

# **RocketRAID 154x/1640 Controller**

## **Red Hat Enterprise Linux**

### **Installation Guide**

Version 2.14

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# 1 Overview

The purpose of this document is to provide clear instructions on how to install and use RocketRAID 154x/1640 Controller on Red Hat Enterprise Linux system.

## 2 Installing Red Hat Enterprise Linux on RR154x/1640 controller

If you would like to install Red Hat Enterprise Linux onto drives attached to RR154x/1640 controller, please perform the following operations:

### Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to RR154x/1640 controller, you can use RR154x/1640 BIOS Setting Utility to configure your hard disks as RAID arrays, or just use them as single disks.

Before installation, you must remove all the disk drives, which are not physically attached to RR154x/1640 controller, from your system.

#### Note

If you have other SCSI adapters installed, you must make sure the RR154x/1640 controller BIOS will be loaded firstly. If not, try to move it to another PCI slot. Otherwise you may be unable to boot up your system.

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### Step 2 Check System BIOS Settings

In your system BIOS SETUP menu, change **Boot Sequence** in such a way that the system will first boot from floppy or CDROM, and then from SCSI. Refer to your BIOS manual to see how to set boot sequence.

If your BIOS settings do not support such a boot sequence, you can first set it to boot from floppy or CDROM. After you finish installation, set SCSI as the first boot device to boot up the system.

### Step 3 Prepare the Driver Diskette

Driver is provided in floppy diskette image file format.

On a DOS or Windows system, you can make the Red Hat driver diskette using rawrite.exe. It can be found on the Red Hat Enterprise Linux CD (under /dosutils). Just run it under a command window and follow its prompt.

On a Linux system, you can use the “dd” command to make the boot diskette. Insert a floppy disk into the floppy drive and type the command (amd64 driver for example):

```
# dd if=rh3dd-amd64.img of=/dev/fd0
```

## Step 4 Install Red Hat Enterprise Linux

- 1) Start installing Red Hat Enterprise Linux by booting from the installation CD.
- 2) On "**Welcome to Red Hat Enterprise Linux**" installation screen, a prompted label "**boot:**" will appear at the bottom of the screen:  
  
 For RedHat Enterprise Linux 3, type in "**expert text hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe hdi=noprobe hdj=noprobe hdk=noprobe hdl=noprobe**" (without quotation mark);  
  
 For RedHat Enterprise Linux 4, type in "**linux dd hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe hdi=noprobe hdj=noprobe hdk=noprobe hdl=noprobe**" (without quotation mark),  
  
 then press **Enter**
- 3) When prompted "**Do you have a driver disk?**". Select "**Yes**".
- 4) When prompted "**Insert your driver disk and press OK to continue**", insert the driver diskette in the floppy drive and then select "**OK**".
- 5) The system will load RR154x/1640 driver automatically. Continue the installation as normal.
- 6) When the "Boot Loader Configuration" dialog appears, type in "**hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe hdi=noprobe hdj=noprobe hdk=noprobe hdl=noprobe**" as boot parameters.
- 7) When asked "**where do you want to install the boot loader?**" in the "Boot Loader Configuration" dialog, you must select "**Master Boot Record (MBR)**" to make your system be able to boot RR154x/1640 controller.
- 8) Continue the installation as normal. You can refer to Red Hat Enterprise Linux installation guide.

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### Note

1. The system device mapping order is the same as the order shown in RR154x/1640 BIOS Setting Utility.
2. On some system the LILO boot loader may be installed incorrectly unless you specify BIOS parameters in /etc/lilo.conf. During installation, when prompted "Would you like to create a boot disk for your system?", switch to console 2 by pressing <Ctl>+<Alt>+F2. Then use the following command:

```
# chroot /mnt/sysimage
# vi /etc/lilo.conf
Add two lines under the line "boot=/dev/sda":
    disk=/dev/sda
    bios=0x80
# /sbin/lilo
Press <Ctl>+<Alt>+F1 to continue the installation.
```

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## 3 Installing RR154x/1640 driver on an Existing System

### Note

If you use a SCSI adapter to boot your system, you must make sure the RR154x/1640 controller BIOS will be loaded after that adapter's BIOS. If not, try to move it to another PCI slot. Otherwise you may be unable to boot up your system.

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### Step 1 Update Lilo/Grub

You must update `/etc/lilo.conf` or `/etc/grub.conf` to disable in-kernel hpt374 driver at first.

1. If you are using Lilo to boot your system, update `/etc/lilo.conf`.

E.g.(`xxx` is the kernel version,2.4.18-14 for Red Hat Linux 8.0, 2.4.20-8 for Red Hat Linux 9.0 )

```
Prompt
timeout=50
default=linux
boot=/dev/hdc
map=/boot/map
install=/boot/message
linear

image=/boot/vmlinuz-xxx
label=linux
initrd=/boot/initrd-xxx.img
read-only
append="hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe
hdi=noprobe hdj=noprobe hdk=noprobe hdl=noprobe
root=LABEL="/
```

Then you need to run lilo:

```
# lilo
```

2. If you are using Grub to boot your system, update `/etc/grub.conf`.

E.g.

```
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
title Red Hat Linux (xxx)
    root (hd0,0)
    kernel /vmlinuz-xxx hde=noprobe hdf=noprobe hdg=noprobe
    hdh=noprobe hdi=noprobe hdj=noprobe hdk=noprobe hdl=noprobe ro
    root=LABEL=/
    initrd /initrd-xxx.img
```

The kernel parameters, "**hdx=noprobe**", are used to prevent Red Hat 8.0/9.0 kernel from loading the default HPT374 IDE driver. When your system has other IDE interfaces supported by Linux, you may need to modify "**hdx=noprobe**" according to your hardware configuration.

Then reboot the system to make new kernel parameter take effect.

## Step 2 Obtain the Driver Module

You can extract the module file from the file `modules.cgz` on the driver disk. Using the following commands:

```
# mount /dev/fd0
# cd /tmp
# gzip -dc /mnt/floppy/modules.cgz | cpio -idumv
```

Driver modules for all supported kernel versions will be extracted. You can find the driver module for your running kernel under the directory that matches your kernel version (`/tmp/`uname -r`/hpt374.o`).

## Step 3 Test the Driver Module

You can test out the module to ensure that it works for your system by changing working directory to the location where `hpt374.o` resides and typing in the command "**insmod hpt374.o**". If you are using a distribution with 2.6 kernel, driver file should be **hpt374.ko**.

Sometimes `insmod` will report "**unresolved symbols**" when you attempt to load the module. This can be caused by two ways:

1) You haven't loaded the SCSI module before loading `hpt374.o`. Try to load SCSI modules first.

E.g.            **# modprobe sd\_mod**  
                 **# insmod hpt374.o**

2) You are using a kernel that is build off a different configuration with the driver. In this case the precompiled drivers cannot be used. You can build a driver for your kernel using OpenBuild package for RocketRAID 154x/1640 controller.

To ensure the module has been loaded successfully, you can check the driver status by typing in the command "**cat /proc/scsi/hpt374/x**", where **x** is the filename you found under `/proc/scsi/hpt374/`. You should see the driver banner and a list of attached drives. You can now access the drives as a SCSI device (the first device is `/dev/sda`, then `/dev/sdb`, etc.).

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### Example

You have configured a RAID 0 array using 2 disks. It will be registered to system as device `/dev/sda`. You can use "**fdisk /dev/sda**" to create a partition on it, which will be `/dev/sda1`, and use "**mkfs /dev/sda1**" to setup a file system on the partition. Then you can mount `/dev/sda1` to somewhere to access it.

---

## Step 4 Configure System to Automatically Load the Driver

Most likely, you will not want to type in "**insmod hpt374.o**" each time you boot up the system. Therefore you must install the module and tell the system about it. To install the module, type in the following commands (first change directory to where the proper hpt374.ko locates):

```
#install -d /lib/modules/`uname -r`/kernel/drivers/scsi.  
#install -c hpt374.o /lib/modules/`uname -r`/kernel/drivers/scsi.  
#depmod
```

Then you should inform the system load the module when system boots up with the following command:

```
#echo "modprobe hpt374" > /etc/init.d/hptdriver  
  
#chmod 755 /etc/init.d/hptdriver  
  
#ln -sf /etc/init.d/hptdriver /etc/rc.d/rc3.d/S01hptdriver  
  
#ln -sf /etc/init.d/hptdriver /etc/rc.d/rc4.d/S01hptdriver  
  
#ln -sf /etc/init.d/hptdriver /etc/rc.d/rc5.d/S01hptdriver
```

## Step 5 Configure System to Mount Volumes when Startup

Now you can inform the system to automatically mount the array by modifying the file /etc/fstab. E.g. you can add the following line to tell the system to mount /dev/sda1 to location /mnt/raid after startup:

```
/dev/sda1      /mnt/raid      ext2      defaults      0 0
```

## 4 Monitoring the Driver

Once the driver is running, you can monitor it through the Linux proc file system support. There is a special file under /proc/scsi/hpt374/. Through this file you can view driver status and send control commands to the driver.

### Note

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The file name is the SCSI host number allocated by OS. If you have no other SCSI cards installed, it will be 0. In the following sections, we will use x to represent this number.

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## Checking Devices Status

Using the following command to show driver status:

```
# cat /proc/scsi/hpt374/x
```

This command will show the driver version number, physical device list and logical

device list.

## 5 Updating the Driver

First obtain the new driver module file hpt374.o from the driver image. Refer to the previous section “**Obtain the Driver Module**”. In the following steps, we assume you have copied it to /tmp/hpt374.o, and your initrd file is /boot/initrd-`uname -r`.img

- 1) If you are not booting from disks attached to RR154x/1640 controller, you can update the driver just by reinstalling it following the previous section, “**Install RR154x/1640 driver on an Existing System**”. Overwrite the driver file in the directory “/lib/modules/`uname -r`/kernel/drivers/scsi”.

```
#cp -f /tmp/hpt374.o /lib/modules/`uname -r`/kernel/drivers/scsi/
```

- 2) If you are using a system installed to RR154x/1640 controller, you can update the driver file in the directory “/lib/modules/`uname -r`/updates”, then update the initrd file.

```
#cp -f /tmp/hpt374.o /lib/modules/`uname -r`/updates/
```

```
#mkinitrd initrd-`uname -r`.img `uname -r`
```

If you are using lilo to boot your system, use “lilo” to reinstall the RAM disk:

```
# lilo
```

## 6 Installing RAID Management Software

HighPoint RAID Management Software is used to configure and keep track of your hard disks and RAID arrays attached to RR154x/1640 controller. Installation of the management software is optional but recommended.

Please refer to HighPoint RAID Management Software documents about more information.

## 7 Uninstalling

You can only uninstall the driver when your system is not booting from devices attached to RR154x/1640 controller. Just remove the lines you added to /etc/fstab, and remove the file files you created in the /etc/init.d.