



End-to-end deployment of the Dell PowerEdge M710HD, Dell PowerConnect M8024-k and Dell EqualLogic PS6010XV using Switch Independent Partitioning and the Broadcom BCM57712-k

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Executive summary

Introduction

Traditional network interfaces resemble a highway system. Each road carries a single type of traffic: one road for passenger traffic, one road for freight and so on. However, converged I/O allows a single connection to carry different types of traffic simultaneously. This guide explains how to converge TCP and iSCSI, with each type of traffic travelling through a dedicated VLAN over a single network interface. You will also learn how to configure a simple network from bare metal, with a server, a SAN (iSCSI) connection and a LAN (TCP/IP) connection.

The components we used in this demonstration, the Dell™ PowerEdge™ M710HD blade server and the Dell PowerConnect™ M8024-k blade switch, can greatly increase the density of your data center – allowing you to accomplish more work in the same space. Converged network adapters (CNAs) allow this density increase in the data center while reducing costs. CNAs contribute to this benefit in three ways: by reducing processor load, reducing complexity and reducing equipment costs.

Because data center networking speeds have increased to 10 Gb, the load that a traditional controller places on the server has increased. CNAs can offload CPU processing of several types of traffic, resulting in more processing resources being available for business-critical tasks. This guide demonstrates the offloading of traffic for a TCP connection and an iSCSI connection.

CNAs reduce complexity by reducing the number of components. Fewer adapter cards, switches, connectors and cables doing the same amount of work as before represents a net increase in efficiency. The Broadcom® BCM57712-k that we used can support four 1Gb channels through a single 10Gb interface, potentially reducing the number of components for network connectivity by 75 percent.

The cost savings are even more impressive. For this analysis, we assume that the chassis already has two Dell PowerConnect M8024-k switches in Fabric A. All prices we mention are those in effect at publication time.

As of publication time, the default Fabric A NIC in the Dell PowerEdge M710HD was the Broadcom 5709 1GbE NIC, which gives the server two 1 Gb connections.

Substituting the Broadcom BCM57712-k for Fabric A costs an additional \$499. With Switch Independent Partitioning active, the server has eight 1 Gb connections.

Without Switch Independent Partitioning, you would have to add both NICs and switches to increase the number of ports on the Dell PowerEdge M710HD. Adding a dual-port BCM5709 for Fabric B and Fabric C costs \$798 per blade. Adding four Dell PowerConnect M2024-k switches for Fabrics B and C costs \$31,764.28, or \$1,985.27 per blade, for a total additional cost of \$1,776.48 per blade to get to six ports.

Using Switch Independent Partitioning, you save \$1,277.48 per blade, or \$20,439.68 for a fully populated chassis, while getting more ports.

Fewer components to buy, maintain, repair, or replace, as well as increased processor availability from the same number of processors translates directly to the bottom line. You accomplish more work with less equipment.

The Dell PowerEdge M710HD and Dell PowerConnect M8024-k

The half-height Dell PowerEdge M710HD fits the capabilities of the full-height Dell PowerEdge M710, effectively doubling the capacity of the chassis. The Dell PowerEdge M710HD has two processor sockets, each capable of supporting a 4-core or 6-core processor. It can support up to 192 GB of RAM and up to 1.2 TB of internal storage. The Dell PowerEdge M710HD is one of the first blade servers in the industry to offer the flexibility of a user-selectable Select NIC in place of a fixed LAN on motherboard adapter. That card, when equipped with a Broadcom BCM57712-k controller offers the advantages of convergence in either two 10Gb network interfaces or eight 1GB interfaces.

The Dell PowerConnect M8024-k supports the 10Gbase-KR standard and offers end-to-end 10Gb connectivity on Fabric A. At 480 Gbps of aggregate bandwidth, it has double the switch fabric capacity of the Dell PowerConnect M8024.

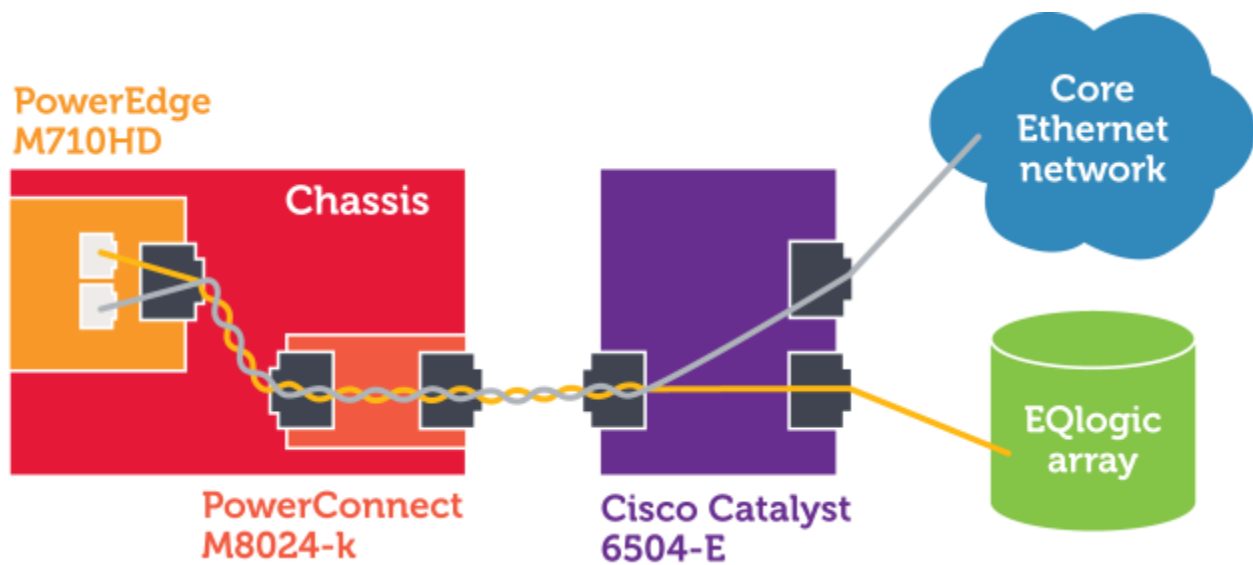


This guide discusses several Dell management features, such as the automatic discovery capabilities of the Dell PowerEdge M1000e Modular Blade enclosure and the Dell Unified Server Configurator.

Overview of the procedure

To illustrate the use of Switch Independent Partitioning to consolidate heterogeneous network traffic, this guide will show how to create a small network using the Dell PowerEdge M710HD with the Broadcom BCM57712-k, Dell PowerConnect M8024-k, Dell EqualLogic™ PS6010XV and the Cisco® Catalyst® 6504-E. Upon completion, the server will be sending and receiving both iSCSI and TCP traffic through a single 10Gb NIC.

Below, we illustrate the goal of our test network. We show that the converged I/O takes two different streams and transmits over one network interface. The grey stream represents TCP/IP traffic, while the orange stream represents iSCSI traffic.



Configure the Cisco Catalyst 6504-E

Using a serial connection and the IOS CLI, configure the Cisco Catalyst 6504-E the following way:

1. Enable portfast and Jumbo Frames.
2. Create the VLANs.
3. Set up trunking and VLAN access.
4. As per the *Dell EqualLogic Configuration Guide*, enable flow control and disable unicast storm control on the interface connected to the Dell EqualLogic PS6010XV. Finally, configure it as a layer-2 port and activate it.
5. Enable 802.1q tagging for the whole switch, and exit global configuration mode.

Configure the Dell PowerConnect M8024-k

Using the PowerConnect OpenManage GUI, configure the Dell PowerConnect M8024-k the following way:

1. Configure frame size per port.
2. Create the VLANs.
3. Set up trunking and VLAN access.

Configure the Dell EqualLogic PS6010XV

Using the setup utility and a serial connection to the management port, configure the Dell EqualLogic PS6010XV as follows:

1. Initialize the array.
2. Enter the networking information for the array.
3. Create a group.
4. Set the administrator (grpadmin) password.

Use the Dell Unified Server Configurator to enable Switch Independent Partitioning on the Broadcom BCM57712-k

1. Boot the server, and press F10 to enter the USC.
2. Select Hardware Configuration→Advanced configuration, and press Enter.
3. Select the first of the two BCM57712-k interfaces, and then select Device Configuration Menu.
4. Enable Switch Independent Partitioning on the BCM57712-k. Enabling Switch Independent Partitioning affects both of the interfaces on the Broadcom BCM57712-k.

Install Windows Server® 2008 R2 and the drivers for the Broadcom BCM57712-k

1. Install a new copy of Windows Server 2008 R2 Enterprise (Full Installation) as the operating system on the Dell PowerEdge M710HD.

At this point, Windows Server 2008 R2 is installed, but it does not recognize the Broadcom BCM57712-k. The driver file we used in this guide is Bcom_LAN_16.2.0_W2K3_8_64_A01.exe, available from <http://www.support.dell.com>.

2. Double-click the executable, and unzip the files.
3. Launch the Broadcom installer.
4. Install the Control Suite and all its sub features. You will use the Broadcom Advanced Control Suite in configuring the interfaces.
5. Now that the system has network connectivity, install Windows updates.

Create the VLAN for iSCSI traffic

1. Launch the Broadcom Advanced Control Suite (BACS).

NOTE: Because there is only one switch in the chassis, half of the interfaces will show as disconnected.

2. Select the corresponding network adaptor, and select the Configurations tab.
3. Set the Jumbo packet size, and disable the IPv4 Large Send Offload option.

NOTE: According to the *Using Broadcom Advanced Control Suite 3: Broadcom NetXtreme 57XX User Guide*, Jumbo Frames and Large Send Offload (LSO) are mutually exclusive properties.

4. Select the iSCSI adaptor, turn off DHCP, and enter the IP address.
5. At Team Management, right-click adaptor #42 (the iSCSI adaptor), and select Create a VLAN.
6. Enter the name of the team, the name of the VLAN, and the tag value. Click Finish to create the VLAN, and click Yes on the warning pop-up.

Repeat steps 1 through 6 in this section to create the VLAN for TCP/IP traffic, changing the team name, VLAN name, and tag value as appropriate. There is no need to set jumbo frames or disable LSO for the TCP/IP connection.

Create the SAN volume

1. Install the EqualLogic Hardware Integration Tools (HIT), using a typical install and answering Yes to all prompts.
2. After the Dell PowerEdge M710HD reboots, select Configure this computer to access a PS Series SAN.
3. Launch Internet Explorer® and enter the IP address for the EqualLogic array.
4. Log into the array using the grpadmin account.
5. Name the array, and select the RAID policy.
6. Choose Volumes in the left pane, and click Create volume.
7. Name the volume, choose the size for the volume, and set the snapshot reserve as appropriate.
8. Restrict iSCSI access as appropriate. You have successfully created the volume.

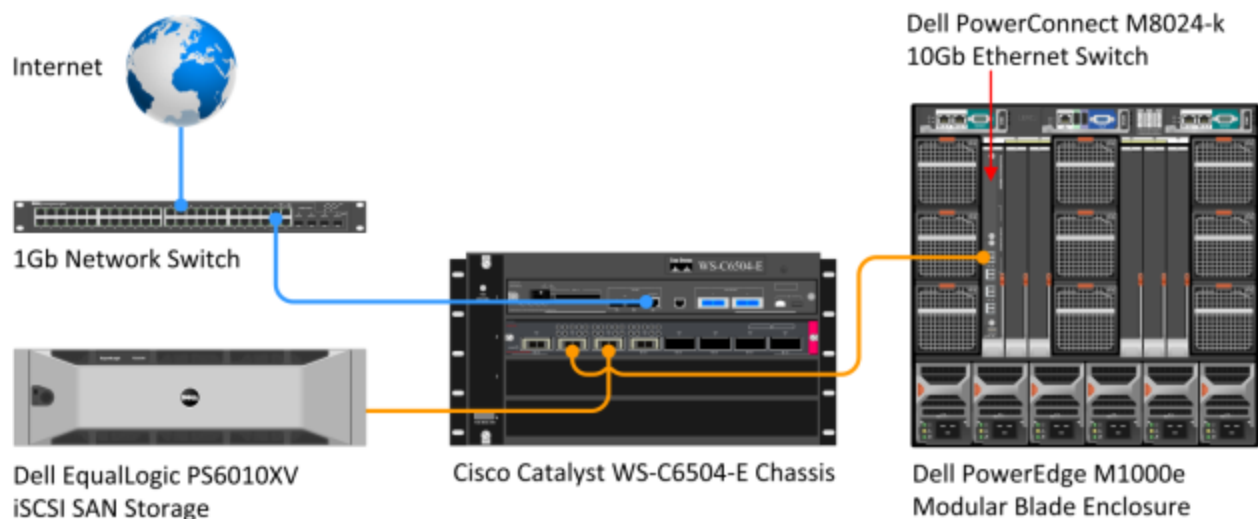
Set iSCSI access to the SAN

1. Start the iSCSI Initiator.
2. Select the Discovery tab.
3. Enter the IP address, and select the adaptor to use. The Broadcom interface will appear in the list of local adaptors.
4. Select the Targets tab, and connect to the target.
5. Close the iSCSI Initiator.
6. Start Server Manager, expand Storage, and select Disk Management.
7. Right-click the new disk, and select Online. Initialize the drive if necessary.

Detailed deployment steps

Wire the network

This diagram shows how the network components are connected. The blue lines represent 1Gb connections, while the orange lines represent 10Gb connections.

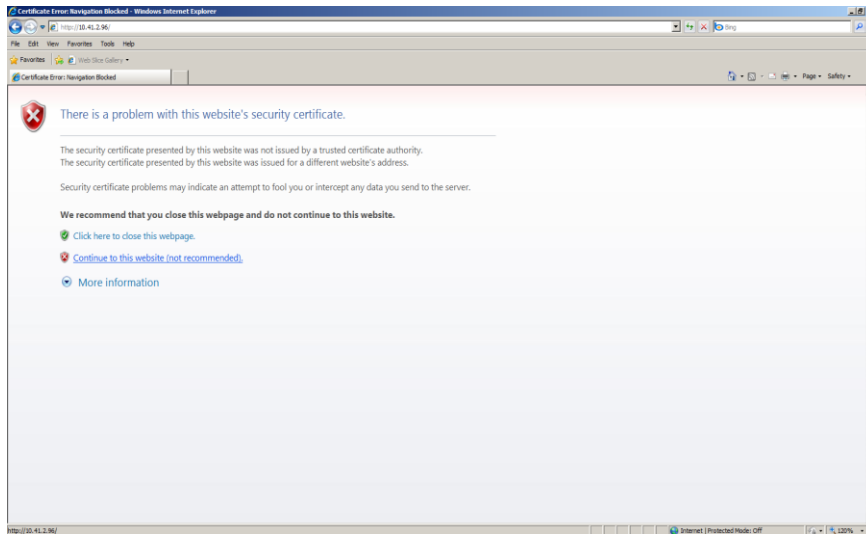


This process assumes a 1Gb connection to the core Ethernet network, so the 1Gb switch is outside the scope of this guide. This guide will show how to configure all other components from bare metal.

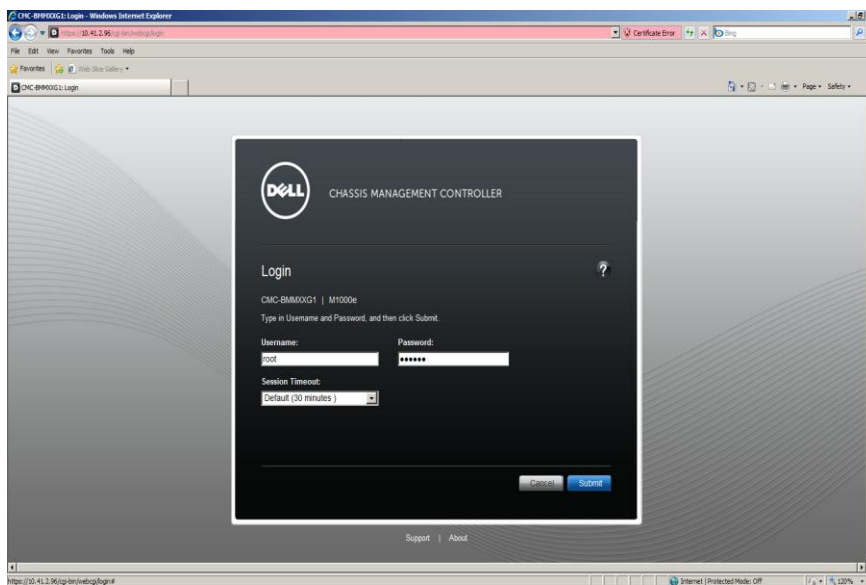
Connect to the Dell PowerEdge M1000e CMC

The Dell PowerEdge M1000e provides many powerful management features, far more than this guide touches on. The section below illustrates only features needed to implement the procedures in this guide.

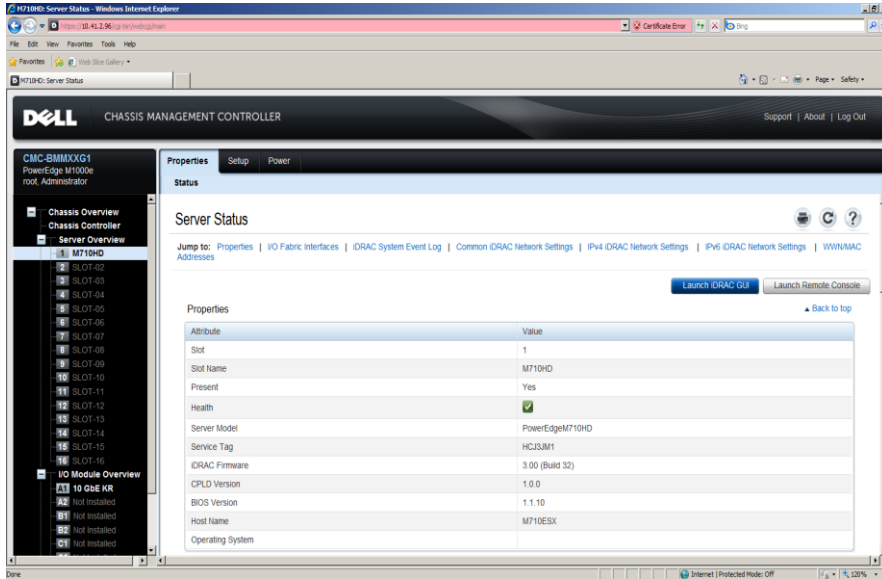
1. Enter the IP address of the Dell PowerEdge M1000e. At the warning about the website's security certificate, click Continue to this website (not recommended).



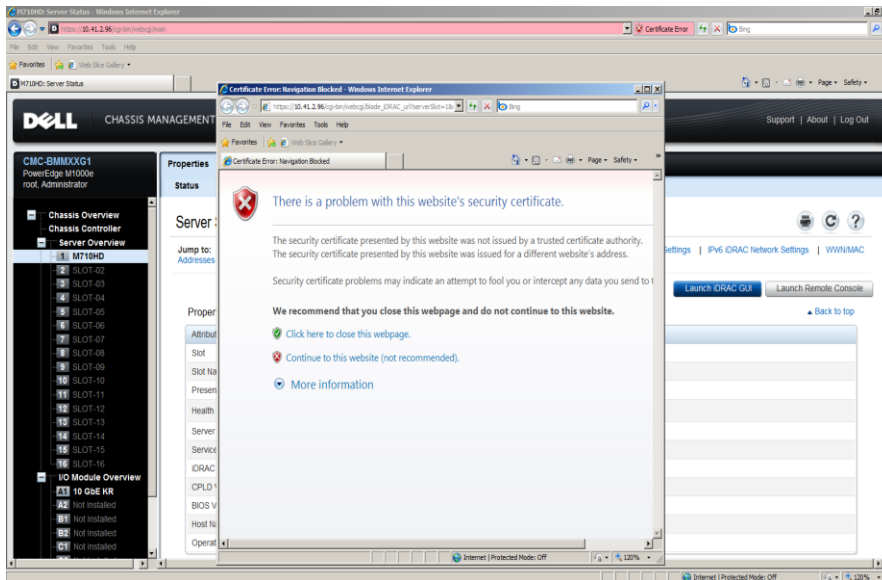
2. Enter the user name and password. The default root password is "calvin".



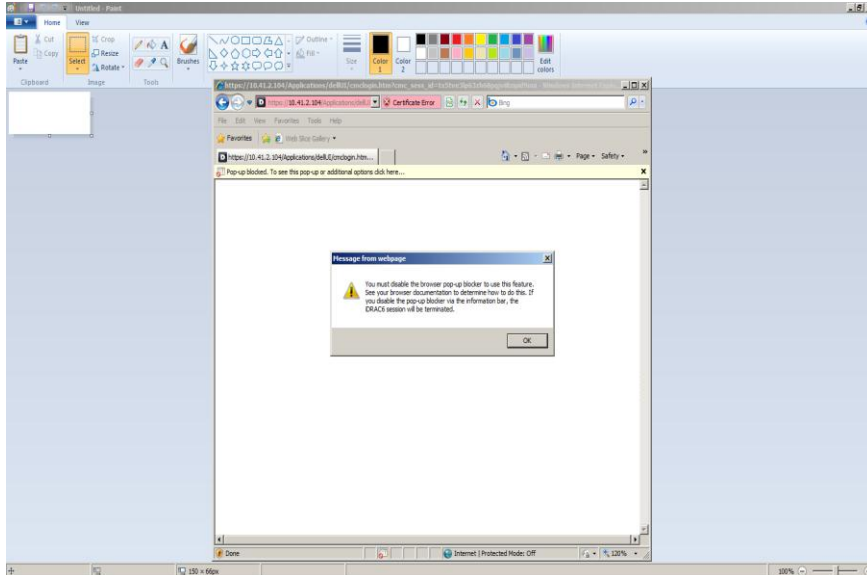
3. To launch the console for the Dell PowerEdge M710HD, select the server and click Launch Remote Console.



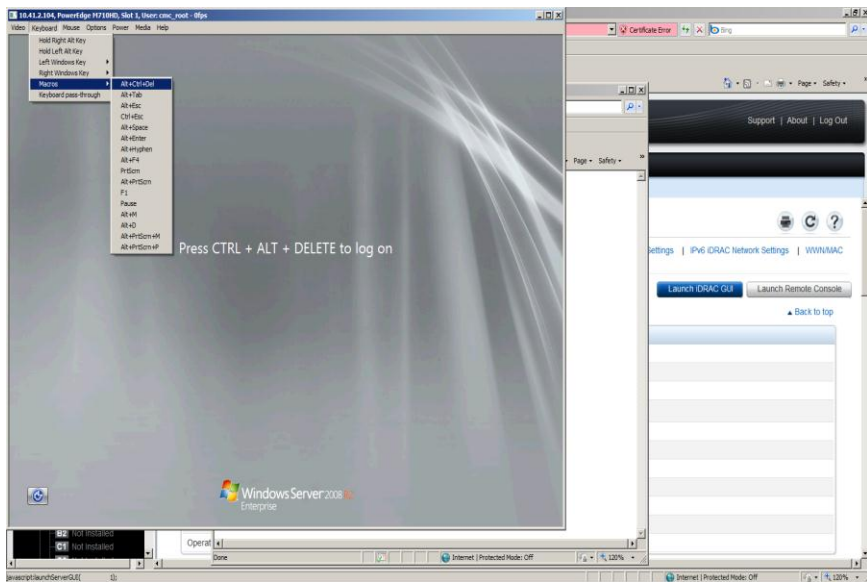
4. At the warning about the website's security certificate, click Continue to this website (not recommended).



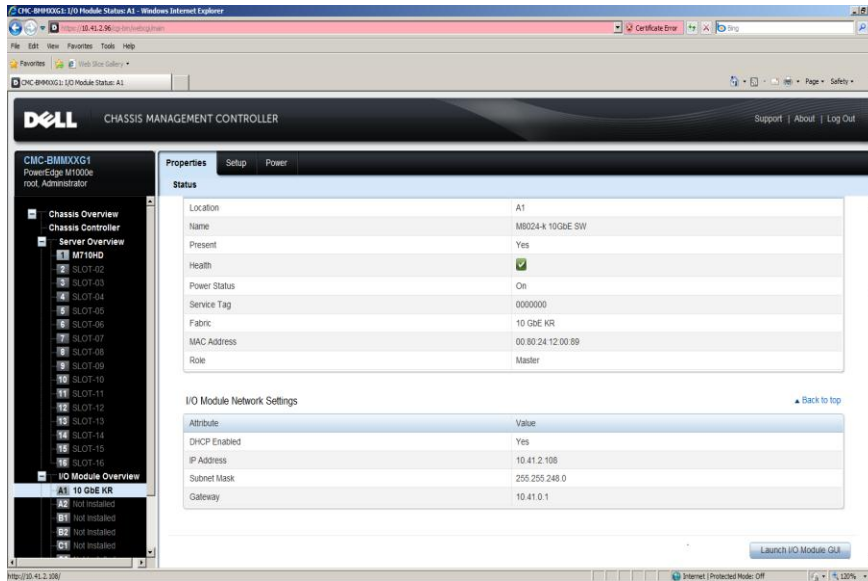
5. Depending on your browser settings, you may need to give permission for the console to launch.



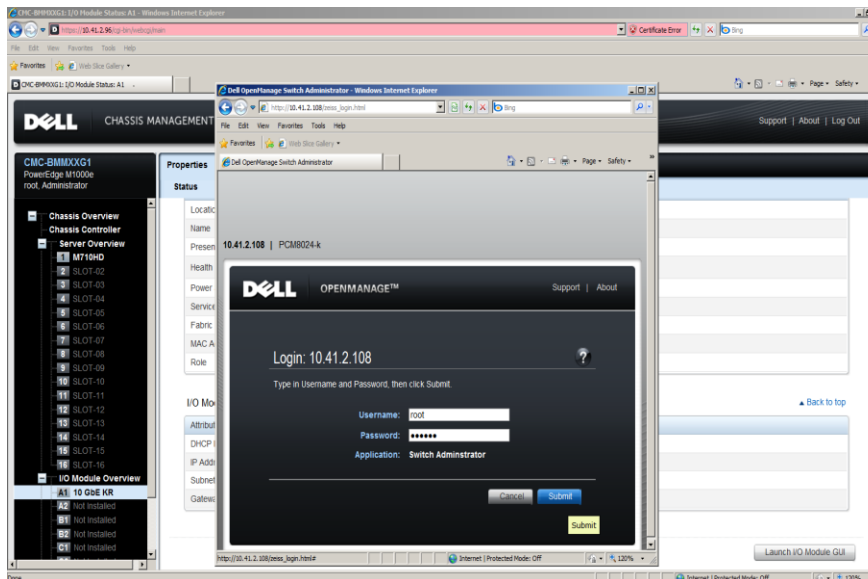
6. The console is running.



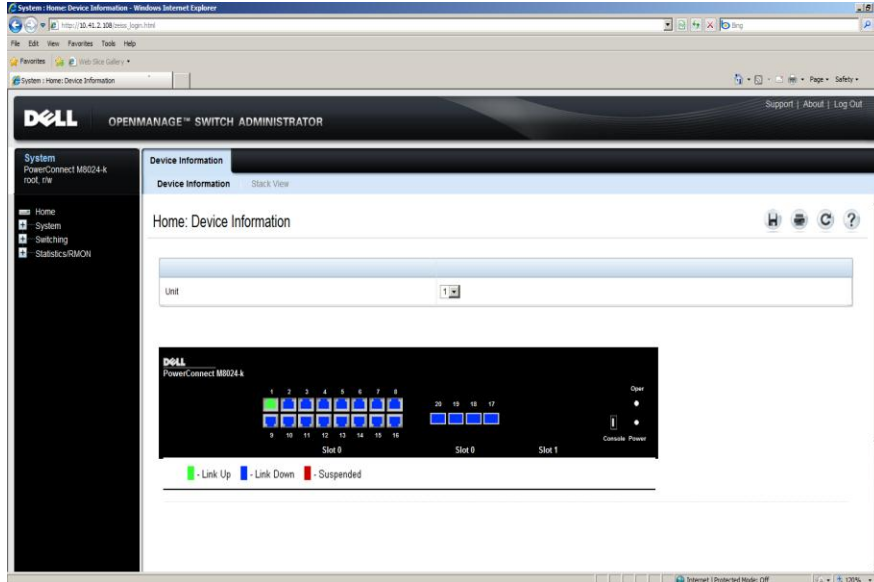
7. To launch the GUI for the Dell PowerEdge M8024-k, select the switch from the chassis overview and scroll down to click Launch I/O Module GUI.



8. Enter the user name and password. The default root password is "calvin".



9. The console is running.



Configure the Cisco Catalyst 6504-E

To configure the Cisco Catalyst 6504-E, you will need a serial connection to the management port.

1. To make changes to the switch, enter privileged mode, and then enter global configuration mode.

```
enable
configure terminal
```

2. According to the Dell EqualLogic *Configuration Guide*, the Rapid Spanning Tree protocol or Cisco portfast functionality is required if the SAN infrastructure consists of more than two switches. Although this deployment only uses two switches for the SAN infrastructure, the command to enable portfast is the following:

```
spanning-tree portfast default
```

3. The Dell EqualLogic *Configuration Guide* recommends enabling Jumbo frames, though it is not required. Set the maximum transmission unit size to 9,000 using the following command:

```
system jumbomtu 9000
```

4. Create the VLANs. VLAN 200 will carry TCP/IP traffic. VLAN 300 will carry the iSCSI traffic from the SAN, so increase its MTU to 9,000.

```
vlan 200
exit
```

```
vlan 300
```

```
mtu 9000
exit
```

Interface port-channel 1 will carry the traffic to and from the Dell PowerConnect M8024-k switch. Configuring this interface is the most complicated part of configuring the Cisco switch, so we will present these steps in sections.

5. Specify that you are configuring port-channel 1 with the following command:

```
interface port-channel 1
```

6. The next set of commands configures the interface as a layer 2 port. Specify that the encapsulation on the trunk will follow the IEEE 802.1q standard, and that the port will accept traffic from VLANs 200 and 300. Because the interface supports multiple VLANs, make it a trunk port. Finally, the no shutdown command brings the port up.

```
switchport
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 200,300
switchport mode trunk
no shutdown
```

7. Specify that the 10Gb interface 2/2 will be in the channel-group. Configure it as a layer 2 port, make the group active, and bring up the group.

```
interface TenGigabitEthernet2/2
switchport
channel-group 1 mode active
no shutdown
```

8. Exit configuration mode.

```
exit
```

The commands we used to configure the port channel are as follows:

```
Router(config)#
Router(config)#interface port-channel 1
Router(config-if)#switchport
Router(config-if)#switchport trunk encapsulation dot1q
Router(config-if)#switchport trunk allowed vlan 200,300
Router(config-if)#switchport mode trunk
Router(config-if)#no shutdown
Router(config-if)#interface TenGigabitEthernet2/2
Router(config-if)#switchport
Router(config-if)#channel-group 1 mode active
Router(config-if)#no shutdown
Router(config-if)#exit
```

9. Interface 1/3 is a 1GB uplink port, which will carry traffic to the core Ethernet network. Configure it as a layer-2 interface, make the port active, and exit.

```
int GigabitEthernet1/3
switchport
no shut
exit
```

10. Next, configure the 10Gb interface 2/3 to carry the iSCSI traffic from the SAN. According to the *Dell EqualLogic Configuration Guide*, enable flow control and disable unicast storm control. Finally, configure it as a layer-2 port and bring it up.

```
interface TenGigabitEthernet2/3
flowcontrol receive on
flowcontrol send on
no storm-control unicast level
switchport
no shut
exit
```

11. Enable 802.1q tagging for the whole switch, and exit global configuration mode.

```
vlan dot1q tag native
end
```

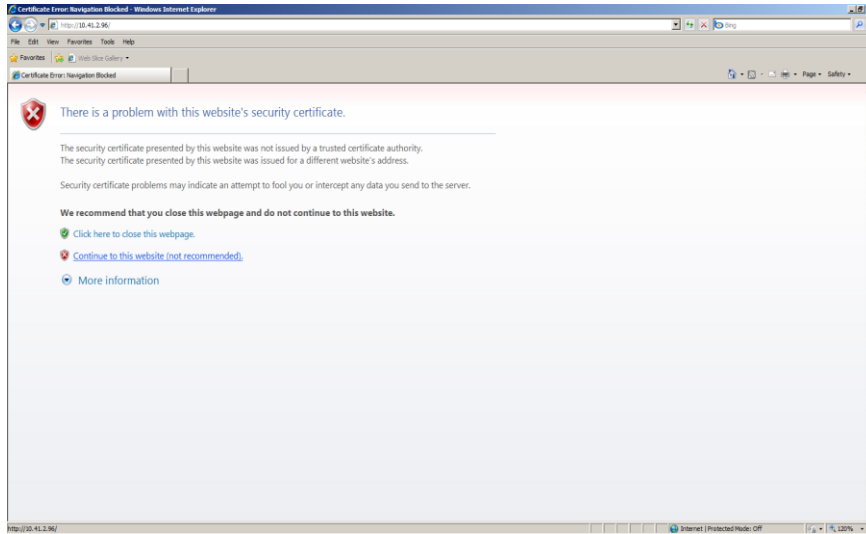
12. Copy this configuration to be the one that loads when the switch boots, and then reboot the switch.

```
copy running-config startup-config
reload
```

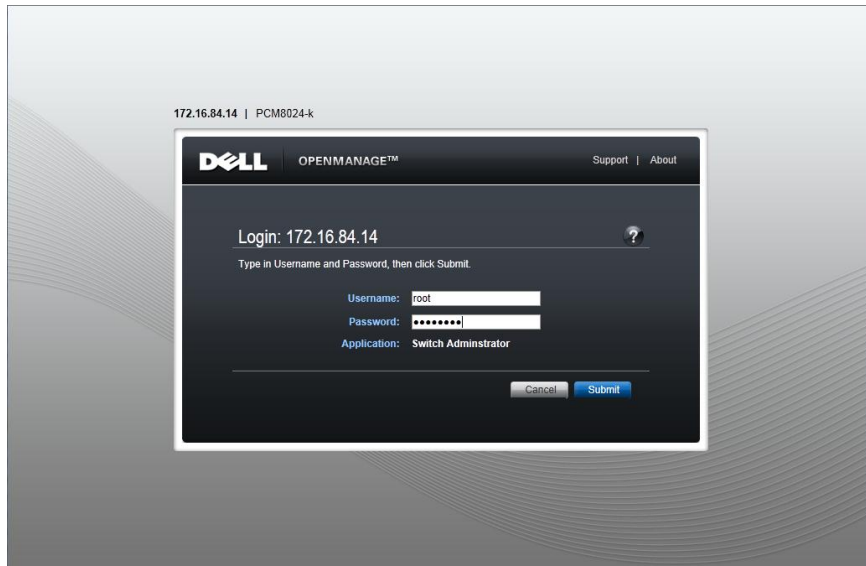
Configure the Dell PowerConnect M8024-k

There are two methods of configuring the Dell PowerConnect M8024-k. This guide uses the web GUI, which requires a network connection to the Dell CMC.

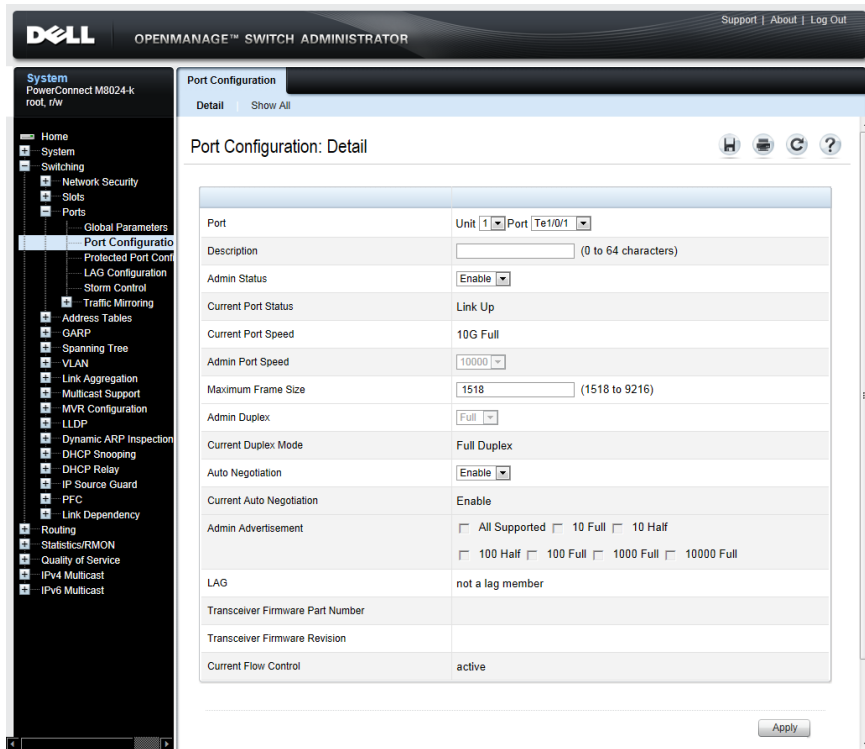
1. Enter the IP address of the Dell PowerEdge M1000e. At the warning about the website's security certificate, click Continue to this website (not recommended).



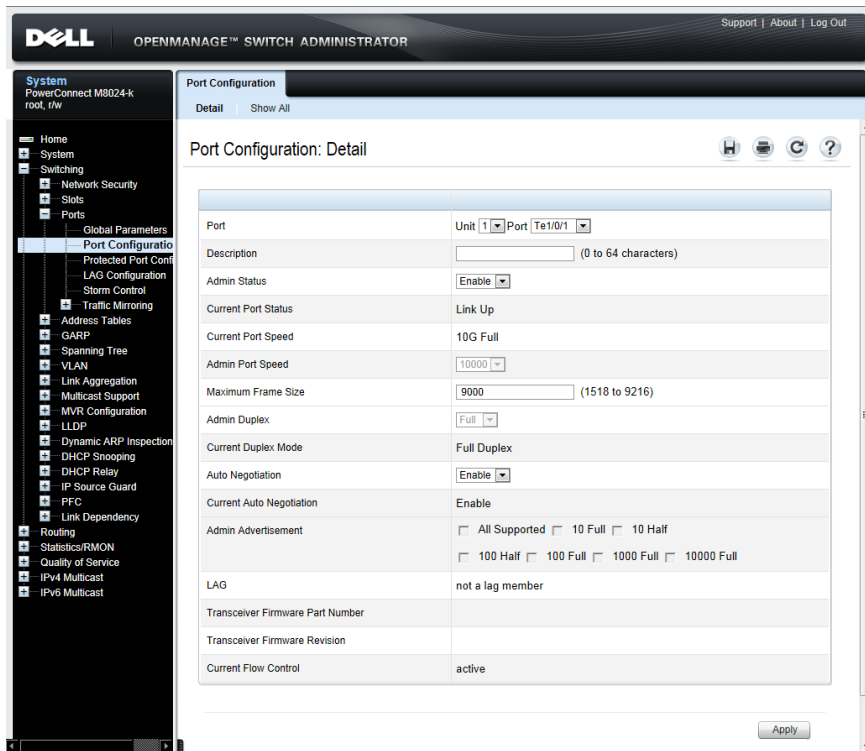
2. Enter the user name and password. The default root password is "calvin".



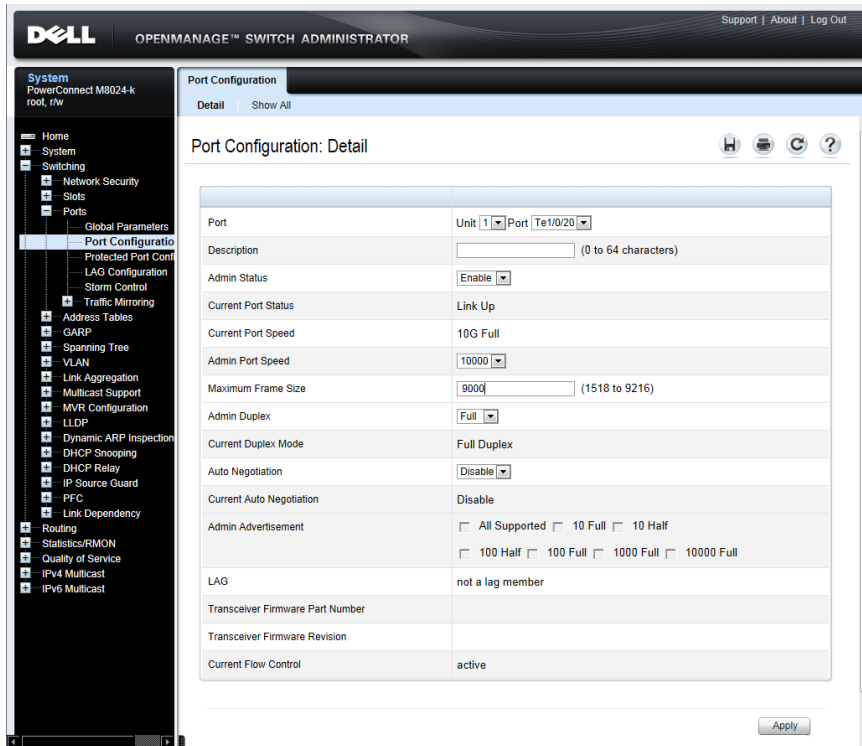
3. In the left pane, expand Switching and Ports, and select Port Configuration.



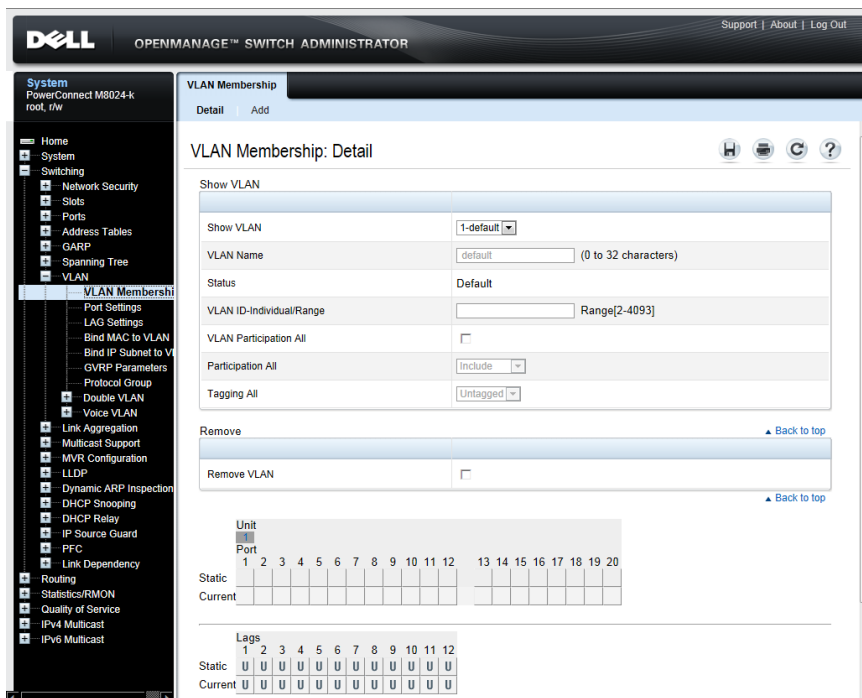
4. Make sure the port selected is Te1/0/1, then in the Maximum Frame Size textbox write 9000 and select Apply.



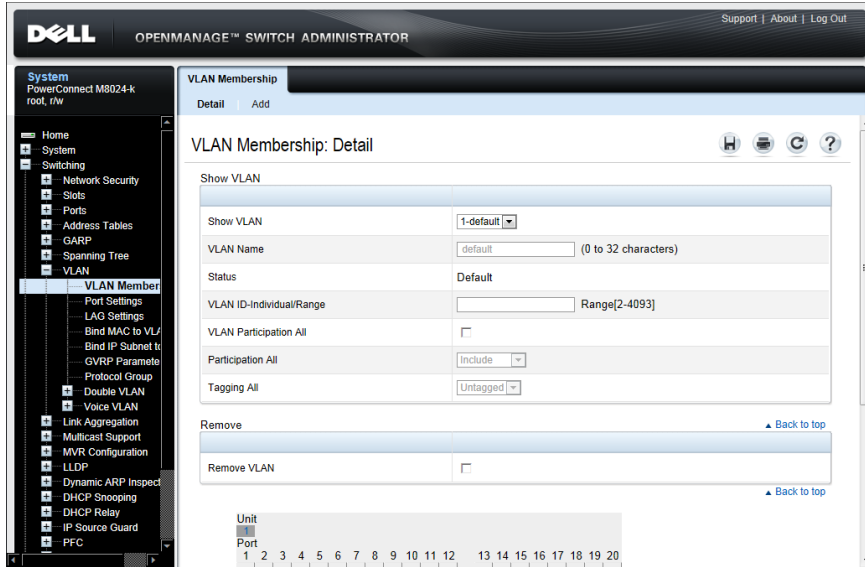
- Select the Te1/0/20 port in the Port dropdown box, then in the Maximum Frame Size textbox write 9000 and select Apply.



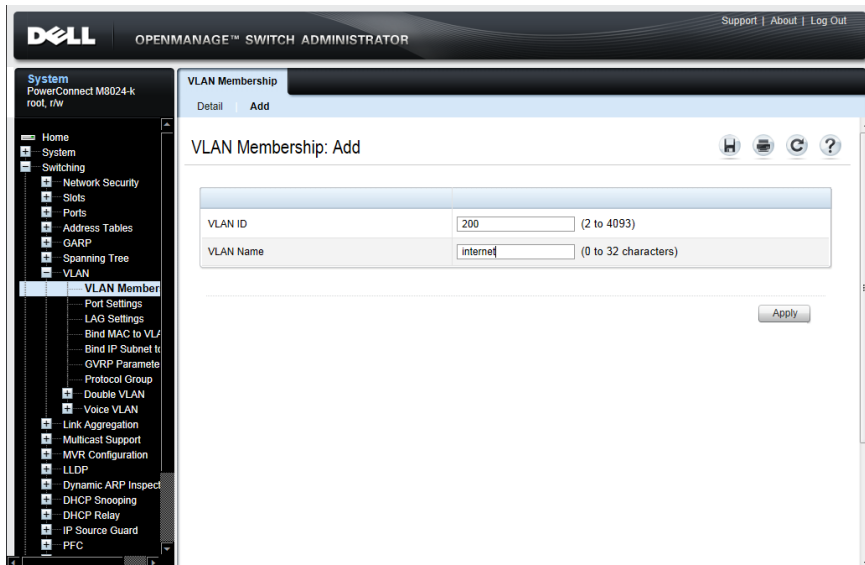
- In the left pane, expand Switching and VLAN, and select VLAN Membership.



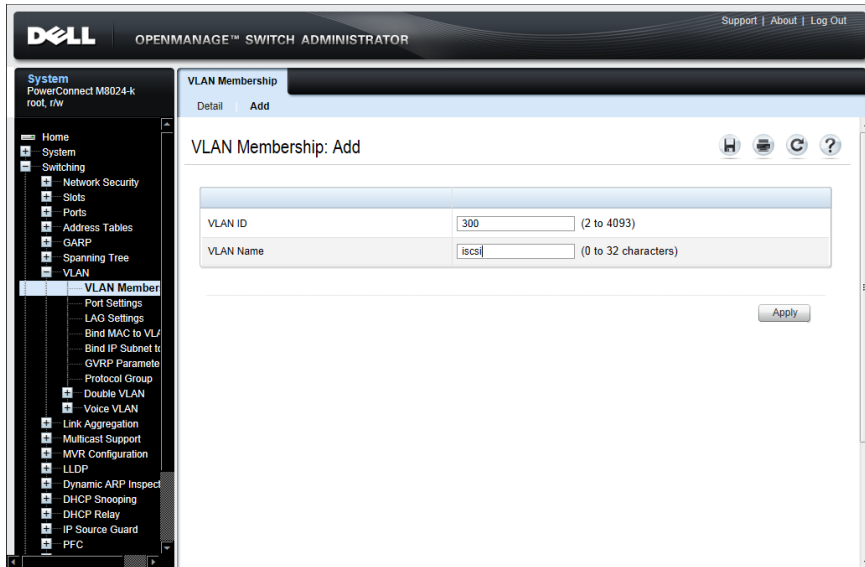
7. Click the Add tab.



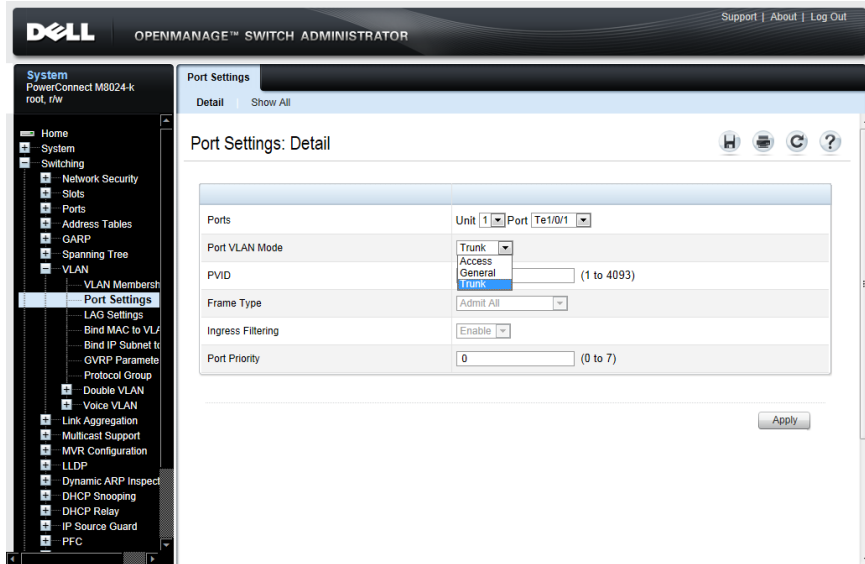
8. In the VLAN Membership: Add tab, type 200 in the VLAN ID text box, and internet in the VLAN Name text box, and select Apply.



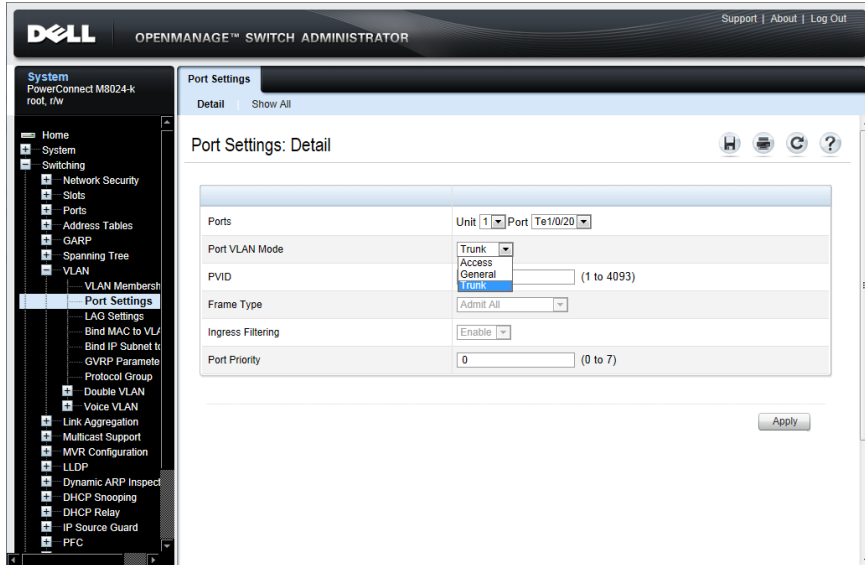
- In the VLAN Membership: Add tab, type 300 in the VLAN ID text box, and `iscsi` in the VLAN Name text box, and select Apply.



- In the left pane, select Port Settings under the VLAN tree.
- Make sure the port selected is Te1/0/1, then in the Port VLAN Mode drop-down box select Trunk and select Apply.



12. Select the Te1/0/20 port, in the Port VLAN Mode drop-down box select Trunk, and select Apply.



Configure the Dell EqualLogic PS6010XV

There are two methods of initializing the Dell EqualLogic PS6010XV. This guide uses the setup utility, which requires a serial connection to the management port.

1. When you boot the array, log in as the group administrator. If the array is set to factory defaults, both the account name and password will be grpadmin.
2. The setup utility asks if you want to figure the array. Type `y` and press Enter to confirm.

```
PS Series Storage Arrays
Unauthorized Access Prohibited

login: grpadmin
Password:

Welcome to Group Manager

Copyright 2001-2011 Dell, Inc.

321:1:netmgtd:22-Apr-2011 15:38:19.870002:rcc_util.c:738:INFO:25.2.9:CLI: Login
to account grpadmin succeeded.
It appears that the storage array has not been configured.
Would you like to configure the array now ? (y/n) [n]y
```

3. At the prompt "Do you want to proceed (yes | no) [no];" type `y` and press Enter.
4. The setup utility displays a message that the array is initializing. When the initialization finishes, it prompts you for the array name. Enter the name, and press Enter.

```

to account grpadmin succeeded.
It appears that the storage array has not been configured.
Would you like to configure the array now ? (y/n) [n]y

Group Manager Setup Utility

The setup utility establishes the initial network and storage
configuration for a storage array and then configures the array
as a member of a new or existing group of arrays.

For help, enter a question mark (?) at a prompt.

Do you want to proceed (yes | no ) [no]: y

Initializing. This may take several minutes to complete.402:219:SP:22-Apr-2011
15:42:03.840220:verify.c:368:INFO:13.2.7:Parity verification completed.
.

Enter the network configuration for the array.

Member name []: Array01

```

5. Next, the setup utility prompts you for the network interface to use. Accept the default of eth0.
6. Enter the IP address of the array.
7. Enter the netmask.
8. Enter the default gateway.
9. The utility displays a message that it is initializing the interface. Then it will prompt for the name of the group. Enter the name of the group.

NOTE: In our example below, the group did not currently exist.

```

as a member of a new or existing group of arrays.

For help, enter a question mark (?) at a prompt.

Do you want to proceed (yes | no ) [no]: y

Initializing. This may take several minutes to complete.402:219:SP:22-Apr-2011
15:42:03.840220:verify.c:368:INFO:13.2.7:Parity verification completed.
.

Enter the network configuration for the array.

Member name []: Array01
Network interface [eth0]:
IP address for network interface []: 111.41.5.200
Netmask [255.255.255.0]: 255.255.255.0
Default gateway [111.41.5.1]:

Initializing interface eth0. This may take a minute.....

Enter the IP address and name of the group that the array will join.

Group name []: Group01

```

10. Enter the IP address for the group
11. The utility checks for the existence of the group. If the group does not exist, it will display the prompt "Do you want to proceed (yes | no) [no]:." Type `y`, and press Enter.
12. At the prompt "Do you want to use the group setting shown above (yes | no) [no]:," type `y` and press Enter.
13. Enter the password for managing the group membership, and press Enter. When the utility prompts you to confirm the password, enter it a second time, and press Enter.

14. Enter the password for the grpadmin account, and press Enter. When the utility prompts you to confirm the password, enter it a second time, and press Enter. The array then saves the configuration.

```
Saving the configuration...

Waiting for configuration to become active...Done
1119:13:psgd:22-Apr-2011 15:58:33.570014:psgd_group.cc:15329:INFO:18.2.0:Group member Array01 now active in the group.

Group Group01 has been created with one member.
Use the Group Manager GUI or CLI to set the RAID policy
for the member. You can then create a volume which
a host can connect to using an iSCSI initiator.

To access the Group Manager GUI, specify http://group_ip_address in
a Web browser window. To access the CLI, use telnet or SSH to
connect to the group IP address from a remote terminal, or attach a
console terminal directly to a serial port on a group member's
active control module. Log in to the default group administration
account (grpadmin) using the password you specified when creating
this group. See the Group Administration manual for more
information.

Group01>
```

Use the Dell Unified Server Configurator to configure the Broadcom BCM57712-k

To use the Dell Unified Server Configurator (USC), you must boot into UEFI rather than BIOS. If your system already boots into UEFI, skip to step 5.

NOTE: You do not have to boot into UEFI to use Switch Independent Partitioning. Once you have configured the Broadcom BCM57712-k, boot into BIOS or UEFI as appropriate.

1. Boot the server. When the system prompts you, press F2 to enter system setup.

```
10.41.2.123, PowerEdge M710HD, Slot 9, User: cmc_root - 4fps
Video Keyboard Mouse Options Power Media Help

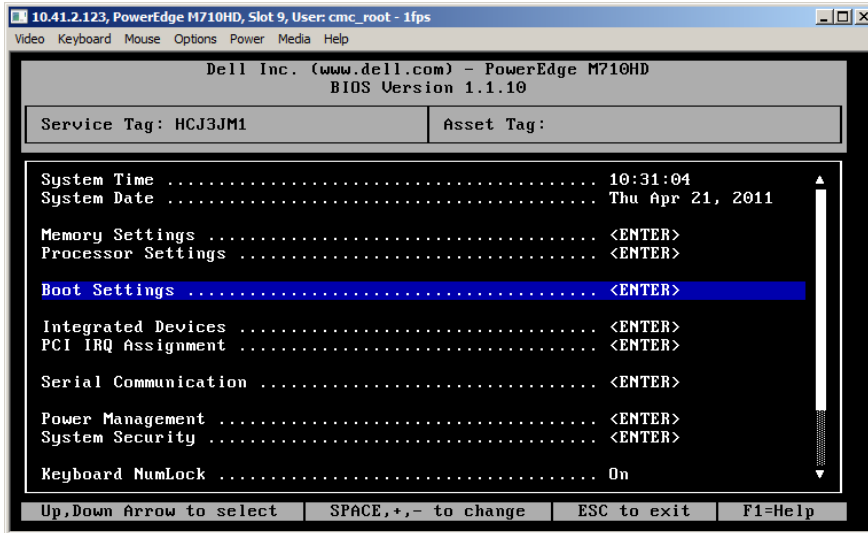
Entering System Setup
F10 = System Services
F11 = BIOS Boot Manager
F12 = PXE Boot

Two 2.66 GHz Six-core Processors, Bus Speed:6.40 GT/s, L2/L3 Cache:1.5 MB/12 MB
System running at 2.66 GHz
System Memory Size: 72.0 GB, System Memory Speed: 800 MHz, Voltage: 1.5V

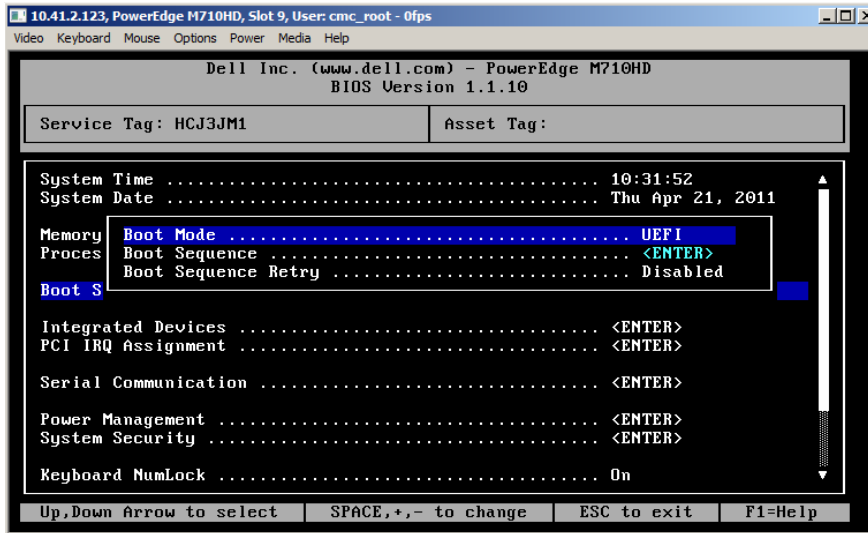
Broadcom NetXtreme Ethernet Boot Agent
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.
Press Ctrl-S to enter Configuration Menu

Dell PERC H200/6Gb/s SAS HBA BIOS
MPT2BIOS-7.01.09.00 (2010.03.22)
Copyright 2000-2009 LSI Corporation.
```

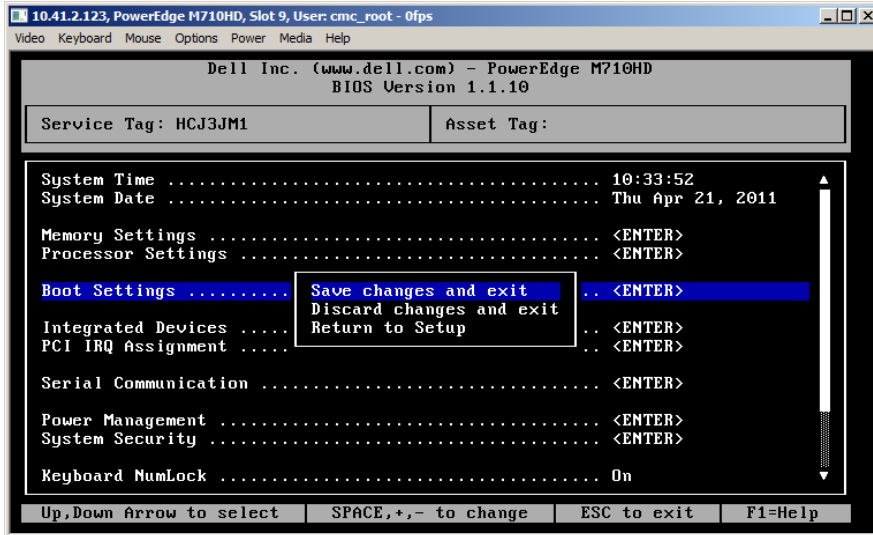
2. Use the down arrow key to highlight Boot Settings, and press Enter.



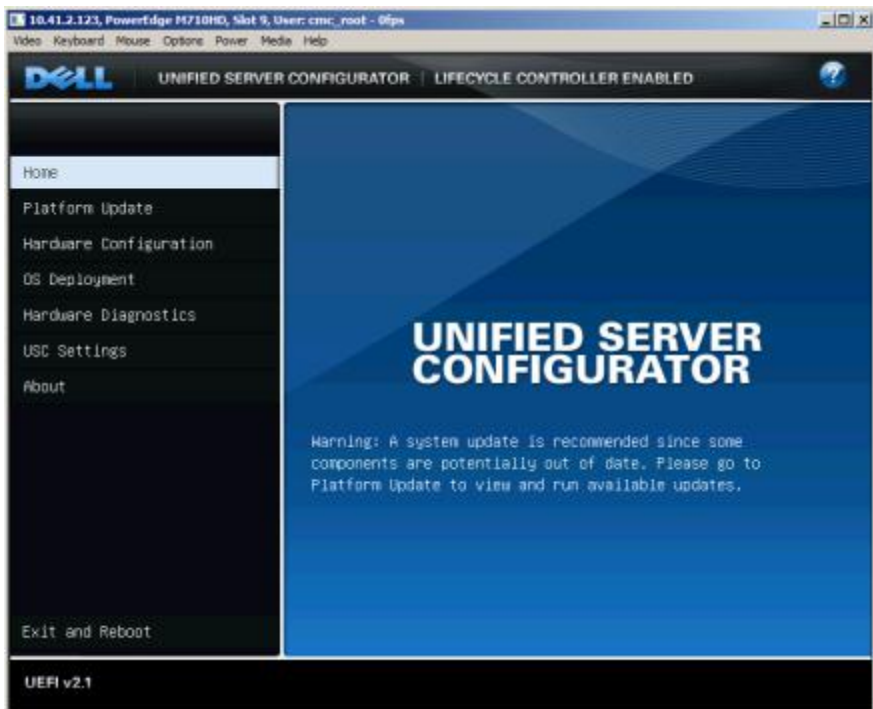
3. Set the Boot Mode to UEFI.



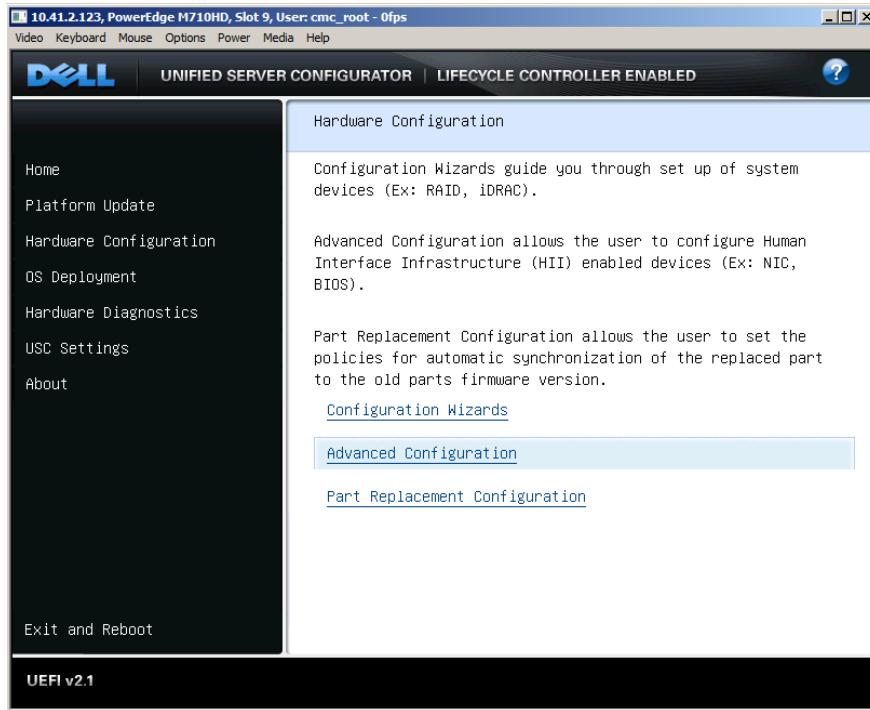
4. Press Esc twice to exit the BIOS. Press Enter to select Save changes and exit.



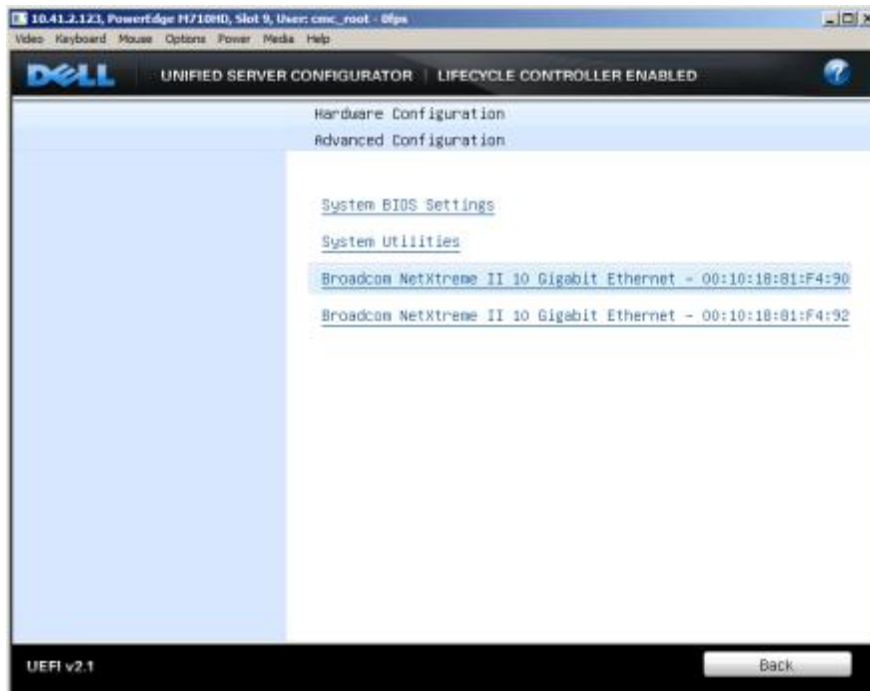
5. When the system reboots, press F10 to enter the USC.



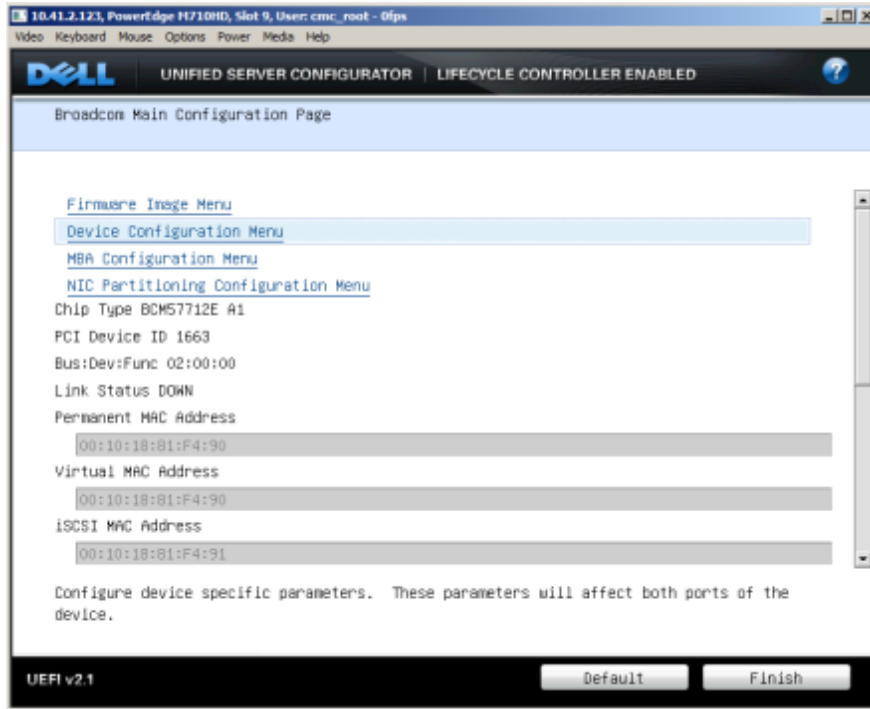
6. Select Hardware Configuration, and press Enter. In the right pane, select Advanced configuration, and press Enter.



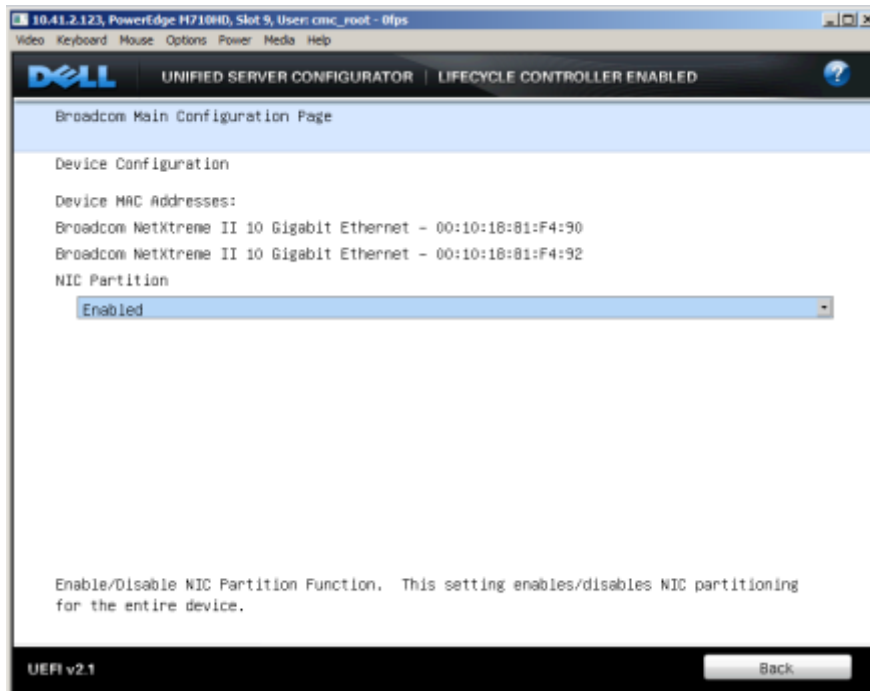
7. The BCM57712-k presents two interfaces to the USC. Select the first interface, and press Enter.



8. Select Device Configuration Menu, and press Enter.



9. From the NIC Partition drop down box, select Enabled. This will enable Switch Independent Partitioning on the BCM57712-k.

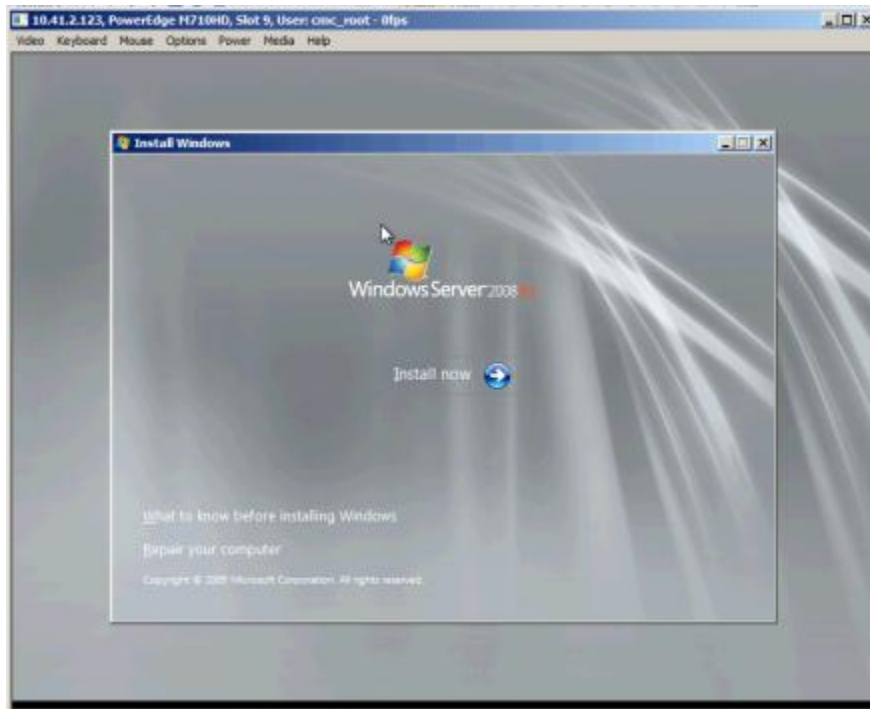


NOTE: Enabling Switch Independent Partitioning affects both of the interfaces on the BCM57712-k.

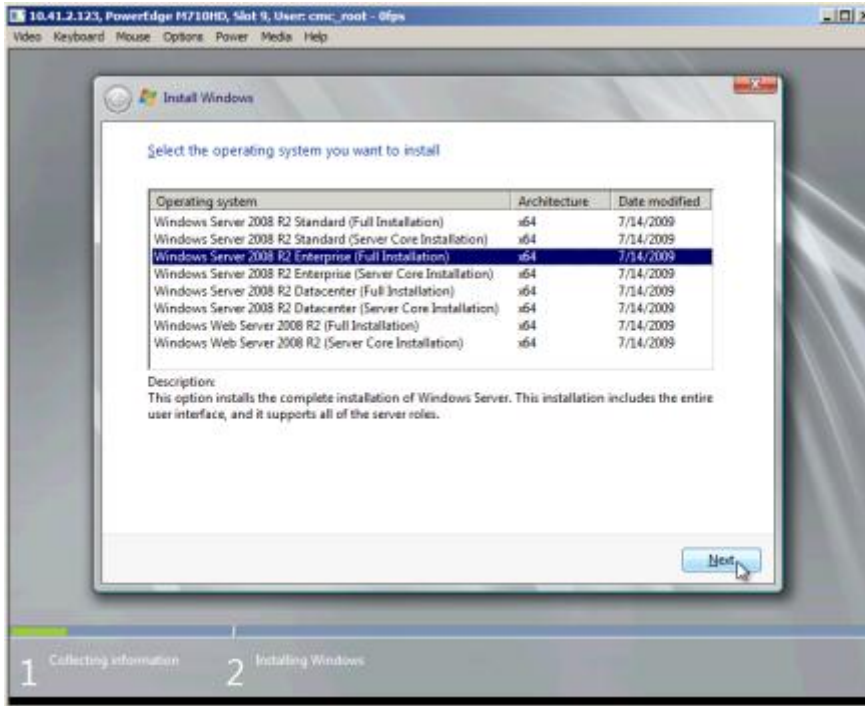
The default parameters on the BCM57712-k are suitable for the deployment in this guide. By default, the BCM57712-k configures the first of the NIC partitions as an iSCSI interface. For information about configuring the parameters of the BCM57712-k, see the [NIC Partitioning \(NPAR\) Setup Guide](#).

Install Windows Server 2008 R2

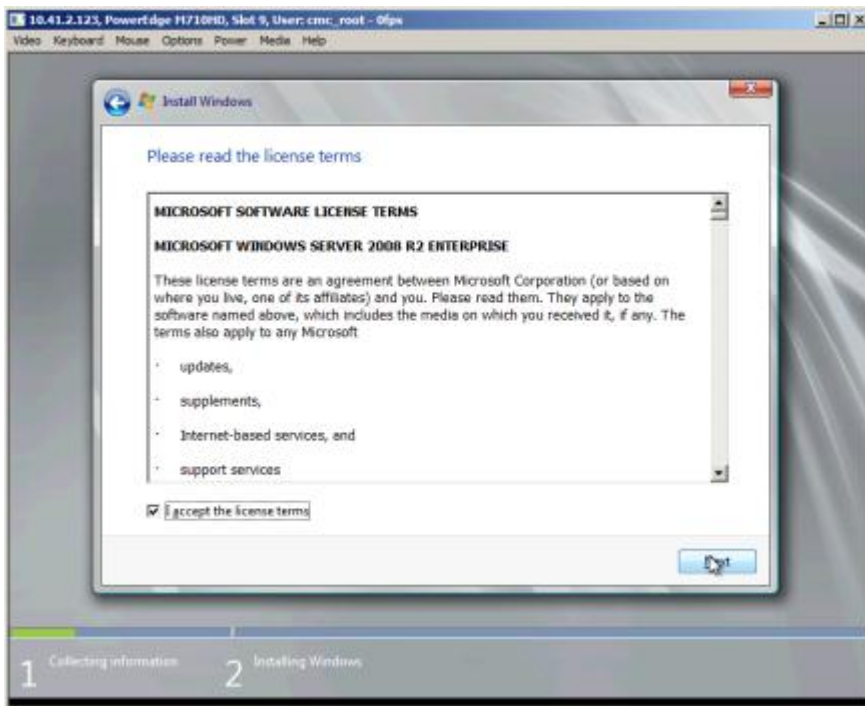
1. Connect a DVD drive with the Windows Server 2008 R2 DVD to one of the USB ports on the front of the PowerEdge M710HD.
2. Launch the console and boot the server.
3. At the Install Windows screen, click Install now.



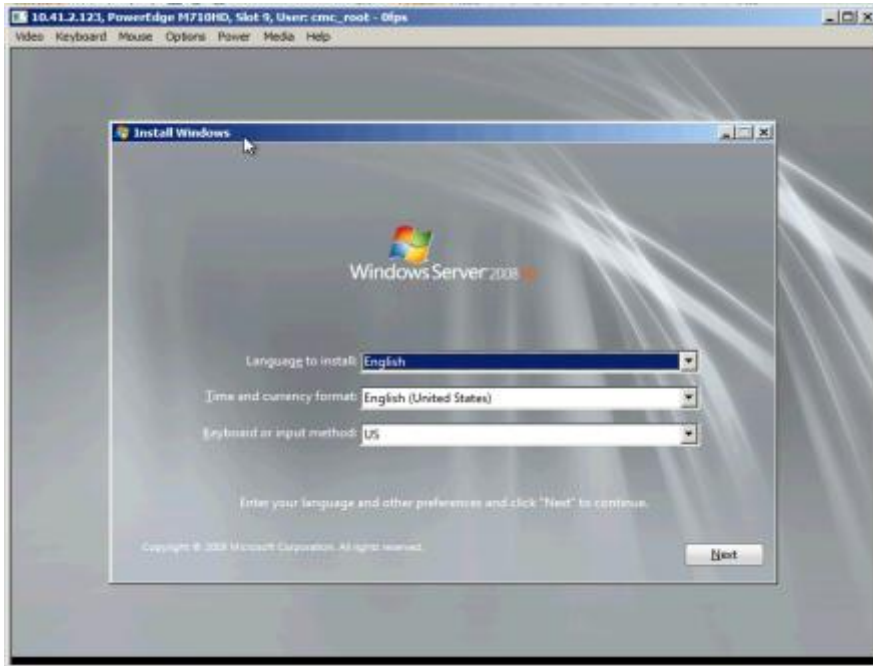
4. Select Windows Server 2008 R2 Enterprise (Full Installation) as the operating system to install.



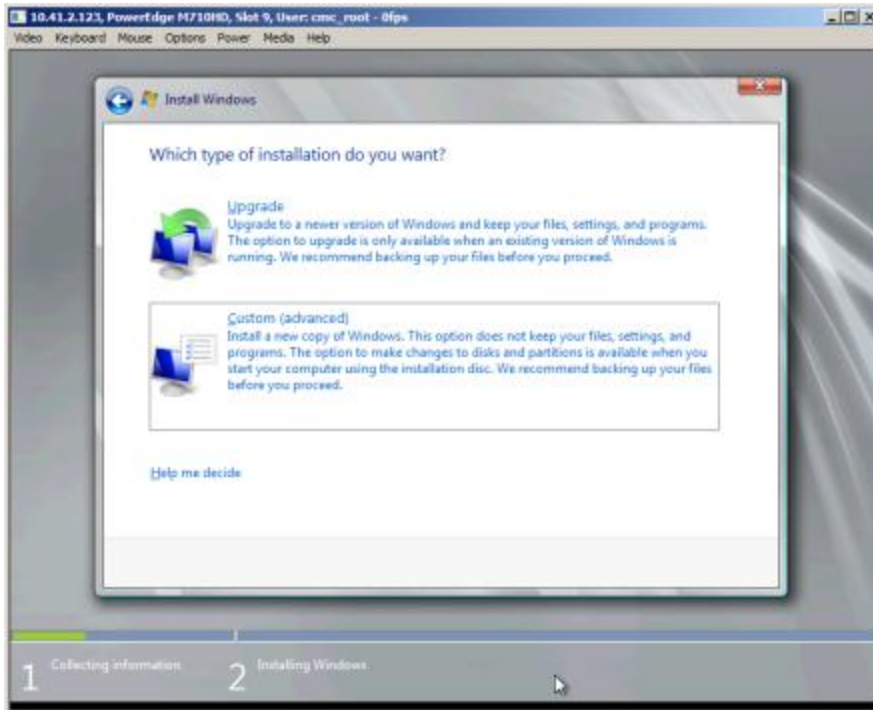
5. Accept the license terms.



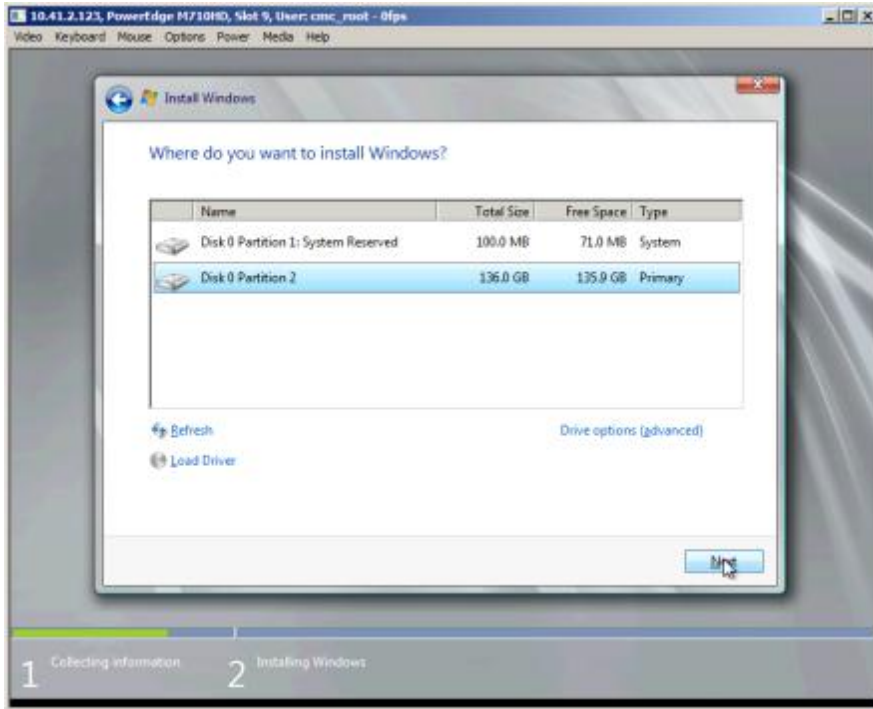
6. Set the Language to install, Choose the appropriate Time and currency format and Keyboard of input method. Click Next.



7. Install a new copy of Windows Server 2008 R2.



8. Select the disk partition to install in. Installation will start.



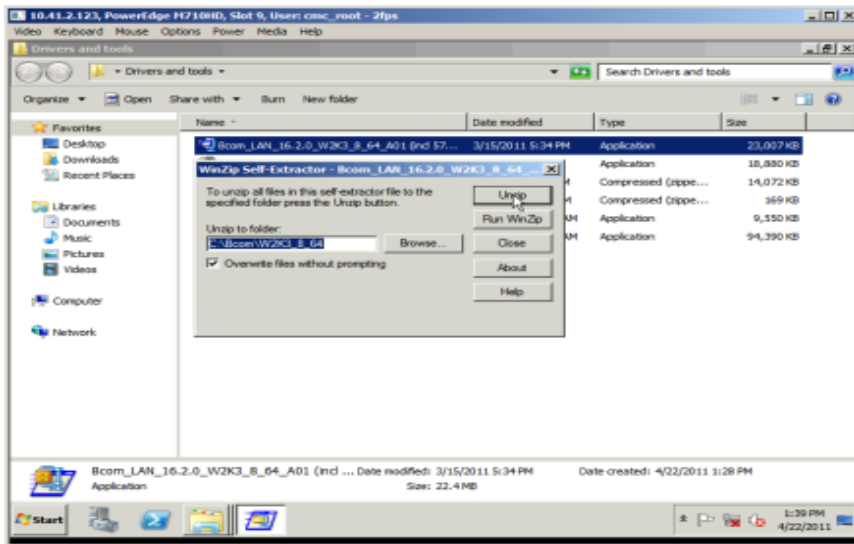
9. After the installation completes, set the administrator password.



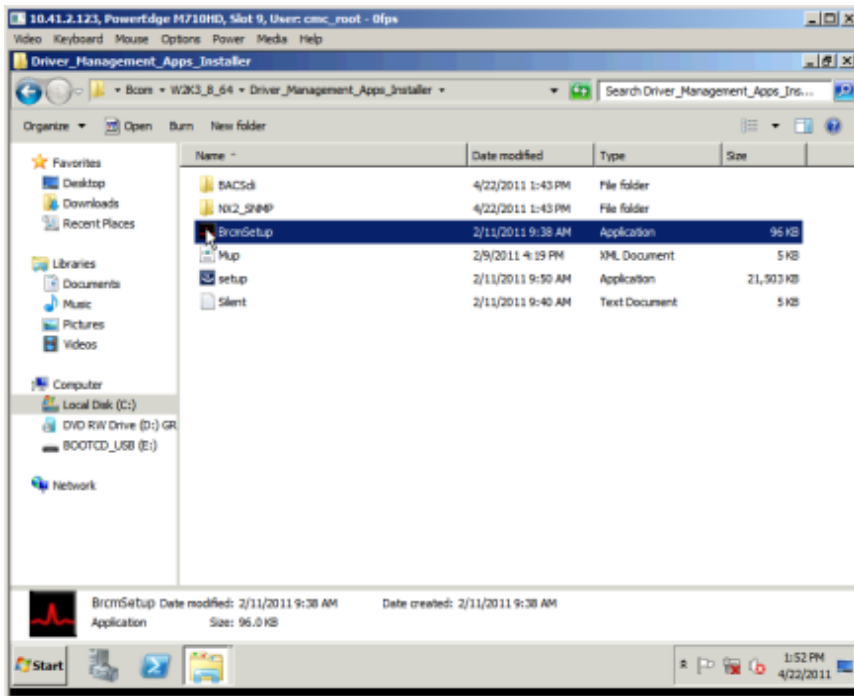
Install the drivers for the Broadcom BCM57712-k

At this point, Windows Server 2008 R2 is installed, but does not recognize the Broadcom BCM57712-k. Use a USB drive to copy the driver to the PowerEdge M710HD. The file used in this guide was Bcom_LAN_16.2.0_W2K3_8_64_A01.exe, available from <http://www.support.dell.com>.

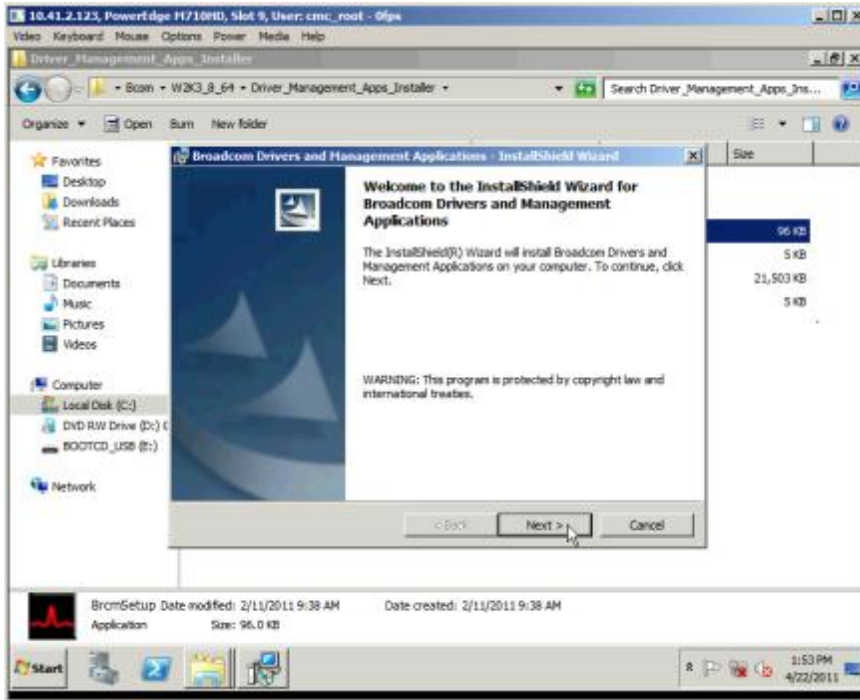
1. Double-click the executable to start the installation.
2. When the WinZip Self-Extractor prompts you, click Unzip to unzip the files.



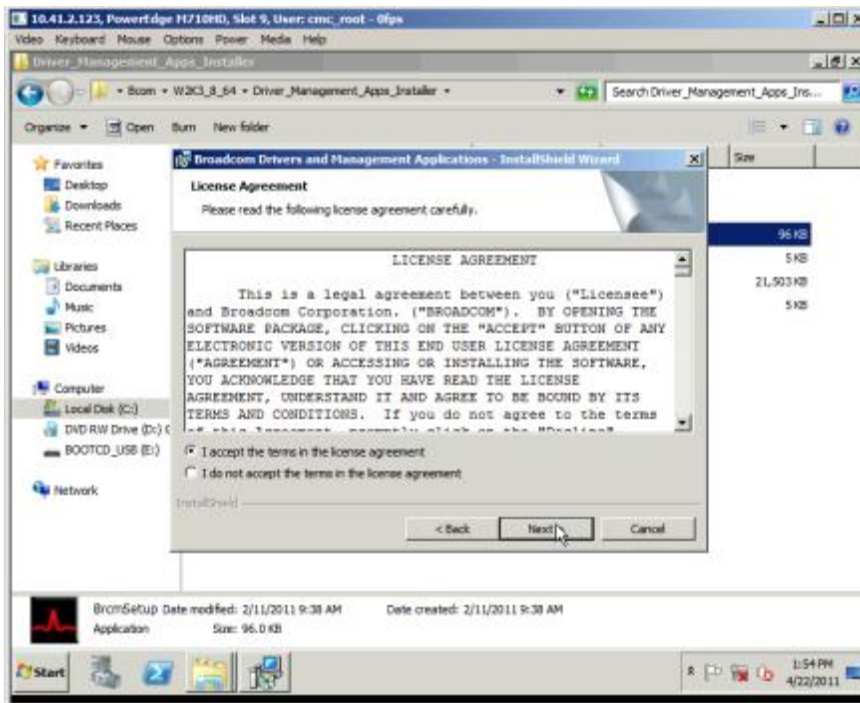
3. Navigate to C:\Bcom\W2K3_8_64\Driver_Management_Apps_Installer, and double-click BcrnSetup.



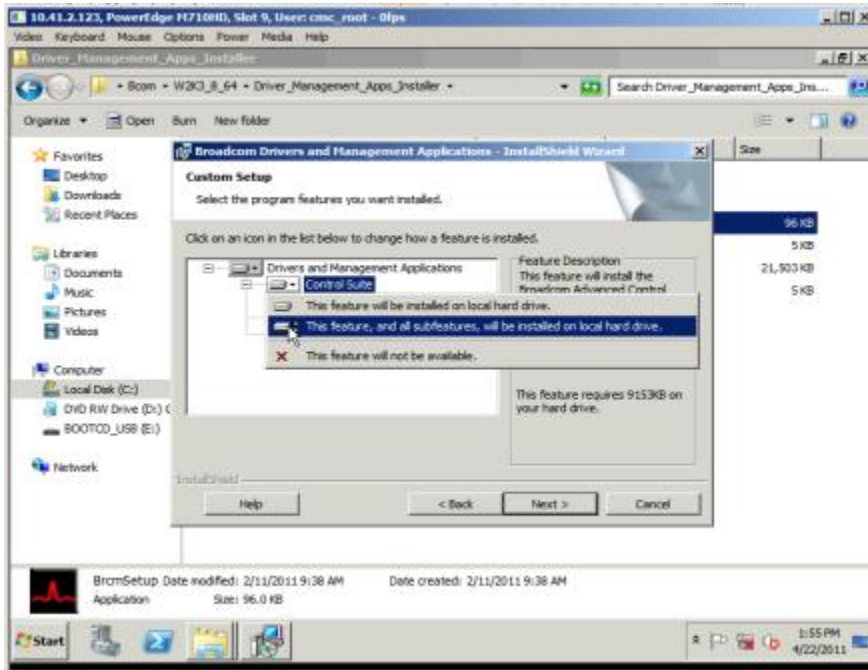
4. At the InstallShield Wizard splash screen, click Next.



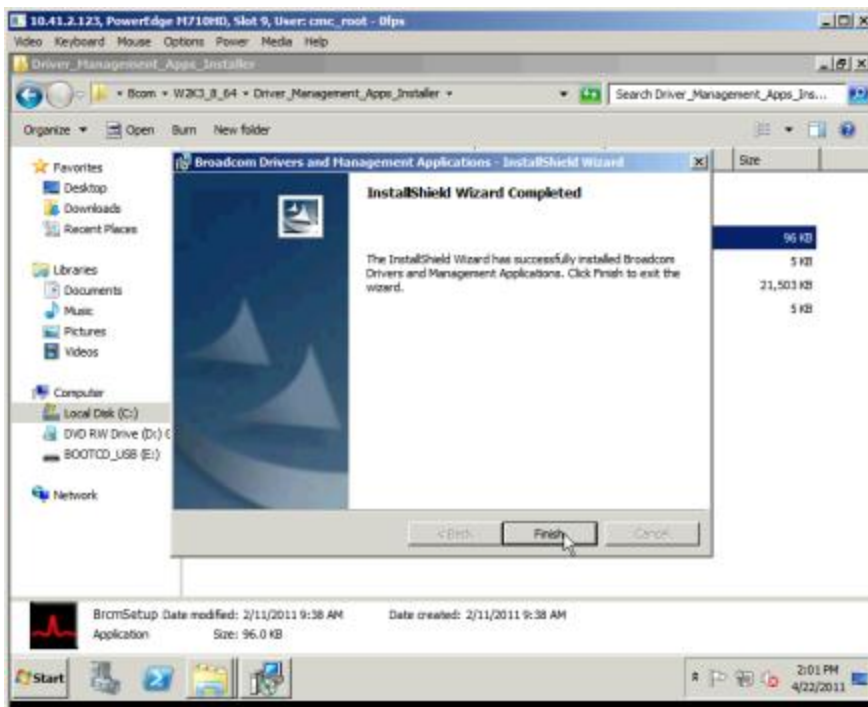
5. Accept the license agreement.



- Click Control Suite and select This feature, and all subfeatures, will be installed on local hard drive. You will use the Broadcom Advanced Control Suite in configuring the interfaces. Click Next.

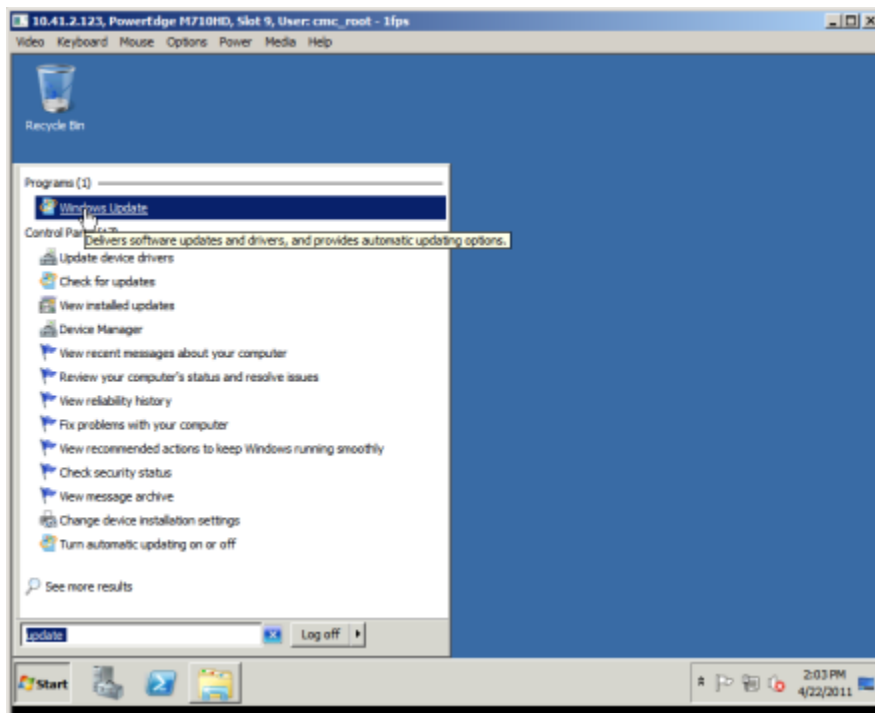


- Click Install. When the install completes, click Finish. The PowerEdge M710HD is now connected to the core Ethernet network.

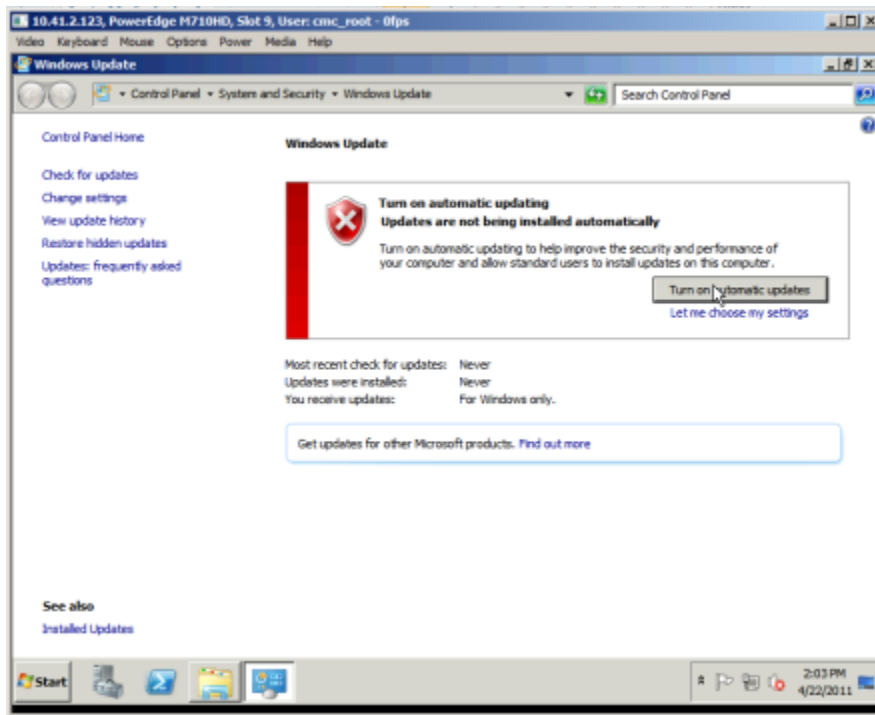


Install Windows updates

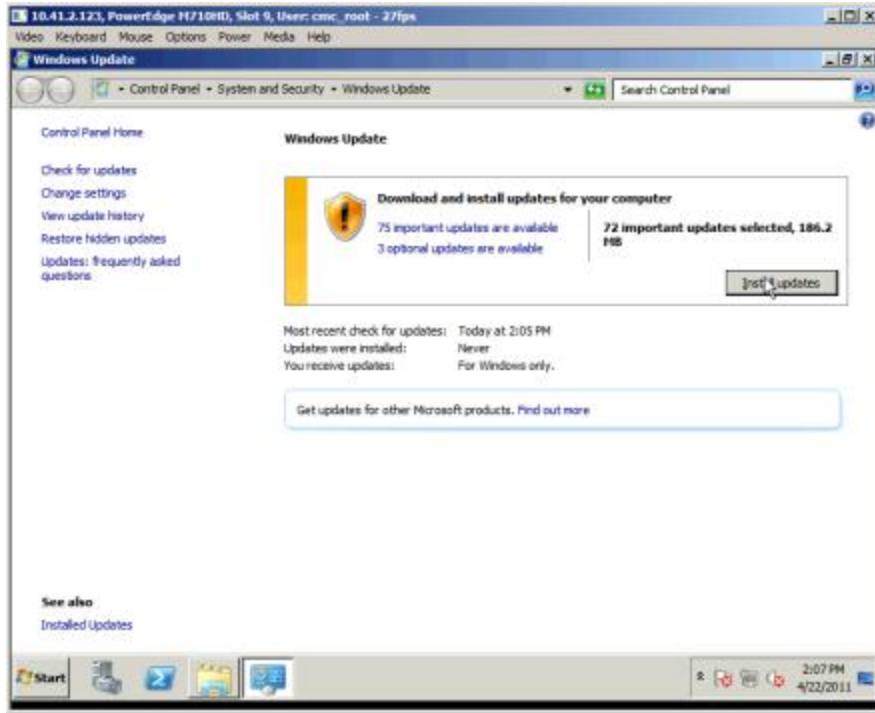
1. Launch Windows Update.



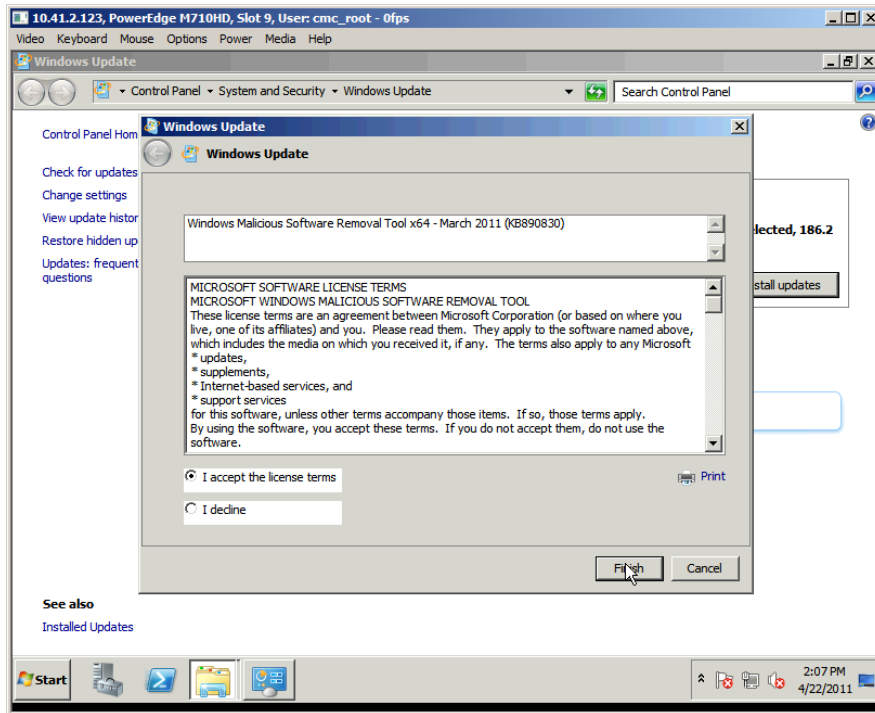
2. Optionally, turn on Automatic Updating.



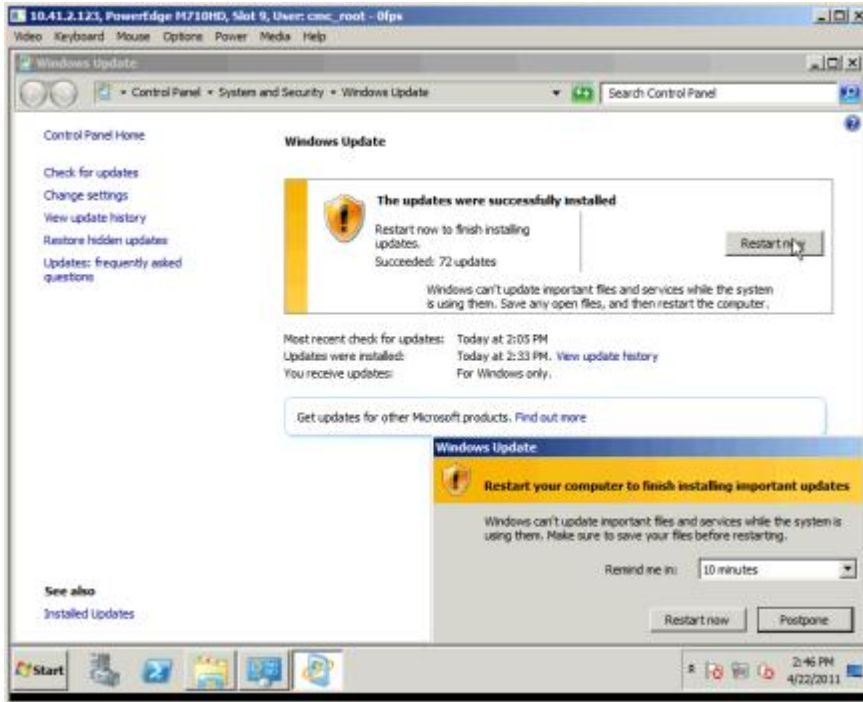
3. Install the updates.



4. Accept the license agreement.

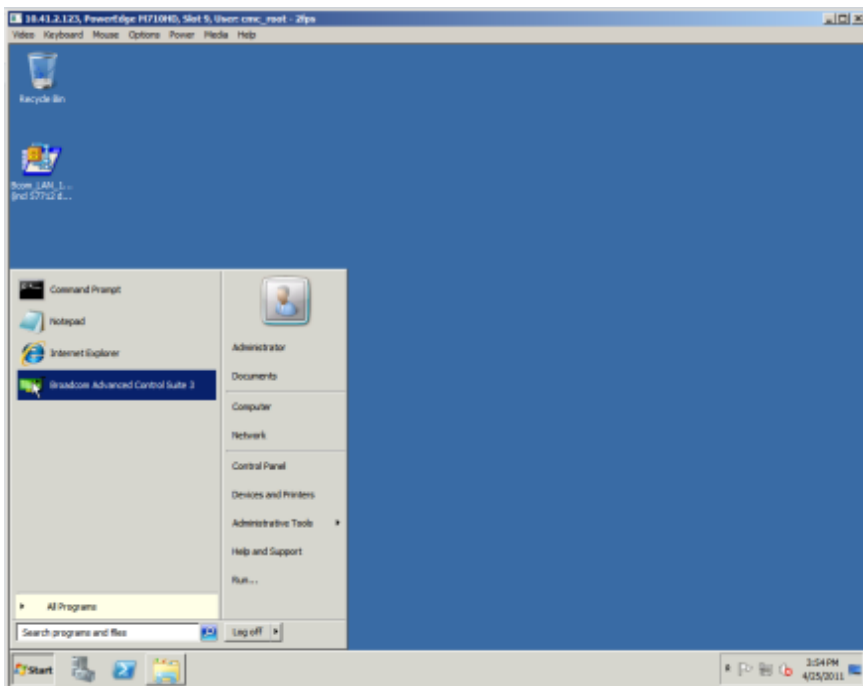


- Restart the system.



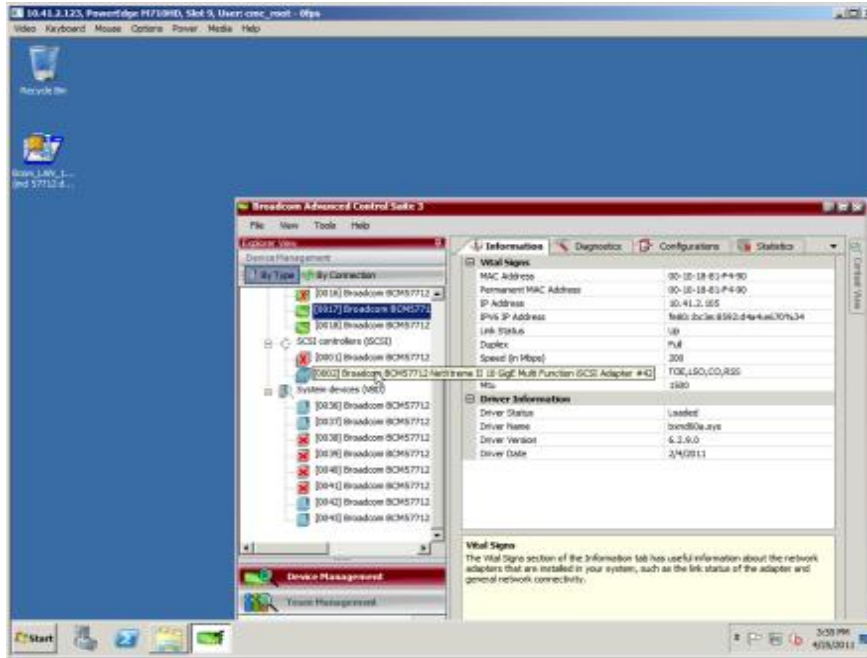
Set the iSCSI adaptor and network interface properties

- Launch the Broadcom Advanced Control Suite (BACS).

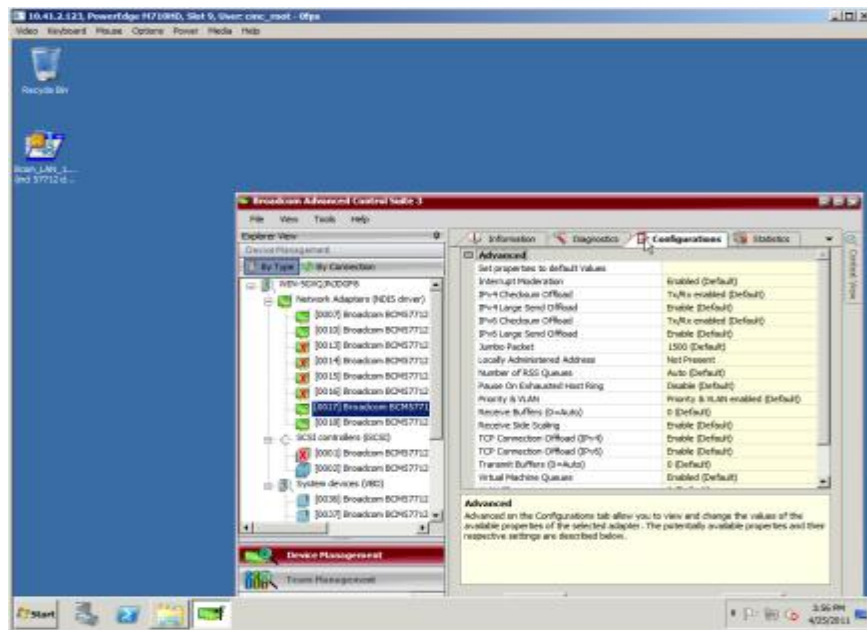


NOTE: Because there is only one switch in the chassis, half of the interfaces will show as disconnected.

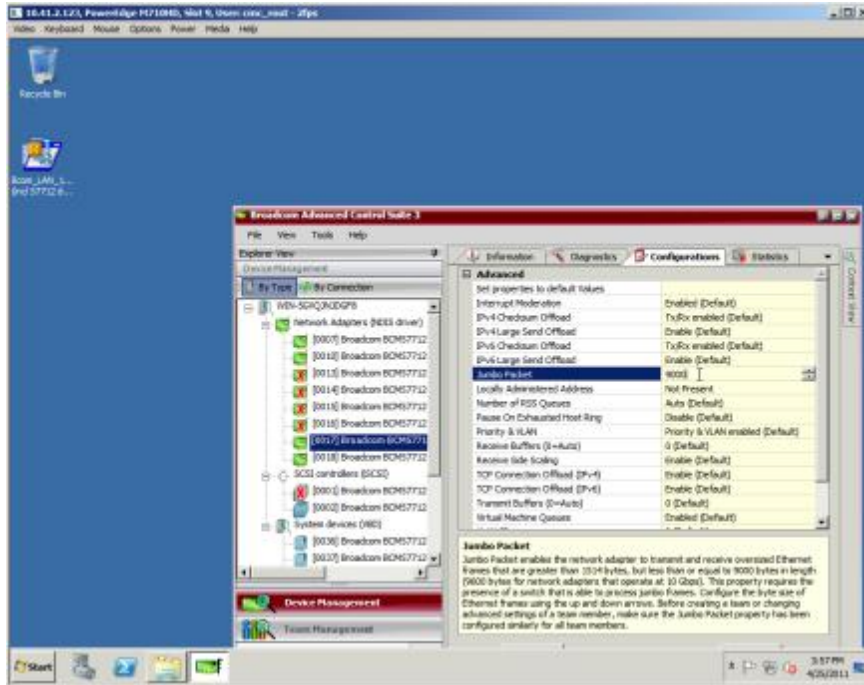
2. Mouse over the connected iSCSI adaptor and note the number of the associated interface.



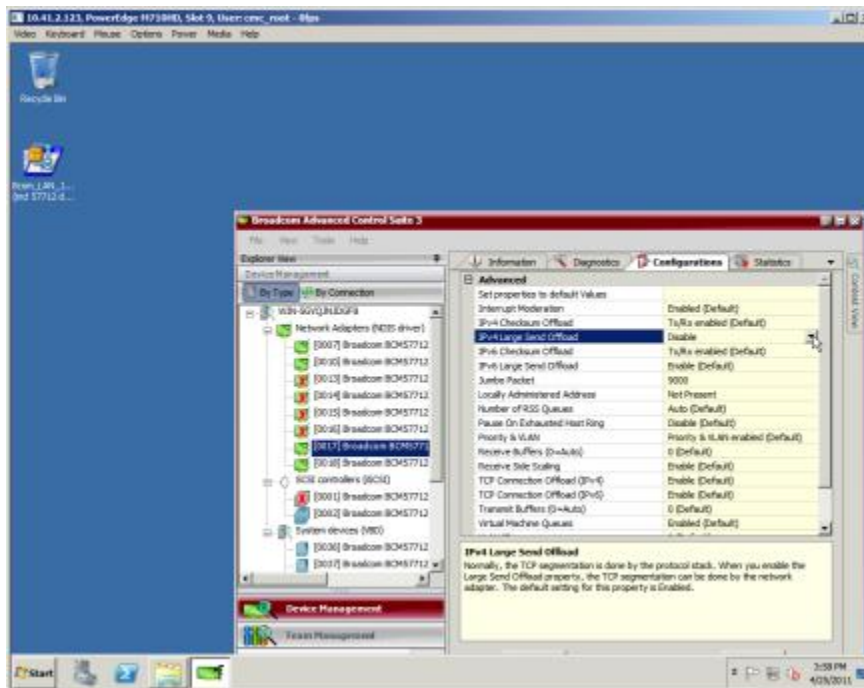
3. Select the corresponding network adaptor, and select the Configurations tab.



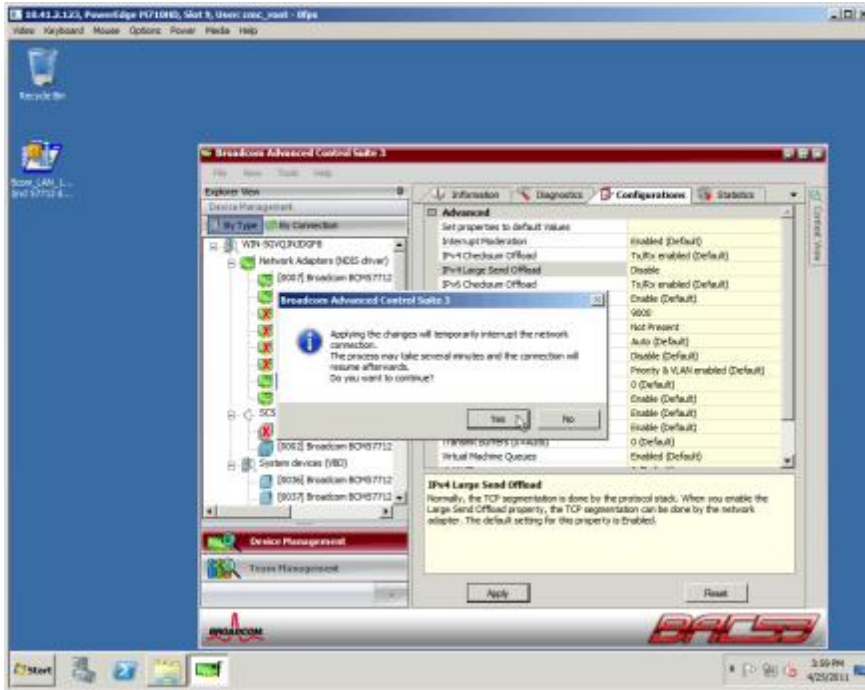
4. Set the Jumbo packet size. In this case, it is set to 9000.



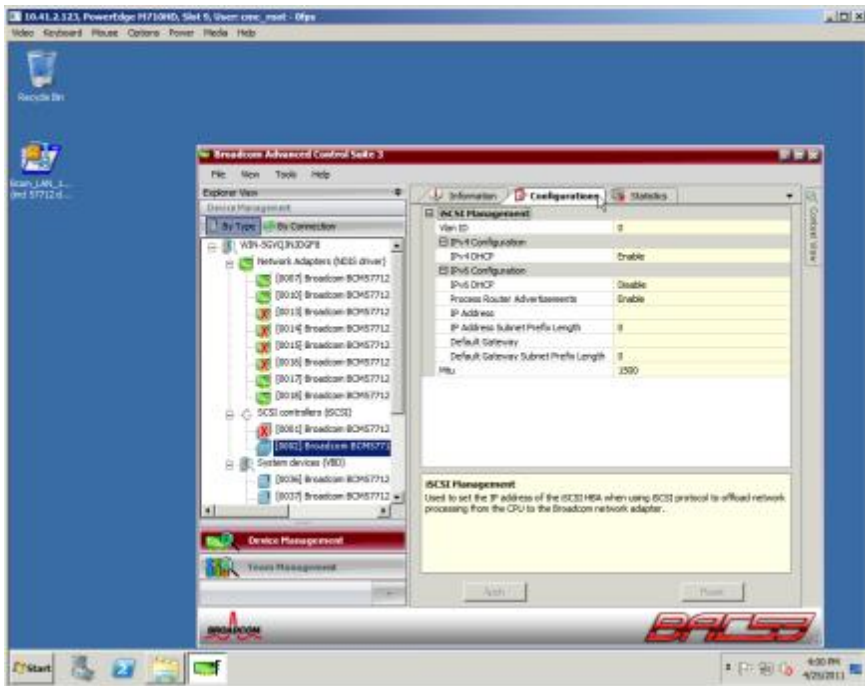
5. Disable the IPv4 Large Send Offload option. According to the [Using Broadcom Advanced Control Suite 3: Broadcom NetXtreme 57XX User Guide](#), Jumbo Frames and Large Send Offload (LSO) are mutually exclusive properties.



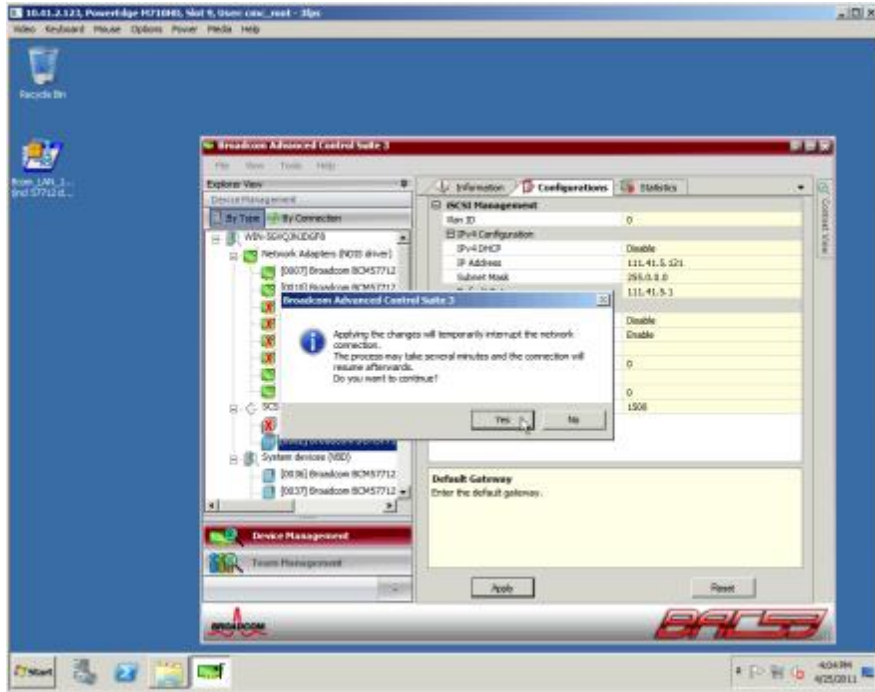
6. Click Apply, and click Yes to clear the warning.



7. Select the iSCSI adaptor, and select the Configurations tab.

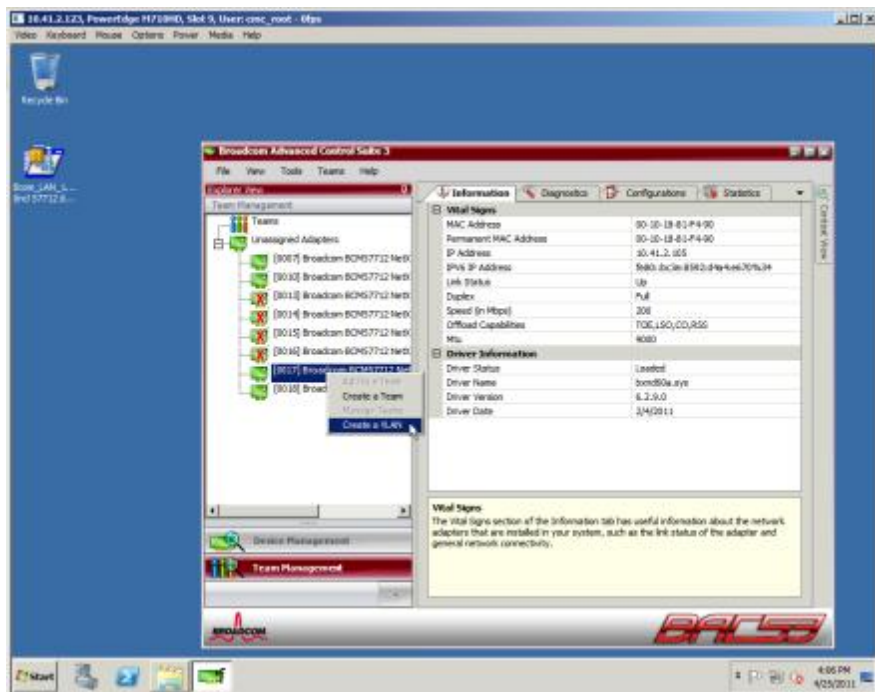


- Turn off DHCP, and enter the IP address. Click Apply, and click Yes to clear the warning.

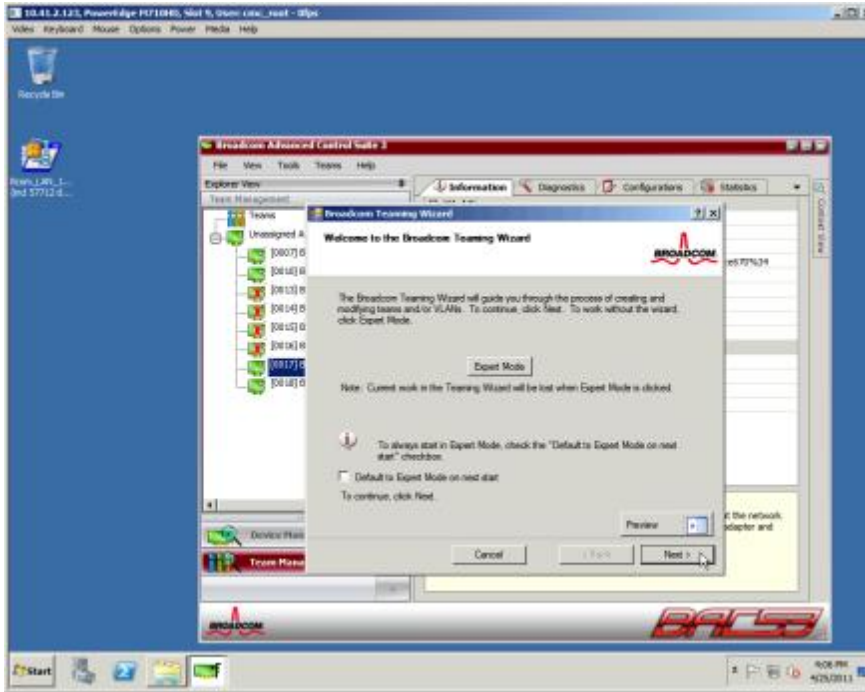


Create the VLANs

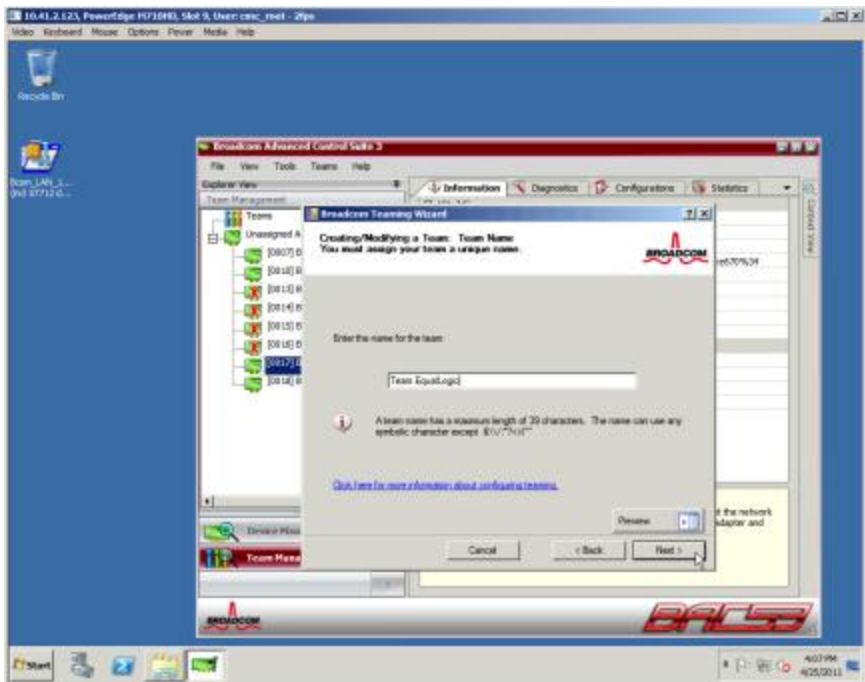
- In the left pane, click Team Management, right-click on the iSCSI adaptor (#42 in our case), and select Create a VLAN.



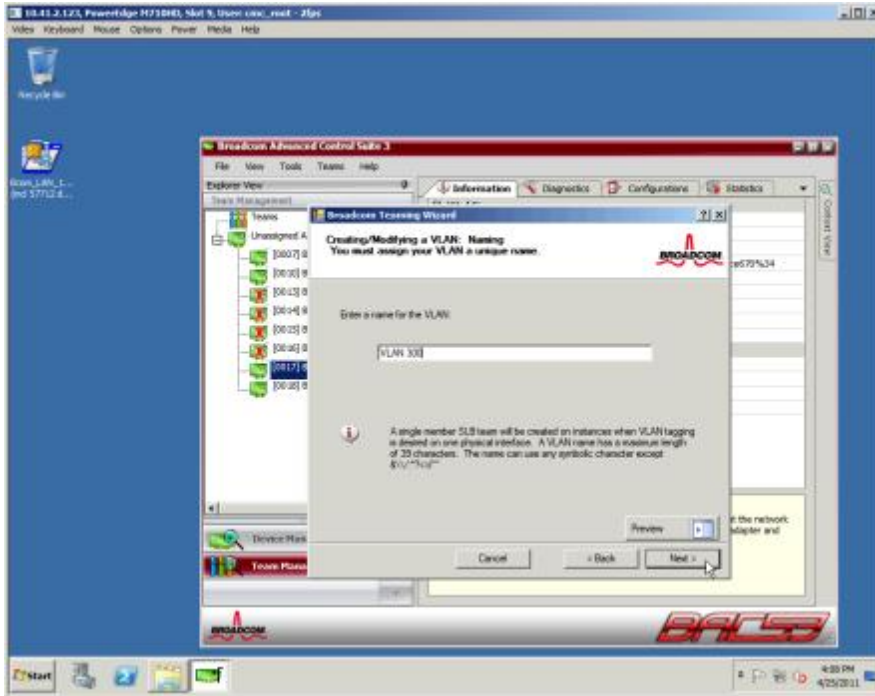
2. Click Next to clear the splash screen.



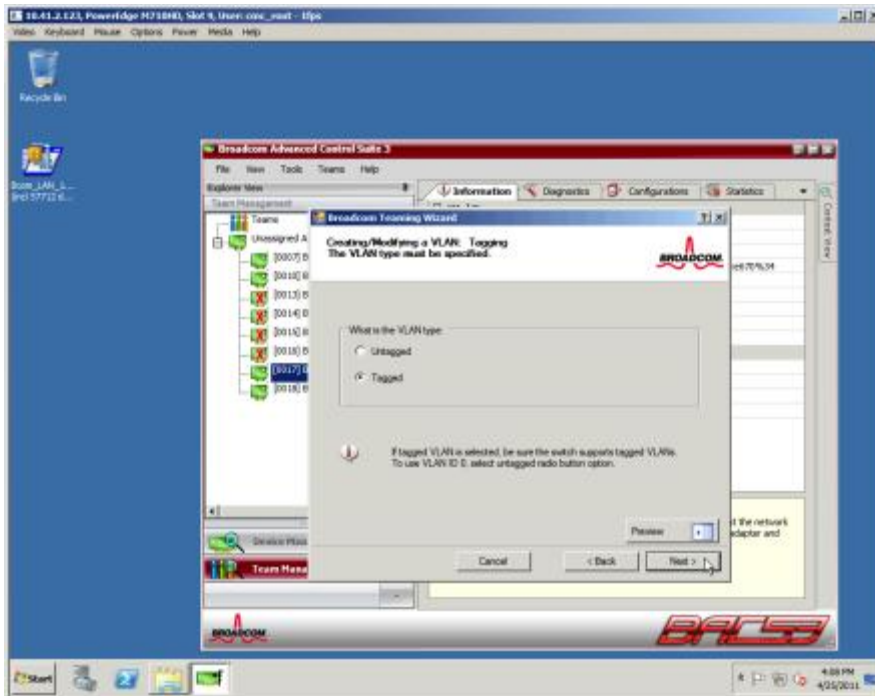
3. Each VLAN is associated with a team. Enter the name of the team, and click Next.



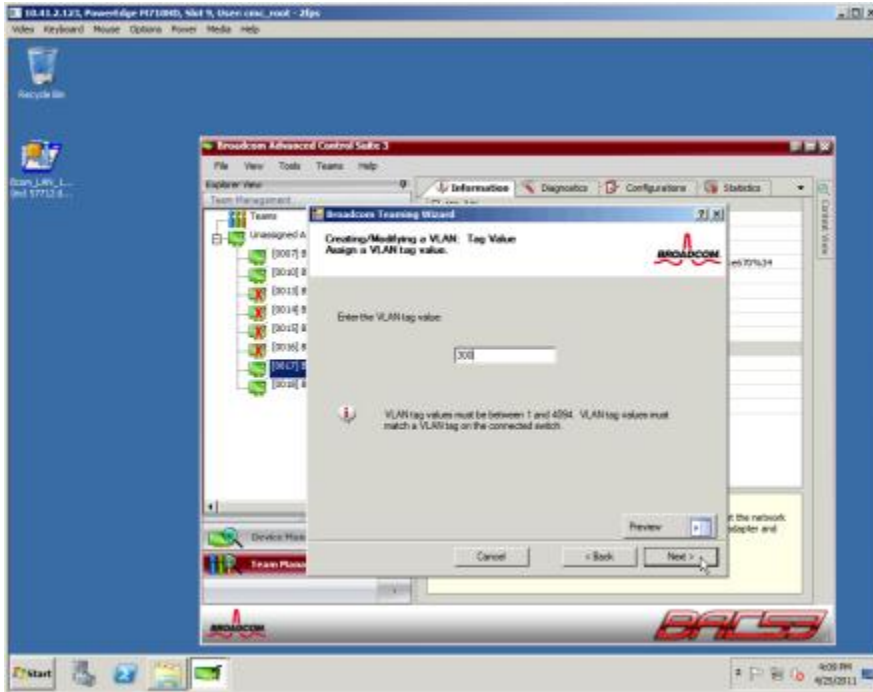
4. Enter the name of the VLAN, and click Next.



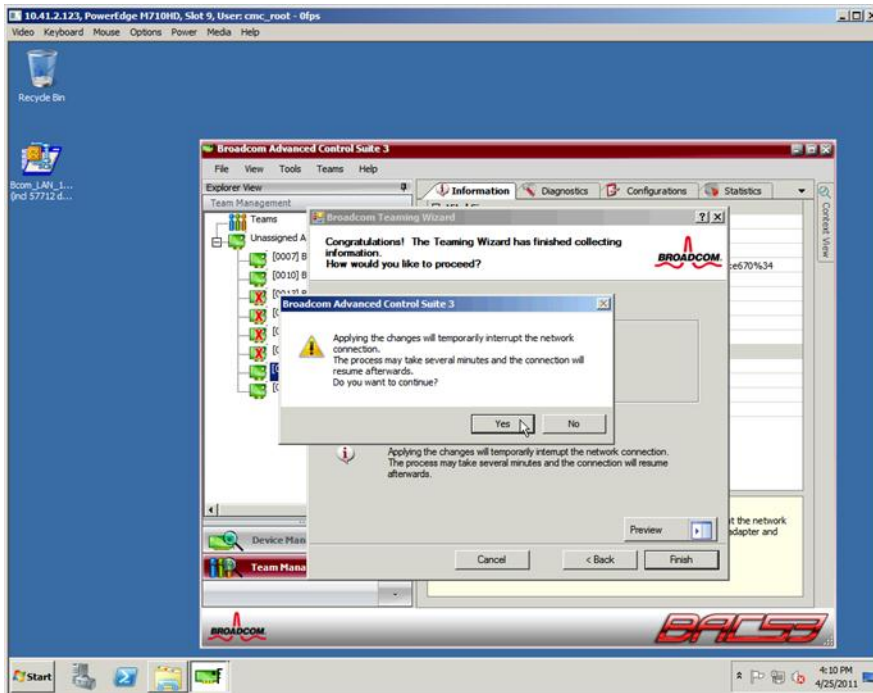
5. Select Tagged for the VLAN type, and click Next.



6. Enter the tag value, and click Next.



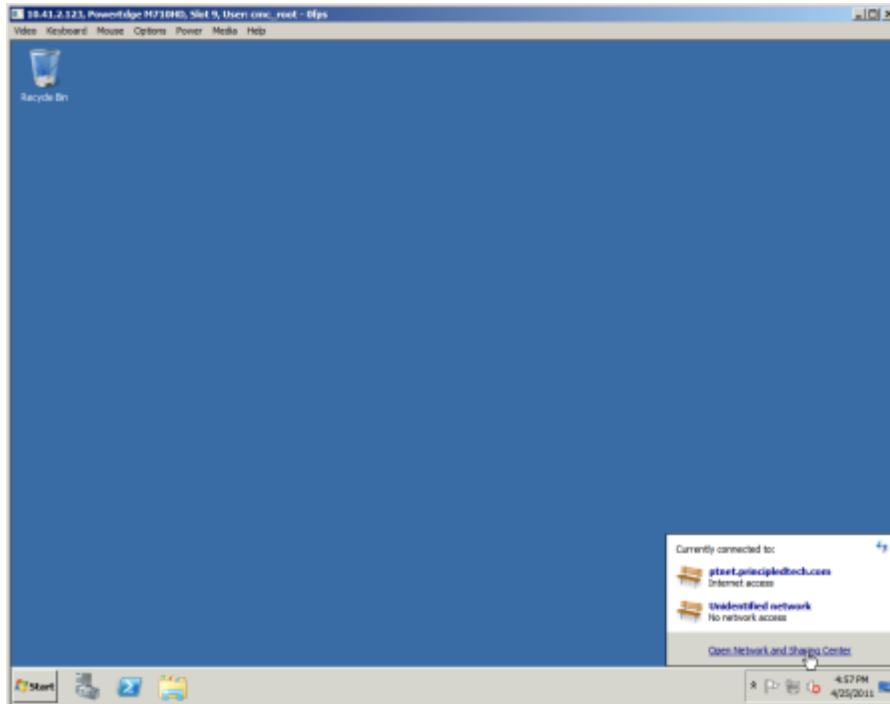
7. Click Finish to create the VLAN, and click Yes to on the warning pop-up.



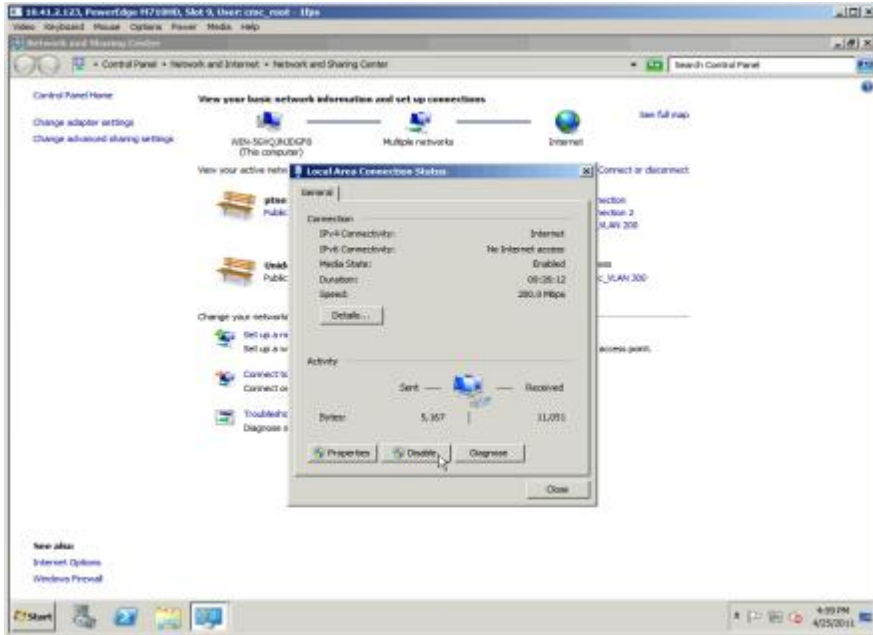
Repeat steps 1 through 7 in this section to create a VLAN for TCP/IP traffic, changing the team name, VLAN name, and tag value as appropriate. For this guide, we used Team TCP, VLAN 200, and 200 as the values for this VLAN. There is no need to set jumbo frames or disable LSO for the TCP/IP connection.

Restrict traffic to the designated VLANs (optional)

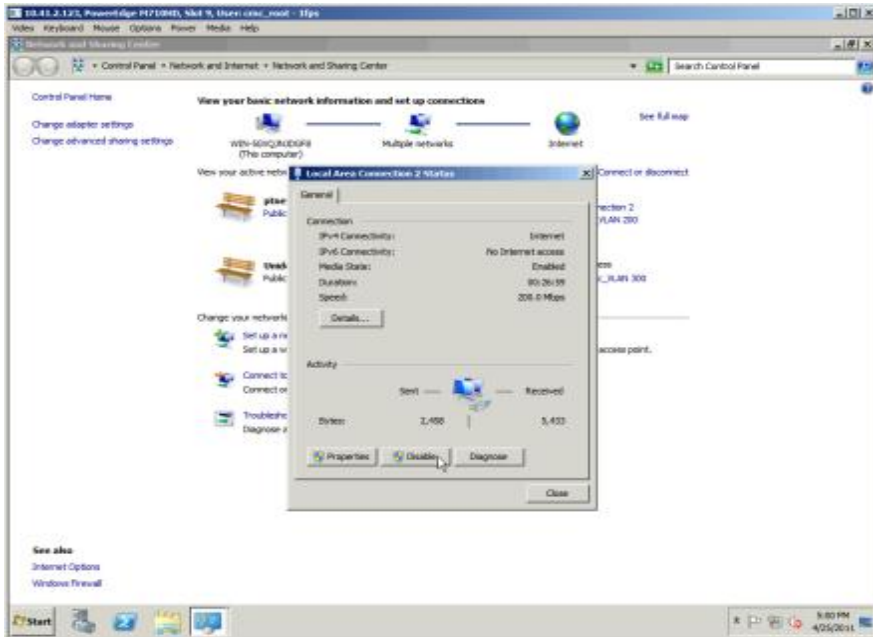
1. Open the Network and Sharing Center.



2. Select the first network connection, right-click it, and select Disable.



3. Select the second network connection, right-click it, and select Disable.

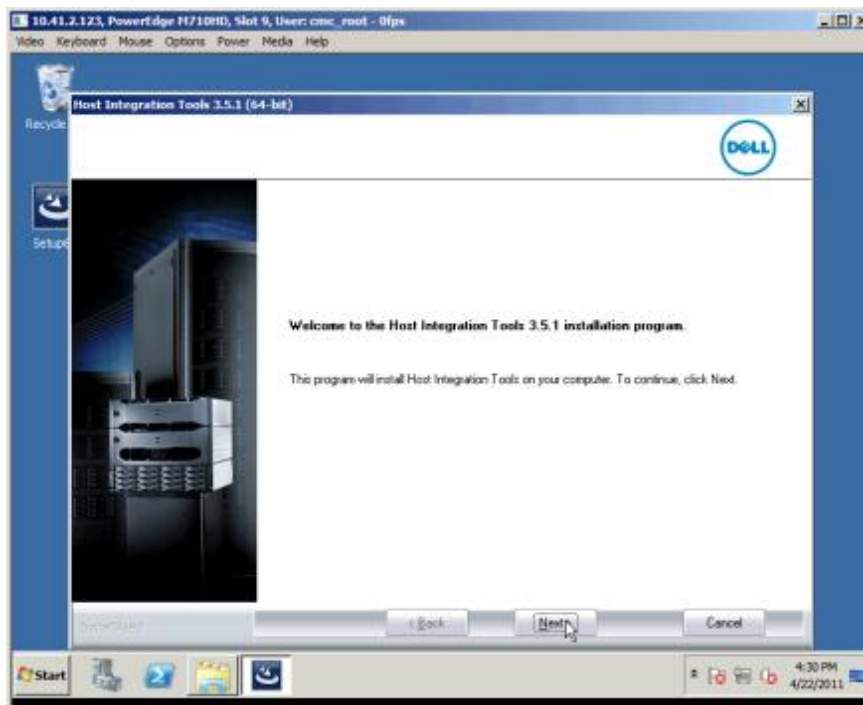


Now, all network traffic goes through the VLANs.

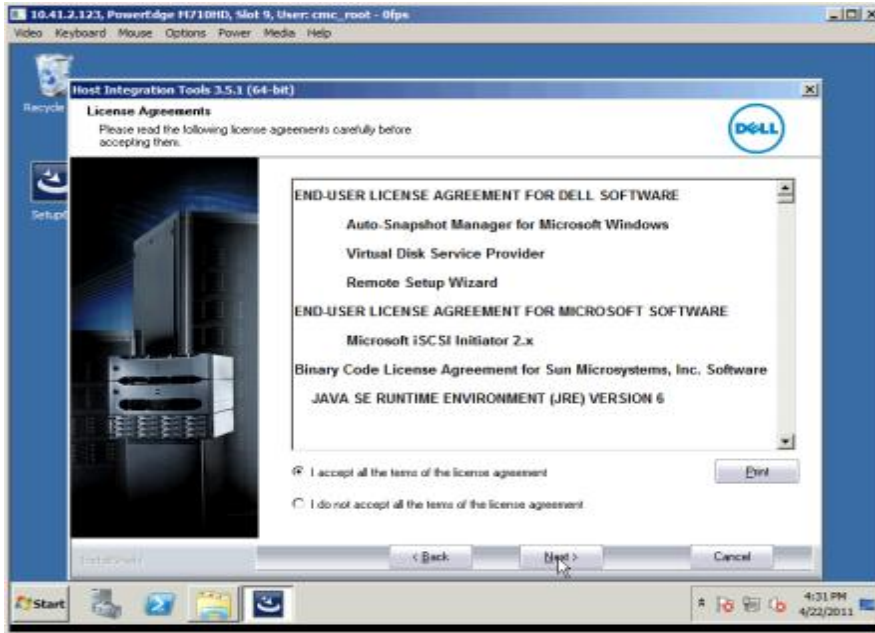


Install the EqualLogic Hardware Integration Toolkit

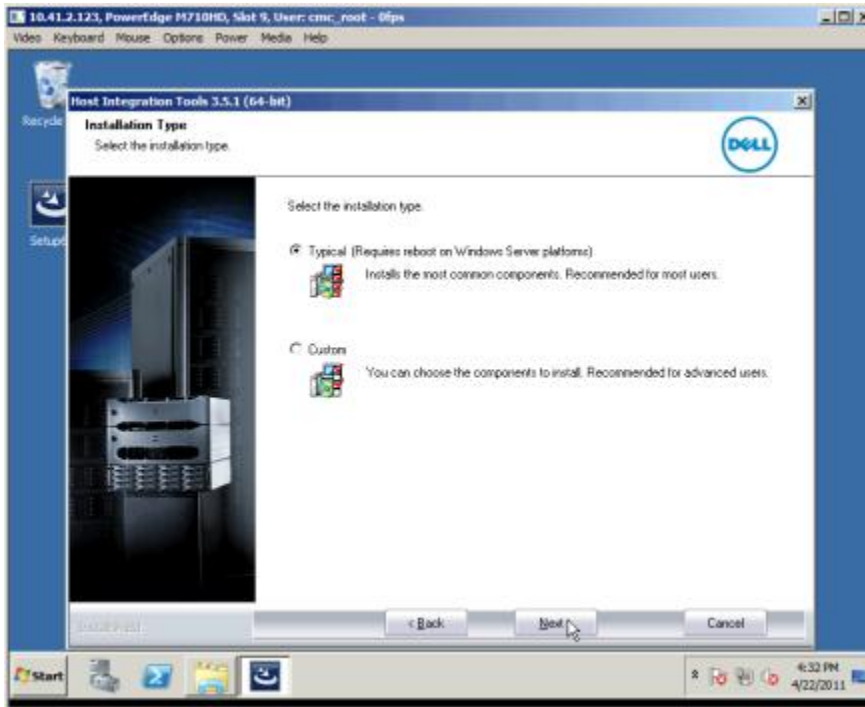
1. Copy the installer for the EqualLogic Hardware Integration Toolkit (HIT) to the PowerEdge M710HD.
2. Double-click the Setup64 icon.
3. At the splash screen, click Next.



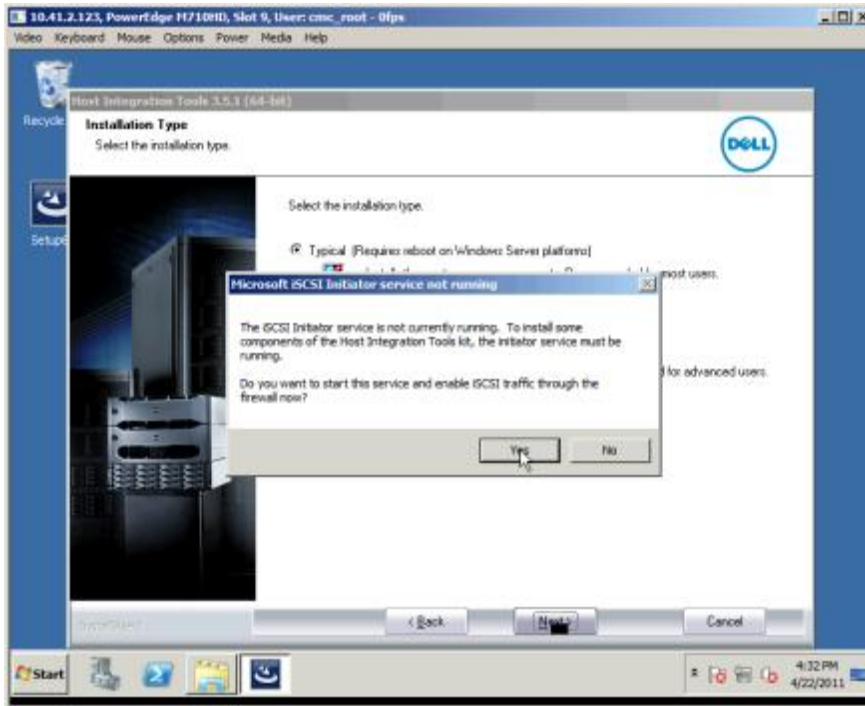
4. Accept the terms of the license agreement, and click Next.



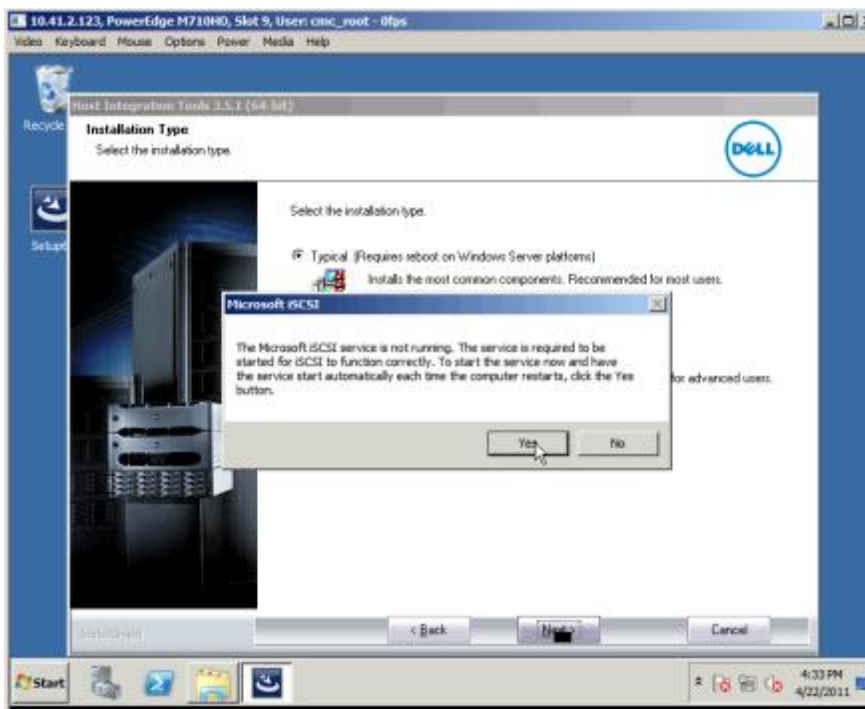
5. Accept the default of Typical for the installation type.



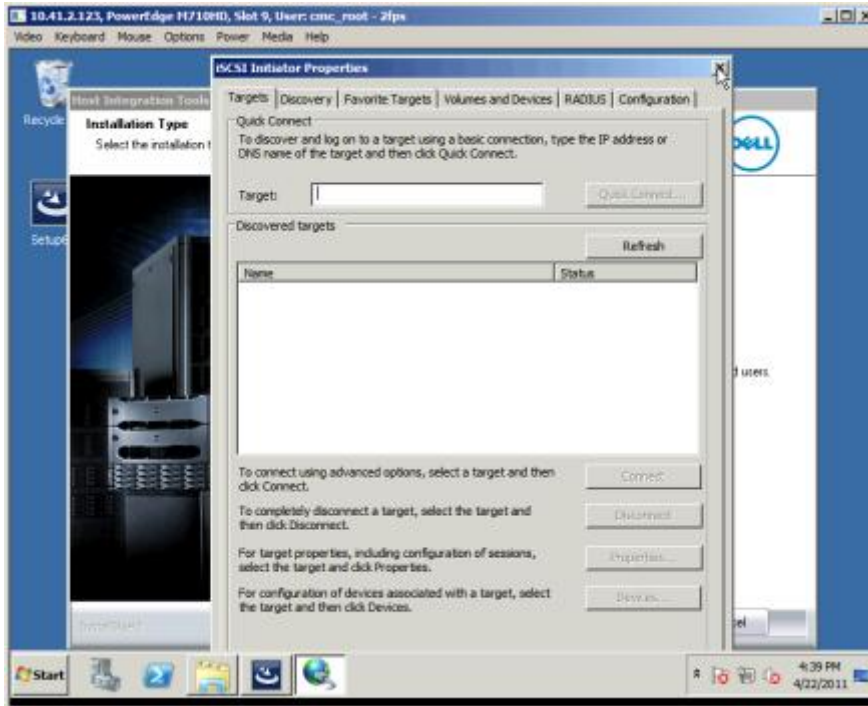
- When the installer prompts you to start the iSCSI Initiator service and make a firewall exception, click Yes.



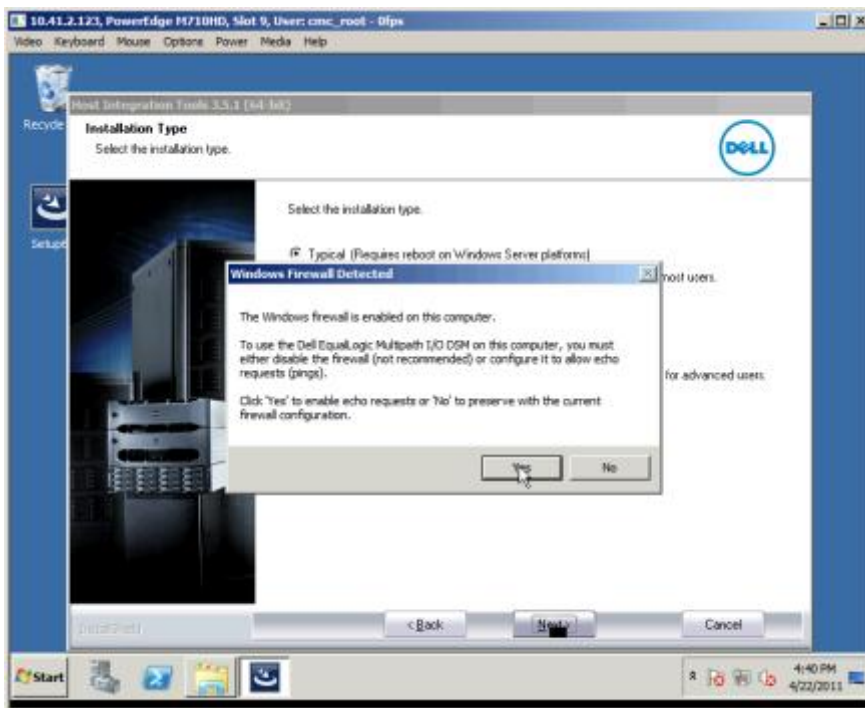
- When the installer prompts you to start the Microsoft iSCSI service, click Yes.



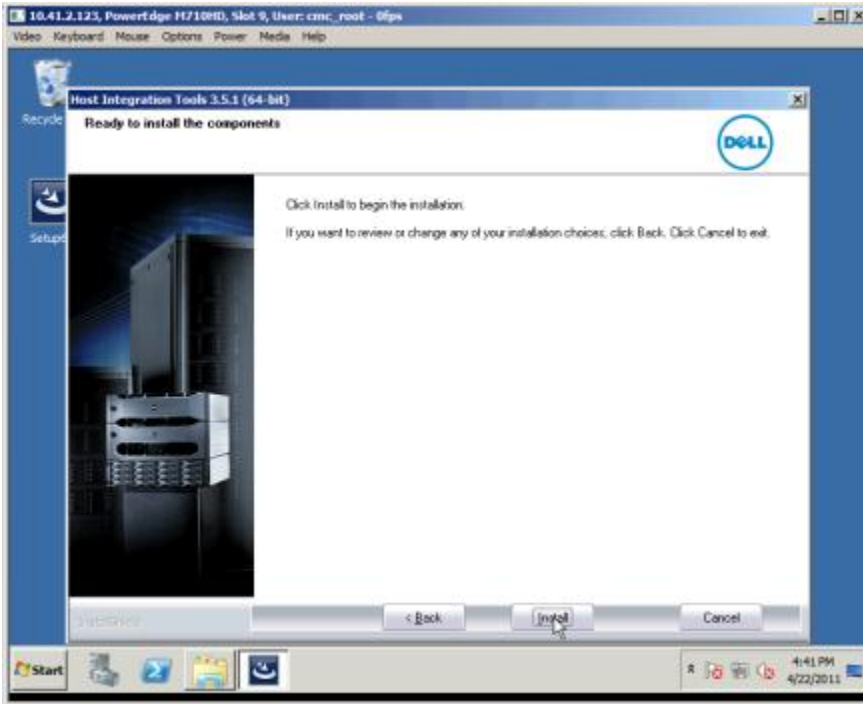
8. Close the iSCSI Initiator properties dialog. It is configured later in the process.



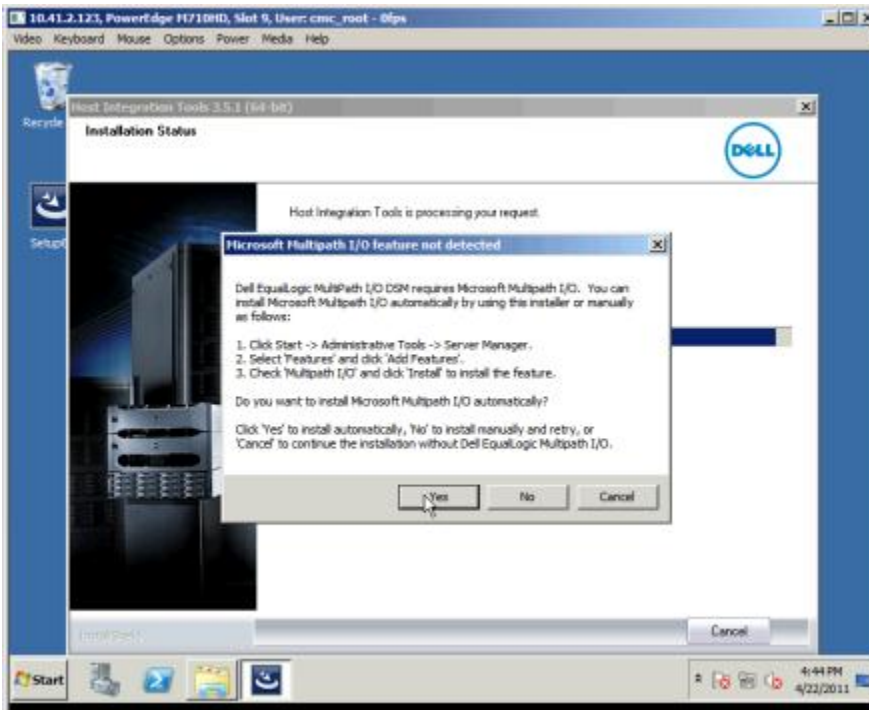
9. When the installer prompts you to make a firewall exception for ping requests, click Yes.



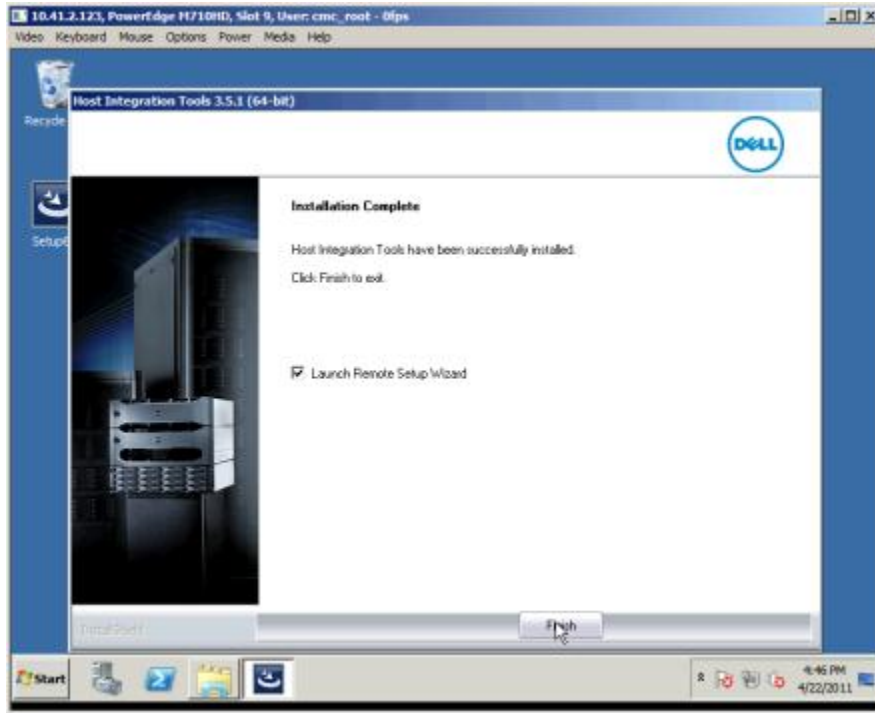
10. Click Install.



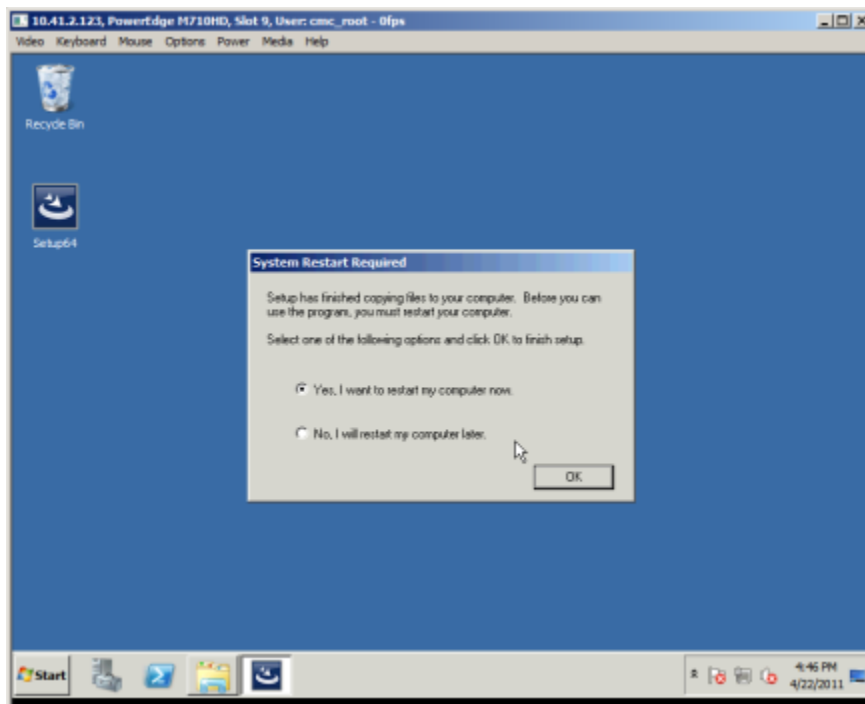
11. Click Yes to install Microsoft Multipath I/O.



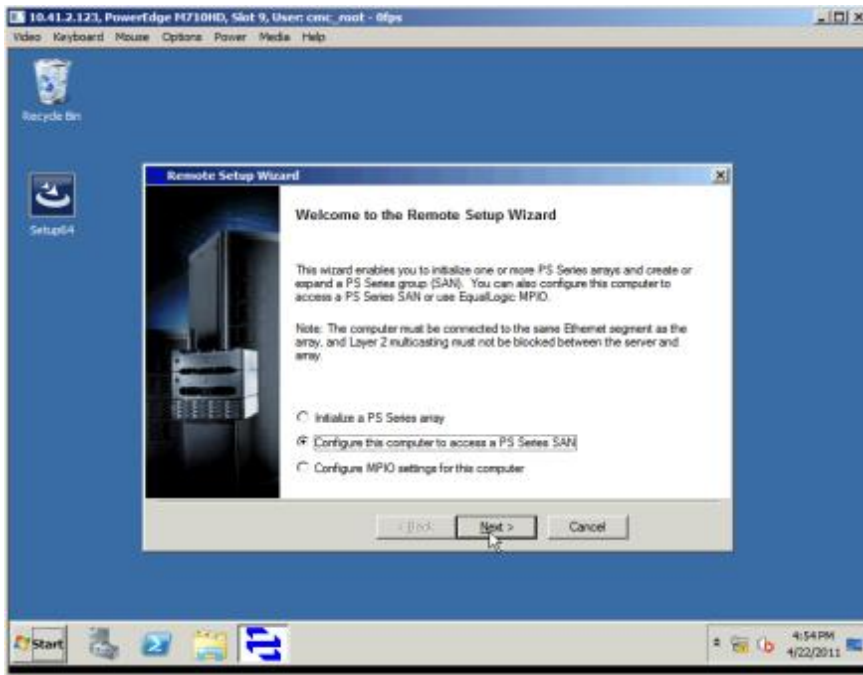
12. Click Finish.



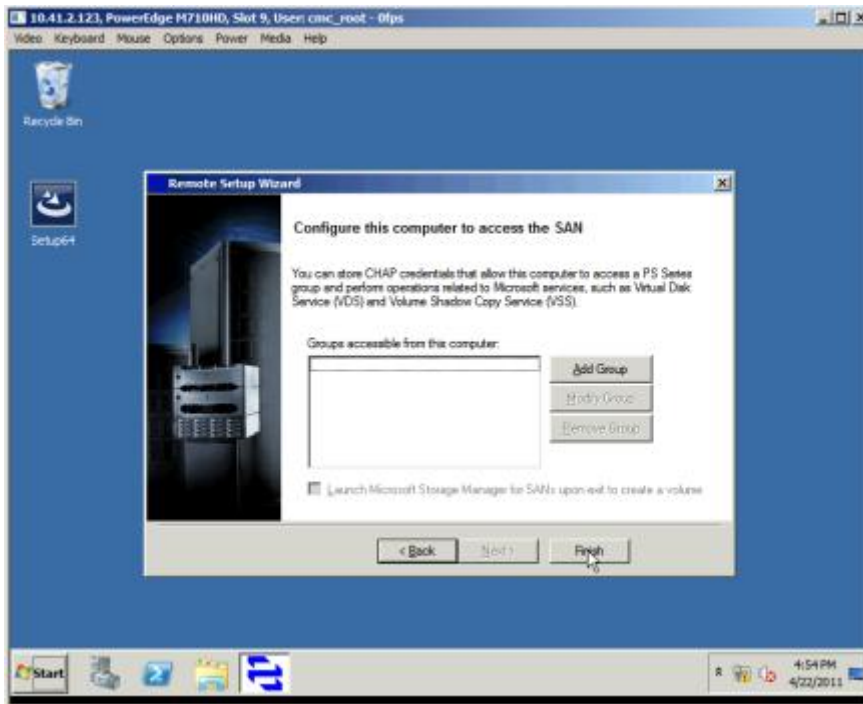
13. Accept the default of Yes, I want to restart my computer now and click OK to reboot the computer.



14. After the PowerEdge M710HD reboots, select Configure this computer to access a PS Series SAN, and click Next.

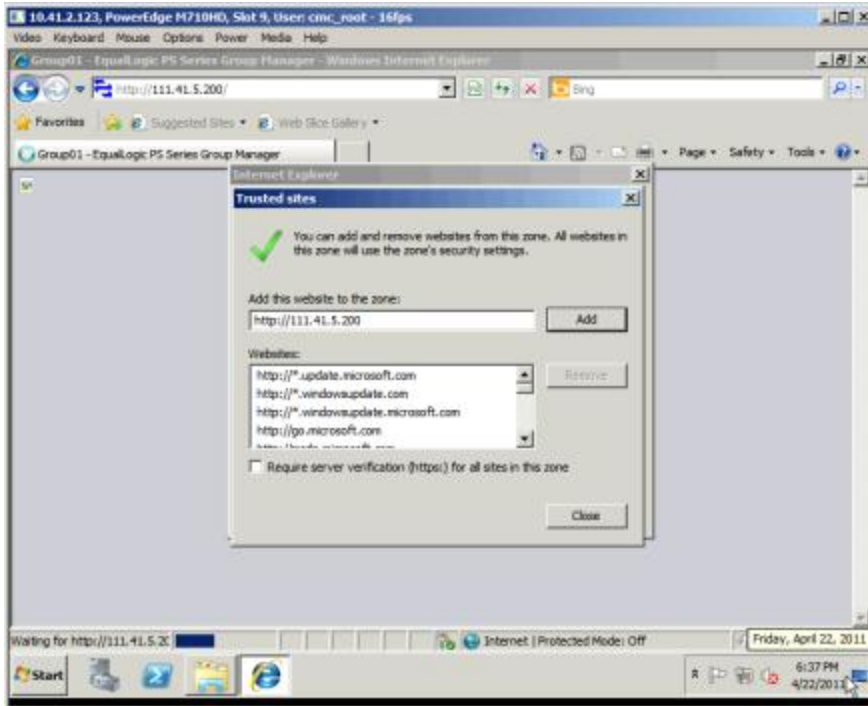


15. Click Finish.

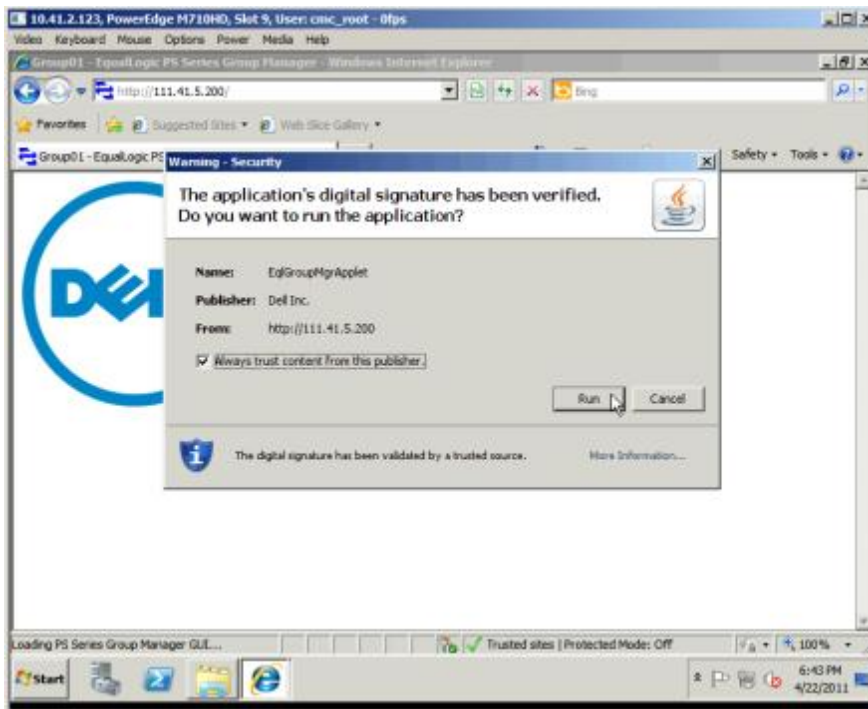


Create the RAID

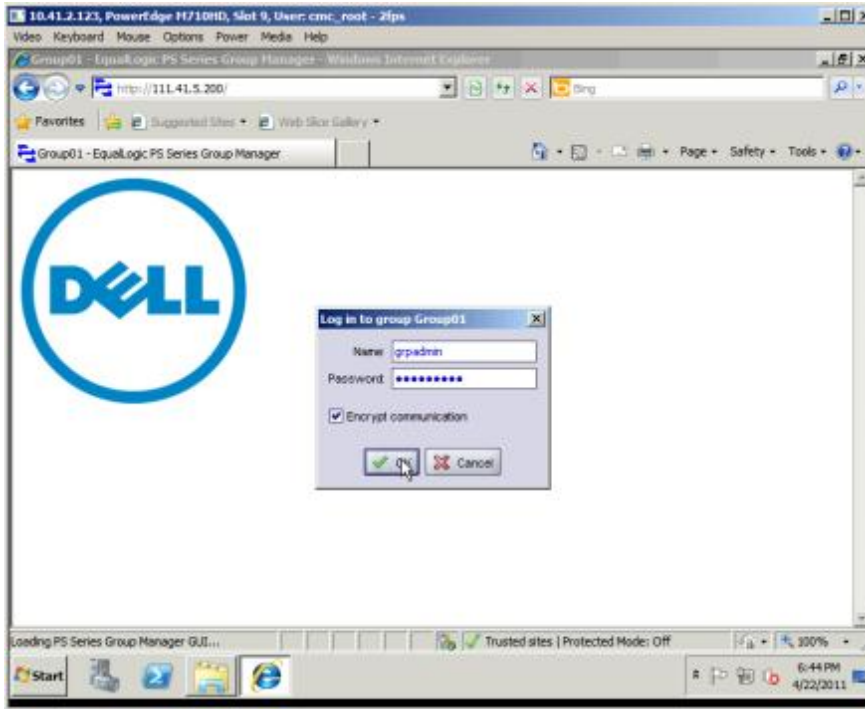
1. Enter the IP address for the EqualLogic array. You may need to add this address to your list of trusted sites.



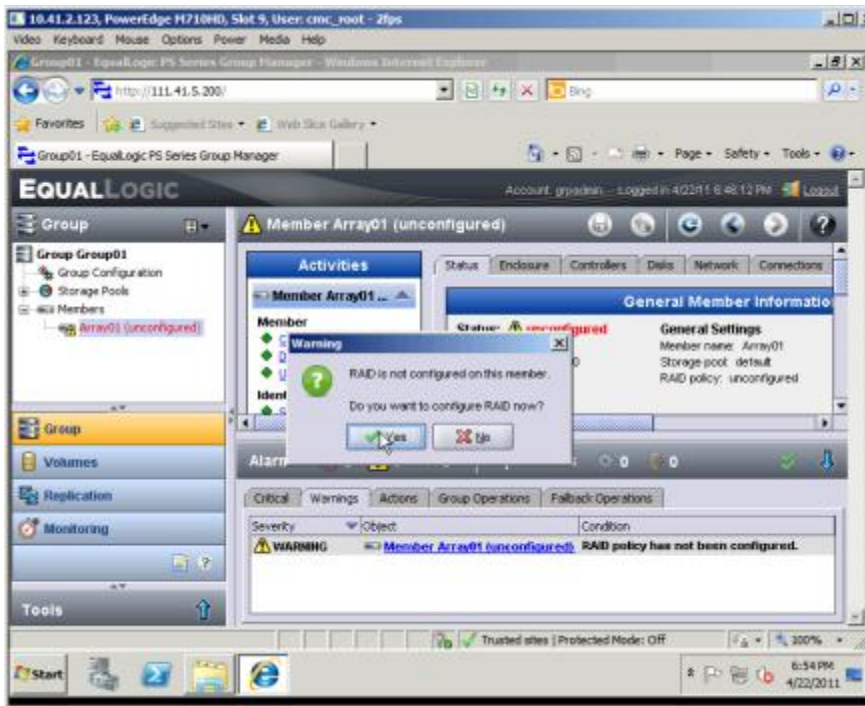
2. At the security warning, click Yes.



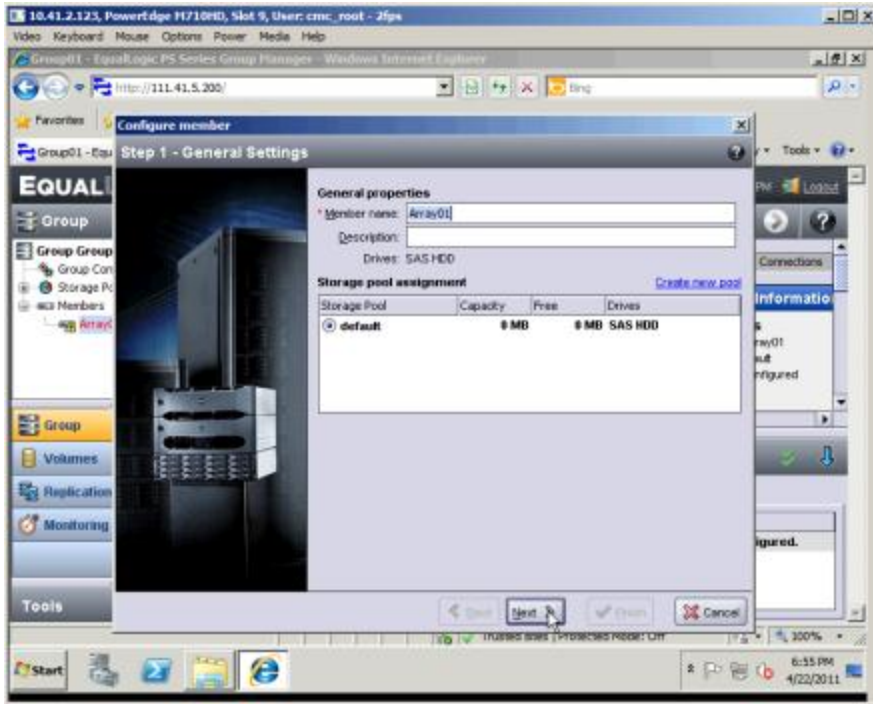
3. Log into the array using the gpadmin account and the password you entered earlier.



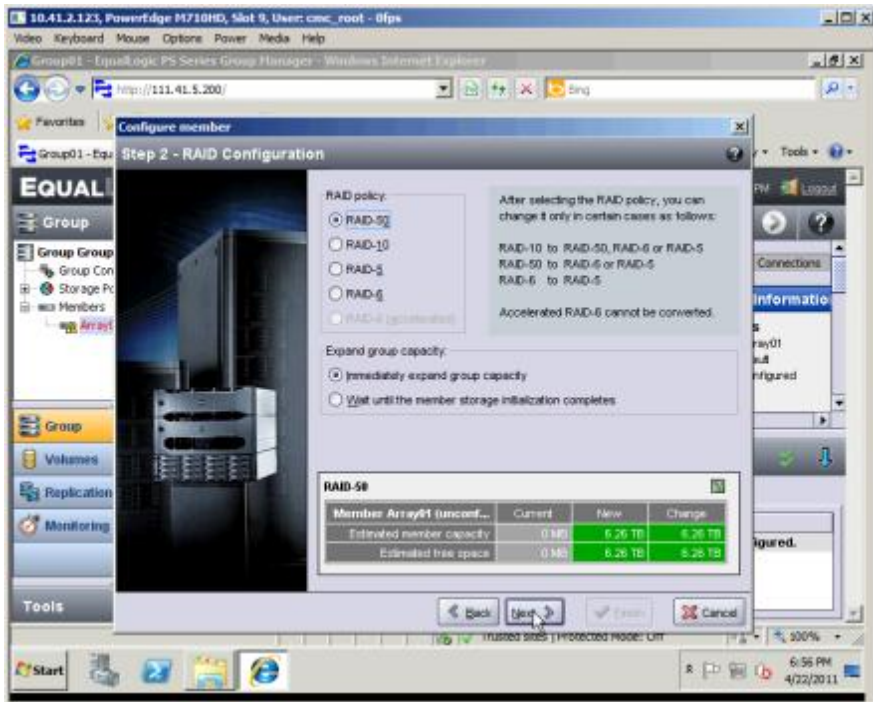
4. Click the warning about Array01 not being configured, and click Yes.



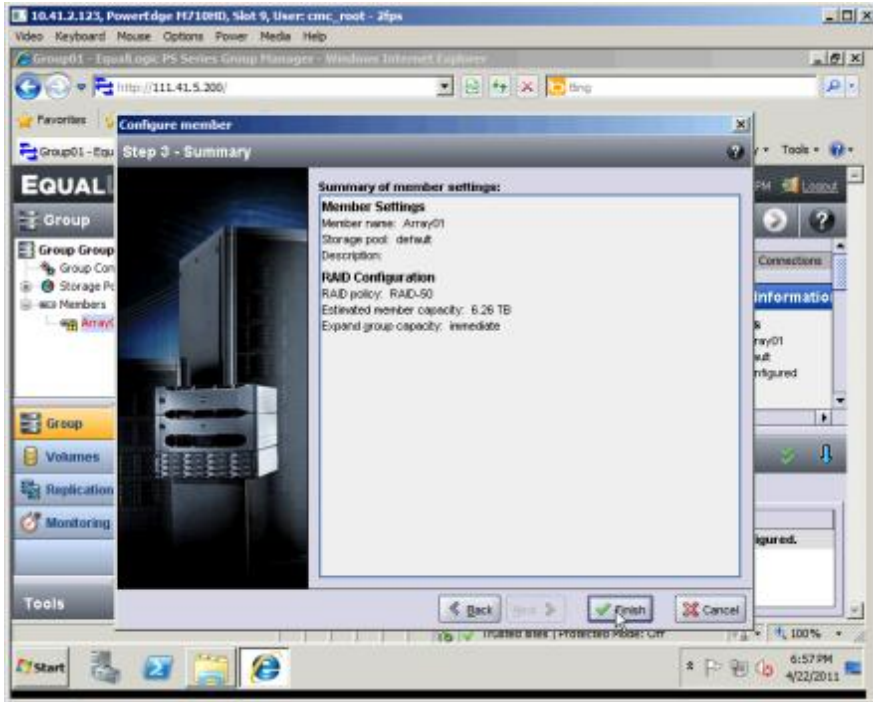
5. Name the array, and click Next.



6. Select the RAID policy, and click Next.

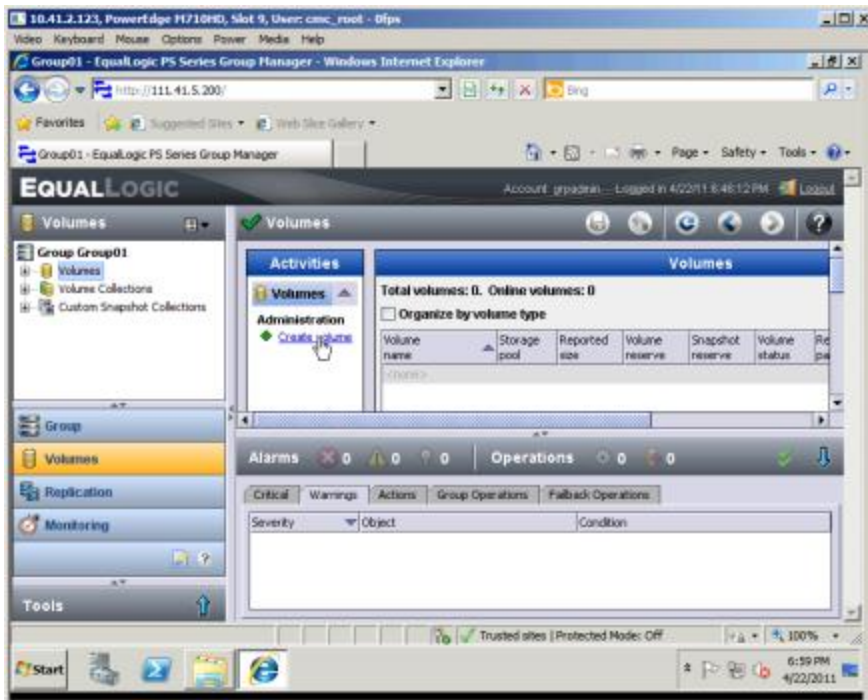


7. Review the summary, and click Finish.

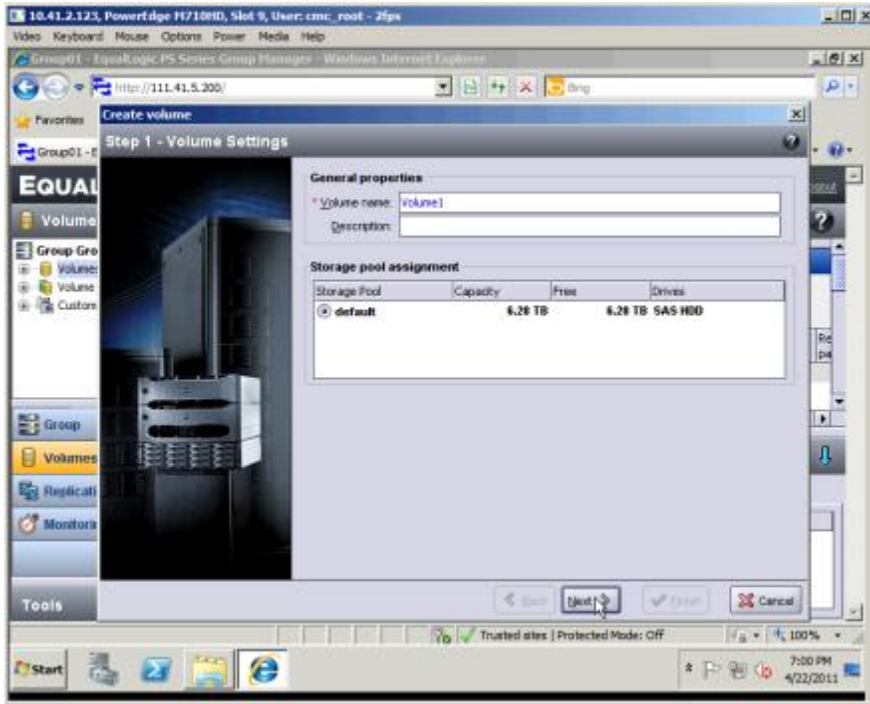


Create the SAN volume

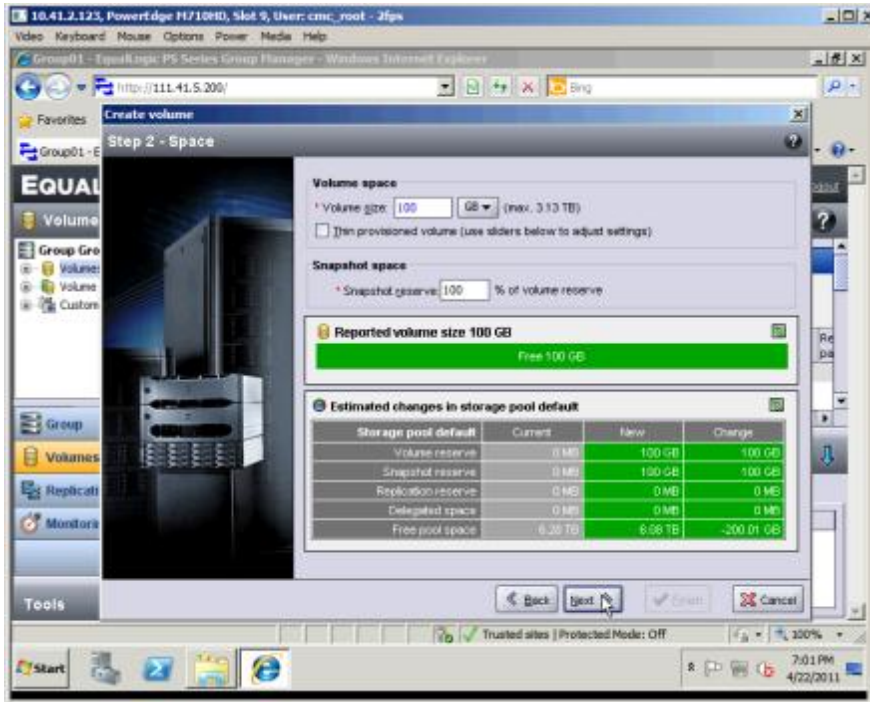
1. Choose Volumes in the left pane, and click Create volume.



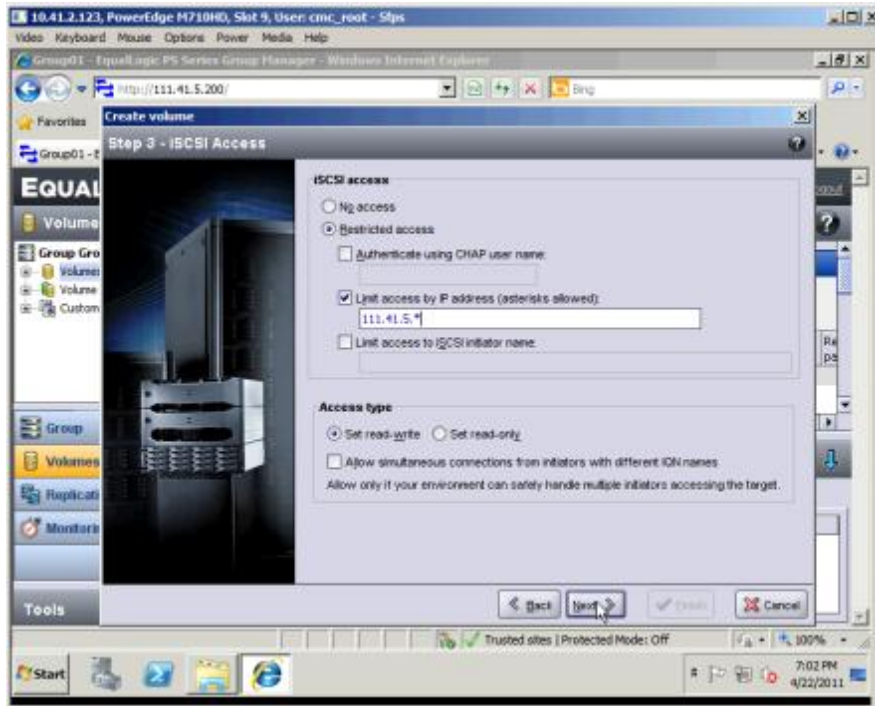
2. Name the volume, and click Next.



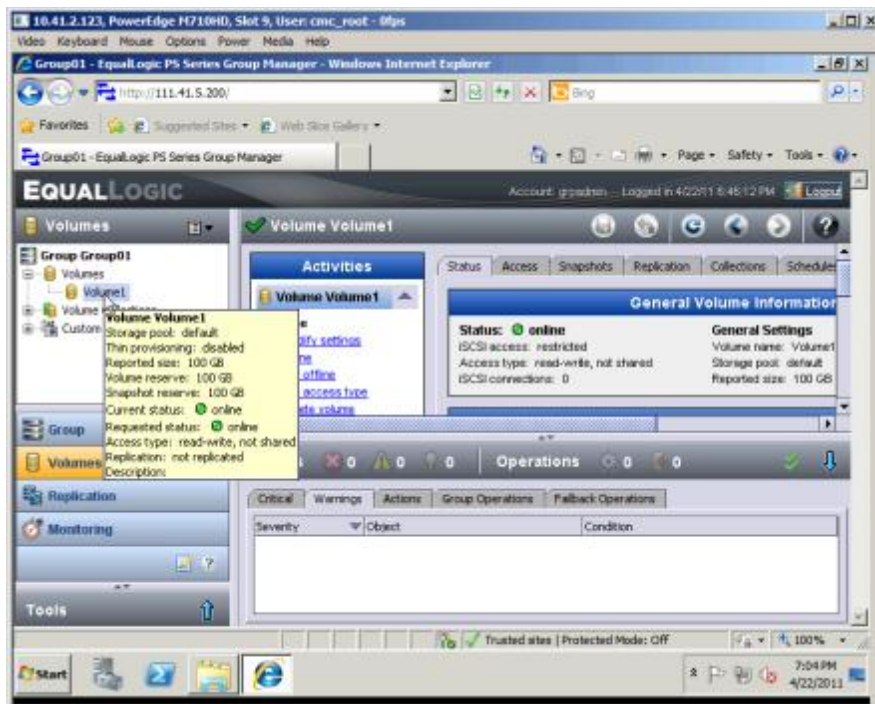
3. Choose the size for the volume, and set the snapshot reserve as appropriate. Click Next.



4. Restrict iSCSI access as appropriate. The example below shows restricting by subnet.

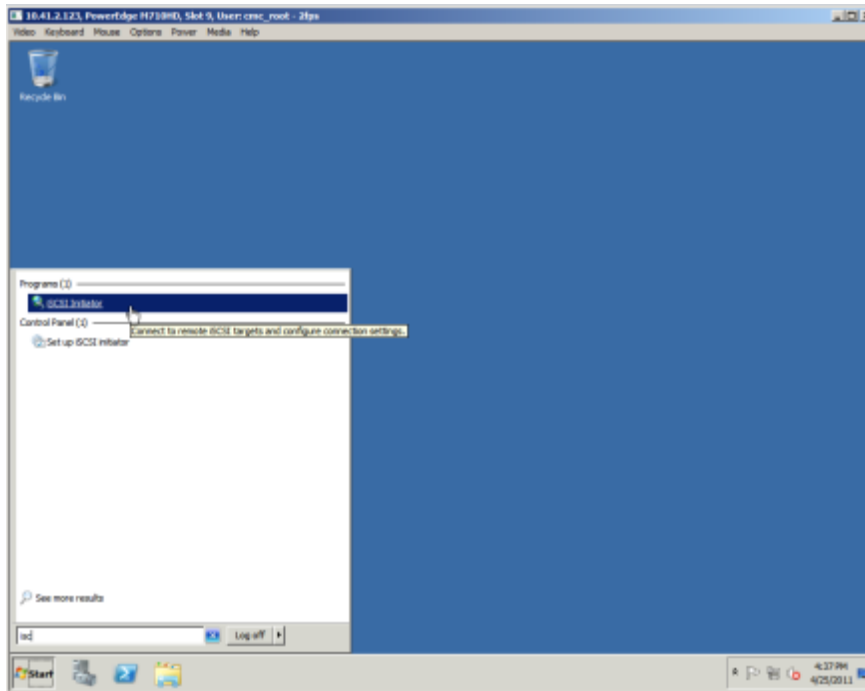


You have now successfully created the volume.

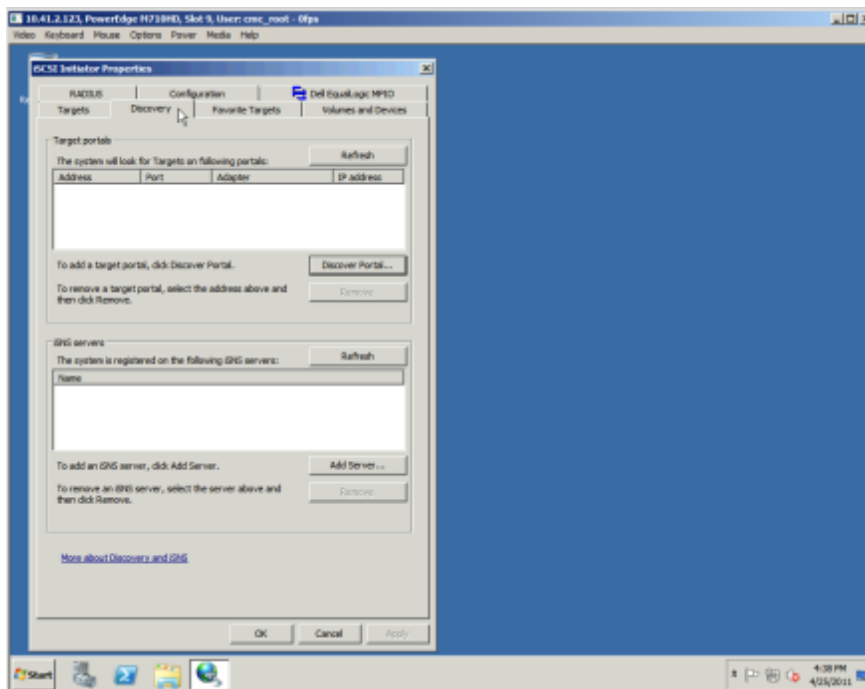


Set iSCSI access to the SAN

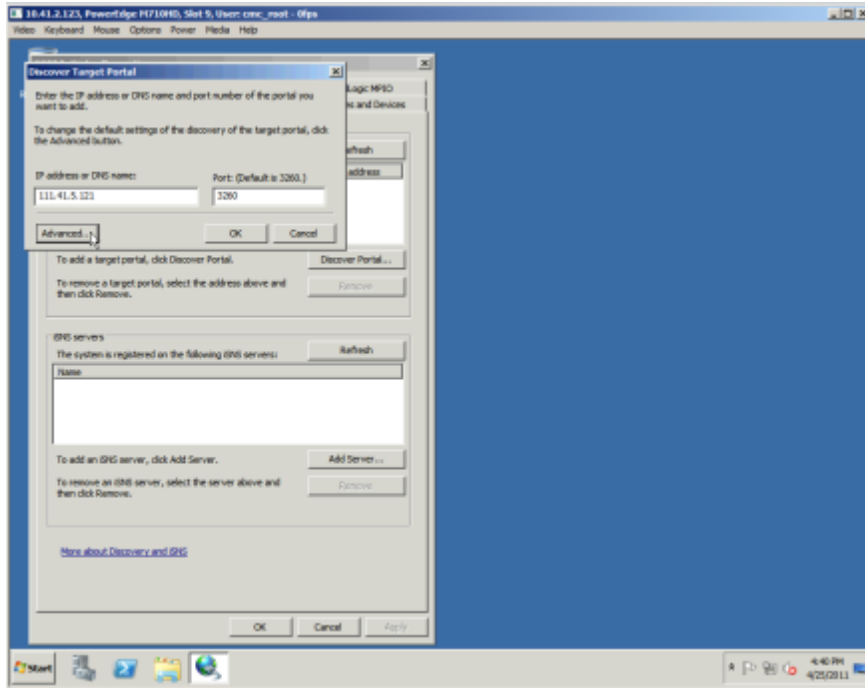
1. Start the iSCSI Initiator.



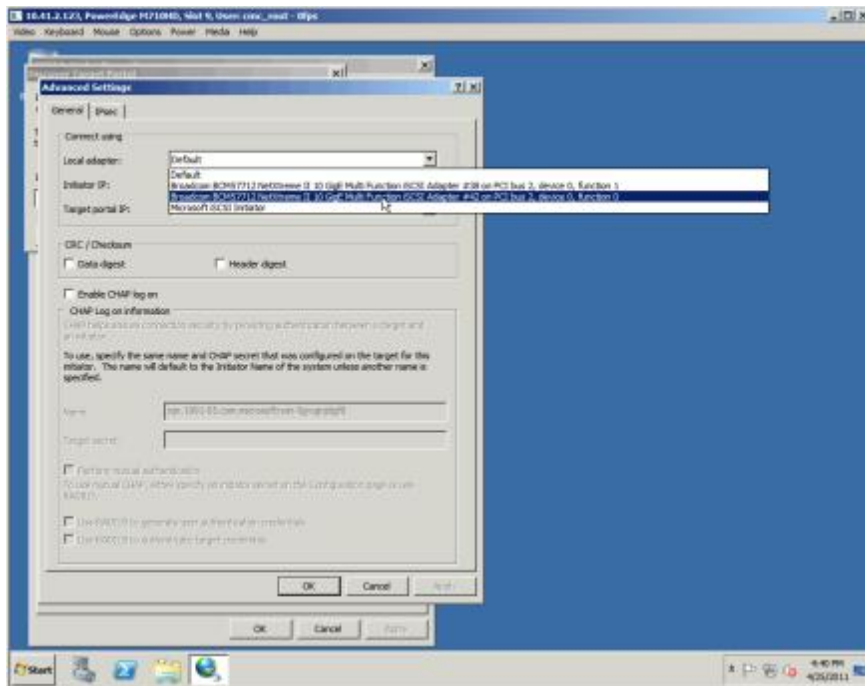
2. Select the Discovery tab.



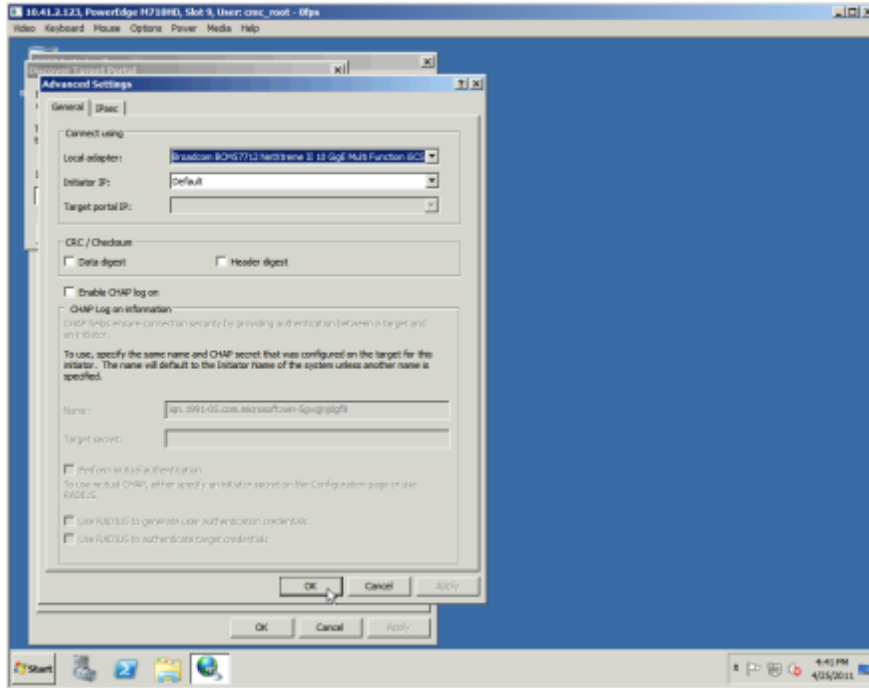
3. Enter the IP address, click Discover Portal, and click Advanced.



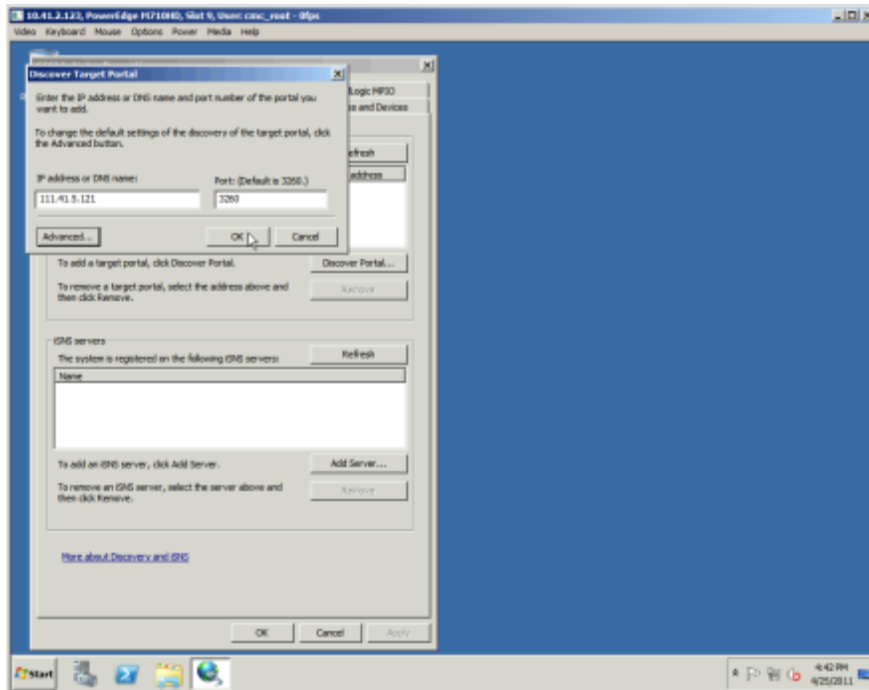
4. Select the adaptor to use. In this case, 42 is the one that's active.



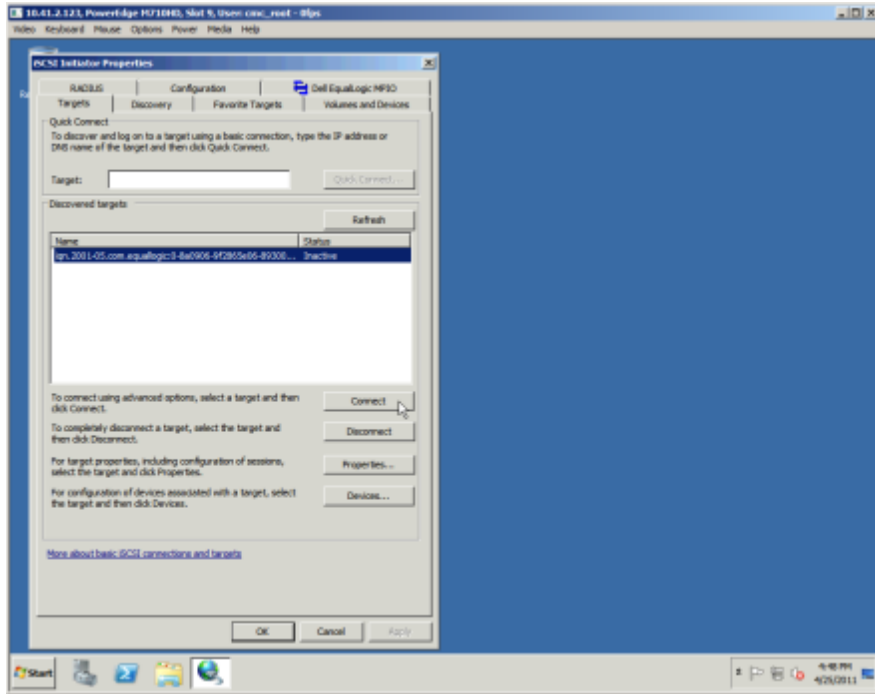
5. Click OK to close the Advanced Settings dialog.



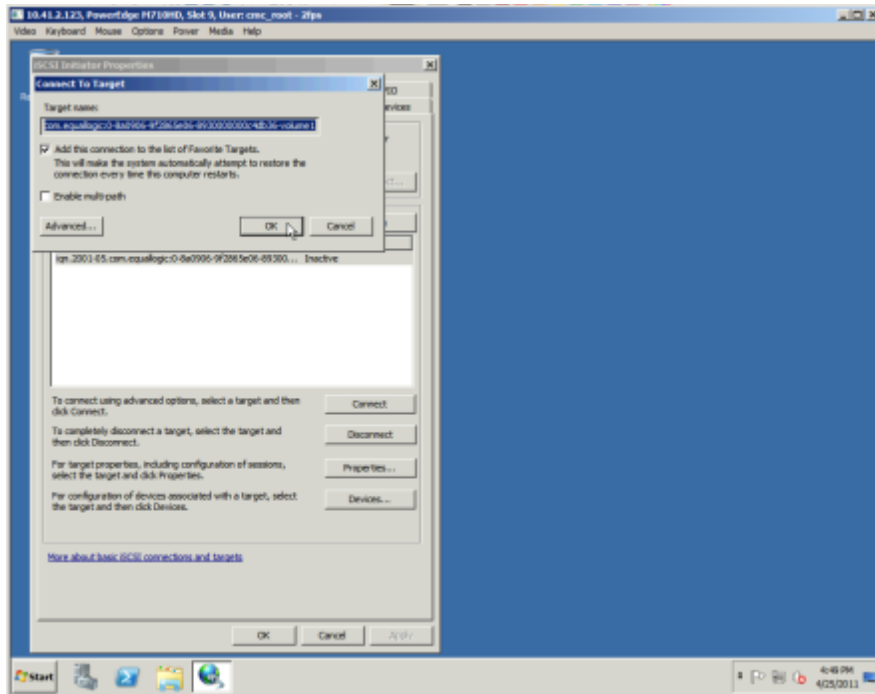
6. Click OK to close the Discover Target Portal dialog.



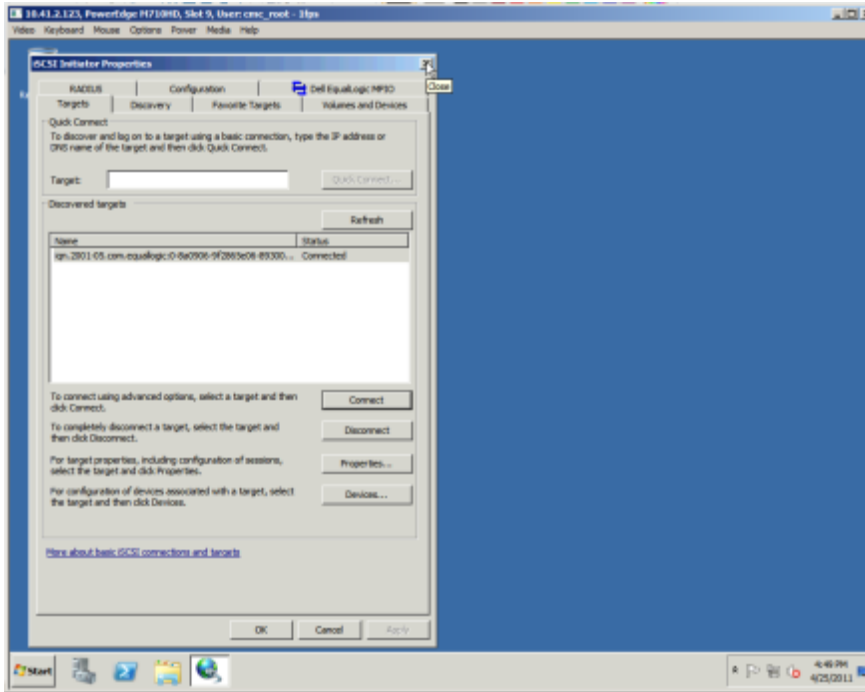
7. Select the Targets tab, and click Connect.



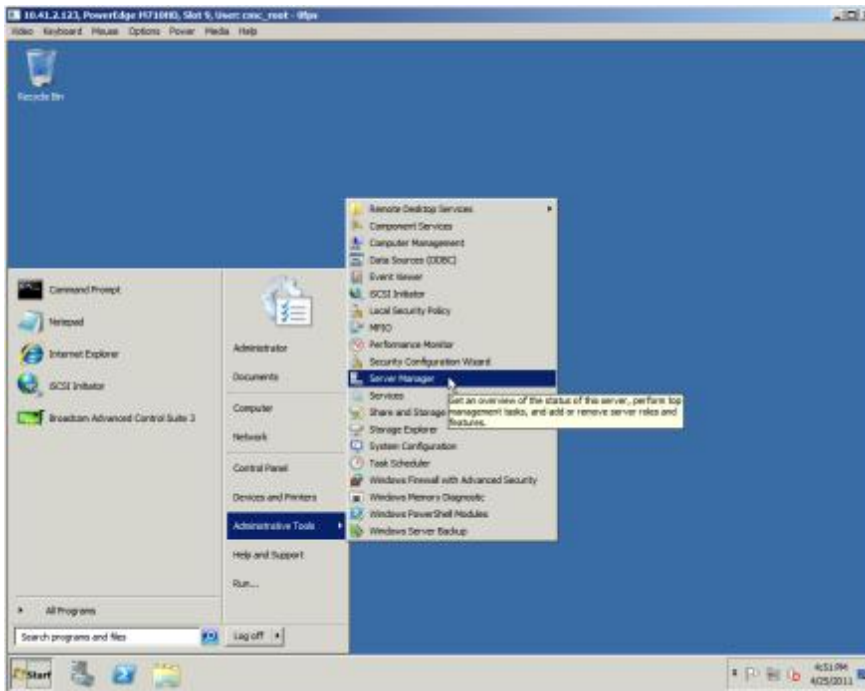
8. Verify the Connect to Target settings, and click OK.



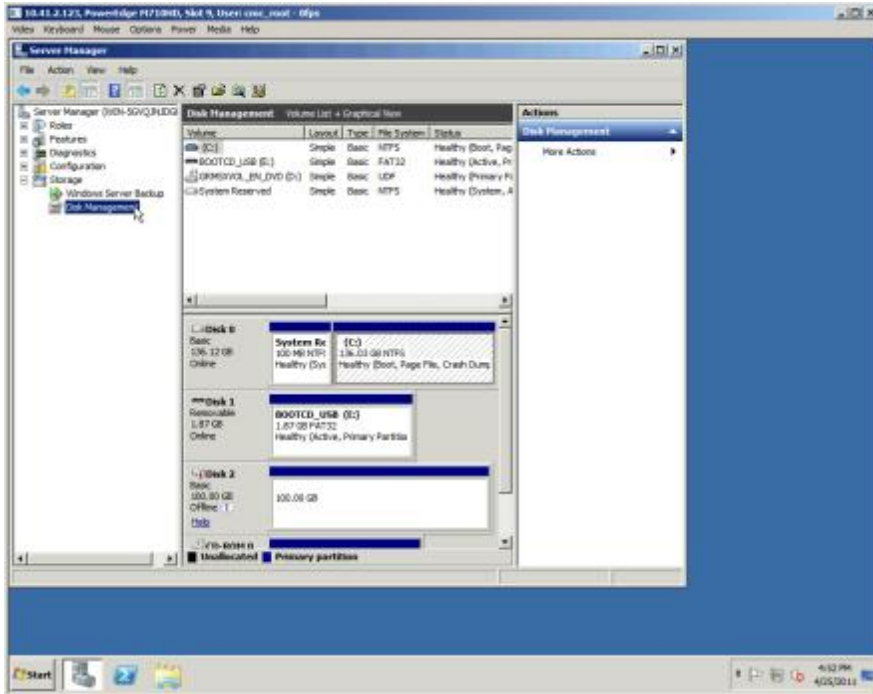
9. Close the iSCSI Initiator.



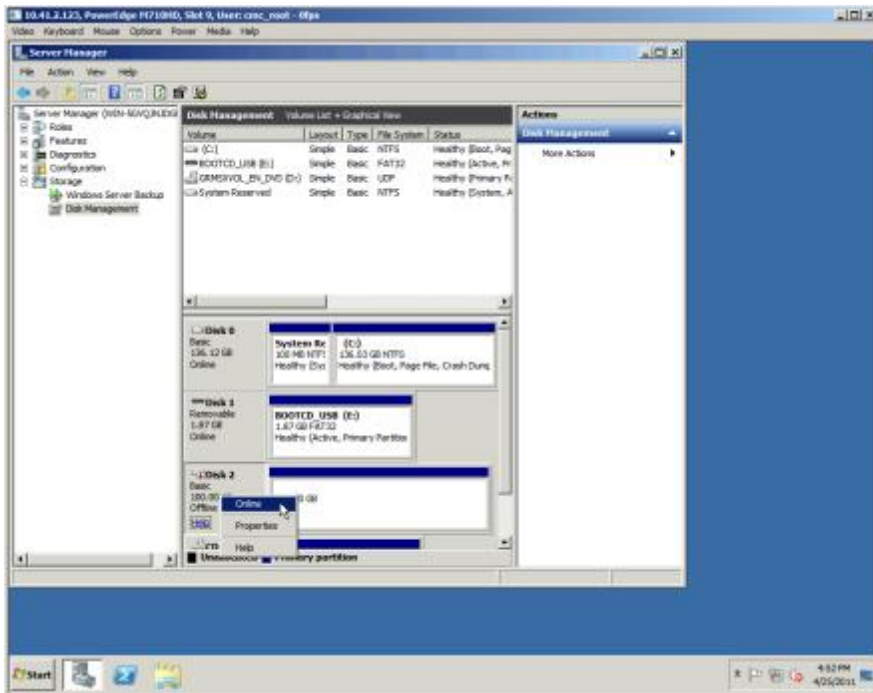
10. Start Server Manager.



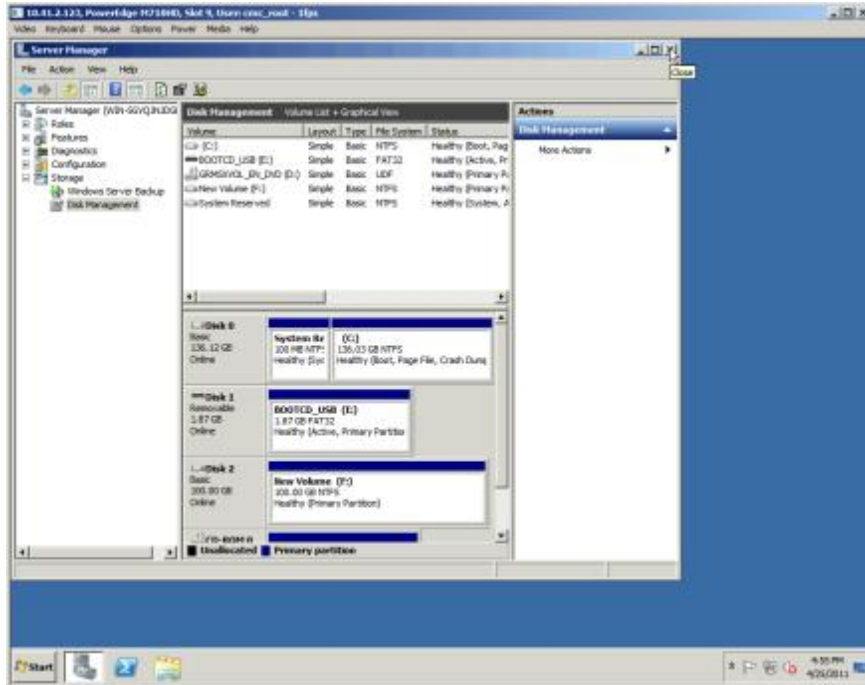
11. Expand Storage, and select Disk Management.



12. Right-click the new disk, and select Online.



13. Close Server Manager.



Conclusion

Converged I/O, enabled by Switch Independent Partitioning, has the potential to generate great savings. Switch Independent Partitioning is very easy to use. Although this guide covers the entire deployment end-to-end, the only steps specific to Switch Independent Partitioning involved using the Dell Lifecycle Controller to enable the feature. Dell provides you with a complete, easy-to-deploy solution, allowing you to get the same amount of work done with fewer components and less maintenance.