

How to Install XenDesktop on CloudPlatform

Lee Bushen – EMEA Tech Readiness July 2014



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With the release of XenDesktop 7.5, it's possible to enjoy the benefits of Cloud Computing with your XenDesktop system. Benefits such as centralised template management, advanced network isolation for shared services, easy scale-up and integration with existing Cloud projects.

This document is intended as a "How To" guide to installing XenDesktop 7.5 on top of a CloudPlatform based cloud. This guide was written as a follow up to the <u>XenDesktop Cloud Provisioning</u> webinar presented by Mikael Lindholm and Lee Bushen and details the steps taken to set up the XDCCP demo shown on that webinar.

As mentioned in the webinar, there are many ways to architect this solution. **This is not an official blueprint for building XenDesktop on CloudPlatform** but this guide will, in around 1.5 days, show you a potential way in which it could be configured. We have used the example of a local government shared service Cloud for the naming structure. Amend these as appropriate for your environment.

What you will need to follow this guide:

- 1) Hardware:
 - a. Two physical x86 servers with sufficient RAM and CPU. The servers used in the demo system had 16GB RAM, 2 CPUs.
 - b. NFS based storage. The demo used around 160GB for a basic installation.
- 2) CloudPlatform 4.3 installation software from <u>Citrix.com</u>
- 3) CentOS 6.4 x64 DVD1 ISO from the CentOS archives here

Note: The CloudPlatform install guide below refers to CentOS 6.3. For simplicity, we recommend that you use CentOS 6.4 for both the Volume Worker VM and the CloudPlatform Management VM.

- 4) XenDesktop 7.5 Trial Software: <u>http://www.citrix.com/products/xendesktop/try</u>
- 5) XenServer 6.2 software <u>http://www.citrix.com/products/xenserver/try</u>
- 6) Static IP addresses for:
 - a. Your CloudPlatform Management server (cpman).
 - b. If you don't have an existing NFS server, we provide info on configuring your own virtual NFS server.
 - c. AD Controller and XD Controller (AD1 and XD1).
- 7) An IP address range for your CloudPlatform System VMs. In a small lab 10-20 addresses will suffice.
- 8) An IP address range for your other VMs within the Cloud, including Virtual Desktops, XenApp servers, Worker VMs etc. At least 20-30 addresses.

Setting up the hosting server for the XenDesktop and CloudPlatform backend

All infrastructure servers are installed outside the CloudPlatform system on a separate XenServer. This is a requirement for the CloudPlatform Management server, which cannot exist on the host system that it is managing, but the XenDesktop system could just as easily have been installed within the CloudPlatform system itself. XenServer 6.2 SP1 (Service Packed) was used as the hosting system. Hardware was HP DL360G5 servers with 16GB RAM and NFS connection to an NFS filer for storage. We'd recommend a higher spec server for a proper proof-of-concept.

Installing Windows Servers for Active Directory and XenDesktop

Install 2 x W2K12R2 Servers. Create two VMs on your XenServer, having first copied your Windows ISOs to your XenServer's ISO Library.

- AD1 2GB Ram, 1 x vCPU, 24GB Disk
- XD1 8GB RAM, 2 or 3 vCPUs, 36GB disk
- Select W2K12R2 DC Edition (Server with GUI) during the installation
- Install XenServer Tools into both VMs.
- Change Hostnames of Servers to AD1 and XD1
- Assign Static IPs and make the DNS server of XD1 the IP of the AD1 host.
- Install AD Domain Services and DNS Server onto AD1
- Using **Server Manager**, promote the AD1 to be a domain controller of **XD75CCP.local** domain, accepting the defaults & warnings about DNS and reboot the server.
- On AD1, launch **DNS Manager**, right click on server and set up a forwarder to an existing DNS server.
- On AD1, use Active Directory Users and Groups to create new OU under your domain called Woking Council and another OU beneath it called Desktops
- Create a new user in Woking called "Lee Bushen".
- Right Click the **Desktops** OU and use **Delegate Control** to add Lee as an Admin for the Desktops OU. Create a **Custom Task** to Delegate, Choose Computer Objects, give create and delete rights then on next page, choose full control.
- Join the XenDesktop Controller XD1 to the XD75CCP.local domain hosted on AD1

Tip: For easier remote admin of each server, go to Server Manager of AD1 and XD1 and click on the Local Server node. Enable Remote Desktop and select the appropriate users within AD (Administrator and other tenant admins).

A word about time syncronisation

The integration between XenDesktop and CloudPlatform uses time-based encryption keys. You need to make sure that the CloudPlatform Management server and both AD and XD servers have the same time or preferably use the same time source. One symptom of bad time sync is when XenDesktop cannot connect to CloudPlatform with a user's API keys. Also, if timesync is lost during provisioning operations, they may fail.

XenDesktop Install

- Having copied the **XenDesktop 7.5 ISO** into your XenServer's ISO repository, mount it into your **XD1** VM and run the installer
- Choose XenDesktop install (rather than XenApp)
- Install Delivery Controller Software, choosing all component (DC, Studio, Director, License Server) and from next screen, Storefront, SQL & Remote Assist. Choose Automatic Ports from the last screen.
- Launch **Citrix Studio** from **XD1** and choose **Site Setup**. Choose a fully configured site, using SQL Express defaults and automatically create the database.
- Choose the 30 Day trial unless you have full licenses
- In the Site setup, choose "No Machine Management" you can do this later when you have CloudPlatform.
- No App-V Publishing.
- Do not start configuring machine catalogs at this point. We do this later.

After a few minutes, you should be able to connect to the Storefront on the address similar to:

http://[XD1-IP-Address]/Citrix/StoreWeb/

Creating a XenServer or a Pool of XenServers for CloudPlatform to Manage.

XenServer is free to download and use <u>here</u>. If you are new to XenServer, details of how to install and configure XenServer can be found on the XenServer QuickStart Master Class here: <u>http://www.citrix.com/tv/#videos/6702</u>. Installing XenServer 6.2 is identical to the installation shown in the video.

Install XenServer 6.2 with all current service packs and hotfixes before adding it as a CloudPlatform Host. If you have multiple XenServers, create and join them to a pool before adding them to CloudPlatform.

Hint: If you are using an Evaluation version of XenDesktop, you can point your XenServers to the license server on the XD1 XenDesktop controller. Although you don't lose any functionality with the free version of XenServer, you will need to install all the patches via the XenServer command line. If, using XenCenter, you point your XenServers at the XenDesktop controller and select **Citrix XenServer for XenDesktop** licensing, you can use XenCenter to install the patches which will save you a lot of time.

Although you can use both Basic and Advanced networking models in CloudPlatform, the demo system we configured was based on Basic mode (flat) networking. For Basic Mode networking in CloudPlatform, you need to make sure your XenServer hosts are configured correctly. Basic mode uses IPtables rules to maintain tenant isolation, so you need to perform the following tasks:

- From the XenServer console, type "xe-switch-network-backend bridge"
- Enable IPtables for Basic networking, in the file /etc/sysctl.conf modify the following lines as shown:
 - net.bridge.bridge-nf-call-iptables = 1
 - net.bridge.bridge-nf-call-arptables = 1
- Now reboot the server.

Configuring CloudPlatform

There is already a great Citrix guide for installing and configuring CloudPlatform. Although the guide was written for a specific hands-on lab, the content has been adapted and is included in **Appendix 1** below for reference [Page 10]

Note: The CloudPlatform Management VM in the demo was called cpman and had a 32GB disk and 1GB RAM.

Installing the Volume Worker Template into the CloudPlatform system

- Download CentOS 6.4 x86 or x64 from a <u>CentOS repository</u> and place it on an internal Webserver. Either 32/64 bit will work as a volume worker. The demo used 64 bit.

Note: If you don't have a webserver and you are not concerned with security, consider using your XenDesktop Storefront server (XD1) to host your ISOs for the purposes of importing. Place the ISOs in **c:\inetpub\wwwroot** and use the IP address of your Storefront server below.

- To import this ISO into the CloudPlatform system, you will need to allow CloudPlatform to download ISOs from an internal website by going to the **Global Settings** tab and searching for the parameter **secstorage.allowed.internal.sites**. Change the value to the IP Address of your Webserver (e.g. 192.168.10.10/32) and restart the CloudPlatform Management Server by typing **service cloudstack-management restart** on the CLI of the cpman server.
- Log into CloudPlatform and go to the **Templates** Tab, select **ISO** from the drop down menu
- Import the ISO for CentOS 6.4 x64 as per these settings:

😳 Register ISO	
* Name:	CentOS 6.4 x64
* Description:	CentOS 6.4 x64
* URL:	http://10.81.5.64/exports/CentOS-6.
Zone:	All Zones 🔻
Bootable:	
* OS Type:	CentOS 6.4 (64-bit)
Extractable:	•
Public:	
Featured:	
Cancel	ок

- From the **Instances** tab, create a new CentOS 6.4 VM, booting from ISO, using a small footprint Compute Offering. For Example: A **Medium Instance** with **Small** (5GB) Hard Drive.
- Install CentOS in the same way you did when you created the cpman VM.

Now follow the configuration instructions for installing the **Volume Worker Template** in the **XenApp** and **XenDesktop concepts and deployment on CloudPlatform** guide: <u>http://support.citrix.com/article/CTX140428</u>

Hint: When you get to the part about copying the XenDesktop RPM to the Volume Worker VM, you will need to open a CloudPlatform ingress rule for Port 22 so that the XenDesktop host can access the Volume Worker via SSH to copy the file.

- Logged into CloudPlatform as Admin. Select **Networks** and select **Security Groups** from the drop down menu. Select the **Default Security Group** and set up the ingress rule as follows:

Details	Ingress Rule	Egress rule			
Add by: • CIDR					
Protocol	Star	t Port	End Port	CIDR	Add
TCP	• 22	22		0.0.0/0	Add

Loading a Windows VDI Template on CloudPlatform

Use the **Templates** tab in CloudPlatform and the **ISO** drop down item to import both a
 Windows 7 & XenDesktop 7.5 ISO into CloudPlatform. You can then use these to create a
 Windows 7 Virtual Machine much in the same way as you installed the volume worker.

Prepare the image as you would for any normal XenDesktop deployment. The following workflow was followed in the lab.

- o Install Windows 7
- o Run a Windows Update and install recommended patches
- Install XenServer Tools
- o Join the Windows 7 machine to the **XD75CCP.local** domain
- o Set IP settings to DHCP for IP address and DNS
- Install XenDesktop 7.5 VDA using the defaults
- o Ensure communication ports are opened automatically

	The default ports are listed belo	DW.	Printable ve
 ✓ Environment ✓ HDX 3D Pro ✓ Core Components ✓ Delivery Controller ✓ Features Firewall Summary Install Finish 	Controller Communications 80 TCP 1494 TCP 2598 TCP 8008 TCP	Remote Assistance 3389 TCP	Real Time Audio 16500 - 16509 UDP
	will be created even if th	ne W glows Firewall is turne	n the Windows Firewall. The ru ed off. wall or if you want to create th
			ack Next Cane

- Now **stop the Windows VM** and click on the root volume object of the VM and choose the option to **Create template** for XenDesktop to use.

	Home > Storage - Volumes > ROOT-24 >
O Dashboard	
Instances	Details
Affinity Groups	
Storage	+ io io U <mark>-</mark>

Using an existing Windows image

You can create a Windows 7 base image on another XenServer and export the VM from your XenServer using OVF/OVA format. This will create a VHD file which needs to be uploaded to your webserver for importing into CloudPlatform.

Import the newly prepared Windows 7 image into CloudPlatform using the Templates/Register Templates option. Use the following settings making sure the XenServer Tools box is ticked.

<u> </u>	
* Name:	Windows 7 Image Version 1.0
* Description:	Prepared image for Win7 VDA
* URL:	http://10.81.5.64/exports/Win7-XD-Ir
Zone:	All Zones 🔻
Hypervisor:	XenServer •
XenServer Tools Version 6.1+:	
Format:	VHD •
OS Type:	Windows 7 (32-bit)
Extractable:	
Password Enabled:	
Dynamically Scalable:	
Public:	×
Featured:	
Routing:	
Cancel	OK

Register template

Tip: When building the lab, the most reliable way was to install the templates directly from the CloudPlatform GUI, rather than importing them from a separate XenServer.

Creation a Service Offering for XenDesktop to use

Log into CloudPlatform and create a new Compute Offering within the **Service Offerings** tab. The demo used a 1Ghz CPU, 1GB RAM and 1 x vCPU offering.

Configuring XenDesktop for Multi-Tenancy

To allow multiple administrators to manage the XenDesktop system, roles and scopes pertaining to AD users are created within Citrix Studio.

- On XD1, launch Citrix Studio, logged in as Domain Admin. Click the Administrators Node.
- Now setup a blank scope and appropriate roles for Woking Council, our new tenant.
 - Create Scope, Name, Description (e.g. Woking Scope) but with no objects at this stage.
 - Create a Role, Name (e.g. **CCP Tenant Admins**) and give them full rights to administer **Delivery Groups, Hosts and Machine Catalogs**.
- Enable Lee Bushen as a new Tenant Admin
 - \circ $\;$ Choose the Administrators tab and Create Administrator $\;$
 - Search for Lee Bushen and click the **Woking Scope** radio button
 - o Click the CCP Tenant Admins role and enable the administrator.

Configuring a Cloud connection from XenDesktop

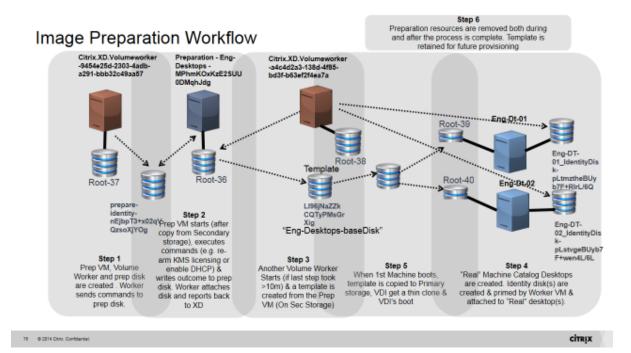
- Login to XenDesktop controller XD1 as **leeb** and observe that he can use Citrix Studio (but can't see others components)
- Launch the CloudPlatform Admin GUI and Choose the Accounts tab.
- Add an account called **Woking-Council** with a username of leeb. Fill in the default fields.
- Login to CloudPlatform as leeb and within Networks tab, and the Security Groups drop down menu, add a security group Woking-Sec-Group-XD with Ingress rules for TCP ports 80, 443 and 2598:

Details	Igress Rule Egress	rule		
Add by: CIDR Account				
Protocol	Start Port	End Port	CIDR	Add
TCP	2598	2598	0.0.0/0	Add
тср	80	80	0.0.0/0	×
TCP	443	443	0.0.0.0/0	×

- Go to the **Accounts** tab and click on **Woking-Council**, find the **leeb** user, click on it and then click the icon to **generate keys**.
- Back in Citrix Studio, create a new Hosting connector to the Cloud using Lee's keys
 - Connection type : CloudPlatform
 - Address: <u>http://[cpman IP Address]:8080/client/api</u>
 - Use API Keys pasted from the CloudPlatform GUI
 - Connection Name Woking Council Cloud
 - Choose I want to create VMs in Zone : London
 - Connection London-Woking-Cloud
- Because the Woking tenant does not have any personal templates, you need to configure the connection to look for all templates in the Cloud
 - Login to the XD1 server as administrator, launch Citrix Studio and change the advanced parameters of the connection to TemplateFilter=executable this will allow the Woking tenant to see templates that do not belong to them (e.g. The Windows 7 template the admin uploaded earlier). Note, at the time of writing, you need to be administrator to do this.
- In XenDesktop, Create a Machine Catalog with the following settings:
 - o Windows Desktop OS
 - \circ $\,$ Machines are power managed and deployed using MCS in London-Woking-Cloud $\,$
 - Choose Random Desktops
 - \circ $\;$ Choose the Desktop image you uploaded to the Cloud earlier.
 - Choose your security group Woking-Sec-Group-XD
 - Provision 1 machine and specify the XenDesktop machine specification (Compute offering) you configured earlier within CloudPlatform.
 - Leave the default for NICs.
 - Create AD Accounts in Woking Council's **Desktops** OU with the name of **Woking-Win7-##**

 Catalog name Woking Win7 Desktops. Leave running; this will take up to 30 minutes to complete.

The following process is happening in the background:



- When the Machine Catalog has finished creating, from Citrix Studio, create a **Delivery Group** & start the VM:
 - Name Pyrford Group
 - Display name Pyrford-Cloud-Desktop
 - Wait approx. 15 mins as the template is copied to Primary Storage and the desktop is launched
 - After a few minutes, check that the desktop is running and that VDA registration has occurred in Citrix Studio
- Finally, launch a browser and login to your Storefront server as **xdccp\leeb.** The Storefront address will be: <u>http://[XD1-IP-Address]/Citrix/StoreWeb/</u>
- Launch your new Cloud Desktop!

That's it! If you got this far, you will have a fully functional XDCCP system. Congratulations!



Appendix 1

XenDesktop 7.5 and CloudPlatform 4.3

Setup CloudPlatform Cheat Sheet

Mike Palmer – Citrix Worldwide Readiness June 2014



CloudPlatform Preparation

CloudPlatform Infrastructure Preparation

This module prepares the minimum infrastructure required for a CloudPlatform implementation.

You will create a Virtual Machine (VM) running on your physical XenServer host and install the CentOS Linux distribution onto the VM. This VM will become the CloudPlatform Management Server (cpman). You will then configure the VMs networking and prepare the VM for the CloudPlatform install.

NFS shared storage is required for CloudPlatform's secondary storage and is often used for CloudPlatform's primary storage. Typically in the datacenter this NFS storage would be provided by a hardware storage device such as a SAN or NAS, but in this lab the NFS storage is provided by a VM (nfs-server) running on the physical XenServer. This nfs-server VM has already been created for you in the same way as cpman, and the network has been similarly configured. You will need to install and configure the components needed to provide the NFS service onto nfs-server, and also install the services necessary to access the NFS shares onto cpman.

Exercises in this module

Exercise 1: Create the cpman VM and install CentOS 6.3 Exercise 2: Install XenServer Tools on the cpman VM Exercise 3: Setup networking on the cpman VM Exercise 4: Configure the nfs-server VM Exercise 5: Configure NFS on the cpman VM

Exercise 1: Create the cpman VM and Install CentOS

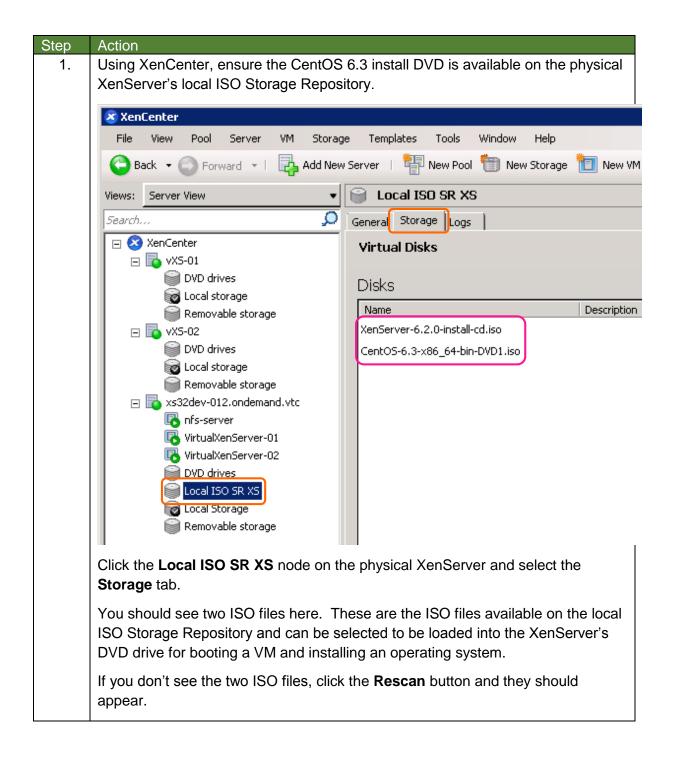
Overview

The CloudPlatform Management Server runs on a RedHat or CentOS operating system version 6.2 or above.

In this exercise you will:

- Create a VM on your physical XenServer.
- Install the CentOS 6.3 operating system on to it.

Step by step guidance



Step	Action		
2.			
	XenCenter		
		Storage Templates Tools	Window Help
	🕒 Back 👻 💮 Forward 👻 🛛 📑 Ac	d New Server 💾 New Po	ol 🛅 New Storage 🔚 New VM 🖓 🅑 Shut Down
	Views: Server View	 xs32dev-012. 	ondemand.vtc
	Search	🔎 Search General Mem	ory Storage Networking NICs Console Performa
	XenCenter XS-01	xs32dev-012.ond	lemand.vtc server console
	DVD drives		
	Local storage		
	Removable storage	Press <e< th=""><th>nter> to login</th></e<>	nter> to login
	VXS-02 DVD drives		
	Local storage		Your physical XenServer name will be different.
	Removable storage	4	hame will be different.
	□ Source State		
	Select your physical XenSe	rver node and click	the New VM button.
3.	🕱 New VM		
0.			
	Select a VM template		0
	Template Search		
	Template Search Name		Q.
	Installation Media	1 7 (22 bit)	Category CentOS
	Home Server		CentOS
	CPU & Memory CentOS	5 (32-bit)	CentOS
	Storage CentOS Networking CentOS		CentOS
	Finish	· · ·	CentOS
	Debian S	queeze 6.0 (32-bit)	Debian
		queeze 6.0 (64-bit)	Debian
		/heezy 7.0 (32-bit) /heezy 7.0 (64-bit)	Debian Debian
		nternrise Linux 5 (32-hit)	Oracle
	You will be asked what VM	template you want	to use. Scroll down the list and
	select the CentOS 6 (64-bi		
	Click Next.		
L	1		

Step	Action	
4.	Enter the name	and description of the VM to be created:
	Name:	cpman
	Description:	CloudPlatform Management Server
	Template	Enter a name that will help you to identify the virtual machine later. This could be a name t and hardware such as RHEL DHCP Server, Win2K3 XenApp Server or Exchange 2007 Clien
	Name	will also be displayed in XenCenter's Resources pane and can be changed later.
	Installation Media	You can also add a more detailed description of the VM, if you wish.
	CPU & Memory	Name: cpman
	Storage	Description: CloudPlatform Management Server
	Click Next.	
5.	New VM	
	-	
	Locate the op	erating system installation media 🛛 👔
	Template	Select the installation method for the operating system software you want to install on the new VM.
	Name	
	Installation Media Home Server	Install from ISO library or DVD drive:
	CPU & Memory	CentOS-6.3-x86_64-bin-DVD1.iso
	Storage	C Install from URL:
	Networking Finish	
	Select the Cent	tOS-6.3-x86_64-bin-DVD1.iso file as the installation media.
	Leave the Adva	anced OS Boot parameters at the default.
	Click Next .	
6.	😣 New VM	
	5elect a home	server (2)
		-
	Template	When you nominate a home server for a virtual machine, the virtual machine will always be started up on that server if it is available. If this is not possible, then an alternate server within the same pool will be selected automatically.
	Name Installation Media	O Don't assign this VM a home server. The VM will be started on any server with the necessary resources.
	Home Server	(Shared storage required)
	CPU & Memory	🔽 xs32dev-012. ondemand.vtc 7306 MB available (32740 MB total)
	Storage Networking	
	Finish	
	Click Next to ac	ccept the default home server (your physical XenServer) to create
	the VM.	

Step	Action	
7.	8 New ¥M	
	i Allocate processor an	d memory resources
	Template Name Installation Media Home Server CPU & Memory Storage Networking Finish	Specify the number of virtual CPUs and the amount of memory that will be initially allocated to the new virtual machine. Number of vCPUs:
8.	• • •	the amount of RAM and number of CPUs for the VM. r of vCPUs to 2 and the Memory to 2048MB , and then click • the new VM
	Template Name Installation Media Home Server CPU & Memory Storage Networking Finish	The virtual machine template you selected earlier provides the virtual disks listed below. You can change the properties of these virtual disks, and add more disks if required. Alternatively, you can select the second option below to create a disk and does not use any virtual disks. When you have finished configuring disks for the new virtual machine, When you have finished configuring disks for the new virtual machine, Constructed disks: Constructed disks: Cocation
	You will increase the	disk size from the default of 8GB. Click Properties .

Step	Action	
9.		
	🔀 Edit Disk	?
	Enter a name, description and size for your virtual disk. The size of your disk and the home server setting of VM the disk belongs to will affect which storage locations are available.	
	Name: cpman 0	
	Description: Created by template provisione	
	Size: 30.000 😴 GB 💌	
	Location: Local Storage 490.04 GB free of 909.01 GB	
	Change the disk size to 30GB , click OK and then click Next .	
10.		
10.	🕱 New VM	
	*	
	Configure networking on the new VM	2
	Template The virtual machine template you have selected provides the virtual network interfaces listed below. You can	
	Name configure or delete the default virtual network interfaces here, and add more if required.	
	Installation Media Virtual network interfaces on coman	
	MAC Network	\dd,,,
	Storage Action Storage	elete
	A <autogenerated mac=""> Private bond0</autogenerated>	operties
	Finish A <autogenerated mac=""> Public bond 1</autogenerated>	
	Put the CloudPlatform Management Server on the same network as the rest of	:
	your infrastructure servers (e.g. XD controller, AD controller).	
11.		
	8 New VM	
	Configure networking on the new VM	
	Template The virtual machine template you have selected provides the virtual network interfaces listed below. You can	n configure
	Name Ultikud estuadu istarfaces or general Ultikud estuadu istarfaces or general	
	Installation Media Virtual network interfaces on cpman Home Server	
	CPU & Memory Acautogenerated MAC Network	Add
	Storage	Delete
	Networking Finish	Properties
	If your screen now looks like the one above, click Next.	

Step	Action					
12.	All the necessary information has been collected and the wizard is ready to provision the new virtual machine using the settings shown below. Review these settings, then click Previous if you need to change anything. Otherwise, click Create Now to create the new VM. It may take several minutes to create the new VM.					
	Template	CentOS 6.0 (64-bit) (experimental)				
	Name	cpman				
	Install Method	CD CD				
	Installation Source					
	Home Server	xs32dev-012.ondemand.vtc				
	VCPUs	2				
	Memory	2048 MB				
	Disk 0	30 GB				
	Network Interface 0	Internal				
	-	<pre></pre>				
	Click Create I	Now.				
13.	You will notice creating the V	e the status bar at the bottom of XenCenter shows the progress in //M.				
	Provisioning VM					
	become the C	r				

Step	Action
14.	😹 XenCenter
	File View Pool Server VM Storage Templates Tools Window Help
	Sack 🗸 🕥 Forward 🖌 🛃 Add New Server 🏪 New Pool 🛅 New Storage 🛅 New VM 🥹 Shut Down 🛞 Reboot 🕕 Suspend 🧟 System Aler
	Views: Server View C cpman on 'xs32dev-012.ondemand.vtc' Logged in as: Local root acc
	Search Q General Memory Storage Networking Console Performance Snapshots Logs
	E tooking for guest console.
	DVD drives Local storage
	🗑 Removable storage
	DVD drives
	Image: Second storage Disc Found Image: Second storage Disc found
	To begin testing the media before installation press OK.
	Choose Skip to skip the media test
	WirtualXenServer-01 and start the installation. VirtualXenServer-02 Image: Constant the installation in the installation is the installation in the installation is the installation in the installation is the install
	DVD drives Elected ISO SR X5 OK Skip
	Cocal Storage
	Removable storage
	Click the cpman node and the Console tab. Once the initial boot is completed, you should see the screen above.
	This is the console to your newly created VM. Adjust the size of the XenCenter window if necessary to show the whole of the console and click in the console to set focus.
	Use the <tab></tab> key to select Skip and then press <enter></enter> .
15.	Wait a few moments for the following screen to appear:
	CentOS Welcome to CentOS?
	Press <enter>.</enter>

Step	Action
16.	Language Selection What language would you like to use during the installation process? Catalan Chinese(Simplified) Croatian Czech Danish Dutch English UE Back VKeep the language selection on English. Use the <tab> key to select OK and then press <enter>.</enter></tab>
17.	Welcome to CentOS for x86_64 Warning Error processing drive: xen-vbd-51712 102400HB Xen Virtual Block Device This device may need to be reinitialized. REINITIALIZING WILL CAUSE ALL DATA TO BE LOST! This action may also be applied to all other disks needing reinitialization. Ignore Ignore all P=initialize Re-initialize all (Tab>/ <alt-tab> between elements <space> selects <f12> next screen</f12></space></alt-tab>
18.	Time Zone Selection In which time zone are you located? I*I System clock uses UTC America/Montevideo America/Montevideo America/Montevideo America/Montevideo I*I System clock uses UTC America/Montevideo I*I System clock uses UTC America/Montevideo I*I System clock uses UTC Back Imerica/New York Back Back Back Imerica/Second Comparison Keep the time zone on America/NewYork. Use the <tab> key to select OK and then press <enter>.</enter></tab>

Action
Welcome to CentOS for x86_64
Root Password
Pick a root password. You must type it twice to ensure you know it and do not make a typing mistake.
Password: ******** Password (confirm): ********
Back
<tab>/<alt-tab> between elements <space> selects <f12> next screen</f12></space></alt-tab></tab>
Enter the root password twice:
Password: Citrix123 Passwords are case sensitive.
Password (confirm): Citrix123
Use the <tab></tab> key to select OK and then press <enter></enter> .
Welcome to CentOS for x86_64 Partitioning Type
Installation requires partitioning of your hard drive. The default layout is suitable for most users. Select what space to use and which drives to use as the install target.
Use entire drive Replace existing Linux system Use free space
Which drive(s) do you want to use for this installation? [*] xuda 30720 MB (Xen Virtual Block Devic) f ?
Back Back
<pre><space>,<+>,<-> selection <f2> Add drive <f12> next screen</f12></f2></space></pre>
Use the <tab></tab> key to select OK and then press <enter></enter> .
Writing storage configuration to disk
The partitioning options you have selected will now be written to disk. Any data on deleted or reformatted partitions will be lost.
Go back Jrite changes to disk
Use the <tab></tab> key to select Write changes to disk and then press <enter></enter> .

Step	Action
22.	After a few minutes you should see the following:
	Complete Congratulations, your CentOS installation is complete. Please reboot to use the installed system. Note that updates may be available to ensure the proper functioning of your system and installation of these updates is recommended after the reboot. Reboot Press <enter></enter> to reboot.
23.	After the reboot, you should see the login prompt. CentOS release 6.3 (Final) Kernel 2.6.32-279.el6.x86_64 on an x86_64 localhost.localdomain login: CentOS 6.3 has been installed on the cpman VM.

You have created a VM named cpman, and have installed the CentOS 6.3 operating system.

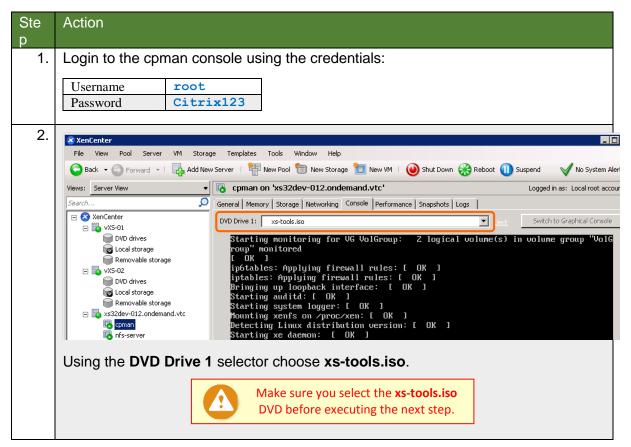
Exercise 2: Install XenServer Tools on the cpman VM

Overview

In this exercise you will:

• Install XenServer tools on the cpman VM. This adds a XenServer agent that assists XenServer in monitoring and controlling the VM.

Step by step guidance



Ste p	Action
3.	To install XenServer tools enter the following commands on the console:
	<pre>mount -r /dev/xvdd /mnt /mnt/Linux/install.sh</pre>
	Answer y <enter> to the prompt.</enter>
	Image: Solution of the second seco
4.	cpman on 'xs32dev-012.ondemand.vtc'
	General Memory Storage Networking Console Performance Snapshots Logs
	DVD Drive 1: xs-tools.iso
	Wait until cpman is in the process of booting and then click Eject to remove the XenServer tools DVD from the DVD drive. Ejecting a DVD when you no longer need it is a XenServer best practice.
	Cpman on 'xs32dev-012.ondemand.vtc'
	General Memory Storage Networking Console Performance Snapshots Logs
	DVD Drive 1: <pre><rpre></rpre></pre> Elect
	The DVD drive should say <empty></empty> .

You have installed the XenServer tools on to the cpman VM.

Exercise 3: Setup Networking on the cpman VM

Overview

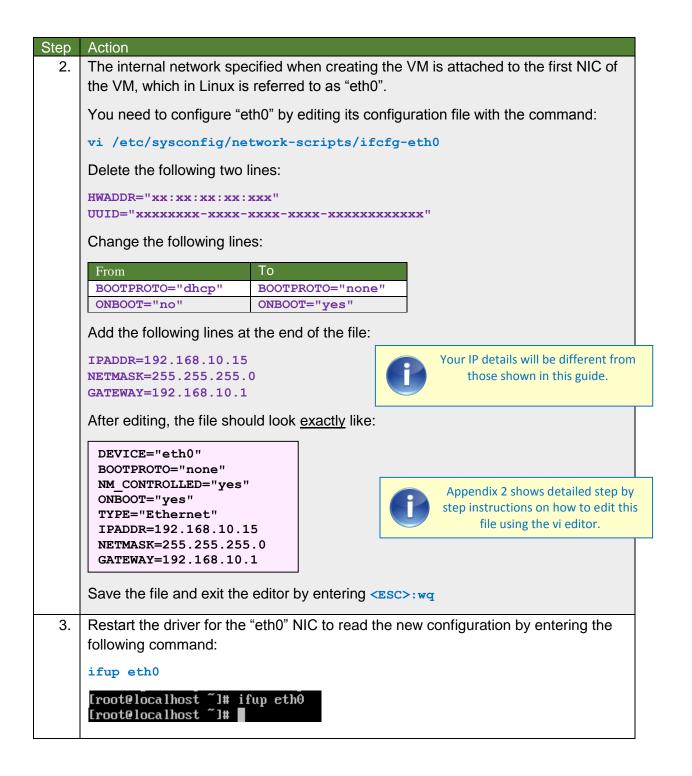
In this exercise you will:

• Configure the networking of the CentOS VM you just created.

You will need to use the vi text editor for this exercise. If you are not familiar with how to use vi, the instructor provided cheat sheet will help you remember the commands needed, or, for more help, refer to Appendix 2 where you will get keystroke by keystroke instructions for editing the first file.

Step by step guidance

Step	Action		
1.	Login to the cpr	nan console usi	ng the credentials:
	Username	root	
	Password	Citrix123	



Step	Action
4.	You can check the network is operational by pinging one of Google's internet DNS
	servers.
	ping -c4 8.8.8.8
	<pre>[root@localhost ~]# ping -c4 8.8.8.8 PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data. 64 bytes from 8.8.8.8: icmp_seq=1 ttl=49 time=8.19 ms 64 bytes from 8.8.8.8: icmp_seq=2 ttl=49 time=7.96 ms 64 bytes from 8.8.8.8: icmp_seq=3 ttl=49 time=7.91 ms 64 bytes from 8.8.8.8: icmp_seq=4 ttl=49 time=7.90 ms</pre>
	8.8.8.8 ping statistics 4 packets transmitted, 4 received, 0% packet loss, time 3012ms rtt min/aug/max/mdev = 7.905/7.994/8.194/0.147 ms [root@localhost ~]#
	Check ping packets were received.
5.	Edit the following file to point to a DNS server for this VM to use.
	vi /etc/resolv.conf
	The file should be empty; add the following line:
	nameserver 192.168.10.10 Your IP details will be different from
	After editing, the file should look like: those shown in this guide. Use the DNS server on the AD controller if following the XDCCP cheat sheet.
	nameserver 192.168.10.10
	Save the file and exit the editor by entering <esc>:wq</esc>
6.	Ping google.com to ensure name resolution is now operational.
	ping -c4 google.com
	[root@localhost ~]# ping -c4 google.com PING google.com (74.125.227.129) 56(84) bytes of data. 64 bytes from dfw06s17-in-f1.1e100.net (74.125.227.129): icmp_seq=1 ttl=57 time= 2.10 ms
	64 bytes from dfw06s17-in-f1.1e100.net (74.125.227.129): icmp_seq=2 ttl=57 time= 1.12 ms
	64 bytes from dfw06s17-in-f1.1e100.net (74.125.227.129): icmp_seq=3 ttl=57 time= 1.08 ms 64 bytes from dfw06s17-in-f1.1e100.net (74.125.227.129): icmp_seq=4 ttl=57 time= 1.11 ms
	google.com ping st <u>atistics</u> 4 packets transmitted, 4 received, 0% packet loss, time 3004ms rtt min/aug/max/mdev = 1.089/1.358/2.109/0.435 ms [root@localhost ~]#
	It may take a few seconds to start the ping. Check the ping packets were received.

Step	Action
7.	Add the two VMs, cpman and nfs-server, to the local name resolution file.
	vi /etc/hosts
	Delete the 2nd line (starting with ::1 localhost) Add the lines:
	127.0.0.1cpman.cplab.local cpman192.168.10.12nfs-server.cplab.local nfs-server
	After editing the file should look like:
	127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4 127.0.0.1 cpman.cplab.local cpman 192.168.10.12 nfs-server.cplab.local nfs-server
	Save the file and exit the editor by entering <esc>:wq</esc>
8.	Verify local name resolution is working.
	ping -c4 nfs-server
	[root@localhost ~]# ping -c4 nfs-server PING nfs-server.cplab.local (192.168.10.12) 56(84) bytes of data. 64 bytes from nfs-server.cplab.local (192.168.10.12): icmp_seq=1 ttl=64 time=1.7 6 ms 64 bytes from nfs-server.cplab.local (192.168.10.12): icmp_seq=2 ttl=64 time=0.1 16 ms 64 bytes from nfs-server.cplab.local (192.168.10.12): icmp_seq=3 ttl=64 time=0.1
	27 ms 64 bytes from nfs-server.cplab.local (192.168.10.12): icmp_seq=4 ttl=64 time=0.1 14 ms
	nfs-server.cplab.local_ping_statistics 4 packets transmitted, 4 received, 0% packet loss, time 3002ms rtt min/aug/max/mdev = 0.114/0.525/1.761/0.711 ms [root@localhost ~]#
	Check ping packets were received.
9.	Edit the following file to change the hostname:
	vi /etc/sysconfig/network
	Change the hostname to cpman
	HOSTNAME=cpman
	After editing the file should look like:
	NETWORKING=yes HOSTNAME=cpman
	Save the file and exit the editor by entering <esc>:wq</esc>
10.	Reboot the VM to get the new hostname registered.
	reboot

Step	Action
11.	CentOS release 6.3 (Final) Kernel 2.6.32-279.el6.x86_64 on an x86_64 Cpman login: After the reboot has completed, notice the hostname.
12.	Login to the cpman console using the credentials: Username root Password Citrix123 Check the hostname is fully qualified by entering the following command: hostname -f Iroot@cpman ~]# hostname -f cpman.cplab.local Iroot@cpman ~]# A fully qualified domain name specifies the host's exact location in the DNS tree hierarchy.

You have configured the network of the cpman VM.

Exercise 4: Configure the nfs-server VM

Overview

In this exercise you will:

• Configure the CloudPlatform primary and secondary shared storage.

CloudPlatform requires shared storage for secondary storage and it is often also used for primary storage. While this would typically be provided by a physical storage device in the datacenter, for the lab, another CentOS based VM running on your physical XenServer will be used as an NFS server. Note: If you don't have a physical NFS server, you will need create one in the same way as in exercise 1-3.

A separate 250GB storage partition was created during the install of the NFS server to act as the primary and secondary shared storage for CloudPlatform. Keeping the OS and data partitions separate is a best practice for an NFS server like this. The partition is mounted on the /nfs mount point.

Step by step guidance

Ste p	Action	
1.	console. Note: If you don't have the same way as in exercise 1	then the Console tab to access the nfs-server VM e a physical NFS server, you will need create one in -3 above. If you have one, skip to exercise 5. re Templates Tools Window Help V Server Window Nelp
	Views: Server View	nfs-server on 'xs32dev-012.ondemand.vtc' General Memory Storage Networking Console Performance Snapshots Logs
	 XenCenter XyX5-01 DVD drives Local storage Removable storage VX5-02 DVD drives Local storage Removable storage Removable storage xs32dev-012.ondemand.vtc rpfs-server VirtualXenServer-01 	DVD Drive 1: <pre> Enabling /etc/fstab swaps: [OK] Entering non-interactive startup Starting monitoring for VG VolGroup: 3 logical v roup" monitored [OK] ip6tables: Applying firewall rules: [OK] iptables: Applying firewall rules: [OK] Bringing up loopback interface: [OK] Bringing up interface eth0: [OK] Starting auditd: [OK] Starting system logger: [OK] Hounting xenfs on /proc/xen: [OK] </pre>

Ste p	Action
2.	Login to the nfs-server console using the credentials:
	UsernamerootPasswordCitrix123
	CentOS release 6.3 (Final) Kernel 2.6.32-279.el6.x86_64 on an x86_64 Infs-server login:
3.	Install the NFS server components required by entering: yum -y install nfs-utils
4.	Setup NFS services to start on reboot.
	chkconfig nfs on
5.	Create directories on the storage partition to serve as the primary and secondary
	storage for two zones, Paris & London. Choose a directory on your NFS Server.
	<pre>mkdir -p /nfs/paris/primary/cluster1 mkdir -p /nfs/paris/secondary</pre>
6.	Edit the NFS exports file to allow these directories to be shared.
	vi /etc/exports
	The file should be empty; add the following line (exactly as shown) to the file:
	<pre>/nfs *(rw,async,no_root_squash)</pre>
	After editing the file should look exactly like:
	/nfs *(rw,async,no_root_squash)
	Save the file and exit the editor by entering <esc>:wq</esc>
7.	Edit the NFS configuration file to open various ports:
	<pre>vi /etc/sysconfig/nfs</pre>
	Uncomment the following lines in the file by deleting the "#" at the beginning of each line:
	<pre>#RQUOTAD_PORT=875 #LOCKD_TCPPORT=32803 #LOCKD_UDPPORT=32769 #MOUNTD_PORT=892 #STATD_PORT=662 #STATD_OUTGOING_PORT=2020</pre>
	Save the file and exit the editor by entering <esc>:wq</esc>

Ste	Action
р	
8.	Enter the following command to verify the NFS configuration file has been edited correctly:
	grep PORT /etc/sysconfig/nfs LOCKD_UDPPORT=32769 MOUNTD_PORT=892
	STATD_PORT=662 STATD_OUTGOING_PORT=2020 DMA_PORT=20049 You should see only the last line (RDMA_PORT) is still commented.

	Action
9.	Configure the Linux firewall (iptables) ingress (inbound) and egress (outbound) rules to allow the NFS traffic by editing the iptables configuration file:
	vi /etc/sysconfig/iptables
	Add the following lines immediately after the 6th line (OUTPUT ACCEPT):
	 -A INPUT -m statestate NEW -p udpdport 111 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 111 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 2049 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 32803 -j ACCEPT -A INPUT -m statestate NEW -p udpdport 32769 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 892 -j ACCEPT -A INPUT -m statestate NEW -p udpdport 892 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 892 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 875 -j ACCEPT -A INPUT -m statestate NEW -p udpdport 875 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 662 -j ACCEPT -A INPUT -m statestate NEW -p udpdport 662 -j ACCEPT
	It is highly recommended to copy and paste the above lines to ensure they are entered correctly. After editing the file should look like: # Firewall configuration written by system-config-firewall
	<pre># Manual customization of this file is not recommended. *filter :INPUT ACCEPT [0:0] :FORWARD ACCEPT [0:0] :OUTPUT ACCEPT [0:0] -A INPUT -m statestate NEW -p udpdport 111 -j ACCEPT</pre>
	<pre># Manual customization of this file is not recommended. *filter :INPUT ACCEPT [0:0] :FORWARD ACCEPT [0:0] -A INPUT -m statestate NEW -p udpdport 111 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 111 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 2049 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 32803 -j ACCEPT -A INPUT -m statestate NEW -p udpdport 32769 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 32769 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 892 -j ACCEPT</pre>
	<pre># Manual customization of this file is not recommended. *filter :INPUT ACCEPT [0:0] :FORWARD ACCEPT [0:0] :OUTPUT ACCEPT [0:0] -A INPUT -m statestate NEW -p udpdport 111 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 111 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 2049 -j ACCEPT -A INPUT -m statestate NEW -p tcpdport 32803 -j ACCEPT -A INPUT -m statestate NEW -p udpdport 32769 -j ACCEPT</pre>

Ste p	Action
10.	Specify the local NFS domain name in the following file:
	vi /etc/idmapd.conf
	Change the 5th line:
	From To
	#Domain = local.domain.edu Domain = cplab.local
	Don't forget to remove the "#" from the start of the line.
	Save the file and exit the editor by entering <esc>:wq</esc>
11.	Reboot by entering:
	reboot
12.	Login to the nfs-server console using the credentials:
	UsernamerootPasswordCitrix123
	Check the /nfs directory is being exported by entering:
	showmount -e
	[root@nfs-server ~]# showmount -e Export list for nfs-server: /nfs * [root@nfs-server ~]#
	Notice the /nfs directory (containing the shared storage directories you created earlier), is in the export list.

You have configured the NFS server that CloudPlatform will use for primary and secondary storage.

Exercise 5: Configure NFS on the cpman VM

Overview

In this exercise you will:

- Configure the required NFS components on the CloudPlatform Management Server (cpman).
- Make some final infrastructure preparations.

Step by step guidance

Ste p	Action
1.	Switch back to the cpman console by clicking the cpman node.
	 xs32dev-012.ondemand.vtc cpman fs of the cpman console. WirtualXenServer-01
2.	Install the NFS components on cpman by entering: yum -y install nfs-utils
3.	Start essential NFS services:
	service rpcbind start service nfslock start service nfs start chkconfig nfs on
	[root@cpman ~]# service rpcbind start Starting rpcbind: [OK] [root@cpman ~]# service nfslock start Starting NFS statd: [OK] [root@cpman ~]# service nfs start Starting NFS services: [OK] Starting NFS mountd: [OK] Starting NFS daemon: [OK] [root@cpman ~]# chkconfig nfs on [root@cpman ~]#

Ste	Action
р 4.	Check the NFS server is accessible from cpman:
	showmount -e nfs-server Use the hostname of your own NFS server
	Export list for nfs-server:
	∕nfs * [root@cpman ~]#
	Notice nfs-server is accessible, and is exporting the /nfs directory.
5.	Linux access control, SELINUX, needs to be set to "permissive" for proper
	CloudPlatform installation and operation.
	Enter the following command to set permissive mode:
	setenforce permissive
6.	While the last command immediately sets permissive mode, it will not survive a
	reboot. Set SELINUX to permissive at boot time by editing the following file:
	vi /etc/selinux/config
	Change the 6th line:
	From: To: SELINUX=enforcing SELINUX=permissive
	After editing, the file should look like:
	<pre># This file controls the state of SELinux on the system. # SELINUX= can take one of these three values:</pre>
	# enforcing - SELinux security policy is enforced. # permissive - SELinux prints warnings instead of enforcing.
	<pre># disabled - No SELinux policy is loaded.</pre>
	SELINUX=permissive # SELINUXTYPE= can take one of these two values:
	<pre># targeted - Targeted processes are protected, # mls - Multi Level Security protection.</pre>
	SELINUXTYPE=targeted
	Save the file and exit the editor by entering <esc>:wq</esc>

Ste p	Action				
7.	Network Time Protocol (NTP) is required to synchronize the clocks of the servers in your cloud. The following command installs the NTP service on cpman.				
	yum -y install ntp				
	Installed: ntp.x86_64 0:4.2.6p5-1.el6.centos				
	Dependency Installed: libedit.x86_64 0:2.11-4.20080712cvs.1.el6 make.x86_64 1:3.81-20.el6 ntpdate.x86_64 0:4.2.6p5-1.el6.centos				
	Dependency Updated: openssl.x86_64 0:1.0.1e-16.el6_5.4				
	Complete! [root@cpman ~]#				
8.	Start the NTP client by entering the following command:				
	service ntpd start				
	[root@cpman ~]# service ntpd start Starting ntpd: [OK] [root@cpman ~]#				
9.	Set NTP to start again upon reboot by entering the following command:				
	chkconfig ntpd on				
	[root@cpman ~]# chkconfig ntpd on [root@cpman ~]#				
10.	The CloudPlatform installation is provided as a consolidated UNIX archive file known as a "TAR" file (short for Tape ARchive). TAR files can be obtained directly from web sites using the wget tool, but before you can use the tool, it must be installed.				
	Enter the following command to install wget:				
	yum -y install wget				
	Once this tool is installed you are ready to install CloudPlatform.				

You have installed and started the NFS services on cpman and configured several other services needed by CloudPlatform. You now have the entire infrastructure in place and are ready to install CloudPlatform.

Module 2

Install & Configure CloudPlatform

CloudPlatform is delivered as a TAR file (often called a "Tar Ball"). You can download the CloudPlatform install TAR file from the Citrix download site: <u>http://www.citrix.com/downloads</u>. To save time, the file has been placed on the Student Desktop web server for you. You will transfer the file directly from the web server onto the cpman VM using the "wget" tool. You will then use the file to install the CloudPlatform Management Server and CloudPlatform MySQL database.

Once the CloudPlatform software install is complete, the CloudPlatform System VM template file must be "seeded" for each of the zones to be built. The System template file is normally downloaded directly from the internet, but again, to save time the system VM template has been placed on the Student Desktop web server. You will run a script to download the template from the web server and install it into the secondary storage for the Paris zone. You will then repeat the seeding for the London zone secondary storage.

Exercises in this module

Exercise 1: Install CloudPlatform Exercise 2: Prepare the System VM Template



If you are using this lab guide to install CloudPlatform in your own lab, see the notes at the end of exercises 1 & 2.

Exercise 1: Install CloudPlatform

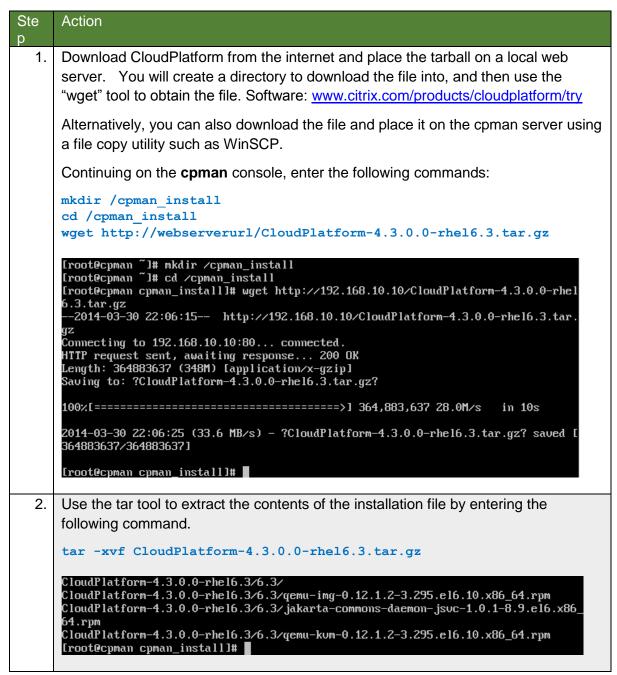
Overview

In this exercise you will:

- Download the CloudPlatform Management Server software TAR file.
- Install the CloudPlatform Management Server software.

Step by step guidance

Estimated time to complete this exercise: 20 minutes.



Ste	Action			
<u>р</u> 3.	Change directory to the CloudPlatform installation files directory. cd CloudPlatform-4.3.0.0-rhe16.3 [root@cpman cpman_install]# cd CloudPlatform-4.3.0.0-rhe16.3 [root@cpman CloudPlatform-4.3.0.0-rhe16.3]#			
4.	Install the CloudPlatform Management Server by entering the command: ./install.shinstall-management Complete! Done Eroot@cpman CloudPlatform-4.3.0.0-rhe16.31#			
5.	Install the MySQL database using the following command: ./install.shinstall-database [OK] Starting mysqld: [OK] Done [root@cpman CloudPlatform-4.3.0.0-rhe16.3]#			

Ste p	Action					
6.	6. Edit the MySQL configuration file to change some of the default configuration parameters required by CloudPlatform. vi /etc/my.cnf Add the following lines after the 2nd line (datadir=): innodb_rollback_on_timeout=1 innodb_lock_wait_timeout=600 max_connections=350 log-bin=mysql-bin binlog-format = 'ROW'					
	After editing, the file should look like:					
	<pre>[mysqld] datadir=/var/lib/mysql innodb_rollback_on_timeout=1 innodb_lock_wait_timeout=600 max_connections=350 log-bin=mysql-bin binlog-format = 'ROW' socket=/var/lib/mysql/mysql.sock user=mysql # Disabling symbolic-links is recommended to prevent security risks symbolic-links=0 [mysqld_safe] log-error=/var/log/mysqld.log pid-file=/var/run/mysqld/mysqld.pid</pre>					
	Save the file and exit the editor by entering <esc>:wq</esc>					
	The max_connections parameter should be set to 350 multiplied by the number of Management Servers you are deploying.					
7.	Restart the MySQL service to re-read the updated configuration file by entering:					
	service mysqld restart					
	[root@cpman CloudPlatform-4.3.0.0-rhe16.3]# service mysqld restart Stopping mysqld: [OK] Starting mysqld: [OK] [root@cpman CloudPlatform-4.3.0.0-rhe16.3]#					

Ste p	Action
8.	Set the MySQL database root password to "Citrix123" by entering:
	<pre>mysql -u root SET PASSWORD = PASSWORD('Citrix123'); GRANT ALL PRIVILEGES ON *.* TO 'root'@'%' WITH GRANT OPTION; exit</pre>
	[root@cpman CloudPlatform-4.3.0.0-rhel6.3]# mysql -u root Welcome to the MySQL monitor. Commands end with ; or Ng. Your MySQL connection id is 2 Server_version: 5.1.73-log Source distribution Copyright (c) 2000, 2013, Oracle and/or its affiliates. All rights reserved.
	Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.
	Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
	mysql> SET PASSWORD = PASSWORD('Citrix123'); Query OK, 0 rows affected (0.00 sec)
	mysql> GRANT ALL PRIVILEGES ON *.* TO 'root'@'%' WITH GRANT OPTION; Query DK, 0 rows affected (0.00 sec)
	mysql> exit Bye [root@cpman CloudPlatform-4.3.0.0-rhe16.3]#
9.	Setup the CloudPlatform database schema in the MySQL database by entering:
	<pre>cloudstack-setup-databases cloud:cloud@localhostdeploy-as=root:Citrix123</pre>
	CloudStack has successfully initialized database, you can check your database co nfiguration in /etc/cloudstack/management/db.properties
	Eroot@cpman CloudPlatform-4.3.0.0-rhe16.31#
	The CloudPlatform database is setup with username:cloud and password:cloud.

Ste	Action					
р 10.	The virtual XenServers used as hosts in the lab do not have Hardware Virtual Machine (HVM) capability like a physical CPU does. This means they are only able to run fully paravirtualized operating systems such as some versions of Linux (for example RedHat or CentOS).					
	By default, CloudPlatform checks the host for HVM capability and will reject any host that does not have it. For the lab you must override the HVM check to allow the virtual XenServers to be used. This step is only required in the lab and would not be required with physical XenServers.					
	Enter the following four commands (the INSERT command that is shown below on four lines, is all one line):					
	<pre>mysql -u rootpassword=Citrix123 INSERT INTO `cloud`.`configuration` (`category`, `instance`, `component`, `name`,`value`, `description`) VALUES ('Advanced', 'DEFAULT', 'management-server','xen.check.hvm', 'false', 'Should w allow only the XenServers support HVM'); commit \q</pre>					
	Query OK, 1 row affected (0.00 sec)					
	mysql> commit -> \q Bye [root@cpman CloudPlatform-4.3.0.0-rhe16.3]#					
	Check you see one row in the database was updated.					
11.	Complete the setup of the CloudPlatform Management Server by entering the command:					
	cloudstack-setup-management					
	Iroot@cpman CloudPlatform-4.3.0.0-rhe16.3]# cloudstack-setup-management Starting to configure CloudStack Management Server: Configure sudoers [OK] Configure Firewall [OK] Configure CloudStack Management Server[OK] CloudStack Management Server setup is Done! Iroot@cpman CloudPlatform-4.3.0.0-rhe16.3]#					
	This completes the setup of the cpman server.					

Note on Installing CloudPlatform outside of this lab environment

To speed up the install process for the lab, the CloudPlatform install file was placed on your Student Desktop web server, and the command in step one of this exercise retrieved the file from there. To install CloudPlatform outside of this lab environment, the CloudPlatform install TAR file should be downloaded from the Citrix web site (<u>http://www.citrix.com/downloads</u>) and then transferred from the download location to the cpman VM using ftp or wget. Note that the TAR filename will change depending on the version of CloudPlatform and the commands in steps 2 & 3 would change accordingly.

Exercise Summary

You have downloaded, installed and configured the CloudPlatform Management Server.

Exercise 2: Prepare the System VM Template

Overview

CloudPlatform secondary storage is the storage used for all CloudPlatform VM templates for the zone, as well as snapshots and ISO images.

In this exercise you will:

• Seed secondary storage with the system VM template using the template installation script.

The system VM template will be used to create all CloudPlatform system VMs (system Virtual Routers, system Console Proxy VMs and system Storage transfer VMs) in the zone. Each zone has its own secondary storage so each zone's secondary storage must be separately seeded with the system template. It is not possible to simply copy the template from the secondary storage of one zone to the secondary storage of another zone. The install script also seeds the CloudPlatform database, so the script must be used on each zone separately.

Note about long and complex CLI commands

Several CLI commands in this exercise are long and complex. The commands are intended to be copied & then pasted into the cpman VM console to ensure the commands are entered accurately. When you paste the command ensure that the command pasted is the complete command from the lab guide. If you experience difficulty pasting, use a text editor on your laptop desktop as an intermediary, checking and reforming the command if necessary.

Step by step guidance

Estimated time to complete this exercise: 10 minutes.

Ste p	Action
1.	Continuing on the cpman console, mount the NFS secondary storage for the Paris zone with the following two commands (choose the path to your Secondary Storage NFS share):
	<pre>mkdir -p /mnt/secondary mount -t nfs -o vers=3 nfs-server.cplab.local:/nfs/paris/secondary /mnt/secondary</pre>

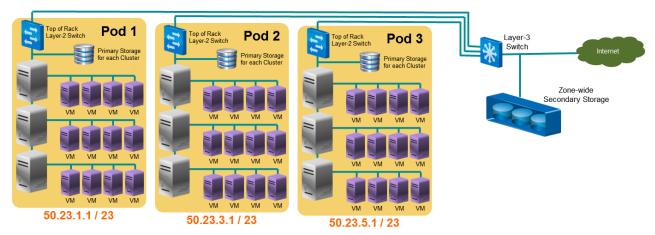
Ste p	Action				
2.	Install the CloudPlatform system VM template by entering the following command (it's all one command):				
	<pre>/usr/share/cloudstack-common/scripts/storage/secondary/cloud-install-sys-tmplt -m /mnt/secondary/ -u \ download.cloud.com/templates/4.3/systemvm64template-2014-01-14-master- xen.vhd.bz2 -h xenserver</pre>				
	The template will be downloaded and installed. This will take several minutes.				
	Uncompressing to /usr/share/cloudstack-common/scripts/storage/secondary/bc8ad401 -9031-46dc-ab60-ec3ab4a2e8f8.vhd.tmp (type bz2)could take a long time Moving to /mmt/secondary/template/tmpl/1/1///bc8ad401-9031-46dc-ab60-ec3ab4a2e8f 8.vhdcould take a while Successfully installed system VM template to /mmt/secondary/template/tmpl/1/1/ Iroot@cpman CloudPlatform-4.3.0.0-rhe16.3]#				
	Check for the "Successfully installed" message.				
3.	Left blank. Not relevant outside CCP Lab				
4.	Left blank. Not relevant outside CCP Lab				
5.	nfs-server console.				
	Comman The next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the nfs-server VM console. Image: Note of the next step is carried out on the n				
	UsernamerootPasswordCitrix123				
6.	Enter the following command:				
	<pre>ls -l /nfs/paris/secondary/template/tmpl/1/1/</pre>				
	[root@nfs-server ~]# ls -1 /nfs/pari s/secondary/template/tmpl/1/1/ total 2565016 -rw-rr 1 root root 2626564608 Mar 30 22:26 bc8ad401-9031-46dc-ab60-ec3ab4a2 e8f8.uhd				
	-rw-rr 1 root root 287 Mar 30 22:28 template.properties [root@nfs-server ~]# ls -1 /nfs/long on/secondary/template/tmpl/1/1/ total 2565016				
	-rw-rr 1 root root 2626564608 Mar 30 22:32 9357a842-ba99-4dcd-9950-c8a9f23d bad6.vhd				
	-rw-rr 1 root root 287 Mar 30 22:33 template.properties [root@nfs-server~]#				
	The two zones, Paris & London, have been seeded with the system VM template VHD file. Each template is about 2 $\frac{1}{2}$ GB in size.				

You have now seeded the CloudPlatform system templates for the London and Paris zones. CloudPlatform is now installed, configured and ready to build a cloud.

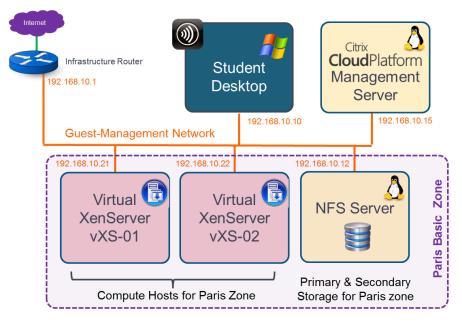
Module 3

Build a Basic Networking Zone

All the Guest VMs throughout a Basic Networking zone share a single flat network, with every Guest VM having a unique IP address assigned from the Guest IP range. Zones are built with Pods, with each Pod consisting of Clusters of Hosts and Primary Storage. Each Pod is on its own management subnet range and contains a dedicated Guest IP range, so this allows a Basic zone to be scaled horizontally by simply adding more Pods.



In this module you will build a Basic Networking zone cloud by creating your first Pod. The diagram below shows the physical networking of the lab infrastructure for the Paris Basic zone. The Paris zone components are shown in the purple dotted area.



Exercises in this module

Exercise 1: Create a XenServer Resource Pool

Exercise 2: Build a Basic networking zone

Exercise 1: Create a XenServer Resource Pool

Overview

When adding multiple XenServer hosts to the same CloudPlatform cluster, the XenServers must already be bound into a "Resource Pool".

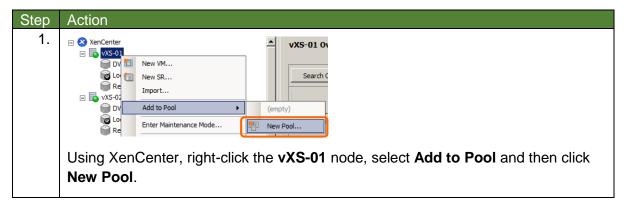
In this exercise you will:

• Create a XenServer pool consisting of two virtual XenServers.

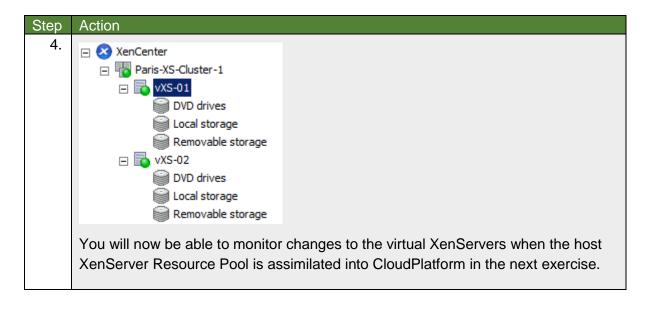
Note: Perform this step on your physical XenServers. The vXS-01/vXS-02 XenServer names are left in for reference.

Step by step guidance

Estimated time to complete this exercise: 5 minutes.



Step	Action					
2.	Enter the pool name:					
	Name: Paris-XS-Cluster-1					
	Consta New Pool					
	Create New Pool					
	To create your pool provide a name and select which servers you would like to be added to the pool.					
	Name: Paris-XS-Cluster-1					
	Description: (optional)					
	Servers					
	Master: vXS-01					
	Additional members:					
	VXS-01 Master					
	xs32dev-200.ondemand.vtc This server's hardware is incompatible with the					
	Add New Server					
	Create Pool Cancel					
	Check vXS-02 and click Create Pool.					
3.	It takes 15 seconds or so to form the Paris-XS-Cluster-1 resource pool consisting					
	of vXS-01 and vXS-02. XenCenter always lists the "Pool Master" server first (vXS-					
	01).					
	E 😣 XenCenter					
	Paris-XS-Cluster-1					
	 ₩ 3 vXS-01 ₩ 3 vXS-02 					
	Expand the vXS-01 and vXS-02 nodes by clicking the $ \mathbb{E} $ on both nodes.					



You have now created a XenServer Resource Pool consisting of two XenServers to provide the compute resources for your cloud's Basic zone.

Exercise 2: Build a Basic Zone

Overview

In this exercise you will:

• Build your first cloud by creating a Basic zone using the CloudPlatform GUI.

Step by step guidance

Estimated time to complete this exercise: 35 minutes.

Step	Action			
1.	On the Student Desktop (not your laptop), start the CloudPlatform Management server GUI by launching the Chrome browser			
2.	Enter the following URL: http://192.168.10.15:8080/client CoudPlatform ^{MM} * Use the IP address of your CPMAN server here. CoudPlatform ^{MMM} * Use the IP address of your CPMAN server here.			

Step	Action						
3.							
	Note that there is no requirement to use XenCenter to monitor the cloud building; it is simply used in the lab to increase understanding of what's going on behind the scenes,						
	сіткіх.						
4.	Login to the CloudPlatform GUI using the following credentials: Username admin Password password Domain Leave Blank						
5							
5. PRODUCT. Licenses are version specific for the PRODUCT. They must be the same version of later than the PRODUCT being accessed. CITRIX grants to you the following worldwide and non-exclusive rights to the PRODUCT and accompanying documentation (collectively called the "SOFTWARE"): a. License. You may install the SOFTWARE on servers containing up to the number of CPU sockets for which you have purchased Licenses ("Production Servers"). In addition, you may install the management portion of the SOFTWARE on management servers as required to support the SOFTWARE running on the Production Servers. You may use the SOFTWARE to provide cloud services for internal users or third parties. Each License this is installed in both a production and disacter sections on one production end with one of the contraments at any one time. 							
	Accept the license agreement by clicking Agree at the very bottom of the page.						

Step	Action			
6.	What is CloudPlatform™?			
	Introduction to CloudPlatform™ CloudPlatform™ is a software platform that pools computing resources to build public, private, and hybrid Infrastructure as a Service (las5) clouds: CloudPlatform™ manages the network, storage, and compute nodes that make up a cloud infrastructure. Use CloudPlatform™ to deploy, manage, and configure cloud computing environments.			
	Extending beyond individual virtual machine images running on commodity hardware, CloudPlatform™ provides a turnkey cloud infrastructure software stack for delivering virtual datacenters as a service - delivering all of the essential components to build, deploy, and manage multi-tier and multi-tenant cloud applications. Both open-source and Premium versions are available, with the open-source version offering nearly identical features.			
	CloudPlatform CloudPlatform Unualized Servers Networking			
	I have used CloudPlatform before, skip this guide Continue with basic installation			
Click Continue with basic installation.				
7.	Please change your password.			
	New Password:			
	Confirm password:			
	Save and continue			
	Please change the password by entering:			
	New Password: Citrix123			
	Confirm Password: Citrix123			
	Click Save and Continue.			
8.	Let's add a zone			
	What is a zone?			
A zone is the largest organizational unit within a CloudPlatform™ deployment. A zone typically corresponds to a single datacenter, although it is permissible to have multiple zones in a datacenter. The benefit of organizing infrastructure into zones is to provide physical isolation and redundancy. For example, each zone can have its own power supply and network uplink, and the zones can be widely separated geographically (though this is not required).				
	Васк			
	Click OK .			

Step	Action				
9.	•		rm needs to know the zone name and the DNS m VMs should use. Enter the following:		
	Name	Paris	The zone name		
	DNS 1	192.168.10.10	DNS the Guest VMs will use		
	DNS 2	Leave Blank			
	Internal DNS 1	192.168.10.10	DNS the System VMs will use		
	Internal DNS 2	Leave Blank			
10	The Guest VMs usually have unrestricted internet access so are able to use external DN but it's not uncommon for the System VM's access to the internet being restricted, hence separate internal DNS can be used. In the lab, the Student Desktop VM acts as the DNS for both the Guest & System VMs.				
10.	Let's add a pod				
	What is a pod? A pod often represents a single	e rack. Hosts in the same pod are in the	same subnet.		
	A pod often represents a single rack. Hosts in the same pod are in the same subnet.				
	A pod is the second-largest organizational unit within a CloudPlatform™ deployment. Pods are contained within zones. Each zone can contain one or more pods; in the Basic Installation, you will have just one pod in your zone.				
	Back OK				
	Click OK .				

Step	Action				
11.	A pod is us	ually a rack of serv	ers. In this dialog you must specify a name for the pod and		
	the range o	f IP addresses to b	be used by CloudPlatform's System VMs.		
	Enter the fo	bllowing parameters	S:		
	Name	Paris-Pod-1	The pod name		
	Gateway	192.168.10.1	Gateway the compute hosts will use		
	Netmask	255.255.255.0	Netmask the compute hosts will use		
	IP range	192.168.10.40 192.168.10.49	IP Range the system VMs will use		
	The IP address of each System VM (Secondary Storage, Console Proxy and Virtual Router) will be assigned from the IP range entered above. The range must belong to the same subnet as the compute hosts (vXS-01 & vXS-02).				
		*Name: Paris-Pod-1			
	*G	ateway: 192, 168, 10, 1			
	*N	letmask: 255,255,255,0			
	* 10	Range: 192.168.10.40	192.168.10.49		
		Range: 192.168.10.40			
	Back		Continue eccc ccc		
	Click Conti	nue.			
12.	To specify t	the Guest network	parameters for this pod enter the following parameters:		
	Gateway	192.168.10.1	Gateway the Guest VMs will use		
	Netmask	255.255.255.0	Netmask the Guest VMs will use		
	IP range	192.168.10.50 192.168.10.99	IP Range the Guest VMs will use		
	The IP add	ross of oach Guast	VM will be assigned from the IP range entered above. The		
			hould be in the same network subnet (CIDR) as the pod.		
	Add gues	st network			
	* Gate	way: 192.168.10.1	Best practice is to separate the		
			System VMs and Guest VMs on		
	* Netr	nask: 255.255.255.0	separate subnets, but for simplicity		
	*IP Ra	ange: 192.168.10.50 192.1	you will use the same subnet for		
	Back		Continue these VMs in the lab.		
			10000		
	Click Conti	nue.			

Step	Action
13.	
	Let's add a cluster
	What is a cluster?
	A cluster provides a way to group hosts. The hosts in a cluster all have identical hardware, run the same
	hypervisor, are on the same subnet, and access the same shared storage. Virtual machine instances
	(VMs) can be live-migrated from one host to another within the same cluster, without interrupting service to
	the user. A cluster is the third-largest organizational unit within a CloudPlatform™ deployment. Clusters are contained within pods, and pods are contained within zones.
	CloudPlatform™ allows multiple clusters in a cloud deployment, but for a Basic Installation, we only need
	one cluster.
	Back OK
	Click OK .
14.	Each pod contains one or more clusters. A cluster provides a way to group hosts. All hosts
	in a cluster must have identical hardware and run the same hypervisor.
	Ensure XenServer is selected as the hypervisor and enter the name as shown below:
	Hypervisor XenServer Name Paris-Cluster-1
	Name Fails Claster I
	Add Cluster
	Hypervisor: XenServer
	*Name: Paris-Cluster-1
	Back
	Click Continue.
15.	
	Let's add a host
	What is a host?
	A host is a single computer. Hosts provide the computing resources that run the guest virtual machines.
	Each host has hypervisor software installed on it to manage the guest VMs (except for bare metal hosts, which are a special case discussed in the Advanced Installation Guide). For example, a Linux KVM-enabled
	server, a Citrix XenServer server, and an ESXi server are hosts. In a Basic Installation, we use a single
	host running XenServer or KVM.
	The host is the smallest organizational unit within a CloudPlatform™ deployment. Hosts are contained within shorters are contained within and and and and and and and and and an
	within clusters, clusters are contained within pods, and pods are contained within zones.
	Back OK
	Click OK .

Step	Action						
16.	Enter the paran	meters shown below to specify the first compute host IP address and login					
	credentials. Th	ne specified IP can be a stand-alone host or a XenServer Resource Pool of					
	hosts. In the case of a pool, use the IP address of the "Pool Master", which in your case is						
	vXS-01.						
	Host name	192.168.10.21					
	Username	root					
	Password	Citrix123					
	Add Host						
	*Host Name: 192.18	68.10.21					
	*Username: root						
	Osemanie. Tubi						
	*Password:	10000					
	Back	Continue					
	Click Continue						
17.	المراجع والمراجع						
		rimary storage					
	What is primary storage A CloudPlatform™ c	ge? cloud infrastructure makes use of two types of storage: primary storage and secondary					
		ise can be iSCSI or NFS servers, or localdisk.					
		associated with a cluster, and it stores the disk volumes of each guest VM for all the					
	VMs running on host	ts in that cluster. The primary storage server is typically located close to the hosts.					
	Back	ок					
		10000 1000 1000 1000 1000 1000 1000 10					
	Click OK .						

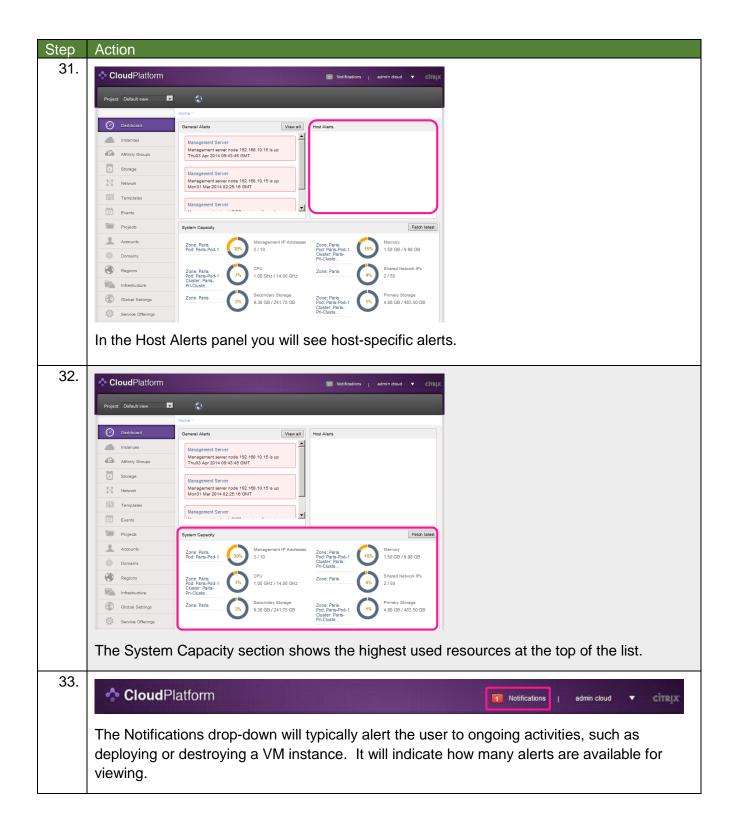
Step	Action						
18.	Primary storage	e is used for the Virtual Disk Images (boot disks) of all VMs running in the					
	cluster. It is shared among all hosts in the Cluster.						
		-					
	Enter or select the following parameters:						
	Name	Paris-Pri-Cluster-1					
	Protocol NFS						
	Scope	Cluster					
	Server	192.168.10.12					
	Path	/nfs/paris/primary/cluster1					
	Add Primary Stor	rade					
	* Name: Paris-Pi						
	Name: (Palis-Pi						
	Protocol: NFS						
	Scope: Cluster	r 🗵					
	* Server: 192.168	10.12					
	36/Vel. [152.100						
	* Path: /nfs/pari	is/primary/cluster1					
	Back	Continue					
		and the second					
	Click Continue						
19.	Let's add secon	Idary					
	storage						
	What is secondary storage?						
	Secondary storage is asso	ciated with a zone, and it stores the following:					
		t can be used to boot ∀Ms and can include					
		rmation, such as installed applications					
	 ISO images - OS images the 	nat can be bootable or non-bootable					
	23	aved copies of VM data which can be used for data					
	 recovery or to create new te 	Impiates					
	Click OK .						

Step	Action	
20.	Secondary stora	ge is used for templates, snapshots and ISO images across the zone.
	Enter or select th	ne following parameters:
	NFS Server	192.168.10.12
	Provider	NFS
	Path	/nfs/paris/secondary
	Add Secondar	ry Storage
	* NFS Server: 192	2.168.10.12
	Provider: NF	-s •
	_	
	* Path: //nfs	/paris/secondary
	Back	Continue
	Oliek C entinue	
	Click Continue.	
21.	Congratulations!	
	Click the launch button.	
	Back	Launch
	Click Launch.	
22.	NI 1 11 11	
	Now building	your cloud
	📀 Creating zone	
	📀 Creating physical net	works
	Configuring physical	networks
	Enabling Security Gro	pup provider
	📀 Creating guest netwo	ork
	📀 Creating pod	
	Configuring guest tra	ffic
	Creating cluster	
	🤣 Adding host	
	Wait about 25 se	econds, then, when CloudPlatform starts addding the host move to the
	next step.	

Step	Action
23.	XenCenter
	6040d30e-b7b4-e012-6459-d162860f33ff
	₩ DVD drives Removable storage
	E DVD drives
	Intersection of the second
	Removable storage 7a6e5771-8656-30d5-b61f-47ebe40f7ca5
	Roughly 40 seconds after launch, in XenCenter, notice the shared Primary Storage Repository (Primary SR) for Paris-XS-Cluster-1 is created (highlighted above).
	This is the SR where the Virtual Disk Images (VDIs or Boot Disks) of the VMs running in this cluster reside. It is shared amongst the cluster of hosts and is located on NFS shared storage.
	Click the new Primary SR node and select the Storage tab.
24.	Views: Server View
	Search
	XenCenter Virtual Disks Image: Ward of the second
	□ □ vXS-01 □ 6040d30e-b7b4-e012-6459-d162860f33ff Disks
	DVD drives Name Description Size Vi Removable storage doud-e474a126-d274-4685-82d3-b00e50 2.4 GB
	□ □ VX5-02
	f1b3a7f0-34aa-16aa-f8ca-0f39d028e9ef
	Image: Constraint of the second sec
	Roughly a minute after launch you will see a VDI is created on the SR as highlighted above.
	This is the System VM template that is now being copied to primary storage from the Paris
	zone secondary storage. It takes about five minutes to copy the 2.4GB template.
25.	The System VM template is used to create the System VMs used by CloudPlatform.
	Roughly six minutes after launch, the name of the template will change to "Template
	routing-1".
	Disks
	Name Description Size Virtual Machine
	Template routing-1
26.	A few seconds later you will see the VDIs for the two CloudPlatform system VMs created as linked clones of the template.
	Disks
	Name Description Size Virtual Machine ROOT-2 2.4 GB s-2-VM Image: Size Image: Size <td< th=""></td<>
	ROOT-1 2.4 GB v-1-VM
	Template routing-1

Step	Action				
27.	Shortly thereafter the VMs will show up running in vXS-01 or vXS-02. It may take a minute				
	for the second VM to show up.				
	 ➢ XenCenter ➢ Paris-XS-Cluster-1 ➢ vXS-01 ➢ s-2-VM ⑥ 604030e-b7b4-e012-6459-d162860f33ff ⓒ DVD drives ⓒ Removable storage ○ vXS-02 ⓒ DVD drives 				
	📔 f1b3a7f0-34aa-16aa-f8ca-0f39d028e9ef				
	There will be two system VMs, the Secondary Storage system VM (s) and the Console proxy system VM (v). The order of creation of the two system VMs is random; the first one to start is numbered 1 (e.g. v-1-VM) and the second is numbered 2 (e.g. s-2-VM).				
	The System VMs may start on vXS-01 or vXS-02. The deployment of all VMs into hosts is based on the allocation algorithm, which, by default, is set to random. CloudPlatform will choose an appropriate host with the capacity and correct hypervisor to run the VM. You can find more information on the VM allocator algorithms here: http://support.citrix.com/article/CTX135790				
28.	It takes another two minutes or so to complete building the zone. You will see the "Cloud setup successful" on the CloudPlatform GUI.				
	Cloud setup successful! You may now continue.				
	Click Launch.				

Step	Action	
29.	Cloud Platform	Interfractions j admin sloud ▼ CTTRIX
	Project: Default view	C .
	Dashboard	Home >
	Dashboard	General Alerts View all Host Alerts
	Affinity Groups	Management Server Management server node 192.188.10.15 is up
	Storage	Thu03 Apr 2014 09:43:45 GMT
	N Network	Management Server Management server node 192.188.10.15 is up
	Templates	Mon31 Mar 2014 02:25:18 GMT
	17 Events	Management Server
	Projects	System Capacity Fetch latest
	Accounts	Zone: Paris Management IP Addresses Zone: Paris Memory
	Domains	Zone: Paris Pod: Paris-Pod-1 005 3 / 10 Paris-Pod-1 Custer: Paris Pri-Custer: Paris 4 150 8 / 9 98 GB
	Regions	Zone: Paris Ped: Paras-Pod-1 Chatser: Paris CTS 10.0 GHz / 14.00 GHz Zone: Paris 2 / 50
	Infrastructure	Cluster and Cluste
	Global Settings	Zone: Paris Secondary Storage Zone: Paris Pod. Paris Po
	Service Offerings	Pri-Cluster
	with alerts and	ne Cloud-Admin CloudPlatform Dashboard which provides at-a-glance status d system capacity performance parameters. Down the left side, the ar" will be present on all screens.
30.		
	CloudPlatform	i i Rotfrications j admin doud ▼ CTRIX
	Project: Default view 💌	©
	Dashboard Gen	neral Alerts View all Hot Alerts
		Management Server
	Affinity Groups	Managament server node 192.108.10.15 is up Tru03 Apr 2014 09:43 45 GMT
	TVT Network N	Management Server Management server node 192 168 10.15 is up
	Templates	Mon31 Mar 2014 02 28:16 GMT
	17 Events	Management Server
		tem Capacity Fetch latest
	Accounts Zc	Anne Parks of Park-Pod-1 0 0 0 0 0 0 0 0 0
	Infrastructure Pr	baser Fars-
		one: Paris 535 Secondary Storage Zooter Paris 9.36 GB / 241.75 GB Politikary Storage 4.86 GB / 483.50 GB / 483.50 GB
	Service Offerings	Pri-Cluste
	In the General	I Alerts panel you will see system wide alerts.



Step	Action						
34.	CloudPlatform						
	Octobe Octobe Octobe Octobe Image: Instances Management server note 152, 168, 10 % up ThuC3 for 2014 09-43 do GMT Imagement server note 152, 168, 10 % up ThuC3 for 2014 09-43 do GMT Imagement server note 152, 168, 10, 15 % up ThuC3 for 2014 09-43 do GMT Imagement server note 152, 168, 10, 15 % up ThuC3 for 2014 09-43 do GMT						
	Pod: Paris-Pod-1 30% 3 / 10	Interit IP Addresses Zone: Pars. Poet Parse-Poet-1 [150 B]. Memory	Petor latest 990 00				
	Regions Zone Paris Pod Paris-Pod-1 Cluber Paris- Character Control Paris Pod Paris-Pod-1 Control Paris-Pod-1 Pod Pod Paris-Pod-1 Pod Paris-Pod Paris-Pod-1 Pod Paris-Pod Paris-Po	Domains Cluster Para- N- Notaria Cluster Para- Notaria Notaria Notaria <t< th=""></t<>					
	Click any of the System	m Capacity items	to see all the resourc	e usage.			
35.	CloudPlatform Project: Default view	0	10	Notifications admin cl	oud 🔻 CİTRİX		
		Home > Zone details >					
	Dashboard			C Refresh			
	Instances	Resources					
	Affinity Groups System-wide capacity						
	Storage	Memory	Allocated: 1.50 GB / 9.98 GB		15%		
	Network	СРИ	Allocated: 1.00 GHz / 14.00 GHz		7%		
	planta	Storage	Allocated: 9.36 GB / 241.75 GB		3%		
	Projects	Primary Storage Allocated	Allocated: 4.58 GB / 453 50 GB		1%		
	Accounts	Public IP Addresses	Allocated: 0 / 0		0%		
	Domains	Management IP Addresses	Allocated: 3 / 10		30%		
	Regions	Secondary Storage	Allocated: 9.36 GB / 241.75 GB		3%		
	Infrastructure						
	Global Settings	VLAN/VNI	Allocated: 0 / 0		0%		
	Service Offerings	Shared Network IPs	Allocated: 2 / 50		4%		
		Local Storage	Allocated: 0 / 0		0%		
	In the left navigation ba	r of the CloudPlat	form GUI, click Infras	tructure.			

Step	Action				
36.	Infrastructure				
	Zones 1 View all	Pods 1 View all	Clusters H 1 U View all	osts 2 View all	
	Primary Storage 1 View all	Secondary Storage	System VMs 2 View all	View all	
	CPU Sockets				
	The infrastructure dis In the Zones box, cli	splay shows a summa ck View All .	ry of the Cloud infras	tructure.	
37.	You will see the zone Home > Infrastructure > Zones				
				۹.	+ Add Zone
	Zone	Network Type	Public	Allocation State	Quickview
	Paris	Basic	Yes	Enabled	+
	Click the Paris node	to see details of the z	one.		
38.	Home > Infrastructure > Zones	> Paris >			
					C Refresh
	Details Comput	e and Storage Physical Network	Resources System	VMs Settings	
				+ Add VMware dat	acenter
	Zone Pa	iris			-
	ID e2	bfdd19-5115-4329-9920-c3c4d742cd12			
	Click the Compute a	nd Storage tab to ex	plore the zone's com	oonents.	

Step	Action					
39.	Zone	International				
	Pods View all Clusters View all Hosts View all Primary Storage View all Storage					
	In the Hosts box	, click View All	arrow to see the	hosts in the zon	е.	
40.	Home > Infrastructure >	> Zones > Paris > H	losts >			
					<u>م</u>	+ Add Host
	Name	Zone	Pod	Cluster	State	Quickview
	vXS-02	Paris	Paris-Pod-1	Paris-Cluster-1	i Up	+
	vXS-01	Paris	Paris-Pod-1	Paris-Cluster-1	i Up	+
	Notice the zone,	pod & cluster c	of the host is sho	wn along with ea	ch host's state	
	Click the vXS-01	node to show	more details.			
41.	Home > Infrastructure >	Zones > Paris > Hosts	> vXS-01 >			
						C Refresh
	Details	Statistics				
	2∎⊕©	:			View Ins	tances
	The details of the	e chosen host a	are shown.			
	Click the Statisti	cs Tab.				

Step	Action				
42.	Home > Infrastructure >	Zones > Paris > Hosts	> vXS-01 >		
					C Refresh
	Details	Statistics			
					*
	Total CPU	2 x 3.50 GHz			
	CPU Utilized	0.44%			
	CPU Allocated for	7.14%			
	VMs				
	Memory Total	4.99 GB			
	Memory Allocated	1.00 GB			
	Memory Used	1.34 MB			
	Network Read	2.51 GB			
	Network Write	2.49 GB			
		2.43 00			
	Notice a range of	host statistics ar	e provided.		
	Click Paris on the	e "breadcrumbs"	bar to return to th	e Paris zone details.	The breadcrumb
	bar is a convenie	nt way to unwind	(or back out) to the	he upper levels.	
43.					
	Home > Infrastructure > 3	Zones > Paris >			
					C Refresh
	Details C	compute and Storage Phys	sical Network Resource	ces System VMs	Settings
					County
	2	Zone	TARK LAR DEFE LAR		
	Click the Physics	Notwork tob to	and the physical	network configuratio	n of the zone
			o see the physical		
44.	Name		State	Isolation method	Actions
	PhysicalNetworkInBasi	7009	Concepted		
	Physical Velwork in Dask	2010	Enabled		×
	Notice there is ju	st one physical n	etwork.		
	-			ee a diagram of this r	etwork
	Cher the Filysica			e a ulagraffi ul ulls l	GIWUIK.

Step	Action
45.	L2/L3 switch
	Guest Configure Management Configure Storage Configure Network Service Providers Configure
	This physical network is carrying the Guest, Management and Storage traffic. Each of the network traffic types can be configured by clicking the appropriate configuration arrow. Click the Guest Configure arrow to show the Guest network details.
40	
46.	Home > Infrastructure > Zones > Paris > PhysicalNetworkInBasicZone > Guest >
	Details IP Ranges
	State Enabled
	Tags
	Broadcast domain POD range
	label Ose default gateway
	KVM traffic label Use default gateway
	VMware traffic label Use default gateway
	OVM traffic label Use default gateway
	LXC Traffic Label Use default gateway
	Click the IP ranges tab to view the IP ranges in use for the Guest network.

Step	Action
47.	Home > Infrastructure > Zones > Paris > PhysicalNetworkInBasicZone > Guest >
	C Refresh
	Details IP Ranges
	Pod Gateway Netmask Start IP End IP Add Actions
	Paris-Pod-1 V Add
	Paris-Pod-1 192.168.10.1 265.255.25 192.168.10 192.168.10
	Additional IP ranges can be added using this screen, but do not add any at this time.
	(IP addresses that do not show completely in the GUI can be viewed in full by rollling over
	the address with the mouse.)
48.	You can explore more of the CloudPlatform GUI on your own. Just don't change anything
	yet!

You have built and started to explore a CloudPlatform Basic Networking zone.

Appendix 2

Appendix 2: Editing Files with vi

Overview

vi is a screen-oriented text editor originally created for the Unix operating system in 1976. That is not a typo. While vi is almost 40 years old, it is still the de-facto standard for text file editing in the Linux/Unix world and is not going away anytime soon. While there are file editors available for Linux that are easier to use, they are often not available when you need them, whereas vi is almost always there, ready and willing! If you will be working with Linux, you might as well learn vi.

Modal Editor

vi is a modal editor operating in either insert mode or command mode. vi operates only from the keyboard so, since there is no mouse to move the cursor, keystrokes are used not only to enter text into the file, but also to move the cursor and control the function of the editor. While for newbies this is cumbersome, for experts, it can be much faster than using a mouse. In the right hands vi is a very powerful editor that can run rings around any mouse driven counterpart with its rich, powerful set of features. You however, only need some simple basic functions to edit the files in this lab, so you'll be up and running in no time.

Insert mode

In insert mode most keystrokes become part of the document.

	i Enter Insert mode	
--	---------------------	--

Command mode

In command mode keystrokes control the edit session.

<ESC> Enter command mode

Moving the cursor

You can use the arrow keys to move the cursor around in either mode.

Deleting

When in command mode you delete text using either of the following commands:

x	Deletes the character under the cursor
dd	Deletes the current line

Writing & Quitting

Once you have edited the file you can write the file and / or quit vi using the following commands:

<esc>:wq</esc>	Writes the file and quits vi	
<esc>:q!</esc>	Quits vi without writing the file (handy if you mess up)	
In this appendix you will edit the /etc/sysconfig/network-scripts/ifcfg-eth0 file to		

setup the cpman network. The step by step assumes you have not previously edited the file.

Step by step guidance

Estimated time to complete this exercise: 10 minutes.

Ste p	Action
1.	On the cpman console, enter the following.
	<pre>vi /etc/sysconfig/network-scripts/ifcfg-eth0</pre>
2.	You will see the following (your HWADDR and UUID will be different):
	<pre>DEVICE="eth0" BOOTPROTO="dhcp" HWADDR="66:7A:D9:13:6A:33" MM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet" UUID="c7d83ddb-b1f0-4e84-ab4c-97ac3351146a" ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</pre>
3.	You will see the cursor at the top left corner (the character is shown in inverse).
	DEVICE="eth0" BOOTPROTO="dhcp" HWADDR="66:7A:D9:13:6A:33" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet" UUID="c7d83ddb-b1f0-4e84-ab4c-97ac3351146a" The editor starts in command mode at this point, meaning keystrokes control the edit session.

Ste p	Action
4.	Remembering not to use the mouse, move the cursor to the third line by pressing the down arrow key twice:
	DEVICE="eth0" BOOTPROTO="dhcp" TWADDR="46:71:D9:D5:15:99" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet" UUID="3d15d237-981f-4831-935b-ecdb4ca06565"
5.	Press the d key twice to delete the "HWADDR=" line.
	DEVICE="eth0" BOOTPROTO="dhcp" TM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet" UUID="3d15d237-981f-4831-935b-ecdb4ca06565"
6.	Move the cursor to the last line using the down arrow key.
	DEVICE="eth0" BOOTPROTO="dhcp" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet" TUID="3d15d237-981f-4831-935b-ecdb4ca06565"
7.	Press the d key twice to delete the "UUID=" line.
	DEVICE="eth0" BOOTPROTO="dhcp" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet"
8.	Using the arrow keys move the cursor to the a of dhcp in the second line:.
	BOOTPROTO=""[hcp" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet"
9.	Press the \mathbf{x} key four times to delete four characters (dhcp).
	DEVICE="eth0" BOOTPROTO="W NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet"

Ste p	Action
10.	Press the i key to put vi into insert mode:
	Notice the insert mode indicator at the bottom of the screen.
	INSERT
11.	Type the word none.
	DEVICE="eth0" BOOTPROTO="none" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet"
12.	Hit the <esc></esc> key to come out of Insert mode and use the arrow keys to move the cursor onto the n of the word no in the fourth line.
	DEVICE="eth0" BOOTPROTO="none" NM_CONTROLLED="yes" ONBOOT="no" TYPE="Ethernet"
13.	Press the \mathbf{x} key twice times to delete two characters (no).
	DEVICE="eth0" BOOTPROTO="none" NM_CONTROLLED="yes" ONBOOT="" TYPE="Ethernet"
14.	Press the i key to put vi into insert mode and type the word yes.
	DEVICE="eth0" BOOTPROTO="none" NM_CONTROLLED="yes" ONBOOT="yes" TYPE="Ethernet"
15.	Use the arrow key to move past the end of the last line.
	DEVICE="eth0" BOOTPROTO="none" NM_CONTROLLED="yes" ONBOOT="yes" TYPE="Ethernet"
16.	Hit <enter></enter> to open up a new line.
	DEVICE="eth0" BOOTPROTO="none" NM_CONTROLLED="yes" ONBOOT="yes" TYPE="Ethernet"

Ste p	Action
17.	Highlight and copy (Ctrl-C) the following three lines from this document: IPADDR=192.168.10.15 NETMASK=255.255.255.0 GATEWAY=192.168.10.1
18.	Back in vi, right click the console and select Paste : DEVICE="eth0" BOOTPROTO="none" MM_CONTROLLED="yes" ONBOOT="yes" TYPE="Ethernet" Paste
19.	The text has been pasted: DEVICE="eth0" BOOTPROTO="none" MM_CONTROLLED="yes" ONBOOT="yes" TYPE="Ethernet" PADDR=192.168.10.15 NETMASK=255.255.255.0 GATEWAY=192.168.10.1 This completes editing of the file. Compare your file with the listing above. Yours should look exactly the same; check carefully for missing characters or typos.
20.	To save and exit press the <esc></esc> key to get out of insert mode, followed by: :wq That was easy, wasn't it? You can use the same principals to edit the other configuration files needed in this lab. Remember to take your time and if you mess up a file and just want to quit without saving, press the <esc></esc> key and then type :q! This will abort the edit; nothing is written to the file, so you can try again.

Appendix 2 Summary

You have learned a few basic vi commands to permit you to edit the files needed for this lab using vi.