

HighPoint RR2720A

RAID Controller

Linux Debian

Installation Guide

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Table of Contents

1 Overview	1
2 Installing Linux Debian on RR2720A RAID controller.....	1
Step 1 Prepare Your Hardware for Installation.....	1
Step 2 Check System EFI Settings.....	1
Step 3 Flash UEFI Rom to RAID Controller	3
Step 4 Create Array	4
Step 5 Prepare the Driver Diskette.....	5
Step 6 Install Linux Debian.....	5
3 Installing RAID Management Software.....	9
4 Troubleshooting.....	9
5 Rebuilding Driver Module for System Update	10
6 Appendix A	10

1 Overview

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

✧ Supported system: Debian 10.1/10.2/10.3/10.4/10.5/10.6/10.7/10.8/10.9/11.3/
11.4/11.5/11.6

✧ Supported controller: RR2720A

2 Installing Linux Debian on RR2720A RAID controller

If you would like to install Linux Debian onto drives attached to RR2720A 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.

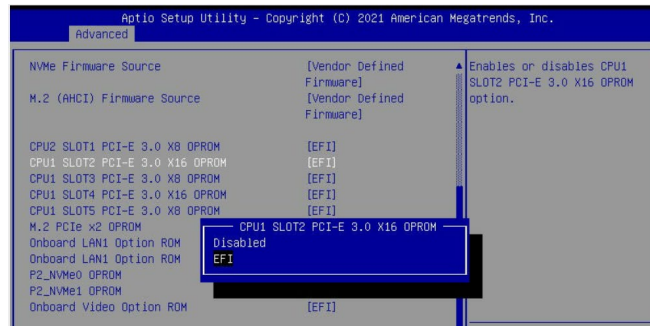
Note

RAID Controller support EFI boot. If you have other SCSI adapters installed, you must make sure the RR2720A 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.

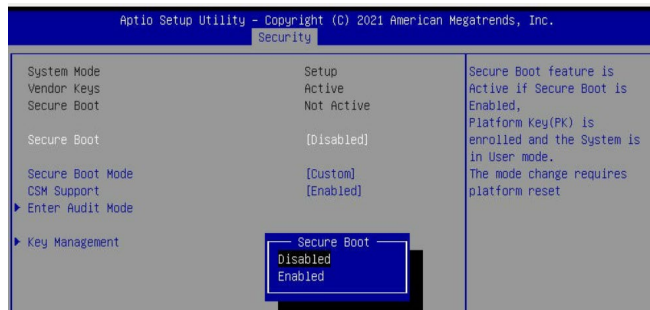
Step 2 Check System EFI Settings

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 OPRM**" 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 OPRM" to "EFI";



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

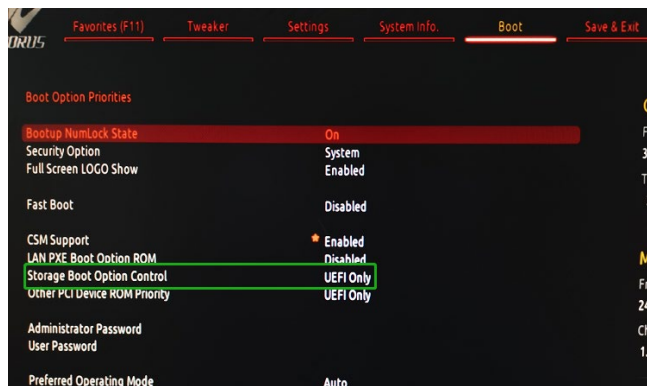


2. Set UEFI setting with GA-X570 AORUS MASTER motherboard as an example.

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

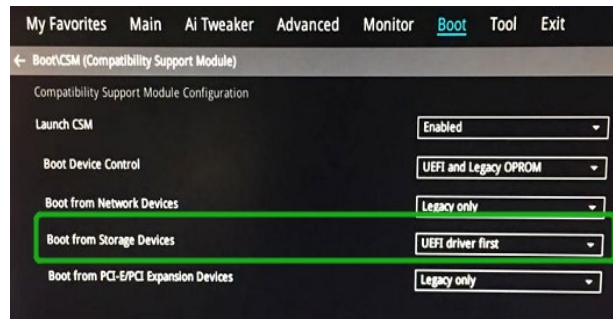


- b. And "Boot-> Storage Boot Option Control" to "UEFI Only";

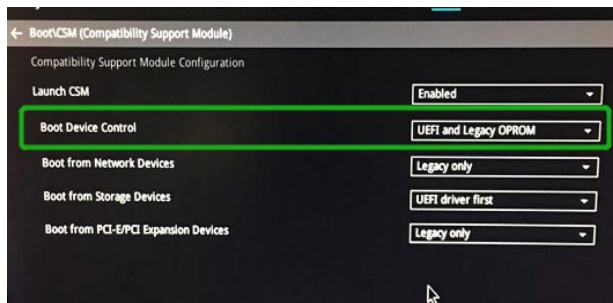


3. Set UEFI setting with ASUS PRIME X299 -DELUXE motherboard as an example:

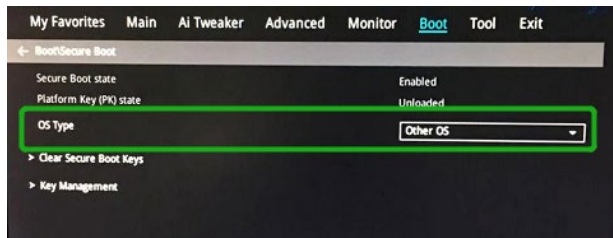
- a. Set "Boot from Storage Devices" to "UEFI driver first";



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



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

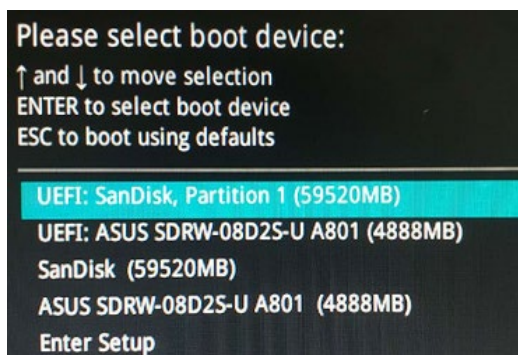


Step 3 Flash UEFI Rom to RAID Controller

For Example RR2720A:

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

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

Flashing Success (total retry 0)

Verifying ....

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:

```
FS0:\> ArrayCreate.efi
Highpoint RAID utility for UEFI (version: 20211022)
==== Controller information:
  PCI Location: 46:00:00
    Vendor: HighPoint Technologies, Inc.
    Product: RocketRAID 272x Controller

==== Physical device list(count 2 of 2):
1/1 Samsung SSD 850 PRO 256GB-S25UNX0H609774X, 255953MB(MaxFree 255953MB), Normal [WC]
1/3 OCZ-AGILITY3-OCZ-I1A2312FL8HEN2B2, 59928MB(MaxFree 59928MB), 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):
1/1 Samsung SSD 850 PRO 256GB-S25UNX0H609774X, 255953MB(MaxFree 196024MB), Normal [WC]
1/3 OCZ-AGILITY3-OCZ-I1A2312FL8HEW2B2, 59928MB(MaxFree 0MB), Normal [WC]

==== Logical device list(count 1 of 1):
1 [VD0-0] RAID0_000041A7 (RAID0), 119856MB (Stripe 64KB), Normal
1/1 Samsung SSD 850 PRO 256GB
1/3 OCZ-AGILITY3
=====

>>> Please specify command to execute:
<<< _
```

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

Step 5 Prepare the Driver Diskette

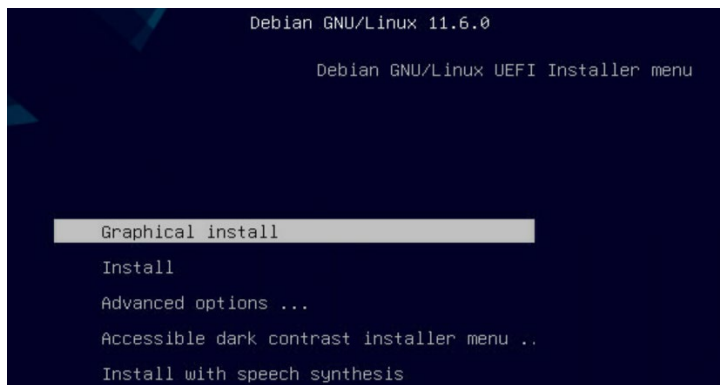
The directory named hptdd can be created in the USB flash drive and the driver **RR3740a** **_debian_11.6.0_x86_64_vx.x.x_xx_xx_xx.tar.gz** can be extracted in the hptdd directory. It will look like:

```
root@debian:/home# tar zxvf RR272x_1x_debian11.6_x86_64_v1.10.19_23_02_27.tar.gz
boot/
boot/rr272x_1x5.10.0-20-amd64x86_64.ko.gz
install.sh
postinst2.sh
postinst.sh
preinst.sh
readme.txt
```

Step 6 Install Linux Debian

For Example: Debian11.6

- 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, press “Graphical Install” to start

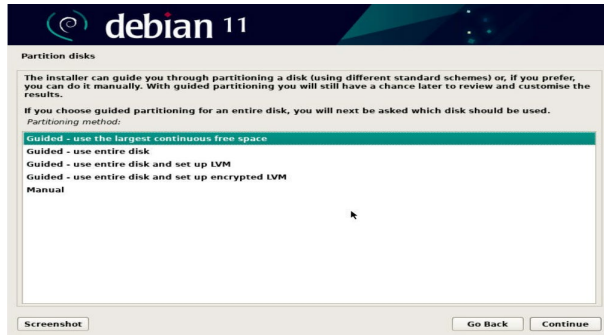


```
Debian GNU/Linux 11.6.0

Debian GNU/Linux UEFI Installer menu

Graphical install
Install
Advanced options ...
Accessible dark contrast installer menu ..
Install with speech synthesis
```

- e. When the following window appears during the installation process,



Press "**Ctrl+ALT+F2**" to switch to the shell on console 2, and then execute following commands to copy the driver contents:

```
# mkdir /hptdd ← Create mount point for USB flash drive
# mount /dev/sda1 /hptdd/ ← Mount the USB flash drive to /hptdd
# cp -a /hptdd/hptdd /tmp/ ← Copy driver installation file to system temporary
                             directory
# umount /hptdd ← Umount the USB flash drive
```

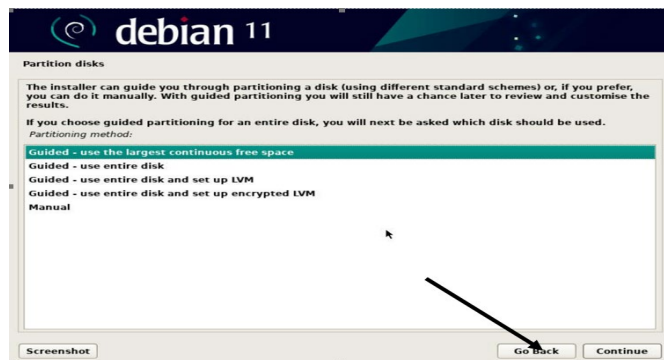
```
:~# mkdir /hptdd
:~# mount /dev/sda1 /hptdd/
:~# cp -a /hptdd/hptdd /tmp/
:~# umount /hptdd/
:~#
```

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 Debian.

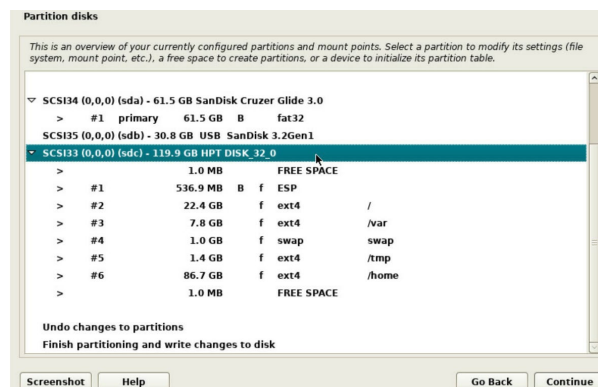
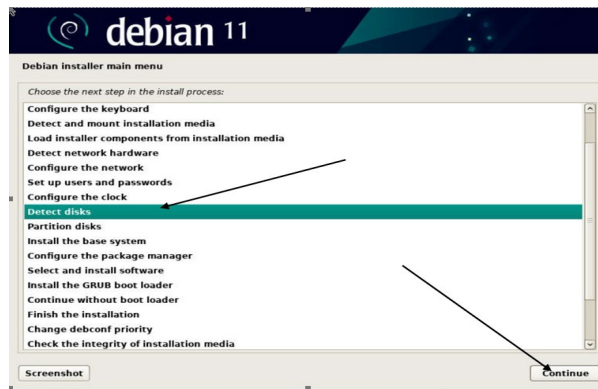
```
# sh /tmp/hptdd/preinst.sh ← Load driver.
```

```
:~# sh /tmp/hptdd/preinst.sh
This step succeeded!
```

- f. Then press "**ALT+F5**" to switch back to installation screen and continue the installation as usual.
- g. Now click the "**Go Back**" button to detect the disk.



- h. Now click the “**Detect disks**” button and “**Continue**” to detect the disk.



- i. When the screen shows that “**Finish the installation**”.



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

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

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

```
# sh /tmp/hptdd/postinst.sh
/
Running in chroot, ignoring request.
Running in chroot, ignoring request.
Generating grub configuration file ...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-5.10.0-20-and64
Found initrd image: /boot/initrd.img-5.10.0-20-and64
Warning: os-prober will be executed to detect other bootable partitions.
Its output will be used to detect bootable binaries on them and create new boot entries.
done
We have completed the driver installation.
```

- j. Press “**ALT+F5**” to switch back to installation screen and **finish the installation**.
- k. If you want to boot from another kernel, please install the RR2700 Series opensource driver after entering the system.
- l. Restart to enter the system, **please connect to the internet**:

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

RR2720A Series: <https://www.highpoint-tech.com/rr272x-overview>

- 02. Please execute the following command before installing the driver

```
# umount /dev/sda1
```

```
# mount /dev/sda1 /media/cdrom
```

***Note:** sda1 is Bootable USB drive, the default repository path is cdrom, so we need to adjust the ISO image mount path to /mnt/cdrom*

```
# apt install gcc
```

```
# apt install make
```

```
# apt install linux-headers-$(uname -r)
```

- 03. Extract driver package:

```
tar zxvf RR272x_1x_Linux_X86_64_Src_vx.x.x_xx_xx_xx.tar.gz
```

- 04. 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@debian:/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 ...
Found program make (/usr/bin/make)
Found program gcc (/usr/bin/gcc)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
```

- m. 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 rr272x_1x is installed successfully for kernel 5.10.0-20-amd64.
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@debian:/home#
```

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

3 Installing RAID Management Software

HighPoint RAID Management Software is used to configure and keep track of your hard disks and RAID arrays attached to RR2720A RAID Controller. Installation of the management software is optional but recommended.

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

4 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 Debian**” and press **Enter**

```
Debian GNU/Linux
*Advanced options for Debian GNU/Linux
FreeDOS (on /dev/sda1)
UEFI Firmware Settings
```

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

```
GNU GRUB version 2.06-3~deb11u5

*Debian GNU/Linux, with Linux 5.10.0-20-amd64
Debian GNU/Linux, with Linux 5.10.0-20-amd64 (recovery mode)
```

Install Linux Opensource driver.

RR2720A Series: <https://www.highpoint-tech.com/rr272x-overview>

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

```
root@debian:/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 ...
Found program make (/usr/bin/make)
Found program gcc (/usr/bin/gcc)
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 rr272x_1x is installed successfully for kernel 5.10.0-20-amd64.
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@debian:/home#
```

5 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 RR2720A RAID Controller opensource package on how to build and install the driver module.

6 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.