RR64xL Controller
Windows BootRAID
Installation Guide

Version 1.02

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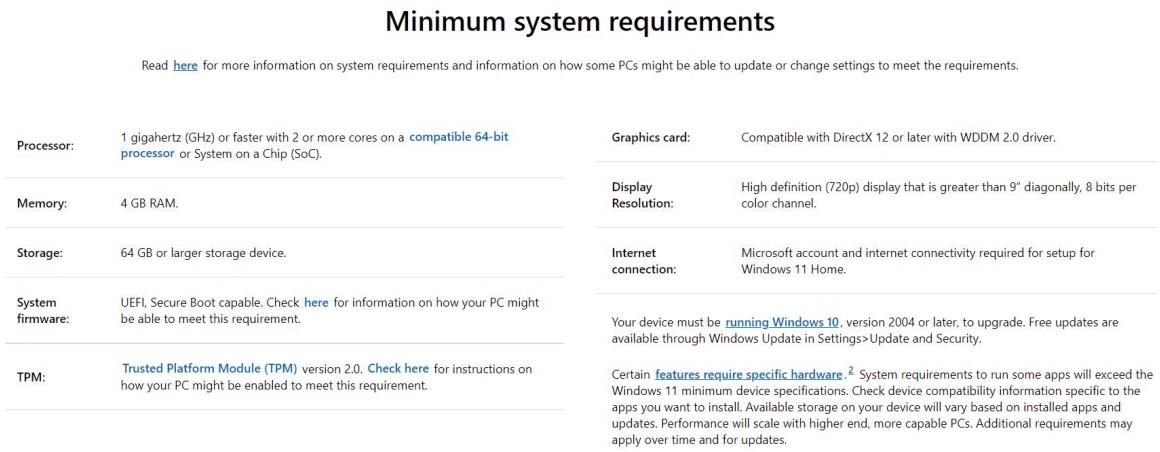
Content

Prerequisites for a Bootable RAID Configuration

The RR640L/642L/644L/644LS controllers can support bootable RAID arrays. After configuring an array using the UEFI RAID tool, you can install a Windows or Linux operating system to the RAID. In order to configure a bootable RAID array, you will need the following:

1. RAID controller. A PCIe 3.0/4.0 slot with x4, x8 or x16 lanes.
2. The RR640L/642L/644L/644LS must be installed into a PCIe 3.0/4.0 slot with x4, x8 or x16 lanes.
3. The motherboard needs to be booted into UEFI mode. Confirm that the motherboard boots in UEFI mode.
4. USB flash drive: FAT32 format. Make sure the file system of the USB flash drive is FAT32 format.
5. Secure Boot must be disabled.
6. Install an optical drive into the system (such as a DVD-ROM, DVD-RW or Blu-Ray drive).
7. Prepare the OS Installation disc (Windows 10 & later / Windows server 2016 & later, or a Linux Distribution that corresponds with the binary diver you intend to install). Download and burn an official copy of the latest ISO image of your preferred operating system to a DVD. This should be inserted into the optical drive when booting the system.
8. You will need a USB flash drive– the UEFI package and driver should be extracted to the root directory of this flash drive.
9. Remove all other drives during the OS installation process. Make sure only the controller, the USB flash drive, and the optical drive are installed into the system during this procedure. This includes any other USB hard drives, USB flash drives, memory sticks, or SATA drives. You can reattach these drives after the operating system has been successfully installed.
10. For Windows 10 /11 users, make sure to Disable Fast Boot.
11. **The following are the basic requirements for installing Windows 11 on your computer.** If your device does not meet these requirements, you may not be able to install Windows 11 on your device; If your device is already running Windows 10, you can use the PC Health Check app to evaluate compatibility.



Minimum system requirements

Read here for more information on system requirements and information on how some PCs might be able to update or change settings to meet the requirements.

Processor:	1 gigahertz (GHz) or faster with 2 or more cores on a compatible 64-bit processor or System on a Chip (SoC).
Memory:	4 GB RAM.
Storage:	64 GB or larger storage device.
System firmware:	UEFI, Secure Boot capable. Check here for information on how your PC might be able to meet this requirement.
TPM:	Trusted Platform Module (TPM) version 2.0. Check here for instructions on how your PC might be enabled to meet this requirement.
Graphics card:	Compatible with DirectX 12 or later with WDDM 2.0 driver.
Display Resolution:	High definition (720p) display that is greater than 9" diagonally, 8 bits per color channel.
Internet connection:	Microsoft account and internet connectivity required for setup for Windows 11 Home.

Your device must be running Windows 10, version 2004 or later, to upgrade. Free updates are available through Windows Update in Settings>Update and Security.

Certain features require specific hardware.[2] System requirements to run some apps will exceed the Windows 11 minimum device specifications. Check device compatibility information specific to the apps you want to install. Available storage on your device will vary based on installed apps and updates. Performance will scale with higher end, more capable PCs. Additional requirements may apply over time and for updates.

Please refer to the following link for detailed requirements：

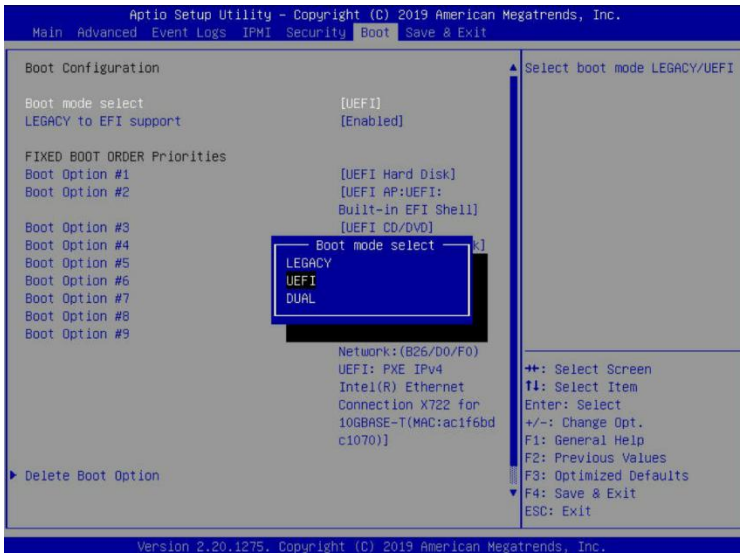
Windows 11 Specs and System Requirements | Microsoft

UEFI BIOS Settings

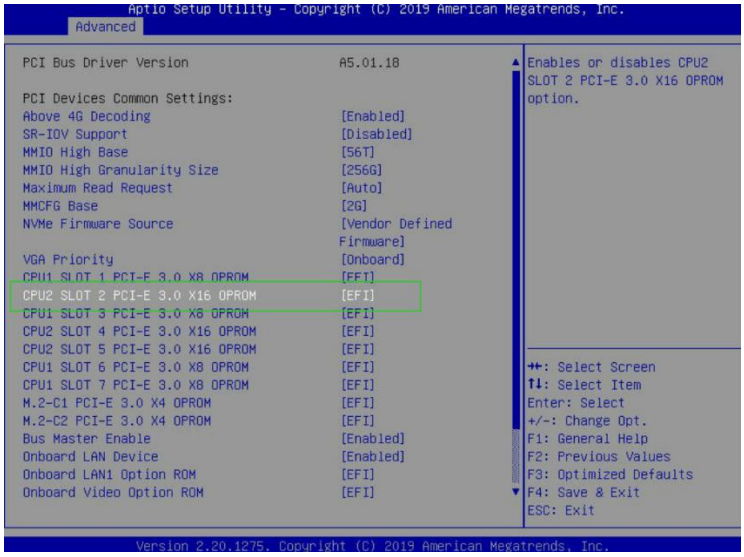
Different motherboards will provide different UEFI-related BIOS settings. Please consult your motherboard's user manual for more information.

Set UEFI setting with SuperMicro X11DAi-N motherboard as an example.

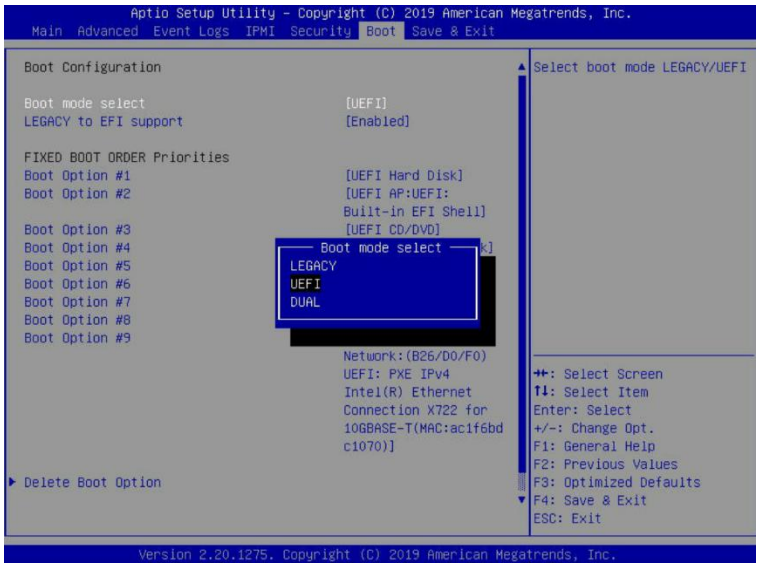
a. Set "Boot Mode Select" to "UEFI";



b. Under "Advanced->PCIe/PCI/PnP Configuration->, change "CPUx Slot x PCI-E OPROM" to "EFI". "x" represents the PCIE slot assignment. For this example, the RR640l is installed into "CPU2 Slot 2"



c. Set "Boot Mode Select" to "UEFI";



How to install Windows to the RAID controller

Step 1 Preparing the USB Flash Drive

When preparing the USB flash dive, make sure to format the USB partition as FAT32. If another file system is used, the USB drive may not be properly recognized, and will not appear as an option under the motherboard's UEFI BIOS menus.

Step 2 Preparing the UEFI Package

The package must be unzipped directly to the root of the bootable USB flash drive (do not extract the contents to a new folder). All of the following items must be present in the root of the USB flash drive.

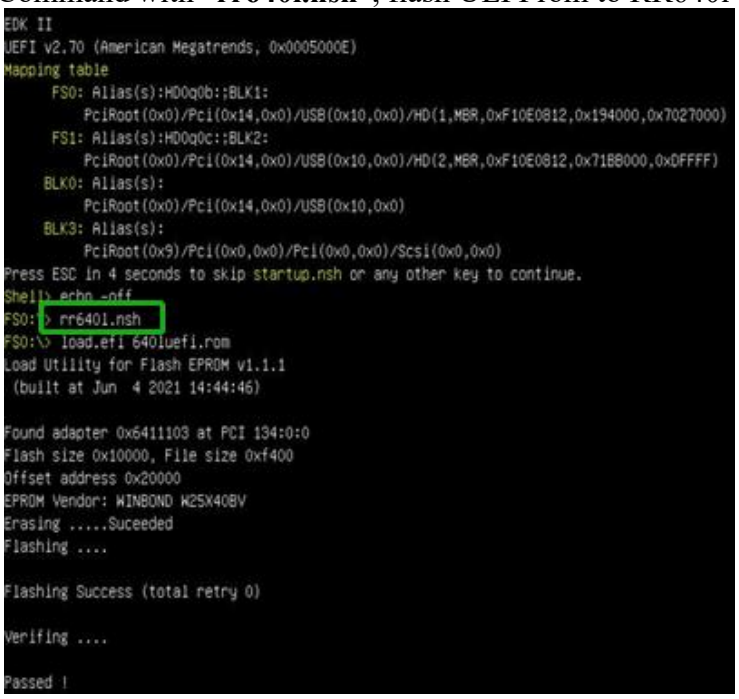
For example (RR640L)

Note: *If the above content is not present in the root directory, the UEFI boot device will not be properly recognized, and/or you will be unable to create an array for OS installation.*

Step 3 Creating the RAID Array

a. 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.

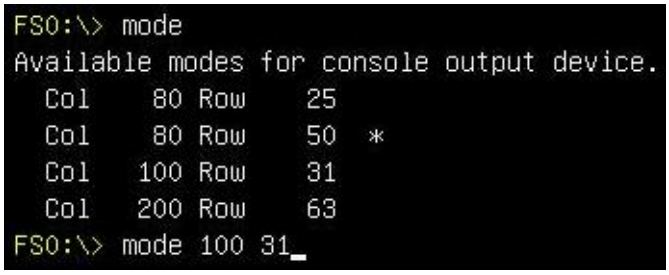


When the message 'Passed' appears, the flash was successful.

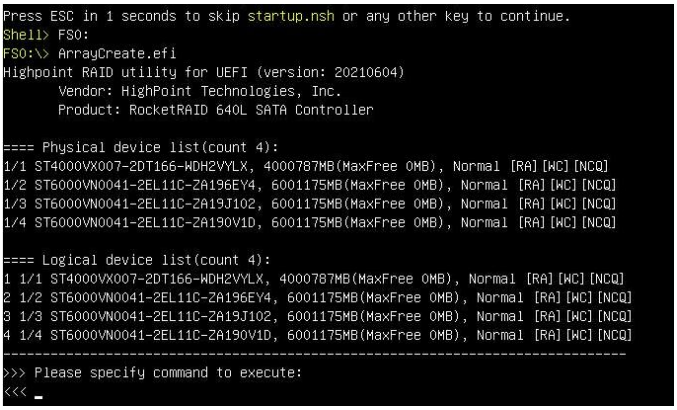
d. Boot, in the presence of the motherboard Log screen, there will be HDDs information：

e. Enter the motherboard's Boot List and select start from **UEFI USB** flash:

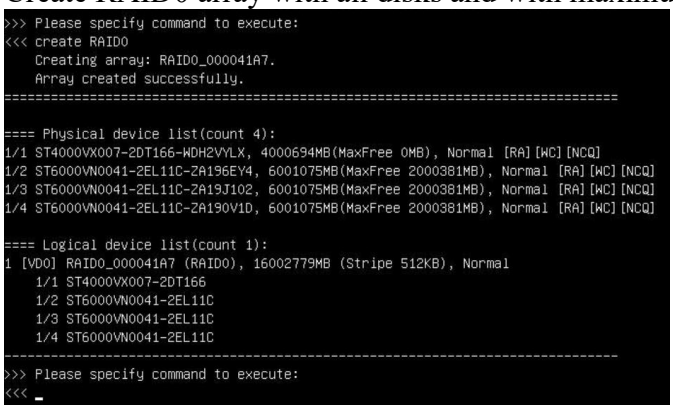
f. At the prompt, enter the following command to change the resolution:
mode 100 31



g. Next, enter the following command to enter the RAID creation utility:
ArrayCreate.efi



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



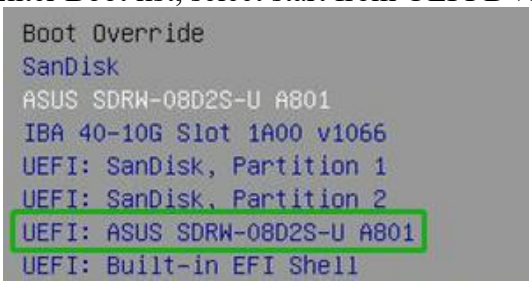
i. You can now exit the utility. Enter the following command: exit;

Note：For more command usages, refer to Appendix A.

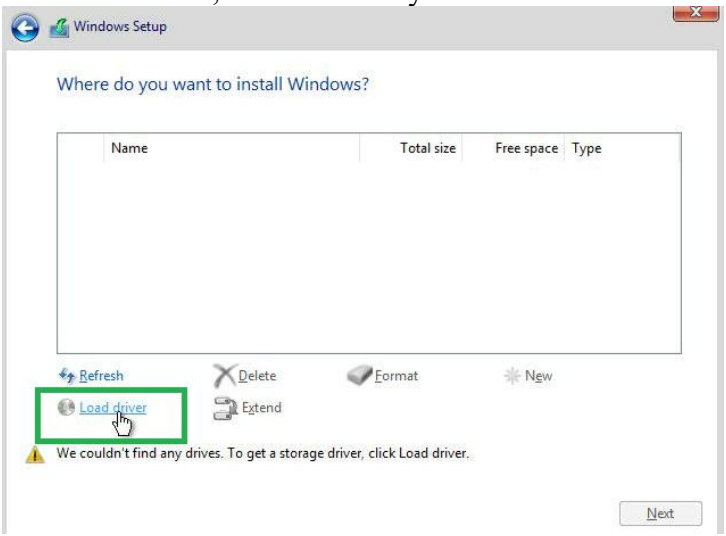
Step 4 Install Windows

a. Put the Windows install DVD in your CD-ROM and then reboot your system;
b. Boot, view RAID information that appears on the motherboard Logo screen;

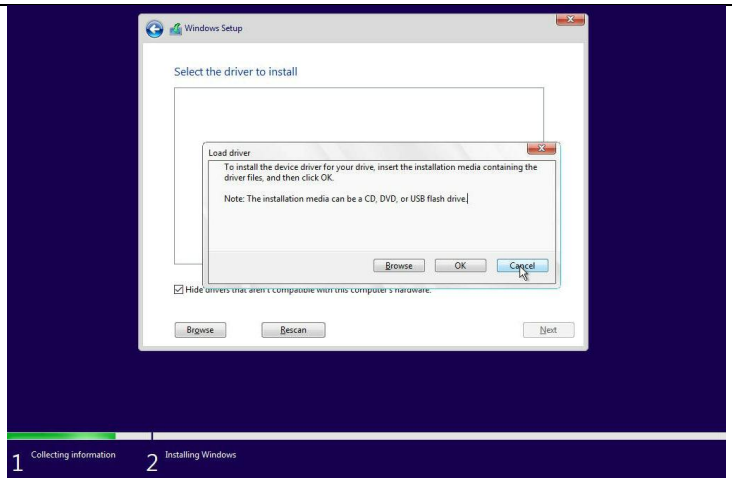
c. Enter Boot list, select start from UEFI DVD;



d. Install Windows, to “Where do you want to install Windows?”;

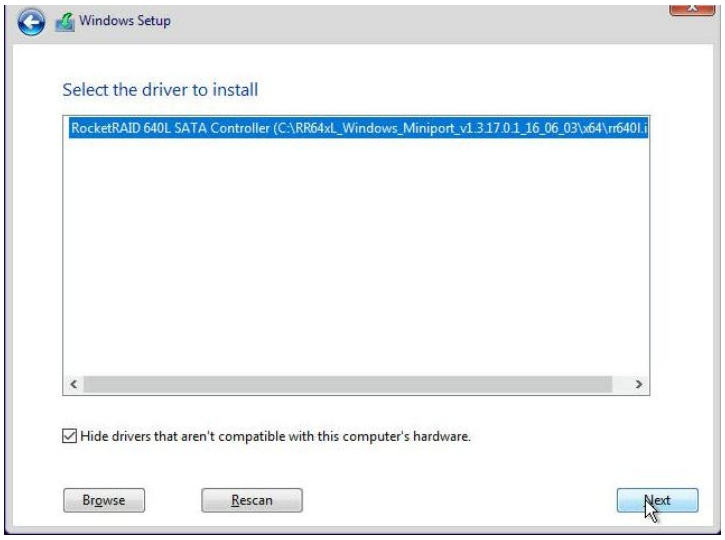


e. Click “Load driver”，in the pup-up window, click “Cancel”;

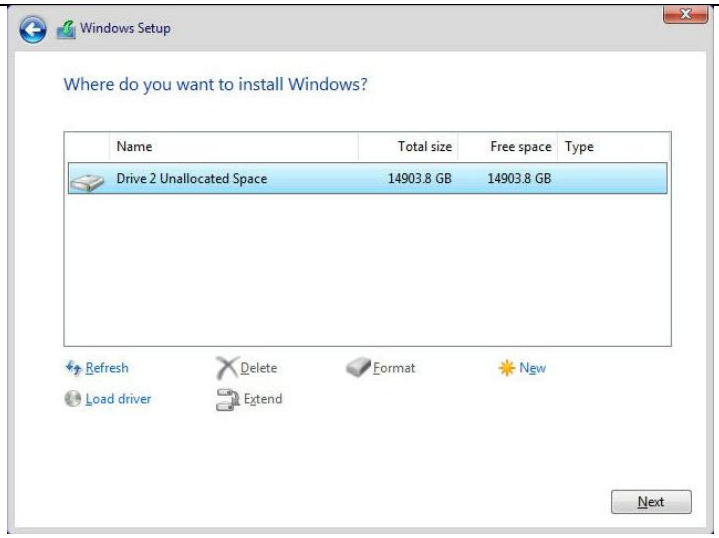


f. Then plug the USB flash with the driver file onto the USB interface of the motherboard, click “Browse”, select the driver file;

g. Load the driver;



h. After load the driver, back to “Where do you want to install Windows?” interface, the Legacy disks have become RAID partitions;



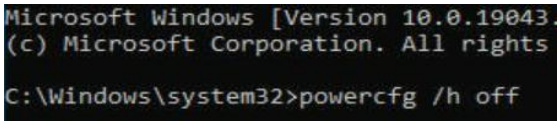
i. After partitioning, continue installing and complete the installation of the Windows.

Step 5 Disabling Hibernation

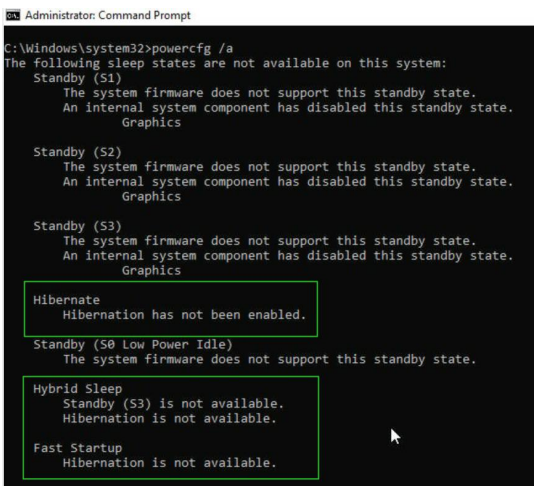
After Windows is installed, boot into the operating system and disable Hibernation. Hibernation fails when the system is installed on a RAID; this bug will slow down or prevent startup and disable sleep mode.
If you do not turn the hibernation functionality off, you may experience the following problems:

a. Shutdown time is extended by an additional 3-5 minutes.
b. You cannot shut down properly, you need to manually press the power switch button of the motherboard to power off the system.

Please use administrator privileges to turn off hibernation using the following command (Command Prompt utility): #**powercfg /h off**



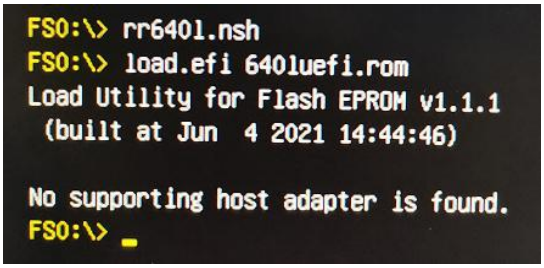
Enter the command to check that the quick shutdown is turned off: **powercfg / a**



Trouble shooting

No supporting host adapter is found

In the UEFI environment, run thecommand,"rr640l.nsh (Please see UEFI Read me for specific input content.)".



Solutions: If you get the message, "No supporting host adapter is found." Try the following,

a. The error message is to remind the user that when the card cannot be found in UEFI. Make sure the HighPointRR Controller is installed into a PCIe slot with x8 or x16 lane.
b. In order to avoid this slot is broken, so replace the slot and test again.

No supported controller detected

In the UEFI environment, run the command, "ArrayCreate.efi".

Solutions: If you get the message, "No supported controller detected." Try the following,

a. Check whether the Storage option ROM is ‘Enabled’ in the motherboard BIOS.

b. Check whether SATA is connected to the controller.

c. Replace the motherboard slot, enter the UEFI environment and re-enter the command.

If none of the above methods work, please provide UEFI log. You can submit a support ticket using our Online Support Portal, include a description of the problem in as much detail as possible.

Appendix A

Support command: help/info/quit/exit/create/delete.

- **Create Command**

  Syntax

  Create Array Type (RAID0/RAID1/10/5) 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 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 1

  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.