Rocket100 UDMA/ATA100 Controller

Red Hat Linux

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 Rocket100 UDMA/ATA100 Controller on Red Hat Linux system.

2 Installing Red Hat Linux on Rocket100 Controller

If you would like to install Red Hat Linux onto drives attached to Rocket100 controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to Rocket100 controller, you can use Rocket100 BIOS Setting Utility to configure your hard disks. You can select a hard disk as boot disk; otherwise Rocket100 BIOS will automatically select the first one attached as boot disk.

Before installation, you must remove all the disk drives, which are not physically attached to Rocket100 controller, from your system.

Note

If you have other SCSI adapters installed, you must make sure the Rocket100 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

If you are installing Red Hat Linux 7.3 on i686 type CPU, or if you are installing Red Hat Linux 7.0/7.1, just copy all the files under rhdd/i686 directory to a dos formatted diskette. If you are installing Red Hat Linux 7.3 on athlon type CPU, just copy all the files under rhdd/athlon directory to a dos formatted diskette.

If you are installing Red Hat Linux 8.0/9.0 on athlon type CPU, just copy all the files under rh8_9dd/athlon directory to a dos formatted diskette; otherwise, just copy all the files under rh8_9dd/i686 directory to a dos formatted diskette;

If you are installing Red Hat Linux 7.2, the driver is contained in a floppy diskette image file. If you are using an Athlon CPU, the image file is rh72dd-athlon.img, otherwise, the image file is rh72dd-i686.img.

On a DOS or Windows system, you can make the Red Hat 7.2 driver diskette using rawrite.exe. It can be found on the Red Hat 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:

for non-Athlon CPU

> # **dd if=rh72dd-i686.img of=/dev/fd0**

for Athlon CPU

> # **dd if=rh72dd-athlon.img of=/dev/fd0**

Step 4 Install Red Hat Linux

1) Start installing Red Hat Linux by booting from installation CD.

2) On "**Welcome to Red Hat Linux**" installation screen, a prompted label "**boot:**" will appear at the bottom of the screen. If you are installing Red Hat Linux 7.0, type in "**expert text** " (without quotation mark) and then press **enter**. If you are installing Red Hat Linux 7.2, type in "**expert text updates hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe** " (without quotation mark) and then press **enter**. If you are installing Red Hat Linux 7.1/7.3/8.0/9.0, type in "**text expert hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" (without quotation mark) and then press **enter**.

> **Note**
>
> The kernel parameter "hdx=noprobe" is used to prevent Linux kernel from loading the default Rocket100 chip IDE driver. When your system has other IDE interfaces supported by Linux, you may need to modify "**hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" according to your hardware configuration.

3) When prompted "**Do you have a driver disk?**". Select "**Yes**".

4) If you are not install Red Hat Linux 9.0, skip this step. When "**Driver Disk Source** " appears, select "**fd0**" and then select "**OK**".

5) When prompted "**Insert your driver disk and press OK to continue**", insert the driver diskette in the floppy drive and then select "**OK**".

6) If you are installing Red Hat Linux 7.1/7.2/7.3/8.0/9.0, please **go to step 11** since the system will load Rocket100 driver automatically.

7) After the "**Devices**" dialog box appears, select "**Add Device**" option.

8) When asked "**What kind of device would you like to add?**", select "**SCSI**", and then select "**Ok**".

9) Scroll down to "**Rocket100 UDMA/ATA100Controller**", and then select "**Ok**".

10) The installation process will now display the "**Rocket100 UDMA/ATA100 Controller** " as been found, select "**Done**".

11) If you are installing Red Hat Linux 7.2, when asked "Insert your updates disk and press ok to continue", just press <Enter> to continue.

12) If you are installing Red Hat Linux 7.1/7.2/7.3/8.0/9.0, when prompted "**A few systems will need to pass special options to the kernel at boot time …**" in the "Boot Loader Configuration" dialog, type in "**hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe**" in the blank.

13) 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 from Rocket100 controller.

3 Installing Rocket100 Driver on an Existing System

If you are currently running **Red Hat Linux 7.0** and would like to access drives or arrays attached to Rocket100 controller, please **go to step 2** directly.

Note

If you use a SCSI adapter to boot your system, you must make sure Rocket100 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

If you are currently running **Red Hat Linux 7.1/7.2/7.3/8.0/9.0,** you must update /etc/lilo.conf or /etc/grub.conf at first. (where xxx is the kernel version, 2.4.2-2 for Red Hat Linux 7.1, 2.4.7-10 for Red Hat Linux 7.2, 2.4.18-3 for Red Hat Linux 7.3, 2.4.18-14 for Red Hat Linux 8.0, 2.4.20-8 for Red Hat Linux 9.0)

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

E.g.

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

The kernel parameters, "**hde=noprobe hdf=noprobe hdg=noprobe hdh=noprobe** ",
are used to prevent kernel from loading the default HPT370 chip IDE driver. When your
system has other IDE interfaces supported by Linux, you may need to modify
"**hde=noprobe hdf=noprobe hdg=noprobe hdh=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 different kernel version will be extracted:

/tmp/2.2.16-22/hpt370.o	Red Hat Linux 7.0 up driver
/tmp/2.2.16-22smp/hpt370.o	Red Hat Linux 7.0 smp driver
/tmp/2.4.2-2/hpt370.o	Red Hat Linux 7.1 up driver
/tmp/2.4.2-2smp/hpt370.o	Red Hat Linux 7.1 smp driver
/tmp/2.4.7-10/hpt370.o	Red Hat Linux 7.2 up driver
/tmp/2.4.7-10smp/hpt370.o	Red Hat Linux 7.2 smp driver
/tmp/2.4.18-3/hpt370.o	Red Hat Linux 7.3 up driver
/tmp/2.4.18-3smp/hpt370.o	Red Hat Linux 7.3 smp driver
/tmp/2.4.18-14/hpt370.o	Red Hat Linux 8.0 up driver
/tmp/2.4.18-14smp/hpt370.o	Red Hat Linux 8.0 smp driver
/tmp/2.4.20-8/hpt370.o	Red Hat Linux 9.0 up driver
/tmp/2.4.20-8mp/hpt370.o	Red Hat Linux 9.0 smp driver

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 hpt370.o resides and typing in the command "**insmod hpt370.o**".

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

1) If your system is using a kernel which has not built-in SCSI support, you must load the SCSI module before load hpt370.o. Try to load SCSI modules first.

E.g.   # **insmod scsi_mod**
         # **insmod sd_mod**
         # **insmod hpt370.o**

2) If you recompile the kernel with SCSI support and still receive the "**unresolved symbols**" error, it may be caused that you have not configured symbol versioning correctly. To correct it, recompile the kernel with symbol versioning configured. Please refer to the kernel documents for more information.

To ensure the module has been loaded successfully, you can check the driver status by typing in the command "**cat /proc/scsi/Rocket100/x**", where **x** is the filename you found under /proc/scsi/Rocket100/. 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

If you have one disk attached to Rocket100, 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 hpt370.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 hpt370.o can be located):

On Red Hat Linux 7.0, use

         # **install -d /lib/modules/2.2.16-22/scsi**
         # **install -c hpt370.o /lib/modules/2.2.16-22/scsi**

On Red Hat Linux 7.1/7.2/7.3/8.0/9.0, use

         # **install -d /lib/modules/`uname –r`/kernel/drivers/scsi**
         # **install -c hpt370.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/modules.conf**" and add the following lines:

> **probeall block-major-8 scsi_mod sd_mod hpt370**
>
> **options –k hpt370**

This tells the kernel to try loading the SCSI and hpt370 modules whenever it tries to access a SCSI device /dev/sd[a-z]. If you have SCSI support compiled in kernel, you may remove the "scsi_mod" and "sd_mod" from that line.

Notice

Upon your system configuration the modules configuration file may be another file, possibly deprecated "conf.modules" file. You may have to check which configuration file you use and modify the correct one.

Now, reboot the system and try to type in the command "fdisk /dev/sda". The kernel should automatically load the Rocket100 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, the using the following commands (we assume the file is /boot/initrd-2.4.2-2.img, For Red Hat 7.2 system, just need to substitute "initrd-2.4.2-2.img" with "initrd-2.4.7-10.img" to get the default RAM disk file name):

> **# gzip –dc /boot/initrd-2.4.2-2.img > /tmp/initrd.ext2**
> **# mkdir /mnt/initrd**
> **# mount –o loop /tmp/initrd.ext2 /mnt/initrd**
> **# cp htp370.o /mnt/initrd/lib/** (specify the correct location of hpt370.o here)

> **Now, add a line "insmod /lib/hpt370.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**
> > **insmod /lib/hpt370.o**   **← new inserted line**
> > **echo "Loading jbd module"**
> > **……**

> **# umount /mnt/initrd**
> **# gzip –c /tmp/initrd.ext2 > /boot/initrd-2.4.2-2.img**

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 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/hpt after startup:

/dev/sda1   /mnt/hpt   ext2   defaults   0 0

For Red Hat Linux 8.0, you also add the following line:

/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/Rocket100/. 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/hpt370/x

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

5 Updating the Driver

If you are not booting from disks attached to Rocket100 controller, you can update the driver just by reinstalling it following the previous section, "**Install Rocket100 Driver on an Existing System**".

If you are using a system installed to Rocket100 controller, you can update the driver by the following steps.

1) First obtain the new driver module file hpt370.o. Refer to the previous section "**Obtain the Driver Module**". In the following steps, we assume you have copied it to /tmp/hpt370.o.

2) Replace hpt370.o in the boot RAM disk image, /boot/initrd-xxx.img, where xxx is the kernel version. (2.2.16-22 for Red Hat Linux 7.0, 2.4.2-2 for Red Hat Linux 7.1, 2.4.7-10 for

Red Hat Linux 7.2, 2.4.18-3 for Red Hat Linux 7.3, 2.4.18-14 for Red Hat Linux 8.0, 2.4.20-8 for Red Hat Linux 9.0)

> # **gzip -dc /boot/initrd-xxx.img > /tmp/initrd.ext2**
> # **mkdir /mnt/initrd**
> # **mount -o loop /tmp/initrd.ext2 /mnt/initrd**
> # **cp /tmp/hpt370.o /mnt/initrd/lib/hpt370.o**
> # **umount /mnt/initrd**
> # **gzip -c /tmp/initrd.ext2 > /boot/initrd-xxx.img**

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

> # **lilo**

4) Update hpt370.o in /lib/modules:

  Red Hat Linux 7.0:
    # **cp /tmp/hpt370.o /lib/modules/2.2.16-22/scsi/hpt370.o**
  Red Hat Linux 7.1/7.2/7.3/8.0/9.0:
    # **cp /tmp/hpt370.o /lib/modules/`uname –r`/kernel/drivers/scsi/hpt370.o**
 5) 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 Rocket100 controller. Just remove the lines you added to /etc/modules.conf and /etc/fstab.