



# Quantum DXi Dynamic Application Environment (DAE) Installation Guide

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# Overview

This document provides instructions for installing and configuring a Dynamic Application Environment (DAE) on DXi4700, DXi6900, and DXi6900-S systems.

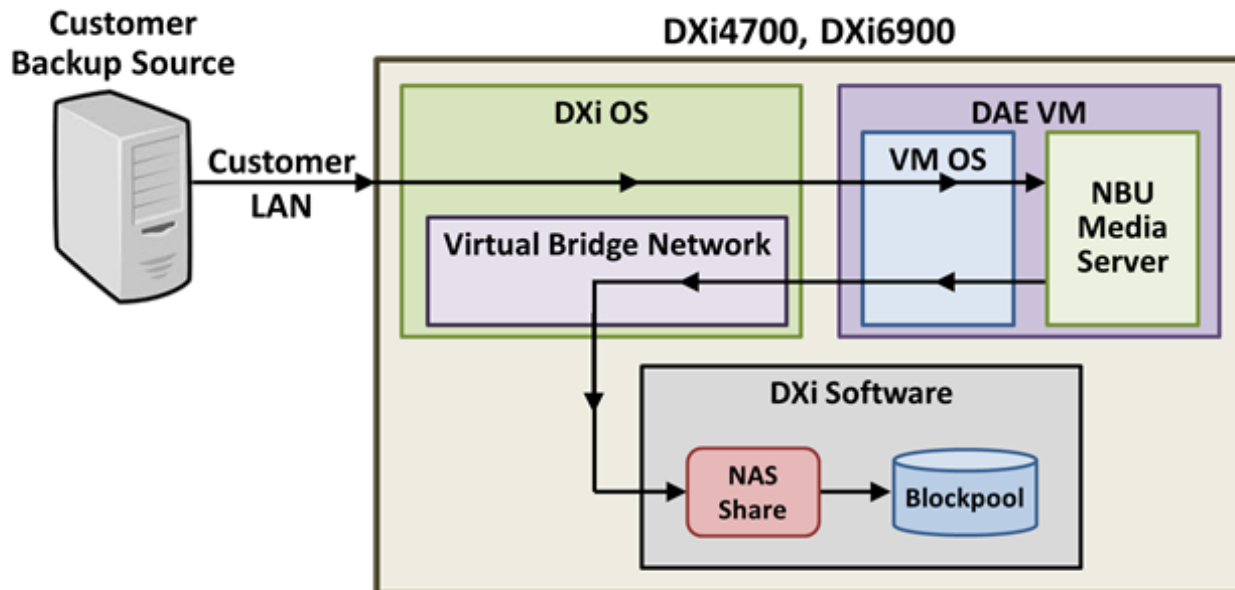
## Dynamic Application Environment (DAE)

DAE, technically known as a Hypervisor, provides a virtual machine environment in which you can install additional operating systems for running third-party applications you provide on your supported system. Once licensed and configured, the DAE feature on the DXi allows applications installed in the VM to run in a completely independent environment, and can also access DXi resources and shares.

An example use for DAE is installing Veritas NetBackup (NBU) media server as a virtual machine (VM) instead of purchasing and installing a dedicated server to run the NetBackup application.

The simplified block diagram below shows the data flow when NBU is installed in a DXi as a DAE VM. Management communication is omitted for simplicity. Backups of the customer data are scheduled by the virtualized NBU Media Server, and backup data is sent from the Customer Data Source to the DXi, where it is routed through the NBU Media Server, then through a Virtual Bridge Network to a NAS Share for deduplication and storage in the Blockpool.

In this example, data stays within the DXi because the NBU Media Server has direct access to a NAS share. Some DAE installations may not have direct access to the DXi software, and would communicate only with the LAN ecosystem.



# Preparing for the Installation

## Installation Prerequisites

To successfully complete a DAE installation, it is important that you have experience in the following areas:

- Installing and configuring Linux operating systems.
- Virtual machine network configuration experience.


DAE installation support is available from Quantum. Please contact your Quantum account sales manager for more information.

Before you begin the DAE installation, make the following preparations:

- [Review DAE System Requirements below](#)
- [Checking System Health on the next page](#)
- [Accessing Remote Management on the next page](#)

## Review DAE System Requirements

The following items are required to successfully install and configure DAE on a DXi system.

Requirement	Description
<b>CLI Admin User</b>	The CLI Admin ( <b>cliadmin</b> ) account must be enabled on the DXi.
<b>DAE License</b>	A DAE License must installed on the DXi system.
<b>DXi Software</b>	The DXi system must be running DXi 3.4.0 Software or higher.
<b>.ISO File</b>	A Linux type operating system .ISO must be used for the virtual machine (VM) operating system installation (OS).
<b>Data Space</b>	The DXi must have a minimum 100 GB + the size of the .ISO file in free data space available.  <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p> <b>Note:</b> Installing DAE when the DXi is in <b>Low Space</b> or <b>Critical Low Space</b> is not supported.</p> </div>
<b>GUI Admin User</b>	You must have the GUI Administrator user account password.
<b>Memory</b>	Depending on the current DXi system memory, a memory upgrade may be required.

Requirement	Description
<b>NAS Support</b>	The DXi must have NAS support. The following systems support NAS: <ul style="list-style-type: none"> <li>• DXi4700 - NAS Configuration</li> <li>• DXi4700 - Multi-Protocol Configuration</li> <li>• DXi6900 (G1/G2)</li> <li>• DXi6900-S</li> </ul>
<b>NIC Ports</b>	One or more NIC ports on the DXi with no IP address assigned to it must be available. These ports will be used by the virtual machine (VM) operating system (OS).
<b>X11 Support</b>	An external host system that supports running X11 Windows is required to install the DAE virtual machine (VM) operating system (OS) and manage the OS via a local DXi VNC connection.

## Checking System Health

Make sure the following conditions are met before you continue with DAE installation:

- All backup jobs are completed and there is no pending I/O.
- All replication jobs are completed, and replication is paused (**Replication > Actions** page).
- All space reclamation tasks are completed without errors (**Utilities > Space Reclamation** page).
- All healthchecks are completed without errors (**Utilities > Space Reclamation** page).
- All components in the system display Normal status (**Status > Hardware** page).
- All outstanding administration alerts are deleted (**Alerts > Admin Alerts** page).
- All service tickets are closed (**Alerts > Service Tickets** page).

For more information, click **Help** in the remote management console to display the DXi online help. To access remote management, see [Accessing Remote Management below](#)).

## Accessing Remote Management

To access the remote management console, do the following:

1. Launch a supported Web browser on a workstation that has network access to the DXi

The DXi remote management console supports the following Web browsers:

  - Mozilla Firefox 36 or later
  - Google Chrome 40 or later
  - Microsoft Internet Explorer 11.
2. In the browser address box, type the IP address of the DXi, and then press **<Enter>**.

The **Login** window displays (see [Figure 1 below](#)).

**Figure 1:** Login Window

If the **Login** window does not display, verify that the IP address is correct and that the network path to the DXi system is valid. Also verify that you are using a supported Web browser. Then try again. If you are still unable to access the **Login** window, contact the DXi GUI administrator.

3. Select **Administrator** and enter the GUI Administrator user password.
4. Click **Login**.
5. If a security banner message has been specified for the DXi, click **Accept**.

The **Home** page displays.

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## DXi System Configuration

To perform the DAE configuration on the DXi system, complete the following steps in order:



Step	Description	Procedure to Complete
1	The DXi requires DXi 3.4 Software and above to complete the DAE installation. Review the current software version and perform an upgrade if necessary.	Go to <a href="#">Software Upgrades on the next page</a> .
2	Review the DAE memory requirements and install additional DXi memory if necessary.	Go to <a href="#">Install Additional Memory on page 13</a>
3	Install the DAE License on the DXi.	Go to <a href="#">Install the DAE License on page 29</a> .

Step	Description	Procedure to Complete
4	Create a virtual machine (VM) NAS share on the DXi.	Go to <a href="#">Create a Virtual Machine NAS Share on page 30</a> .
5	Enable the DAE feature on the DXi.	Go to <a href="#">Enable DAE on the DXi on page 31</a> .

## Software Upgrades

The DXi system requires DXi 3.4.0 Software and above to successfully complete a DAE installation. If the system is already running DXi 3.4.0 Software and above, go to [Install Additional Memory on page 13](#).

There are two methods for upgrading the DXi software:

<p><b>Check for an upgrade (Home page)</b></p>	<p>The DXi can automatically check for software upgrades on the <b>Home</b> page, or you can manually perform an upgrade check. If an upgrade is found, you can choose to download and install it.</p> <p>This is the recommended method for upgrading, but it requires that the DXi be able to access the Internet.</p> <p> <b>Caution:</b> Configure your firewall so that the DXi can send data to and received data from updates.quantum.com using port 80 (HTTP).</p>
<p><b>Upload a software upgrade file (Software Upgrade page)</b></p>	<p>You can download a software upgrade file from the Quantum Service and Support Web site and then manually upload it to the DXi using the <b>Software Upgrade</b> page.</p> <p>You can use this method if the DXi cannot access the Internet.</p> <p> <b>Note:</b> Uploading a software upgrade file may be useful if you are upgrading multiple DXi systems, as the file only needs to be downloaded once. Also, this method assures that all systems will be running the same software version following the upgrade.</p>

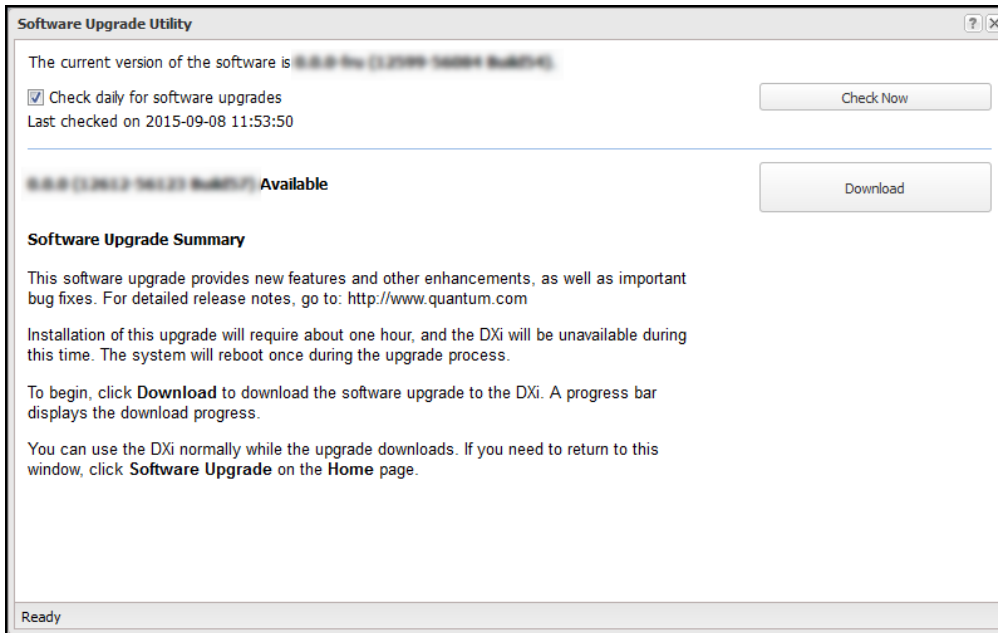
## Checking For Software Upgrades

The **Software Upgrade Utility** (accessible from the **Home** page) allows you to check for available DXi software upgrades and, if available, download and install them. You can also configure the DAE to automatically check for software upgrades.

**Note:** To check for and download software upgrades, the DXi must be able to access the Internet. If the DXi cannot access the Internet, see [Uploading a Software Upgrade File on page 10](#).

To access the **Software Upgrade Utility**, click **Home** on the main menu, and then click the **Software Upgrade** link (see [Figure 2 below](#)).

**Figure 2:** Software Upgrade Utility



## Tasks

Use the **Software Upgrade Utility** to perform the following tasks:

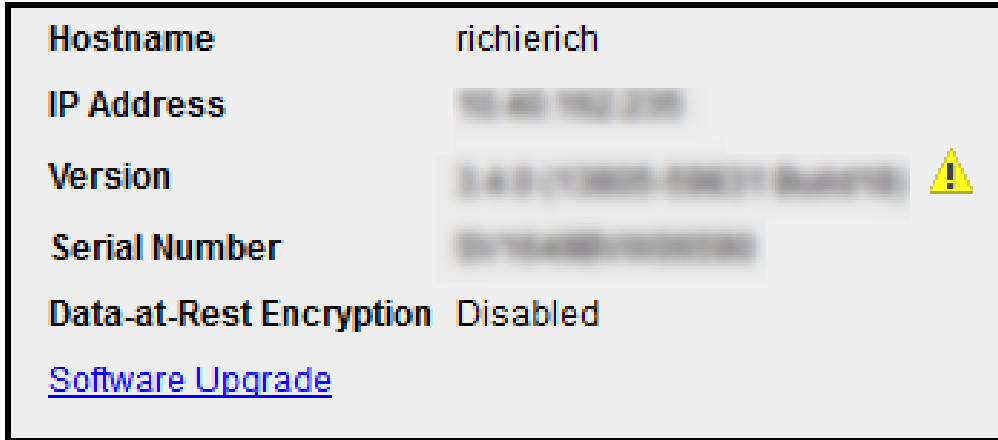
- Configure the DAE to automatically check for software upgrades (see [Automatically Checking for Upgrades below](#)).
- Manually check for software upgrades (see [Manually Checking for Upgrades on the next page](#)).
- Download and install available software upgrades (see [Downloading and Installing Upgrades on the next page](#)).

## Automatically Checking for Upgrades

The DAE can automatically check for available software upgrades on a daily basis. If a software upgrade is found, you will be notified by an admin alert as well as by a Quick Tip icon on the **Home** page, next to the current software version (see [Figure 3 on the next page](#)).

On the **Software Upgrade Utility**, select the **Check daily for software upgrades** check box to enable automatic upgrade checking. Automatic upgrade checking is enabled by default. To disable automatic upgrade checking, clear the **Check daily for software upgrades** check box (not recommended).

**Figure 3:** Home Page - Software Upgrade Available



### Manually Checking for Upgrades

To check for available software upgrades at any time, on the **Software Upgrade Utility**, click **Check Now**.

If a software upgrade is available, you can read information about the contents of the upgrade and, if you choose, download and install it.

### Downloading and Installing Upgrades

If a software upgrade is available (after automatically or manually checking for upgrades), a summary describing the upgrade displays on the **Software Upgrade Utility**.

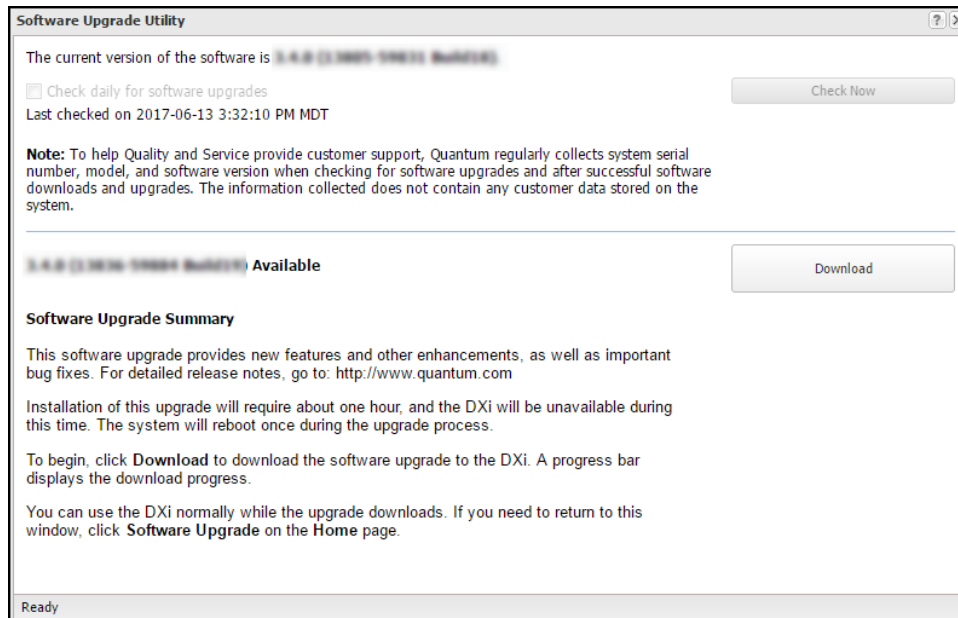
To download and install an available software upgrade:

1. On the **Software Upgrade Utility**, click **Download**.

The bottom status bar displays download progress. It will take several minutes to download the upgrade, depending on network speeds. You can use the DXi normally while the upgrade downloads. If you need to return to this window, click **Software Upgrade** on the **Home** page.

When the download is complete, a list of pre-upgrade actions displays (see [Figure 4 on the next page](#)). These are important actions you should take prior to installing the upgrade.



**Figure 4:** Software Upgrade Utility - Software Upgrade Downloaded

2. To ensure the system is healthy before upgrading, read and follow the instructions in each of the pre-upgrade actions. The pre-upgrade actions can differ depending on the type of upgrade, but typical actions include the following:
  - Address and delete all outstanding administration alerts.
  - Resolve and close all outstanding service tickets.

**Note:** Quantum recommends taking the following actions before upgrading.

- Stop all active backup jobs (see your backup application). Any backup jobs that are run during the upgrade will fail.
  - Make sure all replication jobs are complete. If replication or synchronization jobs are nearly complete, Quantum recommends allowing them to complete before upgrading.
  - Make sure space reclamation is complete. If space reclamation is nearly complete, Quantum recommends allowing it to complete before upgrading.
  - Download a system diagnostics file and transfer the file to a safe repository off of the DXi. The system diagnostics file can help in resolving problems if they occur.
3. Confirm that you have completed all pre-upgrade actions by selecting the **Ready to install** check box.
 

**Note:** The **Ready to install** check box and the **Install** button are disabled if there are any outstanding administration alerts or service tickets.
  4. To begin the upgrade process, click **Install**.

Read the onscreen information to learn what to expect during the upgrade. The bottom status bar displays installation progress, and a message displays if a reboot is required.

Depending on the type of upgrade, the DXi may be placed in service mode for about an hour. While in service mode, the system will shut down all backup and replication services. If necessary, the DXi will restart one or more times to complete the upgrade.

**i Note:** If you decide not to install the software upgrade after downloading it, click **Remove Software Upgrade File** to remove the current download from the DXi.

### Important - Clear Your Web Browser Cache

It is important to clear your Web browser cache before logging on to the remote management console for the first time following the software upgrade. This will ensure the remote management console displays correctly.

## Uploading a Software Upgrade File

The **Software Upgrade** page allows you to upload and install a software upgrade file on the DAE. Use this upgrade method if the DXi cannot access the Internet.

Before you begin, download the software upgrade file on a computer connected to the Internet, and then copy the software upgrade file (.fw) to the computer you will use to access the DXi remote management console. You can download the software upgrade file and release notes from the Quantum Service and Support Web site:

<http://www.quantum.com/ServiceandSupport/Index.aspx>

To access the **Software Upgrade** page, click the **Utilities** menu, and then click the **Software Upgrade** tab (see [Figure 5 below](#)).

**Figure 5:** Software Upgrade Page

The screenshot shows a web interface for uploading a software upgrade file. At the top, there is a blue header bar with the text 'Upload New DXi Software Upgrade File' and a 'Help' link. Below the header is a main content area with a light gray background. In this area, there is a section labeled 'Software Upgrade File' containing a 'Browse...' button and the text 'No file selected.'. Below this section is a warning message with a yellow triangle icon: 'Warning: Upload may take a few minutes and MUST NOT BE INTERRUPTED. Once you click on the Upload button, DO NOT CLICK on any hyperlinks, toolbar buttons, or menu items until the upload finished message appears.' At the bottom of the main content area is an 'Upload' button.

To upload a software upgrade file:

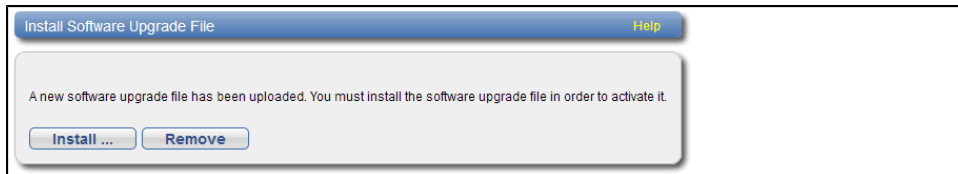
1. Click the **Browse** button to browse the system and locate the software upgrade file.
2. Click **Upload**.
3. Click **Start** to begin the upload process.

Do not close the window until the uploading and unpacking process is complete. An **Information** message displays stating the software upgrade file was uploaded successfully.

4. Click **OK**.

The **Software Upgrade** page indicates that a software upgrade file has been uploaded (see [Figure 6 below](#)).

**Figure 6:** Software Upgrade Page - Software Upgrade File Uploaded

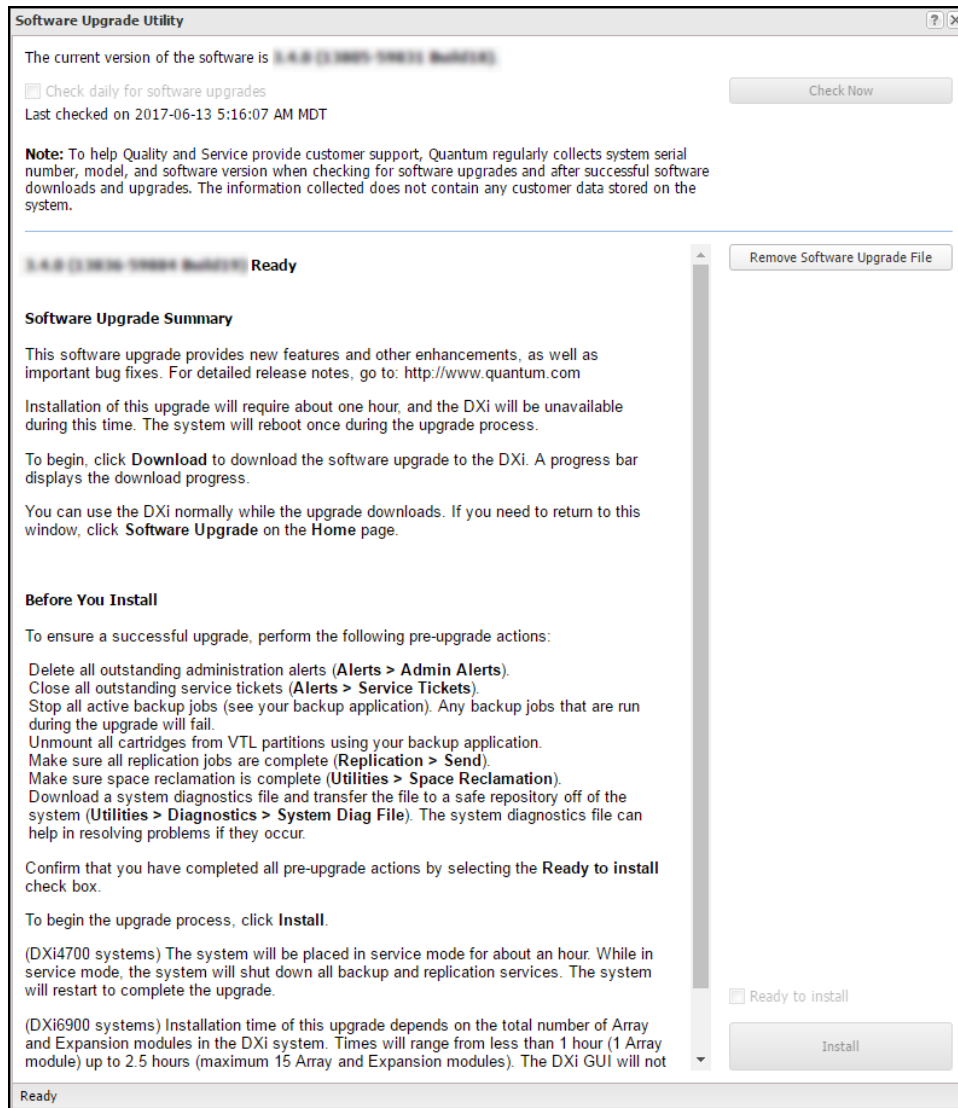


5. Click **Install**.

#### **Additional Information**

- If necessary, click the link to delete any outstanding administration alerts before proceeding.
- If you decide not to install the software upgrade file after uploading it, click **Remove** on the **Utilities > Software Upgrade** page to remove the uploaded software upgrade file from the DXi.

The **Software Upgrade Utility** displays (see [Figure 7 on the next page](#)).

**Figure 7: Software Upgrade Utility - Software Upgrade File Uploaded**

6. To ensure the system is healthy before upgrading, read and follow the instructions in each of the pre-upgrade actions. The pre-upgrade actions can differ depending on the type of upgrade, but typical actions include the following:
  - Address and delete all outstanding administration alerts.
  - Resolve and close all outstanding service ticket.

**Note:** Quantum recommends taking the following actions before upgrading.

- Stop all active backup jobs (see your backup application).
  - Make sure all replication jobs are complete. If replication or synchronization jobs are nearly complete, Quantum recommends allowing them to complete before upgrading.
  - Make sure space reclamation is complete. If space reclamation is nearly complete, Quantum recommends allowing it to complete before upgrading.
  - Download a system diagnostics file and transfer the file to a safe repository off of the DXi. The system diagnostics file can help in resolving problems if they occur.
7. After you have completed all pre-upgrade actions, confirm that you are ready to continue by selecting the **Ready to install** check box.

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**i Note:** The **Ready to install** check box and the **Install** button are disabled if there are any outstanding administration alerts or service tickets.

8. To begin the upgrade process, click **Install**.

Read the on-screen information to learn what to expect during the upgrade. The bottom status bar displays installation progress, and a message displays if a reboot is required.

Depending on the type of upgrade, the DXi may be placed in service mode for about an hour. While in service mode, the system will shut down all backup and replication services. If necessary, the DXi will restart one or more times to complete the upgrade.

### Important - Clear Your Web Browser Cache

It is important to clear your Web browser cache before logging on to the remote management console for the first time following the software upgrade. This will ensure the remote management console displays correctly.

## Install Additional Memory

**WARNING:** The DXi system **must** be running DXi 3.4.0 Software or higher before installing additional memory (see [Software Upgrades on page 6](#)).

A DXi system may require the installation of additional memory modules to support DAE. Please review the tables below to verify if the DXi requires additional memory.

If the DXi already has the correct memory configuration, continue to [Install the DAE License on page 29](#).

### Additional Information

Before beginning the replacement procedure, make sure that you have the required replacement kit. The appropriate memory module kit will be provided by Quantum Customer Support.

You will need the following items to perform this procedure:

- Replacement memory module kit provided by Quantum Customer Support.
- ESD grounding wrist strap (included in the replacement kit)

**Table 1:** DXi4700 DAE Memory Module Installations

Current Capacity	Current Memory	Current DIMM Configuration	DAE Memory Installation	Total New Memory	Procedure
5-27 TB	32 GB	8 x 4 GB	<ul style="list-style-type: none"> <li>• Install 8 x 4 GB</li> </ul>	64 GB	<ol style="list-style-type: none"> <li>1. <a href="#">Turn off the DXi on page 16</a></li> <li>2. <a href="#">Open the Node Cover on page 16</a></li> <li>3. <a href="#">Install a Memory Module on page 22</a></li> <li>4. <a href="#">Close the Node Cover on page 24</a></li> <li>5. <a href="#">Turn on the DXi on page 27</a></li> </ol>
45-99 TB	64 GB	16 x 4 GB	<ul style="list-style-type: none"> <li>• Install 8 x 4 GB</li> </ul>	96 GB	<ol style="list-style-type: none"> <li>1. <a href="#">Turn off the DXi on page 16</a></li> <li>2. <a href="#">Open the Node Cover on page 16</a></li> <li>3. <a href="#">Install a Memory Module on page 22</a></li> <li>4. <a href="#">Close the Node Cover on page 24</a></li> <li>5. <a href="#">Turn on the DXi on page 27</a></li> </ol>

Current Capacity	Current Memory	Current DIMM Configuration	DAE Memory Installation	Total New Memory	Procedure
117-135 TB	96 GB	24 x 4 GB	<ul style="list-style-type: none"> <li>Remove 8 x 4 GB</li> <li>Install 8 x 8 GB</li> </ul>	128 GB	<ol style="list-style-type: none"> <li><a href="#">Turn off the DXi on the next page</a></li> <li><a href="#">Open the Node Cover on the next page</a></li> <li><a href="#">Remove a Memory Module on page 20</a></li> <li><a href="#">Install a Memory Module on page 22</a></li> <li><a href="#">Close the Node Cover on page 24</a></li> <li><a href="#">Turn on the DXi on page 27</a></li> </ol>

**Table 2:** DXi6900 DAE Memory Module Installations

Current Capacity	Current Memory	Current DIMM Configuration	DAE Memory Installation	Total New Memory	Procedure
34-102 TB	128 GB	8 x 16 GB	<ul style="list-style-type: none"> <li>Install 8 x 16 GB</li> </ul>	256 GB	<ol style="list-style-type: none"> <li><a href="#">Turn off the DXi on the next page</a></li> <li><a href="#">Open the Node Cover on the next page</a></li> <li><a href="#">Install a Memory Module on page 22</a></li> <li><a href="#">Close the Node Cover on page 24</a></li> <li><a href="#">Turn on the DXi on page 27</a></li> </ol>

**i Note:** DXi6900-S systems and DXi600 G1/G2 systems with 136-510 TB do not require additional memory.

## Turn off the DXi

Before shutting down the DXi, make sure that all backup and replication jobs are finished, and that space reclamation activity is complete.

1. Shut down the system from the remote management console using the **Shutdown** option on the **Utilities > Reboot & Shutdown** page.

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**i Note:** Shutting down the system can take up to 15 minutes. Only the Node will completely shut down.

2. After the Node shuts down, turn off both power switches on the back of each Array module (DXi6900) or Expansion modules (DXi4700). Wait until the seven segment display on the rear of the module turns off.
3. (DXi6900 only) Turn off both power switches on the back of each Expansion module (EBOD).

## Open the Node Cover

### Additional Information

- You do not need to remove the Node from the rack to remove and replace internal components. Using the DXi sliding rail system, you can pull the Node out on the sliding rails until you have enough space to remove the Node chassis top and access the internal components.
- **IMPORTANT:** If you leave the Node in the rack, you still must disconnect both power cables from the Node prior to opening the Node cover.

To remove the DXi Node from the rack and remove the top cover:

1. Shut down the DXi Node (see [Turn off the DXi above](#)).
2. If installed, remove the front bezel from the Node by lifting the latch on the left side of the bezel.
3. Remove all power, SAS, Ethernet, and Fibre Channel cables from the rear of the Node. Make sure to label the cables so they can be easily identified when they are re-connected to the Node after the replacement procedure is complete.
4. Press the locking tab on either side of the Node, and pull the Node out from the rack until the inner rails lock.

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**⚠ Caution:** Do not use excessive force when pulling the chassis forward to fully extend the Node or Expansion Module in the rack rails. Using excessive force could bypass the slide rail stop mechanism.

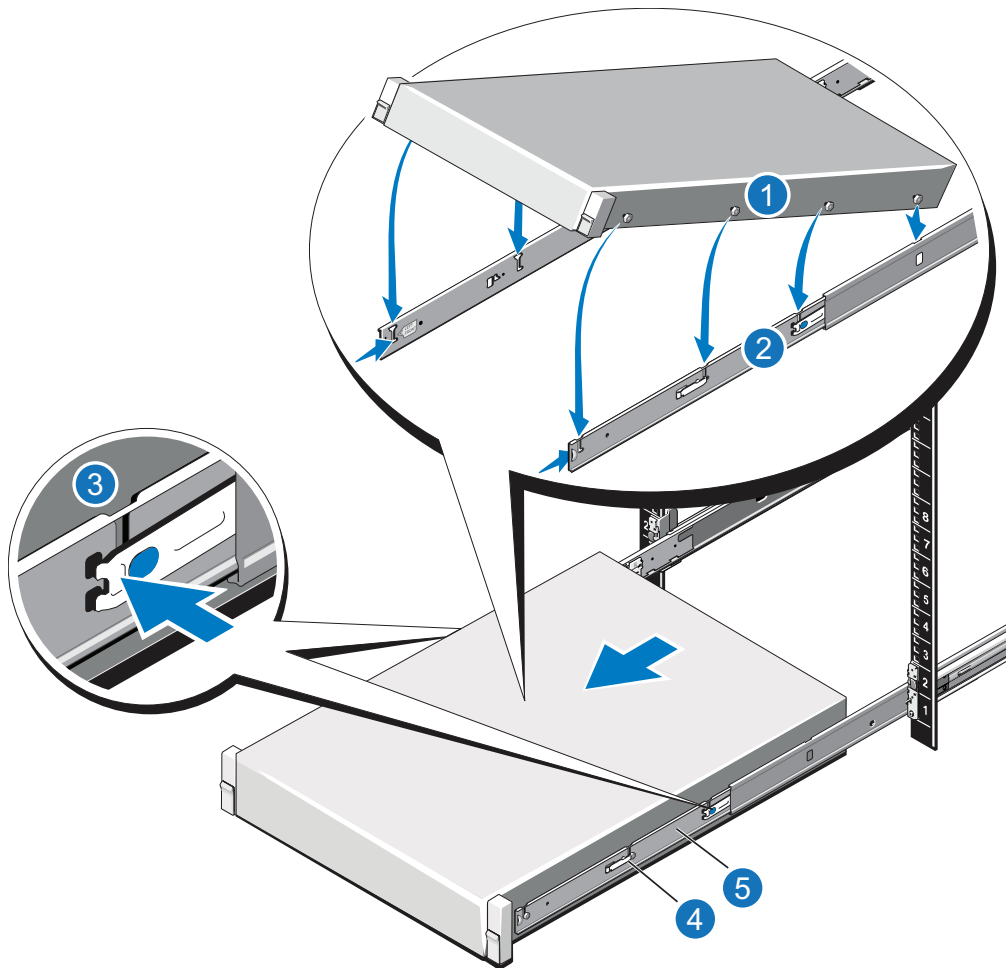
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**i Note:** If necessary, remove the optional screws securing the Node to the front of the rack (behind the locking tab).

5. Locate the lock levers on the sides of the inner rails (see [Figure 8 on the next page](#)). Unlock each lever by rotating it up to its release position.



**Figure 8:** Removing the DXi Node from the Rack



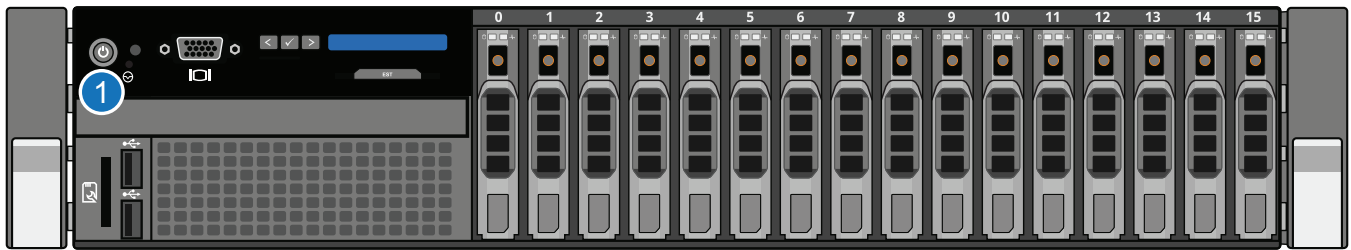
Item	Description
1	Rear rail standoffs
2	Rear rail J-slots
3	Slide-release lock button
4	Lock lever
5	Inner slide rails

- Grasp the sides of the Node firmly and pull it forward until the rail standoffs are at the front of the J-slots.
- Lift the Node up and away from the rack and place it on a level surface.

**WARNING:** A minimum of two people are required to lift the DXi node chassis.

- Press and hold the power button on the front of the Node for three seconds to fully drain the system of stored power prior to removing the cover (see [Figure 9 on the next page](#)).

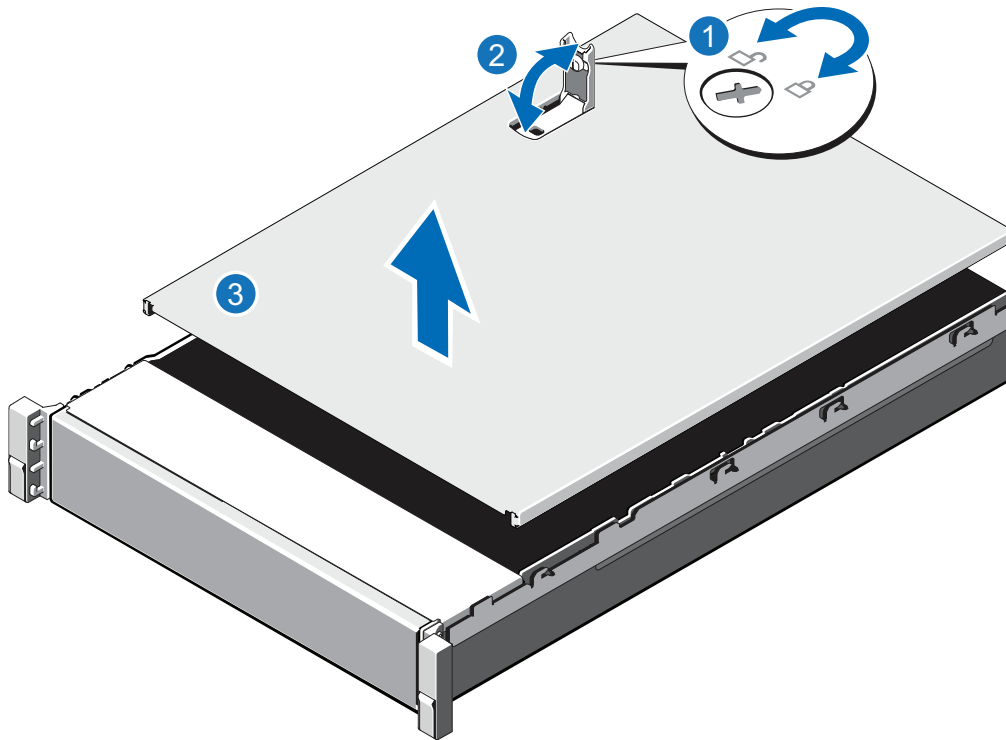
**Figure 9:** DXi6900 Node Power Button



**1. Power Switch**

9. On the Node cover, rotate the latch release lock counterclockwise to the unlocked position (see [Figure 10 below](#)).

**Figure 10:** Removing the Node Cover

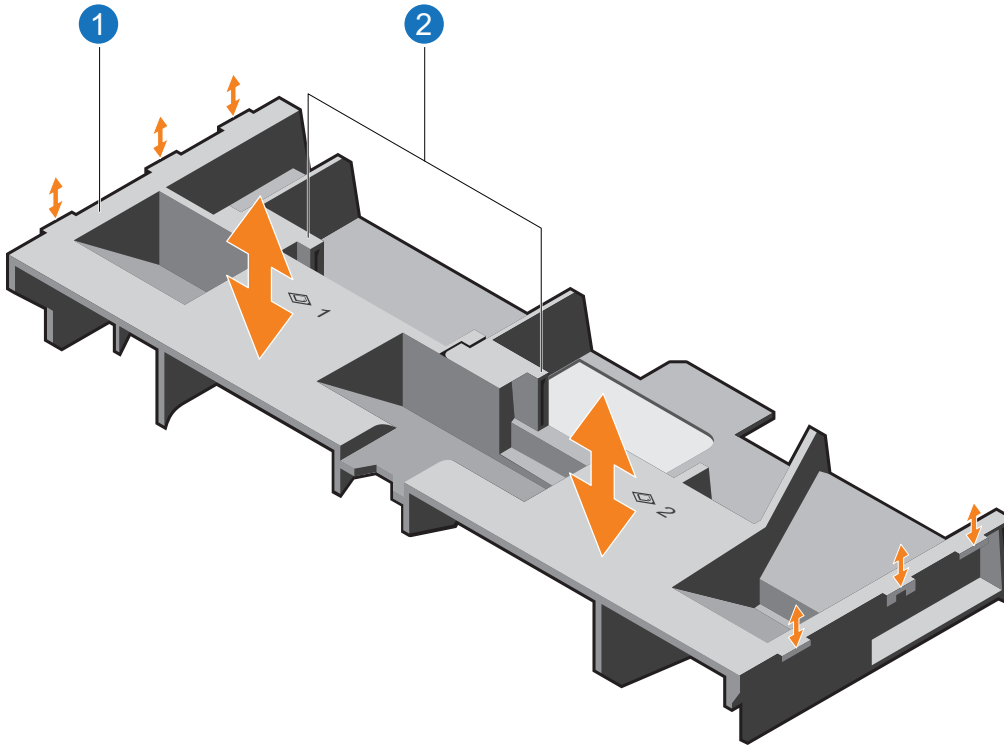


Item	Description
1	Latch release lock
2	Latch
3	Node cover

10. Lift the latch on top of the Node and slide the cover back.

11. Grasp the cover on both sides, and carefully lift the cover away from the Node.
12. Remove the cooling shroud by holding the touch points and lifting the shroud away from the Node (see [Figure 11 below](#)).

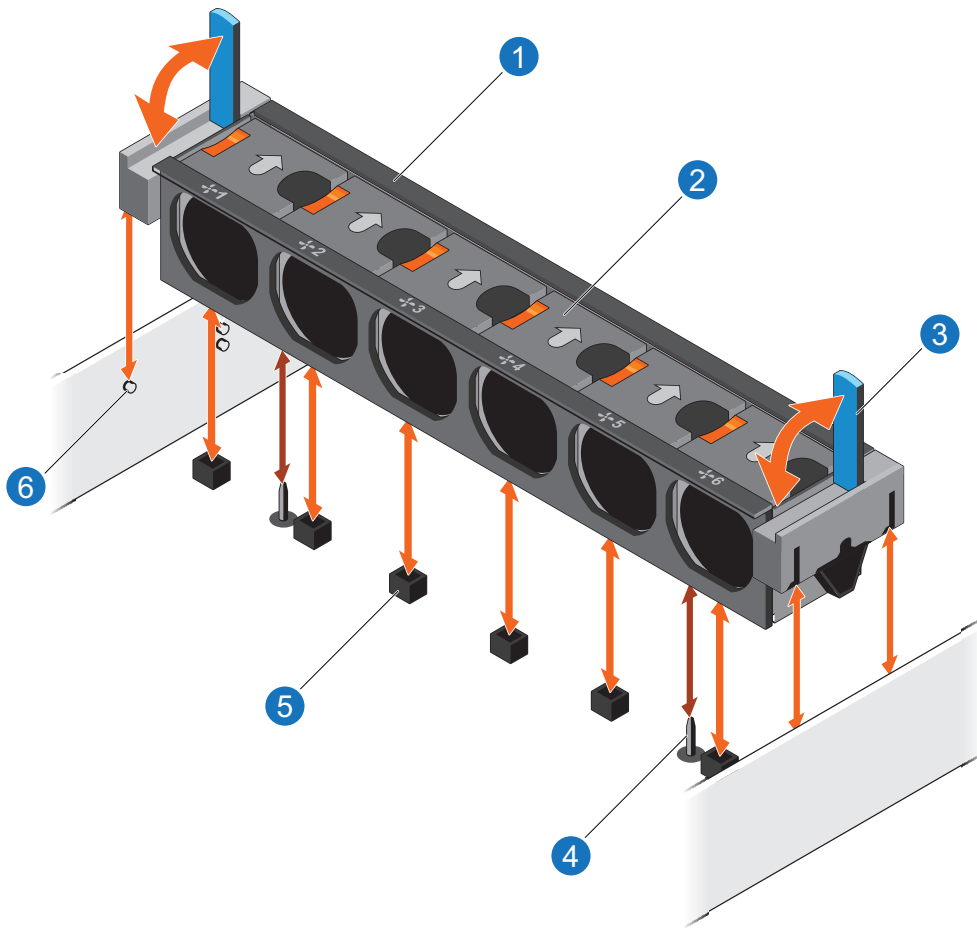
**Figure 11:** Removing and Replacing the Cooling Shroud



Item	Description
1	Cooling shroud
2	Touch point

13. If you are replacing memory modules, remove the cooling-fan assembly by lifting the release levers upwards.

**Figure 12:** Removing the Cooling Fan Assembly



Item	Description
1	Cooling-fan assembly
2	Cooling fan
3	Release lever (2)
4	Guide pin on the system board (2)
5	Cooling-fan connector (6)
6	Guide pin on the chassis (6)

14. Lift the cooling-fan assembly out of the Node.

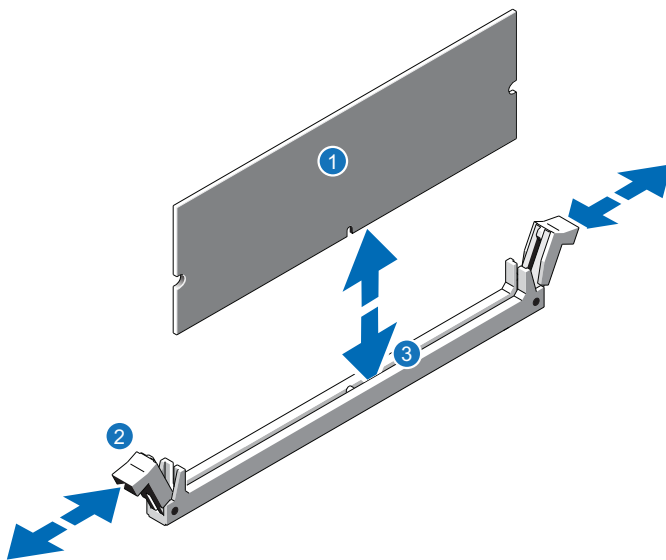
## Remove a Memory Module

To remove a memory module from the DXi Node:

**WARNING:** The memory modules are hot to the touch for some time after the system has been powered down. Allow time for the memory modules to cool before handling them.

1. Locate the memory module.
2. Press down and out on the ejectors on each end of the socket until the memory module pops out of the socket (see [Figure 13 below](#)).

**Figure 13:** Removing and Installing a Memory Module

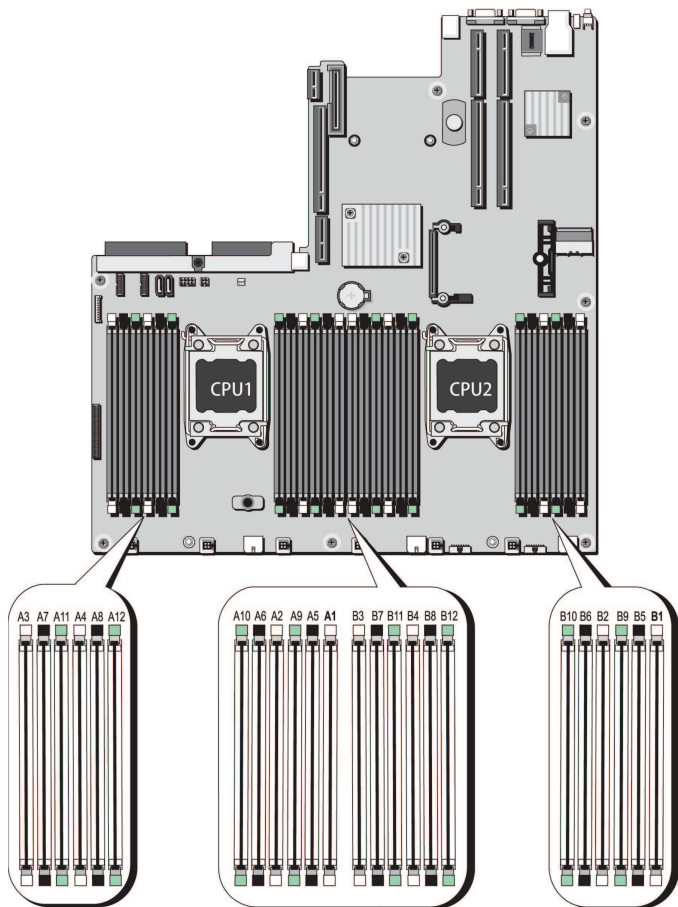


Item	Description
1	Memory module
2	Ejector latch
3	Socket alignment tool

### DXi4700 Memory Removal Order

**Note:** Removing memory from the DXi4700 is only necessary if the system currently has 96 GB of memory.

Current	With DAE	Memory Installation
96 GB All slots full	128 GB	Remove 8 x 4 GB memory modules in slots A1-A4 and from slots B1-B4 (see <a href="#">Figure 14 on the next page</a> )

**Figure 14:** DXi Memory Slots

## Install a Memory Module

To install a memory module in the DXi Node:

**⚠ Caution:** Handle the memory modules by the card edges and avoid touching the components on the memory module.

1. Align the memory module's edge connector with the alignment key of the memory module socket, and insert the memory module in the socket (see [Figure 13 on the previous page](#)).

**i Note:** The memory module socket has an alignment key that allows you to install the memory module in the socket in only one way.

2. Press down on the memory module with your thumbs until the ejector latches snap into a locked position.

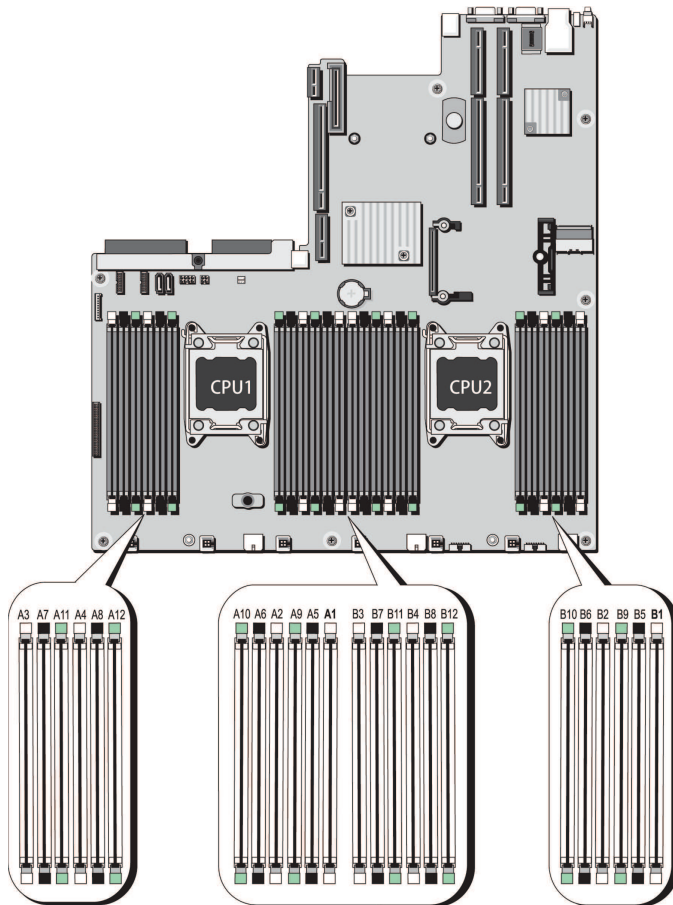
### DXi4700 Memory Installation Order

Current	With DAE	Memory Installation
32 GB	64 GB	Install 8 x 4 GB memory modules in slots A5-A8 and B5-B8 (see <a href="#">Figure 15 below</a> ).
64 GB	96 GB	Install 8 x 4 GB memory modules in slots A9-A12 and B9-B12 (see <a href="#">Figure 15 below</a> ).
96 GB	128 GB	Install 8 x 8 GB memory modules in slots A1-A4 and B1-B4 (see <a href="#">Figure 15 below</a> ).

### DXi6900 Memory Installation Order

Current	With DAE	Memory Installation
128 GB	256 GB	Install 8 x 16 GB memory modules in slots A5-a8 and B5-B8 (see <a href="#">Figure 15 below</a> ).

Figure 15: DXi Memory Slots

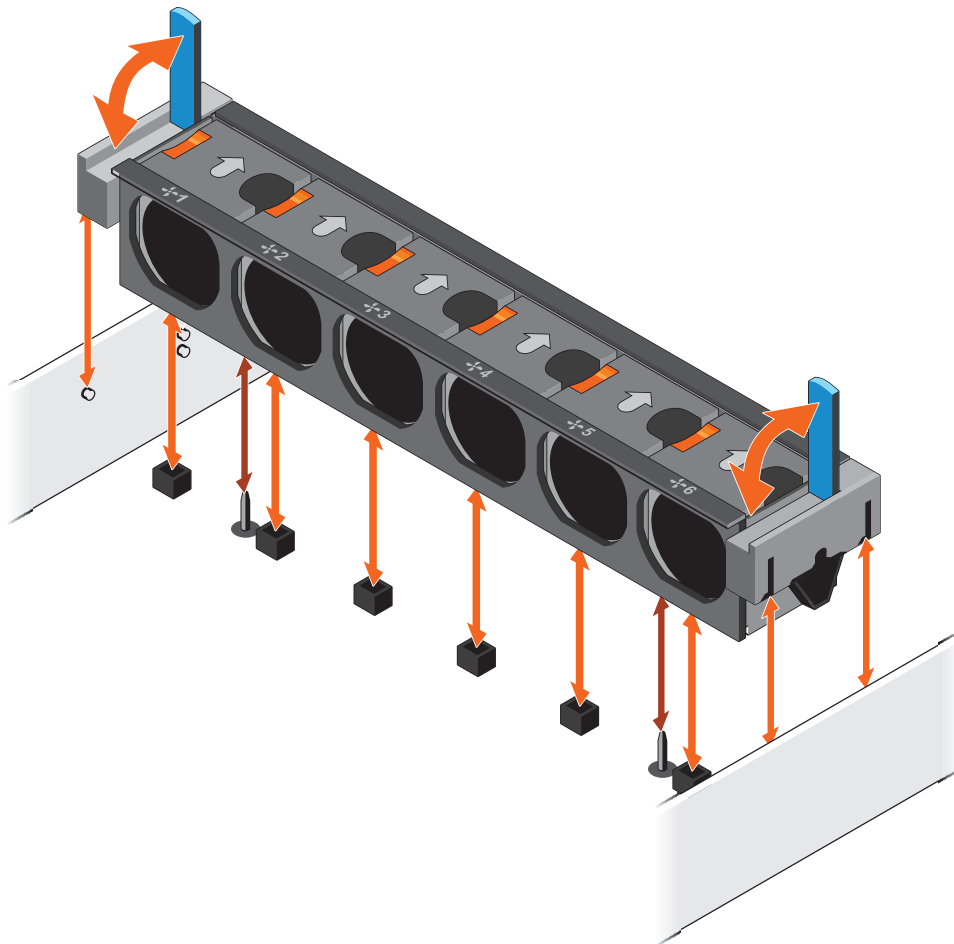


## Close the Node Cover

To replace the Node cover and return the Node to the rack after completing the memory module installation:

1. Replace the cooling-fan assembly:
  - a. Align the cooling-fan assembly slots with the guide pins on the chassis (see [Figure 16 below](#)).
  - b. Slide the cooling-fan assembly into the chassis.
  - c. Lock the cooling-fan assemble into the chassis.

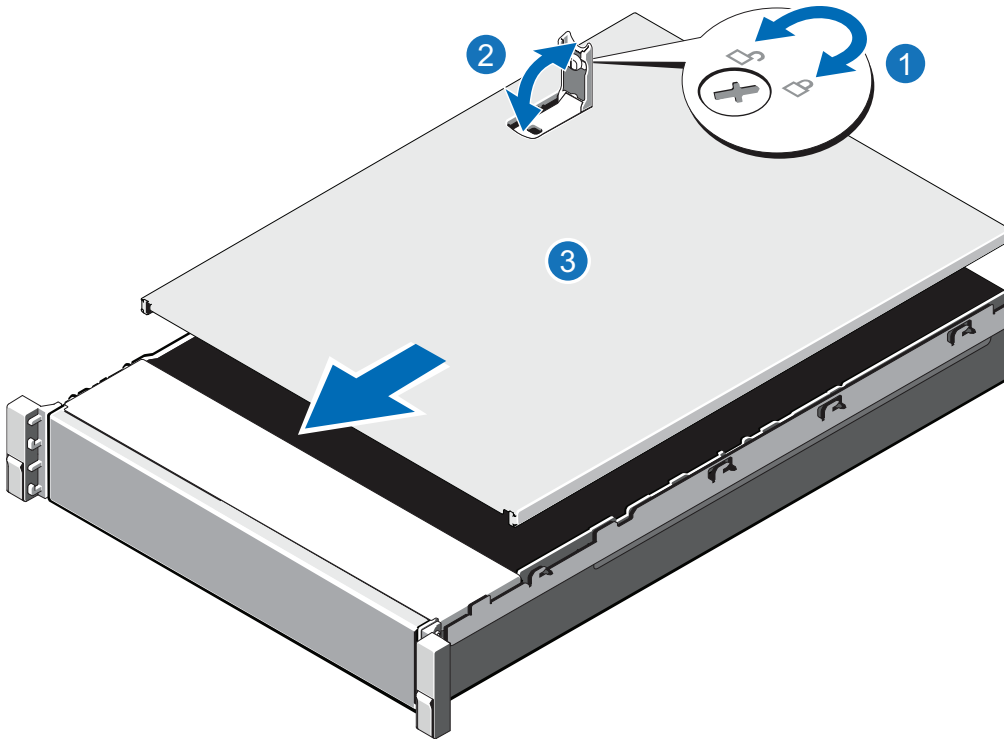
**Figure 16:** Replacing the Cooling-Fan Assembly



2. Replace the cooling shroud:
  - a. Align the tabs on the cooling shroud with the securing slots on the chassis (see [Figure 11 on page 19](#)).
  - b. Lower the cooling shroud into the chassis until it is firmly seated.

**i Note:** For proper seating of the cooling shroud in the chassis, ensure that the cables inside the system are routed along the chassis
3. Lift the latch on the cover (see [Figure 17 on the next page](#)).

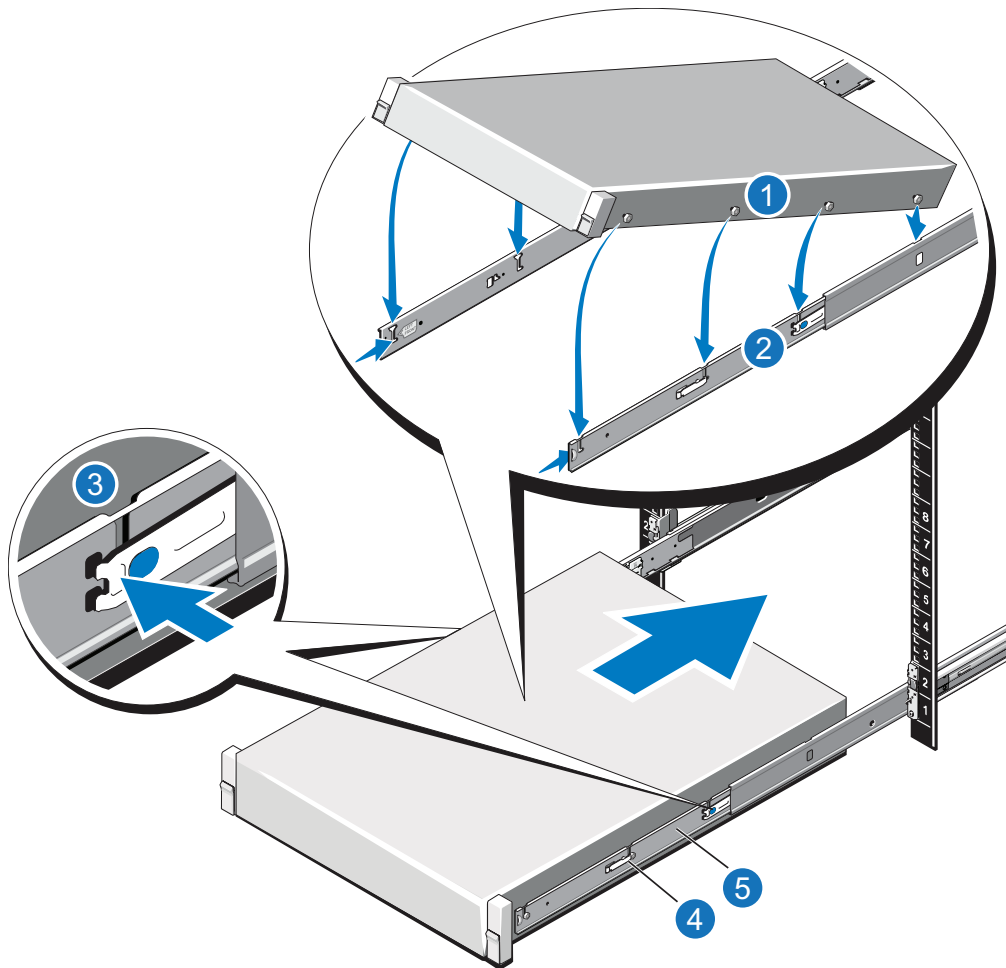


**Figure 17:** Replacing the Node Cover

Item	Description
1	Latch release lock
2	Latch
3	Node cover

4. Place the cover onto the Node chassis and offset the cover slightly back so that it clears the chassis hooks and lays flush on the chassis.
5. Push down the latch to move the cover into the closed position.
6. Rotate the latch release lock in a clockwise direction to secure the cover.
7. Pull the inner slide rails out of the rack until they lock into place (see [Figure 18 on the next page](#)).

**Figure 18:** Installing the DXi6900-S Node in the Rack



Item	Description
1	Rear rail standoffs
2	Rear rail J-slots
3	Slide-release lock button
4	Lock lever
5	Inner slide rails

8. Locate the rear rail standoff on each side of the system and lower them into the rear J-slots on the slide assemblies.
9. Rotate the Node downward until all the rail standoffs are seated in the J-slots.
10. Push the Node inward until the lock levers click into place.
11. Press the slide-release lock buttons on both rails and slide the Node into the rack.

12. Reconnect all power, SAS, Ethernet, and Fibre Channel cables on the rear of the Node.
13. If applicable, replace the front bezel. Insert the right side of the bezel into the slots on the right side of the Node, then snap the left side of the bezel into place.

## Turn on the DXi

### Turn on the DXi4700

To turn on the system:

1. Turn on the DAE system components in the following order:
  - a. Turn on both power switches on the back of each Expansion module (see [Figure 19 below](#)). Wait 30 seconds for the Expansion modules to initialize. Verify on the front panel that the modules have power and there were no hard drive failures (Drive status indicator on hard drive blinks amber four times per second).

**Figure 19:** Expansion Module Power Switches



#### 1 - Power Switches

- b. Press the power button on the front of the Node (see [Figure 20 below](#)). Wait for the system to boot before continuing with the procedure. (This can take up to 30 minutes.)

**i Note:** The system may reboot one or more times depending on the components that were installed. If all components are properly installed and cabled, the LEDs on all hard drives in the Node and the Expansion modules will be lit. (The top LED will be solid and the bottom LED will blink.)

**Figure 20:** Node Power Button



#### 1 - Power Button

## Turn on the DXi6900

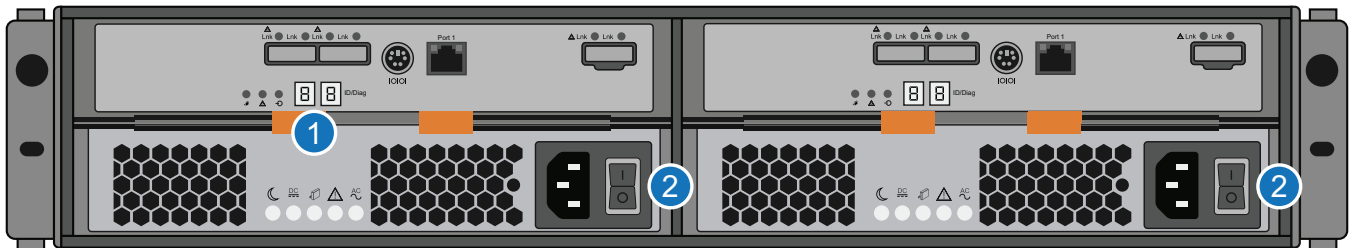
To turn on the system, power on the DXi6900 system components in the following order:

1. Turn on both power switches on the back of each Expansion module (EBOD) (see [Figure 21 below](#)). Wait until the seven segment display on the rear of the module displays **00** (approximately 1 minute).
2. Turn on both power switches on the back of each Array module (RBOD) (see [Figure 22 below](#)). Wait until the seven segment display on the rear of the module displays **99** (approximately 3 minutes).
3. Press the power button on the front of the Node (see [Figure 23 below](#)). Wait for the system to boot before attempting to log on.

**i Note:** The system can take approximately 30 minutes to start up, depending on the amount of installed storage capacity.

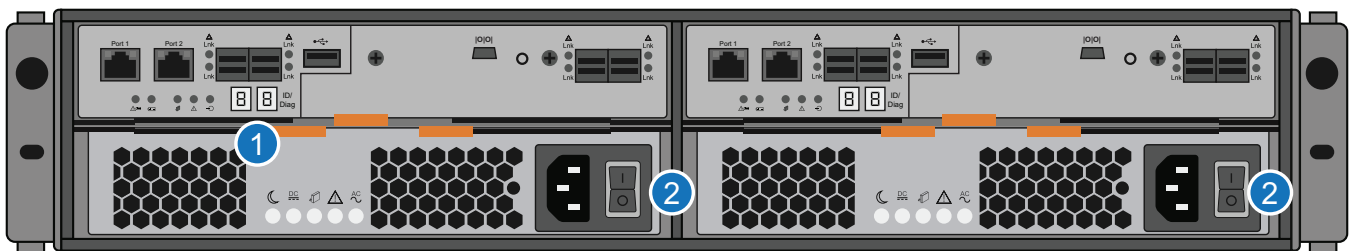
The system is now ready for operation.

**Figure 21:** Powering on the DXi6900 Expansion Modules (EBODs)



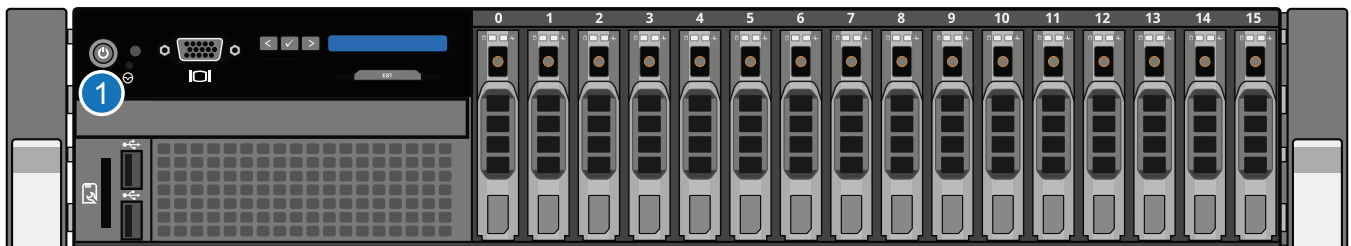
1. Seven Segment Display
2. Power Switches

**Figure 22:** Powering on the DXi6900 Array Modules (RBODs)



1. Seven Segment Display
2. Power Switches

**Figure 23:** Powering on the DXi6900 Node



## 1. Power Switch

# Install the DAE License

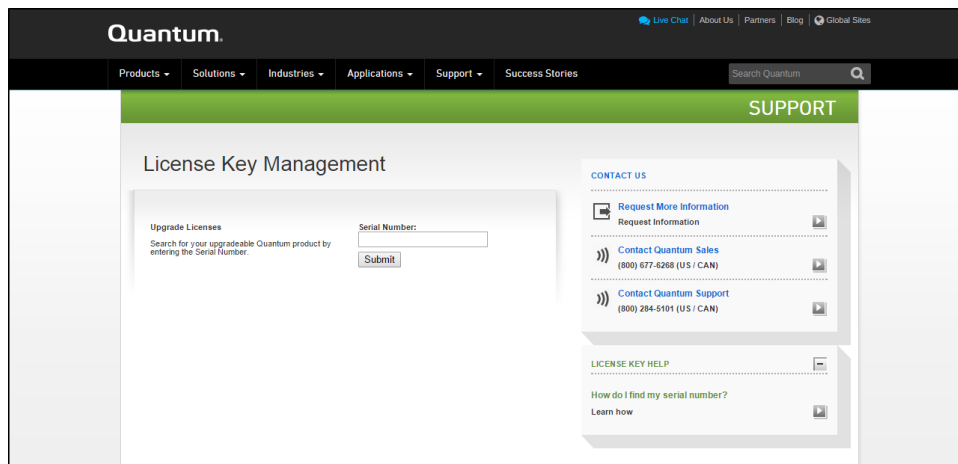
To enable DAE functionality, a DAE License Key must be installed on the DXi system. The appropriate DAE License Certificate is provided by Quantum during a new product installation or product upgrade. This certificate will contain an authorization code.

To add a DAE license key, perform the following steps:

1. Open a Web browser on a computer with Internet access.
2. Enter <http://www.quantum.com/licensekeys> in the browser address box.

The **License Key Management** page displays (see [Figure 24 below](#)).

**Figure 24:** License Key Management Page



3. Enter the DXi system serial number in the **Serial Number** box and click **Submit**.

The **Licensed Feature** page displays.

**Note:** The serial number displays on the **License Keys** page, above the **New Key** box.

4. Enter the authorization code (printed on the DAE License Certificate) and click **Get License Key**.

The **Licensed Feature** page returns a license key. Print out or write down the license key, or save it to a text file.

5. Access the DXi remote management console (see [Accessing Remote Management on page 4](#)).
6. Click the **Utilities** menu, and then click the **License Keys** tab.

The **License Keys** page displays.

7. Enter the DAE license key in the **New Key** box, and then click **Add**.

The DAE license key is added to the system.

# Create a Virtual Machine NAS Share

You must create a Virtual Machine (VM) NAS share to present the storage capacity of the DXi as a NAS share that is compatible to VMs.

## Additional Information

- The VM NAS share should not be used by backup applications. It should only be used to manage DAE virtual machines (VM).

To add a VM NAS share:

- In the DXi remote management console, select **Configuration > NAS**. The **NAS Summary** page displays (see [Figure 25 below](#)).

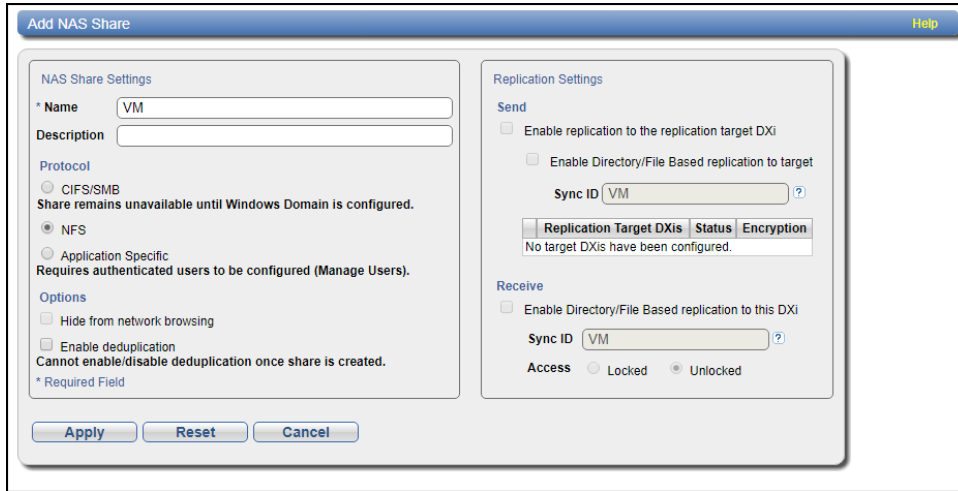
**Figure 25:** NAS Summary Page

Share Name	Protocol	Export Path	Permissions	Access	Deduplication	Replication	Targets	Description
testAppSpec1	Application Specific	testAppSpec1	Read & Write		Enabled	Send Sync ID: testAppSpec1	10.40.166.123	
testNfs1	NFS (sync)	/Q/shares/testNfs1	Read Only	All hosts	Disabled	N/A		
testNfsShare1	NFS (sync)	/Q/shares/testNfsShare1	Read & Write	All hosts	Enabled	<a href="#">Configure</a>		

- Click **Add**.

The **Add NAS Share** page displays (see [Figure 26 on the next page](#)).

**Figure 26:** Add NAS Share Page



3. Under **NAS Share Settings**, enter information about the share:

<b>Name</b>	Enter the name of the DAE NAS share. VM NAS shares must be named <b>VM</b> (upper case).
<b>Description</b>	(Optional) Enter a brief description of the share.
<b>Protocol</b>	Select the NFS option to use the share on a UNIX or Linux network.  <b>Note:</b> CIFS/SMB is not currently supported for VM NAS shares.
<b>Hide from network browsing</b>	Do not select. This is for CIFS/SMB shares only.
<b>Enable deduplication</b>	Deselect the check box. VM NAS shares must have deduplication disabled.

4. Click **Apply**.

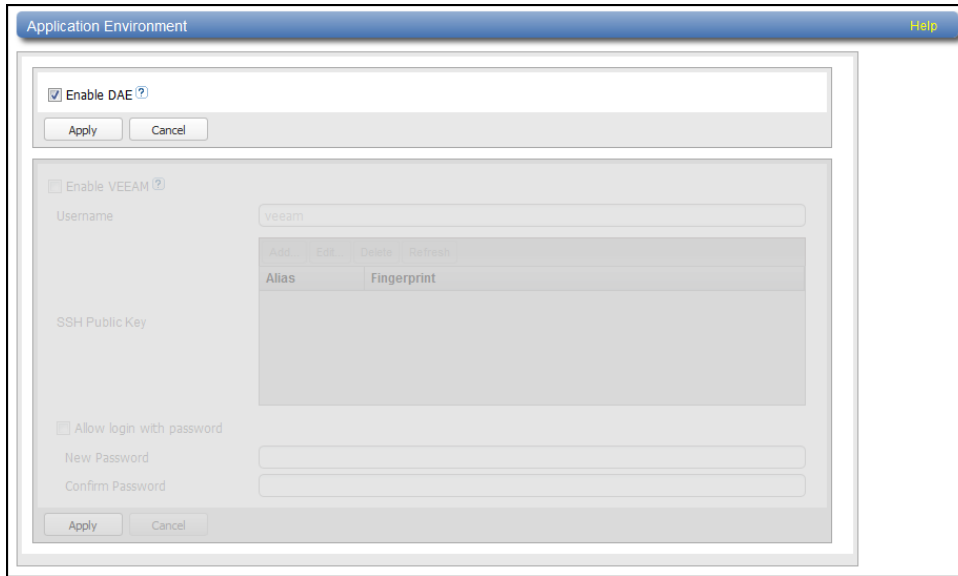
## Enable DAE on the DXi

Once the DAE license is installed and a VM NAS share created, enable DAE on the DXi.

In the DXi remote management console, select **Configuration > System > App Environment**. The **Application Environment** page displays.

1. Select the **Enable DAE** check box (see [Figure 27 below](#)).

**Figure 27:** Application Environment - Enable DAE

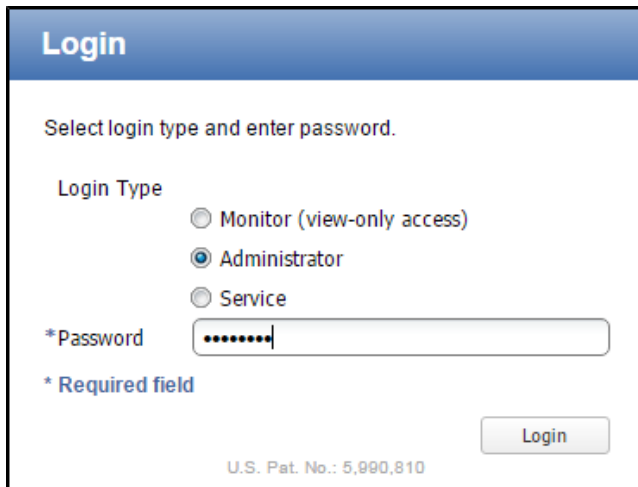


2. Click **Apply**.

A dialog box appears stating that the system will require a reboot. Click **Yes**. The DXi will reboot and the DXi login screen will appear (see [Figure 28 below](#)).

**Note:** The reboot takes approximately 20 minutes to complete.

**Figure 28:** Login Window

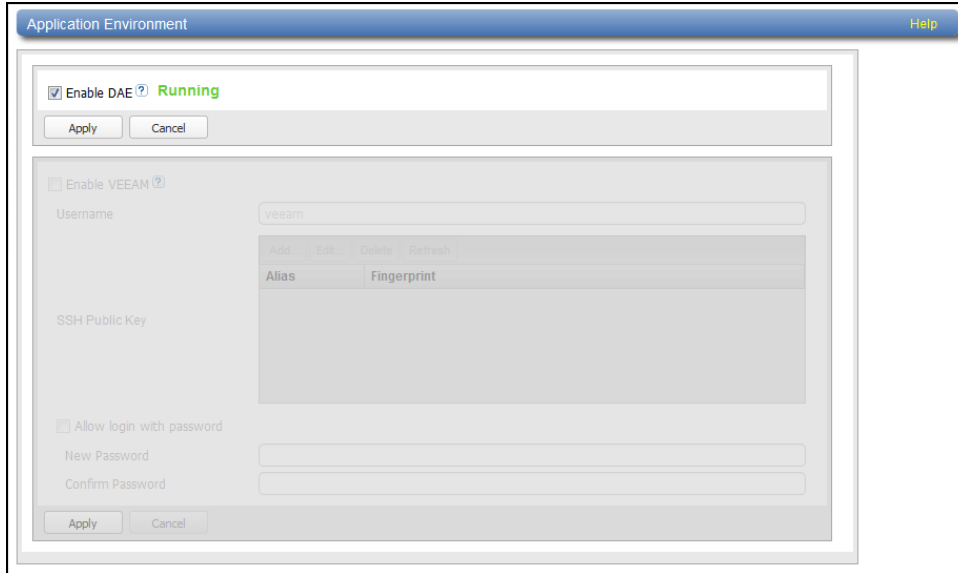


3. Log back into the DXi.
4. On the DXi **Home** page, verify that no Service tickets were generated after the reboot.



5. Navigate back to the **Application Environment** page (**Configuration > System > App Environment**). DAE will now be enabled with a status of **Running** or **Not Running** (see [Figure 29 below](#)).

**Figure 29:** Application Environment - DAE Enabled



## Virtual Machine Installation

To perform the DAE Virtual Machine (VM) installation on the DXi system, complete the following steps in order:

Step	Description	Procedure to Complete
1	Place an image file (.iso) on to the DXi system.	Go to <a href="#">Copy an ISO image to the DXi below</a> .
2	Create a virtual machine (VM) on the DXi system.	Go to <a href="#">Create a Virtual Machine on page 35</a> .
3	Install the operating system on the virtual machine (VM).	Go to <a href="#">Install the Virtual Machine Operating System on page 39</a> .

## Copy an ISO image to the DXi

Once the DXi system has been configured for DAE, a Linux type operating system .iso image file must be copied over from your host Linux system to the DXi system. The .iso file must then be mounted to the virtual

machine (VM) NAS share created on the DXi during the DXi system configuration.

To copy the .ISO image to the target DXi, log in to the host system and perform the following commands:

1. Go to the userhost directory:

**i Note:** This procedure assumes that the .iso image file is located under the /home/user directory.

```
cd /home/user
```

2. Create a directory. In this example, the directory is **VM**.

```
mkdir VM
```

3. Mount the filesystem

```
sudo mount -t nfs -o resvport,rw <dx data IP address>:/Q/shares/VM /home/user/VM
```

### Additional Information

- <linux\_type\_os>.iso - the Linux bootable ISO image to use for the DAE VM.
- <dx data IP address> - the DXi data IP address that has access to the DXi NAS

4. Copy the .iso file to the DXi.

```
cp /home/user/<linux_type_os>.iso cp /home/user/VM/Iso/
```

### Additional Information

- The Iso directory is automatically created when the DAE feature was enabled in the DXi.

5. Unmount the filesystem.

```
sudo umount /home/user/VM
```

The .iso image file is now placed at the VM share as required to create the virtual machine.

### Example: Mount and Copy an Image File

In the example below, a directory named dxivmshare was created. The host Linux system then mounts a DXi VM share on a DXi system with an IP address of 10.40.160.80. A file image named CentOs-6.8-x86-minimal.iso was copied to the DXi VM share /Iso folder.

```
CentOS6-dev1ISOs$ mkdir dxivmshare
CentOS6-dev1ISOs$ ls
CentOS-6.8-x86_64-minimal.iso  CentOS-7-x86_64-Minimal-1511.iso  dxivmshare
CentOS6-dev1ISOs$ sudo mount -t nfs -o resvport,rw 10.40.160.80:/Q/shares/VM ./dxivmshare
CentOS6-dev1ISOs$ ls ./dxivmshare
Iso  VMConfig  VMExportedImages  VMImages  VMImportedImages
CentOS6-dev1ISOs$ cp CentOS-6.8-x86_64-minimal.iso ./dxivmshare/Iso
CentOS6-dev1ISOs$ ls ./dxivmshare/Iso
CentOS-6.8-x86_64-minimal.iso
CentOS6-dev1ISOs$ sudo umount ./dxivmshare
CentOS6-dev1ISOs$ rm -fr ./dxivmshare
CentOS6-dev1ISOs$
```

# Create a Virtual Machine

Once the DXi system has an .ISO image file mounted to a NAS share, a virtual machine (VM) can be created.

## Virtual Machine Prerequisites:

The following items are required to successfully create a VM:

- The CLI Admin (**cliadmin**) account must be enabled on the DXi. If you do not have the password for this account, contact the DXi administrator.
- The host system must have X11 support. Examples include:
  - A Linux system with X11.
  - A Windows system with 3rd party X11 support.

## Tasks

To create a virtual machine (VM), perform the following tasks:

1. Log in to the DXi from the Linux host system (see [Access the DXi from the Host System below](#))
2. Define the VM settings (see [Define the Virtual Machine Settings on the next page](#))
3. Create the VM (see [Create a Virtual Machine on page 38](#))

## Access the DXi from the Host System

Log in to the DXi system using the **cliadmin** user account from a host system that supports X11 Windows.

**Note:** Contact the DXi system Web Administrator for the **cliadmin** user account password.

To log in to the DXi, use the `ssh -Y cliadmin@<ipaddress>` command on the host system (see [Figure 30 below](#)).

**Figure 30:** Log in to DXi using Host System Example

```
39WQL32-LEASE"$ ssh -Y cliadmin@10.40.160.80
cliadmin@10.40.160.80's password:
Last login: Thu Apr 27 14:56:00 2017 from 10.20.128.205

Product Model           = DXi6900
Hardware Configuration = 6902 (node with HDDs, storage with 4TB HDDs)
Operating System        = CentOS release 6.9 (Final)
Kernel Version          = 2.6.32-696.el6_0_1.x86_64
System Version          = 0.0.0
System Serial Number    = SV1716BVM21591
Base OS Version         = 0.0.0-13742
Application Version     = 0.0.0-59587
SCM Build Version       = ENG_Build0
Installation Date       = 2017-04-19 02:22:51
Last Update Date       = 2017-04-26 22:24:05

bash-3.2$ █
```

## Define the Virtual Machine Settings

Before creating a VM on the DXi, you will need to define the following VM parameters:

Use the `syscli --getlimit dae` command to review the current DAE resources available on the DXi (see [Figure 31 below](#) and [Table 1 below](#))


**Figure 31:** DAE Resources Example

```
Kernel Version      = 2.6.32-696.el6.0.1.x86_64
System Version     = 0.0.0
System Serial Number = SV1716BVM21591
Base OS Version    = 0.0.0-13742
Application Version = 0.0.0-59587
SCM Build Version  = ENG_Build0
Installation Date   = 2017-04-19 02:22:51
Last Update Date   = 2017-04-26 22:24:05

bash-3.2$ syscli --getlimits dae
Output data:
  Minimum CPUs = 2
  Maximum CPUs = 4
  Minimum Memory (RAM) = 1024 MB
  Maximum Memory (RAM) = 32768 MB
  Minimum Disk Space = 8 GB
  Maximum Disk Space = 100 GB
  Available NICs = eth2, eth3, eth4, eth5
  NICs In Use =

Command completed successfully.
bash-3.2$
```

**Table 1:** Output Definitions for `syscli --getlimits dae`

Output Field Name	Description	Notes
Minimum CPUs	Defines the minimum number of CPUs that can be assigned to a VM.	The number of CPUs used by a VM can be changed after creation.
Maximum CPUs	Defines the maximum number of CPUs that can be assigned to a VM.	
Minimum Memory (RAM)	Defines the minimum amount of RAM (in MB) that can be assigned to a VM.	 <b>Caution:</b> The memory used by a VM can be re-sized after creation.
Maximum Memory (RAM)	Defines the maximum amount of RAM (in MB) that can be assigned to a VM.	

Output Field Name	Description	Notes
Minimum Disk Space	Defines the minimum amount of disk space (in MB) that can be assigned to a VM.	You cannot change the amount of disk space used by a VM after creation.
Maximum Disk Space	Defines the maximum amount of disk space (in MB) that can be assigned to a VM.	
Available NICs	Defines the list of available network devices not in use by the DXi that can be assigned to a VM.	Once a physical network device on a DXi system is assigned to a VM, that device cannot be used for other DXi network configurations until one of the following occurs:
NICS In Use	Defines the list of network devices that have been already assigned to one or more VMs.	<ul style="list-style-type: none"> <li>The VM is deleted.</li> <li>The VM network device settings are edited to remove or use a different network device.</li> </ul>

### Review .ISO Images on the DXi

Use the `syscli --list daeiso` command to verify the .ISO images copied over to the DXi system (see [Figure 32 on the next page](#)).

- i Note:** If you use the `-path` parameter, that path defines the iso image to use, which must be located under the `/Q/shares/VM` share or below.

### Command Attributes

Review the following attribute descriptions.

<code>--list daeiso</code>	Retrieves a list of .iso files in the specified directory.
<code>--path &lt;iso path&gt;</code>	The directory to search for the .iso files.

**Figure 32:** List of .ISO Images on a DXi Example

```

bash-3.2# syscli --getlimits dae
Output data:
  Minimum CPUs = 2
  Maximum CPUs = 4
  Minimum Memory (RAM) = 1024 MB
  Maximum Memory (RAM) = 32768 MB
  Minimum Disk Space = 8 GB
  Maximum Disk Space = 100 GB
  Available NICs = eth2, eth3, eth4, eth5
  NICs In Use =

Command completed successfully.
bash-3.2# syscli --list daeiso
Output data:
  List of ISO files:
  Total count = 1
  [ISO = 1]
  Name /Q/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso

Command completed successfully.
bash-3.2#

```

## Create a Virtual Machine

Once you have defined the VM parameters and .ISO image list, use the `syscli --add dae` command to create a new VM.

### Command

```

syscli --add dae --name <vm name> --cpus <num cpus> --memory <ram> --diskspace
<vm disk space> --isoimage <iso pathToImage> [--appnetwork <dxs nic port>] [--
autostart yes|no] --password <password> [--sure]

```

### Command Attributes

Review the following attribute descriptions.

<code>--add dae</code>	Create a new VM instance.
<code>--name &lt;vm name&gt;</code>	The name of the VM.
<code>--cpus &lt;num cpus&gt;</code>	The number of CPUs for the VM.
<code>--memory &lt;ram&gt;</code>	Amount of RAM memory (in MB) for the VM.
<code>--diskspace &lt;vm disk space&gt;</code>	Amount of disk space (in GB) for the VM operating system.
<code>--isoimage &lt;iso pathToImage&gt;</code>	Selection of the path and image file to use for the operating system install.
<code>--appnetwork &lt;dxs nic port&gt;</code>	Selection of the application network devices (NIC ports) on the DXi. More than one may be specified.

<code>--autostart yes no]</code>	Autostart the VM on the system boot. The default is no.
<code>--password &lt;password&gt;</code>	Password for accessing the console over VNC.
<code>--sure</code>	If specified, this command will execute immediately without asking for confirmation.

**Figure 33:** Create a New Virtual Machine Example

```

Command completed successfully.
bash-3.2$ syscli --list daeiso
Output data:
List of ISO files:
Total count = 1
[ISO = 1]
  Name /Q/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso

Command completed successfully.
bash-3.2$ syscli --add dae \
> --name VM1 \
> --cpus 4 \
> --memory 32768 \
> --diskspace 100 \
> --isoimage /Q/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso \
> --appnetwork "eth2" \
> --autostart yes \
> --password "password" \
> --sure
You can now open a VNC connection to port 127.0.0.1:0 to install the OS.

Command completed successfully.
bash-3.2$

```

## Install the Virtual Machine Operating System

Once a VM has been created, complete the installation of the VM operating system (OS).

1. From the host system, log in to the DXi. Use the `ssh -Y cliadmins@<dxi_ipaddress>` command on the host system.
2. Enter the **cliadmin** user account password.
3. Enter `vncviewer` (see [Figure 34 below](#)).

The **VNC Viewer Connection** appears (see [Figure 35 on the next page](#)).

**Figure 34:** Connect to VNC Example

```

Total count = 1
[ISO = 1]
  Name /Q/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso

Command completed successfully.
bash-3.2$ syscli --add dae \
> --name VM1 \
> --cpus 4 \
> --memory 32768 \
> --diskspace 100 \
> --isoimage /Q/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso \
> --appnetwork "eth2" \
> --autostart yes \
> --password "password" \
> --sure
You can now open a VNC connection to port 127.0.0.1:0 to install the OS.

Command completed successfully.
bash-3.2$ vncviewer

TigerVNC Viewer for X version 1.1.0 - built Mar 22 2017 18:05:28
Copyright (C) 1999-2011 TigerVNC Team and many others (see README.txt)
See http://www.tigervnc.org for information on TigerVNC.

```

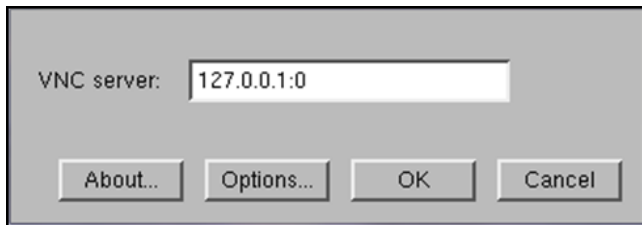
**Figure 35:** VNC Viewer Connection



4. Enter the **VNC server** port. The port is defined from the output in the `syscli --add dae` command (see [Figure 33 on the previous page](#)).

In this example, it is 127.0.0.1:0 (see [Figure 36 below](#)).

**Figure 36:** VNC Server Port



5. Enter the **Password** that was defined when the VM was created (see [Figure 37 below](#)).

**Figure 37:** VNC Server Password



A connection notice will appear (see [Figure 33 on the previous page](#)).



**Figure 38:** VNC Connection to the VM OS Example

```

bash-3.2$ sysctl --add dae \
> --name VM \
> --cpus 4 \
> --memory 32768 \
> --diskspace 100 \
> --isoimage /0/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso \
> --appnetwork "eth2" \
> --autostart yes \
> --password "password" \
> --sure
You can now open a VNC connection to port 127.0.0.1:0 to install the OS.

Command completed successfully.
bash-3.2$ vncviewer

TigerVNC Viewer for X version 1.1.0 - built Mar 22 2017 18:05:28
Copyright (C) 1999-2011 TigerVNC Team and many others (see README.txt)
See http://www.tigervnc.org for information on TigerVNC.

Thu Apr 27 15:25:57 2017
CConn: connected to host 127.0.0.1 port 5900
CConnection: Server supports RFB protocol version 3.8
CConnection: Using RFB protocol version 3.8

```

---

## Virtual Machine Configuration

Once the virtual machine (VM) has been installed, it is the responsibility of the user to correctly configure the VM. Review the following recommendations for VM configuration.

Step	Description	Procedure to Complete
1	Set up and reboot the virtual machine (VM) operating system (OS)	Go to <a href="#">Configure the Virtual Machine Operating System below</a> .
2	Start the VM.	Go to <a href="#">Start the Virtual Machine on page 43</a> .
2	Install Backup Application Software on the VM OS.	Go to <a href="#">Install Backup Application Software on page 44</a> .
3	Mount a DXi Host Share to the VM	Go to <a href="#">Mount a DXi Host Share on page 44</a> .

## Configure the Virtual Machine Operating System

Once a the virtual machine (VM) operating system (OS) has been installed, it must be set up and configured. It is the responsibility of the user to correctly set up the VM OS.

### Important Information

- Do not install any VM packages when setting up the VM OS.
- Once you complete the VM setup and configuration, reboot the VM OS.

## Security

It is the responsibility of the user to correctly set up the VM OS firewall and security. This is not configured by the DXi.

## Network Configuration

Define the following network configuration parameters in the VM.

- Ethernet Interface eth0 (required)
- Additional Ethernet Interfaces (optional)

**i Note:** Do a service network restart to save any network changes.

### NetworkManager

If you modify network configuration parameters on a Red Hat Enterprise Linux (RHEL) based distribution, it is recommended that you do not use NetworkManager to configure the VM network parameters. If you use NetworkManager, add or edit the following parameter in `/etc/sysconfig/network-scripts/ifcfg-eth*`:

- `NM_CONTROLLED` - set to no.

### Ethernet Interface eth0

Each VM is configured with at least one virtual Ethernet port. You must set eth0 to connect on boot using DHCP protocol. eth0 is connected via a VPN to the DXi.

#### eth0 File Example

```
/etc/sysconfig/network-scripts/ifcfg-eth0
TYPE=Ethernet
BOOTPROTO=dhcp
DEFROUTE=no
DEVICE=eth0
NAME=eth0
ONBOOT=yes
NM_CONTROLLED=no
Note: remove the HWADDR and UUID parameters (CentOS 6 and lower).
```

The DXi system will appear on this network at the address of 192.168.122.1. When connecting to DXi shares from the VM OS, use this network address to obtain the best performance for the VM application that needs to access the DXi shares.

Do a service network restart to save any network changes.

### Additional Ethernet Interfaces

- If you are using more than one physical DXi network port for a VM, the first network port will be eth1, where eth1 will be the DXi's lowest named network device.
- For each network port, you must define the network settings as needed for the applications running in the VM.
- The lowest physical NIC port used for the VM will be labeled eth1.

### eth1 File Example

```
/etc/sysconfig/network-scripts/ifcfg-eth1TYPE=Ethernet
BOOTPROTO=none
DEFROUTE=yes
NAME=eth1
DEVICE=eth1
ONBOOT=yes
IPADDR=<available on your network>
PREFIX=
GATEWAY=<available on your network>
DNS=<available on your network>
DOMAIN=<available on your network>
NM_CONTROLLED=no
```

## Start the Virtual Machine

Before starting the virtual machine (VM), verify that the VM is in a "shut off" state using the `syscli --list dae` command (see [Figure 39 below](#)).

**Figure 39:** Verify Virtual Machine Example

```
bash-3.2$
bash-3.2$
bash-3.2$
bash-3.2$
bash-3.2$
bash-3.2$ syscli --list dae
Output data:
List of VMs:
Total count = 1
[VM = 1]
  VM name = VM1
  State = shut off
  Auto Start = yes
  Net Port(s) = eth2
  Max CPU(s) = 4
  Used CPU(s) = 4
  Max Memory = 32768 MB
  Used Memory = 32768 MB
  Disk Capacity = 100 GB
  Image File = /Q/shares/VM/VMImages/VM1.qcow2
  VNC port =
Command completed successfully.
bash-3.2$
```

To start the VM, use the `--start dae syscli` command. Once the VM starts, it will be in a "running" state (see [Figure 40 on the next page](#)).

**Command**

```
syscli --start dae --name <vm name>
```

**Command Attributes**

Review the following attribute descriptions.

<b>--start dae</b>	Starts the VM instance.
<b>--name &lt;vm name&gt;</b>	The name of the VM to start.

**Figure 40:** Running Virtual Machine Example

```
Command completed successfully.
bash-3.2$ syscli --start dae --name VM1

Command completed successfully.
bash-3.2$ syscli --list dae
Output data:
List of VMs:
Total count = 1
[VM = 1]
  VM name = VM1
  State = running
  Auto Start = yes
  Net Port(s) = eth2
  Max CPU(s) = 4
  Used CPU(s) = 4
  Max Memory = 32768 MB
  Used Memory = 32768 MB
  Disk Capacity = 100 GB
  Image File = /Q/shares/VM/VMImages/VM1.qcow2
  VNC port = 127.0.0.1:0

Command completed successfully.
bash-3.2$
```

## Install Backup Application Software

There are two methods to add applications to the VM OS:

- Use an assigned network interface to the VM OS and download or copy files to your VM OS.
- Copy the application software to the /Q/shares/VM folder and mount the share through the VM OS by using 192.168.122.1:/Q/shares/VM.

## Mount a DXi Host Share

To mount a DXi host NAS share in the virtual machine (VM), do the following:

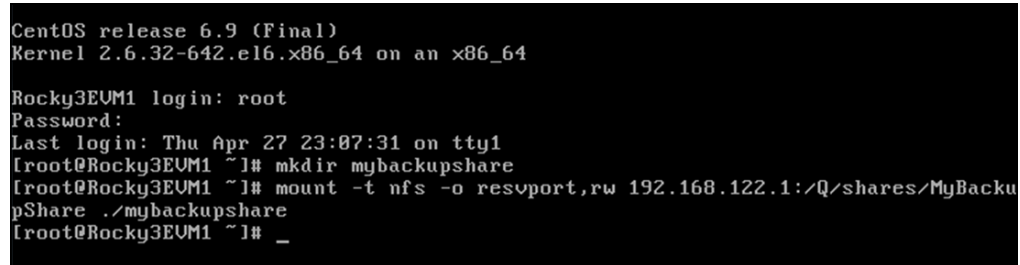
1. Log in to the VM through the VNC connection (see [Install the Virtual Machine Operating System on page 39](#)).
2. Create a directory. In this example, the directory is named "mybackupshare" and the NAS share is "MyBackupShare" (see [Figure 41 on the next page](#)).

```
mkdir mybackupshare
```

3. Mount the file system.

```
mount -t nfs -o resvport,rw 192.168.122.1:/Q/shares/VM/MyBackupShare  
./mybackupshare
```

**Figure 41:** Mounting a DXi Host NAS Share within a Virtual Machine Example



```
CentOS release 6.9 (Final)  
Kernel 2.6.32-642.el6.x86_64 on an x86_64  
  
Rocky3EUM1 login: root  
Password:  
Last login: Thu Apr 27 23:07:31 on tty1  
[root@Rocky3EUM1 ~]# mkdir mybackupshare  
[root@Rocky3EUM1 ~]# mount -t nfs -o resvport,rw 192.168.122.1:/Q/shares/MyBackupShare ./mybackupshare  
[root@Rocky3EUM1 ~]# _
```

---

# Complete Virtual Machine Installation

## Tasks

To complete the virtual machine (VM) installation, perform the following tasks:

1. Unmount the .iso image file (see [Eject Image File from Virtual Machine below](#)).
2. Delete the .iso image file (see [Delete Image File below](#)).

## Eject Image File from Virtual Machine

When you have finished using the .ISO image file used to create the VM, unmount the image on the DXi using the `syscli --ejectiso dae` command.

### Command

```
syscli --eject daeiso --name <vm name>
```

### Command Attributes

Review the following attribute descriptions.

<code>--eject daeiso</code>	Ejects the .iso file for the VM.
<code>--name &lt;vm name&gt;</code>	The name of the VM to eject the .iso file.

## Delete Image File

Once the .iso image file has been ejected from the VM on the DXi, delete the file from the `/Q/shares/VM/Iso` directory

- i Note:** The **cliadmin** user account does not have permission to remove files. To remove the .iso image file, log in to the DXi system using the **ServiceLogin** user account (see [Figure 42 on the next page](#)).

Figure 42: Delete an Image File Example

```
login as: ServiceLogin
ServiceLogin@10.40.160.80's password:
Last login: Fri Apr 28 21:17:14 2017 from 10.50.128.68

Product Model           = DXi6900
Hardware Configuration = 6902 (node with HDDs, storage with 4TB HDDs)
Operating System        = CentOS release 6.9 (Final)
Kernel Version          = 2.6.32-696.el6.Q_1.x86_64
System Version          = 0.0.0
System Serial Number    = SV1716BVM21591
Base OS Version         = 0.0.0-13742
Application Version     = 0.0.0-59587
SCM Build Version       = ENG_Build0
Installation Date       = 2017-04-19 02:22:51
Last Update Date       = 2017-04-26 22:24:05

[ServiceLogin@IrvPE-Rocky3E ~]$ ls /Q/shares/VM/Iso
CentOS-6.8-x86_64-minimal.iso
[ServiceLogin@IrvPE-Rocky3E ~]$ rm -f /Q/shares/VM/Iso/CentOS-6.8-x86_64-minimal.iso
[ServiceLogin@IrvPE-Rocky3E ~]$ ls /Q/shares/VM/Iso
[ServiceLogin@IrvPE-Rocky3E ~]$
```

---

# Manage DAE Virtual Machines

The following Command Line Interface (CLI) commands are used to manage Virtual Machines (VMs) on a DXi system:

- [Delete a Virtual Machine on the next page](#)
- [Export a Virtual Machine Image on the next page](#)
- [Import a Virtual Machine Image on page 49](#)
- [List Virtual Machines on page 50](#)
- [List Virtual Machine Exported Images on page 51](#)
- [Shutdown a Virtual Machine on page 52](#)
- [Start a Virtual Machine on page 53](#)
- [Stop a Virtual Machine on page 53](#)
- [Update a Virtual Machine on page 53](#)

## Delete a Virtual Machine

This command deletes an existing virtual machine (VM) instance.

### Command

```
syscli --delete dae --name <vm name> [--sure]
```

### Command Attributes

Review the following attribute descriptions.

<code>--delete dae</code>	Delete the VM instance.
<code>--name &lt;vm name&gt;</code>	The name of the VM to be deleted.
<code>--sure</code>	If specified, this command will execute immediately without asking for confirmation.

## Export a Virtual Machine Image

This command exports a virtual machine (VM) image to a file suitable for import on another system.

**i Note:** VM image exports can take 10 or more minutes to complete.

### Additional Information

- VM image exports can take 10 or more minutes to complete.
- VM images that are exported will not have a VNC password defined, and the autostart setting will be disabled. To define a VNC password and enable the autostart setting, do the following:
  - Use the `syscli --edit dae` command as shown then start the VM (see [Update a Virtual Machine on page 53](#)).
  - Start the VM (see [Start a Virtual Machine on page 53](#)).
- Update any network settings within the VM OS for the new system on which the image is exported (hostname, static IP address, etc.) if the following occurs:
  - The target DXi system network ports are not available to the application network ports assigned to the VM image being imported.



**Command**

```
syscli --export dae --name <vm name> [--path <path for image>]
```

**VM Network Parameters**

It is recommended that you do not use NetworkManager on a Red Hat Enterprise Linux (RHEL) based distribution to configure the VM network parameters. Use of NetworkManager will require the following file clean up before shutting down and exporting a VM.

1. Remove the following parameters from `/etc/sysconfig/network-scripts/ifcfg-eth*`:
  - HWADDR
  - UUID
2. Remove the `70-persistent-net.rules` file:
 

```
rm -f /etc/udev/rules.d/70-persistent-net.rules
```

**Command Attributes**

Review the following attribute descriptions.

<code>--export dae</code>	Export a VM image.
<code>--name &lt;vm name&gt;</code>	The name of the VM image to save.
<code>--path &lt;path for image&gt;</code>	(Optional) Destination for the exported image. The default path is <code>/Q/shares/VM/VMExportedImages</code> .

## Import a Virtual Machine Image

This command imports a virtual machine (VM) image exported using `--export dae`.

**Additional Information**

- VM images that are imported will not have a VNC password defined, and the `autostart` setting will be disabled. To define a VNC password and enable the `autostart` setting, do the following:
  - Use the `syscli --edit dae` command as shown then start the VM (see [Update a Virtual Machine on page 53](#)).
  - Start the VM (see [Start a Virtual Machine on page 53](#)).
- Update any network settings within the VM OS for the new system on which the image is imported (hostname, static IP address, etc.).

### VM Network Parameters

It is recommended that you do not use NetworkManager on a Red Hat Enterprise Linux (RHEL) based distribution to configure the VM network parameters. Use of NetworkManager will require the following file clean up before shutting down and exporting a VM.

1. Remove the following parameters from `/etc/sysconfig/network-scripts/ifcfg-eth*`:
  - HWADDR
  - UUID
2. Remove the `70-persistent-net.rules` file:
 

```
rm -f /etc/udev/rules.d/70-persistent-net.rules
```

### Command

```
syscli --import dae --image <path name> [--name <new name>]
```

### Command Attributes

Review the following attribute descriptions.

<code>--import dae</code>	Import a VM image.
<code>--image &lt;path name&gt;</code>	The name of file containing the VM image to import.
<code>--name &lt;new name&gt;</code>	The name of the imported VM if different from the original name.

## List Virtual Machines

This command lists current DAE virtual machines (VMs) and summary information on each VM.

**i Note:** Only the **cliadmin** can access the VM with VNC Viewer

### Command

```
syscli --list dae --name <vm name>
```

### Example output

Output data:

List of VMs:

Total count = 1

```
[VM = 1]
VM name = caspervm01
State = running
Auto Start = yes
Net Port(s) = eth2
Max CPU(s) = 4
Used CPU(s) = 4
Max Memory = 32768 MB
Used Memory = 32768 MB
Disk Capacity = 100 GB
Image File = /Q/shares/VM/VMImages/<vmname>.qcow2
VNC port = 127.0.0.1:0
```

### Command Attributes

Review the following attribute descriptions.

<b>--list dae</b>	List the VM instance(s).
<b>--name &lt;vm name&gt;</b>	The name of a specific VM to show (optional).

## List Virtual Machine Exported Images

This command lists DAE virtual machine (VM) image files in a specified directory.

### Command

```
syscli --list daeexport [--path <export file path>]
```

### Command Attributes

Review the following attribute descriptions.

<b>--list daeexport</b>	Retrieves a list of VM image export files in a specified directory.
-------------------------	---

---

**--path <export file path>**

The directory to search for VM image export files. If not specified, the default path is /Q/shares/VM.

---

## Shutdown a Virtual Machine

This command performs a clean operating system (OS) shutdown of the virtual machine (VM). All services are cleanly shutdown within the VM before it is powered off.

### Advanced Configuration and Power Interface (ACPI)

VMs with a CentOS 6 minimal .iso may not install ACPI. This can cause issues when attempting to shut down the VM. Install the `acpi-support-base` package and verify that the `acpid` daemon is running after installing the package:

```
# yum -y install acpid; /etc/init.d/acpid start; chkconfig --level 235 acpid on;
```

### Command

```
syscli --shutdown dae --name <vm name> [--poweroff] [--sure]
```

### Command Attributes

Review the following attribute descriptions.

<b>--shutdown dae</b>	Shutdown the VM instance.
<b>--name &lt;vm name&gt;</b>	The name of the VM to shutdown.
<b>--poweroff</b>	If specified, the VM instance is immediately powered off. The current state is not preserved, so any open files or active I/O could result in VM corruption.
<b>--sure</b>	If specified, this command will execute immediately without asking for confirmation.

---

## Start a Virtual Machine

This command starts a virtual machine (VM) that has been shutdown or stopped.

### Command

```
syscli --start dae --name <vm name>
```

### Command Attributes

Review the following attribute descriptions.

<b>--start dae</b>	Starts the VM instance.
<b>--name &lt;vm name&gt;</b>	The name of the VM to start.

## Stop a Virtual Machine

This command stops a virtual machine (VM) and saves the current state to disk.

### Command

```
syscli --stop dae --name <vm name>
```

### Command Attributes

Review the following attribute descriptions.

<b>--stop dae</b>	Stops the VM instance.
<b>--name &lt;vm name&gt;</b>	The name of the VM to stop.
<b>--sure</b>	If specified, this command will execute immediately without asking for confirmation.

## Update a Virtual Machine

This command allows for the modification of an existing DAE virtual machine (VM) instance.

In order to update VM settings, the VM must be in a shut off state. You can put a DAE VM into a shut off state by either stopping or shutting down the VM (see [Stop a Virtual Machine above](#) and [Shutdown a Virtual Machine on the previous page](#)).

- i Note:** If VM is stopped and has a saved RAM state file, updating that VM will remove the RAM saved state file.

### Updating the Application Network Devices for a VM

Before change the application network devices used by a VM, review the following:

- Ensure that the new application network devices can be used by a VM. The list of available application network devices available for a VM can be retrieved using the `syscli --getlimits dae` command. You can use either the available or used network ports shown on the output of this command
- When updating the application network ports for a VM, un-assign the current network ports for that the VM and then assign the new list of application network devices for the VM.
- When updating the application network devices for a VM, the actual VM virtual network ports assigned to the DXi physical network devices will change within the VM OS.

For example, a VM uses the DXi physical eth2 network device. This network device appears in the VM OS as eth1. If the application network device changes in the VM, the application network device defined with the VM OS will change to a new network device name.

#### Command

```
syscli --edit dae --name <vm name> [--cpus <num cpus>] [--memory <ram>] [(--appnetwork <nic port>)] [--autostart yes|no] [--password <password>]
```

#### Command Attributes

Review the following attribute descriptions.

<code>--edit dae</code>	Edit VM instance.
<code>--name &lt;vm name&gt;</code>	Edit the name of the VM.
<code>--cpus &lt;num cpus&gt;</code>	Edit the number of CPUs for the VM.
<code>--memory &lt;ram&gt;</code>	Modify the amount of RAM memory (in MB) for the VM.
<code>--appnetwork &lt;nic port&gt;</code>	Modify the application network devices (NIC ports). More than one may be specified.
<code>--autostart yes no]</code>	Change the autostart status of the VM on the system boot. The default is no.
<code>--password &lt;password&gt;</code>	Change the password for accessing the console over VNC.
<code>--sure</code>	If specified, this command will execute immediately without asking for confirmation.