HighPoint RR2720A

RAID Controller

Linux Ubuntu

Installation Guide

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1 Overview

The purpose of this document is to provide clear instructions on how to install Linux Ubuntu on the RR Series RAID controller.

✧ Supported system: Ubuntu 20.04/20.04.1/20.04.2.0/20.04.3/20.04.4/20.04.5/20.10/ 22.04/22.04.1/22.10

✧ Supported controller: RR2720A

2 Installing Linux Ubuntu on Series RAID controller

If you would like to install Linux Ubuntu onto drives attached to RR Series RAID controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your hard disks to RAID controller, you can use **EFI Utility** to configure your hard disks as RAID arrays, or just use them as single disks.

Before installation, you must remove all the Hard disks, which are not physically attached to RAID controller, from your system.

Note

RAID Controller support EFI boot. If you have other SCSI adapters installed, you must make sure the RR Series controller EFI 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 EFI Settings

In your system EFI SETUP menu, change **Boot Sequence** in such a way that the system will first boot from **EFI** CDROM or **EFI** a Bootable USB drive, after you finish installation, set RR Series RAID as the first boot device to boot up the system. Refer to your motherboard EFI manual to see how to set boot sequence.

1. Set UEFI setting with SuperMicro X11DPi-NT motherboard as an example.
   a. "**Advanced->PCIe/PCI/PnP Configuration->CPUSlot PCI-E OPROM**"
      to "**EFI**". Suppose RAID Controller is connected to motherboard CPU1 Slot 2 PCI-E X16, then you should set "CPU1 Slot 2 PCI-E X16 OPROM" to "EFI";
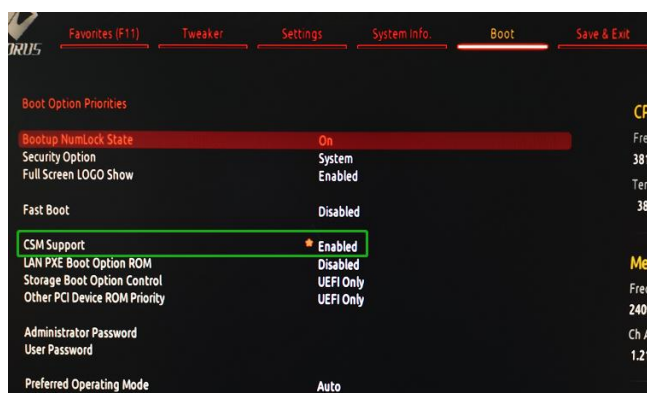
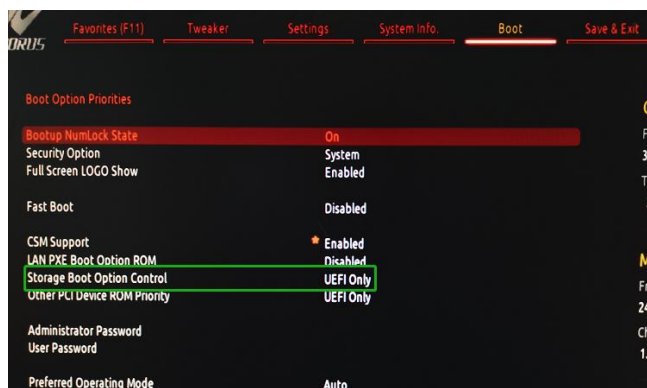b.   Disable "Secure Boot", set "Attempt Secure Boot" to "Disabled".
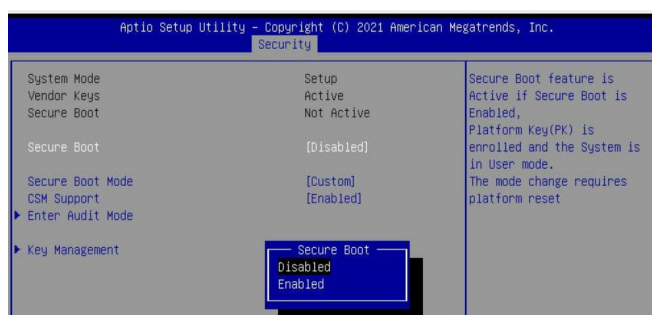
2. Set UEFI setting with GA-X570 AORUS MASTER motherboard as an example.

    a.   Set " Boot->CSM Support " to "Enabled";

b.   And" Boot-> Storage Boot Option Control " to "UEFI Only";

3. Set UEFI setting with ASUS PRIME X299 -DELUXE motherboard as an example:

a. Set "Boot from Storage Devices" to "UEFI driver first";
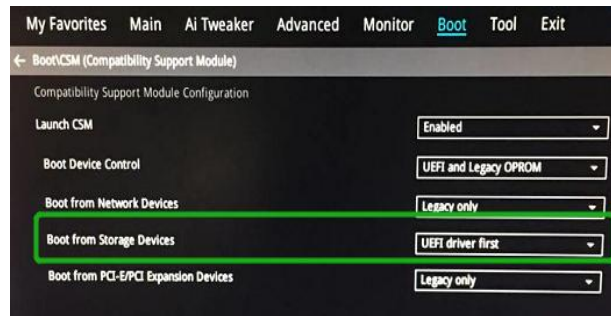
b. And "Boot Device Control" to "UEFI Only" or "UEFI and Legacy OPROM";
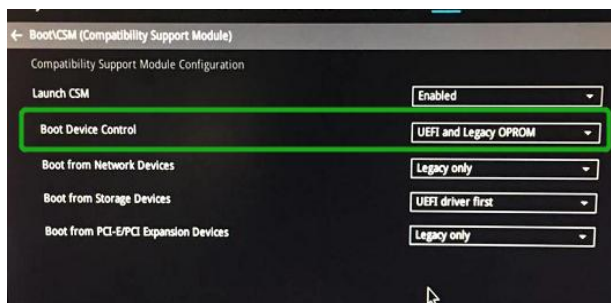
c. Set "OS Type" to "Other OS".
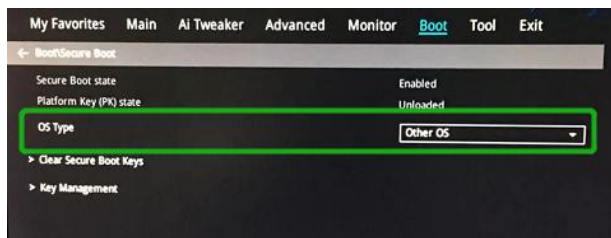
Step 3 Flash UEFI Rom to RAID Controller

For Example RR2720A：

Note：Make sure your USB flash partition format is FAT32.

a. Unzip RR2720A UEFI package to root dir(/) of a USB flash drive, and insert the USB flash drive to the motherboard;

b. Booting from the UEFI USB flash and enter the UEFI environment;

c. Command with "rr2720.nsh", flash UEFI rom to RR2720A Controller and reboot;

```
FS2:\> rr2720.nsh
FS2:\> load.efi 2720uefi.rom
Load Utility for Flash EPROM v1.1.3
 (built at Oct 20 2021 16:39:13)

Found adapter 0x27201103 at PCI 1:0:0
Flash size 0x10000, File size 0xf600
Offset address 0x0
EPROM Vendor: WINBOND W25X40BV
Erasing .....Suceeded
Flashing ....

Flashing Success (total retry 0)

Verifing ....

Passed !
FS2:\> _
```

Step 4 Create Array
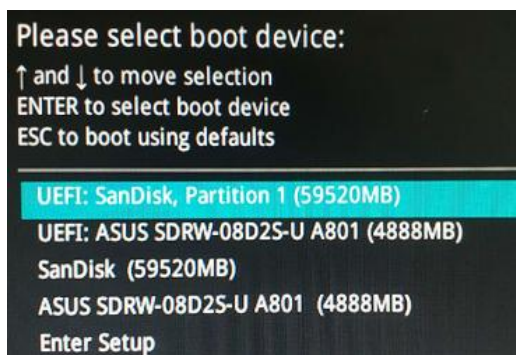
a. Attach two hard disks to RR2720A Controller;

b. Boot, enter the motherboard's Boot List and select start from UEFI USB flash:

```
Boot Override
UEFI: USB, Partition 1
(B97/D0/F0) UEFI PXE: IPv4 Intel(R) I350 Gigabit Network
Connection(MAC:3cecef40a1dc)
```

c. Command "ArrayCreate.efi" to enter the Utility:

```
FS2:\> ArrayCreate.efi
Highpoint RAID utility for UEFI (version: 20211022)
==== Controller information:
 PCI Location: 01:00:00
        Vendor: HighPoint Technologies,Inc.
        Product: RocketRAID 272x Controller

==== Physical device list(count 2 of 2):
1/6 ST4000VN008-2DR166-WDH0Z88B, 4000694MB(MaxFree 4000694MB), Normal [WC]
1/8 ST2000VX000-1CU164-W1E8N3QT, 2000313MB(MaxFree 2000313MB), Normal [WC]

==== Logical device list(count 0 of 0):
----------------------------------------------------------------------------
>>> Please specify command to execute:
<<< _
```

d. Command "create RAID0".
    Create RAID0 array with all disks and with maximum capacity.

```
<<< create RAID0
    Creating array: RAID0_000041A7.
    Array created successfully.
============================================================================

==== Physical device list(count 2 of 2):
1/6 ST4000VN008-2DR166-WDH0Z88B, 4000694MB(MaxFree 2000381MB), Normal [WC]
1/8 ST2000VX000-1CU164-W1E8N3QT, 2000313MB(MaxFree 0MB), Normal [WC]

==== Logical device list(count 1 of 1):
 1 [VD0-0] RAID0_000041A7 (RAID0), 4000627MB (Stripe 64KB), Normal
    1/6 ST4000VN008-2DR166
    1/8 ST2000VX000-1CU164
----------------------------------------------------------------------------
>>> Please specify command to execute:
<<< _
```

e. Command "exit";
f. For more command usages, refer to <u>Appendix A</u>.

Step 5 Prepare the Driver Diskette

Extract **RR272x_1x_ubuntuxx.xx.x_x86_64_vx.xx.xx_xx_xx_xx.tar.gz** to top(/)
directory of an USB flash drive. It will look like:

```
root@test:/home# tar zxvf RR272x_1x_ubuntu22.10_x86_64_v1.10.19_23_02_27.tar.gz
hptdd/
hptdd/install.sh
hptdd/boot/
hptdd/boot/rr272x_1x5.19.0-21-genericx86_64.ko.gz
hptdd/postinst.sh
hptdd/preinst.sh
hptdd/postinst2.sh
hptdd/readme.txt
```

Step 6 Install Linux Ubuntu

For Example：Ubuntu20.04.5 Server

a. **Before you do the following, verify the status of your network environment. To ensure a proper installation, it is recommended to disconnect the network and install the system in a network less environment.**

b. Insert the USB flash drive to the target system.

c. Booting from Bootable USB drive (EFI mode).

d. When the following window appears during the installation process
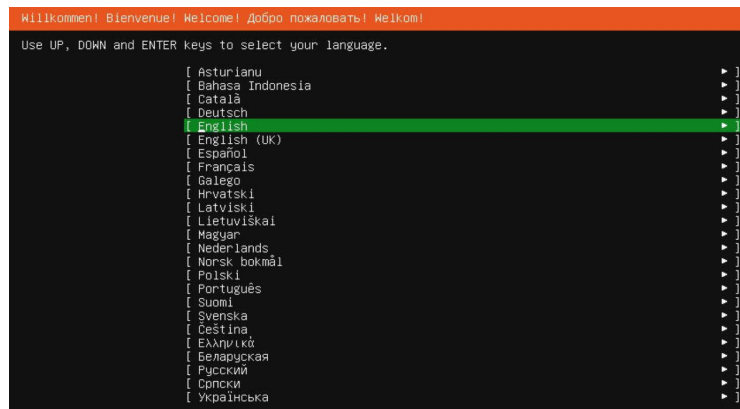
Press **ALT+F2** to switch to the shell on console 2 and press **ENTER** to activate this console.

If you use Ubuntu Desktop, please press **CTRL+ALT+F2** to switch to the shell on console 2 and press **ENTER** to activate this console.

Ubuntu login: ubuntu

```
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.4.0-125-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 System information as of Thu Mar  9 01:35:21 UTC 2023

 System load:   1.77      Memory usage: 1%   Processes:       781
 Usage of /home: unknown   Swap usage:   0%   Users logged in: 0

0 updates can be applied immediately.


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu-server@ubuntu-server:~$ _
```

And then execute following commands to copy the driver contents:

 # mkdir /hptdd   ← Create mount point for USB flash drive

 # mount /dev/sdb1 /hptdd/   ← Mount the USB flash drive to /hptdd

 # cp -a /hptdd/hptdd /tmp/   ← Copy driver installation file to system temporary
                                            directory

 # umount /dev/sdb1   ← Unmount the USB flash drive

```
root@ubuntu-server:/home/ubuntu-server# mkdir /hptdd
root@ubuntu-server:/home/ubuntu-server# mount /dev/sdb1 /hptdd/
root@ubuntu-server:/home/ubuntu-server# cp -a /hptdd/hptdd/ /tmp/
root@ubuntu-server:/home/ubuntu-server# umount /dev/sdb1
```

When the USB flash drive is unmounted, please unplug the USB flash drive from the mainboard. And then execute following command to install driver to install the Linux Ubuntu.

 # sh /tmp/hptdd/preinst.sh   ← Load RR2720A driver.

```
root@ubuntu-server:/home/ubuntu-server# sh /tmp/hptdd/preinst.sh
This step succeeded! Now you can press ALT+F1 to switch back to the installation screen!
root@ubuntu-server:/home/ubuntu-server# _
```

e. Then press **ALT+F1** to switch back to installation screen and continue the installation as usual**.**

f. When the screen shows that "install complete".

press **ALT+F2** to the shell and type the following commands:

If you use Ubuntu20.04.5 desktop , When the installation prompts "Installation Complete", don't click Restart Now . please press **CTRL+ALT+F2** and execute following commands.

 # sh /tmp/hptdd/postinst.sh   ← Install RR2720A driver.

A message will be displayed that the driver has been installed successfully.

g.   Press **ALT+F1** and press **Reboot Now** to finish the installation.

h.   If you want to boot from another kernel, please install the RR Series opensource driver after entering the system.

i.   Restart to enter the system**, please connect to the internet:**

01.   use "apt-get update" to retrieve new lists of ubuntu packages

02. Linux opensource driver link, open the following link to enter the "Software Download" page to download:

RR2700 Series: https://www.highpoint-tech.com/rr272x-overview

Extract driver package:

tar zxvf RR272x_1x_Linux_X86_64_Src_vx.x.x_xx_xx_xx.tar.gz

Run the **.bin** file to install the driver package.

sh rr272x_1x-linux-src-vxx.x.x-xx_xx_xx.bin or

./rr272x_1x-linux-src-vxx.x.x-xx_xx_xx.bin

```
root@test:/home# ./rr272x_1x-linux-src-v1.11.0-23_03_17.bin
Verifying archive integrity... All good.
Uncompressing RR272x_1x Linux Open Source package installer..
Checking and installing required toolchain and utility ...
Installing program make ... done
Installing program gcc ... done
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
```

a. Follow the prompts to complete the driver installation.

```
Its output will be used to detect bootable binaries on them and create new boot entries.
Found FreeDOS on /dev/sdc1
Adding boot menu entry for UEFI Firmware Settings ...
done
Synchronizing state of hptdrv-monitor.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1
Created symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service → /lib/systemd/system/hptdrv-monitor.
SUCCESS: Driver rr272x_1x is installed successfully for kernel 5.19.0-21-generic.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninrr272x_1x to uninstall the driver files.
remove conflicting module mvsas successfully
root@test:/home#
```

b. After the installation is complete, you can perform system update operations.

3 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/rr272x_1x /. 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.

Using the following command to show driver status:

cat /proc/scsi/rr272x_1x /x

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

4 Installing RAID Management Software

HighPoint RAID Management Software is used to configure and keep track of your hard disks and RAID arrays attached to RR Series RAID Controller. Installation of the management software is optional but recommended.

Please refer to HighPoint RAID Management Software documents for more information.

5 Troubleshooting

If you do not install the system or update the kernel according to the installation manual, the system will crash and you will not be able to enter. Please follow the steps below.

Press **ESC** when booting, until the following interface appears. Choose **"Advanced options for Ubuntu"** and press **Enter**

Select the **default** kernel (5.19.0-21-generic) and enter the system.

Install Linux Opensource driver.

RR2700 Series: https://www.highpoint-tech.com/rr272x-overview

sh rr272x_1x-linux-src-vxx.x.x-xx_xx_xx.bin or
./rr272x_1x-linux-src-vxx.x.x-xx_xx_xx.bin

6 Rebuilding Driver Module for System Update

When the system updates the kernel packages, the driver module rr272x_1x.ko should be built and installed manually before reboot.

Please refer to the README file distributed with HighPoint RR Series RAID Controller opensource package on how to build and install the driver module.

7 Appendix A

Support command: help/info/quit/exit/create/delete

- **Create Command**
  Syntax

  Create Array Type (RAID0/1/10/5/50) Member Disk list (1/1, 1/2|*) Capacity (100|*)

  Note:

  The RR2720A controllers can support RAID0/1/10/5/50

  Examples

  <<< create RAID0

  <<< create RAID0 *

  <<< create RAID0 * *

  Create RAID0 array with all disks and with maximum capacity.

  <<< create RAID1 1/1, 1/3 10

  Create RAID1 array with disk 1/1 and 1/3 and with 10GB capacity.

  <<< create RAID10 *

  Create RAID10 array with all disks and with maximum capacity.

  <<< create RAID5 *

  Create RAID5 array with all disks and with maximum capacity.

  <<< create RAID50,3 1/1, 1/2, 1/3, 1/4, 1/5, 1/6

  Create RAID50 array with disk 1/1, 1/2, 1/3, 1/4, 1/5, 1/6 and with sub member count 3 and with maximum capacity.

- **Delete Command
  Syntax**

  delete {array ID}

  ## Examples

  <<< delete 1

  Delete the first array from Logical device list.

  <<< delete 2

  Delete the second array from Logical device list.

- **Info Command
  Syntax**

  info

  Display physical device list and logical list

- **Exit Command
  Syntax**

  Q/q/quit/exit

  Quit the application

- **Help Command
  Syntax**

  H/h/help

  This is help message.