RR3700/2800/800/R700 Controller Linux Debian Installation Guide

Copyright © 2023 HighPoint Technologies, Inc.

All rights reserved.

Last updated on March 17, 2023

Table of Contents

1 Overview	1
2 Installing Linux Debian on RR Series RAID controller	1
Step 1 Prepare Your Hardware for Installation	1
Step 2 Check System EFI Settings	1
Step 3 Flash UEFI Rom to RR Series RAID Controller	3
Step 4 Create Array	4
Step 5 Prepare the Driver Diskette	4
Step 6 Install Linux Debian	5
3 Installing RAID Management Software	8
4 Troubleshooting	8
5 Rebuilding Driver Module for System Update	9
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.

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";

NVMe Firmware Source	[Vendor Defined Firmware]	Enables or disables CPU1 SLOT2 PCI-E 3.0 X16 OPROM
M.2 (AHCI) Firmware Source	[Vendor Defined Firmware]	option.
CPU2 SLOT1 PCI-E 3.0 X8 OPROM	[EF 1]	
CPU1 SLOT3 PCI-E 3.0 X8 OPROM	[EFI]	
CPU1 SLOT4 PCI-E 3.0 X16 OPROM	[EFI]	
CPU1 SLOTS PCI-E 3.0 X8 OPROM	[EFI]	
M.2 PCIe x2 OPROM Onboard LAN1 Option ROM Onboard LAN1 Option ROM P2.NVMe0 OPROM	1 SLOT2 PCI-E 3.0 X16 OPROM d	
P2_NVMe1_OPROM		
Onboard Video Option ROM	[EFI]	

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

System Mode	Setup	Secure Boot feature is
Vendor Keys	Active	Active if Secure Boot is
Secure Boot	Not Active	Enabled, Platform Key(PK) is
		enrolled and the System is in User mode.
Secure Boot Mode	[Custom]	The mode change requires
CSM Support	[Enabled]	platform reset
Enter Audit Mode		
Key Management	Secure Boot	

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

Advanced	Monitor	Boot	Tool	Exit	
			1.		
	[Enabled			•
	[UEFI and Lo	egacy OPR	DM	•
	(Legacy only			-
	[UEFI driver	first		•
	[Legacy only			•
] 	Lesacy only UEFI driver	UEFI and Legacy OPR Legacy only UEFI driver first	UEFI and Legacy OPROM Legacy only UEFI driver first

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

Boot\CSM (Compatibility Support Module) Compatibility Support Module Configuration	
Launch CSM	Enabled
Boot Device Control	UEFI and Legacy OPROM -
Boot from Network Devices	Legacy only 🗸
Boot from Storage Devices	UEFI driver first 🛛 👻
Boot from PCI-E/PCI Expansion Devices	Legacy only 👻

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



Step 3 Flash UEFI Rom to RR Series 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;

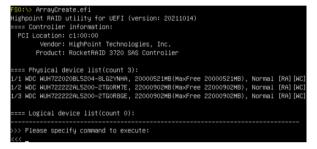
```
FSO:\> rr3720.nsh
FSO:\> load.efi 3720all.blf
Load Utility for Flash EPROM v1.1.5
(built at Jul 18 2022 15:07:51)
Set flash size to 231K
Found adapter 0x37201103 at PCI 193:0:0
Offset address 0x0
EPROM Vendor: WINBOND W25X40BV
Erasing .....Suceeded
Flashing ....
Flashing Success (total retry 0)
Verifing ....
Passed !
```

Step 4 Create Array

- a. Attach three hard disks to RR3720C Controller;
- b. Boot, enter the motherboard's Boot List and select start from UEFI USB flash:



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



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

	ating array: RAIDO_000041A7. ay created successfully.	
====	nysical device list(count 3):	
/1 W	WUH722020BL5204-8LG2YNHA, 20000521MB(MaxFree OMB), Normal [RA] [WC]
/2 W	WUH722222AL5200-2TGORM7E, 22000902MB(MaxFree 2000381MB), Norm	al [RA] [WC
/3 W	WUH722222AL5200-2TGOR8GE, 22000902MB(MaxFree 2000381MB), Norm	al [RA][WC
	gical device list(count 1):	
1 [V	0-0] RAIDO_000041A7 (RAIDO), 60001565MB (Stripe 64KB), Normal	
1	WDC WUH722020BL5204	
1	NDC WUH722222AL5200	
	WDC WUH722222AL5200	

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

RR3740/3720/710/720 also supports the creation method of BIOS/UEFI HII. Please refer to UM-Chapter 4

Step 5 Prepare the Driver Diskette

Extract RR3740a_debian_11.6.0_x86_64_vx.x.x_xx_xx_tar.gz to top (/) directory of

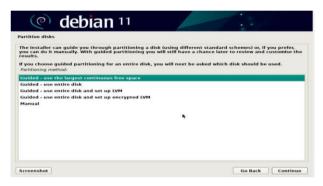
an USB flash drive. It will look like: root@debian:/home/test/Documents# tar zxvf RR37xx_8xx_28xx_Debian11.6_x86_64_v1.23.13_23_02_27.tar.gz hptdd/ hptdd/postinst.sh hptdd/boot/ hptdd/boot/ hptdd/boot/r3740a5.10.0-20-amd64x86_64.ko.gz hptdd/hptblock hptdd/60-persistent-storage-hptblock.rules hptdd/preadme.txt

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			
Accessibl	e dark con	trast in	staller	menu .
Install w	ith speech	synthes	is	

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



umount /hptdd/

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	\leftarrow Create mount point for USB flash drive
# mount /dev/sda1 /hptdd/	\leftarrow Mount the USB flash drive to /hptdd
# cp -a /hptdd/hptdd /tmp/	← Copy driver installation file to system temporary directory
# umount /hptdd	\leftarrow Unmount the USB flash drive
:~# mkdir /hptdd :~# mount /dev/sdal /hptdd/ :~# cp -a /hptdd/hptdd/ /tmp	1

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 \leftarrow Load driver.



- f. Then press "Ctrl+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.

	(e) debian 11
	Partition disks
	The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results. If you choose guided partitioning for an entire disk, you will next be asked which disk should be used. <i>Particioning method</i> :
	Guided - use the largest continuous free space
	Guided - use entire disk
ě.	Guided - use entire disk and set up LVM
	Guided - use entire disk and set up encrypted LVM Manual
	*
	Screenshot Go Back Continue

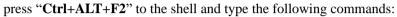
h. Now click the "Detect disks" button and "Continue" to detect the disk.

Debian installer main menu	
Choose the next step in the install process:	
Configure the keyboard	A
Detect and mount installation media	
Load installer components from installation media	
Detect network hardware	
Configure the network	
Set up users and passwords	
Configure the clock	
Detect disks	
Partition disks	=
Install the base system	
Configure the package manager	
Select and install software	
Install the GRUB boot loader	、 II
Continue without boot loader	
Finish the installation	
Change debconf priority	
Check the integrity of installation media	



i. When the screen shows that "Finish the installation".





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

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



- j. Press "Ctrl+ALT+F5" to switch back to installation screen and finish the installation.
- k. If you want to boot from another kernel, please install the RR3700 Series opensource driver after entering the system.
- **I.** 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:

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

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 RR37xx_8xx_28xx_Linux_X86_64_Src_vx.xx.xx_xx_xx_tar.gz

04. 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_st.bin

root@debian:/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 ...
Found program make (/usr/bin/make)
Found program gcc (/usr/bin/gcc)
Found program wget (/usr/bin/perl)
Found program wget (/usr/bin/wget)

m. 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
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 5.10.0-20-amd64.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninrr3740a
to uninstall the driver files.
```

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 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:

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

Run the .bin file to install the driver package.

sh rr37xx_8xx_28xx_linux_x86_64_src_vxx.x.x_xx_xx_st.bin or

/rr37xx_8xx_28xx_linux_x86_64_src_vxx.x.x_xx_xx_bin

root@debian:/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 ...
Found program make (/usr/bin/make)
Found program gcc (/usr/bin/gcc)
Found program wget (/usr/bin/perl)
Found program wget (/usr/bin/wget)

d. 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

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 5.10.0-20-amd64.

Please restart the system for the driver to take effect.

If you want to uninstall the driver from the computer, please run hptuninrr3740a

to uninstall the driver files.
```

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 rr3740a.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 (RAID0/1/10/5/50) 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.