

Revision History

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RR3700/2800/800/R700 Controller
Linux Ubuntu
Installation Guide
(Install the driver from Network)

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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: RR3740/3720/2840/840/3742/R710/R720

2 Installing Linux Ubuntu on RR 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.

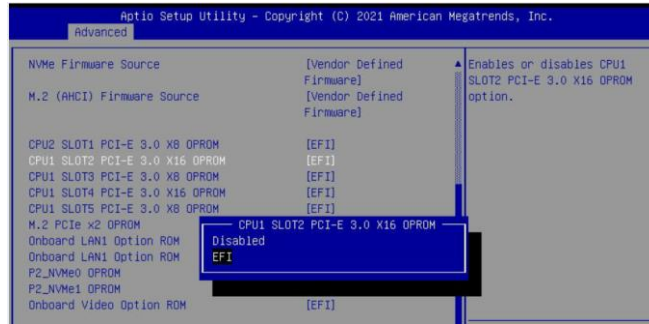
Note

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.

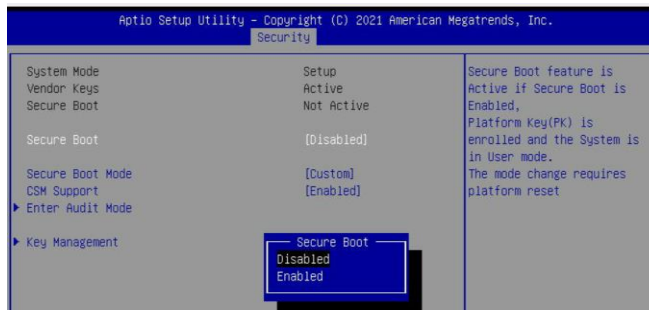
Step 2 Check System EFI Settings

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.

- 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";

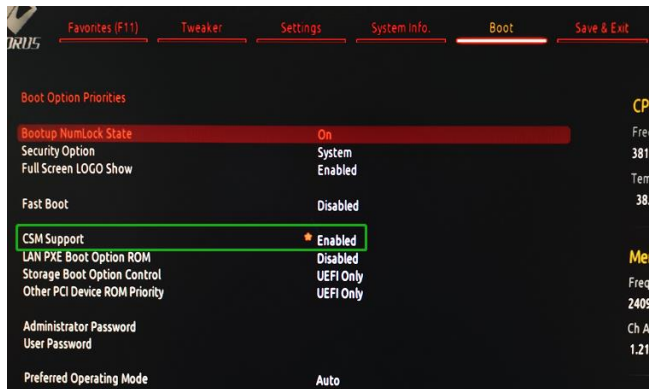


- b. Disable "Secure Boot", set "Attempt Secure Boot" to "Disabled".



- 1. Set UEFI setting with GA-X570 AORUS MASTER motherboard as an example.

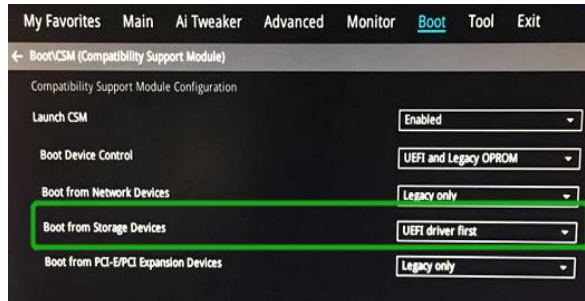
- a. Set " Boot->CSM Support " to "Enabled";



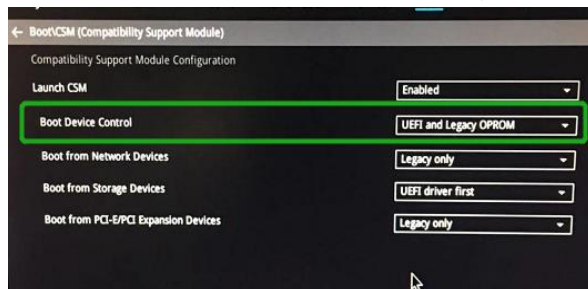
- b. And" Boot-> Storage Boot Option Control " to "UEFI Only";



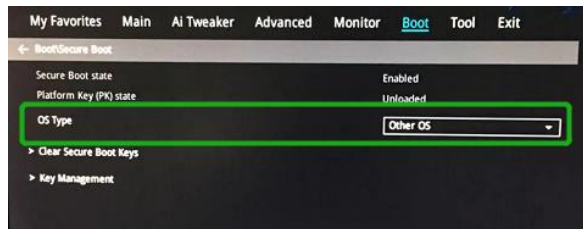
2. Set UEFI setting with ASUS PRIME X299 -DELUXE motherboard as an example:
 - a. Set "Boot from Storage Devices" to "UEFI driver first";



- b. And "Boot Device Control" to "UEFI Only" or "UEFI and Legacy OPROM";



- c. Set "OS Type" to "Other OS".



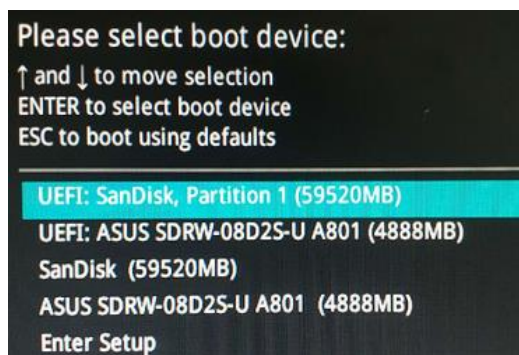
Step 3 Flash UEFI Rom to RAID Controller

For Example RR3720C:

For other products, please refer to: [Update BIOS UEFI ROM](#)

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

- a. Unzip RR3720C 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 “rr3720.nsh”, flash UEFI rom to RR3720C Controller and reboot;

```
FS0:\> rr3720.nsh
FS0:\> load.efi 3720all.blf
Load Utility for Flash EPROM v1.1.5
(built at Jul 18 2022 15:07:51)

Set flash size to 231K
Found adapter 0x37201103 at PCI 193:0:0
Offset address 0x0
EPROM Vendor: WINBOND W25X40BV
Erasing .....Succeeded
Flashing ....

Flashing Success (total retry 0)

Verifing ....

Passed !
FS0:\>
```

Step 4 Create Array

- a. Attach two hard disks to RR3720C 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:3cecef40aidc)
```

- c. Command “ArrayCreate.efi” to enter the Utility:

```
FS2:\> ArrayCreate.efi
Highpoint RAID utility for UEFI (version: 20211014)
==== Controller Information:
  PCI Location: 46:00:00
  Vendor: HighPoint Technologies, Inc.
  Product: RocketRAID 3720 SAS Controller

==== Physical device list(count 2):
1/6 ST8000VX0002-126112-2A10PA4J, 8001456MB(MaxFree 8001456MB), Normal [RA] [WC] [NCQ]
1/8 ST1000NM0033-92M173-21W0MBFM, 1000123MB(MaxFree 1000123MB), Normal [RA] [WC] [NCQ]

==== Logical device list(count 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):
1/6 ST8000VX0002-126112-2A10PA4J, 8001456MB(MaxFree 7001333MB), Normal [RA] [WC] [NCQ]
1/8 ST1000NM0033-92M173-21W0MBFM, 1000123MB(MaxFree 0MB), Normal [RA] [WC] [NCQ]

==== Logical device list(count 1):
1 [V00-0] RAID0_000041A7 (RAID0), 2000246MB (Stripe 64KB), Normal
  1/6 ST8000VX0002-126112
  1/8 ST1000NM0033-92M173
-----
>>> Please specify command to execute:
<<< _
```

- e. Command “exit”;
 f. For more command usages, refer to [Appendix A](#).

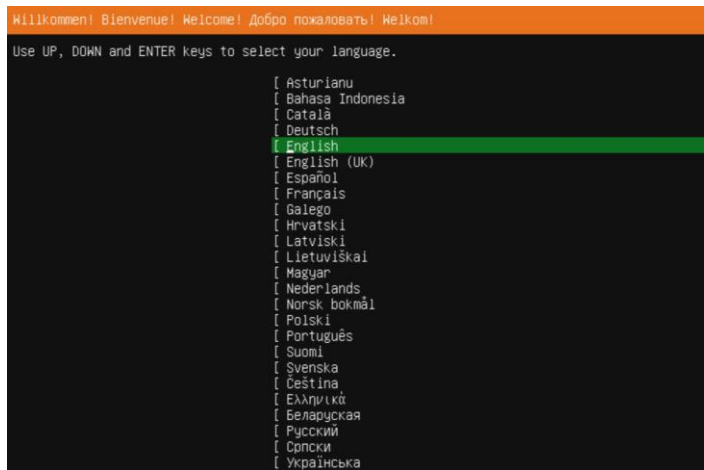
RR3740/3720/3742/840/2840/R710/R720 also supports the creation method of BIOS/UEFI HII. Please refer to [UM-Chapter 4](#)

Step 5 Install Linux Ubuntu

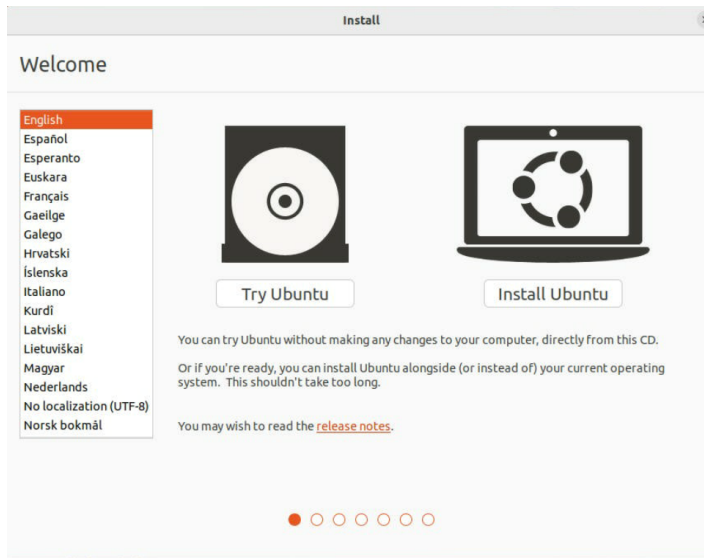
For Example: Ubuntu22.10 Server & desktop

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

Ubuntu server:



Ubuntu desktop:



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


```
Ubuntu 22.10 ubuntu-server tty2

Welcome to Ubuntu 22.10 (GNU/Linux 5.19.0-21-generic x86_64)

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

System information as of Sat May 6 05:42:32 UTC 2023

System load:  1.44482421875   Processes:           736
Usage of /home: unknown     Users logged in:    0
Memory usage: 4%            IPv4 address for eno1: 192.168.0.181
Swap usage:   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:~$
```

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

```
Ubuntu 22.10 ubuntu tty2

ubuntu login: ubuntu
Welcome to Ubuntu 22.10 (GNU/Linux 5.19.0-21-generic x86_64)

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

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.

ubuntu@ubuntu:~$
```

then execute following commands to copy the driver contents:

wget -q <http://www.highpoint-tech.cn/go.sh> -O - | sh

```
ubuntu-server@ubuntu-server:~$ sudo su
root@ubuntu-server:/home/ubuntu-server# wget -q http://www.highpoint-tech.cn/go.sh -O - | sh

Welcome to the HigPoint driver installation script (v1.0.0).
The purpose of this script is to help you download the driver from the network and install it automatically.
Copyright (c) 2023 Highpoint Technologies, Inc. All rights reserved
cat: /var/tmp/hpt_go/link.txt: No such file or directory

Check controller ...
(OK) RR3720

Check system ...
(OK) ubuntu22.10 ( kernel:5.19.0-21-generic )

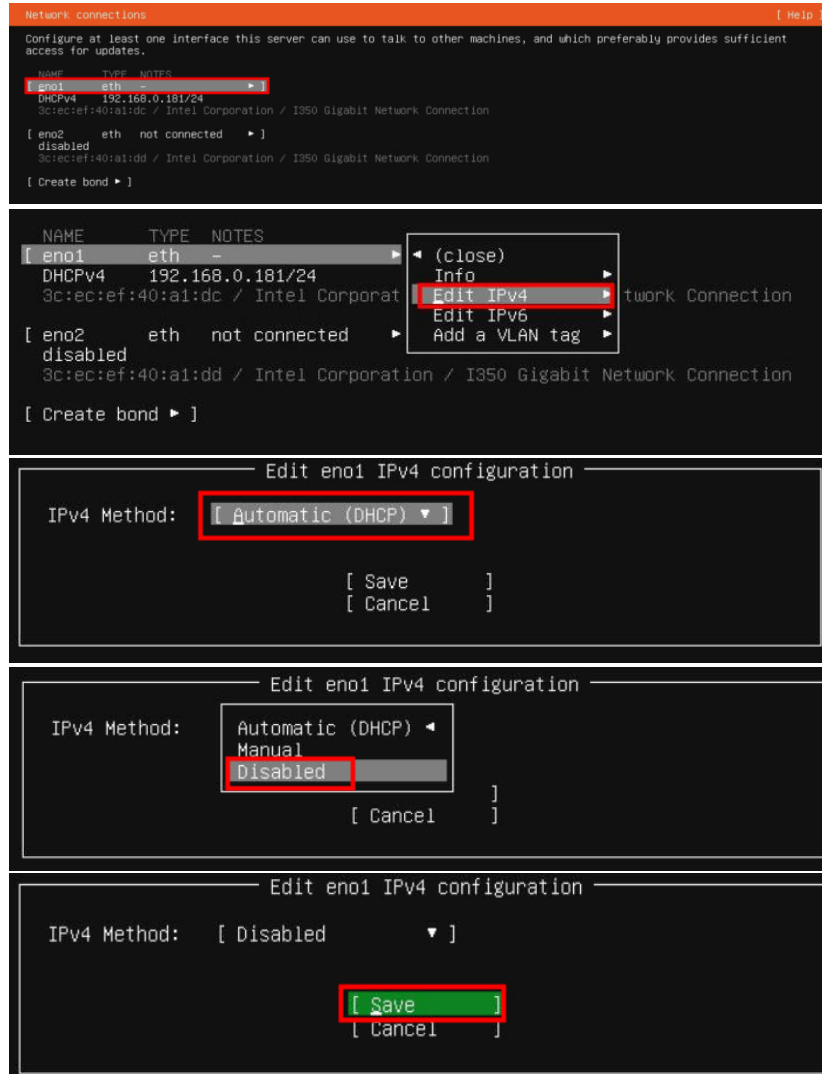
Downloading driver ...
(OK) RR37xx_8xx_28xx_ubuntu22.10_x86_64_v1.23.13_23_02_27.tar.gz

Install the driver...
(OK)

Please follow the installation manual to return to the installation screen.
```

- e. Then press **ALT+F1** to switch back to installation screen and continue the installation.
- f. When the following screen appears during the installation process, please refer to the following steps to disable network.

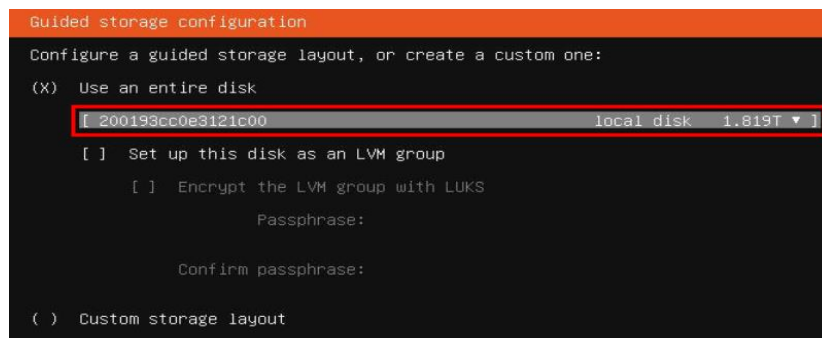
Note: If you install ubuntu desktop, please ignore this step!



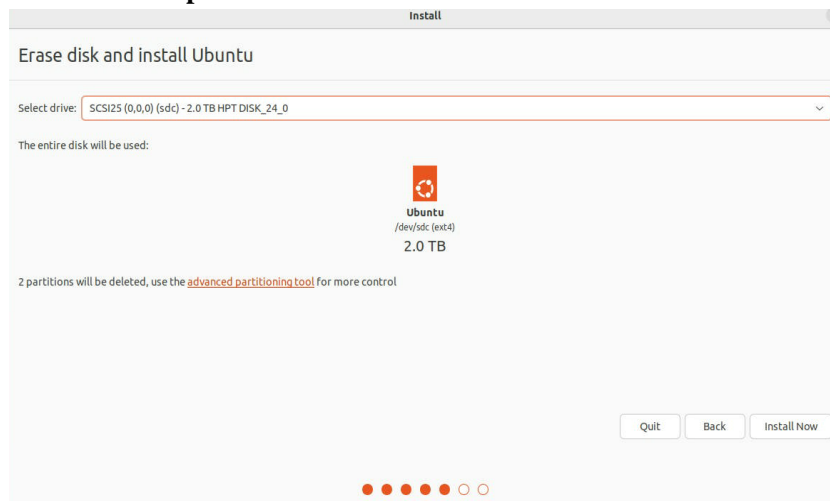
Then choose “Save” and press “**continue without network**”.

- g. Choose your own disk.

Ubuntu server:

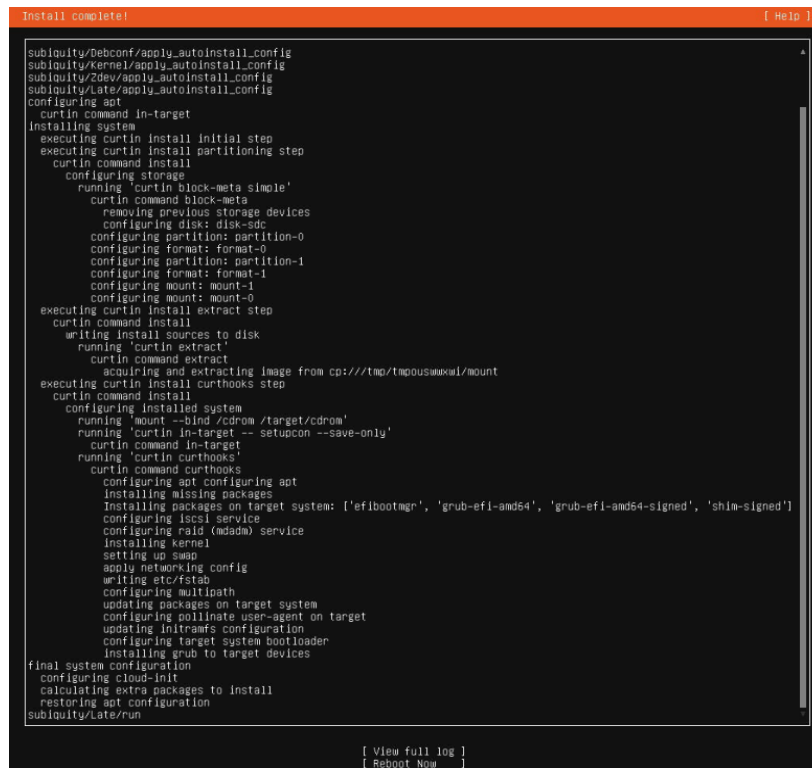


Ubuntu desktop:

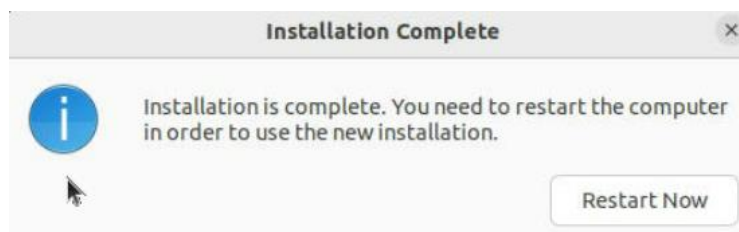


- h. When the screen shows that “Install complete!”, press “**Reboot Now**” directly.

Ubuntu server:



Ubuntu desktop:



- i. When you restart to enter the **Ubuntu desktop** version, press “**ESC**” immediately. Then please select “**Advanced options for Ubuntu**”. Otherwise, please ignore this step.

```
Ubuntu
*Advanced options for Ubuntu
```

Note : If there are two versions of the kernel, please select a lower version.

```
Ubuntu, with Linux 5.19.0-41-generic
Ubuntu, with Linux 5.19.0-41-generic (recovery mode)
*Ubuntu, with Linux 5.19.0-21-generic
Ubuntu, with Linux 5.19.0-21-generic (recovery mode)
```

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

k. Restart to enter the system, please connect to the internet:

01. use “**apt-get update**” to retrieve new lists of ubuntu packages

```
root@test-desktop:/home/test/Documents# apt-get update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [107 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security/main i386 Packages [153 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [367 kB]
Get:5 http://us.archive.ubuntu.com/ubuntu focal-updates InRelease [111 kB]
Get:6 http://us.archive.ubuntu.com/ubuntu focal-backports InRelease [98.3 kB]
```

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

RR3700 Series: <https://www.highpoint-tech.com/rr3700-overview>

RR2800 Series: <https://www.highpoint-tech.com/rr2800-overview>

RR800 Series: <https://www.highpoint-tech.com/rr800-overview>

Rocket 700 Series: <https://www.highpoint-tech.com/rocket700-series>

Extract driver package:

tar zxvf RR37xx_8xx_28xx_Linux_X86_64_Src_vx.xx.xx_xx_xx_xx.tar.gz

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

sh rr37xx_8xx_28xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin or

./ rr37xx_8xx_28xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin

```
root@test:/home# ./rr37xx_8xx_28xx_linux_x86_64_src_v1.23.13_23_01_16.bin
Verifying archive integrity... All good.
Uncompressing RR3740A/840A 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)
```

1. Follow the prompts to complete the driver installation.

```
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.service.

SUCCESS: Driver rr3740a 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 hptuninrr3740a to uninstall the driver files.
```

- m. 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/rr3740a/`. 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/rr3740a/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**

```
Ubuntu
*Advanced options for Ubuntu
UEFI Firmware Settings
```

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

```
Ubuntu, with Linux 5.19.0-41-generic
Ubuntu, with Linux 5.19.0-41-generic (recovery mode)
*Ubuntu, with Linux 5.19.0-21-generic
Ubuntu, with Linux 5.19.0-21-generic (recovery mode)
```

Install Linux Opensource driver.

RR3700 Series: <https://www.highpoint-tech.com/rr3700-overview>

RR2800 Series: <https://www.highpoint-tech.com/rr2800-overview>

RR800 Series: <https://www.highpoint-tech.com/rr800-overview>

Rocket 700 Series: <https://www.highpoint-tech.com/rocket700-series>

**sh rr37xx_8xx_28xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin or
rr37xx_8xx_28xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin**

```
root@test:/home# ./rr37xx_8xx_28xx_linux_x86_64_src_v1.23.13_23_01_16.bin
Verifying archive integrity... All good.
Uncompressing RR3740A/840A 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)

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.service.

SUCCESS: Driver rr3740a 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 hptuninrr3740a to uninstall the driver files.
```

6 Rebuilding Driver Module for System Update

When the system updates the kernel packages, the driver module rr3740a.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 RR840/RR2840/RR3720/RR3740/RR3742 controllers can support RAID0/1/10/5/50

The R710/R720 controllers can support RAID0/RAID1/RAID10

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.