Citrix XenServer 6.0 Administration

Citrix Course CXS-203-1I

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Exercise Workbook
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Courseware

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Module 2

Installing and Configuring XenServer

About Complex Compression Hardware, Systems Inc

Complex Compression Hardware, Systems Inc (CCH Systems) is a for-profit hardware and software development company based in San Francisco, California that creates advanced video compression technologies. CCH oversees an open source foundation that drives development of the software harnessing the open source community. While CCH's main video compression software is open source and freely downloadable, the stable build is very complex and not suitable for enterprise use.

When the open source version of the software reaches certain milestones, the code is forked and CCH integrates enterprise-focused tools to make the software suitable for enterprise use. CCH also sells several hardware devices designed specifically to offload video compression workloads for enterprise customers. The CCH hardware devices can accelerate compression speeds better than that of stock hardware.

When creating their enterprise products, CCH ensures that the software goes through a rigorous quality assurance (QA) process so that every new enhancement to the compression algorithms is fully optimized. Previously, the QA team had a small datacenter with 30 dedicated systems to perform these QA checks. However, the IT team responsible for managing this datacenter found it very difficult to maintain the systems, especially since all of the machines needed to be exact duplicates for testing. The IT team also found that testing the software on dedicated hardware was not actually required for the types of tests that the QA team needed to perform. Additionally, the company's management team could not justify the cost of maintaining their relatively large datacenter.

Lab Scenario

CCH started decommissioning the QA team's datacenter two months ago, opting instead to virtualize their testing workloads to save time and money. Through their local Citrix partner, CCH purchased several XenServer 6.0 Platinum licenses and designed a plan to implement their new QA Lab over the next week.

You are a XenServer 6.0 administrator in charge of implementing the new QA Lab by the specified deadline. In addition to setting up XenServer, you also need to implement Citrix Provisioning Services to create virtual machines that the QA team can use to perform their testing. A few members of the IT team will help you with the initial hardware installation and networking set up, but will move on to other projects once the initial set up is complete.

Lab Environment

The following table provides descriptions and roles of each virtual machine in the lab environment:

Virtual Machine	Role	OS	Hostname
DomainController	• Domain Controller • SQL Server	Windows Server 2008 R2	DC
Router	Performs routing from the Quality Assurance lab network to the IT network. The IT network provides access to the internet and several key company services.	Linux	Router

User Credentials

Please use the following credentials as you complete these exercises:

CCH\CitrixAdmin

- **Username**: CCH\CitrixAdmin
- **Password**: Password1
- **Member of**: CCH\Domain Admins

Win7Admin

- **Username**: Win7Admin
- **Password**: Password1

Exercise 2-1: Installing XenCenter

Scenario

The datacenter staff has already installed Citrix XenServer 6.0 onto a server for you. A member of the IT networking team set up the preliminary networking of the device so that you can access the management interface. The datacenter staff has provided to you a detailed file containing server and peripheral information which has been downloaded to your desktop. The company's Active Directory administrator also set up a virtual machine to act as your department's domain controller.

In order to begin administrating your XenServer host, you need to install Citrix XenCenter to your desktop and connect to your XenServer host.

Estimated time to complete this exercise: 5 minutes

Installing XenCenter

1. Launch the XenCenter setup wizard located in C:\xenserver\client_install folder.
    a. Go to **Start** > **Computer**.
    b. Browse to C:\XenServer\client_install.
    c. Double-click **XenServer-6.0.0-XenCenter.msi**.
2. Install XenCenter in the default directory using the XenCenter wizard.
    a. Click **Next** in the Citrix XenCenter Setup wizard.
    b. Click **Next** to accept the default installation directory C:\Program Files (x86)\Citrix\XenCenter\.
    c. Click **Install** to begin installing XenCenter.

       The Installation Complete screen appears.
    d. Click **Finish**.

Launching XenCenter and Adding a XenServer Host

1. Launch XenCenter and begin adding a new server.
    a. Go to **Start** > **Citrix XenCenter**.
    b. Click **No** to specify not to check for XenServer updates.
    c. Click **Add New Server** from the XenCenter toolbar.
2. Add the XenServer listed to the XenCenter console using the XenServer IP addressfrom the student reference file. Use the root/Password1 credentials to log on and save the connection state on startup.
    a. Type the XenServer IP address listed in the Student Reference file in the server field.

b. Type `root` in the User name field and `Password1` in the Password field.

c. Click **Add**.

d. Select **Save and restore server connection state on startup** and click **OK**.

e. Click **Close** in the License Manager window.

Exercise 2-2: Licensing the XenServer Host

Scenario

You recently received the XenServer Platinum license from Citrix Systems, Inc and need to license the XenServer host. You decide to use the Citrix License Server Virtual Appliance to act as this license server.

You need to import and configure the license server virtual appliance, install the license, and then license the XenServer host to that server.

Estimated time to complete this exercise: 15 minutes

Importing the Citrix License Server Virtual Appliance

1. Begin importing the "Citrix License Server Virtual Appliance.xva" file located in `c:\XenServer\` on to the XenCenter.
   a. Click **File > Import**.
   b. Click **Browse** and browse to `c:\XenServer\`.
   c. Select the **Citrix License Server Virtual Appliance.xva** file and click **Open**.
   d. Click **Next**.
2. Specify your local XenServer as the home server and use its local storage for the new virtual machine. Use the default Network 0 virtual network interface and complete the wizard using the default options specifying to start the virtual machine after the import is completed.
   a. Select **XenServer** as the home server and click **Next**.
   b. Select **Local storage** as the storage for the new virtual machine and click **Import**.
   c. Ensure that **Network 0** is listed as the only virtual network interface and click **Next**.
   d. Verify **Start VM(s) after import** is selected and click **Finish**.
      A virtual machine appears in the resource pane.
3. Rename the "2. Citrix License Server Virtual Appliance" virtual machine to "LicenseServerVPX."
   a. Right-click the **2. Citrix License Server Virtual Appliance** virtual machine and click **Properties**.
   b. Type `LicenseServerVPX` in the Name field and click **OK**.

Configuring the Citrix License Server Virtual Appliance

1. Access the console of the LicenseServerVPX virtual machine to begin configuring the virtual appliance. Set the root password to Password1.
   a. Click the **Console** tab.

b.   Click in the console and press **Enter**.

c.   Type `Password1` and press **Enter** to set the root password.

> Ignore the message that the password is bad. Passwords are not displayed as you type them.

This entry is case sensitive, so it must be exact.

d.   Type `Password1` again to confirm the password and press **Enter**.

2.   Configure the server name as "license-server" and domain suffix as "cch.local". Specify not to use DHCP to configure the network settings.

a.   Type `license-server` as the host name and press **Enter**.

This entry is case sensitive, so it must be exact.

b.   Type `CCH.local` for the domain suffix and press **Enter**.

c.   Type `n` and press **Enter** to ensure DHCP is not used for the network settings.

3.   Configure the IP, subnet address, and gateway using the information below and allow the virtual appliance to restart. Set the admin password to Password1.

- IP Address: `10.10.<X>.50`

> Where <X> is the XenServer ID.

- Netmask: `255.255.255.0`
- Gateway: `10.10.<X>.1`

> Where <X> is the XenServer ID.

a.   Use the above information to configure the networking settings.

b.   Review the network settings. Type `y` and press **Enter** if the settings are correct.

The virtual appliance finishes its set up.

c.   Type `Password1` in Specify an admin password and confirm prompts and press **Enter**.

Importing Licenses into the Citrix License Server Virtual Appliance

1.   Use Internet Explorer on the lab desktop to access the administration section of the Citrix License Server located athttp://10.10.<X>.50:8082, replacing <X> with the server ID in your student reference guide.

a. Launch **Internet Explorer** on the lab desktop and browse to `http://10.10.<X>.50:8082` to access the Citrix License Administration Console.

Replace <X> with the server ID in the student reference guide.

b. Click **Administration** in the upper-right hand portion of the screen.

c. Log on with the `admin/Password1` credentials.

2. Import the XenServer license located in `C:\XenServer\xenserver_license` to the Citrix License Server Virtual Appliance. Do not close Internet Explorer.

a. Click **Vendor Daemon Configuration** and click **Import License**.

b. Click **Browse** and browse to `C:\XenServer\xenserver_license`.

c. Select **xenserver_platinum.lic** and click **Open**.

d. Click **Import License** and click **OK**.

Do not close Internet Explorer.

3. Use XenCenter to restart the Citrix License Server.

a. In XenCenter, right-click the LicenseServerVPX virtual machine and select **Reboot**.

b. Click **Yes.**

The License Server virtual machine restarts. Please allow it to restart before continuing.

4. Use Internet Explorer to access the license server console and verify that the license was installed correctly. Close Internet Explorer.

a. In Internet Explorer, click **Dashboard** in the Citrix License Administration Console.

b. Verify that a license exists for Citrix Provisioning Services, Citrix StorageLink Platinum, and Citrix XenServer Platinum.

c. Close Internet Explorer.

Assigning Licenses to XenServer Hosts

1. Use the License Manager in XenCenter to begin applying a license to the XenServer.

a. Select **Tools > License Manager** from the XenCenter menu.

b. Select your**XenServer** and click **Assign License**.

2. Apply a Citrix XenServer Platinum Edition from the license server located at 10.10.<X>.50 using the default port, replacing <X> with the server ID in your student reference guide.

a. Select **Citrix XenServer Platinum Edition**.

b. Type `10.10.<X>.50` in the Name field and leave the default port as 27000.

Replace <X> with the server ID in the student reference guide.

c. Click **OK** to assign the license.

d. Click **Close** to close the License Manager.

Module 3

XenServer Networking

Exercise 3-1: Managing Networks

Scenario

A request was submitted to the CCH networking team to allow for network and internet access to the virtual machines on the XenServer host. Since you will be hosting your own DHCP and Active Directory servers in your environment, the networking team had to use a vLAN to insure there would be no interference with normal networking operations. The networking team configured a routing virtual machine on the company network to allow for network access to company assets.

To complete the networking implementation you need to configure a network on the assigned vLAN. Then you need to add the new vLAN Network to the Router virtual machine to perform the routing between the different networks. You also need to add the new network to the DomainController virtual machine to provide Active Directory, DHCP, and DNS services for your network.

Before You Begin

To begin this lab, ensure that the following virtual machines are running:

- LicenseServerVPX

Estimated time to complete this exercise: 10 minutes

Creating a New Network

1. Use the New Network wizard in XenCenter to create a new External Network called `vLAN Network`.
   a. Click **XenServer** node and click the **Networking** tab.
   b. Click **Add Network**.
   c. Select **External Network** and click **Next**.
   d. Type `vLAN Network` in the Name field and click **Next**.
2. Configure the new network to use the VLAN ID listed in the student references file using the NIC "NIC 2". Set the network to be added automatically to new virtual machines.
   a. Select **NIC 2** from the NIC drop-down menu.
   b. Type the Network vLAN ID found in the Student_Reference.txt file into the vLAN field.
   c. Select **Automatically add this network to new virtual machines** and click **Finish**.

   The vLAN Network network entry is displayed.

Adding the Virtual Network Interface to Virtual Machines

1. Add the vLAN Network interface as the second interface of the Router virtual machine using an auto-generated MAC address and start the Router virtual machine.

   a. Select the **Router** virtual machine and click the **Networking** tab.

   b. Click **Add Interface**.

   c. Select **vLAN Network** from the Network drop-down menu and click **Add**.

   d. Click **Start** in the toolbar to start the Router virtual machine.

2. Add the vLAN Network interface as the first interface of the DomainController virtual machine using an auto-generated MAC address and start the DomainController virtual machine.

   a. Select the **DomainController** virtual machine and click the **Networking** tab.

   b. Click **Add Interface**.

   c. Select **vLAN Network** from the Network drop-down menu and click **Add**.

   d. Click **Start** in the toolbar to start the DomainController virtual machine.

Module 4

XenServer Storage Repositories

Exercise 4-1: Adding an ISO Library Storage Repository

Scenario

Another administrator created a Windows file share on a back end storage device to use as a central distribution point of DVD media in ISO format for the whole team. He also populated it with many commonly used ISO files.

You want to use this Windows file share as the XenServer's source of ISO files for use with virtual machines. To do this, you need to create a new ISO Library storage repository on your XenServer host.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- Router

Estimated time to complete this exercise: 5 minutes

Creating a Network ISO Library

1. In XenCenter, begin creating a new Windows File Sharing (CIFS) ISO library storage repository named "ISO-Library".
   a. In XenCenter, select your**XenServer**, then click **New Storage** in XenCenter.
   b. Select **Windows File Sharing (CIFS)** under ISO Library and click **Next**.
   c. Type ISO-Library in the name field and click **Next**.
2. Configure the ISO-Library to use the ISO Library Share path in the student reference file using the root/Password1 credentials.
   a. Use ISO Library Share Path from the student reference file as Share Name.
   b. Select **Use different user name**.
   c. Type root in the User name field and Password1 in the Password field.
   d. Click **Finish**.
      A new storage repository called ISO-Library appears under your XenServer host.
3. Verify that the contents of the c:\xenserver\ISO folder appear in the ISO-Library.
   a. Select **ISO-Library**.

b. Click the **Storage** tab.

The Storage panel displays a list of ISO images that are on the file share, including WINDOWS_2008_R2_64Bit_SP1.ISO and PVS_6.0.iso.

Exercise 4-2: Attaching a Virtual Disk Storage Repository

Scenario

By request, IT set up storage space on a back end storage appliance to use with the XenServer host. The storage is being shared through the NFS protocol. You decide to use this network share as virtual machine storage of more mission critical virtual machines.

You need to attach this NFS share to the XenServer host as a virtual disk storage repository.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- Router

Estimated time to complete this exercise: 10 minutes

Adding Virtual Disk Storage to a XenServer Host

1. Create a new NFS storage repository named "Shared VM Storage" using the information located in the student reference file on the landing desktop.
   a. Click **New Storage**.
   b. Select **NFS VHD** and click **Next**.
   c. Type Shared VM Storage in the Name field and click **Next**.
2. Use the NFS VM Storage Share name in the student reference file to scan for an existing storage repository.
   a. Type the <NFS VM Storage Share Name> from the student reference guide in the Share Name field.
   b. Click **Scan**.
3. Reattach the existing storage repository to the XenServer and set it as the default storage.
   a. Select **Reattach an existing SR**, select the storage repository listed, and click **Finish**.
   b. Click **Yes** to reattach the Shared VM Storage.
   c. Right-click **Shared VM Storage** and click **Set as Default**.

For future virtual machines, the Shared VM Storage will be the default storage repository.

Module 4: XenServer Storage Repositories

Exercise 4-3: Creating A New Virtual Machine With an Existing Virtual Disk

Scenario

Another administrator created a few virtual machines that you may need. To reduce duplication of effort she copied the virtual disk from her assigned NFS storage space to the one created for use with this XenServer host. One of the virtual disks contains Windows 7 in a sysprepped state that you eventually want to use as a Windows 7 template.

You need to create a new Windows 7 diskless virtual machine and attach this virtual disk to it.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- Router

Estimated time to complete this exercise: 10 minutes

Creating a Diskless Virtual Machine

1. Launch the New VM wizard on your XenServer Host.
    a. Select **XenServer**.
    b. Click **New VM** on the toolbar.
       The New VM wizard launches.
2. Use the Windows 7 (32-bit) template to create a virtual machine named Windows7-Template .
    a. Select the **Windows 7 (32-bit)** template from the Select a VM template screen and click **Next**.
    b. Type `Windows7-Template` in the Name field and click **Next**.
3. Specify for the virtual machine to boot from the network and use the default home server.
    a. Select **Boot from network** and click **Next**.

> Though this virtual machine will not be starting from the network, this option must be specified to create a diskless virtual machine.

    b. Click **Next** to accept the default home server.

4. Use the default number of vCPUs but change the memory to 1024MB. Specify to create a diskless VM.

    a. Verify that the default Number of vCPUs is set to 1.

    b. Type `1024` in the Memory field and click **Next**.

    c. Select **Create a diskless VM that boots from the network** and click **Next**.

5. Ensure vLAN Network is the only virtual network interface that will be added and finish the New VM wizard specifying for it to start automatically.

    a. Verify that vLAN Network is selected and click **Next**.

    b. Verify that **Start the new VM automatically** is selected and that all virtual machine properties are correct.

    c. Click **Finish**.

Adding an Existing Virtual Hard Disk from Shared Storage

1. View the Windows7-Template virtual machine's console and note that it attempted to start unsuccessfully from the network.

    a. Click the Windows7-Template virtual machine and click the **Console** tab.

    b. View the boot device errors listed in the console. If the console does not appear, click **Start** on the XenCenter toolbar.

> The virtual machine followed its boot up order by attempting to start on the network, then the DVD-drive, followed by a Hard Drive. Because none of these boot methods exist, the virtual machine was unable to find a bootable device and turned off.

2. View the Windows7-Template 's boot order.

    a. Right-click **Windows7-Template** and click **Properties**.

    b. Click **Boot Options** in the Properties dialog box.

3. Set the boot order to first boot from DVD-Drive and then from Hard Disk. Disable booting from the Network.

    a. Select **Network** and click **Move Down** two times to set it last in the Boot order.

    b. Ensure the checkbox for **Network** is deselected.

    c. Ensure that the **DVD-Drive** and **Hard Disk** checkboxes are selected and click **OK**.

4. Attach the "(No Name) 24 GB" disk from the Shared VM Storage to the Windows7-Template virtual machine.

    a. Click the **Storage** tab and click **Attach**.

    b. Select the **(No Name) 24 GB** disk from the Shared VM Storage node.

    c. Click **Attach**.

Do NOT start up the Windows7-Template virtual machine at this time.

Module 5

Creating and Managing
Virtual Machines

Exercise 5-1: Creating Virtual Machines

Scenario

You know that you will need virtual machines running Windows 7, Windows Server 2008 R2, and Linux in the future to perform your duties. Instead of creating each new virtual machine from scratch, you want to create base install templates of each operating system for you and other administrators to use on demand.

Since another administrator already created a Windows 7 template for you, you need to create a Windows Server 2008 R2 and Linux virtual machine to convert into a template at a later time.

Before You Begin

Before you begin this lab, ensure that the following virtual machines are started:

- DomainController
- Router
- LicenseServerVPX

Estimated time to complete this exercise: 15 minutes

Creating a Windows Virtual Machine

1. Launch the New VM wizard on your XenServer Host.
   a. Select **XenServer**.
   b. Click **New VM** on the toolbar.

   The New VM wizard launches.
2. Use the Windows Server 2008 R2 (64-bit) template and call it WindowsServer2008R2-Template .
   a. Select **Windows Server 2008 R2 (64-bit)** and click **Next**.

   The Name screen appears, asking for a machine name and description.
   b. Type `WindowsServer2008R2-Template` in the Name field and click **Next**.
3. Specify to start from the WINDOWS_2008_R2_64Bit_SP1.iso and do not assign a home server.
   a. Select **WINDOWS_2008_R2_64Bit_SP1.ISO** from the Install from ISO library or DVD drive drop-down list and click **Next**.
   b. Select **Don't assign this VM a home server** and click **Next**.
4. Accept the default Number of vCPUs (1) and change Memory to 1536 MB. Accept the default shared storage location and size (24 GB) of the virtual disk.
   a. Verify that 1 is listed in the vCPU field.

b. Type `1536` in the Memory field and click **Next**.

c. Verify that **Shared VM Storage** is selected and the size is **24 GB**.

d. Click **Next**.

5. Ensure vLAN Network is the only virtual network interface that will be added and finish the New VM wizard specifying for it to start automatically.

a. Verify that vLAN Network is selected and click **Next**.

b. Verify that **Start the new VM automatically** is selected and that all virtual machine properties are correct.

c. Click **Finish**.

Installing Windows Server 2008 R2

1. View the console of the WindowsServer2008R2-Template virtual machine and ensure that the virtual machine booted from the Windows installation ISO.

a. Select the **WindowsServer2008R2-Template** virtual machine and click the **Console** tab.

b. Verify that the virtual machine booted from the Windows installation ISO.

2. Begin the Windows Server 2008 R2 Enterprise full installation using the language defaults.

a. Accept the default language settings and click **Next**.

b. Click **Install now**.

c. Select the **Windows Server 2008 R2 Enterprise (Full Installation)** operating system and click **Next**.

d. Respond to the license agreement and click **Next**.

3. Use the custom installation to format all of the unallocated space of Disk 0 and then begin the install.

a. Click **Custom (advanced)** for the installation type.

b. Select **Disk 0 Unallocated Space** as the installation location and click **Next**.

Windows will begin the operating system installation.

Please continue to the following exercises as Windows installs.

Creating a Linux Virtual Machine

1. Launch the New VM wizard on your XenServer Host.

a. Select **XenServer**.

b. Click **New VM** on the toolbar.

The New VM wizard launches.

2. Create a virtual machine named CentOSLinuxServer-Template , using the CentOS 5.0 (32-bit) template.

   a. Select **CentOS 5 (32-bit)** and click **Next**.

     The Name screen appears.

   b. Type `CentOSLinuxServer-Template` in the Name field and click **Next**.

     The Installation Media screen appears.

3. Specify `http://vault.centos.org/centos/` as the installation source for the new virtual machine. Do not assign a host server.

   a. Select **Install from URL**.

   b. Type `http://vault.centos.org/centos/` in the Install from URL field and click **Next**.

   c. Select **Don't assign this VM to a home server** and click **Next**.

4. Specify to use a single vCPU, 512 MB of memory, and to store the virtual disk on the Shared VM Storage.

   a. Accept the default Number of VCPUs (**1**), type `512` into the Memory field, and click **Next**.

   b. Accept the default virtual disk setup and click **Next**.

5. Ensure vLAN Network is the only virtual network interface that will be added and finish the New VM wizard specifying for it to start automatically.

   a. Verify that vLAN Network is selected and click **Next**.

   b. Verify that **Start the new VM automatically** is selected and that all virtual machine properties are correct.

   c. Click **Finish**.

Installing CentOS Linux

1. Open the CentOS Linux virtual machine console and specify English as the default language.

   a. Select **CentOSLinuxServer-Template** and click the **Console** tab.

   b. Click into the **Console** window.

     The Choose a Language screen appears.

> Navigation in these screens uses the following keys:
> - **Tab / Alt-Tab** or **Up/Down/Left/Right Arrows**: Move between elements
> - **Space**: Select / Deselect
> - **F12**: Accept the entered values and move to the next screen

   c. Accept the default language **English** and select **OK**.

2. Configure IPv4 information to be dynamically assigned by the DHCP server and remove IPv6 support.

a. Select **Enable IPv4 support** and select **Dynamic IP configuration (DHCP)**.

b. Deselect **Enable IPv6 support**.

c. Select **OK**.

d. Select **OK** if prompted on the Welcome dialog box.

3. Continue the CentOS installation by accepting the defaults for the Partition Type and Partition Layout.

   a. Select **Yes** to create new partitions on the drive.

   b. Arrow to **Remove all partitions on selected drives and create default layout** and then select **OK**.

   c. Select **Yes**.

      The Review Partition Layout screen appears.

   d. Select **No**.

4. Accept the default values for the networking. Manually set the hostname of the server to CentOSLinuxServer.

   a. Select **OK**.

   b. Press the **Down** arrow then **Space** to select **manually**.

   c. Press the **Right** arrow and type `CentOSLinuxServer-Template`.

   d. Select **OK**.

      The Time Zone Selection screen appears.

5. Specify the time zone for your location and set `Password1` as the Root Password.

   a. Select the nearest region or time zone for your location and select **OK**.

   b. Type `Password1` in the Password and Password (confirm) fields.

   c. Select **OK**.

6. Accept the default desktop and complete the installation. Reboot the virtual machine when the installation is completed.

   a. Select **OK** to accept the default desktop.

   b. Select **OK** to start the installation.

      Installation of CentOS 5 on the virtual machine starts.

   c. Select **Reboot** after the installation is complete.

Exercise 5-2: Installing the XenServer Tools

Scenario

You recently installed CentOS and Windows Server 2008 R2 onto new virtual machines. Now you need to install the XenServer Tools onto each virtual machine to make the Linux system paravirtualized and Windows server system hardware virtualization assisted.

Installing the XenServer Tools at this point allows for subsequent installations of the tools to complete much faster. But once the Windows Server 2008 R2 virtual machine is sysprepped and turned into a template it will need to be installed again after every clone. This reinstallation is required because the sysprep process removes required XenServer device drivers.

Before You Begin

Before you begin this lab, ensure that the following virtual machines are running:

* CentOSLinuxServer-Template
* Router
* DomainController
* LicenseServerVPX
* WindowsServer2008R2-Template

Estimated time to complete this exercise: 15 minutes

Installing XenServer Tools for Linux Virtual Machines

1. Attach the xs-tools.iso to the CentOSLinuxServer-Template virtual machine and then access it's console. Log on using the root/Password1 credentials.
    a. Select **xs-tools.iso** from the DVD Drive 1 drop-down menu in the CentOSLinuxServer-Template virtual machine Console tab.
    b. Click into the console log on using the `root/Password1` credentials.
2. Use the linux command prompt to mount the ISO located at /dev/xvdd to the /mnt directory mount point. Access the /mnt/Linux directory and view its contents.
    a. Type `mount /dev/xvdd /mnt` and press **Enter**.
        The block device is mounted as read-only.
    b. Type `cd /mnt/Linux` and press **Enter** to access the /mnt/Linux directory.
    c. Type `ls` and press **Enter** to view the directory contents.

> Note the different packages available to installing the tools using different package managers.

3. Install the tools using the install.sh script and then reboot the virtual machine.

    a. Type `./install.sh` and pres **Enter**.

    b. Type `y` when the prompt appears asking to continue.

        Once the installation is completed the virtual machine must be restarted.

    c. Type `reboot` and press **Enter** at the prompt to restart the virtual machine.

4. Use XenCenter to verify that the XenServer tools were installed correctly.

    a. Wait for the virtual machine to complete the reboot before continuing.

    b. Click **CentOSLinuxServer-Template** virtual machine.

    c. Click the **General** tab.

    d. Verify that the virtualization state is listed as Optimized (Version 6.0 Installed).

        If the "Virtualization state" reads as "Optimized," the installation was successful.

5. Eject the xstools.iso file from the CentOSLinuxServer-Template .

    a. Click the **Console** tab.

    b. Click **Eject** next to the DVD drive drop-down to eject the ISO.

Installing XenServer Tools for Windows Server 2008 R2

1. Access the console of WindowsServer2008R2-Template virtual machine and set the Administrator password to "Password1".

    a. Click **WindowsServer2008R2-Template** and click **Console**.

    b. Click **OK** to change the user's password.

    c. Type `Password1` into the Password and confirm password field and click **OK**.

    d. Click **OK**.

2. Attach the xs-tools.iso to the WindowsServer2008R2-Template virtual machine and launch the installer.

    a. Select **xs-tools.iso** from the DVD Drive 1 drop-down menu.

    b. Click **Run xensetup.exe** from the AutoPlay dialog box.

3. Respond to the license agreement and install the tools into their default location. Restart the virtual machine when prompted.

    a. Respond to the license agreement and click **Next**.

    b. Accept the default installation destination and click **Install**.

        Allow the XenServer Tools to install before continuing.

    c. Verify that **Reboot now** is selected and click **Finish**.

4. Eject the xen-tools.iso from the virtual machine. When the WindowsServer2008R2-Template virtual machine reaches the logon screen, view its virtualization state.

   a. Select **<empty>** from the DVD Drive 1 drop-down menu.

   b. Wait for the WindowsServer2008R2-Template virtual machine to complete the restart.

   c. Click **WindowsServer2008R2-Template** virtual machine and click the **General** tab.

   d. Ensure that the virtualization state says "Optimized (version 6.0 installed)"

   The Optimized virtualization state indicates that the XenServer Tools were installed successfully.

Exercise 5-3: Creating Templates

Scenario

You recently created a CentOS Linux, Windows Server 2008 R2, and Windows 7 virtual machine to be used as templates. You now need to create the templates from these virtual machines.

The Windows Server 2008 R2 virtual machine first needs to be sysprepped to generalize it before it can be made into the template. While a Windows 7 virtual machine usually requires this as well, you received the virtual disk already in a sysprepped state from the administrator that created it. Linux based virtual machines do not require this step.

The Sysprep process generalizes a Windows virtual machine into an "out-of-the-box" state by removing unique identifiers within the operating system. This is required to ensure that each newly provisioned version of the template creates new identifiers to make it unique.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- CentOSLinuxServer-Template
- Router
- DomainController
- LicenseServerVPX
- WindowsServer2008R2-Template

Estimated time to complete this exercise: 10 minutes

Performing a Sysprep on the WindowsServer2008R2-Template

1. Log on to the WindowsServer2008R2-Template virtual machine as the Administrator user.
   a. Click the **WindowsServer2008R2-Template** virtual machine in XenCenter and click the **Console** tab.
   b. Click **Send Ctrl+Alt+Del** and log on to the virtual machine using the Administrator/Password1 credentials.
2. Launch the Sysprep utility from the C:\Windows\System32\sysprep folder.
   a. Click **Start > Computer** and browse to C:\Windows\System32\sysprep.
   b. Double-click the **sysprep.exe** file.

3. Set the System Preparation tool to enter the System Out-of-Box-Experience and to generalize the virtual machine. Set the tool to Shutdown the virtual machine when the sysprep is completed and then perform the sysprep.

   a. Select **Enter System Out-of-Box Experience (OOBE)** from the System Cleanup Action drop-down menu.

   b. Select the **Generalize** checkbox.

   c. Select **Shutdown** from the Shutdown Options drop-down menu.

   d. Click **OK** to perform the sysprep.

4. Please allow for the sysprep process to complete and the virtual machine to shut down before continuing.

Converting the Virtual Machines into Templates

1. Convert the WindowsServer2008R2-Template virtual machine into a template.

   a. Right-click the **WindowsServer2008R2-Template** virtual machine and click **Convert to Template**.

   b. Click **Convert** in the Convert VM to Template warning.

   The WindowsServer2008R2-Template moves to the bottom of the list and acquires a blue icon indicating that the virtual machine is now a template.

2. Convert the Windows7-Template virtual machine into a template.

   a. Right-click the **Windows7-Template** virtual machine and click **Convert to Template**.

   b. Click **Convert** in the Convert VM to Template warning.

   Since the Windows7-Template virtual machine is already in a Sysprepped state, it is ready to be converted into a template without any additional work.

3. Shut down the CentOSLinuxServer-Template virtual machine and convert it into a template.

   a. Right-click the **CentOSLinuxServer-Template** virtual machine and click **Shut Down**.

   b. Click **Yes** to confirm.

   Wait for the shutdown process to complete.

   c. Right-click the **CentOSLinuxServer-Template** virtual machine and click **Convert to Template**.

   d. Click **Convert** in the Convert VM to Template warning.

Exercise 5-4: Creating a Windows Virtual Machine From Template

Scenario

The Quality Assurance team needs to use Provisioning Services to create identical instances of virtual machines to perform testing on the latest compression algorithms improvements engineered in the company.

You need to prepare a Windows Server 2008 R2 for the Provisioning Services installation. To make it easy you want to use the new template you just created.

> Although the XenServer Tools were installed on this virtual machine before it was converted to template, the sysprep process is destructive and removed several key XenServer drivers. You will need to run the XenServer Tools installer again to reinstall these drivers.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- Router

Estimated time to complete this exercise: 10 minutes

Deploying a New Virtual Machine from a Template

1. Create a new virtual machine from the WindowsServer2008R2-Template template called ProvisioningServicesHost-1 .
   a. Right-click **WindowsServer2008R2-Template** and click **New VM Wizard**.
   b. Select the **WindowsServer2008R2-Template** template and click **Next**.
   c. Type `ProvisioningServicesHost-1` in the Name field and click **Next**.
2. Do not specify any installation media and don't assign the virtual machine a home server.
   a. Leave **<empty>** as the Installation Media and click **Next**.
   b. Select **Don't assign this VM a home server** and click **Next**.
3. Use the template default vCPU, and Memory settings. Specify to use a storage-level fast disk clone and to place the disk on the shared VM storage.
   a. Accept the default values for the vCPUs and Memory fields and click **Next**.

b. Ensure that **Shared VM Storage** is selected as the virtual disk location.

c. Ensure that **Use storage-level fast disk clone** is selected and click **Next**.

4. Ensure vLAN Network is the only virtual network interface that will be added and finish the New VM wizard specifying for it to start automatically.

   a. Verify that vLAN Network is selected and click **Next**.

   b. Verify that **Start the new VM automatically** is selected and that all virtual machine properties are correct.

   c. Click **Finish**.

Recovering from Sysprep and Joining the Domain

1. View the ProvisioningServicesHost-1 virtual machine console and allow the system to recover from Sysprep.

   a. Click the **ProvisioningServicesHost-1** virtual machine and click the **Console** tab.

   b. Wait for the virtual machine to begin the Windows setup wizard. This may take several minutes.

2. Use the default country, time, keyboard layout settings and respond to the license terms.

   a. Accept the defaults for Country or region, Time and currency, and Keyboard layout and click **Next**.

   b. Respond to the license terms and click **Start**.

3. Change the Administrator's password to Password1. Allow the virtual machine to log on to the desktop.

   a. Click **OK**.

   b. Type `Password1` in the password and confirm password fields.

   c. Press **Enter** and then click **OK**.

4. Configure the ProvisioningServicesHost-1 's computer name to be "PSH-1" and the domain cch.local.

   a. Click **Provide computer name and domain** in the Initial Configuration Tasks window.

   b. Click **Change** in the Computer Name tab.

   c. Type `PSH-1` in the Computer name field.

   d. Select **Domain**, type `cch.local` , and click **OK**.

5. Use the CCH\CitrixAdmin credentials to authorize the join. Close all open windows but do NOT restart the virtual machine.

   a. Log on to the cch.local domain using the CCH\CitrixAdmin credentials and click **OK**.

   b. Click **OK** to dismiss the welcome message.

   c. Click **OK** to acknowledge the changes will not take effect until after the virtual machine is restarted.

   d. Close all open windows, and choose **Restart Later** when prompted.

Reinstalling XenServer Tools on a Windows Virtual Machine

1. Attach the xs-tools.iso to the ProvisioningServicesHost-1 virtual machine and launch the installer.

   a. Select **xs-tools.iso** from the DVD Drive 1 drop-down menu.

   b. Click **Run xensetup.exe** from the AutoPlay dialog box.

2. Respond to the license agreement and install the tools into their default location. Restart the virtual machine when prompted.

   a. Respond to the license agreement and click **Next**.

   b. Accept the default installation destination and click **Install**.

      Allow the XenServer Tools to install before continuing.

   c. Verify that **Reboot now** is selected and click **Finish**.

Exercise 5-5: Adding Additional Resources to a Virtual Machine

Scenario

When discussing future needs of the environment with a fellow administrator, she reminded you that Provisioning Services requires shared storage to store the vDisks. Since you did not put an IT request in for this you may not get the storage space in time. You decide to use the DomainController virtual machine to temporarily host the vDisk storage for the time being.

Since the DomainController virtual machine does not currently have adequate storage space for the vDisk storage, you need to add another virtual disk to add additional storage.

You also want to add another virtual CPU to the ProvisioningServicesHost-1 virtual machine to ensure it has adequate resources.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- Router
- ProvisioningServicesHost-1

Estimated time to complete this exercise: 10 minutes

Adding a Virtual CPU and Virtual Disk

1. Shut down the ProvisioningServicesHost-1 virtual machine and add another vCPU.
   a. Right-click the **ProvisioningServicesHost-1** virtual machine and click **Shut Down**.
   b. Click **Yes** to confirm.
   c. Click the **General** tab and click **Properties**.
   d. Click the **CPU** category. View the number of vCPUs assigned to the virtual machine.
   e. Type 2 in the Number of VCPUs field and click **OK**.
2. Start the ProvisioningServicesHost-1 virtual machine.
3. View the DomainController virtual machine's storage.
   a. Click the **DomainController** virtual machine and click the **Storage** tab.
   b. View the current virtual disks attached to the virtual machine.
4. Add a new 50 GB virtual disk called "vDisk Storage" onto the Local Storage.

a. Click **Add**.

b. Type `vDisk Storage` in the Name field.

c. Type `50` in the Size field and ensure that **GB** is selected.

d. Select **Local storage** and click **Add**.

Formatting the Virtual Disk

1. View the console of the DomainController virtual machine and log on as the CCH\CitrixAdmin user.

   a. Click the **DomainController** virtual machine and click the **Console** tab.

   b. Click **Send Ctrl+Alt+Del** and log on as the CCH\CitrixAdmin user.

2. Launch Server Manager and access the Disk Management console.

   a. Click **Start > Administrative Tools > Server Manager**.

   b. Expand the **Server Manager (DC) > Storage** nodes and click **Disk Management**.

3. Initialize the Disk 1 disk using the Master Boot Record Partition style and begin creating a new simple volume.

   a. Ensure that **Disk 1** is selected.

   b. Select **MBR (Master Boot Record)** and click **OK**.

4. Use the unallocated area of Disk 1 to create a new simple volume and assign it the drive letter E.

   a. Right-click the **Unallocated** area for Disk 1 and select **New Simple Volume**.

   b. Click **Next** and click **Next** to accept the default volume size.

   c. Select **Assign the following drive letter**, select **E**, and click **Next**.

5. Perform a quick format to create the simple NTFS volume called "vDisk Storage".

   a. Select **Format this volume with the following settings** and select **NTFS**

   b. Type `vDisk Storage` in the Volume label field.

   c. Select **Perform a quick format** and click **Next**.

   d. Click **Finish**.

6. View the drives and devices attached to the computer. Verify that a new drive exists called "vDisk Storage" that is approximately 50 GB in size and has drive letter E:.

   a. Click **Start > Computer**

   b. Verify vDisk Storage appears as a virtual disk with a 50 GB size and has drive letter E:

7. Close all open windows on the DomainController virtual machine.

Configuring a Share

1. Access the Advanced Sharing settings for the vDisk Storage (E:) drive and share the folder with the share name "vDisk_Storage".
   a. Right-click vDisk Storage (E:) and click **Share With > Advanced Sharing** .
   b. Click **Advanced Sharing**.
   c. Select **Share this folder** and type vDisk_Storage in the Share name field.
2. Set the share permissions to grant all Domain Admins full control.
   a. Click **Permissions** and click **Add**.
   b. Type CCH\Domain Admins and click **Check Names**.
   c. Click **OK** and select **Allow** for the Full Control permission for CCH\Domain Admins.
3. Apply the settings for the share and then close all open windows on the virtual machine.
   a. Click **Apply** and click **OK** in the Permissions for vDisk_Storage window.
   b. Click **Apply** and click **OK** in the Advanced Sharing window.
   c. Close all open windows on the virtual machine.

Exercise 5-6: Integrating XenServer with Active Directory

Scenario

You are considering using the Active Directory integration features in XenServer to control access rights of different administrators to the XenServer host.

You want to implement the Active Directory integration to test the functionality. But because you haven't decided if you will need it, you want to disable it before continuing.

Before You Begin

To begin this lab, ensure that you have the:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- Router

Estimated time to complete this exercise: 15 minutes

Enabling Active Directory Authentication

1. In XenCenter, access the XenServer hosts's user information and begin joining the domain.
   a. Select your **XenServer** and click the **Users** tab.
   b. Click **Join Domain**.
2. Use the CCH\CitrixAdmin credentials to join the domain.
   a. Type `cch.local` in the Domain field.
   b. Type `CitrixAdmin` as the User name and `Password1` as the Password.
   c. Click **OK**.

Adding User Accounts and Assigning Rights

1. Add the "CCH\Domain Admins" and "CCH\TestUser" domain accounts as administrators to the XenServer Host.
   a. Click **Add.**
   b. Type `CCH\Domain Admins, CCH\TestUser`.
      If `testuser` is not available, use `guest` as an alternative.

    c.   Click **Grant Access** and click **Close**.

2. Change the role of the CCH\Domain Admins to grant Pool Admin access.

    a.   Click **CCH\Domain Admins** in the Users and Groups with Access list and click **Change Role.**

    b.   Select **Pool Admin** and click **Save**.

3. Change the role of the TestUser to grant VM Operator access.

    a.   Click **TestUser** and click **Change Role**.

    b.   Select **VM Operator** and click **Save**.

Verifying User Roles and Leaving the Domain

1. Reconnect to XenCenter as the CCH\TestUser user.

    a.   Right-click your **XenServer** and select **Reconnect As**

    b.   Log on using the CCH\TestUser/Password1 credentials.

    You will be connected to the XenServer host as the testuser account.

2. Attempt to view the XenServer host server and DomainController virtual machine consoles.

    a.   Click **XenServer** and click the **Console** tab.

    You are prompted with a warning that your current role is not authorized to perform this action. This will verify that the access for the account has been set appropriately.

    b.   Click the **DomainController** virtual machine and click the **Console** tab.

    You are able to view and interact with the virtual machine, but not the host.

3. Reconnect to the XenServer Host as the root user.

    a.   Right-click **XenServer** and select **Reconnect As**

    b.   Log on as the root/Password1 account.

    You will be connected to XenServer host as the root account.

4. Leave the CCH.local domain using the CitrixAdmin credentials.

    a.   Select **XenServer** and click the **Users** tab.

    b.   Click **Leave Domain**.

    c.   Click **Yes** on the warning message.

    d.   Enter the CitrixAdmin credentials and click **Disable**.

    XenServer is removed from the domain.

Module 6

Installing and Configuring Provisioning Services

Exercise 6-1: Installing Provisioning Services

Scenario

Now that the basic requirements of the XenServer Host are configured you want to start creating the Provisioning Services Host to begin working on the requirements of the Quality Assurance team.

Previously you prepared a Windows Server 2008 R2 virtual machine for use as the Provisioning Services Host. You need to install the Provisioning Services Host software onto the virtual machine along with all of the prerequisites like the .Net 3.5 framework.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- Router
- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1

Estimated time to complete this exercise: 25 minutes

Installing Microsoft .NET Framework

1. View the console of the ProvisioningServicesHost-1 virtual machine and logon as the as the CCH\CitrixAdmin user.
    a. Click the **ProvisioningServicesHost-1** virtual machine and click the **Console** tab.
    b. Log on to the virtual machine as the CCH\CitrixAdmin user.
2. Launch the Server Manager begin adding a new server feature.
    a. Click **Start** > **Administrative Tools** > **Server Manager**.
    b. Click the **Features** node and click **Add Features** from within the Features Summary menu.
3. Install the .NET Framework 3.5.1 feature without installing WCF activation feature, begin the installation and allow for the installation to be completed.
    a. Expand the **.NET Framework 3.5.1 Features** node and select **.NET Framework 3.5.1**.
    b. Click **Next** and then click **Install**.
       After a few moments, the installation completes.
    c. Click **Close**.
4. Close all open windows on the ProvisioningServicesHost-1 virtual machine.

Installing the Provisioning Services Console

1. Attach the PVS_6.0.iso to the ProvisioningServicesHost-1 virtual machine. Launch the setup wizard and begin the console installation process.
   a. Select the **PVS_6.0.iso** file in the DVD Drive menu above the console.
   b. Click **Run autorun.exe** to start the setup.
   c. Click **Console Installation**.
2. Install the Host PowerShell Snap-In x64
   a. Click **Install** to install the Host PowerShell SnapIn.

      The Citrix Host Snap-In screen appears.
   b. Respond to the license agreement and click **Install**.
   c. Click **Finish** to exit the setup wizard.
3. Install the Broker Snap-In x64.
   a. Respond to the license agreement and click **Install**.
   b. Click **Finish** to exit the setup wizard.
4. Begin the Citrix Provisioning Services Console installation and respond to the license agreement.
   a. Click **Next** to install the Citrix Provisioning Services Console.
   b. Respond to the license agreement and click **Next**.
5. Use CitrixAdmin as the User Name, CCH as the Organization and the default destination folder.
   a. Type CitrixAdmin in the username field.
   b. Type CCH in the Organization field and click **Next**.
   c. Click **Next** to accept the default destination folder.
6. Use the default setup type and complete the installation.
   a. Click **Next** to accept the default complete setup type.
   b. Click **Install** and, once completed, click **Finish**.

Installing Provisioning Services

1. Begin the Server Installation. When prompted, allow the installation of SQLncx64.
   a. Click **Server Installation**.
   b. Click **Install Server**.

      The InstallShield Wizard appears.
   c. Click **Install**.

      A notice appears asking you to verify an optional SQLncx64 installation.
   d. Click **Yes** and then confirm the installation of the SQLncx64.

2. Begin the Provisioning Services Installation and accept the terms in the license agreement.
   a. Click **Next** in the Citrix Provisioning Services x64 Installation Wizard.
   b. Respond to the license agreement and click **Next**.
3. Use CitrixAdmin as the User Name, CCH as the Organization and the default destination folder.
   a. Type `CitrixAdmin` in the username field.
   b. Type `CCH` in the Organization field and click **Next**.
   c. Click **Next** to accept the default destination folder.
4. Use the default setup type and complete the installation.
   a. Click **Next** to accept the default complete setup type.
   b. Click **Install** and, once completed, click **Finish**.

Exercise 6-2: Configuring Provisioning Services

Scenario

You recently installed Provisioning Services on to the ProvisioningServicesHost-1 virtual machine and now you need to configure it.

In preparation you had the company's database administrator create a database self-contained to your environment on the DomainController virtual machine. Since you already have DHCP services running within your network, you only want to install the TFTP services to run on the Provisioning Server Host.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- Router

Estimated time to complete this exercise: 20 minutes

Configuring Provisioning Services

1. Begin the Provisioning Services Configuration Wizard on the ProvisioningServicesHost-1 virtual machine. Use the DHCP service on another computer but enabling the PXE service on ProvisioningServicesHost-1 .

    a. Click **Next** in Provisioning Services Configuration Wizard to begin configuring Provisioning Services.

    b. Select **The service that runs on another computer** and click **Next**.

    c. Select **The service that runs on this computer** and click **Next** to enable the PXE service on the ProvisioningServicesHost-1 virtual machine.

2. Create a new farm using the SQLEXPRESS instance name on the DC server.

    a. Ensure that **Create Farm** is selected and click **Next**.

    b. Click **Browse**, select the **DC/SQLEXPRESS** instance, and click **OK**.

    c. Click **Next** to accept the database server settings.

3. Enter additional farm configuration information below. Use Active Directory groups and make the "cch.local/Users/Domain Admins" the administrator group.

- Database name: ProvisioningServices
- Farm name: CCH
- Site name: SanFrancisco
- Collection name: QualityAssuranceLab

   a. Enter the information listed above where required.

   b. Ensure that **Use Active Directory groups for security** is selected.

   c. Select **cch.local/Users/Domain Admins** from the Farm Administrator group and click **Next**.

4. Use "vDisk Store" as the Store name located at \\dc\vDisk_Storage.

   a. Type `vDisk Store` in the Store name field and click **Browse**.

   b. Type `\\dc\vDisk_Storage` in the Default path field.

   c. Click **Next** to proceed.

5. Specify "10.10.<X>.50" as the hostname, replacing <X> with the server ID in your student reference guide. Validate the license server version and communication.

   a. Type `10.10.<X>.50` in the License server name field.

      Replace <X> with the server ID in the student reference guide.

   b. Select **Validate license server version and communication** and click **Next**.

6. Specify the CCH\CitrixAdmin credentials and configure the database for the account.

   a. Select **Specified user account** and type `CitrixAdmin` in the User name field.

   b. Type `cch.local` in the Domain field.

   c. Type `Password1` in the Password and Confirm password fields.

   d. Select **Configure the database for the account** and click **Next**.

7. Use the default Active Directory Computer Account Password and Network Communication settings.

   a. Verify that the **Automate computer account password updates** is checked and click **Next**.

   b. Click **Next** to accept the default nework communication settings.

8. Specify to use the Provisioning Server TFTP service. Use the default stream servers boot list settings and finish the wizard allowing the wizard to automatically start the services.

   a. Select **Use the Provisioning Services TFTP service** and click **Next**.

   b. Click **Next** to accept the default stream servers boot settings.

   c. Click **Finish** to apply all configuration settings.

   d. Click **OK** in the firewall dialog and click **Done** once the configuration is completed.

9. Close all open windows on the ProvisioningServicesHost-1 virtual machine.

Exercise 6-3: Configuring Delegated Administration

Scenario

You recently configured a new Provisioning Service farm. Now you need to connect to the farm and set up delegated administration to allow all Domain Admins to administrate the farm.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- Router

Estimated time to complete this exercise: 15 minutes

Connecting to the Farm

1. Launch the Provisioning Services Console from the ProvisioningServicesHost-1 virtual machine and begin connecting to the farm.

    a. Click **Start > All Programs > Citrix > Provisioning Services > Provisioning Services Console**.

    b. Right-click the **Provisioning Services Console** node and click **Connect to Farm**.

2. Use PSH-1 as Name of the server, specify to auto-login in the future, and connect to the farm using the windows credentials.

    a. Type `PSH-1` in the Name field.

    b. Ensure that **Use my Windows credentials to login** is selected.

    c. Select **Auto-login on application start or reconnect** and click **Connect**.

Configuring Delegated Administration

1. View the group properties of the CCH farm.

    a. Right-click the **CCH (PSH-1)** node and click **Properties**.

    The Farm Properties dialog box opens.

    b. Click the **Groups** tab.

2. Add the "cch.local/Users/Domain Users" group to the CCH (PS-1) farm.
    a. Click **Add**.
    b. Click **Search** to view a list of groups and select the **cch.local/Users/Domain Users** group from the list.
    c. Click **OK** to close the Add System Groups dialog box.
    d. Click **OK** to close the Farm Properties dialog box.
3. View the SanFrancisco site security properties.
    a. Expand the **CCH (PS-1) > Sites > SanFrancisco** node.
    b. Right-click the **San Francisco** node then click **Properties**.
    c. Click the **Security** tab.
4. Add the "cch.local/Users/Domain Admins" as a Site Administrator.
    a. Click **Add**.
    b. Select the **cch.local/Users/Domain Admins** group and click **OK**.
    c. Click **OK** to close the Site Properties dialog box.
5. View the QualityAssuranceLab device collection security properties.
    a. Expand the **Device Collections** node.
    b. Right-click the **QualityAssuranceLab** node and click **Properties**.
6. Add the "cch.local/Users/Domain Admins" group as a device administrator groups to the CCH (PSH-1) farm.
    a. Click the **Security** tab and click the **Add** button under **Groups with 'Device Administrator' access**.
       The Add Security Groups dialog box opens.
    b. Select the **cch.local/Users/Domain Admins** group and click **OK**.
    c. Click **OK**.

Exercise 6-4: Adding a Provisioning Services Host to the Farm

Scenario

Eventually you want to set up load balancing for your Provisioning Service farm. So in preparation you want to add another Provisioning Services Host to the farm. Another administrator set up a virtual disk and placed it onto your shared storage. This virtual disk contains a Windows Server 2008 R2 system that is already joined to the Active Directory domain and has Provisioning Services installed.

You need to create a virtual machine for this virtual disk and then add it to the Provisioning Services farm.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- Router

Estimated time to complete this exercise: 30 minutes

Creating a Diskless Virtual Machine

1. Launch the New VM wizard on your XenServer Host.
   a. Select **XenServer**.
   b. Click **New VM** on the toolbar.
      The New VM wizard launches.
2. Use the Windows Server 2008 R2 (64-bit) template to create a virtual machine named ProvisioningServicesHost-2 .
   a. Select the Windows Server 2008 R2(64-bit) template and click **Next**.
   b. Type `ProvisioningServicesHost-2` in the Name field and click **Next**.
3. Specify for the virtual machine to boot from the network and use the default home server.
   a. Select **Boot from network** and click **Next**.

> Though this virtual machine will not be starting from the network, this option must be specified to create a diskless virtual machine.

    b. Click **Next** to accept the default home server.

4. Specify 2 vCPUs and change the memory to 1536 MB. Specify to create a diskless VM.

    a. Type 2 in the Number of vCPUs field.

    b. Type 1536 in the Memory field and click **Next**.

    c. Verify that **Create a diskless VM that boots from the network** is selected and click **Next**.

5. Ensure vLAN Network is the only virtual network interface that will be added and finish the New VM wizard specifying for it to start automatically.

    a. Verify that vLAN Network is selected and click **Next**.

    b. Verify that **Start the new VM automatically** is selected and that all virtual machine properties are correct.

    c. Click **Finish**.

Adding an Existing Virtual Hard Disk from Shared Storage

1. View the ProvisioningServicesHost-2 virtual machine's boot order.

    a. Right-click the **ProvisioningServicesHost-2** virtual machine and select **Properties**.

    b. Click **Boot Options**.

2. Set the boot order to first boot from DVD-Drive and then from Hard Disk. Disable booting from the Network.

    a. Select **Network** and click **Move Down** two times to set it last in the Boot order.

    b. Ensure the checkbox for **Network** is deselected.

    c. Ensure that the **DVD-Drive** and **Hard Disk** checkboxes are selected and click **OK**.

3. Attach the (No Name) 50GB disk from the Shared VM Storage to the ProvisioningServicesHost-2 virtual machine.

    a. Click the **Storage** tab and click **Attach**.

    b. Select the **(No Name) 50 GB** vDisk from the Shared VM Storage node.

    c. Click **Attach** and click **OK**.

4. Restart the ProvisioningServicesHost-2 virtual machine and view the console. Ensure that the virtual machine is starting into Windows Server.

    a. Right-click **ProvisioningServicesHost-2** virtual machine and click **Force Reboot**.

    b. Click **Yes** and click the **Console** tab.

    c. Ensure that the virtual machine is now starting into Windows Server 2008 R2.

Adding a Provisioning Services Host to the Farm

1. Log on to the ProvisioningServicesHost-2 virtual machine as the CCH\CitrixAdmin user.
2. Launch the Provisioning Services Configuration Wizard and begin the configuration.
   a. Click **Start > All Programs > Citrix > Provisioning Services > Provisioning Services Configuration Wizard**.
   b. Click **Next**.
3. Set the DCHP and PXE to use the service on another computer and join an existing farm.
   a. Select **The service that runs on another computer** and click **Next**.
   b. Select **The service that runs on this computer** and click **Next** to enable the PXE service.
   c. Select **Join existing farm** and click **Next**.
4. Add the existing SQLEXPRESS database to the configuration.
   a. Click **Browse**, select the **DC/SQLEXPRESS** instance, and click **OK**.
   b. Click **Next** to accept the database server settings.
5. Specify to use the ProvisioningServices:CCH farm, the existing SanFrancisco site, and the existing store.
   a. Click **Next** to accept the default ProvisioningServices:CCH farm name.
   b. Click **Next** to accept the default Existing site.
   c. Click **Next** to accept the default Existing store.
6. Specify the CCH\CitrixAdmin credentials and configure the database for the account.
   a. Select **Specified user account** and type `CitrixAdmin` in the User name field.
   b. Type `cch.local` in the Domain field.
   c. Type `Password1` in the Password and Confirm password fields.
   d. Select **Configure the database for the account** and click **Next**.
7. Use the default Active Directory Computer Account Password and Network Communication settings.
   a. Verify that the **Automate computer account password updates** is checked and click **Next**.
   b. Click **Next** to accept the default nework communication settings.
8. Specify to use the Provisioning Server TFTP service. Use the default stream servers boot list settings and finish the wizard allowing the wizard to automatically start the services.
   a. Select **Use the Provisioning Services TFTP service** and click **Next**.
   b. Click **Next** to accept the default stream servers boot settings.
   c. Click **Finish** to apply all configuration settings.
   d. Click **OK** in the firewall dialog and click **Done** once the configuration is completed.
9. Use XenCenter to restart the ProvisioningServicesHost-1 and ProvisioningServicesHost-2 virtual machines.

Module 7

Managing vDisks and Target Devices

Exercise 7-1: Configuring the Master Target Device

Scenario

The Quality Assurance team needs to perform their testing using identical Windows 7 virtual machines. In order to meet this need you need to create a Windows 7 vDisk for use with Provisioning Services.

You decided to use your Windows 7 template to create this first version of the vDisk and update it as needed later. You need to create a new Windows 7 virtual machine from template and then prepare it to be a target device by installing the target device software.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router

Estimated time to complete this exercise: 20 minutes

Preparing a Windows 7 Target Device

1. Use the Windows7-Template template to create a new virtual machine called ProvisioningTarget .
   a. Right-click **Windows7-Template** and click **New VM Wizard**.
   b. Select the **Windows7-Template** template and click **Next**.
   c. Type ProvisioningTarget for the new virtual machine and click **Next**.
2. Do not specify any installation media and don't assign the virtual machine a home server.
   a. Leave **<empty>** as the Installation Media and click **Next**.
   b. Select **Don't assign this VM a home server** and click **Next**.
3. Use the template default vCPU, and Memory settings. Specify to use a storage-level fast disk clone and to place the disk on the shared VM storage.
   a. Accept the default values for the vCPUs and Memory fields and click **Next**.
   b. Ensure that **Shared VM Storage** is selected as the virtual disk location.

c. Ensure that **Use storage-level fast disk clone** is selected and click **Next**.

4. Ensure vLAN Network is the only virtual network interface that will be added and finish the New VM wizard. Do not specify for the new virtual machine to start automatically.

   a. Verify that vLAN Network is selected and click **Next**.

   b. Deselect the **Start the new VM automatically** option.

   c. Click **Finish**.

5. View the Networking virtual interface information for the ProvisioningTarget virtual machine.

   a. Select the ProvisioningTarget virtual machine in the XenCenter console.

   b. Click the **Networking** tab.

6. Set the MAC address of the virtual network interface to "a2:f6:76:c6:79:77".

   a. Select the **0** network device and click **Properties**.

   b. Click **Use this MAC Address** and type `a2:f6:76:c6:79:77`.

   c. Click **OK**.

7. Start the ProvisioningTarget virtual machine and view its console. Allow the virtual machine to recover from sysprep.

   a. Click **Start** to start the virtual machine.

   b. Click the **Console** tab.

   c. View the virtual machine console as it recovers from sysprep.

8. Use the default country, time, and keyboard settings. Use the username "Win7Admin" leaving the computer name as it appears. Use "Password1" as the password and password hint.

   a. Click **Next** to accept the default values for the Country or region, Time and currency, and Keyboard layout fields.

   b. Type `Win7Admin` in the Type a user name field and click **Next**.

   c. Type `Password1` in the Type a password and Retype your password fields.

   d. Type `Password1` in the Type a password hint field and click **Next**.

9. Respond to the license agreement and specify ask you later about software updates. Keep the default time settings and specify to use the work network settings. Wait for the virtual machine to load the desktop before continuing.

   a. Respond to the license terms and click **Next**.

   a. Select **Ask me later**.

   b. Accept the Time zone defaults and click **Next**.

   c. Click **Work Network**.

   d. Wait for the virtual machine to load the desktop before continuing.

10. Attach the xs-tools.iso to the ProvisioningTarget virtual machine and launch the installer.

    a. Select **xs-tools.iso** from the DVD Drive 1 drop-down menu in XenCenter.

    b. Click **Run Xensetup.exe** from the Autoplay dialog box in the virtual machine console.

    c. Click **Yes** in the User Account Control dialog.

11. Respond to the license agreement and install the tools into their default location. Restart the virtual machine when prompted.

   a. Respond to the license agreement and click **Next**.

   b. Accept the default installation destination and click **Install**.

   Allow the XenServer Tools to install before continuing.

   c. Verify that **Reboot now** is selected and click **Finish**.

Installing Provisioning Services Target Device Software

1. Log on to the ProvisioningTarget virtual machine as the Win7Admin user.

2. Attach the `PVS_6.0.iso` media to the ProvisioningTarget virtual machine and launch the setup screen from the DVD media. Begin the target device installation process.

   a. Select the **PVS_6.0.iso** file in the DVD Drive 1 drop-down menu above the console.

   b. Click **Run autorun.exe** to start the setup.

   c. Click **Yes** in the User Account Control dialog box.

   d. Click **Target Device Installation**.

3. Start the Provisioning Services target device installation.

   a. Click **Target Device Installation** and click **Next** in the Welcome screen.

   b. Respond to the license agreement and click **Next**.

4. Use CitrixAdmin as the User Name, CCH as the Organization and the default destination folder.

   a. Type `CitrixAdmin` in the username field.

   b. Type `CCH` in the Organization field and click **Next**.

   c. Click **Next** to accept the default destination folder.

5. Complete the Install and close the Installation wizard without restarting or launching the imaging wizard.

   a. Click **Install** to begin installation.

   b. Deselect the **Launch Imaging Wizard** check box and click **Finish** to complete the installation.

   c. Click **No** to verify the restart of the virtual machine.

6. Shut down the ProvisioningTarget virtual machine.

Exercise 7-2: Creating a vDisk

Scenario

You recently prepared a Windows 7 virtual machine for use as a Provisioning Service vDisk. Now you need to create the vDisk from this virtual machine and transfer the contents of the virtual machine's virtual hard disk onto the vDisk.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router

Estimated time to complete this exercise: 30 minutes

Configuring a Virtual Machine to PXE Boot

1. View the boot options properties of the ProvisioningTarget virtual machine in XenCenter.
    a. Click the **ProvisioningTarget** virtual machine in the XenCenter.
    b. Click the **General** tab and click **Properties**.
    c. Click **Boot Options**.
2. Configure the ProvisioningTarget virtual machine to PXE boot upon startup.
    a. Select **Network** in the Boot order field and click **Move Up** until Network is at the top of the list.
    b. Deselect **Hard Disk**.
    c. Click **OK** to close ProvisioningTarget Properties dialog box.
3. Start the ProvisioningTarget virtual machine and view its console. Allow the virtual machine to boot from the local hard drive.
    a. Select the **ProvisioningTarget** virtual machine and click **Start**.
    b. Click the **Console** tab and view the virtual machine start.
    c. When prompted type any key to allow ProvisioningTarget to boot from local hard drive.

Using the Provisioning Services Imaging Wizard to Create a vDisk

1. Log on to the ProvisioningTarget virtual machine as the Win7Admin user.
2. Launch and begin the Imaging Wizard.
   a. Click **Start > All Programs > Citrix > Provisioning Services > Imaging Wizard**

      The Provisioning Services Imaging Wizard opens.
   b. Click **Yes** in the User Account Control dialog box.
   c. Click **Next** to begin the wizard.
3. Connect to the PSH-1 server using the CCH\CitrixAdmin credentials.
   a. Type PSH-1 in the server field and select **Use these credentials**.
   b. Enter the CCH\CitrixAdmin credentials and click **Next**.
4. Create a new vDisk called Windows7 on the vDisk Store store using a dynamic VHD type.
   a. Select **Create new vDisk** and click **Next**.
   b. Type Windows7 in the vDisk name field.
   c. Select **Dynamic** as the VHD type and click **Next**.
5. Do not select any volume licensing and use the default image volume configuration.
   a. Select **None** and click **Next**.
   b. Click **Next** to accept the default Image Volume configuration.
6. Name the target device Win7TestVM and optimize it for Provisioning Services before finishing the Imaging Wizard.
   a. Type Win7TestVM in the Target device name field and click **Next**.
   b. Click **Optimize for Provisioning Services** and click **OK**.
   c. Click **Finish** and click **Yes** to restart the virtual machine.

      The restart process may take a few minutes to initially connect.
7. Log on to the ProvisioningTarget virtual machine as the Win7Admin user.
8. Allow XenConvert to convert files from the local volume to the provisioning server and then shut down the ProvisioningTarget virtual machine.
   a. Allow XenConvert to complete.

> This process may take several minutes to complete.

   b. Click **Finish**.
   c. Click **Shutdown** to shutdown the virtual machine.

Verifying the vDisk Image

1. Use XenCenter to rename the hard disk attached to the ProvisioningTarget virtual machine to "Windows7-TargetBase" and then detach the hard disk .

    a. Click **ProvisioningTarget** and click the **Storage** tab.

    b. Click the virtual disk in the **0** position and click **Properties**.

    c. Type `Windows7-TargetBase` in the name field and click **OK**.

    d. Click **Detach** and click **Yes** to confirm.

2. View the console of the ProvisioningServicesHost-1 virtual machine and log on as the CCH\CitrixAdmin user.

    a. Click **ProvisioningServicesHost-1** and click the **Console** tab.

    b. Click **Send Ctrl+Alt+Del** and log on as the CCH\CitrixAdmin user.

3. Launch the Provisioning Services Console from the ProvisioningServicesHost-1 virtual machine and begin connecting to the farm.

    a. Click **Start > All Programs > Citrix > Provisioning Services > Provisioning Services Console**.

    b. Right-click the **Provisioning Services Console** node and click **Connect to Farm**.

4. Use PSH-1 as Name of the server, specify to auto-login in the future, and connect to the farm using the windows credentials.

    a. Type `PSH-1` in the Name field.

    b. Ensure that **Use my Windows credentials to login** is selected.

    c. Select **Auto-login on application start or reconnect** and click **Connect**.

5. View the QualityAssuranceLab collection in the Provisioning Services Console.

    a. Expand the **CCH (PSH-1) > Sites > SanFrancisco > Device Collections** node is expanded.

    b. Click **QualityAssuranceLab**.

6. Access the Win7TestVM properties and set it to boot from the vDisk.

    a. Right-click **Win7TestVM** and select **Properties**.

    b. Select **vDisk** in the Boot from field.

    c. Click **OK**.

7. Start the ProvisioningTarget virtual machine and log on as the Win7Admin user.

    a. Right-click **ProvisioningTarget** and click **Start**.

    b. Click the **Console** tab and allow the virtual machine to start.

    > Although the virtual disk was removed from the ProvisioningTarget virtual machine, it starts normally because it is booting from the vDisk on the Provisioning Services Host.

    c. Log on as the Win7Admin user.

8. View the Virtual Disk settings and confirm that the vDisk is Active and booted from the Windows7.vhd vDisk and then shut down the ProvisioningTarget virtual machine.

   a. Right-click the **Virtual Disk** icon in the System Tray and click **Virtual Disk Status**.

   b. Verify that the vDisk is `Windows7.vhd` and is Active.

   c. Click **Shutdown** to shutdown the virtual machine.

Exercise 7-3: Preparing the vDisk for Mass Deployment

Scenario

You previously created a vDisk containing Windows 7. Now you want to set this vDisk as a read only vDisk that all target devices can use.

You need to set the vDisk to Standard Image mode and then create a target device template to use as a base for future target devices.

Before You Begin

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router

Estimated time to complete this exercise: 10 minutes

Setting the vDisk to Standard Image Mode

1. View the console of the ProvisioningServicesHost-1 virtual machine and access the properties of the Windows7 vDisk.
    a. Click the **ProvisioningServicesHost-1** virtual machine and click the **Console** tab.
    b. Click the **vDisk Pool** node in the Provisioning Services Console.
    c. Right-click **Windows7** and select **Properties**.
2. Change the access mode of the vDisk to Standard Image mode and enable active directory machine account password management.
    a. Select **Standard Image (multi-device, read-only access)** from the Access mode menu.
    b. Select **Enable Active Directory machine account password management**.
    c. Click **OK**.
3. Access the Win7TestVM target device settings and change the name to Win7Template. Set it as the template of the collection.
    a. Expand the **CCH (PSH-1) > Sites > SanFrancisco > Device Collections** node and click **QualityAssuranceLab**.
    b. Right-click **Win7TestVM** and select **Properties**.

c.   Type `Win7Template` in the Name field and click **OK**.

d.   Right-click **Win7Template**, click **Set Device as Template** and click **Yes**.

4.   Use XenCenter to convert the ProvisioningTarget virtual machine into a template.

a.   Right-click the **ProvisioningTarget** virtual machine in XenCenter and select **Convert to Template**.

> Ensure that the ProvisioningTarget virtual machine is shut down.

b.   Click **Convert**.

5.   Rename the ProvisioningTarget template to QA-System.

a.   Click **Properties** in the General tab of the ProvisioningTarget template.

b.   Type `QA-System` in the Name field and click **OK**.

Configuring Target Device for Auto-Add

1.   View the ProvisioningServicesHost-1 virtual machine's console.

2.   Use the Provisioning Services Console to begin the Auto-Add wizard on the QualityAssuranceLab collection.

a.   Right-click the **QualityAssuranceLab** node and select **Auto-Add Wizard**.

b.   Click **Next**.

3.   Enable Auto-Add on the QualityAssuranceLab collection of the SanFrancisco site using the Win7Template properties as base.

a.   Select **Enable auto-add** and click **Next**.

b.   Select **SanFrancisco** from the Site field and click **Next**.

c.   Select **QualityAssuranceLab** from the Collection field and click **Next**.

d.   Select **Win7Template** from the Template field and click **Next**.

4.   Configure the Automatic Device Naming to have the prefix "Win7Test" and use 3 number lengths with zero fill and then finish the wizard.

a.   Type `Win7Test` in the Prefix field.

b.   Type `3` in the Length field.

c.   Ensure that **Zero fill** is selected and click **Next**.

d.   Click **Finish**.

5.   Use XenCenter to provision 6 quick clones of the QA-System virtual machine and allow them to boot from the Provisioning Server.

a.   Right-click the **QA-System** template in XenCenter and select **Quick Create**.

b.   Repeat sub-step a five more times for a total of 6 quick clones.

6. View the consoles of each quick clone to verify that they are correctly PXE booting into Windows.

> Since QA-System virtual machines do not have any virtual hard disks attached that contain a Windows operating system, if the virtual machine it is booting into Windows successfully, it must be PXE booting correctly.

7. View the ProvisioningServicesHost-1 virtual machine's console, refresh the QualityAssuranceLab collection and ensure that 6 new target device entries now exist.

    a. Click **ProvisioningServicesHost-1** and click the **Console** tab.

    b. Right-click QualityAssuranceLab and click **Refresh**.

    c. Verify that 6 new target devices now exist.

Exercise 7-4: Updating vDisks to Add Active Directory Integration

Scenario

When you looked at the build plan for the environment you forgot that the Windows 7 vDisk needed to be added to Active Directory. Now you need to update the virtual disk to add the vDisk to Active Directory and configure machine accounts for each new target device.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)

Estimated time to complete this exercise: 35 minutes

Configuring the vDisk for Automatic Updates

1. Use XenCenter to shutdown the QA-System (1) through QA-System (6) virtual machines.
   a. In XenCenter, select the **QA-System (1)** virtual machine.
   b. Shift-click the **QA-System (6)** virtual machine to select all virtual machines in between.
   c. Click **Shut Down** and click **Yes**.
   Please wait for all virtual machines to shut down completely before continuing.
2. View the console of the ProvisioningServicesHost-1 virtual machine and access the vDisk Pool on the Provisioning Services Console.
   a. Click **ProvisioningServicesHost-1** and click the **Console** tab.
   b. Click **vDisk Pool** in the Provisioning Service Console.
3. View the Auto Update properties of the Windows 7 vDisk and enable Auto Update.
   a. Right-click **Windows7** and click **Properties**.
   b. Click the **Auto Update** tab and select **Enable automatic updates for this vDisk**.
   c. Click **OK**.
4. Use XenCenter to start the QA-System (1) through QA-System (6) virtual machines.

a. In XenCenter, select the **QA-System (1)** virtual machine.

b. Shift-click the **QA-System (6)** virtual machine to select all virtual machines in between.

c. Click **Start**.

Creating and Updating a New vDisk version

1. View the console of the ProvisioningServicesHost-1 virtual machine and access the vDisk Pool on the Provisioning Services Console.

   a. Click **ProvisioningServicesHost-1** and click the **Console** tab.

   b. Click **vDisk Pool** in the Provisioning Service Console.

2. Add a new version to the Windows 7 vDisk.

   a. Right-click **Windows 7** and select **Versions**.

   b. Click **New** and click **Done**.

3. Set Win7Test001 target device to maintenance type.

   a. Click **QualityAssuranceLabs**.

   b. Right-click **Win7Test001** and select **Properties**.

   c. Select **Maintenance** in the Type drop-down menu and click **OK**.

4. Use XenCenter to restart the QA-System (1) and boot up off the Windows 7.1 [maint] vDisk.

   a. In XenCenter, Right-click **QA-System (1)**, click **Reboot** and click the **Console** tab.

   b. Type 1 and press **Enter**.

5. Log on to the QA-System (1) virtual machine as the Win7Admin user. View the target devices settings to ensure that the disk is in read/write mode and close all open windows.

   a. Log on as the Win7Admin user.

   b. Click the **arrow** in the notification area, right-click the **Virtual Disk icon** and click **Virtual Disk Status**.

   c. Ensure that the virtual disk listed is "Windows7.1.avhd" and that it is in read/write mode.

   d. Close all open windows on the QA-System (1) virtual machine.

Joining the Domain

1. Access the computer properties and begin changing the computer name and domain settings.

   a. Click **Start**, right-click **Computer** and select **Properties**.

   b. Click **Change settings** and click **Change**.

2. Change the domain to cch.local using the CCH\CitrixAdmin credentials.

   a. Select **Domain** from the Member of field, type cch.local, and click **OK**.

   b. Authenticate with the CCH domain using the CitrixAdmin/Password1 credentials and click **OK** once the join is confirmed.

    c. Click **OK**.

3. Close all open windows on the QA-System (1) virtual machine and restart the virtual machine when prompted.

4. Start up from the Windows 7.1 [maint] and log on as the CCH\CitrixAdmin user.

    a. Type 1 and press **Enter**.

    b. Log on as the CCH\CitrixAdmin user.

5. Verify that the domain join was successful and then shut down the QA-System (1) virtual machine.

    a. Click **Start**, right-click **Computer** and select **Properties**.

    b. Verify that the full computer name is listed as win7test001.cch.local.

    c. Click **Shut Down** to shut down the virtual machine.

6. View the console of the DomainController virtual machine and log on as the CCH\CitrixAdmin user.

7. Use the Active Directory Users and Computers console to verify that the WIN7TEST001 computer account is listed as a part of the domain.

    a. Click **Start > Administrative Tools > Active Directory Users and Computers**.

    b. Click the **cch.local > Computers** node.

    c. Verify that WIN7TEST001 appears in the computer list.

Adding Devices to Active Directory

1. Access the Provisioning Services Console on the ProvisioningServicesHost-1 virtual machine.

2. Create a machine account in Active Directory for Win7Test002-Win7Test006 in the Provisioning Services Console.

    a. Click **QualityAssuranceLab** to view the collection.

    b. Shift-click **Win7Test002** and Shift-click **Win7Test006** to highlight all of the target devices.

    c. Right-click the **Win7Test002** device and click **Active Directory > Create Machine Account**.

    d. Click **Create Account**.

    The Status indicates Success when the device has been added to Active Directory.

    e. Click **Close**.

Promoting the new vDisk Version to Production

1. Set the Win7Test001 target device to Production type.

    a. Right-click **Win7Test001** and click **Properties**.

    b. Select **Production** in the type menu and click **OK**.

2. View the version information of the Windows 7 vDisk.
    a. Click **vDisk Pool**.
    b. Right-click **Windows7** and select **Versions**.
3. Promote the new version of the Windows 7 vDisk immediately to production.
    a. Click Version **1** and click **Promote**.
    b. Select **Production** and ensure **Immediate** is selected.
    c. Click **OK** and click **Done**.

Testing Automatic Update

Use the following procedure to test automatic updates.

1. View the console of the QA-System (2) virtual machine and logon as the Win7Admin user.
    a. Click **QA-System (2)** and click **Console**.
    b. Log on to the QA-System(2) as the Win7Admin user.
2. View the virtual disk status of the virtual machine. Verify that it is running the Windows7.vhd vdisk in Read Only mode.
    a. Click the hidden icons arrow on the notification area of the task bar, right-click t**he virtual disk icon**, and select **Virtual Disk Status**.
    b. Verify that the Virtual Disk field shows the Windows7.vhd file.
3. Use XenCenter to restart the QA-System (2) through QA-System (6) virtual machine.
    a. In XenCenter, select the **QA-System (2)** virtual machine.
    b. Shift-click the **QA-System (6)** virtual machine to select all virtual machines in between.
    c. Click **Reboot**.
4. View the console of the QA-System (2) virtual machine and logon as the CCH\CitrixAdmin user.
    a. Click **QA-System (2)** and click **Console**.
    b. Log on to the QA-System(2) as the CCH\CitrixAdmin user.
5. View the virtual disk status of the virtual machine. Verify that it is running the Windows7.1.avhd vdisk in Read Only mode.
    a. Click the hidden icons arrow on the notification area of the task bar, right-click the **virtual disk icon**, and select **Virtual Disk Status**.
    b. Verify that the Virtual Disk field shows the Windows7.1.avhd file.
6. Start the QA-System (1) virtual machine.

Before the restart, the vDisks were running of off the original version that was not joined to the domain. However, after rebooting them they immediately took on the new version of the vDisk and were joined to the domain.

Module 8

Implementing Resource Pools

Exercise 8-1: Creating a Resource Pool

Scenario

A new stakeholder was added to the project which resulted in an expansion of the scope. To support this change you require more system resources than a single server can offer. Another XenServer host will be needed to provide adequate computing resources.

In addition to the change in scope, the required completion date has been moved up to this Friday. To meet these new requirements, you will be teamed with another administrator. The two of you will have to work together to complete the project on time.

Work with the other administrator to create a resource pool and join both of your servers in the resource pool.

Going Forward

You will now be paired with another student to complete the rest of the labs. When you are paired you need to decide on which student will perform each of the following roles:

- **Administrator 1:** This administrator will use their system to become the pool master. When the book refers to the master ID, it is referring to this student's XenServer host. You will use this student's virtual machines only going forward. This student will only perform the tasks marked as for Administrator 1.

- **Administrator 2:** This student's XenServer host will be joined to Administrator 1's pool. During the process it will lose the virtual machines and settings on their host. This student will only perform the tasks marked as for Administrator 2.

How to decide on roles: Either student can perform the role of Administrator 1 or Administrator 2, but it is recommended that the student that has most closely executed on the exercise workbook's instructions, or has had the fewest issues, become Administrator 1.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)

Estimated time to complete this exercise: 20 minutes

Administrator 2: Preparing a XenServer Host for Addition to a Pool

1. Shut down all active or suspended virtual machines.
   a. Shift-select all running virtual machines.
   b. Right-click a virtual machine and click **Force Shutdown**.
2. Detach and forget the ISO-Library storage repository from your XenServer host.
   a. Right-click **ISO-library** and click **Detach**.
      Wait for the process to complete.
   b. Right-click **ISO-library** and click **Forget**.
3. Detach and forget the Shared VM Storage storage repository from your XenServer host.
   a. Right-click **Shared VM Storage** and click **Detach**.
      Wait for the process to complete.
   b. Right-click **Shared VM Storage** and click **Forget**.
4. Remove all non-physical server networks.
   a. Click **XenServer** and click **Networking**.
   b. Click **vLAN Network**, click **Remove Network**, and click **Yes**.
   c. Perform the previous substep on any network without a MAC address.
5. Please communicate to your partner when this task is completed.

Administrator 1: Creating a Resource Pool

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.
2. Create a new resource pool called "CCH QualityAssurance Pool" using your XenServer as the master.
   a. Click **New Pool** on the toolbar.
   b. Type `CCH QualityAssurance Pool` in the name field and click **Create Pool**.
      The XenServer host is converted to the master of the resource pool. A new top level node named CCH QualityAssurance Pool, is added. The resource pool contains a single XenServer host.

> The ISO-Library previously created is a shared resource for the resource pool.

3. Add your partner's XenServer to your XenCenter console.
   a. Click **Add New Server**.
   b. Type the IP address of your partner's XenServer host in the Server field.

    c.   Enter the `root\Password1` account and click **Add**.

4.   Add your partner's XenServer host to the pool.

    a.   Right-click **CCH QualityAssurance Pool** and click **Add Server > XenServer\<A2\>** .

        Replace \<A2\> with the secondary host's ID in Administrator 2's student reference guide.

    b.   Click **Yes**.

        The second XenServer host is added to Resource Pool. Once the pool-join operation is complete, the icon turns green and the resource pool contains two servers.

5.   Please communicate to your partner when this task is completed.

Administrator 2: Accessing the Resource Pool

1.   Please wait for your partner to indicate that they have completed the previous tasks before continuing.

2.   Allow for XenCenter to reconnect to the Pool Master automatically and display the resource pool.

3.   Confirm that both servers are licensed in the License Manager.

    a.   Click **Tools > License Manager** .

    b.   Confirm both XenServer hosts have the same license version.

    c.   Click **Close** to close the License Manager.

4.   Use XenMotion to migrate the QA-System (4) - QA-System (6) virtual machines from the XenServer host to the secondary host.

    a.   Expand both XenServer nodes.

    b.   Shift-click the **QA-System(4)** and **QA-System(6)** virtual machines.

    c.   Drag the virtual machines to the secondary host and click **Yes**.

Module 9

Distributed Virtual Switching

Exercise 9-1: Configuring the Distributed Virtual Switch

Scenario

As part of the recent increase in scope, it was determined that several members of the Quality Assurance team will need to run virtual machines in private networks that can span all current and future XenServer hosts. Since regular private networks are limited to a single XenServer host, you need to create a cross-server private network.

To create a cross-server private network you need to install the distributed virtual switch virtual machine and then configure it to work in the resource pool.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)

Estimated time to complete this exercise: 15 minutes

Administrator 2: Importing the Distributed Virtual Switch

1. Launch the Import Wizard on the CCH QualityAssurance Pool.
   a. Select **CCH QualityAssurance Pool**.
   b. Click **File > Import**.
2. Begin the import of the Distributed Virtual Switch virtual appliance from the file XenServer-6.0-dvsc.xva located in `C:\XenServer`.
   a. Click **Browse** and browse to **C:/XenServer**.
   b. Select **XenServer-6.0-dvsc.xva** and click **Open** .
   c. Click **Next**.
3. Specify that the virtual machine to run on the pool master server using the Shared VM Storage.
   a. Select the pool master server as the home server and click **Next**.
   b. Select **Shared VM storage** as the storage repository and click **Import**.

4. Use only a single virtual network interface on the Network0 network and complete the wizard specifying that the virtual machine start after import.

   a. Select **Network0** as the default network interface in the Network drop-down list and click **Next**.

   b. Verify that **Start VM(s) after import** is selected and click **Finish**.

   The Distributed Virtual Switch virtual appliance may take a few minutes to import.

5. Rename the "DVS Controller 8124 amd64" virtual machine as vSwitchController .

   a. Click **DVS Controller 8124 amd64**.

   b. Click the **General** tab, then click **Properties**.

   c. Type vSwitchController in the Name field and click **OK**.

Administrator 2: Configuring the Distributed Virtual Switch

1. Log in to the console of the vSwitchController virtual machine using the admin/admin credentials.

   a. Select the **vSwitchController** virtual machine and click the **Console** tab.

   b. Click on the console window and log on using the admin/admin credentials.

2. Use the "set controller management-interface" command to give the vSwitchController virtual machine a static IP address of 10.10.<A1>.15, netmask of 255.255.255.0 and default gateway 10.10.<A1>.1, replacing <A1> with the pool master host's ID in Administrator 1's student reference guide.

   a. Type set controller management-interface config static 10.10.<A1>.15 255.255.255.0 10.10.<A1>.1 and press **Enter**

   Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

3. Use the "show controller management-interface" command to verify the settings are correct and restart the controller appliance to enable the IP address configuration.

   a. Type show controller management-interface and press **Enter** to confirm the network settings.

   b. Type restart controller appliance and press **Enter**.

4. Please communicate to your partner when this task is completed.

Administrator 1: Adding an NTP Server to the Distributed Virtual Switch Controller

1. You can view the status and follow along with your partner's progress by viewing the console of the vSwitchController once available.

2. Please wait for your partner to indicate that they have completed the previous tasks before continuing.

3. Access the xsconsole of the pool master XenServer host.

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a. Select the pool master XenServer host, then click the **Console** tab.

b. Press **Enter** to access the command prompt.

c. Type xsconsole and press **Enter**.

4. Access the Network Time settings and write down the IP address.

a. Browse to **Network and Management Interface** and press **Enter**.

b. Browse to **Network Time (NTP)** and note the IP address located in the right pane.

5. Use Internet Explorer on the lab desktop to access the vSwitchController configuration site at https://10.10.<A1>.15, replacing <A1> with the pool master host's ID in Administrator 1's student reference guide. Use the admin/admin credentials to login and then update the password to Password1.

a. Open Internet Explorer on the lab desktop and enter https://10.10.<A1>.15.

Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

b. Click **Continue to this website** on the security warning.

c. Type admin in the Username field, admin in the Password field and click **Login**.

d. Type Password1 in the New Password and Confirm Password fields, then click **Change Password**.

6. Access the NTP settings on the configuration site and add the environment NTP server IP address.

a. Click **Settings** in the Distributed Virtual Switch Controller GUI.

b. Click **Time & NTP**.

c. Click **Add NTP Server**.

d. Type the written down NTP IP address into the NTP Server Address field and click **Add**.

The new NTP server is listed with a green icon.

Administrator 1: Adding the Resource Pool to the Distributed Virtual Switch Controller

1. Add the pool master host using the admin/Password1 credentials.

a. Click **Visibility & Control** in the Distributed Virtual Switch Controller GUI.

b. Click **Add Resource Pool**.

c. Type 10.10.<A1>.10 in the Pool Master Server field.

Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

d. Enter the root/Password1 credentials and click **Connect** .

The Distributed Virtual Switch Controller scans for all networks, XenServer hosts, and virtual machines.

2. Allow the distributed virtual switch to connect to the servers in the pool and return a green status. This may take several minutes.

> Network errors may appear in the distributed virtual switch controller configuration site, but these can safely be ignored.

Administrator 1: Create a Distributed Virtual Switch Controller Snapshot

1. Access the configuration snapshot settings.
    a. Click **Settings** in the GUI.
    b. Click **Configuration Snapshots.**
2. Create a new snapshot called "Base".
    a. Click **Create New Snapshot**.
    b. Type `Base` in the description field and click **Create Snapshot**.

        The new snapshot is created and listed under Configuration Snapshots.
3. View the information available on the dashboard and then close Internet Explorer.
    a. Click **Dashboard** and view the information available.
    b. Close Internet Explorer.
4. Please communicate to your partner when this task is completed.

Exercise 9-2: Creating and Testing a Cross-Server Private Network

Scenario

You recently imported the Distributed Virtual Switch Controller. You now need to create the cross-server private network and test it by verifying the connections between two virtual machines across XenServer hosts on the cross-server private network.

Before You Begin

To begin this lab, ensure that the following virtual machines are started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)
- vSwitchController

Estimated time to complete this exercise: 20 minutes

Administrator 2: Creating a Cross-Server Private Network

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.
2. Begin creating a Cross-Server Private Network on the CCH QualityAssurance Pool pool.
   a. Select **CCH QualityAssurance Pool** and select the **Networking** tab.
   b. Click **Add Network**.
   c. Select **Cross-Server Private Network** and click **Next**.
3. Call the network "Temporary Staging Network". Use Network 0 as the management interface and complete the wizard. Do not have this network automatically added to new virtual machines.
   a. Type `Temporary Staging Network` in the Name field and click **Next**.
   b. Ensure that **Network 0** is selected in the Management interface menu.
   c. Ensure that **Automatically add this network to new virtual machines** is not selected and click **Finish**.

4. Please communicate to your partner when this task is completed.

Administrator 1: Adding a Virtual Machines to the Cross-Server Private Network

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.
2. Create a snapshot of the DomainController virtual machine called "Base Config".
   a. Select the **DomainController** virtual machine, then click the **Snapshots** tab.
   b. Click **Take Snapshot**.
   c. Type `Base Config` in the Name field.
   d. Use the default Snapshot mode and click **Take Snapshot**.
3. Create a new VM from the Base Config called "TemporaryDC" using no installation media.
   a. Right-click the **Base Config** snapshot icon, and click **New VM from Snapshot**.
   b. Verify that the Base Config snapshot is selected and click **Next**.
   c. Type `TemporaryDC` in the name field and click **Next**.
   d. Ensure **<empty>** is selected the DVD Drive menu and click **Next**.
4. Place the new virtual machine on the pool master using the default processor and memory resources.
   a. Verify that the pool master is selected, and click **Next**.
   b. Use the default values for vCPU and Memory, and click **Next**.
5. Use the default virtual disks will be created using fast clone on the local storage.
   a. Ensure that two new virtual disks will be created on the local storage.
   b. Verify that Use storage-level fast disk clone is selected, and click **Next**.
6. Use the Temporary Staging Network as the only network associated with the virtual machine and complete the wizard with the new virtual machine starting automatically.
   a. Select the current network interface from the list and click **Properties**.
   b. Select **Temporary Staging Network** from the Network drop-down menu, and click **OK**.
   c. Verify the settings and click **Next**.
   d. Verify **Start the new VM automatically** is selected, and click **Finish**.
7. Please communicate to your partner when this task is completed.

Administrator 2: Adding Virtual Machines to the Cross-Server Private Network

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.

2. Create a new VM from the CentOSLinuxServer-Template called "TemporaryServer" with no installation media.

   a. Right-click **CentOSLinuxServer-Template** and click **New VM wizard**.

   b. Verify that the CentOSLinuxServer-Template snapshot is selected and click **Next**.

   c. Type `TemporaryServer` in the name field and click **Next**.

   d. Verify that **<empty>** from the DVD Drive menu and click **Next**.

3. Place the VM on the second XenServer using the default processor and memory resources.

   a. Select **Place the VM on this server**.

   b. Select the second XenServer host, and click **Next**.

   c. Use the default values for vCPU and Memory, and click **Next**.

4. Use storage-level fast disk clone to create a virtual disk on the Shared VM Storage.

   a. Verify that **Shared VM Storage** is selected.

   b. Verify that **Use storage-level fast disk clone** is selected, and click **Next**.

5. Use the Temporary Staging Network as the only network associated with the virtual machine and complete the wizard with the new virtual machine starting automatically.

   a. Select the current network interface from the list and click **Properties**.

   b. Select **Temporary Staging Network** from the Network dropdown menu.

   c. Verify Auto-generate a MAC address is selected, and click **OK**.

   d. Verify the settings and click **Next**.

   e. Verify **Start the new VM automatically** is selected, and click **Finish**.

6. Please communicate to your partner when this task is completed.

Both Administrators: Testing the Cross-Server Private Network

1. **Administrator 1 complete the following steps:**
   Administrator 2, please continue to your specific task below. These tasks can be performed concurrently.

2. Please wait for your partner to indicate that they have completed the previous tasks before continuing.

3. View the console of the TemporaryServer virtual machine and log on with the root/Password1 credentials.

   a. Click **TemporaryServer** virtual machine and click the **Console** tab.

   b. Log in using root/Password1 credentials.

4. Use the ping command to test communication with the TemporaryDC virtual machine (192.168.2.100) located on the pool master. Attempt to ping the pool master XenServer host (10.10.<A1>.10), replacing <A1> with the pool master host's ID in Administrator 1's student reference guide.

a. Type `ping 192.168.2.100` and press **Enter**.

> The ping has a response from the 192.168.2.100 because the virtual machine is within the same cross-server private network, even when on another host in the pool.

b. Press **CTRL+C** to stop the ping operation.

c. Type `ping 10.10.<A1>.10` and press **Enter**.

   Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

d. Press **CTRL+C** to stop the ping operation.

> No response is received from the pool master XenServer host because this virtual machine is on a private network to which the XenServer host is not a member.

5. Please communicate to your partner when this task is completed.

6. Please wait for your partner to complete their steps in this task before continuing.

7. When your partner has completed their steps in this task, shutdown and delete the TemporaryServer virtual machine along with all associated virtual disks.

a. Right-click **TemporaryServer** and click **Shut Down**.

   Wait until the virtual machine completely shuts down.

b. Right-click **TemporaryServer** and click **Delete VM**.

c. Verify the attached virtual disks are selected, then click **Delete**.

8. **Administrator 2 complete the following steps:**
   These tasks can be performed concurrently with Student 1.

9. View the IP address of the TemporaryServer virtual machine.

a. Select the **TemporaryServer** virtual machine, then click the **Networking** tab.

b. Write down the IP address listed.

10. View the console of the TemporaryDC virtual machine and log on as the CCH\CitrixAdmin user.

a. Click **TemporaryDC** and click the **Console** tab.

b. Log on as the CCH\CitrixAdmin/Password1 user.

11. Within a command prompt use the ping command to test communication with the TemporaryServer virtual machine located on the pool master. Attempt to ping the pool master XenServer host (10.10.<A1>.10), replacing <A1> with the pool master host's ID in Administrator 1's student reference guide.

a. Click **Start > Command Prompt**.

b. Type `ping <insert IP of TemporaryServer>` and press **Enter**.

> The ping has a response from the TemporaryServer because the virtual machine is within the same cross-server private network, even when on another host in the pool.

    c. Type ping 10.10.<A1>.10 and press **Enter**.

       Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

    d. Verify that the destination host is unreachable.

> No response is received from the pool master XenServer host because this virtual machine is on a private network to which the XenServer host is not a member.

12. Please communicate to your partner when this task is completed.

13. Please wait for your partner to indicate that they have completed the previous tasks before continuing.

14. When your partner is completed with their tasks, shutdown and delete the TemporaryDC virtual machine along with all associated virtual disks.

    a. Right-click **TemporaryDC** and click **Shut Down**.

       Wait until the virtual machine completely shuts down.

    b. Right-click **TemporaryDC** and click **Delete VM**.

    c. Verify the attached virtual disks are selected, then click **Delete**.

15. When your partner is completed with their tasks, shutdown and delete the TemporaryServer virtual machine along with all associated virtual disks.

    a. Right-click **TemporaryServer** and click **Shut Down**.

       Wait until the virtual machine completely shuts down.

    b. Right-click **TemporaryServer** and click **Delete VM**.

    c. Verify the attached virtual disks are selected, then click **Delete**.

Module 10

Workload Balancing

Exercise 10-1: Enabling the Workload Balancing Virtual Appliance

Scenario

To accommodate the greater workloads required by change in the scope of the project, you need to maximize the efficiency of the resource pool. To accomplish this, you need to configure a workload balancing virtual appliance and connect it to the pool. With workload balancing enabled, workloads can shift between XenServer hosts as needed to ensure optimal performance.

Before You Begin

To begin this lab, ensure that you have the following virtual machines turned on:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)
- vSwitchController

Estimated time to complete this exercise: 30 minutes

Administrator 1: Importing the Workload Balancing Virtual Appliance

1. Use XenCenter to import the Workload Balancing virtual appliance located in c:\XenServer\XenServer-6.0-wlb.xva into theCCH QualityAssurance Pool.

    a. In XenCenter, click **File > Import**.

    b. Browse to `c:\XenServer\XenServer-6.0-wlb.xva` and click **Open**.

    c. Click **Next**.

    d. Select **CCH QualityAssurance Pool** as the home server and click **Next**.

2. Use Shared VM Storage for the virtual appliance's virtual disk and Network0 as the Network. Complete wizard allowing the virtual machine to start after import.

    a. Choose **Shared VM Storage** and click **Import**.

    b. Confirm **Network0** is selected and click **Next**.

    c. Verify that the **Start VM(s) after import** option is selected and click **Finish**.

The Workload Balancing virtual machine appears and starts automatically.

3. Rename the Citrix WLB Virtual Appliance to WorkloadBalancingVPX .

   a. Right-click **Citrix WLB Virtual Appliance** and click **Properties**.

   b. Type `WorkloadBalancingVPX` in the Name field and click **OK**.

Administrator 1: Configuring the Workload Balancing Virtual Appliance

1. View the console of the WorkloadBalancingVPX virtual machine and set the password of the root user to Password1.

   a. Select **WorkloadBalancingVPX** and click the **Console** tab.

   b. Type `Password1` and press **Enter**.

   > The console does not display placeholders for the characters.

   c. Retype `Password1` and press **Enter**.

2. Configure the Citrix WLB Virtual Appliance with a hostname of WBVPX and a domain suffix cch.local. Do not use DHCP to configure network settings.

   a. Type `WBVPX` as the hostname and press **Enter**.

   b. Type `cch.local` as the domain suffix and press **Enter**.

   c. Type `n` and press **Enter** to configure the network settings manually.

3. Set the IP address to 10.10.<A1>.40 with a subnet mask of 255.255.255.0 and gateway 10.10.<A1>.1, replacing <A1> with the pool master host's ID in Administrator 1's student reference guide. Allow the virtual appliance to restart.

   a. Type `10.10.<A1>.40` and press **Enter**.

   Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

   b. Type `255.255.255.0` for the netmask and press **Enter**.

   c. Type `10.10.<A1>.1` and press **Enter**.

   Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

   d. Verify that the network settings are correct and type `y` and press **Enter**.

   The WLB_Appliance restarts and is configured with the new network settings.

4. Create Workload Balancing database account using the default user name "postgres" and "Password1" as the password.

   a. Press **Enter** to use the postgres as the default user name.

   b. Type `Password1` and press **Enter**.

   c. Retype `Password1` and press**Enter**.

5. Create the Workload Balancing server credentials with wlbuser as the user name, the default port, and Password1 as password.

   a. Press **Enter** to use the wlbuser as the default user name.

   b. Type `Password1` and press **Enter**.

   c. Retype `Password1` and press **Enter**.

   d. Press **Enter** to use the 8012 as the default port.

6. Please communicate to your partner when this task is completed.

Administrator 2: Connecting a Resource Pool to the Workload Balancing Virtual Appliance

1. You can follow along with your partner's progress by viewing the console of the WorkloadBalancingVPX virtual machine, when available.

2. Please wait for your partner to indicate that they have completed the previous tasks before continuing.

3. Access the resource pool's workload balancing settings and begin connecting it to the workload balancing server.

   a. Select **CCH QualityAssurance Pool** and click the **WLB** tab.

   b. Click **Connect**.

4. Connect the resource pool to the workload balancing server at 10.10.<A1>.40 using the wlbuser/Password1 credentials, replacing <A1> with the pool master host's ID in Administrator 1's student reference guide. Use the current XenServer credentials.

   a. Type `10.10.<A1>.40` in the Address field.

   Replace <A1> with the pool master host's ID in Administrator 1's student reference guide.

   b. Type `wlbuser/Password1` in the WLB Server Credentials section.

   c. Select **Use the current XenServer credentials** and click **OK**.

Exercise 10-2: Accepting Workload Balancing Optimization Recommendations

Scenario

You recently imported the Workload Balancing Virtual Appliance and configured the pool to use it. Now you need to configure the workload balancing settings to ensure the most efficient balancing to achieve maximum performance.

Before You Begin

To begin this lab, ensure that you have the following virtual machines started:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)
- vSwitchController
- WorkloadBalancingVPX

Estimated time to complete this exercise: 30 minutes

Administrator 2: Adjusting Workload Balancing Settings

1. Access the resource pool's Workload Balancing settings and set it to automatically apply the optimization recommendations.
   a. Click **Settings** in Resource Pool WLB tab.
   b. Click **Automation** and select **Automatically apply Optimization recommendations**.
2. Adjust critical threshold settings of the CPU Utilization to 40% and Free Memory to 2048MB.
   a. Select **Critical Thresholds**.
   b. Type 40 in the CPU Utilization field.
   c. Type **2048** into the Free Memory field and click **OK**.
3. Please communicate to your partner when this task is completed.

Administrator 1: Continuing to Configure Workload Balancing

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.
2. Access the resource pool's workload balancing settings.
   a. Click **CCH QualityAssurance Pool** and click the **WLB** tab.
   b. Click **Settings**.
3. Set the Metric Weighting of the Network Read, Network Write, Disk Write and Disk Read to be less important.
   a. Select **Metric Weighting**.
   b. Slide the slider of the **Network Read**, **Network Write**, **Disk Read**, and **Disk Write** to **Less Important**.
4. Access the Advanced settings and set the VM Migration Interval to 5 minutes. Set the Recommended Severity to Low and the Optimization Aggressiveness to High.
   a. Select **Advanced**.
   b. Type 5 in the VM Migration Interval field
   c. Select **Low** in the Recommendation Severity menu.
   d. Select **High** in the Optimization Aggressiveness menu, and click **Ok**.
5. Use the QA-System template to quick create another 6 virtual machines.
   a. Right-click the QA-System template and select Quick Create.
   b. Perform sub-step a five more times.

> Even though the QA-System is set to start all of the virtual machines on the pool master, the workload balancing system is automatically switching the new virtual machines to run on the second XenServer.

6. Please communicate to your partner when this task is completed.

Exercise 10-3: Generating Workload Balancing Reports

Scenario

You recently configured the workload balancing preferences. Now you want to run a few reports to see what kind of valuable information they contain.

Before You Begin

To begin this lab, ensure that you have:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (12)
- vSwitchController
- WorkloadBalancingVPX

Estimated time to complete this exercise: 10 minutes

Both Administrators: Generating Workload Balancing Reports

Use the following procedure to generate a Workload Balancing report.

1. **Administrator 1 complete the following steps:**
   Administrator 2, please continue to your specific task below. These tasks can be performed concurrently.
2. Create a Pool Audit Trail Workload Balancing Report for activity since Monday.
   a. Click **CCH QualityAssurance Pool** and click the **WLB** tab.
   b. Click **Reports**.
   c. Enter last Monday's date in the Start Date field and today's date into the End Date field.
   d. Select **Pool Audit Trail** and click **Run Report**.
3. Review the information contained generated in the report and save it as a PDF on the local desktop called "PoolAuditTrail".
   a. View the report to see the information it contains.

b. Click the **Diskette** icon and select **Acrobat (PDF) file**.

   c. Type `PoolAuditTrail` and click **Save**.

   d. Click **Close**.

4. **Administrator 2 complete the following steps:**
   These tasks can be performed concurrently with Student 1.

5. Create a Virtual Machine Motion History Report for activity since Monday.

   a. Click **Reports**.

   b. Enter last Monday's date in the Start Date field and today's date into the End Date field.

   c. Select **Virtual Machine Motion History** and click **Run Report**.

6. View the report and the information contained generated in it and save it as a PDF on the local desktop called "VMMotionHistory".

   a. View the report to see the information it contains.

   b. Click the **Diskette** icon and select **Acrobat (PDF) file**.

   c. Type `VMMotionHistory` and click **Save**.

   d. Click **Close**.

Module 11

Configuring High Availability

Exercise 11-1: Creating a vApp

Scenario

Some sets of virtual machines that work together exclusively. It would be best to manage them as a single entity rather than as separate virtual machines using the vApp feature. You identify two separate infrastructures that you want to make into vApps: Provisoning Services Infrastructure, and XenServer Infrastructure.

To save time you want to divide up the tasks between you and the other administrator. Administrator 2 will create the Provisioning Services vApp and Administrator 1 will create the XenServer Infrastructure vApp.

Before You Begin

To begin this lab, ensure that you have the following:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (12)
- vSwitchController
- WorkloadBalancingVPX

Estimated time to complete this exercise: 15 minutes

Administrator 2: Creating a vApp for Provisioning Services Infrastructure

This task can be performed concurrently with the similar lab performed by Administrator 1.

1. Begin configuring a new vApp in XenCenter.
   a. Right-click **CCH QualityAssurance Pool** > **Manage vApps** .
   b. Click **New vApp**.
2. Create a new vApp called "Provisioning Services vApp" containing the DomainController , ProvisioningServicesHost-1 , and ProvisioningServicesHost-2 virtual machines.
   a. Type `Provisioning Services vApp` in the Name field and click **Next**.
   b. Select the **DomainController**, **ProvisioningServicesHost-1**, and **ProvisioningServicesHost-2** check boxes and click **Next**.

3. Change the virtual machine start order so that the DomainController starts first with an order of 0, and then both the ProvisioningServicesHost-1 and ProvisioningServicesHost-2 virtual machines started second with an order of 1 with a 120 second delay.

  a. Select **ProvisioningServicesHost-1** from the VM Startup Sequence list.

  b. Type 1 in the Start order field.

  c. Type 120 in the Attempt to start next VM after field.

  d. Perform substeps b and c with the **ProvisioningServicesHost-2** virtual machine and click **Next**.

4. Complete new vApp wizard confirming that it is properly defined with the 3 virtual machines.

  a. Click **Finish** to create the vApp.

  b. Verify the vApp name, and the selected virtual machines are included and click **Close**.

5. Please communicate to your partner when this task is completed.

Administrator 1: Creating a vApp for XenServer Infrastructure Virtual Machines

This task can be performed concurrently with the similar lab performed by Administrator 2.

1. Begin configuring a new vApp in XenCenter.

  a. Right-click **CCH QualityAssurance Pool > Manage vApps** .

  b. Click **New vApp**.

2. Create a new vApp called "XenServer Infrastructure vApp" containing the Router , LicenseServerVPX, vSwitchController ,and WorkloadBalancingVPX virtual machines.

  a. Type XenServer Infrastructure vApp in the Name field and click **Next**.

  b. Select the **Router**, **LicenseServerVPX**, **vSwitchController**, and **WorkloadBalancingVPX** check boxes and click **Next**.

3. Change the virtual machine start order so that the Router starts first with an order of 0, and then the LicenseServerVPX, vSwitchController , and WorkloadBalancingVPX virtual machines started second with an order of 1 with a 60 second delay.

  a. Select **LicenseServerVPX** from the VM Startup Sequence list.

  b. Type 1 in the Start order field.

  c. Type 60 in the Attempt to start next VM after field.

  d. Perform steps b & c on the **vSwitchController** and **WorkloadBalancingVPX** virtual machines.

  e. Click **Next**.

4. Complete new vApp wizard confirming that it is properly defined with the 4 virtual machines.

  a. Click **Finish** to create the vApp.

  b. Verify the vApp name, and the selected virtual machines are included.

  c. Click **Close**.

Administrator 1: Verifying the Virtual Appliance

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.
2. Shut down all 12 QA-System virtual machines and ensure they are all off before continuing.
3. Shutdown the "Provisioning Services vApp" components
   a. Right-click **CCH QualityAssurance Pool** and click **Manage vApps**.
   b. Click **Provisioning Services vApp** and click **Shut down**
   c. Click **Yes** to confirm the shut down operation.

   Wait for the virtual machines to completely shut down.

   > Note that the virtual machines automatically shut down in the reverse order of how they were set to start up.

4. After all the Provisioning Services vApps shutdown successfully shut down the "XenServer Infrastructure vApp".
   a. Click **XenServer Infrastructure vApp** and click **Shut down**
   b. Click **Yes** to confirm the shut down operation.

   Wait for the virtual machines to completely shut down.
   c. Click **Close**.
5. Please communicate to your partner when this task is completed.

Administrator 2: Using the vApps

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.
2. Access the vApps and start the "XenServer Instrastructure vApp". Wait 2 minutes until all virtual machines are fully started before continuing.
   a. Right-click **CCH QualityAssurance Pool** and click **Manage vApps**.
   b. Click **XenServer Infrastructure vApp** and click **Start**

   Wait for the virtual machines to fully start. This may take several minutes.
3. Access the vApps and start the "Provisioning Services vApp". Wait 2 minutes until all virtual machines are fully started before continuing.
   a. Click **Provisioning Services vApp** and click **Start**

   Wait for the virtual machines to fully start. This may take several minutes.
   b. Click **Close**.
4. Start the QA-System (1) through QA-System (6) virtual machines.

a. Shift-click the **QA-System (1)** virtual machine and shift-click the **QA-System (6)** virtual machine.

b. Click **Start**.

c. Click **QA-System (1)** and click **Console**.

d. Verify that the virtual machine is starting into Windows.

> If the virtual machine is not booting to windows, ensure that the Provisioning Services Hosts have completed their startup and/or restart them.

5. Please communicate to your partner when this task is completed.

Exercise 11-2: Configuring High Availability

Scenario

The Quality Assurance team needs to have the Provisioning Services Infrastructure available at all times. They need to be up even in the case where a XenServer host goes down. To comply with this request you need to configure high availability on the Provisioning Services Infrastructure. You then want to test HA by causing an abrupt non-graceful system restart of a XenServer host.

Before You Begin

To begin this lab, ensure that you have the following:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)
- vSwitchController
- WorkloadBalancingVPX

Estimated time to complete this exercise: 20 minutes

Administrator 1: Enabling High Availability

1. Begin configuring High Availability on the resource pool using the Shared VM Storage repository.
   a. Click **CCH QualityAssurance Pool** and click the **HA** tab.
   b. Click **Configure HA** and click **Next**.
   c. Select **Shared VM Storage** and click **Next**.
2. Configure the ProvisioningServicesHost-1 , ProvisioningServicesHost-2 , and WorkloadBalancingVPX virtual machines to each restart at order 0 and with no delay.
   a. Click the **Virtual Machine** column header to sort the list by virtual machine name.
   b. Click **ProvisioningServicesHost-1** and select **Restart** in the HA restart priority menu.
   c. Type 0 in the Restart Order and Attempt to start next VM after fields.
   d. Repeat substeps b - c with the ProvisioningServicesHost-2 and WorkloadBalancingVPX virtual machines.
3. Configure the non-agile virtual machines to not restart and complete the configure HA wizard.

a. Click the **Agile** column header to sort the list by agile status.

b. Click any non-agile virtual machines with a restart priority of Restart.

c. Select **Do not restart** in the HA restart priority dropdown menu.

d. Repeat substeps b - e with the other virtual machines that are not listed as agile.

e. Click **Next**.

> If the Next button is not available to you, ensure that any virtual machine not listed as agile has the restart policy "Do not restart".

f. Review the configuration summary, and click **Finish**.

4. Please wait for the Enabling HA process to completed before communicating to your partner.

5. Please communicate to your partner when this task is completed.

Administrator 2: Verifying Automatic Host Migration to Pool Master

1. Please wait for your partner to indicate that they have completed the previous tasks before continuing.

2. Ensure that the QA-System (1) through QA-System (6), WorkloadBalancingVPX , virtual machines are on the secondary XenServer host before continuing.

> If they are not on that host, please use XenMotion to move them to the second host before continuing.

3. Ensure that the following virtual machines are running on the secondary XenServer host:

   - QA-System (1) through QA-System (6)
   - WorkloadBalancingVPX
   - ProvisioningServicesHost-1
   - ProvisioningServicesHost-2

   If any of these virtual machines are not running on the secondary XenServer host, use XenMotion to migrate them to the secondary XenServer host.

4. Launch the putty.exe utility located at C:\XenServer\putty.exe on the lab desktop.

   a. Navigate to C:\XenServer, on the lab desktop.

   b. Double-click **putty.exe**.

5. Use 10.10.<A2>.10 IP address in the host name field, replacing <A2> with the secondary host's ID in Administrator 2's student reference guide. Open a new session using the SSH protocol and log on with the root/Password1 credentials.

   a. In the Host Name field, type 10.10.<A2>.10.

Replace <A2> with the secondary host's ID in Administrator 2's student reference guide.

b.   Verify that the **SSH** protocol is selected, and click **Open**.

> Please double check that you are connecting to the secondary host and not the pool master.

c.   Click **Yes** in the security alert.

d.   Log on to the pool master using the `root/Password1` credentials.

6.   Enter the following commands to cause an instant non-graceful reboot of the XenServer host:

```
echo 1 > /proc/sys/kernel/sysrq
```

```
echo b > /proc/sysrq-trigger
```

> You will not receive a prompt back once the second command is entered.

7.   View the resource pool's HA status, and wait until the heartbeat returns an error and High Availability policies begin.

a.   Click **CCH QualityAssurance Pool** and click **HA**.

b.   Watch the heartbeat status change after a few minutes, and the high availability virtual machines are restarted on the pool master.

8.   Wait until the second XenServer Host boots and reconnects to the pool before continuing.

9.   Start the QA-System (1) through QA-System (6) virtual machines.

a.   Select **QA-System (1)**.

b.   Shift-click **QA-System (6)** and click **Start**.

Module 12

Managing and Troubleshooting XenServer

Exercise 12-1: Using the xe Command-Line Interface

Scenario

Your manager wants you and your partner to become more experienced with the command line interface to better troubleshoot any potential issues.

Before You Begin

Before you begin this lab, ensure that you have the following virtual machines on:

- DomainController
- LicenseServerVPX
- ProvisioningServicesHost-1
- ProvisioningServicesHost-2
- Router
- QA-System (1) - QA-System (6)
- vSwitchController
- WorkloadBalancingVPX

Estimated time to complete this exercise: 45 minutes

Both Administrators: Logging on to the Server Console using SSH

1. Close Citrix XenCenter.
2. Launch the putty.exe application located in the C:\XenServer folder.
   a. On the local desktop, navigate to C:\XenServer.
   b. Double-click **putty.exe**.
3. Enter your host server IP address in the host name field, using the SSH protocol, and open a new session. Log on to the XenServer host as the root/Password1 user.
   a. Type 10.10.<x>.10 in the Host Name field.
      Where <x> is your host server ID.
   b. Verify that the **SSH** protocol is selected, and click **Open**.
   c. Click **Yes** in the putty security alert.
   d. Log on as the root/Password1 user.

Both Administrators: Removing a Virtual Machine using the Command Line Interface

1. Use the xentop command and write down how many virtual machines are running on your host.

    a. Type `xentop` and press **Enter**.

    b. Resize the putty.exe window to display all the information.

    c. Type `q` to exit xentop and return to the command prompt.

2. Use a command to view the hosts in the resource pool and write down the first four characters of the UUID of your host.

    a. Type `xe host-list` and press **Enter**.

    b. Write down the first four characters of the UUID of your host.

3. Use a command to view all the running virtual machines running only on your host. Write down the UUID of one of the QA-System virtual machines.

    a. Type `xe vm-list power-state=running resident-on=<hostUUID>` press **Tab** to autocomplete the host UUID.

        Where `hostUUID` is the first four characters of your host server UUID, written down previously.

    b. Press **Enter** to view the results.

    c. Write down the first four characters of a QA-System virtual machine UUID.

> If a QA-System virtual machine is not available on your host, use XenCenter to migrate one to it.

4. Use a command to view the parameters associated with this virtual machine.

    a. Type `xe vm-param-list uuid=QA-SystemUUID` press **Tab** to autocomplete the QA-System UUID.

        Where `QA-SystemUUID` is the first four characters of the QA-System UUID written down previously.

    b. Press **Enter** to view the results.

5. Use a command to shut down the QA-System virtual machine captured previously.

    a. Type `xe vm-shutdown uuid=QA-SystemUUID` in the console and press **Tab**.

        Where `QA-SystemUUID` is the first four characters of the QA-System UUID, written down previously.

    b. Press **Enter** to shut down the virtual machine.

6. Use a command to view all the running virtual machines running only on your host. Verify that the QA-System virtual machine from the previous step is not in the list.

a.   Type `xe vm-list power-state=running resident-on=hostUUID` press **Tab** to autocomplete the host UUID.

   Where `hostUUID` is the first four characters of the host server UUID.

b.   Press **Enter** to view the results.

7.   Use the command to delete the QA-System virtual machine.

a.   Type `xe vm-destroy uuid=QA-SystemUUID` in the console and press **Tab**.

   Where `QA-SystemUUID` is the first four characters of the QA-System UUID.

There is no confirmation when using the "xe vm-destroy" command. Verify the UUID before the next step.

b.   Press **Enter** to delete the virtual machine.

Exercise 12-2: Self-Servicing XenServer

Scenario

While working on the XenServer pool you noticed a few issues that, while not affecting the workload, you wanted to check out with Citrix Support just to be sure.

Citrix Support asked you to use XenCenter to create a status report to send in to them.

Estimated time to complete this exercise: 10 minutes

Both Administrators: Viewing a System Status Report in XenCenter and XenServer

1. Using XenCenter, launch the Server Status Report wizard.
    a. Click **Start** > **Citrix XenCenter** on the local desktop.
    b. Click **Tools** > **Server Status Report** from the Toolbar.

        The Server Status Report wizard opens.
2. Create a server status report of your XenServer host which includes all the default items and crash dump files.
    a. Select your XenServer host and click **Next**.
    b. Select **Crash dump files** and click **Next.**

        XenServer compiles the report. This may take a few minutes to complete.
    c. Click **Next** when the file is completed.
3. Save the server status report on the XenCenter desktop. Do not remove the crash dump files.
    a. Click **Browse** and browse to the desktop.
    b. Use the existing File name, click **Desktop** and click **Save**.
    c. Click **Finish**.

        The file is saved to the landing desktop.
    d. Click **No** on the Remove Crash Dump Files message.
4. Open the status-report zip on the XenCenter desktop file to view the server status report.
    a. Double-click **status-report.zip** on the XenCenter desktop to open the zip file.
    b. Open the XenCenter.log file and view the content.
5. Close all open windows, except for XenCenter.

Exercise 12-3: Working with Citrix Support

Scenario

Citrix Support reviewed the status report and did not find any issues. They want you to run a few other tests to see if they can identify anything wrong.

Estimated time to complete this exercise: 30

Both Administrators: Performing Network Traces

1. View the console of your XenServer host and access a command prompt.

    a. Click your XenServer host and click **Console**.

2. Execute and stop a network trace on the eth0 physical network interface using the "tcpdump" command.

    a. Type `tcpdump –i eth0 –w eth0_trace`.

    b. Allow the trace to run for 30 sec.

    c. Press **Ctrl-C** to stop the trace.

3. Execute and stop a network trace on the xenbr0 virtual bridge using the " tcpdump" command.

    a. Type `tcpdump –i xenbr0 –w xenbr0_trace` and press **Enter**.

    b. Allow the trace to run for 30 sec.

    c. Press **Ctrl-C** to stop the trace.

4. Use an xe command to get the dom-id and networks of one of the QA-System virtual machines.

    a. Type `xe vm-list name-label=QA-System\ \(n\) params=dom-id,networks`
        Where n is the number of a QA-System virtual machine running on your host.

    b. Write down the dom-id and the virtual interface (vif) number.

    The virtual interface (vif) number is the number preceding the slash on the networks line.

5. Execute and stop a network trace on a QA-System virtual machine used in the previous step running on your host, using the command "tcpdump" command. Then list the trace files listed in the current directory.

    a. Type `tcpdump –i vif<DOM-ID>.<V> –w vif_trace`.

        Replace <DOM-ID> with the dom-id identified in the previous step. Replace <V> with the virtual interface identified in the last step.

    b. Allow the trace to run for 30 seconds.

c. Press **Ctrl-C** to stop the trace.

d. Type `ls -l` and press **Enter** to view all of the trace files that were captured.

Both Administrators: Running the Bugtool from the Command-Line Interface

1. Generate a diagnostic file using the "xen-bugtool" command.

    a. Type the command `xen-bugtool --yestoall` and press **Enter**.

> If both dashes are not placed before **yestoall**, you will be prompted for each report individually.

2. Record the filename created at the end of this process.

> The filename is of the form bug-report-`datestamp`.tar.bz2 where `datestamp` indicates the date the diagnostic file was created.

Another administrator is going to capture all of these output files and send them in to Citrix Support for them to be analyzed.

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