EMC® VNX® For File Simulator

Release 8.1

Installation and Configuration Guide

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EMC²

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PREFACE

As part of an effort to improve its product lines, EMC periodically releases revisions of its software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact your EMC technical support professional if a product does not function properly or does not function as described in this document.

Note: This document was accurate at publication time. Go to EMC Online Support (https://support.emc.com) to ensure that you are using the latest version of this document.

Purpose

This document describes how to configure and use EMC VNX Simulator.

Audience

This document is part of the EMC VNX Simulator documentation set, and intended for use by trained EMC or EMC partner personnel during installation and setup of the product.

Readers of this guide are expected to be familiar with the following topic:

◆   *VNX hardware and software configuration*

Related documentation

For more information about VNX Network servers, VNX Operating Environment for File, VNX for File system configuration and management, refer to the VNX series documentation on the EMC Online Support website at:

https://support.emc.com

Conventions used in this document

EMC uses the following conventions for special notices:

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Note: A note presents information that is important, but not hazard-related.

IMPORTANT

An important notice contains information essential to software or hardware operation.

Typographical conventions

EMC uses the following type style conventions in this document:

Bold	Use for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
Italic	Use for full titles of publications referenced in text
`Monospace`	Use for: • System output, such as an error message or script • System code • Path names, file names, prompts, and syntax • Commands and options
`Monospace italic`	Use for variables.
`Monospace bold`	Use for user input.

[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections — the bar means "or"
{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information omitted from the example

Where to get help

EMC support, product, and licensing information can be obtained as follows:

Product information — For documentation, release notes, software updates, or information about EMC products, go to EMC Online Support at:

https://support.emc.com

Technical support — Go to EMC Online Support and click Service Center. You will see several options for contacting EMC Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to:

techpubcomments@emc.com

Preface

CHAPTER 1
EMC VNX for File Simulator

This chapter introduces the EMC VNX for File Simulator and provides instructions on how to install and configure it.

Introduction

The EMC® VNX® for File Simulator package is a pre-installed virtual VNX for File run on VMware Player, or VMware Workstation software. The simulator behaves like a VNX for File system with a Control Station and one or two Data Movers running the DART operating system. It manages simulated LUNs on the local virtual disk and allows the user to create and manage new simulated LUNs on mounted external file systems.

Users will be able to configure the virtual VNX for File's network settings, but other settings, such as the size of the virtual hard drive and the amount of virtual memory, are fixed.

The laptop or desktop system running the VNX for File Simulator must meet the minimum system requirements or the simulator will not install. Refer to "System requirements" on page 11 for more information on the minimum requirements.

Performance

The performance of EMC VNX for File Simulator is considerably less than that of an actual VNX for File system. Do not attempt to perform any large requests or any jobs that will put the simulator under stress. The simulator is not designed for a large workload.

For the two Data Mover version, each virtual Data Mover has 750 MB of memory for processing requests. The one Data Mover version has 600 MB of memory for processing requests. The simulator comes enabled with 22.5 GB of virtual storage at installation time. This comes in the form of two storage pools, one 18 GB and one 4.5 GB.

Installation overview

When you install the VNX for File Simulator, you must perform the following tasks:

◆   Download and install VMware Workstation or VMware Player on the desktop or laptop system if necessary.

◆   Download and extract the VNX for File Simulator zip file.

> **Note:** If you are planning to run more than one virtual VNX for File, use a different folder for each virtual machine.

◆   Start the EMC VNX for File Simulator in VMware Player or VMware Workstation.

◆ Load Unisphere to verify the VNX for File Simulator works correctly.

Additional information

For more information about VNX for File, VNX Operating Environment for File, VNX for File configuration, and VNX for File management, refer to the VNX for File configuration and management documentation on EMC Online Support at:

https://support.emc.com

System requirements

At a minimum, the EMC VNX for File Simulator package requires the following hardware and software configuration for installation:

Hardware requirements

◆ 64-bit-capable CPU supported by VMware Workstation or VMware Player

Note: Refer to the VMware software documentation for more information.

◆ RAM:

• One Data Mover: 4.0 GB (more is recommended)

• Two Data Movers: 6.0 GB (more is recommended)

Note: If more than 6.0 GB of RAM is present, the two Data Mover simulator starts automatically.

◆ 40 GB of **FREE** hard drive space at install time

Initial installation requires 4 GB, and 10 GB are automatically set aside for storage, but VNX for File Simulator may require more space depending on use.

Note: If VNX for File Simulator is run with a small number of file systems, and under a light operating load, it can be run with 21 GB of free hard drive space. However, EMC strongly recommends using 40 GB of disk space, as running out of hard drive space may cause a fatal corruption of the VNX for File Simulator.

Software requirements

◆ 64-bit-capable operating system supported by VMware Workstation or VMware Player

Note: Refer to the VMware software documentation for more information.

◆ VMware software requirements:

• One Data Mover: VMware Workstation 8.0 or higher, or VMware Player

• Two Data Movers: VMware Workstation 8.0 or higher, or VMware Player

Step 1: Installing VNX for File Simulator

Note: Before installing, make sure there are no installations of VMware GSX, or VMware ACE packages. To remove any existing VMware installs using Windows, use the **Add/Remove Programs** feature in the **Control Panel**.

To install the EMC VNX for File Simulator package, complete the following steps:

If you have VMware Workstation version 8.0 or later, or VMware Player already installed on your system, go to Step 3. Otherwise, continue with the steps below to download and install the free VMware Player

1. Download VMware player from:

   http://vmware.com/products/player

2. Install the VMware Player on the host system.

3. Download the VNX for File Simulator zip file from EMC Online Support.

   a. Go to http://support.EMC.com

   b. Search for **VNX File Simulator**

4. Extract the zip file to a folder of your choice.

Note: If you are planning to run more than one virtual VNX for File, use a different folder for each virtual machine.

Step 2: Configuring physical network interface ports

Configuring a physical network interface port allows the VNX for File Simulator to create a share that is accessible from outside of the host system. The simulator would be accessible from an outside system on the same network sharing the host Windows operating system.

By default a host-based network has been configured between the host Windows operating system and the VNX for File Simulator. This default network uses a virtual IP address that is automatically assigned to port **VMnet1** for use with the virtual Control Station port **eth2**. Configuring a physical network interface is only required if users would like to connect the simulator to an external network.

To configure one or more network interface ports for use with the VNX for File Simulator do the following:

◆ Configure the network interface port through Windows

◆ Configure the network interface port through VMware Player or Workstation

◆ Configure the network interface port for an external network

If you have a single network interface port on the host system, the simulator automatically configures that NIC as **VMnet0** for use with the virtual Control Station port **eth0**.

If you have two or more network interface ports on the host system, you need to configure which network port is going to be assigned to which VMnet port (**VMnet0** or **VMnet2**) and which virtual Control Station port (**eth0** and **eth1**).

> **Note:** If you have a single network interface port on the host system, the simulator automatically configures that NIC as **VMnet0** for use with the virtual Control Station port **eth0**.

Step 3: Starting the VNX for File Simulator

To start the VNX for File Simulator, do the following:

1. Verify the free hard drive space on the host computer. If you have not created any file systems, you must have approximately 10 GB of free hard drive space on your host computer.

Note: If you created any file systems or if you have used any of the 25 GB of virtual storage created on the simulator, you might have less than 10 GB of free space from the original 14 GB. As you use the virtual storage on the simulator, the 10 GB of free space on your host system will decrease proportionally.

2. Shut down any applications running on the host system, including any email applications.

   If you have less than 2 GB of free memory in the host system, you are warned about the simulator swapping virtual machine memory to compensate for the lack of memory. Using the swap memory will degrade simulator performance. We recommend you shut down all applications or increase the physical memory before continuing.

3. Double-click the shortcut for VMware Workstation or VMware Player on the Desktop.

4. Open the `Other Linux 2.6.x kernal 64-bit.vmx` file in the VMware software.

   At this point, the VMware package is ready to run VNX for File Management tools. Management of the virtual VNX for File system can be accomplished through the VNX for File command line interface (CLI) or by loading Unisphere in a web browser.

   Log in as **root** using the default password **nasadmin** to configure the virtual external network interface.

Configuring the virtual external network interface

To configure the network interface(s) for an external network, do the following:

1. Type the following command to configure the virtual `eth0` port for the simulator:

   netconfig -d eth0

   A screen appears asking if you want to set up networking.

2. Tab to **Yes** and press ENTER.

3. If you wish to use dynamic IP configuration, press the space bar to select the **Use dynamic IP configuration (BOOTP/DHCP)** option. Tab to **OK** and press ENTER, as shown in .

Note: To use DHCP with the VNX for File Simulator, the external network must support DHCP clients.

To use a static IP address, enter the port IP address, netmask, default gateway IP address, and primary nameserver IP address. Tab to **OK** and press ENTER, as shown in Figure 1.

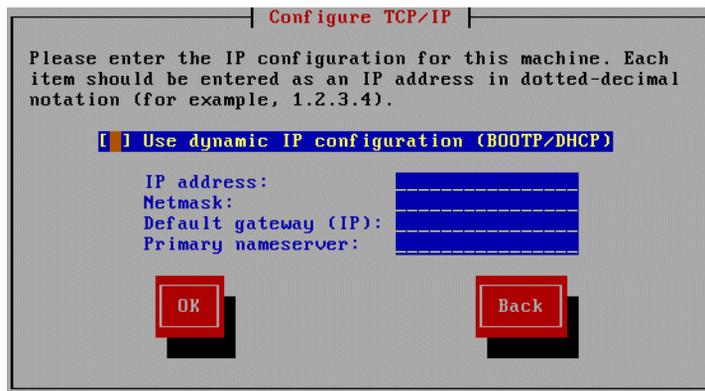**Note:** The virtual machine must reside on the same subnet as the host machine.

Figure 1 Configure TCP/IP

4. At the command prompt, type **ifup eth0** to activate the network interface.

5. Type **ifconfig eth0** to view the network interface's configuration information.

6. To configure an optional second network interface port, repeat steps 1 through 2 in this procedure and use eth1 in all of the commands, instead of eth0.

    If you want to configure network interface eth2, you must configure it using DHCP.

    Note: The IP addresses for eth0 and eth1 must be different.

7. Type **exit** to log out of root.

    At this point, the virtual network interfaces have been configured, and the VMware package is ready to run VNX for File Management tools.

    Go to "Step 4: Loading Unisphere" on page 16 to load Unisphere

Go to Chapter 2, "VNX for File Simulator Advanced Configuration," for advanced configuration options.

Step 4: Loading Unisphere

To access Unisphere on the VNX for File Simulator, do the following:

1. Log in to the VNX for File Simulator as `root`. The default password is `nasadmin`.

2. Type **`ifconfig eth2`** to view the network interface's configuration information.

   Sample output:

```
eth2 Link encap:Ethernet  HWaddr 00:0C:29:07:29:F9
    inet addr:192.168.20.1 Bcast:192.168.20.255  Mask:255.255.255.0
    UP BROADCAST NOTRAILERS RUNNING  MTU:1500  Metric:1
    RX packets:12 errors:0 dropped:0 overruns:0 frame:0
    TX packets:13 errors:0 dropped:0 overruns:0 carrier:0
    collisions:0 txqueuelen:100
    RX bytes:1102 (1.0 Kb)  TX bytes:1564 (1.5 Kb)
    Interrupt:5 Base address:0x1480
```

3. Locate the IP address of **eth2**, this is the virtual IP address of the VNX for File Simulator. It should be 192.168.xxx.1 and be listed after `inet addr:`.

4. Open a web browser on the host system and enter the IP address from the previous step in the address bar.

   The following error message may appear on your browser:

   ```
   Internal Server Error

   The server encountered an internal error or misconfiguration and
   was unable to complete your request.
   ```

   The error message means that the configuration information for the virtual VNX for File has not updated yet. Refreshing the web browser, or closing it and waiting a few minutes before opening it again will take care of the problem.

5. If a security alert about the system's security certificate appears, click **Yes** to proceed.

6. At the login prompt, log in as user **`nasadmin`** and password **`nasadmin`**.

7. If a security warning about the system's security certificate being issued by an untrusted source appears, click **Yes** to accept the certificate.

8. If a warning about a hostname mismatch appears, click **Yes** to proceed.

9. Enable any licenses as appropriate. The virtual storage will not be available unless you enable CIFS and NFS.

> **Note:** For more information about CIFS and NFS, refer to *Configuring and Managing CIFS on VNX* and *Configuring NFS on VNX* on EMC Online Support at: https://support.emc.com

Each virtual Data Mover has 600 MB of memory for processing requests.

The simulator comes enabled with 22.5 GB of virtual storage at installation time. This comes in the form of two storage pools, one 18 GB and one 4.5 GB

Troubleshooting

For troubleshooting information regarding the setup or management of the virtual VNX for File Simulator, refer to the VNX for File configuration and management documentation on EMC Online Support at:

https://support.emc.com

For troubleshooting information regarding the VMware software, refer to the VMware Knowledge Base at:

http://www.vmware.com/support/kb/enduser/std_alp.php

EMC VNX for File Simulator

CHAPTER 2
VNX for File Simulator Advanced Configuration

This document describes how to perform advanced tasks with the VNX for File Simulator.

Binding Data Mover ports to network interfaces

At installation time two Data Mover ports **cge0** and **cge1** are configured and mapped to the Control Station port eth0. To change one of these existing Data Mover ports to a different Control Station port (**eth1** or **eth2**) or to create any additional (up to six total) Data Mover ports, do the following:

Note: This procedure requires the reboot of the VNX for File Simulator for the change to take affect.

1. Log in to the VNX for File Simulator as `root`. The default password is `nasadmin`.

2. Run the script to add a device to Control Station ports **eth1** or **eth2** by entering the following command:

   `./configure_nic server_<x> -a eth<y>`

   Where `x` is the slot number, and `y` is the Control Station port number.

```
server_2: added new device cge3 in slot 8.
  Use server_ifconfig to configure the newly added device
  after reboot the virtual machine.
  -------------------------------------------------------
  server_2: network devices:
  Slot DeviceDriverStub  Ifname Irq    Id     Vendor
  -------------------------------------------------------
  3   cge0   bbnic  direct eth0   0x0018 0x1645 0x14e4
  4   cge1   bbnic  direct eth1   0x0019 0x1645 0x14e4
  5   cge2   bbnic  direct eth1   0x001a 0x1645 0x14e4
  8   cge3   bbnic  direct eth2   0x001b 0x1645 0x14e4
  -------------------------------------------------------
```

3. Reboot the VNX for File Simulator by typing the following command:

   `reboot`

   The simulator reboots and logs you out.

4. When the simulator is finished rebooting, log in to the VNX for File Simulator as `root`. The default password is `nasadmin`.

5. Verify the change was successful by typing:

   a. Export the NAS database, by typing:

      `export NAS_DB=/nas`

b. Display the PCI devices, by typing:

```
/nas/bin/server_sysconfig server_2 -p
```

The `server_sysconfig` command displays all of the PCI devices for the virtual Data Mover.

Sample output:

```
server_2 : PCI DEVICES:

Slot: 3
Broadcom Gigabit Ethernet Controller
0:  cge0  IRQ: 18
speed=auto duplex=auto

Slot: 4
Broadcom Gigabit Ethernet Controller
0:  cge1  IRQ: 19
speed=auto duplex=auto

Slot: 6
Broadcom Gigabit Ethernet Controller
0:  cge3 IRQ: 20
speed=auto duplex=auto
```

Creating/Deleting virtual storage

This section describes how to create, bind, unbind, and delete virtual storage (user LUNs, diskgroups, and hot spares). At installation time, the simulator has 10 virtual user LUNs already created. These procedures allow you to create new virtual LUNs or delete any existing virtual LUNs.

The default configuration of the VNX for File Simulator requires 40 GB of storage on the host system that is reserved for the simulator. From this 40 GB of reserved storage, approximately 5-7 GB of that space is required for the simulator software and files. 22.5 GB of space is allocated to two storage pools, one is 4.5 GB and the other is 18 GB. The two storage pools consist of a total of ten 2.2 GB LUNs.

The ten LUNs are sparse LUNs, meaning the disk space has not been specifically reserved for the LUNs. Sparse LUNs allow other users to use disk space allocated for the LUN, causing the LUN to run out of physical disk space before its maximum size is reached.

⚠CAUTION

If you plan to create any new virtual storage, you must have the same amount of free storage on the host laptop or desktop. This free space must be over and above the free space required for the original 25 GB of virtual storage.

Types of LUN creation

When creating new LUNs for the VNX for File Simulator, you can create LUNs using internal storage or external storage. Internal storage uses the local disks on the host system to create additional LUNs. External storage uses a mounted file system outside of the host system to create additional LUNs.

External storage is the recommended choice for creating additional LUNs for the simulator. This allows for an unlimited amount of disk space. You must have an external network connection for the simulator and the file system with the free space for the new LUN must be mounted by the simulator. The file system must be persistently mounted with NFS. The free space should be dedicated for the simulator.

Refer to "Creating LUNs using external storage" on page 24 for more information on creating an external storage LUN.

You have three different ways to create LUNs:

Creating LUNs using available free space

The safest way to create new LUNs is to use the available space on the external storage as determined by the simulator. Once you identify the pathname of the file system to create the LUNs, the simulator identifies the available storage to create new LUNs. This is option 1 on the **Data LUN Creation Menu** as shown in Figure 5 on page 28.

Once created the LUN will have the same functionality as the original LUNs created on the host system. Refer to "Creating LUNs using external storage" on page 24 for more information on creating LUNs using external storage.

Creating sparse LUNs to mimic a full VNX for Block array

The simulator allows for the creation of sparse LUNs on the host system that appear to the simulator as actual LUNs. This allows the simulator user to create sparse LUNs that appear as full size LUNs equivalent to an actual VNX for Block array, without having to actually have that much free space on the host system.

Sparse LUNs allow other users to use disk space allocated for the LUN, potentially causing the LUN to run out of physical disk space before its maximum size is reached. The LUNs would not be able to perform any input/output operations at that point, but they would appear to the simulator just like an actual array. This would be ideal for demonstration purposes.

Refer to "Type exit to log out of root." on page 29 or more information on creating sparse LUNs.

Creating user-specified LUNs

The simulator allows for the creation of user-specified LUNs, where the user selects the size of the LUN to create. The danger with this option is that the user can define a LUN much larger than the free space available.

If the user defines a LUN larger than the available free space, a sparse LUN is created. Sparse LUNs appear to the simulator as normal LUNS, but cannot perform any input/output operations.

If the user defines a LUN that is equal to or less than the available space, a normal LUN is created.Normal LUNs have the same functionality as the original LUNs created on the host system.

Refer to "Type exit to log out of root." on page 29 for more information on creating user-specified LUNs.

Creating LUNs using external storage

o create additional user LUNs on external storage for the VNX for File Simulator, do the following:

Note: You must have an external network connection for the simulator and the file system with the free space for the new LUN must be mounted by the simulator. The file system must be persistently mounted with NFS. The free space should be dedicated for the simulator. Refer to "Troubleshooting 33" on page 19 for information on creating an external network connection.

1. Log in to the VNX for File Simulator as `root`. The default password is `nasadmin`.

2. Run the `setup_clariion` command by typing:

   /nas/sbin/setup_clariion -init

Note: The **Enclosure Configuration Menu** appears, as shown in Figure 2.

3. Enter **1** to add a new enclosure, as shown in Figure 2.

4. Enter the number of the new enclosure, or press ENTER to use the default value, as shown in Figure 2.

5. Enter the disk size for the new enclosure, or press ENTER to use the default value, as shown in Figure 2.

6. Enter the disk type for the new enclosure, or press ENTER to use the default value, as shown in Figure 2.

Figure 2 Enclosure Configuration Menu

You have created the new virtual enclosure. To add additional enclosures, repeat steps 2 through 6 as needed. The **Enclosure Configuration Menu** appears.

7. Enter **3** to select a diskgroup template for the new enclosure, as shown in Figure 3.

The available diskgroup templates are displayed.

8. Select the diskgroup template to use for the new enclosure, as shown in Figure 3. Options for selecting a diskgroup template include a CX_Standard_Raid_5 configuration and a variety of User_Defined configurations. Selecting 1 from this menu will leave the new enclosure unbound.

```
-----------------------------------------------------------
1_0: 146 146 146 146 146 146 146 146 146 146 146 146 146 146
 FC    9   9   9   9   9  10  10  10  10  10  11  11  11  11  11  R5
-----------------------------------------------------------
0_0: 146 146 146 146 146 146 146 146 146 146 146 146 146 146
 FC    0   0   0   0   0 200   8   8   8   8   8   8   8   8   8  R5
-----------------------------------------------------------

Enclosure Configuration Menu:

1. Add New Enclosure
2. Delete Existing Enclosure
3. Continue to Diskgroup Template Menu

Please select a choice in the range of 1-3 or 'q' to quit [3]: 3


The following 3 template(s) available:

1. CX_Standard_Raid_5
2. User_Defined
3. None

Configuration for BB000C29009699
Please select a template in the range of 1-3 or 'q' to quit: _
```

Figure 3 Enclosure Configuration Menu - Template Selection

9. Enter **yes** to confirm your selection for the desired configuration.

10. Enter the pathname for disk storage location and press ENTER, as shown in
Figure 4. The pathname is the external mounted file system where you would like
to create the new user LUNs.

Note: Once you press ENTER, the simulator scans the external file system for
available storage. The file system must be accessible and have free space.

Figure 4 Enclosure Configuration Menu - Pathname Selection

The **Data LUN Creation Menu** appears, as shown in Figure 5.

11. Select the size for the new LUNs on the **Data LUN Creation Menu,** as shown in Figure 5.

The default size for the LUNs uses the maximum available storage size in the specified path (option **1**). You can also create Sparse LUNs (option **2**) or a user-specified storage size (option **3**).

If you select user-specified storage size (option **3**), you must enter the size and confirm your selection. The size is the total size of all the LUNs you are creating. For example, if you are creating four LUNs and you select a user-specified storage size of 20 GB, each LUN you create will be 5 GB.

Note: If you plan on creating sparse LUNs, make sure the external storage is exclusive to the VNX for File Simulator.

Figure 5 Data LUN Creation Menu

If you selected option **1** or option **3** from the **Data LUN Creation Menu,** a prompt about zeroing all LUNs to reserve the storage size is displayed.

Note: If you selected option **2** or **3** and you defined LUNs larger than the available space, a warning is displayed about over-provisioning and the creation of sparse LUNs. If you would like to create sparse LUNs, click **y** to confirm this.

You are not prompted about zeroing the LUNs. Type **exit** to log out of root.

12. Enter **no** to zero the LUNs if the disk space for the LUN is dedicated for the VNX for File Simulator.

   Enter **yes** to zero the LUNs if the disk space for the LUNs is not dedicated for the VNX for File Simulator.

   Note: Zeroing the LUNs is a very time-consuming process, but if you skip it, the LUNs will be created from sparse files. This means that other users may use disk space allocated for the LUN, causing the LUN to run out of physical disk space before its maximum size is reached.

   For example: To zero a 100 MB LUN, it takes approximately three hours. To zero a 1 GB LUN, it takes approximately 30 hours.

13. Type **exit** to log out of root.

Deleting virtual storage

To delete virtual storage (user LUNs, disk groups, or hot spares) from the simulator, complete the following steps:

Note: Before you delete any virtual storage, all file systems and volumes associated with the LUNs must be deleted. Use the `nas_disk -l` command to identify any file systems or volumes associated with the LUNs you are about to delete are in use.

1. Log in to the VNX for File Simulator as `root`. The default password is `nasadmin`.

2. Set the `NAS_DB` variable by typing:

   export NAS_DB=/nas

3. Navigate to the `/nas/sbin/setup_backend` directory by typing:

   cd /nas/sbin/setup_backend

4. Type **./nas_raid list** command to bring up a list of raid groups, as shown in Figure 6.

Figure 6 nas_raid List Output

Before an enclosure can be deleted, all of its LUNs must be unbound.

5. When unbinding the LUNs in the diskgroup, you have three options:

• To delete all the LUNs in a specific diskgroup, use the following command:

./nas_raid delete diskgroup <diskgroup number>

Where the diskgroup number is the number following the RG ID: in the nas_raid command output, as shown in Figure 6 on page 30.

Note: If you intend to delete more than one diskgroup, you can wait until all the diskgroups are deleted before rebooting the DMs.

• To unbind a spare disk, use the following command:

./nas_raid delete spare <spare disk number>

Where the spare disk number is the number following the Spare ID: in the nas_raid command output, as shown in Figure 6 on page 30.

- To delete all the diskgroups in the virtual storage, use the following command:

  > ⚠️**WARNING**
  >
  > **This command will erase all of the virtual storage, including any data that is contained there. This includes the original 25 GB of virtual storage configured at installation.**

  /.nas_raid cleanup

  Before you run the `/.nas_raid cleanup` command, all file systems and volumes associated with the LUNs must be deleted. Use the `nas_disk -l` command to identify any file systems or volumes associated with the LUNs you are about to delete are in use.

  Type **yes** at the confirmation screen to confirm the deletion of the virtual storage.

6. If you have multiple diskgroups or multiple hot spares to delete, repeat the `./nas_raid delete` command as appropriate.

   > **Note:** Before you can delete an enclosure, you must delete all of the diskgroups and hot spares in the enclosure. If you do not delete all of them, the enclosure deletion will fail.

7. Reboot the Data Movers by typing:

   /nas/bin/server_cpu ALL -reboot now

8. Return to the `root` directory by typing:

   cd /root

9. Run the `setup_clariion` command by typing:

   /nas/sbin/setup_clariion -init

   The **Enclosure Configuration Menu** appears, as shown in Figure 2 on page 25.

10. Enter **2** to select **Delete Existing Enclosure**.

11. Enter the number of the enclosure to delete, as shown in Figure 7. The number is written in the format of

`<Bus number>_<enclosure number>`. For example, enclosure 3_2 is enclosure two on the third bus.

Figure 7 Delete Enclosure

12. Type **exit** to log out of root.

Adding a second Data Mover to VNX for File Simulator

Verify the following requirements before adding a second Data Mover to VNX for File Simulator:

◆ The host system must have a minimum of 6.0 GB of RAM.

◆ If you are using VMware Workstation, you must be using version 8.0 or higher.

You may also need to increase the memory simulated by the virtual machine.

Note: Be aware that increasing the simulated memory too much will degrade the performance of your PC and virtual machine.

Complete the following steps to add a second Data Mover to the VNX for File Simulator:

1. Reboot the virtual machine and log in as root. There will be two Data Movers running. The second one (server_3) comes up as a standby for the original Data Mover.

2. Run the following command to verify that both Data Movers are set up:

   `/nas/bin/nas_server -l`

   Both server_2 and server_3 should be listed.

3. Configure the Data Movers using the normal VNX OE for File commands.

   For more information about VNX OE for File commands, refer to *VNX Command Line Interface Reference for File* on EMC Online Support at:

   https://support.emc.com

Troubleshooting

For troubleshooting information regarding the setup or management of the virtual VNX for File Simulator, refer to the VNX for File configuration and management documentation on EMC Online Support at:

https://support.emc.com

For troubleshooting information regarding the VMware software, refer to the VMware Knowledge Base at:

http://www.vmware.com/support/kb/enduser/std_alp.php

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