Revision History

Date	Internal Ver	Official Ver	Editor	HPT_U	FAE	MCM	Description
2023/3/22	V0.10	V1.00	YYC				Init version

HighPoint RR3700/2800/800/R700

RAID Controller

Linux CentOS

Installation Guide

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1 Overview

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

✧ Supported system: CentOS7.0/7.1/7.2/7.3/7.4/7.5/7.6/7.7/7.8/7.9/8.0/8.1

✧ Supported controller: RR3740/3720/2840/840/3742/710/720

2 Installing Linux CentOS on RR Series RAID controller

If you would like to install Linux CentOS 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";
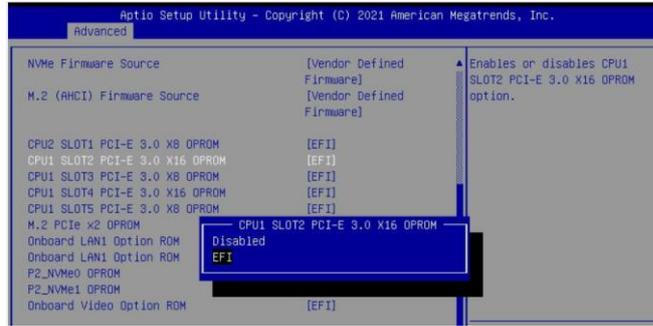
b.   Disable "Secure Boot", set "Attempt Secure Boot" to "Disabled".
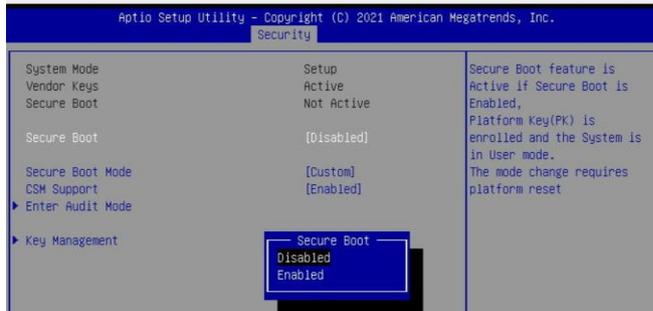
2. Set UEFI setting with GA-X570 AORUS MASTER motherboard as an example.
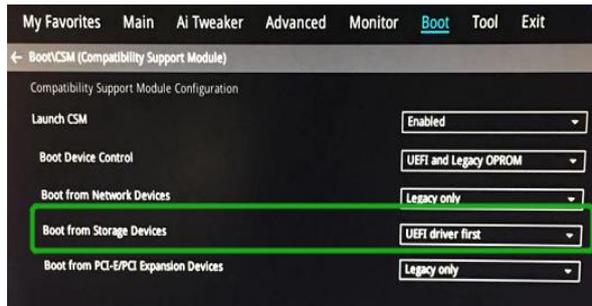
a.   Set " Boot->CSM Support " to "Enabled";

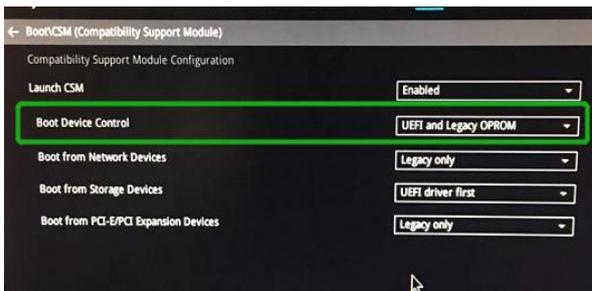b.   And" Boot-> Storage Boot Option Control " to "UEFI Only";

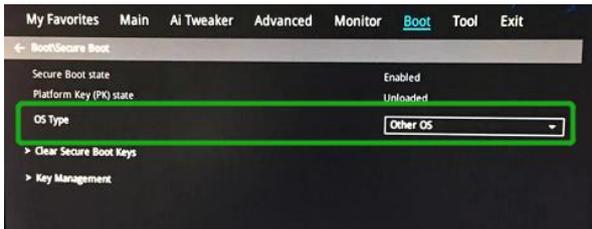3. Set UEFI setting with ASUS PRIME X299 -DELUXE motherboard as an example:
   a. Set "Boot from Storage Devices" to "UEFI driver first";

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

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

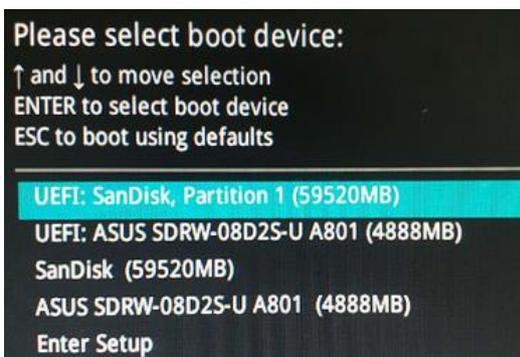## Step 3 Flash UEFI Rom to RAID Controller

For Example RR3740C：

For other products, please refer to: Update BIOS_ UEFI ROM

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

   a. Unzip RR3740C 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 "rr3740.nsh", flash UEFI rom to RR3740C Controller and reboot;

Step 4 Create Array

a. Attach two hard disks to RR3740C 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.

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

RR3742/3720/710/720/2840/840 also supports the creation method of BIOS/UEFI HII. Please refer to UM-Chapter 4

Step 5 Prepare the Driver Diskette

Extract **RR37xx_8xx_28xx_centosxxx.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@localhost home]# tar zxvf RR37xx_8xx_28xx_centos8.1_x86_64_v1.23.13_23_03_
15.tar.gz
hptdd/
hptdd/modules.pcimap
hptdd/modules.alias
hptdd/install.sh
hptdd/modinfo
hptdd/pcitable
hptdd/modules.cgz
hptdd/rhel-install-step1.sh
hptdd/modules.dep
hptdd/rhel-install-step2.sh
hptdd/rhdd
hptdd/pci.ids
hptdd/readme.txt
[root@localhost home]#
```

Step 6 Install CentOS

For Example：CentOS8.1

a. Insert the USB flash drive to the target system.
b. Booting from Bootable USB drive (EFI mode).
c. When the following window appears during the installation process,
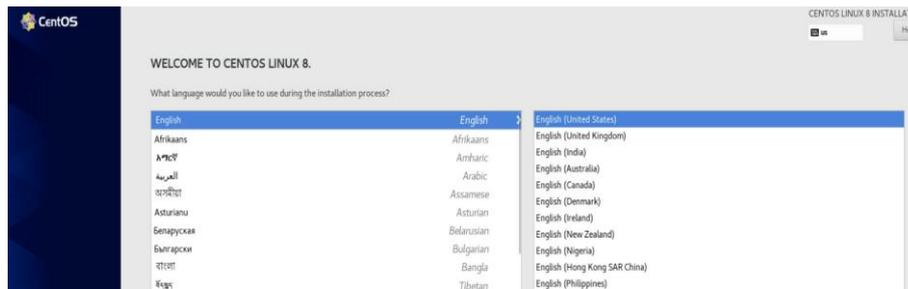
Press **Ctrl+ALT+F2** to switch to the shell on console and press **Enter** to activate this console.

```
CentOS Linux 8 (Core)
Kernel 4.18.0-147.el8.x86_64 on an x86_64

[anaconda root@localhost /]#
```

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 /dev/sda1   ← Unmount the USB flash drive

```
[anaconda root@localhost /]# mkdir /hptdd
[anaconda root@localhost /]# mount /dev/sda1 /hptdd/
[anaconda root@localhost /]# cp -a /hptdd/hptdd/ /tmp/
[anaconda root@localhost /]# umount /dev/sda1
```

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 CentOS.

 # sh /tmp/hptdd/rhel-install-step1.sh   ← Load RR3740C driver.

you need to type the following commands to restart the installation program, otherwise the disk connected the RR Series will not be recognized by the installation program:

 # restart-anaconda   ←restart the installation program

```
[anaconda root@localhost /]# sh /tmp/hptdd/rhel-install-step1.sh
Driver Installation
Driver installation step 1 completed.
[anaconda root@localhost /]# restart-anaconda _
```

d. Then You will be returned to the installation process**.**
e. When the following window appears during the installation process,

LOCALIZATION	SOFTWARE	SYSTEM
Keyboard English (US)	**Installation Source** Local media	**Installation Destination** No disks selected
Language Support English (United States)	**Software Selection** Server with GUI	**KDUMP** Kdump is enabled
Time & Date Americas/New York timezone		**Network & Host Name** Not connected
		Security Policy No content found
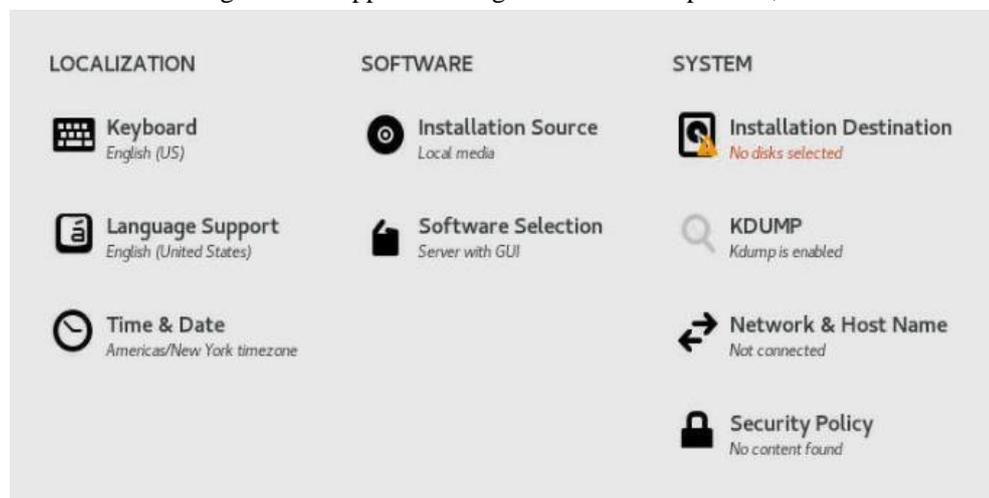
1) Set **Software Selection** and choose **Server with GUI→Development Tools**
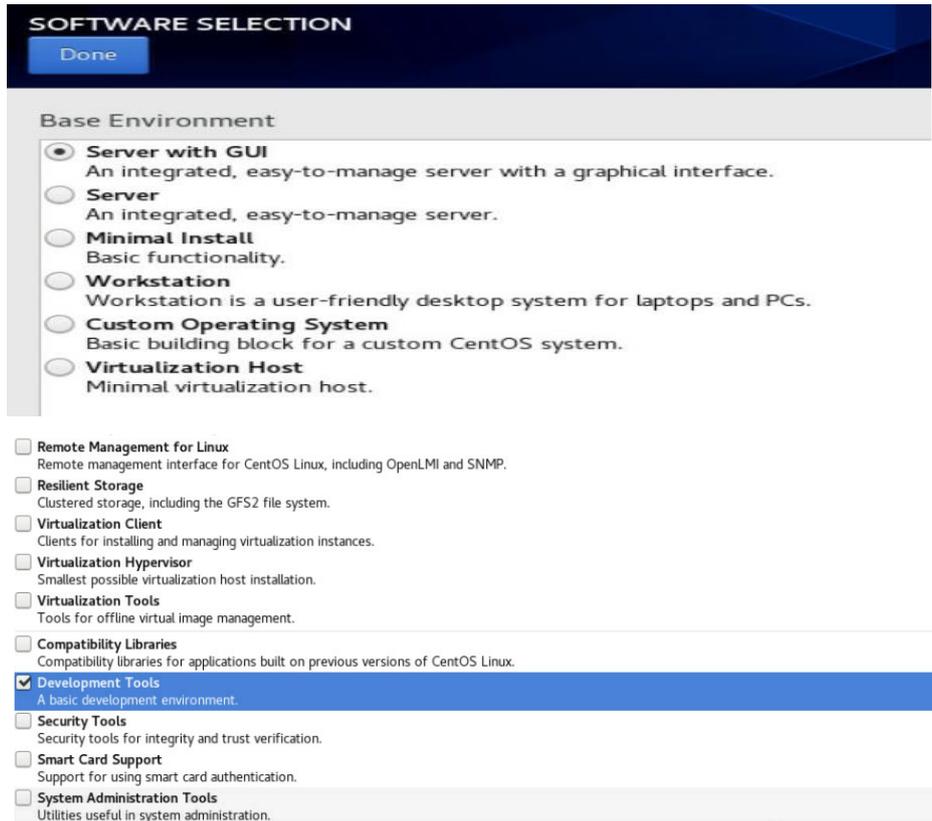
2) Select Installation Destination
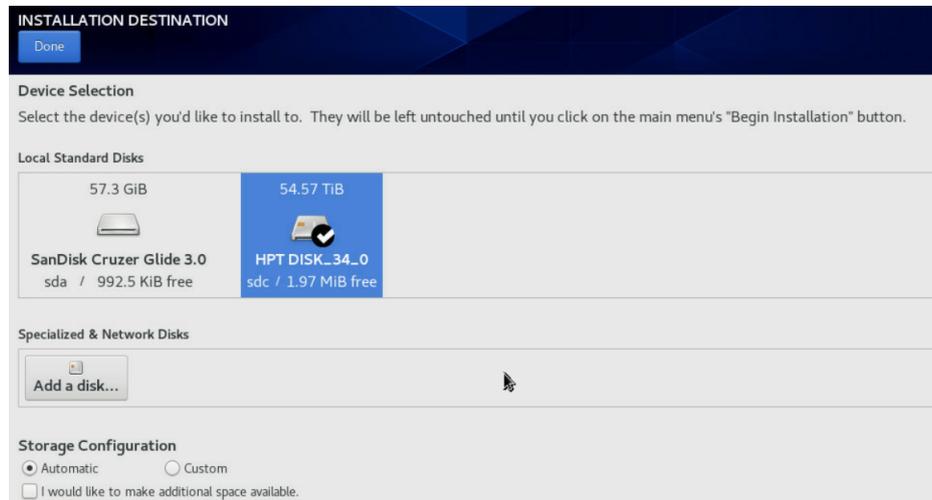
then choose your own disk and begin installation.

f.   When the screen shows that "Complete!".
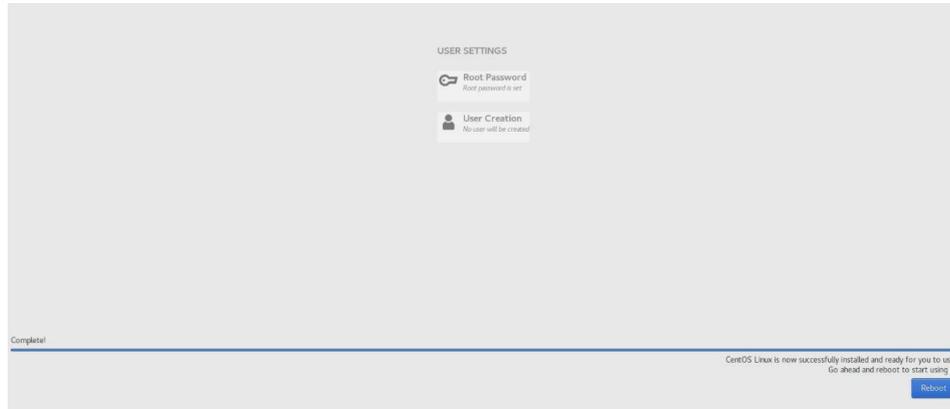
press **Ctrl**+**ALT**+**F2** to the shell and type the following commands:

 # cp -r /tmp/hptdd /mnt/sysimage/tmp/hptdd

 # chroot /mnt/sysimage

 # sh /tmp/hptdd/rhel-install-step2.sh

 # rm -rf /tmp/hptdd

 # exit

g. Press **ALT**+**F6** and press **Reboot.**

h. 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:**

j. 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@localhost 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)
```

k.   Follow the prompts to complete the driver installation.

```
Synchronizing state of hptdrv-monitor.service with SysV service script with /usr
/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable hptdrv-monitor

SUCCESS: Driver is installed successfully for kernel 4.18.0-147.el8.x86_64 from
Internet.
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.
[root@localhost home]#
```

l.   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

1. 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 **"CentOS Linux (4.18.0-147.el8.x86_64) 8"** and press enter the system

```
CentOS Linux (4.18.0-147.el8.x86_64) 8 (Core)
CentOS Linux (0-rescue-c0173ef4647b4ba69d65f739a4d72fc0) 8 (Core)
FreeDOS (on /dev/sda1)
System setup
```

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

d. 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@localhost 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)
```

e. Follow the prompts to complete the driver installation.

```
Synchronizing state of hptdrv-monitor.service with SysV service script with /usr
/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable hptdrv-monitor

SUCCESS: Driver is installed successfully for kernel 4.18.0-147.el8.x86_64 from
Internet.
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.
[root@localhost home]#
```

2. If you encounter error: some building tools are missing or toolchain to built the driver is incomplete

a. The system is not connected to a network (internet connection)

solution:

- Double check the system's internet connection

- Once confirmed, reinstall the driver.

b. This problem can be caused by a lack of dependency packages

solution:

- Make sure that your system can install software from the network.

For example：yum install vim

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/RAID1/10/5/50) Member Disk list (1/1, 1/2|*)
  Capacity (100|*)

  Note:

  The RR840/RR2840/RR3720/RR3740/RR3742 controllers can support RAID0/RAID1/10/5/50

  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.