

# **VMware vSphere: What's New**

Lab Manual

ESXi 5.5 and vCenter Server 5.5



VMware® Education Services  
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## **VMware vSphere:**

### **What's New**

ESXi 5.5 and vCenter Server 5.5  
Part Number EDU-EN-WN55-LAB  
Lab Manual

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# **Lab 1**

## Using the VMware vSphere Web Client

### **Objective: Explore and use the vSphere Web Client**

In this lab, you will perform the following tasks:

1. Examine the Main Parts of the vSphere Web Client
2. License vSphere Components
3. (Optional) Explore the vSphere Web Client UI

### **Task 1: Examine the Main Parts of the vSphere Web Client**

In this task, you examine the most commonly used parts of the VMware vSphere® Web Client inventory view.

Use the following information from the class configuration handout:

- Jump-box server IP address or name
- Jump-box server user name
- Jump-box server password
- ControlCenter IP address
- vSphere Administrator user name
- Student administrator user name
- Standard lab password

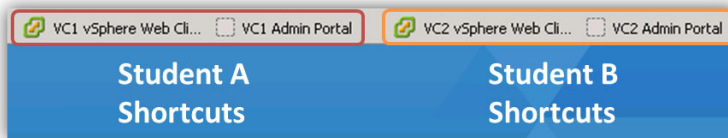
The instructor will provide the information necessary for you to connect to the jump-box server.

1. On the desktop of the jump-box server, double-click the **Remote Desktop Connection** icon.
2. In the **Computer** text box, type the ControlCenter IP address provided by the instructor.
3. Use the student vSphere Web Client user name and standard lab password to log in to the ControlCenter server.
4. Review the navigation shortcuts in the Mozilla Firefox Web browser.
  - a. On the ControlCenter desktop, double-click **Mozilla Firefox**.

The browser opens to the Home page of the vSphere Web Client hosted on VMware® vCenter™ Server Appliance™.

- b. Examine the shortcuts on the Mozilla Firefox shortcut bar.

In most lab tasks, student A uses the first and second shortcuts. Student B uses the third and fourth shortcuts. A lab step specifies student-specific shortcuts when necessary.



#### **NOTE**

The Home Page for each student is set to the correct vSphere Web Client for that student's vCenter Server Appliance.

5. View the address bar in Mozilla Firefox.

#### **Q1. On which port does the vSphere Web Client server run?**

6. Use the vSphere Web Client user name and standard lab password to log in to the vSphere Web Client.
  - a. In the **User name** text box, type the vSphere Administrator user name.
  - b. In the **Password** text box, type the standard lab password.
  - c. Click **Login**.
7. In the left pane, click **vCenter**.

The left pane is called the inventory view.

**Q2. What four objects appear as inventory trees?**

8. In the inventory view, select **Hosts and Clusters**.
9. Expand the **Training** data center and expand **Cluster**.

**Q3. What object types are viewable from this inventory view?**

10. In the inventory view, click the **VMs and Templates** icon.
11. Expand the **Training** data center.



**Q4. What object types are visible from this inventory view?**

12. Investigate the information that is available in the center pane.
  - a. In the inventory view, select **Training**.
  - b. In the center pane, click the **Summary** tab.

**Q5. What information is available on the Summary tab?**

- c. In the center pane, click the **Monitor** tab.

**Q6. What page is selected for the Monitor tab?**

**Q7. What other pages are available on the Monitor tab?**

13. At the top of the vSphere Web Client, click the **Go Home** button.



## Task 2: License vSphere Components

In this task, you use the vSphere Web Client to update the licenses for the VMware vSphere® server and the VMware ESXi™ host.

Use the following information from the class configuration handout:

- VMware® vCenter Server® license key provided by the instructor
  - ESXi host license key provided by the instructor
1. In the inventory view, select **Administration**.
  2. If necessary, expand **Licensing**.
  3. Under Licensing, select **Licenses**.
  4. License the vCenter Server instance.
    - a. In the center pane, click the **vCenter Server Systems** tab.
    - b. Click the **Usage** column to select the vCenter Server row.
    - c. Click **Assign License Key**.
    - d. Select **Assign a new license key** from the drop-down menu.
    - e. In the **License key** text box, type the vCenter Server license key and click **OK**.
  5. Assign a license key to the ESXi host.
    - a. In the center pane, click the **Hosts** tab.
    - b. Click the **Usage** field to select the ESXi host.
    - c. Click **Assign License Key**.
    - d. Select **Assign a new license key** from the drop-down menu.
    - e. In the **License key** text box, type the ESXi license key and click **OK**.
  6. If the host state is Disconnected, reconnect the ESXi host.
    - a. In the center pane, right-click the ESXi host and select **Connect**.
    - b. In the Reconnect host window, click **Yes**.
    - c. Monitor the Recent Tasks pane until the task to reconnect the ESXi host is complete.
    - d. In the inventory view, select **Home**.



## Task 3: (Optional) Explore the vSphere Web Client UI

In this task, you perform a competitive exercise to explore the vSphere Web Client user interface.

1. Using the vSphere Web Client, work with your lab partner to answer as many of the questions as you can.

Your instructor will set a time limit.

**Q1. How many virtual machine objects, including templates, are in each vSphere environment?**

**Q2. How many datastores are configured?**

**Q3. What format are the datastores in?**

**Q4. What was the first event recorded against either of the datastores?**

**Q5. What is the virtual machine swap file location set to on your host?**

**Q6. What is the configured action for the License Error alarm?**

**Q7. What role has the user vSphere.local\Administrator been granted on the vCenter Server instance?**

**Q8. What is the vmhba identifier that has been assigned to the iSCSI software adapter on your host?**

2. Close the vSphere Web Client.



## **Lab 2**

# VMware vCenter Single Sign-On

### **Objective: Use vCenter Single Sign-On to add users from external identity sources**

In this lab, you will perform the following tasks:

1. Connect the vCenter Server Appliance to the AD Domain
2. Add an Identity Source and Configure a Lockout Policy
3. Assign the Administrator Role to the Student AD Accounts

### **Task 1: Connect the vCenter Server Appliance to the AD Domain**

In this task, you attach VMware® vCenter™ Server Appliance™ to the Active Directory (AD) domain.

Use the following information from the class configuration handout:

- VMware vCenter Server Appliance administrator shortcut
- vCenter Server administrator user name
- vCenter Server administrator password
- AD fully qualified domain name
- VMware vSphere® Web Client shortcut
- AD domain administrator user name
- Standard lab password

1. On the ControlCenter desktop, double-click **Mozilla Firefox**.
2. On the shortcut tool bar, click the vCenter Server administrator shortcut.
3. Use the vCenter Server administrator credentials to log in to the vCenter Server Appliance administrator portal.
4. On the **vCenter Server** tab, click **SSO**.

**Q1. What is the vCenter Single Sign-On deployment type?**

5. Click **Authentication**.
6. On the Authentication page, configure the AD authentication settings.

<b>Option</b>	<b>Action</b>
Active Directory Enabled	Select the check box.
Domain	Type the AD fully qualified domain name.
Administrator user	Type the AD domain administrator user name.
Administrator password	Type the AD domain administrator user name and standard lab password.

7. Click **Save Settings**.

The message “Operation was successful” appears in green text at the top of the Authentication page.

If the action is not successful, verify the domain and credential information and try again or check with the instructor.

8. Restart the vCenter Server Appliance.
  - a. Click the **System** tab.
  - b. On the **System** tab, click **Reboot**.
  - c. In the System reboot dialog box, click **Reboot**.
  - d. Click **Cancel** to log out.

**IMPORTANT**

You must reboot the vCenter Server Appliance to complete the lab.

9. On the shortcut toolbar, click your **vSphere Web Client** shortcut.
10. Continue to refresh the Web page until the Web browser displays the message “Unable to connect.”

The “Unable to connect” message indicates that the vCenter Server Appliance is rebooting.

11. Continue to refresh the vSphere Web Client page until the login page appears.

The vCenter Server Appliance reboot takes approximately 5 minutes.

## Task 2: Add an Identity Source and Configure a Lockout Policy

In this task, you use the vSphere Web Client to add the AD domain controller as an identity source. Before VMware® vCenter™ Single Sign-On™ can access users from an external identity source, you must add the source to vCenter Single Sign-On.

Use the following information from the class configuration handout:

- vSphere Web Client administrator user name
  - Standard lab password
1. Use the vSphere Web Client administrator user name and standard lab password to log in to the vSphere Web Client.
  2. In the inventory view, click **Administration**.
  3. Under Single Sign-On, select **Configuration**.
  4. In the center pane, click the **Identity Sources** tab.
  5. On the tool bar, click **Add Identity Source** icon.

The Add Identity Source icon is a green plus sign.



6. In the Add Identity Source window, click **Active Directory (Integrated Windows Authentication)**.

The classroom AD domain name appears in the identity source list because in task 1 you added the vCenter Server Appliance to the AD domain.

7. Click **OK**.
8. Verify that the classroom AD domain name appears in the identity source list.
9. In the center pane, click the **Policies** tab and click **Lockout Policy**.

10. Click **Edit**.
11. Configure the lockout policy.

<b>Option</b>	<b>Action</b>
Description	Type <b>Custom lockout policy</b> .
Max. number of failed attempts	Leave at the default.
Time interval between failures	Leave at the default.
Unlock time	Type <b>1</b> and select <b>minutes</b> from the drop-down menu.

12. Click **OK**.
13. Verify that the new policy appears in the center pane.
14. In the inventory view, click **Home**.

### **Task 3: Assign the Administrator Role to the Student AD Accounts**

In this task, you add two AD accounts from the domain as vSphere Administrators.

Use the following information from the class configuration handout:

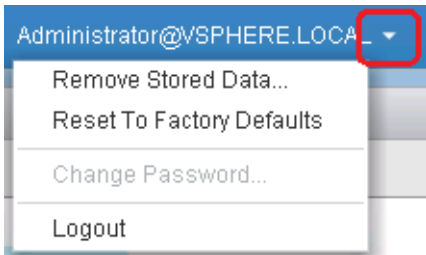
- vSphere Web Client administrator user name
- Standard lab password
- AD student user names
- Student vSphere Web Client user name

1. In the inventory view, click **vCenter** and click **vCenter Servers**.
2. Select the vCenter Server system.
3. In the center pane, click the **Manage** tab and click **Permissions**.
4. On the Permissions page tool bar, click the **Add permission** icon.

The Add permission icon is a green plus sign.

5. In the Users and Groups pane, click **Add**.
6. In the Select Users/Groups window, select the classroom AD domain from the **Domain** drop-down menu.
7. In the Users and Groups pane, select both classroom AD student user names and click **Add**.

8. Verify that both users appear in the **Users** text box and click **OK**.
9. In the Users and Groups pane, select the first AD user.
10. In the Assigned Role pane, select **Administrator** from the drop-down menu.
11. Repeat steps 8 and 9 for the second classroom AD user.
12. Click **OK**.
13. Verify that the classroom AD users appear in the user list and have the Administrator role.
14. On the top of the vSphere Web Client, select **Logout** from the drop-down menu.



15. Use the student vSphere Web Client administrator user name and standard lab password to log in to the vSphere Web Client.

### **IMPORTANT**

All the remaining labs assume that each student of a student team consistently uses the same student user account in the vSphere Web Client. Student A uses the student A AD account. Student B uses the student B AD account.





## Lab 3

# Configuring the VMware ESXi Firewall

### Objective: Use the ESXi firewall to block a protocol

In this lab, you will perform the following tasks:

1. Configure the ESXi Firewall to Restrict Access to SSH
2. Prepare for the Next Lab

### Task 1: Configure the ESXi Firewall to Restrict Access to SSH

In this task, you use the VMware ESXi™ firewall to restrict access to the SSH service on the ESXi host.

Use the following information from the class configuration handout:

- VMware® vCenter Server™ administrator user name
  - vCenter Server administrator password
  - ESXi host name
  - IP address of the network allowed to access the SSH server
  - Student VMware vSphere® Web Client user name
  - Standard lab password
1. Verify that you can establish an SSH connection to your ESXi host.
    - a. Minimize the vSphere Web Client.
    - b. On the ControlCenter desktop, double-click **Putty**.
    - c. In the **Host Name** text box, type the name of your ESXi host.

- d. Click **Open**.
- e. In the PuTTY Security Alert window, click **Yes**.

When a login prompt appears in the PuTTY window, the SSH connection is established. The successful connection indicates that the firewall allows SSH. You do not have to log in.

- f. Close the PuTTY window.
- g. On the ControlCenter task bar, click **vSphere Web Client**.

2. Use the student vSphere Web Client user name and standard lab password to log in to the vSphere Web Client.

This user is the Active Directory user added in lab 2.

Example: ADStudentA@vclass.local

3. In the inventory view, click **vCenter** and click **Hosts and Clusters**
4. Expand **Training and Cluster**.
5. Select the ESXi host.
6. In the center pane, click the **Manage** tab and click **Settings**.
7. In the center pane, select **Security Profile**.
8. In the Firewall row, click **Edit**.
9. In the Edit Security Profile window, select **SSH Server**.
10. Leave the **SSH Server** check box selected.
11. Deselect the **Allow connections from any IP address** check box.
12. In the **IP Addresses** text box, type the IP address of the network that is allowed to access the SSH server.
13. Click **OK**.
14. On the Firewall panel, verify that the SSH Server row shows the IP address specified in step 12.
15. To verify that your firewall setting works, use PuTTY to try to connect to your ESXi host.
  - a. Minimize the vSphere Web Client.
  - b. On the ControlCenter desktop, double-click the **PuTTY** icon.
  - c. In the **Host Name** text box, type the name of your ESXi host.
  - d. Click **Open**.

A failed PuTTY connection indicates that the firewall works.

- e. Close the PuTTY window and click **OK** in the warning pop-up window.
16. Configure the firewall setting to allow SSH connections from all IP addresses.
  - a. On the ControlCenter task bar, click **vSphere Web Client**.
  - b. In the Firewall row, click **Edit**.
  - c. In the Edit Security Profile window, select **SSH Server**.
  - d. Select the **Allow connections from any IP address** check box.
  - e. Click **OK**.
  - f. In the Firewall panel, verify that the SSH Server row displays All.
17. (Optional) Verify that you can establish an SSH connection to your ESXi host.
  - a. Minimize the vSphere Web Client.
  - b. On the ControlCenter desktop, double-click the **PuTTY** icon.
  - c. In the **Host Name** text box, type the name of your ESXi host.
  - d. Click **Open**.

When a login prompt appears in the PuTTY window, the SSH connection is established. The successful connection indicates that the firewall allows SSH. You do not have to log in.
  - e. Close the PuTTY window.
  - f. On the ControlCenter task bar, click **vSphere Web Client**.

## Task 2: Prepare for the Next Lab

In this task, you power on the virtual machines to prepare for the next lab.

1. In the inventory view, click **vCenter** and click **VMs and Templates**.
2. Expand **Training**.
3. Power on the first two virtual machines.
  - a. In the inventory view, right-click the first virtual machine and select **Power On**.
  - b. Right-click the second virtual machine and select **Power On**.
4. At the top of the vSphere Web Client, click the **Go Home** button.



## **Lab 4**

# Managing Virtual Machines

### **Objective: Perform basic maintenance tasks for virtual machines**

In this lab, you will perform the following tasks:

1. Upgrade the Virtual Machine Hardware for Virtual Machines

### **Task 1: Upgrade the Virtual Machine Hardware for Virtual Machines**

In this task, you use the VMware vSphere® Web Client to upgrade VMware® Tools™ and the virtual machine hardware.

1. In the inventory view, click **vCenter** and click **VMs and Templates**.
2. Select each virtual machine and click the **Summary** tab in the center pane.

**Q1. What compatibility version is each virtual machine running?**

**Q2. What version of Tools is each virtual machine running?**

The reported versions are older versions of the hardware and Tools.

3. In the Training data center, create a folder and name it `MyVMs`.
  - a. In the inventory view, right-click **Training** and select **All vCenter Actions > New VM and Template Folder**.
  - b. In the New Folder window, type **MyVMs** in the **Name** text box and click **OK**.
4. Drag the virtual machines into the `MyVMs` folder.
5. Upgrade the virtual machine hardware on the first virtual machine.
  - a. In the inventory view, right-click the first virtual machine and select **Edit Settings**.
  - b. In the Edit Settings window, expand **Upgrade**.
  - c. Select the **Schedule VM Compatibility Upgrade** check box.
  - d. Verify that **ESXi 5.5 and later** is selected in the **Compatible with** drop-down menu and click **OK**.
  - e. In the inventory view, right-click the first virtual machine and select **Restart Guest OS**.
  - f. In the Confirm Restart dialog box, click **Yes**.
  - g. After the restart completes, refresh the vSphere Web Client view every minute until the Compatibility is version 10.
6. Upgrade the virtual machine hardware on the second virtual machine.
  - a. In the inventory view, right-click the second virtual machine and select **Shut Down Guest OS**.
  - b. In the Confirm Shut Down dialog box, click **Yes**.
  - c. Refresh the center pane every 5 to 10 seconds until the virtual machine is powered off.
  - d. In the inventory view, right-click the second virtual machine and select **All vCenter Actions > Compatibility > Upgrade VM Compatibility**.
  - e. In the Confirm VM Compatibility Upgrade dialog box, click **Yes**.
  - f. Verify that **ESXi 5.5 and later** is selected on the **Compatible with** drop-down menu and click **OK**.
  - g. Refresh the vSphere Web Client view and verify that the second virtual machine's Compatibility is version 10.
  - h. Power on the second virtual machine.
7. At the top of the vSphere Web Client, click the **Go Home** button.

## Lab 5

# Configuring Port Mirroring

### Objective: Create and monitor a port mirroring session on a new distributed switch

In this lab, you will perform the following tasks:

1. Create a Distributed Switch for the Virtual Machine Network
2. Create a Distributed Port Group for Lab05-dvs
3. Assign a Host and Uplink to Lab05-dvs
4. Migrate Virtual Machines to the Distributed Port Group
5. Create a Port Mirroring Session
6. Verify That Port Mirroring Works Properly
7. Clean Up for the Next Lab

### Task 1: Create a Distributed Switch for the Virtual Machine Network

In this task, you create a distributed switch to handle networking traffic for all associated hosts in the data center.

Use the following information from the class configuration handout:

- Student VMware vSphere® Web Client administrator user name
  - Standard lab password
1. In the inventory view, click **vCenter** and click **Networking**.
  2. Expand the **Training** data center to display the dvs-Lab distributed switch.

3. Right-click the **Training** data center and select **New Distributed Switch**.
4. On the Name and Location page, in the Name text box, type **Lab05-dvs** and click **Next**.
5. On the Select version page, leave **Distributed Switch Version 5.5.0** clicked and click **Next**.
6. Configure the new distributed switch settings.

<b>Option</b>	<b>Action</b>
Number of uplinks	Set to 1.
Network I/O Control	Select <b>Enabled</b> .
Default port group	Deselect the check box.

7. Click **Next** and click **Finish**.
8. Expand the **Training** data center and verify that the distributed switch appears in the inventory view.

## **Task 2: Create a Distributed Port Group for Lab05-dvs**

In this task, you create a distributed port group for the distributed switch.

1. In the inventory view, right-click **Lab05-dvs** and select **New Distributed Port Group**.
2. On the Select name and location page, change the name from DPortGroup to Lab-Production and click **Next**.
3. On the Configure settings page, leave the configuration at the defaults and click **Next**.
4. On the Ready to complete page, click **Finish**.
5. In the inventory view, expand the **Lab05-dvs** distributed switch and verify that the Lab-Production port group appears.

## **Task 3: Assign a Host and Uplink to Lab05-dvs**

In this task, you join the VMware ESXi™ host to Lab05-dvs through an uplink.

Use the following information from the class configuration handout:

- vmnic for the Production network
1. In the inventory view, right-click **Lab05-dvs** and select **Add and Manage Hosts**.
  2. On the Select hosts page, leave **Add hosts** clicked and click **Next**.
  3. On the Select task page, click **New hosts**.



4. In the Select new hosts window, select the ESXi host check box and click **OK**.
5. Click **Next**.
6. On the Select network adapter tasks page, deselect the **Manage VMkernel adapters** check box and click **Next**.
7. On the Manage physical network adapters page, select the vmnic for the Production network and click **Assign uplink**.
8. In the Select an Uplink window, select **Uplink 1** and click **OK**.
9. Verify that the vmnic for the Production network appears on the switch as *vmnic\_number* (Assigned) and click **Next**.
10. On the Analyze impact page, view the status pane and click **Next**.
11. On the Ready to complete page, click **Finish**.
12. Verify that the correct uplink appears for the ESXi host.
  - a. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  - b. Select the ESXi host.
  - c. In the center pane, verify that the **Manage** tab is selected.
  - d. On the **Manage** tab, click **Networking** and select **Virtual switches**.
  - e. In the **Switch** list, select **Lab05-dvs**.

**Q1. Which uplink shows one assigned network adapter?**

## Task 4: Migrate Virtual Machines to the Distributed Port Group

In this task, you migrate the virtual machines from the VM Network to the port group on the distributed switch.

1. In the inventory view, click **vCenter** and click **Networking**.
2. Right-click **Lab05-dvs** and select **Migrate VM to Another Network**.
3. On the Select source and destination networks page, verify that **Specific network** is selected under Source Network.
4. Click **Browse**, select **VM Network**, and click **OK**.
5. Under Destination network, click **Browse**, select **Lab-Production**, and click **OK**.
6. Click **Next**.
7. On the Select VMs to Migrate page, select the check boxes for virtual machines 01 and 02.

8. Click **Next**.
9. On the Ready to Complete page, click **Finish**.
10. In the inventory view, select the **Lab-Production** port group.
11. In the center pane, click the **Related Objects** tab and click **Virtual Machines**.
12. Restart both virtual machines.
  - a. In the virtual machine list, right-click each virtual machine and select **Restart Guest OS**.
  - b. In the Confirm Restart dialog box, click **Yes**.

The reboot is a simple way to force the virtual machines to acquire an IP address from the new switch. A reboot is not required. The virtual machines can get the same result by releasing and renewing their IP addresses.

## Task 5: Create a Port Mirroring Session

In this task, you create a port mirroring session to mirror distributed switch traffic to a specific switch port. Port mirroring is used to analyze and debug data or diagnose errors on a network. Before creating a port mirroring session, you gather key pieces of information about the source and destination virtual machines. This information includes the name, port ID, and IP address of each virtual machine.

Use the following information from the class configuration handout:

- Source virtual machine
  - Destination virtual machine
1. Identify the port IDs for the virtual machines.
    - a. In the inventory view, select the **Lab05-dvs** virtual switch.
    - b. In the center pane, click the **Manage** tab and select **Ports**.
    - c. In the table, record the following information for the virtual machines:
      - The source virtual machine name with the name ending in 01
      - The destination virtual machine name with the name ending in 02
      - The port ID for each virtual machine
      - The IP address for each virtual machine

The IP address is on the VMs and Templates page, on the virtual machine's **Summary** tab.

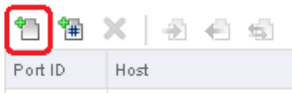
<b>Virtual Machine</b>	<b>Connectee Name</b>	<b>Port ID</b>	<b>IP Address</b>
Source virtual machine			
Destination virtual machine			

2. In the inventory view, click **vCenter** and click **Networking**.
3. Enable port mirroring on the Lab05-dvs distributed switch.
  - a. In the inventory view, select **Lab05-dvs**.
  - b. In the center pane, click the **Manage** tab and click **Settings**.
  - c. On the Settings page, select **Port mirroring**.
  - d. On the Port mirroring panel, click the **New** icon.
  - e. In the Add Port Mirroring Session window, verify that **Distributed Port Mirroring** is clicked and click **Next**.
  - f. On the Edit Properties page, configure the port mirroring session properties.

<b>Option</b>	<b>Action</b>
Name	Type <b>PortMirrorLab</b> .
Status	Select <b>Enabled</b> .
Session type	Not configurable.
Normal I/O on destination ports	Select <b>Allowed</b> .
Mirrored packet length (Bytes)	Leave the check box deselected.
Sampling rate	Leave at the default.
Description	Leave blank.

- g. Click **Next**.

- h. On the Select sources page, click the **Select distributed ports** icon.



- i. In the Select Ports window, select the check box of the source virtual machine and click **OK**.
  - j. Click **Next**.
  - k. On the Select sources page, click the **Select distributed ports** icon.
  - l. In the Select Ports window, select the check box of the destination virtual machine and click **OK**.
  - m. Click **Next** and click **Finish**.
4. In the center pane, verify that the port mirroring session is created and enabled.

## Task 6: Verify That Port Mirroring Works Properly

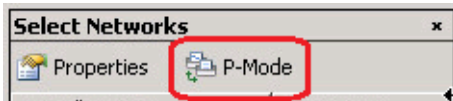
In this task, you use Internet Control Message Protocol (ICMP) requests generated from the source machine mirrored on the destination machine to verify that the port mirroring is configured correctly. If requests are not mirrored, you verify that the port mirroring session settings are configured correctly.

Use the following information from the class configuration handout:

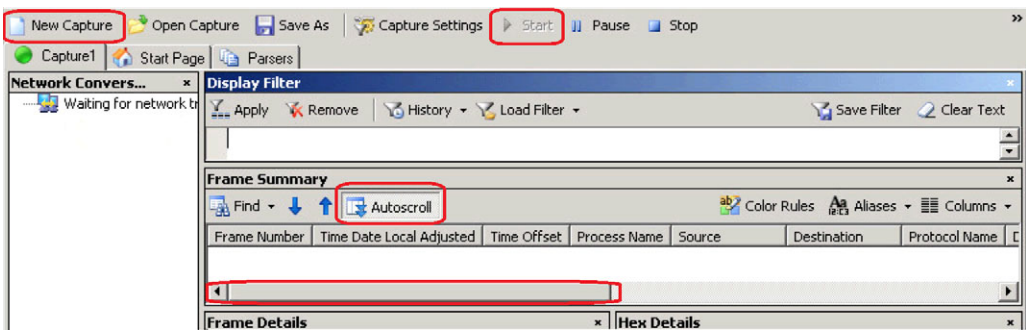
- Virtual machine administrator user name
  - Standard lab password
  - ESXi host IP address
1. Open one console to each virtual machine.
    - a. In the inventory view, click **vCenter** and click **VMs and Templates**.
    - b. Right-click the first virtual machine and click **Open Console**.

To view the virtual machine console when using Internet Explorer, the Client Integration plug-in must be installed. Mozilla Firefox does not require this plug-in.
    - c. In the virtual machine console, click the **Send Ctrl-Alt-Delete** button.
    - d. Use the virtual machine administrator credentials to log in to the virtual machine.
    - e. In the Mozilla Firefox browser, click the **vSphere Web Client** tab.
    - f. Repeat substeps a through d on the second virtual machine.

2. On the destination virtual machine, start Microsoft Network Monitor.
  - a. On the virtual machine desktop, double-click the **Microsoft Network Monitor 3.4** icon.
  - b. Maximize the Network Monitor window.
3. In the Network Monitor 3.4 window, in the Select Networks pane, click **P-Mode** to enable promiscuous mode.



4. Start capturing packets.
  - a. At the top left of the Network Monitor window, click **New Capture**.
  - b. On the Network Monitor toolbar, click the **Start** button.
  - c. In the Frame Summary panel, click **Autoscroll**.
  - d. Move the **Frame Summary** slider to the right to display the Source, Destination, Protocol Name, and Description columns.



5. Initiate ICMP (ping) requests from the source virtual machine to the ESXi host.
  - a. In the Mozilla Firefox window, click the source virtual machine tab.
  - b. On the virtual machine desktop, double-click the **Command Prompt** icon.
  - c. Continuously ping the ESXi host from the source virtual machine.
 

```
ping -t IP_address
```

*IP\_address* is the IP address of the ESXi host.
6. In the Mozilla Firefox window, click the destination virtual machine tab.

7. Verify that the ICMP requests appear in the Network Monitor window of the destination virtual machine.

The ICMP requests have source and destination addresses or names matching those of the source virtual machine and the ESXi host.

8. Close the Network Monitor.

Do not save the network capture.

9. On the source virtual machine, close the Command Prompt window.
10. Close both virtual machine consoles.

## Task 7: Clean Up for the Next Lab

In this task, you return the VMware® vCenter Server™ system to its original state by migrating the virtual machines back to the VM Network port group and removing the new distributed switch. The distributed switch configuration is not need in subsequent labs.

1. In the inventory view, click **vCenter** and click **Networking**.
2. Right-click **Lab05-dvs** and select **Migrate VM to Another Network**.
3. Under Source Network, click **Browse**, select **Lab-Production**, and click **OK**.
4. Under Destination Network, click **Browse**, select **VM Network**, and click **OK**.
5. Click **Next**.
6. On the Select VMs to Migrate page, select the **All virtual machines** check box and click **Next**.
7. On the Ready to Complete page, click **Finish**.
8. In the inventory view, select **VM Network** and click the **Related Objects** tab.
9. On the **Related Objects** tab, verify that **Virtual Machines** is selected and that the two virtual machines appear in the list.
10. In the virtual machine list, select both virtual machines.
11. Right-click the selected virtual machines, select **Restart Guest OS**, and click **Yes**.
12. In the inventory view, right-click **Lab05-dvs** and select **All vCenter Actions > Remove From Inventory**.
13. In the Remove Distributed Switch dialog box, click **Yes**.
14. At the top of the vSphere Web Client, click the **Go Home** button.

## Lab 6

# Datastore Upgrades

### Objective: Upgrade and create VMFS datastores

In this lab, you will perform the following tasks:

1. Upgrade a VMFS-3 Datastore to a VMFS-5 Datastore
2. Create a VMFS-5 Datastore

### Task 1: Upgrade a VMFS-3 Datastore to a VMFS-5 Datastore

In this task, you upgrade the shared VMware vSphere® VMFS-3 datastores to VMFS version 5.

Use the following information from the class configuration handout:

- Student VMware vSphere® Web Client user name
  - Standard lab password
  - Specified shared VMFS-3 datastore
1. In the inventory view, click **vCenter** and click **Storage**.
  2. Expand the **Training** data center.
  3. Select the specified shared VMFS-3 datastore.

#### **CAUTION**

Upgrade only the datastore specified for your use. If you upgrading the datastore not assigned to you, your partner cannot complete the lab.

4. In the center pane, click the **Summary** tab.

**Q1. What version of VMFS is the shared datastore?**

5. In the inventory view, right-click the specified shared datastore and select **All vCenter Actions > Upgrade to VMFS-5**.
6. In the Upgrade to VMFS-5 window, select the shared VMFS datastore check box and click **OK**.
7. In the right pane, in the Recent Tasks pane, monitor the Upgrade VMFS task.

**Q2. What version of VMFS is the shared datastore now?**

8. Right-click your assigned shared VMFS datastore and select **Rename**.
9. Name the datastore *Your\_Name* Shared Silver and click **OK**.

*Your\_Name* is your first name.

Example: John Shared Silver

## **Task 2: Create a VMFS-5 Datastore**

In this task, you create a local VMFS-5 datastore.

1. In the inventory view, right-click **Training** and select **All vCenter Actions > New Datastore**.
2. In the New Datastore window, click **Next**.
3. On the Type page, verify that **VMFS** is clicked and click **Next**.
4. On the Name and device selection page, type ***Your\_Name* Local Gold** in the **Datastore name** text box

*Your\_Name* is your first name.

Example: John Local Gold

5. Select the VMware ESXi™ host from the drop-down menu.
6. Select the LUN and click **Next**.
7. On the VMFS version page, accept the VMFS-5 default and click **Next**.
8. On the Partition configuration page, view the partition details.

This LUN is already partially used. The gray areas of the Partition Layout diagram represent those areas.

9. Accept the default settings and click **Next**.



10. On the Ready to complete page, click **Finish**.
11. In the right pane, in the Recent Tasks pane, monitor the Create VMFS datastore task.
12. After the datastore is created, select the *Your\_Name Local Gold* datastore.
13. On the datastore's **Summary** tab, verify that the VMFS datastore is version 5.
14. At the top of the vSphere Web Client, click the **Go Home** button.



# Lab 7

## Storage Management

### Objective: Work with user-defined storage tags

In this lab, you will perform the following tasks:

1. Create a User-Defined Storage Tag
2. Enable the ESXi Host to Use Virtual Machine Storage Policies
3. Create a Virtual Machine Storage Policy
4. Associate a Storage Policy with Virtual Machine 1
5. Associate a Storage Policy with Virtual Machine 2
6. Rename Virtual Machines 3 and 4
7. Remove Storage Policies from Virtual Machines 1 and 2

### Task 1: Create a User-Defined Storage Tag

In this task you create two user-defined tags: Gold Tier and Silver Tier. You assign the tags to your datastores.

1. In the inventory view, click **vCenter** and click **Storage**.
2. Select the **Your\_Name Local Gold** datastore.
3. On the **Summary** tab, view the Tags panel.

**Q1. Are any tags listed?**

4. Right-click the **Your\_Name Local Gold** datastore and select **Assign Tag**.

5. In the *Your\_Name* Local Gold - Assign Tag dialog box, click the **New tag** icon.

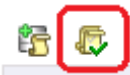


6. In the **Name** text box, type **Gold Tier**.
7. In the **Description** text box, type **Top Class Storage**.
8. Select **New Category** from the **Category** drop-down menu.
9. In the **Category Name** text box, type **Top Class** and click **OK**.
10. Select the **Gold Tier** tag and click **OK**.
11. Verify that the Gold Tier tag appears in the Tags panel.
12. Create a tag named Silver Tier of the Second Class category and assign it to the Silver Tier datastore.
  - a. Right-click the *Your\_Name* Shared Silver datastore and select **Assign Tag**.
  - b. In the *Your\_name* Shared Silver - Assign Tag dialog box, click the **New tag** icon.
  - c. In the **Name** text box, type **Silver Tier**.
  - d. In the **Description** text box, type **Second Class Storage**.
  - e. Select **New Category** from the **Category** drop-down menu.
  - f. In the **Category Name** text box, type **Second Class** and click **OK**.
  - g. Select the **Silver Tier** tag and click **OK**.
  - h. Verify that the Silver Tier storage tag appears in the Tags panel.

## Task 2: Enable the ESXi Host to Use Virtual Machine Storage Policies

In this task, you enable the VMware ESXi™ host to use virtual machine storage policies.

1. In the top of the vSphere Web Client, click the **Go Home** button.
2. Click **Rules and Profiles** and click **VM Storage Policies**.
3. In the center pane, click the **Enable VM storage policies per compute resource** icon on the toolbar.



4. In the Enable VM Storage Policies window, select the cluster and click **Enable**.
5. Verify that the VM Storage Policy Status column shows Enabled for the cluster.
6. Click **Close**.

### Task 3: Create a Virtual Machine Storage Policy

In this task, you create a virtual machine storage policy named Gold Storage Policy.

1. In the center pane, click the **Create a new VM Storage Policy** icon on the toolbar.



2. On the Name and description page, type **Gold Storage Policy** in the **Name** text box and click **Next**.
3. On the Rule-Sets page, click **Next**.
4. On the Rule-Set 1 page, click **Add tag-based rule**.  
Vendor-specific tags are unavailable because no VASA provider storage is available.
5. In the Add Tag-Based Rule window, select **Top Class** from the **Categories** drop-down menu.
6. Select the **Gold Tier** check box and click **OK**.
7. Click **Next**.
8. On the Matching resources page, view the resources matched to the rule set.

**Q1. Which resource is matched to this rule set?**

9. Click **Next** and click **Finish**.
10. Verify that the new storage policy appears in the VM Storage Policies inventory.
11. In the inventory view, click **Gold Storage Policy**.
12. In the center pane, click the **Monitor** tab and verify that **VMs and Virtual Disks** is selected.

**Q2. How many virtual machines are associated with this policy?**

13. In the inventory view, select **VM Storage Policies**.
14. Repeat steps 3 through 11 to create a virtual machine storage policy for the Silver storage category.

- a. Name the policy Silver Storage Policy.
- b. Assign the Silver Tier tag from the Second Class category.
- c. Verify that the Silver Tier datastore appears as a matching resource.

## Task 4: Associate a Storage Policy with Virtual Machine 1

In this task, you associate a storage policy with virtual machine 1.

1. At the top of the vSphere Web Client, click the **Go Home** button.
2. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
3. Select virtual machine 1.
4. Right-click virtual machine 1 and select **Rename**.
5. Rename the virtual machine *Your\_Name*Server01.  
*Your\_Name* is your first name.  
Example: MikeServer01
6. Right-click the **Your\_NameServer01** virtual machine and select **All vCenter Actions > VM Storage Policies > Manage VM Storage Policies**.
7. In the Manage VM Storage Policies window, select **Silver Storage Policy** from the **Home VM Storage Policy** drop-down menu.
8. Click **Apply to Disks** and click **OK**.
9. In the center pane, verify that the **Summary** tab is active.
10. In the VM Storage Policies panel, verify that the virtual machine is storage compliant.

## Task 5: Associate a Storage Policy with Virtual Machine 2

In this task, you associate a storage policy with virtual machine 2.

1. In the inventory view, select virtual machine 2.
2. Right-click virtual machine 2 and select **Rename**.
3. Rename the virtual machine *Your\_Name*Server02.  
*Your\_Name* is your first name.  
Example: MikeServer02
4. Right-click the **Your\_NameServer02** virtual machine and select **All vCenter Actions > VM Storage Policies > Manage VM Storage Policies**.

5. In the Manage VM Storage Policies window, select **Gold Storage Policy** from the **Home VM Storage Policy** drop-down menu.
6. Click **Apply to Disks** and click **OK**.
7. In the inventory view, verify that *Your\_NameServer02* is selected and that the **Summary** tab is active.
8. In the VM Storage Policies panel, verify that the virtual machine is Not Compliant.
9. In the center pane, click the **Manage** tab and select **VM Storage Policies**.

**Q1. What is the value listed in the VM Storage Policy column?**

10. In the center pane, click the **Monitor** tab and select **Storage Reports**.
11. Click the **Rescan vCenter Server** icon and click **Yes**.



Datastore

**Q2. What is the value listed in the Datastore column?**

**Q3. Using the information from the views in steps 9 and 11, why is the virtual machine listed as Not Compliant?**

12. Use VMware vSphere® Storage vMotion® to bring the Server02 virtual machine into compliance.
  - a. In the inventory view, right-click the Server02 virtual machine and select **Migrate**.
  - b. On the Select Migration Type page, click **Change datastore** and click **Next**.
  - c. On the Select Datastore page, select the *Your\_Name Local Gold* datastore.  
The *Your\_Name Local Gold* datastore is listed under Compatible. All other datastores are listed under Incompatible.
  - d. For the virtual disk format, select **Same format as source** from the drop-down menu and click **Next**.
  - e. On the Review Selections page, click **Finish**.
  - f. In the Recent Tasks pane, monitor the Relocate virtual machine task until it completes.

13. After the migration is complete, click the **Monitor** tab.
14. On the Storage Reports page, click **Rescan** and click **Yes**.
15. Verify that the *Your\_Name* Local Gold datastore appears in the datastore list.
16. In the center pane, click the **Manage** tab.
17. In the VM Storage Policies pane, click the **Compliance Check** icon to force the server to verify the virtual machine compliance status.



18. Verify that the Server02 virtual machine is Compliant.

## Task 6: Rename Virtual Machines 3 and 4

In this task, you rename virtual machines 3 and 4.

1. In the inventory view, click **vCenter** and click **VMs and Templates**.
2. Rename virtual machine 3.
  - a. Right-click virtual machine 3 and select **Rename**.
  - b. Rename the virtual machine *Your\_Name*Server03.  
*Your\_Name* is your first name.  
Example: MikeServer03
3. Rename virtual machine 4.
  - a. Right-click virtual machine 4 and select **Rename**.
  - b. Rename the virtual machine *Your\_Name*Server04.  
*Your\_Name* is your first name.  
Example: MikeServer03
4. Leave virtual machines 3 and 4 powered off.

## Task 7: Remove Storage Policies from Virtual Machines 1 and 2

In this task, you remove the storage tagging in preparation for the next lab.

1. Remove the storage policy from virtual machine 1.
  - a. In the inventory view, right-click *Your\_Name*Server01.



- b. Select **All vCenter Actions > VM Storage Policies > Manage VM Storage Policies**.
  - c. In the Manage VM Storage Policies window, select **None** from the **Home VM Storage Policy** drop-down menu.
  - d. Click **Apply to Disks** and click **OK**.
2. Remove the storage policy from virtual machine 2.
  - a. In the inventory view, right-click *Your\_NameServer02*.
  - b. Select **All vCenter Actions > VM Storage Policies > Manage VM Storage Policies**.
  - c. In the Manage VM Storage Policies window, select **None** from the **Home VM Storage Policy** drop-down menu.
  - d. Click **Apply to Disks** and click **OK**.
3. At the top of the vSphere Web Client, click the **Go Home** button.



## Lab 8

# Managing Datastore Clusters

### Objective: Manage and run vSphere Storage DRS on a datastore cluster

In this lab, you will perform the following tasks:

1. Create a Datastore Cluster Enabled for vSphere Storage DRS
2. Perform a Datastore Evacuation with Datastore Maintenance Mode
3. Manually Run vSphere Storage DRS and Apply Migration Recommendations
4. Prepare for the Next Lab

### Task 1: Create a Datastore Cluster Enabled for vSphere Storage DRS

In this task, you create a datastore cluster that is enabled for VMware vSphere® Storage DRS™. You verify that the datastores in the datastore cluster have the proper virtual machine configuration.

Use the following information from the class configuration handout:

- Student VMware vSphere® Web Client user name
  - Standard lab password
1. In the inventory view, click **vCenter** and click **Storage**.
  2. Right-click the **Training** data center and select **New Datastore Cluster**.
  3. On the Name and Location page, type ***Your\_Name*DatastoreCluster**.

*Your\_Name* is your first name.

Example: GregDatastoreCluster

4. Leave the **Turn on Storage DRS** check box selected and click **Next**.
5. On the Storage DRS Automation page, leave **No Automation (Manual Mode)** clicked and click **Next**.
6. On the Storage DRS Runtime Settings page, leave the **Enable I/O metric for SDRS recommendations** check box selected.
7. Drag the **Utilized Space** slider fully to the right and click **Next**.
8. On the Select Clusters and Hosts page, select the **Cluster** check box and click **Next**.
9. On the Select Datastores page, select the **Your\_Name Local Gold** and **Your\_Name Shared Silver** datastore check boxes.

### **IMPORTANT**

The cluster created in the lab environment is for the sole purpose of performing lab tasks. In a production environment, you should avoid mixing local and shared datastores, datastores with different performance characteristics, datastores of differing tiers, or datastores with different capacities in the same datastore cluster.

10. Click **Next**.
11. On the Ready to Complete page, verify the datastore cluster information and click **Finish**.
12. Verify that the datastore cluster appears in the inventory view and that it contains the *Your\_Name* Local Gold and *Your\_Name* Shared Silver datastores.
13. Verify that your Gold Tier and Silver Tier datastores each contain at least one virtual machine that is powered on.
  - a. In the inventory view, select each datastore.
  - b. In the center pane, click the **Related Objects** tab and select **Virtual Machines**.

*Your\_Name* Local Gold should contain *Your\_Name*Server02 powered on.

*Your\_Name* Shared Silver should contain *Your\_Name*Server01, 03, and 04.

*Your\_Name*Server01 should be powered on.

## Task 2: Perform a Datastore Evacuation with Datastore Maintenance Mode

In this task, you place a datastore in maintenance mode and apply a migration recommendation. You verify that the evacuated datastore is empty.

1. In the inventory view, right-click the *Your\_Name Local Gold* datastore and select **All vCenter Actions > Enter Maintenance Mode**.

The SDRS Maintenance Mode Migration Recommendations dialog box shows one recommendation and the reasons for the recommendation.

2. Verify that the **Apply** check box is selected for the recommendation.
3. Click **Apply Recommendations**.
4. Monitor the progress of the migration in the Recent Tasks pane until the tasks are complete.
5. After the migration is complete, verify that the Gold Tier datastore is in maintenance mode.

The icon of a datastore in maintenance mode looks like the screenshot.



6. In the inventory view, select the *Your\_Name Local Gold* datastore.
7. If necessary, click the **Related Objects** tab and select **Virtual Machines**.
8. In the center pane, verify that no virtual machines appear in the center pane under Virtual Machines on the **Related Objects** tab.
9. In the inventory view, select the *Your\_Name Shared Silver* datastore.
10. Verify that all the virtual machines are listed in the center pane under Virtual Machines on the **Related Objects** tab.
11. Right-click the *Your\_Name Local Gold* datastore and select **All vCenter Actions > Exit Maintenance Mode**.

The datastore immediately exits maintenance mode.

Because the thresholds for storage and CPU are not exceeded, no VMware vSphere® Storage vMotion® migrations are necessary. Even if the thresholds were exceeded, because the automation level of the datastore cluster is set to No Automation (Manual Mode), no migrations would occur.

## Task 3: Manually Run vSphere Storage DRS and Apply Migration Recommendations

In this task, you manually run vSphere Storage DRS to generate a migration recommendation. You apply the recommendation.

1. In the inventory view, select *Your\_Name*DatastoreCluster.
2. In the center pane, click the **Monitor** tab and select **Storage DRS**.
3. Verify that there are no recommendations in the **Storage DRS Recommendations** list.
4. Decrease the utilized space threshold to generate recommendations.
  - a. In the center pane, click the **Manage** tab.
  - b. Under Settings, select **Storage DRS** and click **Edit**.
  - c. In the Edit Storage DRS Settings window, click **Storage DRS Automation**.

**Q1. What is the current utilized space threshold?**

- d. Drag the slider all the way to the left to set **Utilized Space Threshold** to 50 percent.
  - e. Click **OK**.
5. Click the **Monitor** tab and click **Run Storage DRS Now**.

One migration recommendation appears in the Storage DRS Recommendations list.

The **Apply** check box is selected for the recommendation and cannot be deselected. When you want to deselect a recommendation, select the **Override Storage DRS Recommendations** check box.

6. Click **Apply Recommendations**.
7. Monitor the Recent Tasks pane until the Execute Storage vMotion task is complete.
8. After the migration is complete, verify that the *Your\_Name* Shared Silver and *Your\_Name* Local Gold datastores contain virtual machines.
  - a. In the inventory view, select the *Your\_Name* Shared Silver datastore.
  - b. In the center pane, click the **Related Objects** tab.
  - c. Verify the presence of three virtual machines.
  - d. Select the *Your\_Name* Local Gold datastore.
  - e. Verify the presence of one virtual machine.

## Task 4: Prepare for the Next Lab

In this task, you remove your datastore cluster to prepare for the next lab.

1. In the inventory view, right-click *Your\_NameDatastoreCluster* and select **All vCenter Actions > Remove from Inventory**.
2. Click **Yes** to verify removal.
3. Verify that the datastore cluster is removed from the inventory and that the Shared Silver and Local Gold datastores are directly under the Training data center.
4. At the top of the vSphere Web Client, click the **Go Home** button.







## **Lab 9**

# Monitoring VMware vSphere High Availability

### **Objective: Create and monitor a vSphere cluster enabled for vSphere HA**

In this lab, you will perform the following tasks:

1. Place the ESXi Host into Maintenance Mode
2. Create a Cluster Enabled for vSphere HA
3. Add Student B's ESXi Host to Student A's vSphere HA Cluster
4. View Information About the vSphere HA Cluster
5. Monitor Activity in the vSphere HA Cluster
6. (Student B) Prepare for the Next Lab
7. (Student A) Prepare for the Next Lab

### **Task 1: Place the ESXi Host into Maintenance Mode**

In this task, you place the VMware ESXi™ host into maintenance mode.

Students perform this task individually.

Use the following information from the class configuration handout:

- Student VMware vSphere® Web Client user name
- Standard lab password

1. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
2. Expand **Training** and expand **Cluster**.
3. Shut down all powered-on virtual machines.
  - a. Right-click each virtual machine, select **Shut Down Guest OS**, and click **Yes**.
  - b. Monitor the virtual machines until they fully power off.
4. Right-click the ESXi host and select **Enter Maintenance Mode**.
5. In the Confirm Maintenance Mode dialog box, click **OK**.

## Task 2: Create a Cluster Enabled for vSphere HA

In this task, you create a cluster enabled for VMware vSphere® High Availability.

Students perform this task as a team from student A's ControlCenter.

1. Create a vSphere HA cluster.
  - a. Right-click the **Training** data center and select **New Cluster**.
  - b. On the New Cluster page, type **HA Lab Cluster** in the **Name** text box.
  - c. Select the **Turn On vSphere HA** check box.
  - d. Configure the vSphere HA settings.

Option	Action
Enable host monitoring	Leave selected.
Enable admission control	Leave selected.
Percentage of cluster resources reserved as failover spare capacity	Click the button.
Reserved Failover CPU capacity	In the text box, type <b>40</b> .
Reserved failover memory capacity	In the text box, type <b>30</b> .
VM Monitoring	Leave at the defaults.

- e. Click **OK**.
2. After the vSphere HA cluster is created, drag student A's ESXi host into the new cluster.

3. Monitor the Recent Tasks pane until the Move Host task completes.
4. In the inventory view, expand **HA Lab Cluster**.
5. Right-click the ESXi host and select **Exit Maintenance Mode**.

### **Task 3: Add Student B's ESXi Host to Student A's vSphere HA Cluster**

In this task, you add student B's ESXi host to the vSphere HA cluster.

Students perform this task as a team from student B's ControlCenter.

Use the following information from the class configuration handout:

- Name of student A's ESXi host
  - Name of student B's ESXi host
  - ESXi host user name
  - Standard lab password
  - Student A vSphere Web Client shortcut
  - Student vSphere Web Client user name
1. On the Mozilla Firefox shortcut bar, click student A's vSphere Web Client shortcut.
  2. Use the student vSphere Web Client user name and standard lab password to log in to the vSphere Web Client.
  3. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  4. Expand **Training**.
  5. Right-click **HA Lab Cluster** and select **Add Host**.
  6. On the Name and location page, type the name of student B's ESXi host in the **Host name or IP address** text box and click **Next**.
  7. On the Connection settings page, type the ESXi host user name and standard lab password.
  8. Click **Next**.
  9. In the Security Alert dialog box, click **Yes**.
  10. Complete the addition of the ESXi host.
    - a. On the Host summary page, notice the warning at the top of the page and click **Next**.
    - b. On the Assign license page, select the current license and click **Next**.
    - c. On the Lockdown mode page, click **Next**.

- d. On the Ready to Complete page, click **Finish**.
  - e. In the Recent Tasks pane, monitor the Add host task until it is complete.
11. In the inventory view, expand **HA Lab Cluster**.
  12. Right-click student B's ESXi host and select **Exit Maintenance Mode**.
  13. After the host exits maintenance mode, power on the *Student\_AServer01* and *Student\_BServer02* virtual machines.  
If powering on the second virtual machine fails and generates an error, wait 1 to 2 minutes and try again.

## Task 4: View Information About the vSphere HA Cluster

In this task, you view information about the vSphere HA cluster. You view the cluster summary, the configuration issues, and the vSphere HA state of the virtual machines and hosts.

Students perform this task individually.

1. In the inventory view, select **HA Lab Cluster**.
2. In the center pane, click the **Monitor** tab.
3. On the **Monitor** tab, click **vSphere HA**.

**Q1. Which host is the master host?**

**Q2. How many virtual machines are protected?**

4. In the center pane, click the **Related Objects** tab.
5. On the **Related Objects** tab, click **Virtual Machines**.
6. In the list of virtual machines, drag the HA Protection column to the left so that it can be seen next to the Name column.  
You can find the HA Protection column by scrolling the list of virtual machines to the right.
7. View the HA Protection status for each virtual machine.

**Q3. What is the status of virtual machines that are powered on?**

**Q4. What is the status of virtual machines that are powered off?**

8. Right-click the powered-on virtual machine assigned to your ESXi host and select **All vCenter Actions > Power > Suspend**.

Student A uses *Student\_AServer01*. Student B uses *Student\_BServer02*.

9. In the Confirm Suspend dialog box, click **Yes**.

**Q5. What stages does the virtual machine go through while being suspended?**

## Task 5: Monitor Activity in the vSphere HA Cluster

In this task, you simulate a master host becoming unavailable in the vSphere HA cluster by placing the master host in maintenance mode. You monitor the cluster activity as the host becomes unavailable and available.

Students perform this task as a team from their individual ControlCenter servers.

1. (Student A) Put the master host in maintenance mode.
  - a. In the inventory view, right-click the master host that you recorded in task 4, step 5 and select **Enter Maintenance Mode**.
  - b. In the Confirm Maintenance Mode pop-up window, deselect the **Move powered off and suspended virtual machines to other hosts in the cluster** check box.
  - c. Click **OK**.
2. (Students A and B) View the status to determine what takes place.
  - a. In the inventory view, verify that the **HA Lab Cluster** is selected.
  - b. In the center pane, click the **Monitor** tab and click **vSphere HA**.
  - c. Refresh the vSphere Web Client view.

**Q1. Which host is the master host?**

## Task 6: (Student B) Prepare for the Next Lab

In this task, you return student B's ESXi host to its original VMware vSphere® environment.

Student B performs this task.

Use the following information from the class configuration handout:

- Name of student B's ESXi host
- ESXi host user name

- Standard lab password
  - Student B vSphere Web Client shortcut
  - Student vSphere Web Client user name
1. In the inventory view, right-click student B's ESXi host and select **Enter Maintenance Mode**.
  2. In the Confirm Maintenance Mode dialog box, deselect the **Move powered-off and suspended virtual machines** check box and click **OK**.
  3. On the Mozilla Firefox shortcut bar, click the student B vSphere Web Client shortcut.
  4. If necessary, use the student vSphere Web Client user name and standard lab password to log in to the vSphere Web Client.
  5. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  6. Right-click student B's ESXi host and select **Connect**.  
If the connection attempt fails with the message "Not available on this object at this time," wait a few seconds and repeat step 6 until the connection succeeds.
  7. In the Reconnect host dialog box, click **Yes** to start the Add Host wizard.
  8. On the Name and location page, click **Next**.
  9. On the Connection setting page, type the ESXi host user name and standard lab password and click **Next**.
  10. In the Security Alert dialog box, click **Yes**.
  11. On the Host summary page, click **Next**.
  12. On the VM location page, select **MyVMs** and click **Next**.
  13. On the Resource Pool page, click **Next**.
  14. On the Ready to complete page, click **Finish**.
  15. In the Recent Tasks pane, monitor the Reconnect host task until it is complete.
  16. After the host is connected, right-click the host and select **Exit Maintenance Mode**.
  17. At the top of the vSphere Web Client, click the **Go Home** button.

## **Task 7: (Student A) Prepare for the Next Lab**

In this task, you return student A's ESXi host to its original location.

Student A performs this task.

1. Right-click student B's ESXi host and select **All vCenter Tasks > Remove from Inventory**.
2. In the Remove Host confirmation window, click **Yes**.

3. Drag student A's ESXi host to the vSphere cluster named Cluster.
4. Right-click student A's ESXi host and select **Exit Maintenance Mode**.
5. Right-click **HA Lab Cluster** and select **All vCenter Actions > Remove from Inventory**.
6. In the Remove cluster dialog box, click **Yes**.
7. In the top of the vSphere Web Client, click the **Go Home** button.





## **Lab 10**

# Using VMware vSphere Auto Deploy on vCenter Server Appliance

### **Objective: Configure vSphere Auto Deploy for vCenter Server Appliance and autodeploy an ESXi host**

In this lab, you will perform the following tasks:

1. Prepare for the Lab
2. Start the vSphere Auto Deploy Service
3. Configure the TFTP service
4. Extract a Host Profile
5. Use vSphere PowerCLI to Configure vSphere Auto Deploy
6. Configure DHCP
7. Reboot Student B's ESXi Host
8. (Optional) Watch Student B's ESXi Host Reboot and Autodeploy
9. Remediate the Autodeployed Host
10. View the Autodeployed Host in the vCenter Server Inventory
11. (Optional) Export an Image Profile to an ISO File

## Task 1: Prepare for the Lab

In this task, you collect information necessary to complete other tasks in this lab.

Perform this task as a team on student B's ControlCenter.

Use the following information from the class configuration handout:

- Student VMware vSphere® Web Client user name
  - Standard lab password
1. If necessary, use the student vSphere Web Client user name and standard lab password to log in to the student B VMware vSphere® Web Client.
  2. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  3. Select the ESXi host.
  4. In the center pane, click the **Manage** tab and click **Networking**.
  5. On the Networking page, select **VMkernel Adapters**.

### Q1. What networks are connected?

6. Record the following information from the VMkernel Adapters page:
  - Host IPv4 address for the Management network \_\_\_\_\_
  - Host IPv4 address for the vMotion network \_\_\_\_\_
  - Host IPv4 address for the IPStorage network \_\_\_\_\_
7. In the center pane, select **Storage**.
8. In the **Adapter** list, select the iSCSI software adapter.
9. Record the software iSCSI adapter iSCSI qualified name (IQN): \_\_\_\_\_  
The software iSCSI adapter IQN is in the Identifier column.
10. In the center pane, click the **Monitor** tab and select **Storage Reports**.
11. Select **Datastores** from the **Report On** drop-down menu.

### Q2. What datastores are listed?

## Task 2: Start the vSphere Auto Deploy Service

In this task, you start the VMware vSphere® Auto Deploy™ service on VMware® vCenter™ Server Appliance™.

Students perform this task individually.

Use the following information from the class configuration handout:

- VMware® vCenter™ Server Appliance™ administrator shortcut
- VMware® vCenter Server™ administrator user name
- vCenter Server administrator password

1. On the Mozilla Firefox shortcut bar, click your vCenter Server administrator shortcut.
2. Use the vCenter Server administrator credentials to log in to the vCenter Server Appliance.
3. If necessary, scroll down to Services.
4. Verify that the vSphere Auto Deploy status is Stopped.
5. Click **Start**.

The vSphere Auto Deploy status changes to Running.

6. Log out of vCenter Server Appliance and close the Web browser.

### Task 3: Configure the TFTP service

In this task, you configure the TFTP service on vCenter Server Appliance.

Students perform this task individually on their vCenter Server Appliance.

Use the following information from the class configuration handout:

- vCenter Server Appliance name
- vCenter Server administrator user name
- vCenter Server administrator password

1. Using PuTTY, log in to the vCenter Server Appliance with the vCenter Server administrator credentials.
  - a. On the ControlCenter desktop, double-click **Putty**.
  - b. In the **Host Name** text box, type the vCenter Server Appliance name and click **Open**.
  - c. If necessary, click **Yes** in the PuTTY Security Alert dialog box.
  - d. Log in with the vCenter Server administrator credentials.

2. In the PuTTY session, run the `more` command to display the `/etc/sysconfig/atftpd` file.

```
more /etc/sysconfig/atftpd
```

No changes are necessary. The boot files are in the `/srv/tftpboot` directory.

3. Notice the value of the `ATFTPD_DIRECTORY` variable.

4. Run the `ls` command to display the contents of the `/srv/tftpboot` directory.

```
ls /srv/tftpboot
```

The contents of this folder are the files that an autodeployed host uses to start the deployment.

**Q1. How many items are listed?**

5. Run the `service` command to start the TFTP service.

```
service atftpd start
```

6. Run the `service` command to check the status of the atftpd service.

```
service atftpd status
```

**Q2. What is the status of the atftpd service?**

7. Type `exit` to end the PuTTY session.

## Task 4: Extract a Host Profile

In this task, you extract a host profile from student A's ESXi host.

Students perform this task as a team in student A's ControlCenter.

Use the following information from the class configuration handout:

- Name of student A's ESXi host

1. Log in to the vSphere Web Client.
  - a. On the ControlCenter desktop, double-click **Mozilla Firefox**.
  - b. Log in using the student vSphere Web Client user name and standard lab password.
2. In the inventory view, click **Rules and Profiles** and click **Host Profiles**.
3. In the center pane, click the **Extract profile from a host** icon.

The icon looks like a green plus sign.
4. In the Extract Host Profile window, click the button for student A's ESXi host and click **Next**.
5. On the Name and Description page, rename the profile to `host_profile` and click **Next**.
6. Click **Finish**.
7. Monitor the Extract Host Profile task until it completes.
8. Close the Mozilla Firefox window.

## Task 5: Use vSphere PowerCLI to Configure vSphere Auto Deploy

In this task, you use VMware vSphere® PowerCLI™ to configure vSphere Auto Deploy on vCenter Server Appliance.

Students perform this task individually from their ControlCenter to their vCenter Server Appliance. Student A uses VC1 and Student B uses VC2.

Use the following information from the class configuration handout:

- vCenter Server Appliance host name
  - vCenter Server administrator user name
  - vCenter Server administrator password
  - Path to the ESXi offline depot
1. Minimize the Mozilla Firefox window.
  2. On the ControlCenter desktop, double-click **VMware vSphere PowerCLI**.  
vSphere PowerCLI starts with a series of errors because of its current execution policy. You resolve these errors in this lab.
  3. At the command prompt, run the `Get-ExecutionPolicy` cmdlet to check the execution policy.

```
Get-ExecutionPolicy
```

### NOTE

You can use the Tab key to automatically complete vSphere PowerCLI cmdlets. For example, on the vSphere PowerCLI command line, type `get-ex` and press the Tab key. The full `Get-ExecutionPolicy` cmdlet is entered on the command line.

#### Q1. What is the status of the execution policy?

4. Run the `Set-ExecutionPolicy` cmdlet to set the execution policy to `RemoteSigned`.

```
Set-ExecutionPolicy RemoteSigned
```

5. Type `y` for yes and press Enter.
6. Type `exit` to end the vSphere PowerCLI session.

You must restart vSphere PowerCLI for the `RemoteSigned` execution policy to be in effect.

7. On the ControlCenter desktop, double-click **VMware vSphere PowerCLI**.

8. Run the `Connect-VIServer` cmdlet to connect to your vCenter Server Appliance.

```
connect-viserver vCenter_Server_Appliance
```

`vCenter_Server_Appliance` is the host name of the vCenter Server Appliance.

#### **NOTE**

A warning appears in the vSphere PowerCLI user interface as the connection is made. Ignore this error message. The message is due to a problem with the certificate for the vCenter Server Appliance. It does not affect the lab.

9. In the Specify Credential window, type the vCenter Server administrator credentials and click **OK**.

The cmdlet returns a table that specifies the name or IP address of the vCenter Server system, the port in use, and the user that is using that connection.

<b>Name</b>	<b>Port</b>	<b>User</b>
<b>vc1</b>	<b>443</b>	<b>root</b>

10. Run the `Add-ESXSoftwareDepot` cmdlet to load the software repository.

```
add-esxsoftwaredepot path_to_the_ESXi_offline_depot
```

11. Run the `Get-EsxImageProfile` cmdlet to list the image profiles in the software repository.

```
get-esximageprofile
```

#### **Q2. What two profiles are listed?**

12. Run the `New-DeployRule` cmdlet to create a rule named rule-imageprofile.

```
new-deployrule -name rule-imageprofile -item image_profile_name -allhosts
```

This rule assigns an image profile to all hosts that are autodeployed. `image_profile_name` is the name of the no-tools image profile that is displayed by the `Get-EsxImageProfile` cmdlet. The image profile name is case-sensitive.

The `-AllHosts` option applies the new rule to all hosts that are autodeployed. This cmdlet can take up to 5 minutes to run.

**Example:** `new-deployrule -name rule-imageprofile -item ESXi-5.5.0-1209974-no-tools -allhosts`

13. Run the `New-DeployRule` cmdlet to create a rule named rule-cluster.

```
new-deployrule -name rule-cluster -item Cluster -allhosts
```

This rule assigns an autodeployed host to a cluster.

14. Run the `New-DeployRule` cmdlet to create a rule named `rule-hostprofile`.

```
new-deployrule -name rule-hostprofile -item host_profile -allhosts
```

This rule assigns a host profile to all hosts that are autodeployed.

15. Run the `Add-DeployRule` cmdlet to add the new rules to the working rule set.

```
add-deployrule -deployrule rule-imageprofile
```

```
add-deployrule -deployrule rule-cluster
```

```
add-deployrule -deployrule rule-hostprofile
```

16. Run the `Get-DeployRuleSet` cmdlet to verify that the rules were added.

```
get-deployruleset
```

### Q3. What rule names are listed?

17. Type `exit` to quit vSphere PowerCLI.

## Task 6: Configure DHCP

In this task, you configure the DHCP service on the domain controller to support the necessary Bootstrap Protocol (BOOTP) features.

Students perform this task as a team on student A's ControlCenter.

Use the following information from the class configuration handout:

- Active Directory (AD) domain administrator user name
  - Standard lab password
  - TFTP server name
1. Access the scope options for the Management scope.
    - a. On the ControlCenter desktop, double-click **dc.RDP**.
    - b. Use the AD domain administrator user name and standard lab password to log in.
    - c. On the domain controller desktop, double-click **DHCP**.
    - d. In the right pane, double-click the DHCP server.
    - e. In the inventory view, select the **Management** scope.

- f. In the right pane, double-click **Scope Options**.
2. Add the Boot Server Host Name and Bootfile Name options to the scope.
  - a. In the inventory view, right-click **Scope Options** and select **Configure Options**.
  - b. In the Scope Options window, select the **066 Boot Server Host Name** check box.
  - c. In the **String Value** text box, type the TFTP server name.
  - d. In the Scope Options window, select the **067 Bootfile Name** check box.
  - e. In the **String Value** text box, type `undionly.kpxe.vmw-hardwired`.
  - f. In the Scope Options window, click **OK**.
  - g. Verify that the new options appear in the right pane.
3. Disconnect the domain controller remote desktop session.
4. On the ControlCenter desktop, double-click **Mozilla Firefox**.

## Task 7: Reboot Student B's ESXi Host

In this task, you reboot student B's ESXi host and confirm the autodeploy status.

Students perform this task as a team on student B's ControlCenter.

Use the following information from the class configuration handout:

- Student vSphere Web Client user name
  - Standard lab password
  - Student A vSphere Web Client shortcut
  - Student B vSphere Web Client shortcut
1. Log in to student B's vSphere Web Client.
    - a. On the ControlCenter desktop, double-click **Mozilla Firefox**.
    - b. Log in using the student vSphere Web Client user name and standard lab password.
  2. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  3. Right-click the ESXi host and select **Reboot**.
  4. In the Reboot Host window, click **OK**.

## Task 8: (Optional) Watch Student B's ESXi Host Reboot and Autodeploy

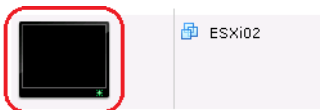
In this task, you access the console for the ESXi server and monitor the reboot as it autodeploys.



Both students perform this task individually.

Use the following information from the class configuration handout:

- VMware® vCloud Director® URL
  - Jump-box server user name
  - Jump-box server password
  - Name of student B's ESXi host
1. Minimize the ControlCenter remote desktop connection window to access your jump-box server desktop.
  2. Open Internet Explorer.
  3. In the address text box, type the vCloud Director URL.
  4. Use the jump-box server credentials to log in to vCloud Director.
  5. In the vCloud Director UI, find your classroom vApp and click the **Open** link.  
You should see only a single vApp.
  6. In the center pane, click the **Virtual Machines** tab.
  7. Click the **Console** link for Student B's ESXi host.  
The **Console** link appears as a black window image.



8. Monitor the ESXi host until it completes the deployment.
9. Minimize the ESXi host console window and open your ControlCenter Remote Desktop Protocol window.

## Task 9: Remediate the Autodeployed Host

In this task, you remediate the autodeployed host profile after the autodeployed host appears in Student A's vCenter Server Appliance.

Students perform this task as a team on student B's ControlCenter.

Use the following information from the class configuration handout:

- Student vSphere Web Client user name

- Standard lab password
  - Student A vSphere Web Client shortcut
1. On the shortcut bar, click the student A vSphere Web Client shortcut.
  2. Use the student vSphere Web Client user name and standard lab password to log in to the vSphere Web Client.
  3. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  4. Refresh the vSphere Web Client every 3 minutes until the autodeployed host appears in the inventory view.  
The host appears in maintenance mode.
  5. At the top of the vSphere Web Client, click the **Go Home** button.
  6. In the inventory view, click **Rules and Profiles** and click **Host Profiles**.
  7. In the center pane, click the host profile named **host\_profile** to open the profile.
  8. In the inventory view, select **Hosts**.
  9. In the center pane, click the **Summary** tab.

**Q1. Is the autodeployed host compliant?**

10. In the inventory view, right-click the autodeployed host and select **All vCenter Actions > Host Profiles > Remediate**.
11. On the Customize hosts page, click the **Property Name** column header to sort the selections by name.
12. Customize the host.

You might have to resize the Customize hosts pane to correlate the information in the table with the UI.

<b>Property Name</b>	<b>Path Detail</b>	<b>Value</b>
Disable the Adapter profile	Not applicable	Leave unselected.
Host IPv4 Address	Management network	Type the information that you recorded in task 1.
Host IPv4 Address	vMotion network	Type the information that you recorded in task 1.

Property Name	Path Detail	Value
Host IPv4 Address	IPStorage network	Type the information that you recorded in task 1.
iSCSI Alias for the adapter	Not applicable	Leave blank.
Mac Address	IPStorage network	Leave blank.
Mac Address	vMotion network	Leave blank.
Specify IQN for iSCSI adapter	Not applicable	Type the information that you recorded in task 1.
Subnet mask	Management network	Type <b>255 . 255 . 255 . 0.</b>
Subnet mask	vMotion network	Type <b>255 . 255 . 255 . 0.</b>
Subnet mask	IPStorage network	Type <b>255 . 255 . 255 . 0.</b>

13. Click **Next** and click **Finish**.
14. In the Recent Tasks pane, monitor the Update host customizations and Apply host configurations tasks until they complete.
15. In the inventory view, right-click the autodeployed host and select **Exit Maintenance Mode**.
16. In the Recent Tasks pane, monitor the Exit Maintenance Mode task until it completes.
17. At the top of the vSphere Web Client, click the **Go Home** button.
18. In the inventory view, click **Rules and Profiles** and click **Host Profiles**.

**Q2. Is the autodeployed host compliant?**

19. At the top of the vSphere Web Client, click the **Go Home** button.

## Task 10: View the Autodeployed Host in the vCenter Server Inventory

In this task, you verify that your autodeployed ESXi host appears in the vSphere Web Client inventory.

Both students perform this task individually.

Use the following information from the class configuration handout:

- Student vSphere Web Client user name
  - Standard lab password
  - Student A vSphere Web Client shortcut
1. If necessary, log in to the Student A vSphere Web Client.
    - a. On the Mozilla Firefox shortcut bar, click the Student A vSphere Web Client shortcut.
    - b. Use the student vSphere Web Client user name and standard lab password to log in to the vSphere Web Client.
  2. In the inventory view, click **vCenter** and click **Hosts and Clusters**.
  3. Select the autodeployed host.
  4. In the center pane, verify that the **Manage** tab is active and that **Networking** is selected.
  5. Select VMkernel adapters.

**Q1. How many networks is the host configured for?**

6. In the center pane, click the **Monitor** tab and click **Storage Reports**.
7. In the center pane, select **Datastores** from the **Report On** drop-down menu.
8. Click the **Rescan vCenter Server** icon and click **Yes**.



Datastore

**Q2. How many datastores are listed?**

9. Close the Mozilla Firefox Web browser.

## Task 11: (Optional) Export an Image Profile to an ISO File

In this task, you log in to vSphere PowerCLI, add an offline depot, clone an image profile, and export the profile to an ISO file.

Students perform this task individually.

Use the following information from the class configuration handout:

- vCenter Server Appliance name
- vCenter Server administrator user name

- vCenter Server administrator password
  - Path to the ESXi offline depot
1. On the ControlCenter desktop, double-click the **VMware vSphere PowerCLI** icon.
  2. Run the `Connect-VIServer` cmdlet to connect to your vCenter Server system.
 

```
connect-viserver vCenter_Server_system_FQDN
```
  3. In the Specify Credential window, use the vCenter Server administrator credentials to log in.
  4. Run the `Add-ESXSoftwareDepot` cmdlet to add a software depot to VMware vSphere® ESXi™ Image Builder CLI.

```
add-esxsoftwaredepot path_to_the_software_depot
```

5. Run the `Get-ESXImageProfile` cmdlet to verify that the image depot can be read.
 

```
get-esximageprofile
```

Two image profiles are listed: ESXi 5.5 (no tools) and ESXi 5.5 (standard).

6. Run the `New-ESXImageProfile` cmdlet to create an image profile by cloning a profile.

```
Example: new-esximageprofile -cloneprofile image_profile
        -name myprofile -vendor vmware
```

*image\_profile* is the name of one of the profiles that you listed (your choice).

#### NOTE

When this step is complete, you can create your own custom image profile with the `Add-ESXSoftwarePackage` cmdlet. Do not create a custom image profile in this lab.

7. Run the `Export-ESXImageProfile` cmdlet to export the image profile to an ISO file.

```
export-esximageprofile -imageprofile myprofile -exporttoiso
        -filepath c:\depot\your_name-profile.iso
```

8. When the export is complete, verify that the *your\_name-profile.iso* file exists in the depot directory.

```
ls c:\depot
```

9. Type **exit** to quit vSphere PowerCLI.



# Answer Key

## Lab 1: Using the VMware vSphere Web Client

Task 1: Examine the Main Parts of the vSphere Web Client	1
1. Port 9443	
2. Hosts and Clusters, VMs and Templates, Storage, and Networking	
3. Data centers, clusters, ESXi hosts, and virtual machines	
4. Data centers, virtual machine folders, virtual machines, and virtual machine templates	
5. The number of hosts, virtual machines, clusters, networks, and datastores in the data center and the overall storage allocation	
6. The All Issues page	
7. The Performance, Tasks, Events, and Storage Reports pages	

Task 3: (Optional) Explore the vSphere Web Client UI	5
1. Three: Two virtual machines and a template	
2. Two	
3. VMFS-3	
4. Created VMFS. In the inventory view, select vCenter > Storage > Training. Select a datastore. Click the Monitor tab. View the Events page.	
5. Virtual Machine Directory. In the inventory view, select vCenter > Hosts and Clusters. Select the ESXi host. Select the Manage tab. View the Settings page. Select Swap file location.	
6. Send a notification trap. From any of the vCenter Server inventory views (Hosts and Clusters, VMs and Templates, Storage, or Networking), select the vCenter Server. Click the Manage tab. View the Alarm Definitions page.	
7. Administrator. From any of the vCenter Server inventory views (Hosts and Clusters, VMs and Templates, Storage, or Networking), select the vCenter Server instance. Click the Manage tab. View the Permissions page.	
8. vmhba33. Select vCenter > Hosts and Clusters. Select the host. Click the Manage tab. View the Storage page.	

## Lab 2: VMware vCenter Single Sign-On

Task 1: Connect the vCenter Server Appliance to the AD Domain	7
1. vCenter Server Appliance uses the embedded vCenter Single Sign-On deployment type.	

## Lab 4: Managing Virtual Machines

Task 1: Upgrade the Virtual Machine Hardware for Virtual Machines . . . . .17

1. Version 8
2. Version 9216

## Lab 5: Configuring Port Mirroring

Task 3: Assign a Host and Uplink to Lab05-dvs . . . . .20

1. Uplink 1

## Lab 6: Datastore Upgrades

Task 1: Upgrade a VMFS-3 Datastore to a VMFS-5 Datastore . . . . .27

1. The shared datastore is VMFS-3.
2. The local datastore is VMFS-5.

## Lab 7: Storage Management

Task 1: Create a User-Defined Storage Tag . . . . .31

1. No tags are listed for this datastore.

Task 3: Create a Virtual Machine Storage Policy . . . . .33

1. The Your\_Name Local Gold datastore.
2. None

Task 5: Associate a Storage Policy with Virtual Machine 2 . . . . .34

1. Gold Storage Policy
  2. Your\_Name Shared Silver
  3. The virtual machine is not compliant, because the Server02 virtual machine is on the Silver
- datastore. To be compliant, the Server02 virtual machine must be on the Gold datastore.

## Lab 8: Managing Datastore Clusters

Task 3: Manually Run vSphere Storage DRS and Apply Migration Recommendations . . .42

1. Utilized space is set to 100 percent.

## Lab 9: Monitoring VMware vSphere High Availability

Task 1: Place the ESXi Host into Maintenance Mode . . . . .45

Task 2: Create a Cluster Enabled for vSphere HA . . . . .46

Task 3: Add Student B's ESXi Host to Student A's vSphere HA Cluster . . . . .47

Task 4: View Information About the vSphere HA Cluster . . . . .48

1. Student A's ESXi host
2. Two
3. Protected status
4. N/A status
5. As the virtual machine is suspended, the protection status changes from Protected to Unprotected to N/A.

Task 5: Monitor Activity in the vSphere HA Cluster . . . . .49

1. Student B's ESXi host



## Lab 10: Using VMware vSphere Auto Deploy on vCenter Server Appliance

Task 1: Prepare for the Lab. . . . .	54
1. Management Network, pg-vMotion, and pg-IPStorage	
2. SharedLUN0#, Your_Name Shared Silver, and Your_Name Local Gold	
Task 3: Configure the TFTP service . . . . .	55
1. Seven items	
2. Running	
Task 5: Use vSphere PowerCLI to Configure vSphere Auto Deploy . . . . .	57
1. Restricted	
2. ESXi-5.5.0-1209974-no-tools and ESXi-5.5.0-1209974-standard	
3. rule-ImageProfile, rule-cluster, rule-hostprofile	
Task 9: Remediate the Autodeployed Host. . . . .	61
1. No.	
2. Yes.	
Task 10: View the Autodeployed Host in the vCenter Server Inventory . . . . .	63
1. The host has its original three VMkernel adapters.	
2. All three original datastores are listed.	

