RR640L/620L Controller

Linux Debian

Installation Guide

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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: Debian10.1/10.2/10.3/10.4/10.5/10.6/10.7/10.8/10.9/11.3/ 11.4/11.5/11.6

✧ Supported controller: RR640L/620L

2 Installing Linux Debian on RR Series RAID controller

If you would like to install Linux Debian 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 Controller is connected to motherboard CPU1 Slot 2 PCI-E X16, then you should set "CPU1 Slot 2 PCI-E X16 OPROM" to "EFI";
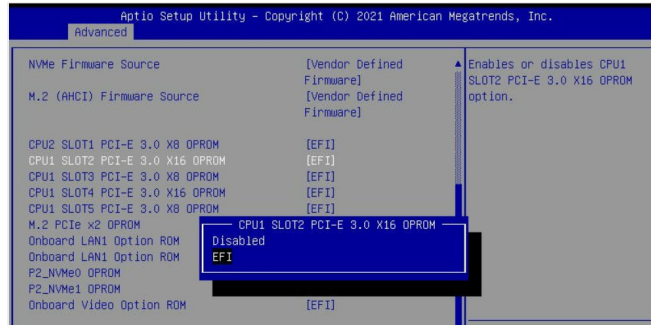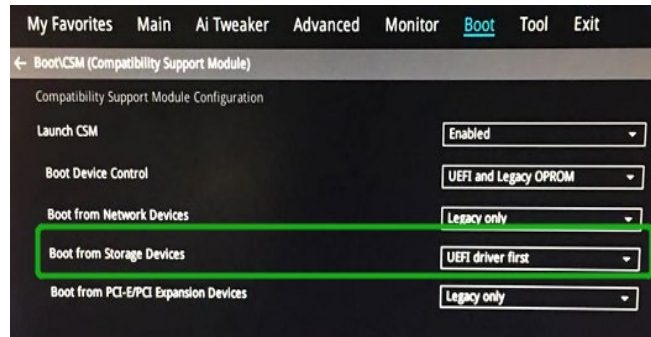
b.   Disable "Secure Boot", set "Attempt Secure Boot" to "Disabled".
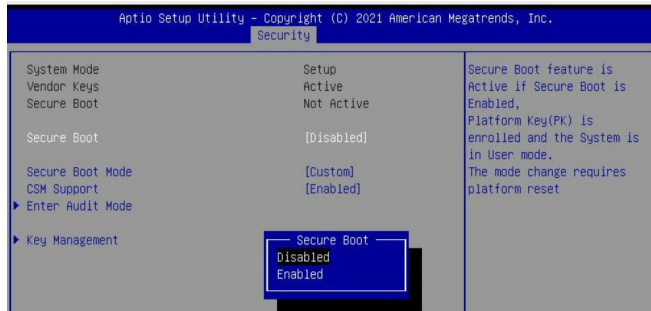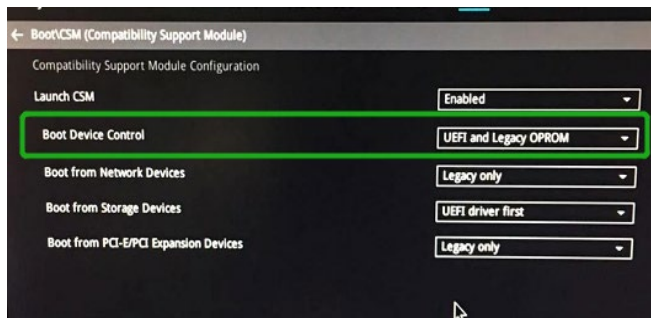

2. Set UEFI setting with ASUS PRIME X299 -DELUXE motherboard as an example:

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".
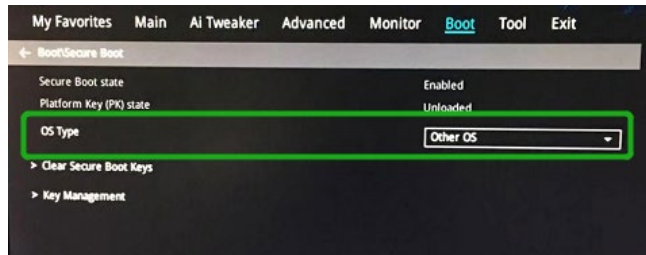
Step 3 Flash UEFI Rom to RR Series RAID Controller

For Example RR640L：

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

a. Unzip RR640L 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 "rr640l.nsh", flash UEFI rom to RR640L Controller and reboot;

For RR620L:

Command with "go.nsh", flash UEFI rom to RR620L Controller and reboot:
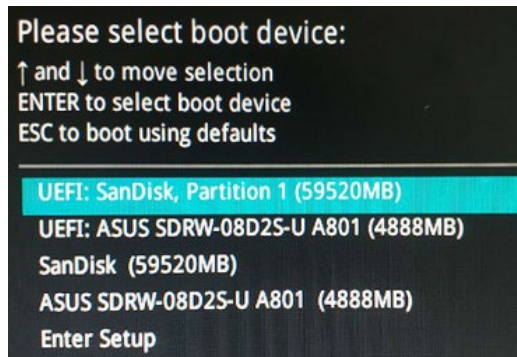
```
FS0:\> go.nsh
FS0:\> load.efi 620luefi.blf /a /f
Load Utility for Flash EPROM v1.1.5
 (built at Mar 27 2023 15:19:46)

Set flash size to 256K
Found adapter 0x6411103 at PCI 177:0:0
Offset address 0x0
EPROM Vendor: WINBOND W25X40BV
Erasing ........Succeeded
Flashing ....

Flashing Success (total retry 0)

Verifing ....

Passed !
FS0:\> _
```

Step 4 Create Array

a.   Attach three hard disks to RR640L 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: 20211014)
==== Controller information:
  PCI Location: c1:00:00
        Vendor: HighPoint Technologies, Inc.
       Product: RocketRAID 3720 SAS Controller

==== Physical device list(count 3):
1/1 WDC WUH722020BL5204-8LG2YNHA, 20000521MB(MaxFree 20000521MB), Normal [RA][WC]
1/2 WDC WUH722222AL5200-2TG0RM7E, 22000902MB(MaxFree 22000902MB), Normal [RA][WC]
1/3 WDC WUH722222AL5200-2TG0R8GE, 22000902MB(MaxFree 22000902MB), Normal [RA][WC]

==== 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 3):
1/1 WDC WUH722020BL5204-8LG2YNHA, 20000521MB(MaxFree 0MB), Normal [RA][WC]
1/2 WDC WUH722222AL5200-2TG0RM7E, 22000902MB(MaxFree 2000381MB), Normal [RA][WC]
1/3 WDC WUH722222AL5200-2TG0R8GE, 22000902MB(MaxFree 2000381MB), Normal [RA][WC]

==== Logical device list(count 1):
 1 [VD0-0] RAID0_000041A7 (RAID0), 60001565MB (Stripe 64KB), Normal
      1/1 WDC WUH722020BL5204
      1/2 WDC WUH722222AL5200
      1/3 WDC WUH722222AL5200
----------------------------------------------------------------
>>> Please specify command to execute:
<<<
```

    e.   Command "exit";

    f.   For more command usages, refer to Appendix A.

Step 5 Prepare the Driver Diskette

Extract **RR640l_debian_11.6.0_x86_64_vx.x.x_xx_xx_xx.tar.gz** to top (/) directory of an USB flash drive. It will look like:
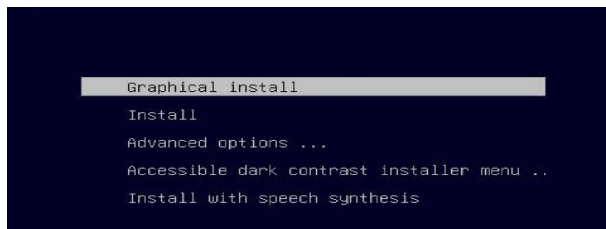
```
root@debian:/home/test# tar zxvf RR640l_debian11.6_x86_64_v1.6.7_23_02_27.tar.gz
boot/
boot/rr640l5.10.0-20-amd64x86_64.ko.gz
install.sh
postinst2.sh
postinst.sh
preinst.sh
readme.txt
root@debian:/home/test#
```

Step 6 Install Linux Debian

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 Bootable USB drive to the target system.

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

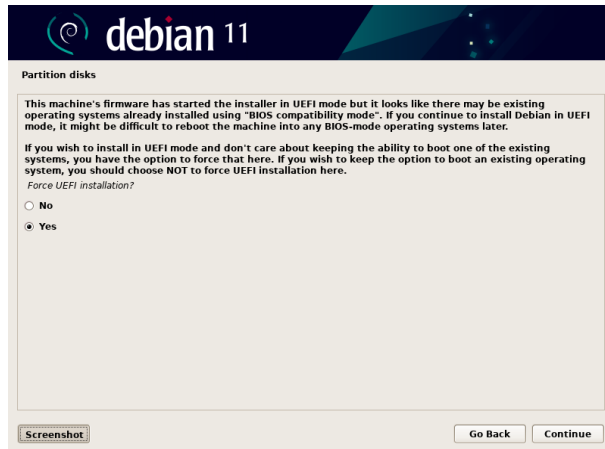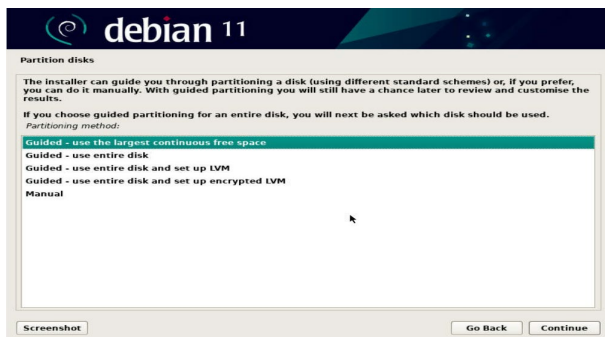d.   When the Installation screen appears, press '**Graphical Install**' to start.

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

e.   When the following window appears, if your motherboard is in UEFI mode, click YES

f. When the following window appears during the installation process,

Press **"Ctrl+ALT+F2"** to switch to the shell on console 2, and the 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 /tmp/ ← Copy driver installation file to system temporary
              directory

 # umount /hptdd   ← Unmount 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.
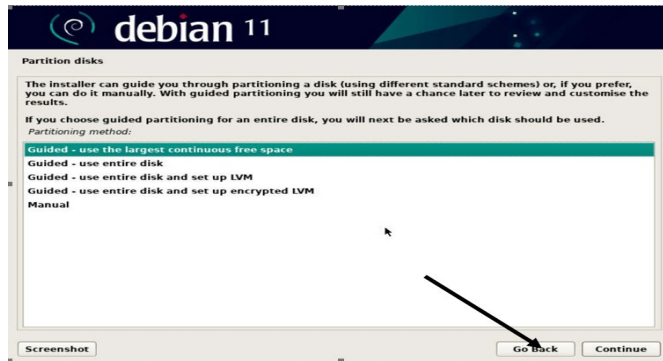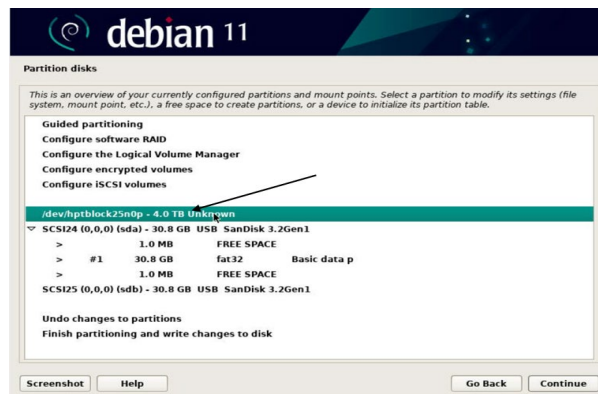
 # sh /tmp/hptdd/preinst.sh   ← Load driver.
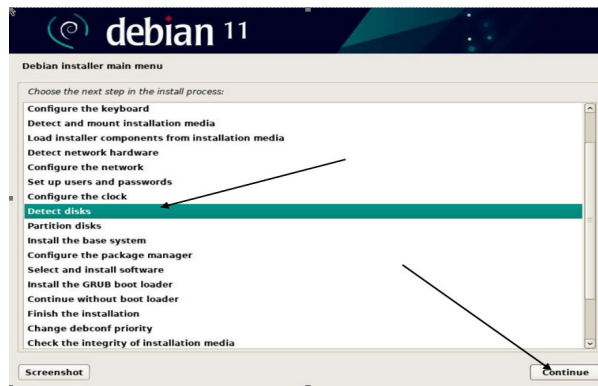
```
:~# sh /tmp/hptdd/preinst.sh
This step succeeded!
```
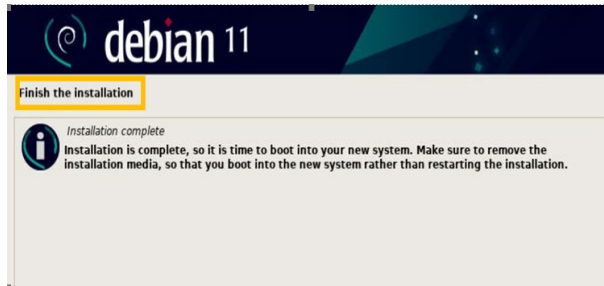
g. Then press **"Ctrl+ALT+F5"** to switch back to installation screen and continue the installation as usual**.**

h. Now click the "**Go Back**" button to detect the disk.

i. Now click the "**Detect disks**" button and "**Continue**" to detect the disk.

j. When the screen shows that "**Finish the installation**".

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

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

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

k. Press **"Ctrl+ALT+F5"** to switch back to installation screen and **finish the installation**.

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

m. 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:

RR620L/640L Series: https://www.highpoint-tech.com/rr600-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 RR64xx_Linux_X86_64_Src_vx.xx.xx_xx_xx_xx.tar.gz

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

sh rr64xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin or

./ rr64xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin

```
root@debian:/home# tar zxvf RR600l_Linux_X86_64_Src_v1.7.0_23_03_21.tar.gz
rr64xl-linux_x86_64_src_v1.7.0_23_03_21.bin
README
root@debian:/home# ./rr64xl-linux_x86_64_src_v1.7.0_23_03_21.bin
Verifying archive integrity... All good.
Uncompressing RR64xL 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)
Generating grub configuration file ...
```

n. Follow the prompts to complete the driver installation.

```
Executing: /lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1

SUCCESS: Driver rr640l is installed successfully for kernel 5.10.0-18-amd64.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninrr640l
to uninstall the driver files.
```

o. 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 RR Series 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.

a. Select the default (kernel: 5.10.0-20-amd64) and enter the system.

```
Loading Linux 5.10.0-20-amd64 ...
Loading initial ramdisk ...
```
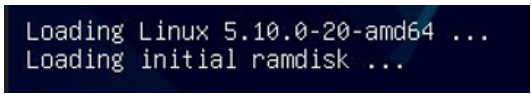
b. Install Linux Opensource driver.

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

RR620L/640L Series: https://www.highpoint-tech.com/rr600-overview

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

sh rr64xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin or

./ rr64xx_linux_x86_64_src_vxx.x.x_xx_xx_xx.bin

```
root@debian:/home# tar zxvf RR600l_Linux_X86_64_Src_v1.7.0_23_03_21.tar.gz
rr64xl-linux_x86_64_src_v1.7.0_23_03_21.bin
README
root@debian:/home# ./rr64xl-linux_x86_64_src_v1.7.0_23_03_21.bin
Verifying archive integrity... All good.
Uncompressing RR64xL 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)
Generating grub configuration file ...
```

d. 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

SUCCESS: Driver rr640l is installed successfully for kernel 5.10.0-20-amd64.
Driver rr640l is installed successfully for kernel 5.10.0-21-amd64.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninrr640l to uninstall the driver files.
root@debian:/home#
```

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

5 Rebuilding Driver Module for System Update

When the system updates the kernel packages, the driver module rr640l.ko should be built and installed manually before reboot.

Please refer to the README file distributed with RR Series 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) Member Disk list (1/1, 1/2|*) Capacity
  (100|*)

  Note:

  The RR640L controllers can support RAID0/1/10/5

  The 620Lcontrollers can support RAID0/1

  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.

- **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.