



Remote PC Guide Series - Volume 2b

Dell R720 BIOS and RAID Configuration

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This guide provides hardware model-specific guidance in server configuration, with BIOS and RAID configuration instructions for the **Dell R720**.

This guide is part of a multi-volume series, designed to provide you with the guidance needed to implement remote PCs on your NETLAB+ system. [Learn more about the Remote PC Guide Series](#). See the [Documentation Library](#) for a list of all NETLAB+ guides.

This guide should be followed in conjunction with [Remote PC Guide Series - Volume 2, Installation](#).

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1 Background

This guide is designed to assist an administrator with setting up and configuring the NDG Supported **Dell R720**.

If you are using a Dell R710, please see the [Remote PC Guide Series - Volume 2a - Dell R710 BIOS and RAID Configuration](#).

If you are using a Dell R630, please see the [Remote PC Guide Series - Volume 2c - Dell R630 BIOS and RAID Configuration](#).

Before proceeding with the setup and configuration process described in this guide, please review the current recommended specifications for ESXi host servers used to host virtual machines in NETLAB+ pods. The latest information is available on the NDG Website:

http://www.netdevgroup.com/support/remote_pc.html#vm_host_server_specification

Server Specifications for Hosting NETLAB+ Pod Virtual Machines

The following table shows the current recommended specifications for ESXi host servers used to host virtual machines in NETLAB+ pods.

Please check the [VMware Compatibility Guide](#) to verify that all server hardware components are compatible with the version of VMware ESXi that you wish to use.

Specification Last Updated: December 7, 2012

⚠ Please note that the Dell PERC H700 RAID controller for the Dell R710 is no longer recommended due to poor performance under load. Currently, we recommend using Dell PERC H700 controllers for the Dell R710.

Component	Recommended Minimum Features - Dell R710	Recommended Minimum Features - Dell R720
Server Model	Dell R710	Dell R720
Operating System	Specify iSO operating system on order.	Specify iSO operating system on order.
Hypervisor (installed by you)	VMware ESXi 4.1 U2	VMware ESXi 4.1 U2
Physical CPU	Two (2) x Intel Xeon E5600 Quad Core @ 2.40GHz	Two (2) x Intel Xeon E5-2650 Six Core @ 2.93GHz
Hardware Assisted Virtualization Support	Intel VT	Intel VT and Intel QPT
RAM (CPU)	8 GB	12 GB
Notes	Requirements vary based on server role or function. Management Server: iSCSI or higher recommended. Class 1 Network only. iSCSI or higher recommended.	Requirements vary based on server role or function. Management Server: iSCSI or higher recommended. Class 1 Network only. iSCSI or higher recommended.
Form Factor	2U	2U
Storage	Use iSCSI equivalent RAID for maximum expansion. (Storage part number H70-PE2-00-100) See Recommended System Configurations for Dell R710	Use iSCSI equivalent RAID for maximum expansion. (Storage part number H70-PE2-00-100)
Chassis	2U	2U
Storage Configuration Options	3.5" B Internal Direct Attached Storage Option • H700 RAID Controller, 32GB Cache • RAID 5 • 2 X 1TB, 3.5 SATA, 10000RPM, 3.05GB/x • Western Digital R24 WD1002FVYX Recommended • 1 VMware VMD3 Datastore 3.5" B Internal Direct Attached Storage Option • H700 RAID Controller, 32GB Cache • RAID 5 • 2 X 1TB, 3.5 SATA, 10000RPM, 3.05GB/x • Western Digital R24 WD1002FVYX Recommended • 2 VMware VMD3 Datastores Please review the RAID controller section for important performance information. Dell PERC H700 Controllers with 32GB cache are recommended. Dell PERC H700 Controllers are NOT recommended.	3.5" B Internal Direct Attached Storage Option • H700P RAID Controller, 1GB Cache • RAID 10 • 4 X 1TB, 3.5 SATA, 10000RPM, 3.05GB/x • Western Digital R24 WD1002FVYX Recommended • 1 VMware VMD3 Datastore 3.5" B Internal Direct Attached Storage Option • H700P RAID Controller, 1GB Cache • RAID 10 • 4 X 1TB, 3.5 SATA, 10000RPM, 3.05GB/x • Western Digital R24 WD1002FVYX Recommended • 2 VMware VMD3 Datastores
NIC	One Two-Port Embedded Broadcom NetXtreme-E 5709 Gigabit Ethernet	Broadcom 5709 GP 1Gb Network Daughter Card
Base Case	Base with 2 PCIe x8 + 2 PCIe x16 Slot	Base with 8 PCIe x8 + 1 PCIe x16 Slot
BIOS Setting	Performance BIOS Setting	Performance BIOS Setting
Power Supply	High Output Power Supply, Redundant, 870W	One, High-Output Redundant Power Supply (1+1), 750W
Network Management	DRAC2 Express	DRAC2 Express
Optical Drive	DVD ROM, SATA, Internal	DVD ROM, SATA, Internal

2 DELL R720 BIOS System changes

Please verify that your system has the latest BIOS installed. You may obtain the latest [drivers and downloads](#) for the Dell R720 from Dell's website.

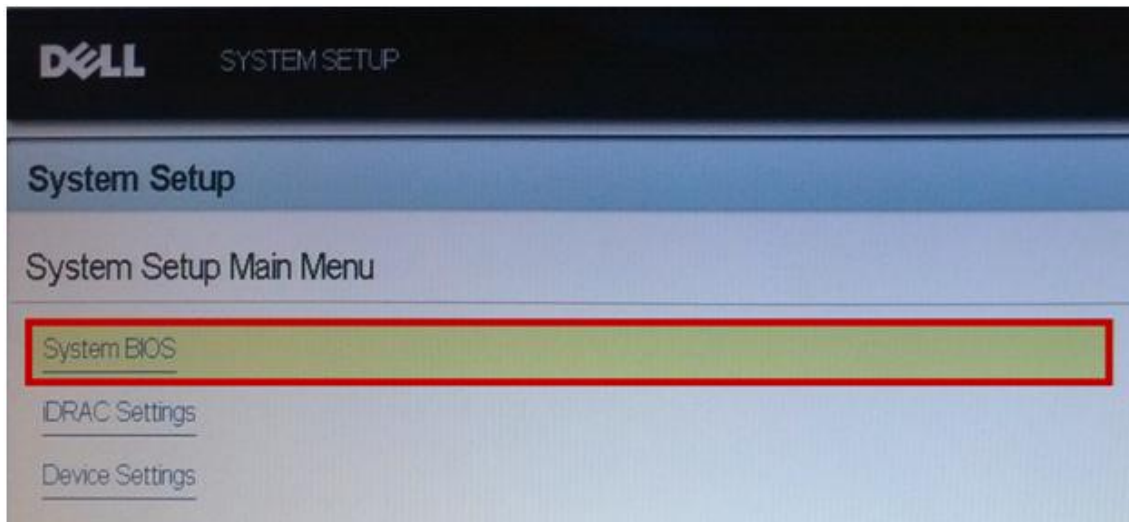
Instructions for changing BIOS settings:

1. Turn on or restart your system.
2. Press <F2> to enter System Startup at the BIOS startup screen.

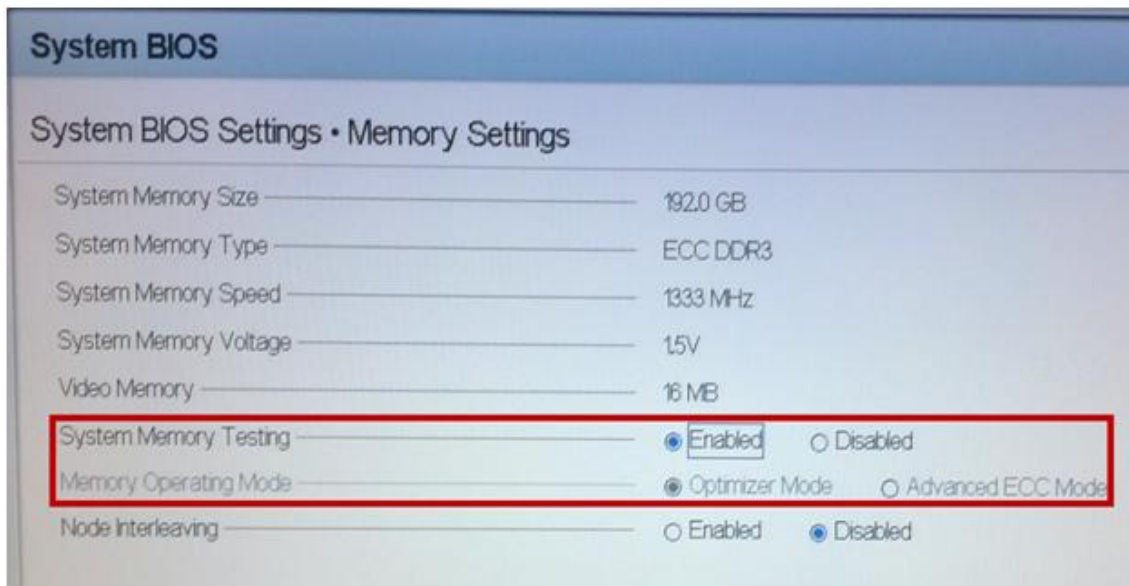


Note: BIOS Revision at the time of this document was 1.4.8.

3. Select **System BIOS** from the System Setup Main Menu.

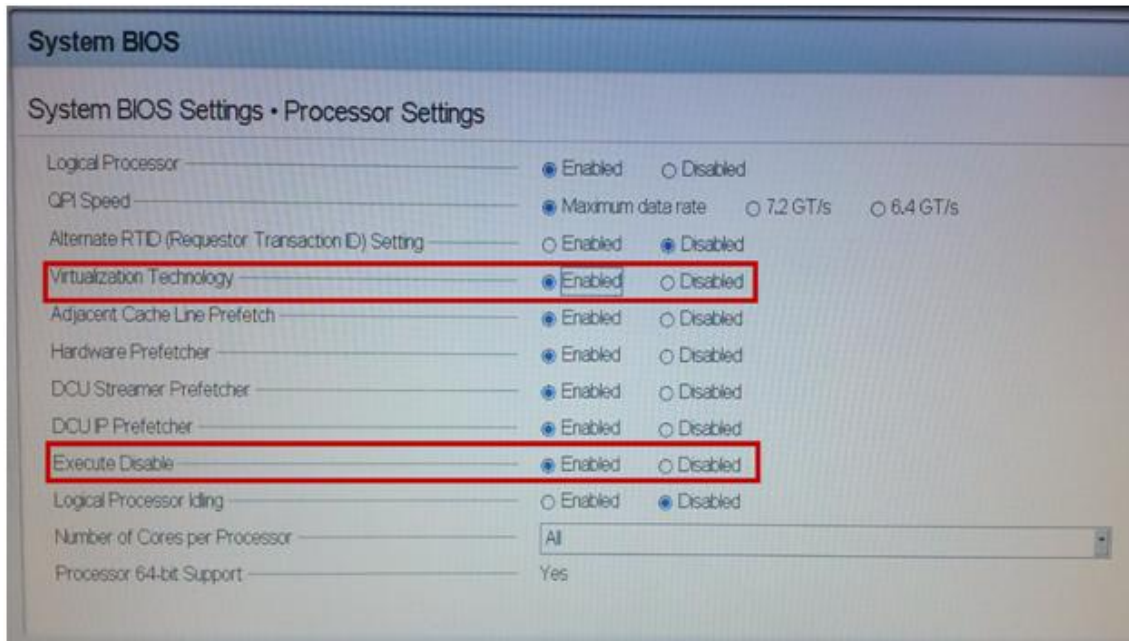


4. Use the arrow keys to select **Memory Settings** and make sure **System Memory Testing** is enabled and **Memory Operating Mode** is set to **Optimizer Mode**.

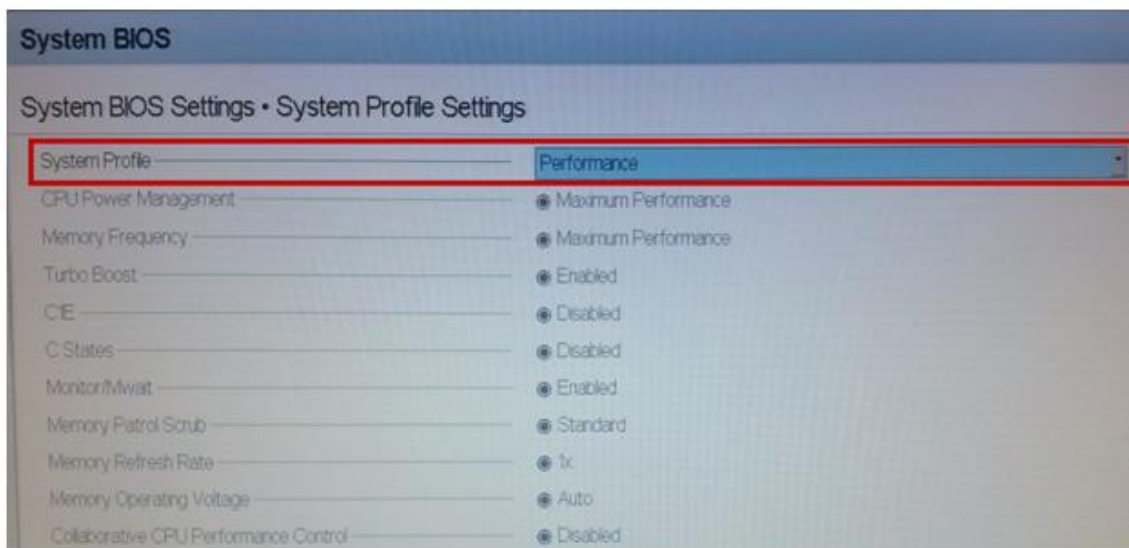


5. Press **ESC** to return to the main menu.

- Use the arrow keys to select **Processor Settings**. Make sure **Virtualization Technology** is set to **Enabled**. Also, check **Execute Disable** is set to **Enabled**.

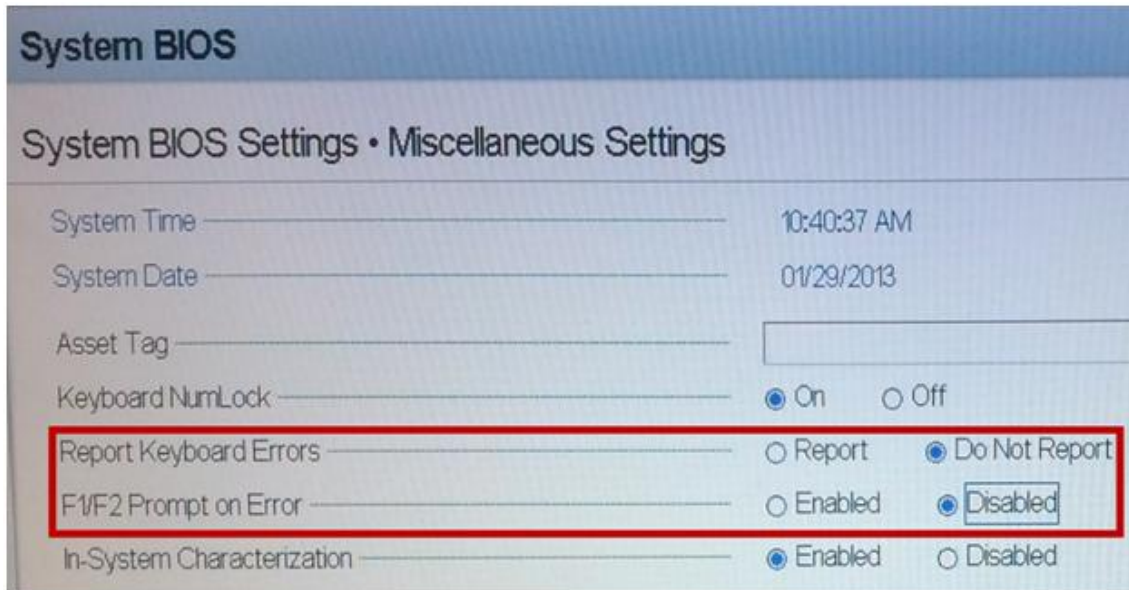


- Press **ESC** to return to the main menu.
- Use the arrow keys to select **System Profile Settings**. Make sure **System Profile** is set to **Performance**.



- Press **ESC** to return to the main menu.

10. Use the arrow keys to select **Miscellaneous Settings**. Make sure **Report Keyboard Errors** is set to **Do Not Report** and **F1/F2 Prompt on Error** is set to **Disabled**.



11. Press **ESC** to return to the main menu.
12. Make sure to save settings and exit.

3 DELL R720 RAID Configuration

Redundant Array of Independent Disks (RAID) is designed to give the server redundancy and increased performance depending on the RAID type selected. The recommended and tested configuration for an eight-drive setup is RAID 5. If you wish to teach courses that need high IOPS (Input/Output Operations per Second) such as VMware View, then you will need to consider the eight-drive configuration to maximize writes speeds and pod count per host. The H710P RAID controller with 1GB cache is recommended and supported.

RAID 5 arrays may take several hours to initialize as the controller creates parity on the drives. The 8x2TB drive configuration will take approximately **4 hours**.

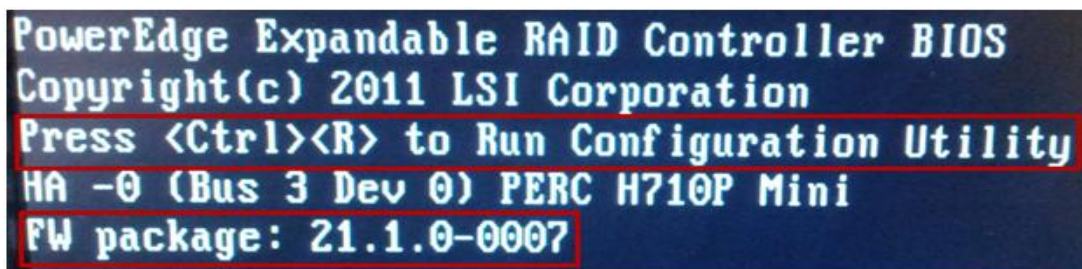
RAID 5 is known as striping with parity. RAID 5, when leveraged on proper RAID controllers, combine performance characteristics of a striped array with fault tolerance and maximizing drive space.

RAID 5 requires a minimum of 3 drives and distributes parity across all drives. If a drive fails, the array performance will be impacted as the reads for the failed drive is reconstructed from parity striped across the other disks. RAID 5 can only tolerate one disk failure. A two-disk failure will cause the array to fail.

Until recent years, the performance of RAID 5 was limited and not as robust as other RAID solutions. This was due to parity algorithms and limited processing resources on the controllers. High-end controllers with faster processors and larger cache can perform at levels where they no longer are the bottle-neck to storage, allowing us to leverage additional storage space and spindle count for increased IO operations.

Please verify that your system has the latest H710P RAID Controller Firmware installed. You may obtain the [latest drivers and downloads](#) for the Dell R720 from Dell's website.

1. Turn on or restart your system.
2. During the boot process, you will be prompted to, **Press <Ctrl><R> to Run Configuration Utility.**

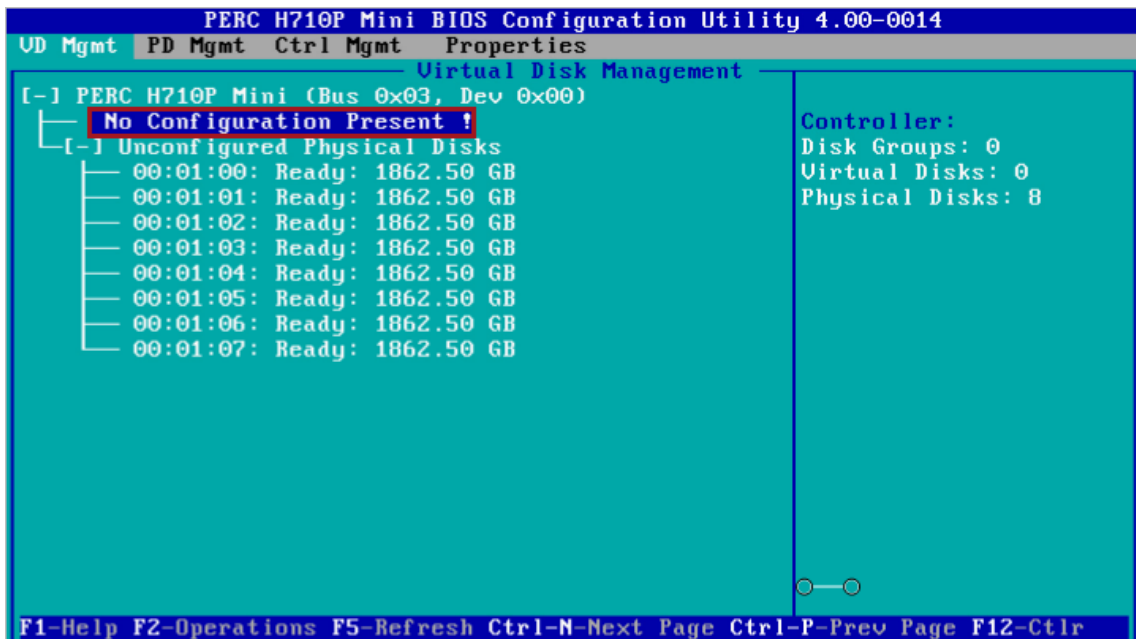


Note: The H700 FW package at the time of this document was 21.1.0-0007.

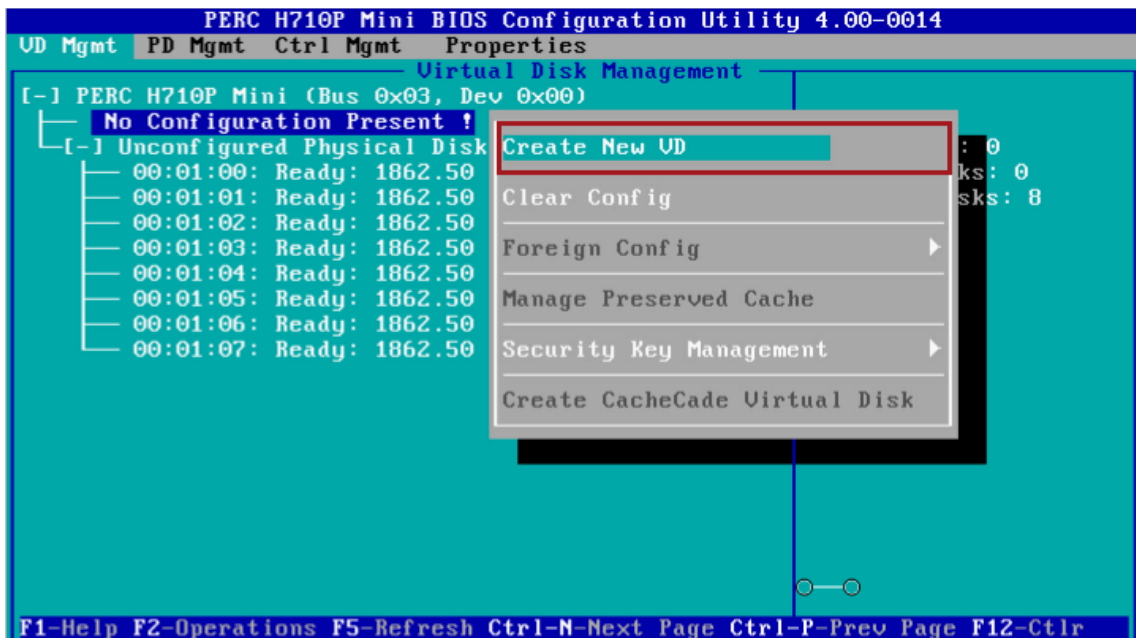
3. You should start with a clean configuration. If not, you will need to clear any existing configuration.

3.1 Dell R720 8x2TB HDD Configuration

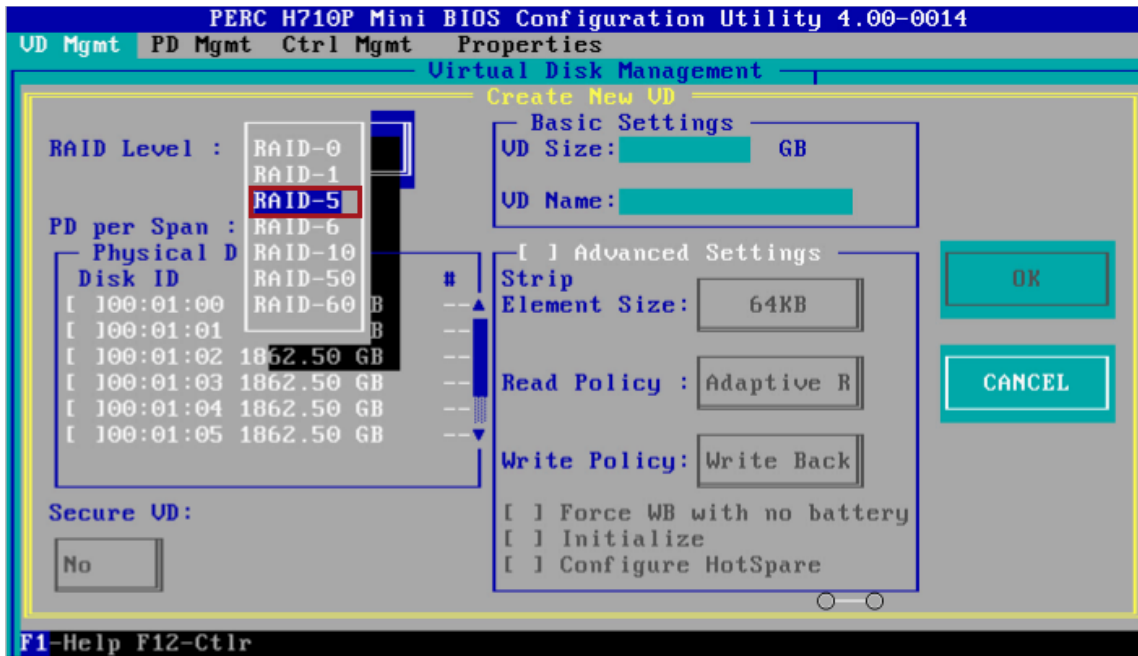
1. Use the arrow keys to select the **No Configuration Present**, and then press **F2**.



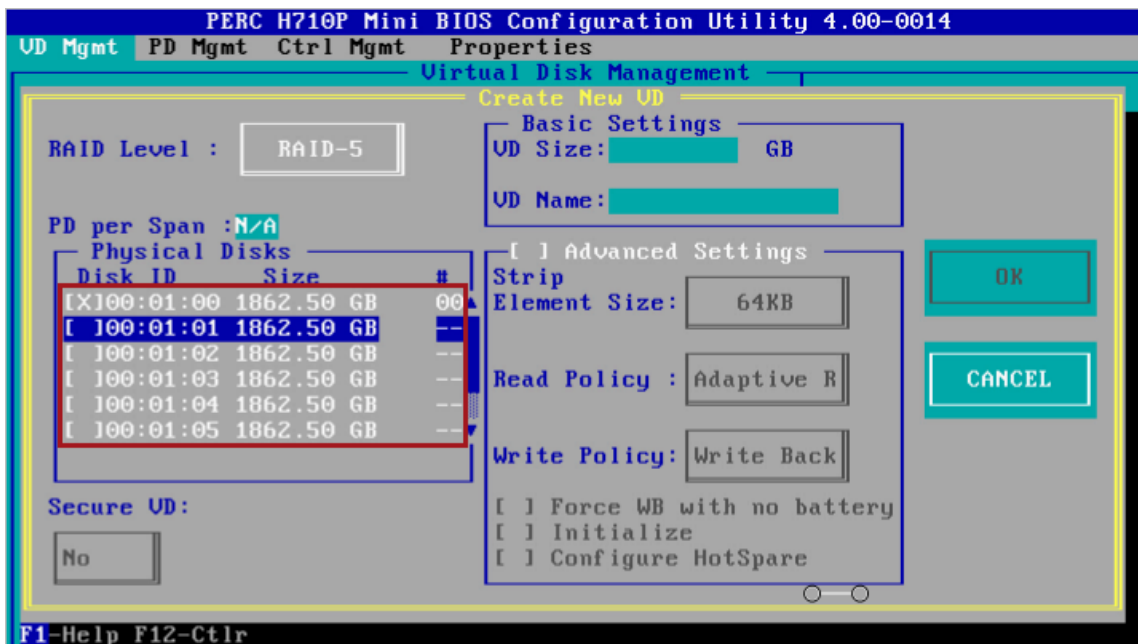
2. Select **Create New VD** and press **Enter**.



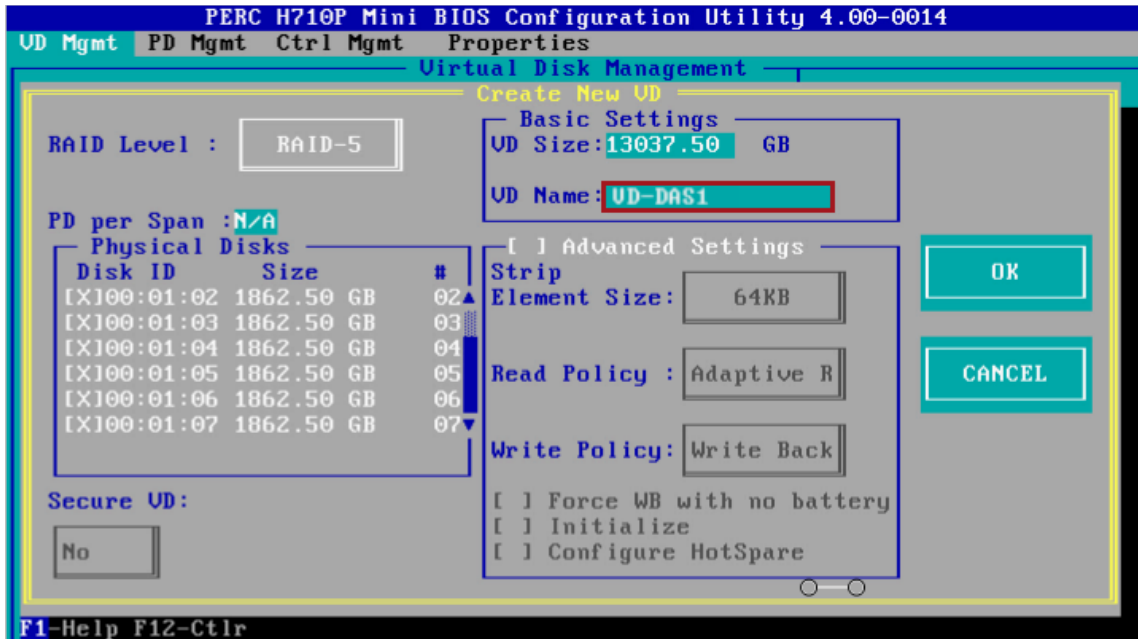
3. Tab to RAID Level, select **RAID-5**.



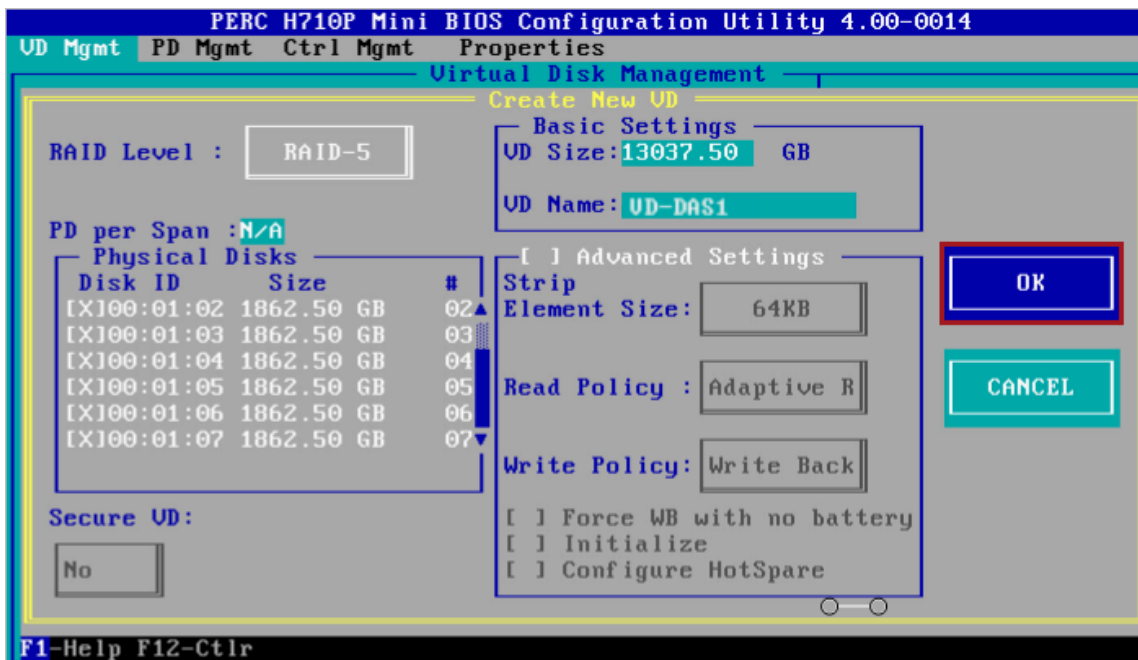
4. Tab to **Physical Disks** and select all available physical disks by depressing the **space bar**. You should have to depress the space bar eight times, once for each drive in the array.



5. Tab to the **VD Name** field and type the name of your volume. In our case, we used **VD-DAS1**.



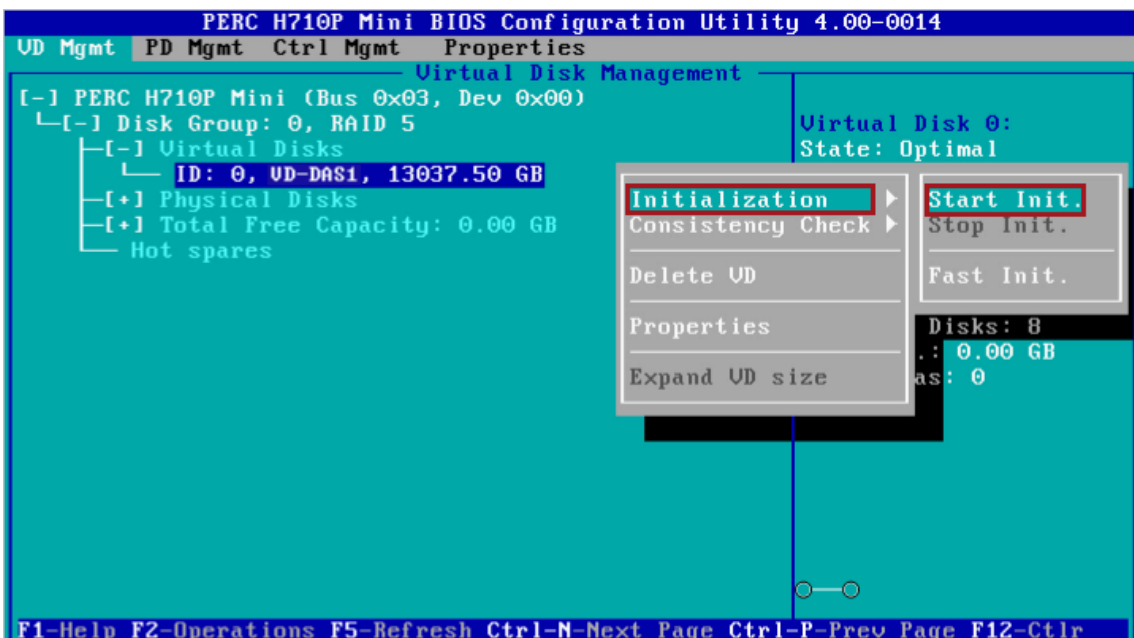
6. Select **OK** on the right.



7. A popup box will appear indicating we need to initialize the Virtual Disk after it has been configured, select **OK**.



8. Use your arrow keys to highlight **VD-DAS1**. Press **F2** and select **Initialization > Start Init.** Select **Yes** to confirm Initialization of the HDDs. This process can take several hours.



9. If prompted to continue, select **YES** and press **Enter**.
10. You can press **Enter** on the Virtual Disk to see the estimated time remaining.
11. When initialization is completed, select **OK** to confirm.
12. Press **ESC** to close out of the RAID Configuration Utility. Select **OK** to confirm exiting. You will be prompted to reboot your system.