



Mellanox FlexBoot for ConnectX[®]-4 / ConnectX[®]-4 Lx / ConnectX[®]-5 Release Notes

Rev 3.5.305

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Release Update History

Table 1 - Release Update History

| Release | Date | Description |
|-------------|------------------|---|
| Rev 3.5.305 | October 30, 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 / ConnectX-5 Ex | 16.21.1000 |
| ConnectX-4 Lx EN | 14.21.1000 |
| ConnectX-4 | 12.21.1000 |
| 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.

1.2 Supported Tools (MFT)

Table 3 - Supported Tools (MFT)

| Tools | Version |
|-------------------------------|---------|
| MFT (Mellanox Firmware Tools) | 4.8.0 |

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 (supported only when installing MLNX_OFED 4.2-x.x.x.x driver) |
| RHEL | 6.5 (supported only when installing MLNX_OFED 4.2-x.x.x.x driver) |
| RHEL | 6.6 |
| RHEL | 6.8 |

Table 4 - Supported Operating Systems

| OSs | Version |
|----------------|---------|
| RHEL | 7.0 |
| RHEL | 7.1 |
| RHEL | 7.2 |
| RHEL | 7.3 |
| RHEL | 7.4 |
| SLES | 12.1 |
| SLES | 12.2 |
| SLES | 12.3 |
| 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 |
|------------|----------------------|--------------------------------|
| HPE | ProLiant DL380 Gen10 | U30 v1.20 (07/29/2017) |
| HPE | ProLiant DL360 Gen10 | U32 v1.24 (09/14/2017) |
| HPE | ProLiant XL260a Gen9 | U24 v1.00 (05/18/2016) |
| HPE | ProLiant DL180 Gen9 | U20 v2.40 (02/17/2017) |
| HPE | ProLiant DL380 Gen9 | P89 v2.20 (06/02/2016) |
| HPE | XL730f G9 | U18 v1.5 (08/04/2015) |
| Lenovo | 3650 M5 | 2.4 TCE130K (11-04-2017) |
| Lenovo | 3650 M5 | 1.20 TCE108IUS (17/2/2015) |
| Lenovo | 3550 M5 | 1.20 TBE108IUS (17/2/2017) |
| Lenovo | 7X06CTO1WW | 1.05 CDI306U (15/08/2017) |
| pxedell167 | R730 | 2.5.5 |
| qadell047 | R730xd | 0.0.10 |
| qadell014 | R640 | 2.5.4 |
| Pxdell126 | R630xd | 2.4.3 |
| qadell068 | C6320p | |
| Fujitsu | PRIMERGY RX2520 M4 | V5.0.0.12 R1.8.0 for D3386-A1x |

Table 5 - Tested Platforms

| Vendor | Type of server | Bios Version |
|----------|------------------|--|
| Qualcomm | QDF2400 DP ARM64 | XBL.DF.2.0.R1-00362 QDF2400_REL CRM |
| Quanta | Yosemite AMI | F20_3A13 02/16/2017 |

2 Changes and New Features in Rev 3.5.305

Table 6 - Changes and New Features

| Category | Description |
|--|--|
| 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. |
| Upstream sync | Synced the source with iPXE (upstream sync) |

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 (Sheet 1 of 6)

| Internal Ref. | Description |
|---------------|---|
| 1157875 | Description: Pressing any of the arrow keys during boot might cause the boot process to be aborted. |
| | Workaround: N/A |
| | Keywords: Abort boot, arrows, FlexBoot |
| | Discovered in Release: 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 |
| 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 |

Table 7 - Known Issues (Sheet 2 of 6)

| Internal Ref. | Description |
|---------------|---|
| 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 |
| 689460 | Description: To use the DHCP server to identify ipxe requests when using <code>undionly.kpxe</code> or <code>ipxe.pxe</code> when booting over IB requires special configuration. (see the Workaround below). |
| | <p>Workaround: 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:00:00:00:00:02:00:00:02: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> |
| | Keywords: undionly.kpxe or ipxe.pxe |
| 928217 | 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 boot-loader, a PSOD occurs. |
| | <p>Workaround: Use FlexBoot (or iPXE) to load mboot.c32 directly instead of pxelinux.0 using the script below:</p> <pre> #!ipxe set base /nfs/Esxi-6.5_INBOX chain \${base}/mboot.c32 -c \${base}/boot.cfg BOOTIF=01- \${mac:hexhyp}</pre> <p>where the "set base ..." specifies a suitable absolute path.</p> <p>Note: iPXE does not need an absolute path, however, mboot.c32 requires it.</p> |
| | Keywords: mboot.c32, PSOD, |

Table 7 - Known Issues (Sheet 3 of 6)

| Internal Ref. | Description |
|---------------|---|
| 976878 | Description: When using bootloader grub2 to boot WDS, if the WDS boot fails, an RSOD might appear. |
| | Workaround: N/A |
| | Keywords: Bootloader grub2, WDS, RSOD |
| 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 continuous looping. |
| | Workaround: N/A |
| | Keywords: Bootloader grub2, WDS, RSOD |
| - | Description: Several BIOS vendors have limited boot-vector space and may not display FlexBoot in their boot menu. |
| | Workaround: Disable the embedded NIC boot agent in BIOS |
| | Keywords: BIOS |
| - | Description: In several BIOS, the server might hang during FlexBoot booting due to wrong configuration of the PMM. |
| | Workaround: N/A |
| | Keywords: BIOS |
| - | Description: Only EBX, ESI, DS, ES registers can be saved in Boot Entry. |
| | Workaround: N/A |
| | Keywords: BIOS |
| - | Description: If a client returned control to the BIOS after a successful connection to an iSCSI target (but did not boot from it), then, unexpected behavior may occur. |
| | Workaround: Follow the instructions described in the FlexBoot UM for the proper iSCSI boot/install |
| | Keywords: BIOS |
| 673114/821899 | Description: FlexBoot banner might not be shown in some BIOSes. |
| | Workaround: N/A |
| | Keywords: BIOS |
| - | Description: In some cases, PXE boot will not work if the client was given only the filename without next-server (siaddr). |
| | Workaround: N/A |
| | Keywords: PXE Boot |

Table 7 - Known Issues (Sheet 4 of 6)

| Internal Ref. | Description |
|---------------|--|
| - | Description: PXE boot after iSCSI boot with static configuration is currently not supported. |
| | Workaround: N/A |
| | Keywords: PXE Boot |
| - | Description: Boot over VLAN with IB port is currently not supported. |
| | Workaround: N/A |
| | Keywords: PXE Boot |
| - | Description: Some faulty boot loaders do not close the underlying UNDI device which may result in unexpected behavior and possible system crash after the OS starts to load. |
| | 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 |

Table 7 - Known Issues (Sheet 5 of 6)

| Internal Ref. | Description |
|---------------|--|
| - | 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 |
| - | 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: 56Gb/s is currently not supported. |
| | Workaround: N/A |
| | Keywords: Link Speed |
| - | Description: Setting the number of Virtual Functions higher than the machine's memory capability may cause memory issues and system instability. |
| | Workaround: N/A |
| | Keywords: Virtualization |

Table 7 - Known Issues (Sheet 6 of 6)

| Internal Ref. | Description |
|---------------|---|
| - | Description: SLAM, FTP, HTTPS and SRP are currently not supported. |
| | Workaround: N/A |
| | Keywords: Protocols |
| - | Description: Occasionally, using the Spanning Tree Protocol (STP) in the switches may cause packet drops and boot failure in the system. |
| | 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 |
| - | Description: FCoE, BCV are not supported. |
| | Workaround: N/A |
| | 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 |

4 Bug Fixes History

Table 8 - Fixed Bugs List

| 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 |

Table 8 - Fixed Bugs List

| 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 |

5 Changes and New Feature History

Table 9 - Changes and New Feature History

| Release | Changes |
|------------------------------|---|
| 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 (<code>exp_rom</code>) version exposition according to the new specification (e.g. expose ARCH in flint tool). |
| FlexBoot UI | Added a FlexBoot menu support for <code>NV_POWER_CONF</code> . Now power consumption configuration is supported from the FlexBoot menu. |
| | Enhanced FlexBoot/firmware debug capability using Flexboot UI. Added the <code>reg_dump</code> option to the <code>panic_behavior</code> configuration in the FlexBoot menu |
| Upstream sync | Synced the source with iPXE (upstream sync) |
| Rev. 3.5.110 | |
| 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 |
| Bootimg | Enabled booting 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 <code>PCI-Bus:Dev.Func</code> to <code>0000:Bus:Dev.Func</code> |
| 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. |

Table 9 - Changes and New Feature History

| Release | 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 |
| Upstream sync | Synced the source with iPXE (upstream sync) |
| Rev. 3.4.719 | |
| IPv6 | Added IPv6 support |
| x64 Architecture | Added x64 architecture support in ConnectX-4 and Connect-IB adapter cards |
| SHELL CLI | Removed support for the following SHELL CLI commands: <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 For further information, please refer to: http://ipxe.org/cmd |
| 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) |