Revision History

Date	Internal Ver	Official Ver	Editor	HPT_U	FAE	MCM	Description
2023/3/29	V0.10	V1.00	YYC				Init version

SSD7000 Controller

Linux Ubuntu

Installation Guide

Last updated on May 8, 2023

Table of Contents

1 Overview

The purpose of this document is to provide clear instructions on how to install Linux Ubuntu on the SSD7000 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: SSD7580A/7580B/7540/7505/7502/7202/7105

2 Installing Linux Ubuntu on SSD7000 controller

If you would like to install Linux Ubuntu onto drives attached to SSD7000 controller, please perform the following operations:

Step 1 Prepare Your Hardware for Installation

After you attach your NVMe SSD to SSD7000 controller, you can use SSD7000 **EFI Utility** to configure your NVMe SSD as RAID arrays, or just use them as single disks.

Before installation, you must remove all the NVMe SSD, which are not physically attached to SSD7000 controller, from your system.

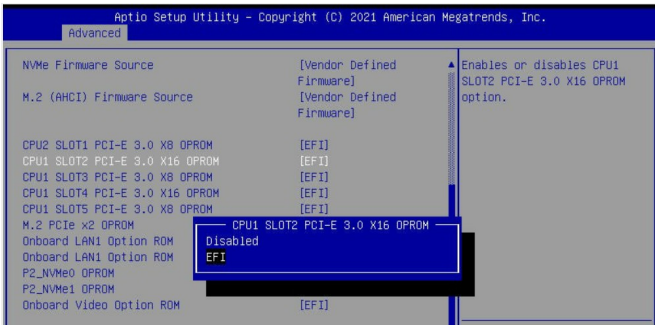
Note

SSD7000 only support EFI boot. If you have other SCSI adapters installed, you must make sure the SSD7000 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.

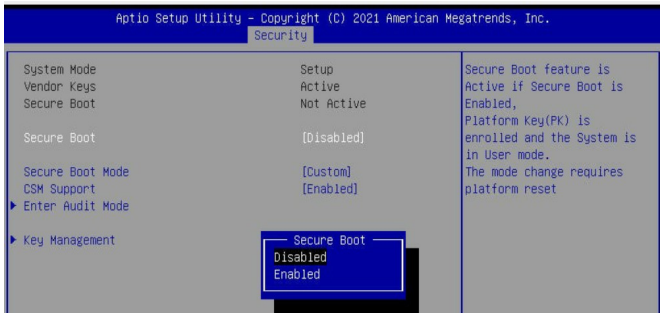
Step 2 Check System EFI Settings

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 SSD7000 RAID controller 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 SSD7000 is connected to motherboard CPU1 Slot 2 PCI-E X16, then you should set "CPU1 Slot 2 PCI-E X16 OPROM" to "EFI";

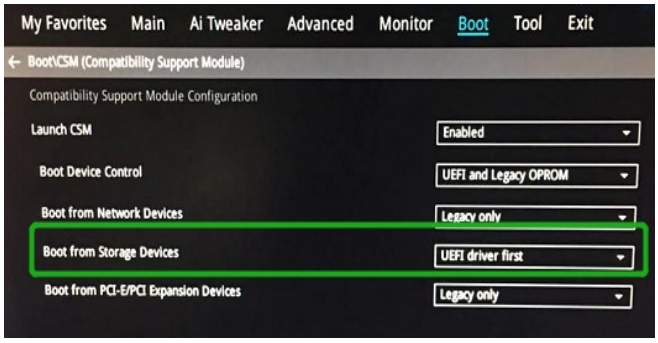


b. Disable "Secure Boot", set "Attempt Secure Boot" to "Disabled".

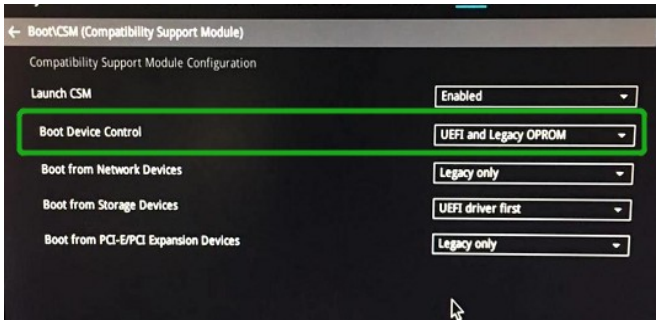


2. Set UEFI setting with ASUS PRIME X299 -DELUXE motherboard as an example:

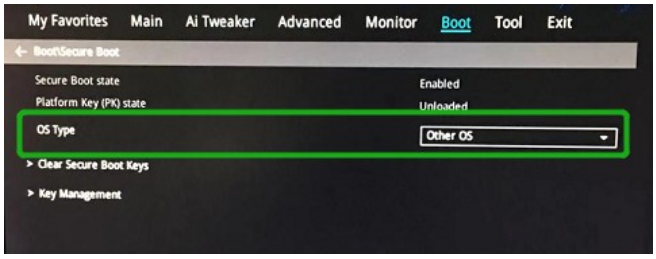
a. Set "Boot from Storage Devices" to "UEFI driver first";



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 SSD7000

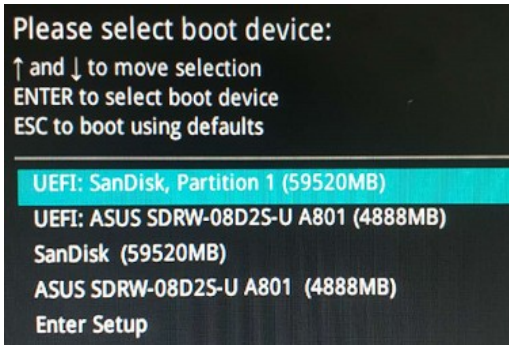
For Example SSD7505：

For other products, please refer to: Update UEFI ROM

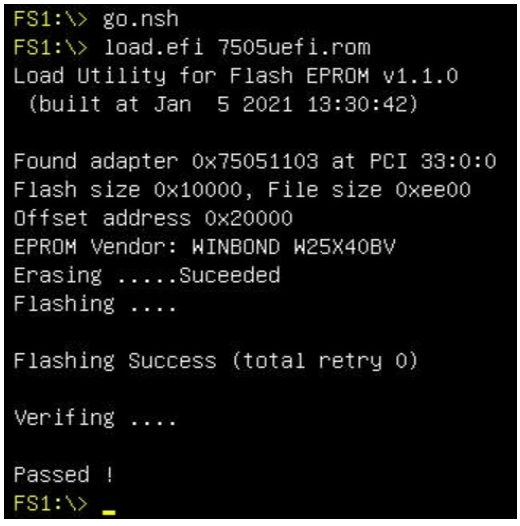
Note：Make sure your USB flash partition format is FAT32.

a. Unzip SSD7000 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 “go.nsh”, flash UEFI rom to SSD7000 Controller and reboot;

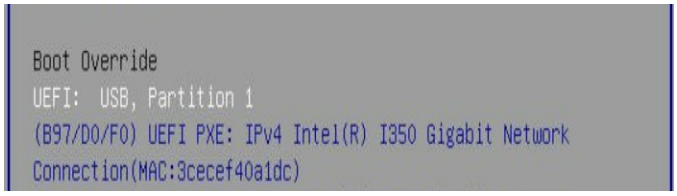


d. Command “exit” ;

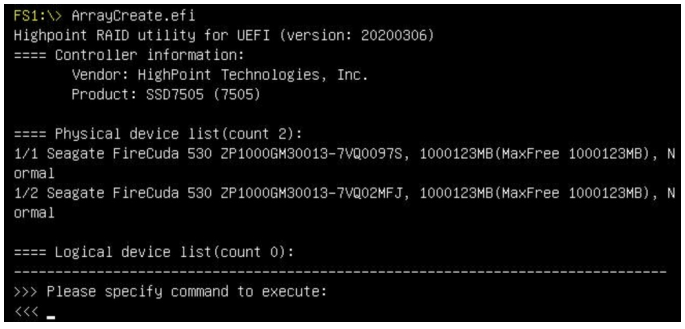
Step 4 Create Array

a. Attach two NVMe SSD to SSD7000 Controller;

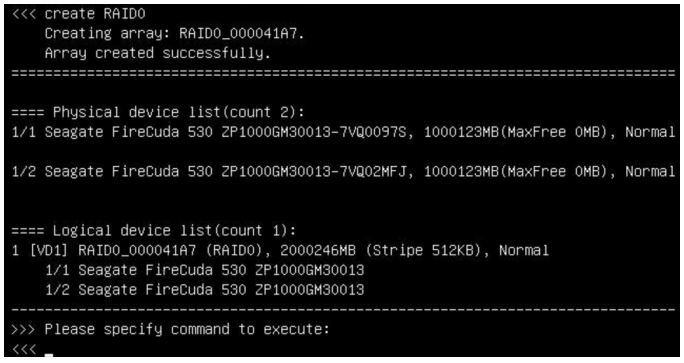
b. Boot, enter the motherboard's Boot List and select start from UEFI USB flash:



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



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

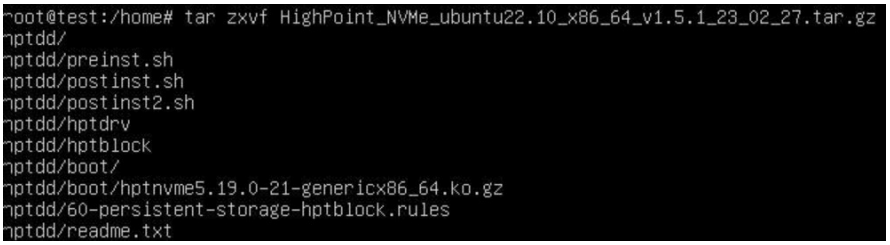


e. Command "exit" ;

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

Step 5 Prepare the Driver Diskette

Extract **HighPoint_NVMe_Ubuntuxx.xx_x86_64_vx.x.x_xx_xx_xx.tar.gz** to top(/) directory of an USB flash drive. It will look like:



Step 6 Install Linux Ubuntu

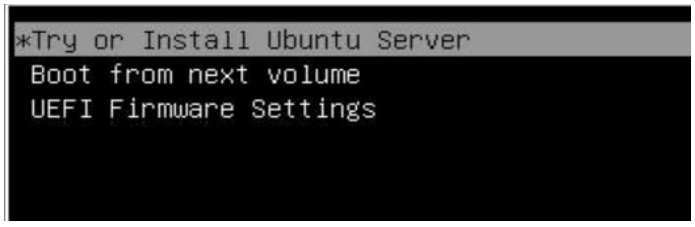
For Example：Ubuntu22.10 server

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).

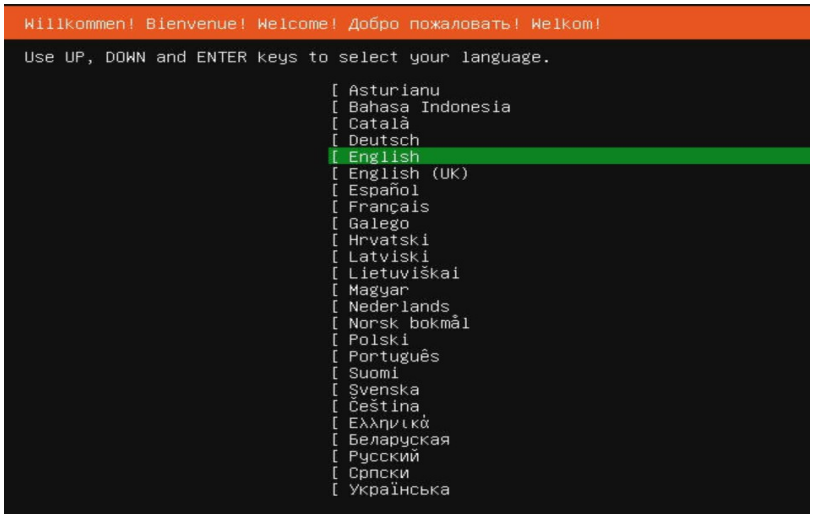
d. When the Installation screen appears, press '**e**' to edit boot command line option.



On the edit command window, move the cursor to the end of line "linux /install/vmlinuz... ", and append "**modprobe.blacklist=nvme** " (double quotation mark are not include).

Press **CTRL+X** or **F10** to start the system.

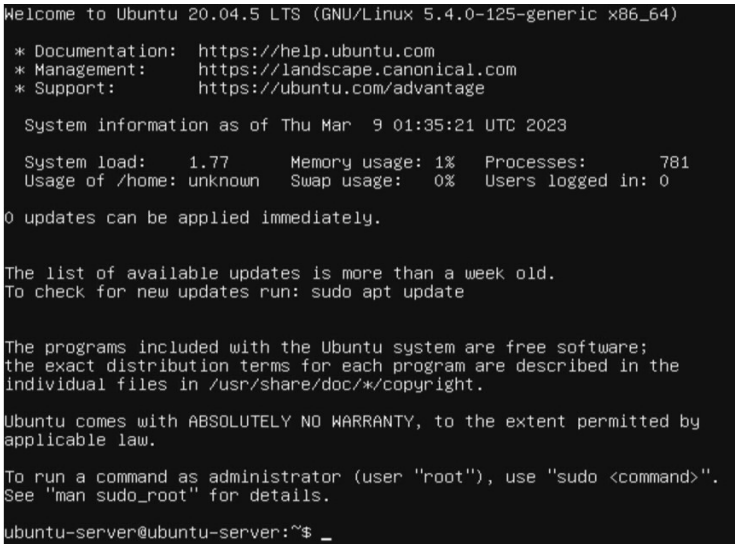
e. When the following window appears during the installation process,



Press "**ALT+F2**" to switch to the shell on console 2, and press **ENTER** to activate this console.

If you use Ubuntu Desktop, please press **CTRL+ALT+F3** to switch to the shell on console 2 and press **ENTER** to activate this console.

Ubuntu login: ubuntu



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/hptdd /tmp/ ← Copy driver installation file to system temporary directory

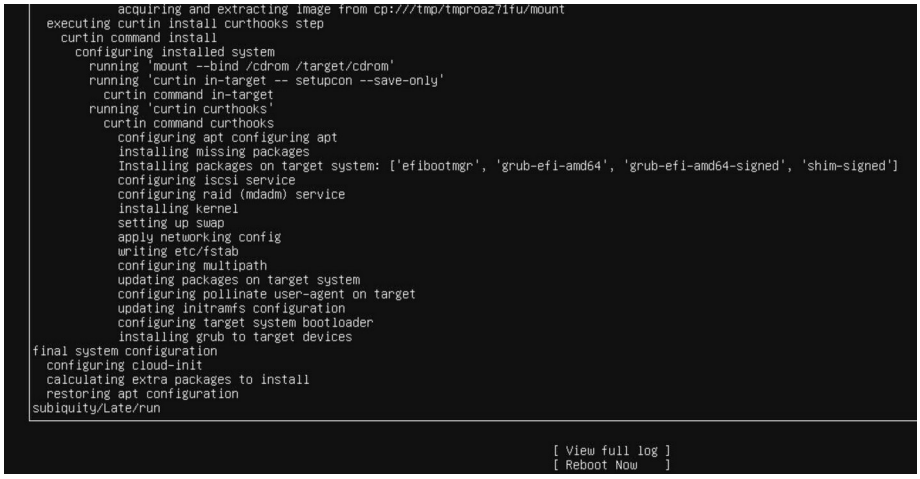
 # umount /hptdd ← Unmount the USB flash drive

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 Ubuntu.

 # sh /tmp/hptdd/preinst.sh ← Load SSD7000 driver.

f. Then press **"ALT+F1"** to switch back to installation screen and continue the installation as usual**.**

g. When the screen shows that "**install complete**".



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

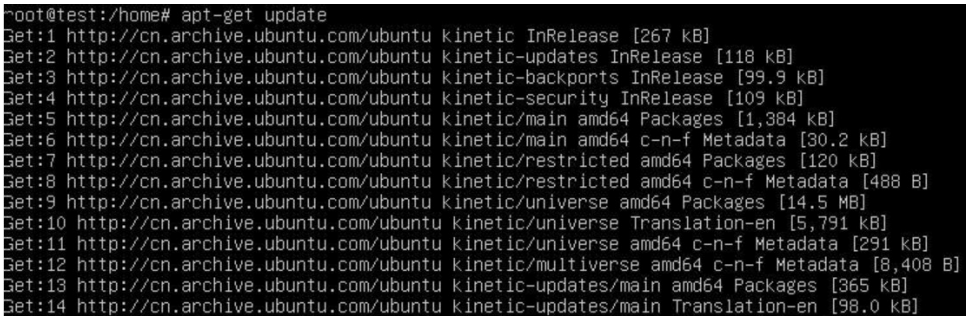
 # sh /tmp/hptdd/postinst.sh ← Install SSD7000 driver.

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

h. Press **"ALT+F1"** to switch back to installation screen and finish the installation.

i. If you want to boot from another kernel, please install the SSD7000 driver after entering the system.

1) use "apt-get update" to retrieve new lists of ubuntu packages (**please connect to the internet**)



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

https://www.highpoint-tech.com/nvme-3/ssd7540

https://www.highpoint-tech.com/nvme-2/ssd7505

https://www.highpoint-tech.com/nvme-2/ssd7502

https://www.highpoint-tech.com/nvme-2/ssd7105

https://www.highpoint-tech.com/nvme-2/ssd7202

https://www.highpoint-tech.com/nvme-3/ssd7580b

https://www.highpoint-tech.com/nvme-2/ssd7580a

Extract driver package:

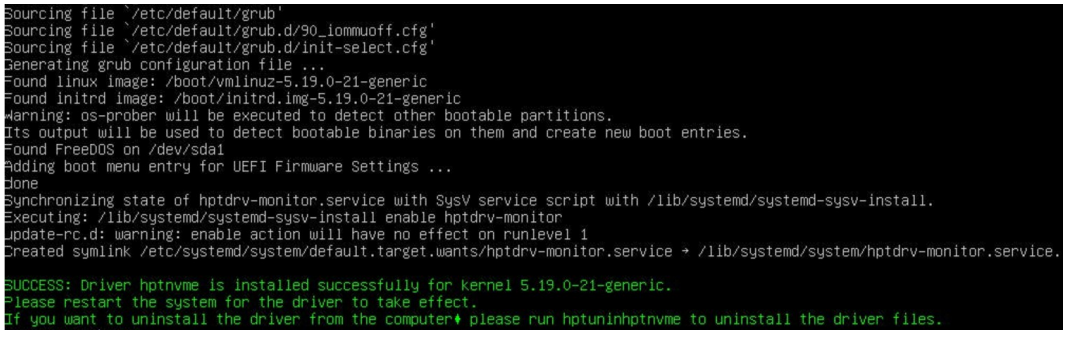
tar zxvf HighPoint_NVMe_G5_Linux_Src_Src_vx.xx.xx_xx_xx_xx.tar.gz

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

sh hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin or

./ hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin

j. Follow the prompts to complete the driver installation.



k. 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/hptnvme /. 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/hptnvme /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 SSD7000 controller. Installation of the management software is optional but recommended.

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

5 Trouble Shooting

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: 5.19.0-21-amd64) and enter the system.

b. Install Linux Opensource driver.

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

https://www.highpoint-tech.com/nvme-3/ssd7540

https://www.highpoint-tech.com/nvme-2/ssd7505

https://www.highpoint-tech.com/nvme-2/ssd7502

https://www.highpoint-tech.com/nvme-2/ssd7105

https://www.highpoint-tech.com/nvme-2/ssd7202

https://www.highpoint-tech.com/nvme-3/ssd7580b

https://www.highpoint-tech.com/nvme-2/ssd7580a

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

sh hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin or

./ hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin

```
root@test:/home# ./hptnvme_g5_linux_src_v1.5.1_2023_02_21.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller 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)
```

d. Follow the prompts to complete the driver installation.

```
Sourcing file `/etc/default/grub'
Sourcing file `/etc/default/grub.d/90_iommuoff.cfg'
Sourcing file `/etc/default/grub.d/init-select.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.19.0-21-generic
Found initrd image: /boot/initrd.img-5.19.0-21-generic
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.
Found FreeDOS on /dev/sda1
Adding boot menu entry for UEFI Firmware Settings ...
done
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 hptnvme 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 hptuninhptnvme to uninstall the driver files.
```

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

6 Rebuilding Driver Module for System Update

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

Please refer to the README file distributed with HighPoint SSD7000 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/RAID10) Member Disk list (1/1,1/2|*) Capacity (100|*)

  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 *
<<< create RAID10 * *
Create RAID10 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.