RocketRAID 182x Controller

Debian GNU/Linux

Installation Guide

Version 1.01

Copyright © 2004 HighPoint Technologies, Inc.

April 28, 2004

Table of Contents

1 Overview

The purpose of this document is to provide clear instructions on how to install and use RocketRAID 182x Controller on Debian3.0 Linux system.

2 Installing Debian GNU/Linux on RR182x controller

If you would like to install Debian3.0 Linux onto drives attached to RR182x controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to RR182x controller, you can use RR182x 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 RR182x controller, from your system.

Note

If you have other SCSI adapters installed, you must make sure the RR182x 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

The driver is provided by a disk image file debiandd.img. You can use follow instruction to create a driver diskette.

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

If you have no Linux system you can use windows tool rawrite.exe to create the driver diskette. Just type rawrite.exe and then follow the screen you can finish it.

Step 4 Install Debian GNU/Linux

1) Boot from the Debian installation CD. As it prompts "**Boot:**" on the welcome screen, type "**bf24**" (without quotation mark) to install.

2) When the window "**Debian GNU/Linux Installation Main Menu**" appears, insert the driver diskette into floppy drive and select menu "**Preload Modules from a Floppy**".

3) Select "**Yes**" in the next two dialogs. The drivers on the floppy diskette will be listed. Choose the driver module **hptmv2.4.18-bf2.4.o** for installation.

4) The RR182x controller driver will be loaded. You can continue the installation as usual. The system device mapping order is the same as the order shown in RR182x BIOS Setting Utility. If you have no other SCSI adapters installed, the device marked as "BOOT" or "HDD0" will be /dev/sda, "HDD1" will be /dev/sdb, "HDD2" will be /dev/sdc, etc.

5) When you come to the step "**Make System Bootable**" and prompted "where should the LILO boot loader be installed?", select "**Install LILO in the MBR**".

6) At the end of the installation, remove the floppy from floppy drive and eject the CD-ROM, then reboot from the RR182x controller and go on installing the complete system.

3 Installing RR182x driver on an Existing System

Note

If you use a SCSI adapter to boot your system, you must make sure the RR182x 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 Obtain the Driver Module

If you are currently running Linux and would like to access drives attached to the RR182x Controller, you can refer to the following information. First obtain the new RR182x driver floppy diskette. Using the following commands to get the correct driver module for your system (here we copy it to /tmp/hptmv.o):

> # **mount -o ro /dev/fd0 /floppy**
> # **cp /floppy/boot/hptmv`uname –r`.o /tmp/hptmv.o**
> # **umount /floppy**

Step 2 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 hptmv.o resides and typing in the command "**insmod ./hptmv.o**".

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

1) If your system is using a kernel that has no built-in SCSI support, you must load the SCSI module before load hptmv.o. Try to load SCSI modules first.

E.g.   # **insmod scsi_mod**
              # **insmod sd_mod**
              # **insmod ./htpmv.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 182x controller.

To ensure the module has been loaded successfully, you can check the driver status by typing in the command "**cat /proc/scsi/hptmv/x**", where **x** is the filename you found under /proc/scsi/hptmv/. 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 3 Configure System to Automatically Load the Driver

Most likely, you will not want to type in "**insmod hptmv.o**" every 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 hptmv.o can be located):

> # **install -d /lib/modules/`uname –r`/kernel/drivers/scsi**
> # **install -c hptmv.o /lib/modules/`uname –r`/kernel/drivers/scsi**

Then you should inform the system when to load the module.

1. If you have no other SCSI adapters installed, you can edit the file "**/etc/modutils/aliases**" and add the following lines:

> **alias   block-major-8 hptmv**

Then run below instruction:

> # **update-modules**

This tells the kernel to try loading the SCSI and hptmv modules whenever it tries to access a SCSI device /dev/sd[a-z].

Now, reboot the system and try to type in the command "fdisk /dev/sda". The kernel should automatically load the RR182x driver.

2. If you use a SCSI adapter to boot the system, you cannot do as above since this may conflict with other SCSI devices. However, you can add the driver to the existing RAM disk image. First check which image file you are using by checking the "initrd=" line in file /etc/lilo.conf, then using the following commands (we assume the file is /boot/debianinstall)

> # **cp /boot/debianinstall /tmp/debianinstall.gz**
> # **cd /tmp**
> # **gunzip debianinstall.gz**
> # **mkdir /mnt/initrd**
> # **mount –o loop /tmp/debianinstall   /mnt/initrd**

 # cp hptmv.o /mnt/initrd/lib/hptmv.o (specify the correct location of hptmv.o here)

Now, add a line "insmod /lib/hptmv.o" to the file /mnt/initrd/linuxrc, just below the line of insmoding SCSI adapter's kernel module. Example of linuxrc:

......
echo "Loading scsi_mod module"
insmod /lib/scsi_mod.o
echo "Loading sd_mod module"
insmod /lib/sd_mod.o
echo "Loading aic7xxx module"
insmod /lib/aic7xxx.o   ← **SCSI adapter's kernel module**
echo   "Loading hptmv.o module"
insmod /lib/hptmv.o   ← **new inserted line**
echo "Loading jbd module"
......

 # umount /mnt/initrd
 # gzip /tmp/debianinstall
 # cp /tmp/debianinstall.gz /boot/debianinstall

If you are using lilo to boot your system, you also need to run lilo:

 # lilo

Then reboot your system and the driver will be loaded.

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**   **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/hptmv/. Through this file you can view driver status and send control commands to the driver.

Note

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.

Checking Devices Status

Using the following command to show driver status:

 # cat /proc/scsi/hptmv/x

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

Rebuilding a Critical Array

A RAID 1 array may become critical after a disk member fails. When an array is in critical status, it will loss the ability of fault tolerance until you finish rebuilding.

Generally rebuilding will automatically start if you have a spare disk or you have put back the failed disk. In these cases, the array only needs to be synchronized to ensure data consistency. If the array is broken, you must first add a disk to the array. To add a disk to an array and start rebuilding, you can use the following command:

> # **echo "hpt rebuild a,b" > /proc/scsi/hptmv/x**

In the command, "**a**" is array number shown in the logical device list. " **b** " is channel number. E.g.

> # **echo "hpt rebuild 1,2" > /proc/scsi/hptmv/x**

This will rebuild the array with logical device number 1 using the disk on secondary channel.

If rebuilding cannot be automatically started, you can use command

> # **echo "hpt rebuild start" > /proc/scsi/hptmv/x**

to start rebuilding. To stop the rebuilding process, use command

> # **echo "hpt rebuild stop" > /proc/scsi/hptmv/x**

Verifying RAID 1/RAID 5

To RAID 1/RAID 5,verifying will ensure data consistency.

You can use the following command to start verifying:

> # **echo "hpt verify start a" > /proc/scsi/hptmv/x**

To stop the verifying process, use command:

> # **echo "hpt verify stop a" > /proc/scsi/hptmv/x**

In the command, "**a**" is array number shown in the logical device list.

5 Updating the Driver

If you are not booting from disks attached to RR182x controller, you can update the driver just by reinstalling it following the previous section, "**Install RR182x driver on an Existing System**".

If you are using a system installed to RR182x controller, you can update the driver by the following steps.

1) First obtain the new driver module file hptmv.o. Refer to the previous section "**Obtain the Driver Module**". In the following steps, we assume you have copied it to /tmp/hptmv.o.

2) Replace hptmv.o in the boot RAM disk image, /boot/debianinstall.

```
# cp /boot/debianinstall /tmp/debianinstall.gz
# cd /tmp
# gunzip debianinstall.gz
# mkdir /mnt/initrd
# mount –o loop /tmp/debianinstall   /mnt/initrd
# cp hptmv.o /mnt/initrd/lib/hptmv.o
# umount /mnt/initrd
# gzip –9   /tmp/debianinstall
# mv debianinstall.gz debianinstallraid
# cp debianinstall /boot/debianinstallraid
```

3) If you are using lilo to boot your system, use "**lilo**" to reinstall the RAM disk:

changed the "initrd=" line to use our new image file "**debianinstallraid**"

```
# lilo
```

4) Update hptmv.o in /lib/modules:

cp /tmp/hptmv.o /lib/modules/`uname –r`/kernel/drivers/scsi/hptmv.o

5) Reboot your system to make the new driver take effect.

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 RR182x controller. Installation of the management software is optional but recommended.

Checking System Requirements

To run the RAID Management GUI, you must have the following software packages installed on your system:

1) X-Window system
2) gtk library v1.2 or later.

If you are using KDE or GNOME workstation, they are already installed. Otherwise you may check your system and refer to your Linux system manual for how to install these packages.

Preparing the Installation Files

You should have two files to finish the installation.

hptinstall.sh   Installation script file

hptraid.tar.gz   Package of software components

Installing the Software Package

Before installation, you must log on as root and change the directory to the location where your installation files are. Then you can use the command "**sh hptinstall.sh –i**" to install the software.

The following is an example.

```
[root@tmp]# ls
hptinstall.sh hptraid.tar.gz
[root@tmp]# sh hptinstall.sh -i
Starting hptsvr daemon:                                    [ OK ]
HighPoint ATA RAID Management Software has been installed successfully!
[root@tmp]#
```

Note

If an old version is installed on your system you will be prompted to choose whether to overwrite existing files or not. To continue installation, type in "**Y**".

If you have got the message that can't find the libstdc++2.9-glibc6.1 information,
You should install the lib **libstdc++-libc6.1-1.so.2 libstdc++2.9-glibc2.1** first.

Running the Management Software

You must log on as root to run the management software.

To run the software from a console window, you can just type in "**hptraid**" to start it. If you do not want to block the console, type in "**hptraid&**".

If you are using GNOME or KDE, you can also run it from the menu bar:

On KDE, you can start it by choosing "**Menus (menu-bar)->Applications->HighPoint ATA RAID Management Software**".

On GNOME, you can start it by choosing "**KDE menus->GNOME->Applications-> HighPoint ATA RAID Management Software**".

7 Uninstalling

Uninstalling the Driver

You can only uninstall the driver when your system is not booting from devices attached to RR182x controller. Just remove the lines you added to /etc/modules.conf and /etc/fstab.

Uninstalling the Management Software

Before you uninstall the software, you must log on as root. Then you can use the command "**hptinstall.sh –u**" to uninstall the software.

```
[root@tmp]# hptinstall.sh -u

Are you sure to uninstall HighPoint ATA RAID Management Software?(Y/N)y

Stopping hptsvr daemon:                                    [ OK ]

Uninstall finished!

[root@tmp]#
```