HP-LXBIOS User's Guide

'**hp-lxbios**' is a tool provided by HP Workstations R&D for updating System BIOS's and cloning system BIOS settings from the Linux command line. It is intended for use on the following **HP Workstations** only:

- Z1
- Z220
- Z230
- Z420
- Z620
- Z820

'**hp-lxbios**' is distributed without warrantee or guaranteed compatibility with future systems. This version of 'hp-lxbios' was tested on Red Hat Enterprise Linux 5.10 (RHEL 5.10), Red Hat Enterprise Linux 6.5 (RHEL 6.5), and SuSE Linux Enterprise Desktop 11 (SLED11, SP3) distributions.

What's in the package?

'**lxbios**' has two main components, the 'xwbios' kernel module, and the 'hplxbios' application.
- The '**xwbios**' kernel module is distributed as a source RPM called
    - O   hp-lxbios-mod.<version>.src.rpm
- The '**hplxbios**' application is distributed as and RPM called
    - O   hp-lxbios.<version>.rpm

Installation

The kernel module must be installed before the application. Be sure that you have the 'development' option for RHEL (or 'C/C++ development' option for SLED) installed on your system before you attempt to install the '**lxbios**' module and app. One of these rpms that HP is providing requires you to build a binary component from source. To do this will require the '**rpmbuild**' application. If '**rpmbuild**' is not installed on your system, you will need to load it from the RHEL installation media. The '**rpm-build.<version>.rpm**' can be found in the

"Workstation" directory on the installation media. You may find while installing the '**rpm-build**' rpm that there are other packages which are missing from your system and need to be installed before you can proceed. Take note of the missing packages and install each one directly from the RHEL media. Once you have these dependencies taken care of, complete installation of the 'rpm-build' .rpm and proceed with the installation instructions below.

- **Note** - The '**hplxbios**' binary package is an x86 (32-bit) utility that can execute in x86-64 (64-bit) environments with the availability of proper runtime compatibility libraries (specifically **glibc-2*.i686.rpm** / **glibc-devel-*.i686.rpm** support packages and dependencies). Please consult your specific distribution for more details about these packages.

- **Note** – 'root' administration privileges are required for build, installation, and execution of these utilities. In particular, the build-from-source steps ('rpmbuild') may occur in differing locations according to prevailing system defaults, user definitions ($HOME/.rpmmacros), or other environmental overrides. On some distributions, the following command can help determine the location of build source:

  ```
  rpmbuild –showrc | grep _topdir
  ```

  The value for `%{_topdir}` reported by the command above may include any of the following paths for your distribution and revision:

  - `/usr/src/redhat`
  - `$HOME/rpmbuild`
  - `/usr/src/packages`

  The command examples below use the `$HOME/rpmbuild` version for demonstration.

To install the kernel module:
- `rpm –i hp-lxbios-mod-<version>.src.rpm`
- `rpmbuild –bb $HOME/rpmbuild/SPEC/hp-lxbios-mod.spec`
- `rpm –i $HOME/rpmbuild/RPM/<architecture>/hp-lxbios-mod-<version>.rpm`

To install the application:
- `rpm –i hp-lxbios-<version>.rpm`

The application is now installed on the system in the following directory:

```
/opt/hp/hp-lxbios
```

BIOS Flashing

Attention: The flashed BIOS image is NOT checked for validity. ONLY flash the system BIOS with BIN file from the HP support website. Also, some older systems may require a non-UEFI legacy support option during flashing. See further documentation below.

'**hp-lxbios**' can be used to update a system's BIOS.

- To update (flash) the BIOS, obtain a current BIN file for the target system from the HP support website. Follow the posted instructions for extracting this file from the posted SoftPAQ archive, if necessary. The `--flash` option will instruct the application to update the bios with the supplied BIN file:

    o `/opt/hp/hp-lxbios/hp-lxbios --flash <romfile.bin>`

- Transitional systems may still require non UEFI support with an additional `--legacy` flag described below. Such a command will execute like:

    o `/opt/hp/hp-lxbios/hp-lxbios --legacy --flash <romfile.bin>`

- DO NOT restart the system while flashing is in progress. The system will become unresponsive for a few seconds. The changes will take effect after a reboot.

Replicated Setup

'**hp-lxbios**' replicated setup (repset) can be used to clone BIOS Settings in systems of the same type. The repset feature mimics the BIOS F10 setup menu. BIOS settings are saved to a file, and can be restored from the file. '**hplxbios**' implements repset from the command line. Here is the procedure for using this feature:
- Enter the BIOS setup menu (hit <F10> at boot) and customize settings.
- Reboot the system, and use '**lxbios**' to grab the repset file:
    o `/opt/hp/hp-lxbios/hp-lxbios --saveparms <saverep.txt>`
- This will save all BIOS settings to the file.
- Transfer the repset file to a target system of the same type. Apply the repset file:
    o `/op/hp/hp-lxbios/hp-lxbios --setparms <saverep.txt>`
- This will apply all changes. Changes will take affect after a reboot

Other Options

Password
If a BIOS password is set on the system, it will need to be supplied on the command line using the `--pw` option for changes to be made. For example:
    `/opt/hp/hp-lxbios/hp-lxbios --flash <romfile.bin> --pw <setup passwd>`

Attention: The BIOS interface used with *--setparms* cannot validate the password supplied. If an incorrect password is entered, the requested setting changes you require will also not occur. The recommended procedure is to use the command line above to set your changes, reboot the system, and use *--saveparms* to confirm your settings were changed.

<u>Automate</u>
Use the `--automate` option to turn of user prompts for full automation of the process. For example:
```
/opt/hp/hp-lxbios/hp-lxbios --flash <romfile.bin> --automate
```

<u>Unique Mode</u>
There are several BIOS settings that are system unique, like 'Asset Tracking Number' and 'Ownership Tag'. By default, 'unique mode' is turned off, and 'hp-lxbios' does not change these settings. To enable 'unique mode' and apply system unique settings, use the `--unique` option. For example:
```
/opt/hp/hp-lxbios/hp-lxbios --setparms <setrep.set> --unique
```

<u>Password Cloning</u>
The 'hp-lxbios' replicated setup functionality will clone the setup password by default. To turn off password cloning, use the `--no-clone-passwd` option. For example:
```
/opt/hp/hp-lxbios/hp-lxbios --setparms <setrep.set> --no-clone-passwd
```

<u>Legacy</u>
Use the `--legacy` option to force 'lxbios' to utilize the legacy interrupt interface. This option is provided for compatibility with non UEFI systems. For example:
```
/opt/hp/hp-lxbios/hp-lxbios --legacy --saveparms <saverep.txt>
/opt/hp/hp-lxbios/hp-lxbios --legacy --flash <romfile.bin>
```

<u>Sysid</u>
Use the `--sysid` option to display the current workstation model name and active BIOS for a given platform. For example:
```
/opt/hp/hp-lxbios/hp-lxbios --sysid
```

Note that on some non UEFI systems, the use of the `--legacy` option is required to access the workstation model name and active BIOS version. This method can be useful to help determine the possible requirement of the `--legacy` option in other commands (as described above):
```
/opt/hp/hp-lxbios/hp-lxbios --legacy --sysid
```

Repset File Format

Replicated Setup is implemented by the BIOS from the F10 setup menu. The file used by the F10 menu is DOS formatted and UNICODE UTF-16BE encoded. In order to be fully compatible, 'lxbios' also uses a DOS formatted (CR/LF) UNICODE UTF-16BE encoded repset file. Therefore, please only use files generated by 'lxbios' or the F10 menu.

Extra care should be taken when modifying repset files. Since contents may differ between platforms, there is no syntax checking before applying settings to a system. Errors encountered during an install may result in only a partially updated system.

The repset file is a list of BIOS objects with their current options. Settings are stored with the name of the setting first, followed by a list of options. There are no spaces separating options. Here are some examples of settings as they appear in a repset file:

```
Setup Language
        *English
        Danish
        Finnish
        French
        German
        Italian
        Japanese
        Dutch
        Norwegian
        Portuguese
        Swedish
        Spanish
Removable Media Boot
        *Enable
        Disable
EFI Boot Order
        USB Floppy/CD
        USB Hard Drive
        ATAPI CD-ROM Drive
        Other
Legacy Boot Order
        USB Floppy/CD
        Hard Drive
        NIC Controller
        NIC Controller (AMT)
        ATAPI CD-ROM Drive
        PnP Device #3
        PnP Device #4
        PnP Device #5
        PnP Device #6
        PnP Device #7
        PnP Device #8
        PnP Device #9
        PnP Device #10
        PnP Device #11
Enter Ownership Tag
        Z820 #2
```

Recovering from a ROM flash failure: the FailSafe Boot Block ROM and SoftPaq-created BIOS image CD

The FailSafe Boot Block ROM enables system recovery in the unlikely event of a ROM flash failure. For example, if a power failure occurs during a ROM upgrade, the Boot Block uses a flash-protected section of the ROM to verify a valid system ROM flash when power is restored to the system:

If the system ROM is valid, the system starts normally.

If the system ROM fails the validation check, the FailSafe Boot Block ROM provides enough support to start the system from a BIOS image CD created from a SoftPaq. The BIOS image CD programs the system ROM with a valid image.

When Boot Block detects an invalid system ROM, the workstation power LED blinks red eight times and beeps eight times, then the workstation pauses for two seconds and eight simultaneous beeps are sounded. On some models, a Boot Block recovery mode message appears.

CAUTION: To prevent a loss of data following a ROM flash failure and enable system recovery, use the BIOS CD media file in the SoftPaq to create a BIOS image CD when first setting up your workstation.

To recover your system after it enters Boot Block recovery mode:
1. Remove any media in the diskette or optical drives.
2. Insert a BIOS image CD into the CD drive.
        You can also use USB media (such as an HP DriveKey).
3. Power off, then power on the workstation.
        If no BIOS image CD or USB media is found, you are prompted to insert one and restart the workstation.
4. Enter the setup password.
If the system starts from the CD or USB media and reprograms the ROM, three keyboard lights illuminate. A rising-tone series of beeps also signals successful recovery.
5. Remove the CD or USB media and power off the workstation.
6. Restart the workstation.

For more details, please see *Support and Technical Reference Guide*

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