Flexboot UI
Performance	Performance enhancements in Ethernet mode
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.4.903	
iSCSI re-imaging	Enables the user to install a new image on active iSCSI target
FlexBoot UI	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
Bootting	Enabled bootting with non-default Pkey in ConnectX-4 when the physical port is IB
Link Status	Removed link status line printout at boot time
Boot Menu	Changed the Bus:Device:Function format in boot menu, from <i>PCIBus:Dev.Func</i> to <i>0000:Bus:Dev.Func</i>
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.4.812	
FlexBoot UI	Added debug prints option in the FlexBoot boot menu. For further information, please refer to FlexBoot and UEFI User Manual.
Upstream sync	Synced the source with iPXE (upstream sync)

Category	Changes
System Diagnosis	Added the ability to diagnose problems in released ROMs by enabling the debug log levels for specific modules. Note: This ability should be used only when debug session is needed.
Interrupts	Added support for ConnectX-4/ConnectX-4 Lx interrupts
Rev. 3.4.719	
IPv6	Added IPv6 support
x64 Architecture	Added x64 architecture support in ConnectX-4 and Connect-IB adapter cards
SHELL CLI	<p>Removed support for the following SHELL CLI commands:</p> <ul style="list-style-type: none"> • 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 <p>For further information, please refer to: http://ipxe.org/cmd</p>
Upstream sync	Synced the source with iPXE (upstream sync)
Rev. 3.4.650	
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)

Bug Fixes History - FlexBoot

Internal Ref.	Description
1149467	Description: Chain-loading "ipxe.pxe" and "undionly.kpxe" over InfiniBand is currently not supported when using DHCP client identification based on InfiniBand 32-bit Prefix+GUID (as with FlexBoot).
	Keywords: FlexBoot, chainload, InfiniBand, undionly.kpxe, ipxe.pxe
	Discovered in Version: 3.5.305
	Fixed in Version: 3.7.102
1755286	Description: Fixed an issue where the Flexboot driver set SDR link speed for devices operating on Multi-Host mode or when the keep_link_up was enabled.
	Keywords: SDR, Multi-Host, Single-Host, port speed
	Discovered in Version: 3.5.305
	Fixed in Version: 3.6.901
3044598	Description: Added support for PXE legacy interrupt for ConnectX-7 adapter cards.
	Keywords: Chain-loading, boot, ConnectX-7
	Discovered in Version: 3.6.204
	Fixed in Release: 3.6.804
1725147	Description: In devices that operate in Socket-Direct mode, the physical MAC of the auxiliary partitions is displayed as zeros instead of the actual MAC when the card is configured as InfiniBand.
	Keywords: Physical MAC, Boot menu, Socket-Direct
	Discovered in Version: 3.5.701
	Fixed in Release: 3.6.204

Internal Ref.	Description
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.
	Keywords: Physical MAC, Boot menu
	Discovered in Version: 3.5.901
	Fixed in Release: 3.6.102
1725147	Description: In devices that operate in Socket-Direct mode, the physical MAC of the auxiliary partitions is displayed as zeros instead of the actual MAC when the card is configured as InfiniBand.
	Keywords: Physical MAC, Boot menu, Socket-Direct
	Discovered in Version: 3.5.701
	Fixed in Release: 3.6.102
1447149	Description: FlexBoot menu Link Speed configuration will be "NA" in case speed is configured to 50GBase-KR4
	Keywords: FlexBoot menu, Link Speed; 50GBase-KR4
	Discovered in Version: 3.5.504
	Fixed in Release: 3.5.803
1072419	Description: The FlexBoot DHCP loops indefinitely when it continuously gets NACK on the DHCP requests. On some setups, it might also cause an RSOD after a continues looping.
	Keywords: Bootloader grub2, WDS, RSOD
	Discovered in Release: 3.5.305
	Fixed in Release: 3.5.504
1157875	Description: Pressing any of the arrow keys during boot might cause the boot process to be aborted.
	Keywords: Abort boot, arrows, FlexBoot
	Discovered in Release: 3.5.305
	Fixed in Release: 3.5.403

Internal Ref.	Description
1113560	Description: Fixed an issue that prevented the first iSCSI target parameters to be reset to their default values.
	Keywords: iSCSI target
	Discovered in Release: 3.5.110
	Fixed in Release: 3.5.305
-	Description: FlexBoot supports only 2K MTU.
	Keywords: Networking
	Discovered in Release: 3.4.903
	Fixed in Release: 3.5.210
843209	Description: Fixed an 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.
	Keywords: Link up, Ports
	Discovered in Release: 3.4.903
	Fixed in Release: 3.5.109
847950	Description: Fixed wrong default value of Boot-To-Target in FlexBoot configuration.
	Keywords: Boot-To-Target, FlexBoot configuration
	Discovered in Release: 3.4.719
	Fixed in Release: 3.4.903
691148	Description: When connecting a pre-configured port with VLAN to an IB fabric, the port runs as Ethernet port with the VLAN tag.
	Keywords: VLAN, Port Management
	Discovered in Release: 3.4.719
	Fixed in Release: 3.4.903
792432	Description: Booting PXE using Grub2.X over HP G9/G8 servers results in system hang.
	Keywords: PXE boot, Grub2.X, HP G9/G8
	Discovered in Release: 3.4.719
	Fixed in Release: 3.4.903

Internal Ref.	Description
690792	Description: If the PMM fails to allocate memory, the system hangs since FlexBoot cannot load from the expansion ROM.
	Keywords: PMM, expansion ROM
	Discovered in Release: 3.4.719
	Fixed in Release: 3.4.812
697291	Description: 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.
	Keywords: PXE Boot
	Discovered in Release: 3.4.719
	Fixed in Release: 3.4.812
689068	Description: In hybrid BIOSes, if the BIOS loads legacy driver without closing the UEFI driver, the legacy driver fails to load.
	Keywords: BIOS, legacy mode
	Discovered in Release: 3.4.719
	Fixed in Release: 3.4.812
634794	Description: Enabled 'boot_pci_busdevfn' initialization when booting from UNDI loader.
	Keywords: UNDI loader
	Discovered in Release: 3.4.650
	Fixed in Release: 3.4.719
-	Description: Removed the instruction that enabled write-protected section modifications after POST.
	Keywords: PXE Boot
	Discovered in Release: 3.4.650
	Fixed in Release: 3.4.719

Changes and New Features History- UEFI

Category	Description
Rev 14.40.10	
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
Rev 14.39.13	
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
Rev 14.38.16	
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
App Shield	Added support for automatically detecting allowed memory regions via UEFI driver.
DPU	Added support for hosting boot only after DPU is ready.
PLDM	Added support for orchestrating full-chip-reset for DPU by EXP_ROM driver (host reboot based).
Category	Changes
Rev 14.37.14	
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
Rev 14.36.21	
General	Added support for ConnectX-8 SuperNic.
General	Updated MFT and firmware versions. For the firmware versions supported see, Compatible Products .
Rev. 14.36.16	
Networking	UEFI support filters by default to drop all packets except for UDP/TCP/ICMP packets that are needed for boot. This feature can be disabled by the setting "Pxe Boot Filter" which is added to HII "Device Level Configuration".
Rev. 14.35.15	
General	Added support for booting with UEFI BlueField-3 SuperNic.
HII	Removed VMware Configuration section for non-Bluefield devices.

Category	Description
Networking	Added support to apply filters to drop all packets except for UDP/TCP/ICMP packets that are needed for boot. This feature is disabled by default and can be enabled by the new setting "Pxe Boot Filter" that is added to HII "Device Level Configuration".
Rev. 14.34.12	
General	Introducing a UEFI version update due to a firmware version change
Link Status	FlexBoot PXE driver will report logical link status instead of physical link status. This impacts the Bluefield devices as follows: As long as the OVS on the ARM side is ready, the FlexBoot driver on the Host will report the link status is up even if the physical link status is down
Virtio Blk UEFI	Added support to boot Windows OS installer through the Virtio BLK emulation device from the Host for Bluefield devices
Rev. 14.33.10	
General	Introducing a UEFI version update due to a firmware version change.
Rev. 14.32.17	
Hii Menu	Added an option to enable/disable NIC mode on BlueField-2 and BlueField-3, as well as additional internal/external BlueField HCA settings. For Further information, please refer to the latest NVIDIA PreBoot Drivers User Manual and the latest NVIDIA BlueField User Manual.
	Added an option to enable/disable macOS Monterey on BlueField-3 from the host side. For Further information, please refer to the latest PreBoot Drivers User Manual and the latest NVIDIA BlueField User Manual.
NVIDIA BlueField-2	Added support for boot over BlueField-2 when the device is operating in NIC mode and InfiniBand link type.
NVIDIA BlueField-2 and BlueField-3	Added the ability to expose AIP UEFI protocol on BlueField DPU when the device is operating on NIC mode.
Rev. 14.31.20	

Category	Description
Hii Menu	Added a new Hii setting to the NIC Configuration menu - "Boot Legacy Interrupt". It is used to enable/disable interrupt support in boot legacy mode.
	Added a new Hii setting to the NIC Configuration menu - "DHCP Client-ID HW Type IB". It is used to enable/disable sending DHCP client-ID option (61) with Hardware IB Type + GUID, instead of full prefix + GUID.
	Added a new Hii setting to the Nic Configuration menu - "DHCP HW Type IB". It is used to enable/disable sending DHCP IB discover packets with Hardware Type IB and Hardware GUID address instead of MAC address.
Adapter Cards	Added support for BlueField-3 adapter cards at GA level.
Rev. 14.29.14	
Hii Menu	Added an option to enable/disable Bluefield Management PF setting from the host side through the Vmware Configuration sub-menu. For Further information, please refer to the <i>NVIDIA PreBoot Drivers User Manual</i> and the <i>NVIDIA BlueField User Manual</i> .
General	Added an option for the UEFI driver to run over UEFI BIOS when HeapGuard protection mode is enabled.
Link Speed/InfiniBand	Updated the Flexboot driver to boot with the highest link speed on InfiniBand mode (instead of configuring it to SDR) on devices that operate on Multi-Host mode and on devices that operate with keep_link_up enabled.
Rev. 14.28.16	
General	Updated firmware versions.
Rev. 14.28.15	
Hii Menu	Added new settings to enable/disable Monterey on BlueField-2 from the host side. For Further information, refer to the PreBoot Drivers User Manual and the NVIDIA BlueField User Manual
Rev. 14.27.15	
NVIDIA BlueField-2	Added support for boot over Virtio Net/Blk emulation hotplug/static device on Arm servers. For further information, refer to the NVIDIA BlueField User Manual.

Category	Description
Hii Menu/General	Changed the device name exposed by the UEFI driver from “Nidia Network Adapter” to “Mellanox Network Adapter” on all the device except for ConnectX-7.
Hii Menu	Added a new setting to enable/disable RT_PPS_ENABLED_ONPOWERUP. For further information, refer to the PreBoot Drivers User Manual.
Rev. 14.26.17	
General	Added support for NVIDIA® ConnectX®-7 adapter cards. ConnectX-7 has the same feature set as ConnectX-6 adapter card. For the list of the ConnectX-6 firmware features, please see ConnectX-6 Firmware Release Notes .
Hii Menu/General	Changed the device name that is exposed by UEFI driver from “Mellanox Network Adapter” to “Nvidia Network Adapter”.
Hii Menu /FMP	UEFI driver on ConnectX-7 will expose the firmware version with format xx.yy.zzzz through HII and FMP UEFI protocols.
Rev. 14.25.17	
Hii Menu	Added new Hii setting "Network Link Type" in the main configuration menu used for changing the link type (Ethernet/InfiniBand). For Further information please refer to the PreBoot User Manual
NVIDIA® BlueField®-2	Enabled the option management and boot over DBU management PF (IDRAC/BMC) on SmartNic To verify if the firmware supports Management PF, please refer to the relevant adapter card firmware Release Notes and User Manual.
Rev. 14.24.13	
Hii Menu	Removed NIC Configuration section from the Hii menu when the device is operating in ETH mode and on an Arm arch server.
Hii Menu	Changed the Default value of advertised mode setting and SR-IOV setting in the Hii menu to be aligned with firmware's default value.
UNDI	Added support for reporting the link status to the BIOS in real time through UNDI Get Status protocol function.
Rev. 14.23.17	

Category	Description
Hii Menu	Changed the Hii Configuration (UEFI HII protocol) to be Enabled by default.
Rev. 14.22.16	
General	This version of UEFI does not have any changes. The version number was increased due to the release of a new firmware version.
Rev. 14.22.14	
Adapter Cards	Added support for BlueField 2 adapters cards at GA level.
BlueField 2	Added support for boot over Virtio Net/Blk emulation hotplug/static device. For further information, refer to the BlueField User Manual.
Hii Menu	Added a new setting for IPv6 in the iSCSI Initiator/General Section for adding iSCSI boot over IPV6 support on legacy mode. For further information, refer to the PreBoot Driver User Manual.
Hii menu	Now the value of BlinkLeds can be applied by the EFI_BROWSER_ACTION_CHANGED (change and press enter operation) callback operation instead of the save operation.
General	Added the option to expose the expansion ROM only on the first PF on Multi PF devices.
Bug Fixes	Bug Fixes
Rev. 14.21.17	
General	This version of UEFI does not have any changes. The version number was increased due to the release of a new firmware version.
Rev. 14.21.16	
Adapter Cards	Added support for ConnectX-6 Lx adapter cards.
Adapter Cards	[Beta] Added support for BlueField 2 adapters cards.
Hii Menu	Changed the default value of "Blink Leds" setting to "0" For further information, refer to Mellanox PreBoot Drivers User Manual.

Category	Description
General [BlueField/SmartNic]	Added support for loading the UEFI driver so the UEFI NIC will be visible as boot option in Mellanox Bluefield 1/Mellanox Bluefield 2 when operating on Embedded CPU mode and the Arm side is down. Note: As long as the Arm side is down the link of the UEFI NIC in the X86 side will be down.
Rev. 14.20.22	
General	Updated the UEFI version to support new ConnectX-5 / ConnectX-6 / ConnectX-6 Dx firmware versions.
Rev. 14.20.19	
Adapter Cards	Added support for ConnectX-6 Dx adapter cards.
UEFI Driver in EXPROM	Enabled the UEFI driver in ConnectX-6 and ConnectX-6 DX for both x86 and Arm architectures.
General	Added support to expose the maximum link speed via CLP/AIM on devices that support HDR100 and EDR50 speeds.
Rev. 14.19.14	
Hii Menu	Added "Socket Direct Operation" new setting in Hii main menu. For further information refer to the PreBoot Drivers User Manual
Firmware Management Protocol	Optimized the performance (run time) of both the SetImage and the GetImage FMP functions.
Rev. 14.18.19	
General	Update the supported EFI specification version to 2.7
Firmware Management Protocol	Added the option to return unsupported status on secure adapter cards when using the "GetImage" operation.
Rev. 14.17.11	
Secure Boot	Added support for secure boot on Arm servers for Mellanox adapter cards.
Rev. 14.16.17	

Category	Description
HII Menu	<p>Added “PXE boot without fail-over to iSCSI” and “iSCSI boot without fail-over to PXE boot” options for legacy_boot_protocol configuration.</p> <p>For further information, refer to Mellanox PreBoot Drivers User Manual.</p>
	<p>Enabled UEFI to expose the current link speed of the system in the HII menu.</p>
Bug Fixes	<p>See See Bug Fixes History.</p>
Rev. 14.15.19	
Enable/Disable UEFI in EXPROM via mlxconfig	<p>Added UEFI support to additional ConnectX-4/ConnectX-4 Lx/ConnectX-5 adapter cards.</p> <p>Note: Not all cards are compiled with UEFI. For the full list of the OPNs compiled with the new UEFI capability, please refer to the firmware Release Notes</p> <ul style="list-style-type: none"> • ConnectX-4 adapter cards are compiled with x86-UEFI and Arm-UEFI1 • ConnectX-4 Lx adapter cards are compiled with x86-UEFI and Arm-UEFIa • ConnectX-5 adapter cards are compiled with x86-UEFIa <p>Enabling/Disabling UEFI in ConnectX-4/ConnectX-4 Lx/ConnectX-5 in EXPROM is done via mlxconfig.</p> <p>The default values are:</p> <ul style="list-style-type: none"> • UEFI_X86 disabled • UEFI_AARCH64 disabled <p>Note: The values above can be set only in adapter cards that support this capability.</p> <p>For further information on how to enable/disable UEFI, refer to section Enabling/Disabling FlexBoot/UEFI in EXPROM via mlxconfig in the Mellanox PreBoot Drivers (FlexBoot & UEFI) User Manual.</p>
Rev. 14.14.22	
Client Identifier	<p>Added support for client_identifier option (option 61) in InfiniBand mode.</p>
HII menu	<p>Added the option to Enable/Disable HII Configuration via mlxconfig.</p>

Category	Description
Rev. 14.13.24	
Secure Firmware Update	Integrated the MFT package to support Secure Firmware Update image.
HII menu	Added HII Power Configuration menu.
Rev. 14.12.24	
Networking	Ethernet only: The MTU value is set to 1500 upon driver bring up.
General	Updated the supported EFI version to 2.6.
Rev. 14.12.20	
Adapter Cards	[Beta] Added support for ConnectX-5/ConnectX-5 Ex adapter cards.
Boot performance	Boot performance improvements. Enabled post Tx doorbell using UAR.
Rev. 14.11.28	
Boot	Enabled booting with non default pkey in InfiniBand mode
	Added boot to target configuration
Platform to driver protocol	Added the option to return <i>EfiPlatformConfigurationActionUnsupportedGuid</i> in case the GUID is not supported
Driver Health	Updated the DriverHealth behavior to comply with the UEFI spec
Diagnostics protocol	Deprecated Extended Diagnostics (return unsupported)
Rev. 14.10.16	
Boot over IPv4 and IPv6	Enabled network boot via PXE over IPv4 and IPv6
Device Diagnosis	Enables the driver to run self diagnostics tests via Diagnostics protocol
Firmware Management	Enables the driver to manage firmware using Firmware Management Protocol (FMP)
Secure Boot	The UEFI driver is signed and complied with SecureBoot standard

Bug Fixes History - UEFI

Internal Ref.	Description
4549164	Description: Fixed an issue where UEFI driver links-up with HDR/EDR instead of SDR while the cable supports SDR.
	Keywords: HDR/EDR, SDR
	Discovered in Version: 14.39.11
	Fixed in release: 14.39.13
4357164	Description: Fixed an issue related to PXE IPV6 boot failure when working with WinOF-2 version 25.1.50020
	Keywords: PXE IPV6 boot
	Discovered in Version: 14.38.50
	Fixed in release: 14.38.16
4314502	Description: Fixed an issue related to Ethernet UEFI disconnecting after 'reconnect' -r.
	Keywords: reconnect' -r
	Discovered in Version: 14.38.50
	Fixed in release: 14.38.16
4206022	Description: DPU is changed from Nic mode to DPU mode after load default setting on host bios.
	Keywords: HII Restore to Default
	Discovered in Version: 14.36.21
	Fixed in release: 14.37.14
4252759	Description: Fixed an issue related to CX6_LX Macro adapter (PSID MT_0000000551) VLAN Config for IPv4/IPv6 failure when connected with PXE Server using firmware 26.43.1014.
	Keywords: VLAN Config
	Discovered in Version: 14.36.21
	Fixed in release: 14.37.14

Internal Ref.	Description
4247798	Description: Fixed an issue related to UEFI Self Certification Tests (SCT) failure at EFI_ADAPTER_INFORMATION_PROTOCOL.GetInformation on CX-7 OCP card.
	Keywords: UEFI Self Certification Tests
	Discovered in Version: 14.36.21
	Fixed in release: 14.37.14
4172439	Description: Filtering all DNS packets when PXE filter is enabled will cause boot failure in the boot process when trying to fetch OS by using boot server name and not the IP.
	Keywords: DNS, PXE boot, PXE filter
	Discovered in Version: 14.36.16
	Fixed in release: 14.36.21
3745757	Description: The UEFI HII "Host Priv Rshim" setting appears in the DPU UEFI HII menu, but since the setting is empty, changing it has no affect on the firmware.
	Keywords: HII menu to Disable/enable RSHIM, HII menu
	Discovered in Version: 14.33.10
	Fixed in release: 14.34.12
3660603	Description: Driver boot fails when UEFI boot Images that include a boot loader attempt to read data larger than 2MB.
	Workaround: Do no use Memory Manager nor GGA for Snap3. You may use DV (configure SNAP_DMA_Q_OPMODE=2 <--- DV).
	Keywords: NVMe ,Virtio-blk Emulation Device
	Discovered in Version: 14.32.17
3365363	Description: Fixed an issue where unexpected behavior and possible system failure to boot could occur when booting over BlueField-3 Virtio Net emulation device using a GRUB2 boot loader.
	Keywords: System boot, BlueField-3
	Discovered in Version: 14.30.13
	Fixed in release: 14.32.17

Internal Ref.	Description
N/A	<p>Description: Fixed an issue that occurred when booting over BlueField-3 Virtio Net emulation, while the device was using a GRUB2 boot loader. The GRUB2 loader would attempt to close and re-open the Virtio Net device. This caused unexpected behavior and possible system boot failure.</p>
	<p>Keywords: System boot, BlueField-3</p>
	<p>Discovered in Version: 14.30.13</p>
	<p>Fixed in release: 14.31.20</p>
1755286	<p>Description: Fixed an issue where the UEFI driver set SDR link speed for devices operating on Multi-Host mode or when the keep_link_up was enabled.</p>
	<p>Keywords: SDR, Multi-Host, Single-Host, port speed</p>
	<p>Discovered in Version: 3.5.305</p>
	<p>Fixed in release: 3.6.901</p>
-	<p>Description: In BlueField server that operates in EMBEDDED CPU mode, the UEFI driver will not be loaded. and the UEFI NIC will not be visible as a boot option before the driver on the embedded (Arm) side is loaded. and has completed NIC configuration on the Arm OS.</p>
	<p>Keywords: UEFI BlueField EMBEDDED_CPU</p>
	<p>Discovered in Version: 14.19.14</p>
	<p>Fixed in Release: 14.22.14</p>
1725147	<p>Description: In devices that operate in Socket-Direct mode, the MAC address of the auxiliary partitions in the Hii menu is the same as the MAC address.</p>
	<p>Keywords: MAC address, Hii menu, Socket-Direct</p>
	<p>Discovered in Version: 14.18.19</p>
	<p>Fixed in Release: 14.20.19</p>
1447149	<p>Description: Hii menu Link speed configuration will be "NA" in case speed is configured to 50GBase-KR4.</p>
	<p>Keywords: Hii, Link Speed</p>
	<p>Discovered in Version: 14.16.17</p>
	<p>Fixed in Release: 14.19.14</p>

Internal Ref.	Description
1714636	Description: Fixed an issue that prolonged the system's boot time over 3 minutes after rebooted the system.
	Keywords: Boot, UEFI
	Discovered in Version: 14.17.11
	Fixed in Release: 14.18.19
1440062	Description: Fixed an issue that resulted in RSOD (Red Screen of Death) when burned the firmware using UEFI on secured adapter cards.
	Keywords: Secured Adapter Cards, Firmware Burning, RSOD
	Discovered in Version: 14.15.19
	Fixed in Release: 14.16.17
1323188	Description: Fixed an issue in ConnectX-4 Lx adapter cards, where the Virtual LAN Mode and the Virtual LAN ID settings were missing from the HII menu.
	Keywords: Virtual LAN Mode, Virtual LAN ID, HII
	Discovered in Version: 14.15.19
	Fixed in Release: 14.16.17
-	Description: Fixed an issue which limited the Number of Virtual Functions Supported to 126 after restore to default.
	Keywords: Number of Virtual Functions Supported
	Discovered in Release: 14.11.28
	Fixed in Release: 14.12.20
-	Description: Fixed Hii ExtractConfig to handle without
	Keywords: Hii ExtractConfig
	Discovered in Release: 14.10.16
	Fixed in Release: 14.11.28
827564	Description: Enabled a persistent virtual MAC reboot.
	Keywords: MAC reboot
	Discovered in Release: 14.10.16
	Fixed in Release: 14.11.28

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