

HPT302 UDMA/ATA133 Controller

FreeBSD

Installation Guide

Version 1.0

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1 Overview

The purpose of this document is to provide clear instructions on how to install and use HPT302 UDMA/ATA133 Controller on a FreeBSD-4.3/4.4 system.

2 Installing FreeBSD on HPT302 Controller

If you would like to install FreeBSD onto drives attached to HPT302 controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to HPT302 controller, you can use HPT302 BIOS Setting Utility to configure your hard disks. You can select a hard disk as boot disk, otherwise HPT302 BIOS will automatically select the first one attached as boot disk.

Note

If you have other SCSI adapters installed, you must make sure the HPT302 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 HPT302 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 with FreeBSD CDROM.
- 2) On loader's screen, it will ask you whether to boot immediately. 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:jkhn@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

- 3) A prompted label "**ok**" will appear at the bottom of the screen. According to the prompt, 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 -
```

- 4) Insert HPT302 driver diskette into floppy drive now. Type in "load disk1:hpt302-4.3" or "load disk1:hpt302-4.4" (without quotation mark) and then press **enter**.

```
for FreeBSD 4.3-RELEASE
ok load disk1:hpt302-4.3
disk1:/hpt302-4.3.ko text=0xf571 data=0x2c8+0x254

for FreeBSD 4.4-RELEASE
ok load disk1:hpt302-4.4
disk1:/hpt302-4.4.ko text=0xf571 data=0x2c8+0x254
```

- 5) 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 HPT302 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.

- 6) Before exit install, an additional step must be taken to copy HPT302 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 HPT302 Driver on an Existing System

If you are currently running FreeBSD and would like to access drives or arrays attached to the HPT302 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 4.3-RELEASE
# mount -o ro /dev/fd0 /mnt
# cp /mnt/hpt302-4.3.ko /modules/hpt302.ko
# umount /mnt

for FreeBSD 4.4-RELEASE
# mount -o ro /dev/fd0 /mnt
# cp /mnt/hpt302-4.4.ko /modules/hpt302.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 HPT302 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 -
/
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 hpt302
/modules/hpt302.ko text=0xf571 data=0x2c8+0x254
ok autoboot
```

If you have one disk attached to HPT302, 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 hpt302” 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 'hpt302_load="YES"' >> /boot/defaults/loader.conf
```

This tells the loader to try loading the HPT302 module together with the kernel.

Now, reboot the system. HPT302 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 hpt302.status
```

This command will show the driver version number, physical device list and 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 4.3-RELEASE
# mount -o ro /dev/fd0 /mnt
# cp /mnt/hpt302-4.3.ko /modules/hpt302.ko
# umount /mnt

for FreeBSD 4.4-RELEASE
# mount -o ro /dev/fd0 /mnt
```

```
# cp /mnt/hpt302-4.4.ko /modules/hpt302.ko
# umount /mnt
```

Reboot your system to make the new driver take effect.

6 Uninstalling

Uninstalling the Driver

You can only uninstall the driver when your system is not booting from devices attached to HPT302 controller. Just remove the line

```
hpt302_load="YES"
```

in `/boot/defaults/loader.conf`, and then delete the driver module **`/modules/hpt302.ko`** .