RocketRAID 182x S-ATA Controller

FreeBSD Installation Guide

Version 1.1

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1 Overview

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

2 Installing FreeBSD on RocketRAID 182x Controller

If you would like to install FreeBSD onto drives attached to RocketRAID 182x 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.

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 CDROM, next from and then from floppy drive, 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 CDROM. After you finish installation, set SCSI as the first boot device to boot up the system.

Step 3 Prepare the Driver Diskette

If you are installing FreeBSD, you must prepare a driver disk for RR182x before installation.

First obtain the driver diskette image file, freebsd.img.

On a DOS or Windows system, you can make the boot diskette using rawrite.exe. It can be found on the FreeBSD CD (under \tools). Just run it under a command window and follow its prompt.

On a FreeBSD system, you can use the "dd" command to make the driver diskette. Insert a floppy disk into the floppy drive and type the command:

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

Step 4 Install FreeBSD

1) Start installing the FreeBSD by booting from installation CD.

2) If you are installing FreeBSD 5.0 or earlier versions, skip this step. When "**Welcome to FreeBSD**" screen appears, select "**6**".

3) When "**Hit [enter] to boot immediately or any other key for command prompt**"
   screen appears, press SPACE key to stop loader from autobooting.

   ```
   BTX loader 1.00  BTX version is 1.01
   Console: internal video/keyboard
   BIOS driver A: is disk0
   BIOS driver B: is disk1
   BIOS driver C: is disk2
   BIOS 636kB/74512kB available memory

   FreeBSD/i386 bootstrap loader, Revision 0.8
   (mailto:jkh@narf.osd.bsdi.com, Sat Apr 21 08:46:19 GMT 2001)
   -
   Hit [Enter] to boot immediagely, or any other key for command prompt.
   Booting [kernel] in 9 seconds…
   ```

   <-press SPACE key
   A prompted label "**ok**" will appear at the bottom of the screen.

4) If you are installing FreeBSD 4.5 or later, please skip this step. Type in "load kernel"
   (without quotation mark) and then press **enter**.

   ```
   Type '?' for a list of commands, 'help' for more detailed help.
   ok load kernel

   /kernel text=0x24f1db data=0x3007ec+0x2062c -
   ```

5) Insert RR182x driver diskette into floppy drive now. Type in "**load diskx:hptmv-x.x**"
   (without quotation mark) and then press **enter**.

   ```
   for FreeBSD 4.1-RELEASE
     ok load disk1:hptmv-4.1
     disk1:/hptmv-4.1.ko text=0xf571 data=0x2c8+0x254

   for FreeBSD 4.3-RELEASE
     ok load disk1:hptmv-4.3
     disk1:/hptmv-4.3.ko text=0xf571 data=0x2c8+0x254

   for FreeBSD 4.4-RELEASE
     ok load disk1:hptmv-4.4
     disk1:/hptmv-4.4.ko text=0xf571 data=0x2c8+0x254

   for FreeBSD 4.5-RELEASE
     ok load disk1:hptmv-4.5
     disk1:/hptmv-4.5.ko text=0xf571 data=0x2c8+0x254

   for FreeBSD 4.6.2-RELEASE
     ok load disk1:hptmv-4.6.2
     disk1:/hptmv-4.6.2.ko text=0xf571 data=0x2c8+0x254

   for FreeBSD 4.7-RELEASE
     ok load disk1:hptmv-4.7
    disk1:/hptmv-4.7.ko text=0xf571 data=0x2c8+0x254

   for FreeBSD 4.8-RELEASE
     ok load disk1:hptmv-4.8
     disk1:/hptmv-4.8.ko text=0xf571 data=0x2c8+0x254
   ```

```
for FreeBSD 4.9-RELEASE
  ok load disk1:hptmv-4.9
 disk1:/hptmv-4.9.ko text=0xf571 data=0x2c8+0x254

for FreeBSD 5.0-RELEASE
  ok load disk0:hptmv-5.0.ko
 disk0:/hptmv-5.0.ko text=0xf571 data=0x2c8+0x254

for FreeBSD 5.1-RELEASE
  ok load disk0:hptmv-5.1.ko
 disk0:/hptmv-5.1.ko text=0xf571 data=0x2c8+0x254

for FreeBSD 5.2.1-RELEASE
  ok load disk0:hptmv-5.2.1.ko
 disk0:/hptmv-5.1.ko text=0xf571 data=0x2c8+0x254
```

6)   Type in "boot" and continue the installation as normal. You can refer to FreeBSD installation guide.

```
ok boot
```

> **Note**
>
> The system device mapping order is the same as the order shown in RR182x BIOS Setting Utility. If you have no other SCSI devices, the device marked as "BOOT" or "HDD0" will be /dev/da0, "HDD1" will be /dev/da1, "HDD2" will be /dev/da2, etc.

7)   Before exit install, an additional step must be taken to copy RR182x driver module to system. On the driver disk, there is a setup script "**postinstall**" which will do this work for you. Before you reboot the system, press **Alt-F4** to the command shell and type the following commands:

```
# mount –o ro /dev/fd0 /mnt
# sh /mnt/postinstall
# umount /mnt
```

Then press **Alt-F1** to return to the setup screen and choose **[X Exit Install]** to finish setup.

3 Installing RR182x Driver on an Existing System

If you are currently running FreeBSD and would like to access drives or arrays attached to the RR182x Controller, you can perform the following steps.

Step 1 Copy the Driver Module

Insert the driver diskette to floppy drive, then using the following commands to copy the driver module:

```
for FreeBSD 4.1-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.1.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.3-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.3.ko /modules/hptmv.ko
```

```
    # umount /mnt

for FreeBSD 4.4-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.4.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.5-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.5.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.6.2-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.6.2.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.7-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.7.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.8-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.8.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.9-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.9.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 5.0-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-5.0.ko /boot/kernel/hptmv.ko
  # umount /mnt

for FreeBSD 5.1-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-5.1.ko /boot/kernel/hptmv.ko
  # umount /mnt

for FreeBSD 5.2.1-RELEASE
  # mount –o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-5.2.1.ko /boot/kernel/hptmv.ko
  # umount /mnt
```

Step 2 Test the Driver Module

You can test out the module to ensure that it works for your system by load it during system booting.

If the module has been loaded successfully you should see the RR182x banner and a display screen of the attached drives. You can now access the drives as a SCSI device (if you have no other SCSI device, the first device is /dev/da0, then /dev/da1, etc.).

Example

```
F1    FreeBSD
Default: F1

>> FreeBSD/i386 BOOT
Default: 0:ad(0,a)/boot/loader
boot:
```

```
BTX loader 1.00  BTX version is 1.01
Console: internal video/keyboard
BIOS driver A: is disk0
BIOS driver C: is disk2
BIOS 636kB/74512kB available memory

FreeBSD/i386 bootstrap loader, Revision 0.8
(mailto:jkh@narf.osd.bsdi.com, Sat Apr 21 08:46:19 GMT 2001)
Loading /boot/defaults/loader.conf
/kernel text=0x24f1db data=0x3007ec+0x2062c -
<- For FreeBSD 5.1 and later: select "6" on "Welcom to FreeBSD" screen.

Hit [Enter] to boot immediagely, or any other key for command prompt.
Booting [kernel] in 9 seconds…

 <-press SPACE key
Type '?' for a list of commands, 'help' for more detailed help.
ok load hptmv
/modules/hptmv.ko text=0xf571 data=0x2c8+0x254
ok autoboot
```

If you have configured a RAID 1/0 using 4 disks, it will be registered to system as device **/dev/da0**. You can use "**/stand/sysinstall**" to create partitions and disklabels *(like da0s1e)* on **da0**. Then you can create new filesystem using "**newfs /dev/da0s1e**". Now you can mount **/dev/da0s1e** to somewhere to access it.

Step 3 Configure System to Automatically Load the Driver

Most likely, you will not want to type "load hptmv" each time you boot up the system. Therefore you must install the module and tell the system about it. To configure system to automatically load the driver, type in the following commands:

```
# echo 'hptmv_load="YES"' >> /boot/defaults/loader.conf
```

This tells the loader to try loading the RR182x module together with the kernel.

Now, reboot the system. RR182x module should be automatically loaded each time system start up.

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/da1s1e to location /mnt/hpt after startup:

/dev/da1s1e   **/mnt/hpt**   **ext2**   **defaults**   **0 0**

4 Monitoring the Driver

Once the driver is running, you can monitor the running status of driver.

Checking Devices Status

Using the following command to show driver status:

```
# sysctl hptmv.status
```

This command will show the driver version number, physical device list and logical device list. And this command will stop beeper when beeping.

Rebuilding a Critical Array

A RAID 1 array or a RAID 1/0 array may become critical after a disk member failed. When an array is in critical status, it will loss the ability of fault tolerance until you finished 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:

```
# sysctl –w hptmv.status="hpt a rebuild b,c"
```

In command, "**a**" is controller number (0 for first controller and 1 for second controller), "**b**" is array number as shown in the logical device list. "**c**" is channel number. E.g.

```
# sysctl –w hptmv.status="hpt 0 rebuild 1,2"
```

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

If rebuilding cannot be automatically started, you can use command

```
# sysctl –w hptmv.status="hpt a rebuild start"
```

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

```
# sysctl –w hptmv.status="hpt a rebuild stop"
```

In command, "**a**" is controller number (0 for first controller and 1 for second controller).

Verifying RAID 1/RAID 5

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

You can use the following command to start verifying:

```
# sysctl –w hptmv.status="hpt a verify start b"
```

To stop the verifying process, use command:

```
# sysctl –w hptmv.status="hpt a verify stop b"
```

In the command, "**a**" is controller number (0 for first controller and 1 for second controller), "**b**" is array number shown in the logical device list.

5 Updating the Driver

You can update the driver if you have newer driver diskette.

Insert the driver diskette to floppy drive, then using the following commands to update the

driver module：

```
for FreeBSD 4.1-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.1.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.3-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.3.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.4-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.4.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.5-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.5.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.6-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.6.2.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.7-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.7.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.8-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.8.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 4.9-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-4.9.ko /modules/hptmv.ko
  # umount /mnt

for FreeBSD 5.0-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-5.0.ko /boot/kernel/hptmv.ko
  # umount /mnt

for FreeBSD 5.1-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-5.1.ko /boot/kernel/hptmv.ko
  # umount /mnt

for FreeBSD 5.2.1-RELEASE
  # mount -o ro /dev/fd0 /mnt
  # cp /mnt/hptmv-5.2.1.ko /boot/kernel/hptmv.ko
  # umount /mnt
```

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.
3) Compat4.x (for FreeBSD5.x)

If you choose X-User during install FreeBSD system, X-Window system is already installed. Otherwise you may check your system and refer to your FreeBSD system manual for how to install it.

As to gtk library, e.g. you can install them from FreeBSD CD by typing in the following command:

```
# mount /cdrom
# pkg_add /cdrom/packages/All/gtk-1.2.10.tgz
# umount /cdrom
```

As to compat4.x, you can install them from FreeBSD 5.x CD by typing in the following command:

```
# mount /cdrom
# cd /cdrom/compat4x
# ./install.sh
# cd /
# umount /cdrom
```

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 the 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 "**./hptinstall.sh –i**" to install the software.

The following is an example.

```
[root@tmp]# ls
hptinstall.sh hptraid.tar.gz
[root@tmp]# ./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**".

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&**".

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 line

hptmv_load="YES"

in /boot/defaults/loader.conf, and then delete the driver module **/modules/hptmv.ko** or **/boot/kernel/hptmv.ko** .

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 daemon:                                    [ OK ]
Uninstall finished!
[root@tmp]#
```