RocketRAID 1520 Controller

Fedora Linux

Installation Guide

Version 2.1

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1 Overview

The purpose of this document is to provide clear instructions on how to install and use RocketRAID 1520 Controller on Fedora Linux system.

2 Installing Fedora Linux on RR1520 controller

If you would like to install Fedora Linux onto drives attached to RR1520 controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to RR1520 controller, you can use RR1520 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 RR1520 controller, from your system.

Note

If you have other SCSI adapters installed, you must make sure the RR1520 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.

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 via floppy diskette image files.

On a DOS or Windows system, you can make the Fedora driver diskette using rawrite.exe. It can be found on the Fedora 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:

> # **dd if=fc1dd.img of=/dev/fd0**

Step 4 Install Fedora Linux

Installation steps for Fedora Core 5

1) Start installing Fedora Linux by booting from the installation CD.

2) On "**Welcome to Fedora Linux**" installation screen, a prompted label "**boot:**" will appear at the bottom of the screen. Type in "**linux dd updates hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" (without quotation mark) and then press **Enter**.

3) When prompted "**Do you have a driver disk?**". Select "**Yes**". When prompted "**Insert your driver disk and press OK to continue**", insert the driver diskette in the floppy drive and then select "**OK**". The system will load RR222x driver automatically.

4) When prompted for an update disk source, select **fd0**. The installer will read updates from the driver floppy.

5) Continue the installation as usual. **Do not remove the floppy diskette** until installation completed.

Installation steps for Fedora Core 1, Core 3 and Core 4

6) Start installing Fedora Linux by booting from the installation CD.

7) On "**Welcome to Fedora Linux**" installation screen, a prompted label "**boot:**" will appear at the bottom of the screen. type in "**linux dd hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" (without quotation mark) and then press **enter**.

8) When prompted "**Do you have a driver disk?**". Select "**Yes**". When prompted "**Insert your driver disk and press OK to continue**", insert the driver diskette in the floppy drive and then select "**OK**".

9) Now the system will load RR1520 driver automatically.

10) When configure the Boot Loader, select the "**Configure advanced boot loader options**", then continue.

11) At the "**General kernel parameters**", type in "**hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" in the blank

12) Continue the installation as usual.

Installation steps for Fedora Core 2

1) Start installing Fedora Linux by booting from the installation CD.

2) On "**Welcome to Fedora Linux**" installation screen, a prompted label "**boot:**" will appear at the bottom of the screen. type in "**linux hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe** " (without quotation mark) and then press **enter**.

3) When prompted the warning "**No hard drives have been found"**, press "**ALT+F2**" to switch the shell on console 2. Insert the driver diskette into floppy drive and type the following commands:

> **# mkdir /dd**
> **# mount /dev/fd0 /dd**
> **# cd /dd**
> **# sh fedora-install-step1.sh**
> **# umount /dev/fd0**

Then press **"ALT+F1"** to switch back to installation screen and select **"No"** to continue.

4) When configure the Boot Loader, select the "**Configure advanced boot loader options**", then continue.

5) At the "**General kernel parameters**", type in "**hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" in the blank.

6) Continue the installation as usual. You can refer to Fedora Linux installation guide. Make sure you have finished the next step before system reboot.

7) When installation finishes and prompts you to reboot the system, press "**CRL+ALT+F2**" to the shell and type the following commands:

> **# chroot /mnt/sysimage**
> **# mount /dev/fd0 /mnt**
> **# cd /mnt**
> **# sh fedora-install-step2.sh**
> **# umount /dev/fd0**
> **# exit**

8) Then switch back to console 1 and finish the installation.

3 Installing RR1520 driver on an Existing System

Note

If you use a SCSI adapter to boot your system, you must make sure the RR1520 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.

Step 1 Update Lilo/Grub

You must update /etc/lilo.conf or /etc/grub.conf at first.

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

```
Prompt

   timeout=50
   default=linux
   boot=/dev/hdc
```

```
        map=/boot/map
        install=/boot/message
        linear

        image=/boot/vmlinuz
                label=linux
                initrd=/boot/initrd.img
                read-only
                append="hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe
                root=LABLE=/"
```

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
root (hd0,0)
    kernel /vmlinux hde=noprobe hdf=noprobe hdg=noprobe
hdh=noprobe ro root=LABLE=/
    initrd /initrd.img
```

The kernel parameters, "**hdx=noprobe**", are used to prevent Fedora Core kernel from loading the default HPT3xx 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`/athlon/hpt37x2.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 hpt37x2.o resides and typing in the command "**insmod hpt37x2.o**". If you are using a distribution with 2.6 kernel it should be "**insmod hpt37x2.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 hpt37x2.o. Try to load SCSI modules first.

E.g.   # **insmod scsi_mod**
                    # **insmod sd_mod**
                    # **insmod hpt37x2.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 1520 controller.

To ensure the module has been loaded successfully, you can check the driver status by typing in the command "**cat /proc/scsi/hpt37x2/x**", where **x** is the filename you found under /proc/scsi/hpt37x2/. 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.).

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 hpt37x2.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 driver resides):

        # **cp hpt37x2.ko /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 hpt37x2" > /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 4 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   ext3   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/hpt37x2/. You can use the following command to show driver status:

> # **cat /proc/scsi/hpt37x2/x**

Here x is the SCSI host number allocated by OS. If you have no other SCSI cards installed, it will be 0. This command will show the driver version number, physical device list and logical device list.

5 Updating the Driver

1) If the original driver is installed in the system initrd(Initial RAM Disk) file(e.g. when you are using a system installed to RR154x controller), you should update the driver module in the initrd file with the **mkinitrd** command, or extract the initrd file and replace the driver module manually. Reboot the OS to apply the updated module.

    For example:

    We assume the Fedora OS is installed on the RocketRAID controller. Get the driver module from the driver disk or build from the open source driver.

    1, Update driver for Core 1, Core 3 and Core 4

    We assume the running kernel is 2.6.9-1.667(Get it by the command "uname -r"), and current initial ram disk is /boot/initrd-2.6.9-1.667.img, backup the old initrd-2.6.9-1.667.img, then add the new driver into the initrd file.

    > **#mv /boot/initrd-2.6.9-1.667.img /boot/initrd-2.6.9-1.667.img.save**
    >
    > **#cp hpt37x2.ko /lib/modules/2.6.9-1.667/updates/**
    >
    > **#/sbin/mkinitrd /boot/initrd-2.6.9-1.667.img 2.6.9-1.667**

    2, Update driver for Core 2:

    We assume the running kernel is 2.6.5(Get it by the command "uname -r"), so the initial ram disk for the current kernel is /boot/initrd-2.6.5.img, backup it, then add the new driver into the initrd File.

    > **#mv /boot/initrd-2.6.5.img /boot/initrd-2.6.5.img.save**
    >
    > **#cp hpt37x2.ko /lib/modules/2.6.5/kernel/drivers/scsi/**
    >
    > **#/sbin/mkinitrd --preload scsi_mod --preload sd_mod --with=hpt37x2**

/boot/initrd-2.6.5.img 2.6.5

2) If the original driver is installed in the /lib/modules/`uname –r`/kernel/drivers/scsi/ directory, and load it by the script file(e.g. /etc/init.d/hptdriver) during the init process, or the configure file(e.g. /etc/modules.conf), please replace it with the new driver(hpt37x2.o or hpt37x2.ko). Reboot the OS to apply the updated driver.

    For example:

    Update driver for Core 1, 2, 3, 4.

    #cp hpt37x2.ko /lib/modules/`uname –r`/kernel/drivers/scsi/

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 RR1520 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 RR1520 controller. Just remove the lines you added to /etc/modules.conf and /etc/fstab.