Newer Cisco SBA Guides Available

This guide is part of an older series of Cisco Smart Business Architecture designs. To access the latest Cisco SBA Guides, go to http://www.cisco.com/go/sba

Cisco strives to update and enhance SBA guides on a regular basis. As we develop a new series of SBA guides, we test them together, as a complete system. To ensure the mutual compatibility of designs in Cisco SBA guides, you should use guides that belong to the same series.

VDI—Basic Implementation with Cisco UCS and Citrix Deployment Guide

SMART BUSINESS ARCHITECTURE

August 2012 Series

Preface

Who Should Read This Guide

This Cisco® Smart Business Architecture (SBA) guide is for people who fill a variety of roles:

- Systems engineers who need standard procedures for implementing solutions
- Project managers who create statements of work for Cisco SBA implementations
- Sales partners who sell new technology or who create implementation documentation
- Trainers who need material for classroom instruction or on-the-job training

In general, you can also use Cisco SBA guides to improve consistency among engineers and deployments, as well as to improve scoping and costing of deployment jobs.

Release Series

Cisco strives to update and enhance SBA guides on a regular basis. As we develop a series of SBA guides, we test them together, as a complete system. To ensure the mutual compatibility of designs in Cisco SBA guides, you should use guides that belong to the same series.

The Release Notes for a series provides a summary of additions and changes made in the series.

All Cisco SBA guides include the series name on the cover and at the bottom left of each page. We name the series for the month and year that we release them, as follows:

month year Series

For example, the series of guides that we released in August 2012 are the "August 2012 Series".

You can find the most recent series of SBA guides at the following sites:

Customer access: http://www.cisco.com/go/sba

Partner access: http://www.cisco.com/go/sbachannel

How to Read Commands

Many Cisco SBA guides provide specific details about how to configure Cisco network devices that run Cisco IOS, Cisco NX-OS, or other operating systems that you configure at a command-line interface (CLI). This section describes the conventions used to specify commands that you must enter.

Commands to enter at a CLI appear as follows:

```
configure terminal
```

Commands that specify a value for a variable appear as follows:

```
ntp server 10.10.48.17
```

Commands with variables that you must define appear as follows:

```
class-map [highest class name]
```

Commands shown in an interactive example, such as a script or when the command prompt is included, appear as follows:

```
Router# enable
```

Long commands that line wrap are underlined. Enter them as one command:

```
wrr-queue random-detect max-threshold 1 100 100 100 100 100
100 100 100
```

Noteworthy parts of system output or device configuration files appear highlighted, as follows:

```
interface Vlan64
  ip address 10.5.204.5 255.255.255.0
```

Comments and Questions

If you would like to comment on a guide or ask questions, please use the SBA feedback form.

If you would like to be notified when new comments are posted, an RSS feed is available from the SBA customer and partner pages.

Table of Contents

What's In This SBA Guide

Cisco SBA Solutions

Cisco SBA helps you design and quickly deploy a full-service business network. A Cisco SBA deployment is prescriptive, out-of-the-box, scalable, and flexible.

Cisco SBA incorporates LAN, WAN, wireless, security, data center, application optimization, and unified communication technologies—tested together as a complete system. This component-level approach simplifies system integration of multiple technologies, allowing you to select solutions that solve your organization's problems—without worrying about the technical complexity.

Cisco SBA Solutions are designs for specific problems found within the most common technology trends. Often, Cisco SBA addresses more than one use case per solution because customers adopt new trends differently and deploy new technology based upon their needs.

Route to Success

To ensure your success when implementing the designs in this guide, you should first read any guides that this guide depends upon—shown to the left of this guide on the route below. As you read this guide, specific prerequisites are cited where they are applicable.

About This Guide

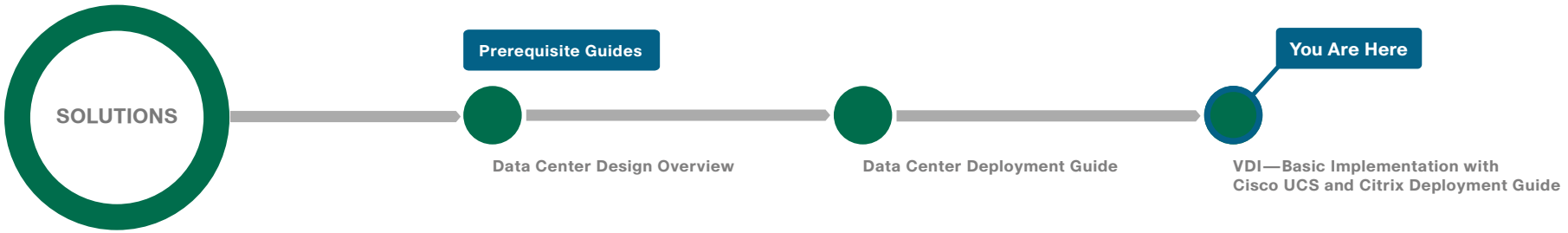
This *deployment guide* contains one or more deployment chapters, which each include the following sections:

- **Business Overview**—Describes the business use case for the design. Business decision makers may find this section especially useful.
- **Technology Overview**—Describes the technical design for the business use case, including an introduction to the Cisco products that make up the design. Technical decision makers can use this section to understand how the design works.
- **Deployment Details**—Provides step-by-step instructions for deploying and configuring the design. Systems engineers can use this section to get the design up and running quickly and reliably.

You can find the most recent series of Cisco SBA guides at the following sites:

Customer access: http://www.cisco.com/go/sba

Partner access: http://www.cisco.com/go/sbachannel



Introduction

Desktop virtualization separates a personal desktop environment, including operating system, desktop applications, and personal files and settings, from the physical device on which the desktop environment runs. In a virtual desktop infrastructure (VDI) deployment, the operating system runs in a virtual machine on a server hosted in a data center.

The *VDI—Basic Implementation with Cisco UCS and Citrix Deployment Guide* is designed to be a comprehensive guide for an organization's initial needs for virtual desktops, deployed rapidly by using basic configuration options for VDI. With the end goal of rapid provisioning in mind, the basic setup uses a single Cisco Unified Computing System (UCS) C-Series server with integrated hard drives, teamed with Citrix virtualization components. It also uses the Citrix XenServer host hypervisor and the Citrix VDI-in-a-Box software appliance for desktop virtualization management.

Related Reading

Even though the *VDI—Basic Implementation with Cisco UCS and Citrix Deployment Guide* offers a comprehensive solution, other guides in the Cisco SBA August 2012 Series may be beneficial for organizations wishing to customize or scale their deployments by using additional servers or blade servers, UCS Manager, RAID storage, a different hypervisor, or networking components.

- The *Cisco SBA—Data Center Unified Computing System Deployment Guide* provides the processes and procedures necessary to deploy a Cisco Unified Computing System using both the Cisco B-Series Blade Server system and Cisco C-Series Rack-Mount Servers to a point where they are ready to deploy an operating system or hypervisor software.
- The *Cisco SBA—Data Center Virtualization with Cisco UCS, Nexus 1000V, and VMware Deployment Guide* describes how to deploy a VMware hypervisor on the Cisco Unified Computing System, including both the Cisco B-Series Blade Servers and Cisco C-Series Rack-Mount Servers. It also describes how to install and deploy Cisco Nexus 1000V Series Switches as a full-featured virtual switch for the VMware servers.
- The *Cisco SBA—Data Center Design Overview* provides an overview of the data center architecture. This guide discusses how the Cisco SBA data center architecture is built in layers—the foundation of Ethernet and storage networks and computing resources; the data center services of security, application resilience, and virtual switching; and the user services layer that contains applications and user services.
- The *Cisco SBA—Data Center Deployment Guide* focuses on the processes and procedures necessary to deploy your data center foundation Ethernet and storage transport. The data center foundation is designed to support the flexibility and scalability of the Cisco Unified Computing System and provides details for the integration of functionality between the server and the network for Cisco and non-Cisco servers. The foundation design includes data center services like security with firewall and intrusion prevention, and application resiliency with advanced server load-balancing techniques. This guide also discusses the considerations and options for data center power and cooling. The supplemental *Data Center Configuration Files Guide* provides snapshots of the actual platform configurations used in the design.

There are also a number of related Cisco SBA Bring Your Own Device (BYOD) guides, which are helpful for deploying the client connectivity to the network for VDI access. They include:

- *Cisco SBA Solutions—BYOD—Virtual Desktop Access Deployment Guide*
- *Cisco SBA Solutions—BYOD—Advanced Guest Wireless Access Deployment Guide*
- *Cisco SBA Solutions—BYOD—Identification and Authentication Deployment Guide*
- *Cisco SBA Solutions—BYOD—Internal Corporate Access Deployment Guide*
- *Cisco SBA Solutions—BYOD—Remote Mobile Device Access Deployment Guide*

Business Overview

Smaller organizations face many of the same IT challenges as larger organizations when trying to accommodate increasing demand for new IT capabilities and services. They often place even greater emphasis on cost savings and on protecting business-critical systems and data because they have smaller IT staffs and budgets, and they need to leverage IT assets to their fullest extent. Organizations require cost-effective solutions that can better leverage their existing server, storage, and network resources.

To improve availability and ensure business continuity, organizations need efficient ways to maintain production systems while minimizing downtime. Virtualization technology simplifies IT so that organizations can more effectively use their storage, network, and computing resources to control costs and respond faster. The virtual approach to IT management creates virtual services out of the physical IT infrastructure, enabling administrators to allocate these resources efficiently.

With virtualization, hardware management is completely separated from software management, and hardware equipment can be treated as a single pool of processing, storage, and networking resources to be reallocated as needed to various software applications. In a virtual infrastructure, users see resources as if they were dedicated to them—while administrators gain the ability to efficiently manage and optimize resources to serve the needs of the organization.

Technology Overview

Virtual Desktop Infrastructure

VDI delivers a desktop and workspace virtualization solution that can dramatically improve business operations and data security while increasing end-user productivity, mobility, and flexibility. The premise of VDI is to decouple the location of the execution of the application from where the client resides allowing new client compute paradigms. These tools to help enterprises rapidly respond to events such as mergers and acquisitions, open new branch offices, and maintain business continuity across workplace interruptions. By keeping the work data centrally located and not available on storage of devices such as laptops leaving the organization's facilities, data is retained by the organization in the data center, where it can be protected.

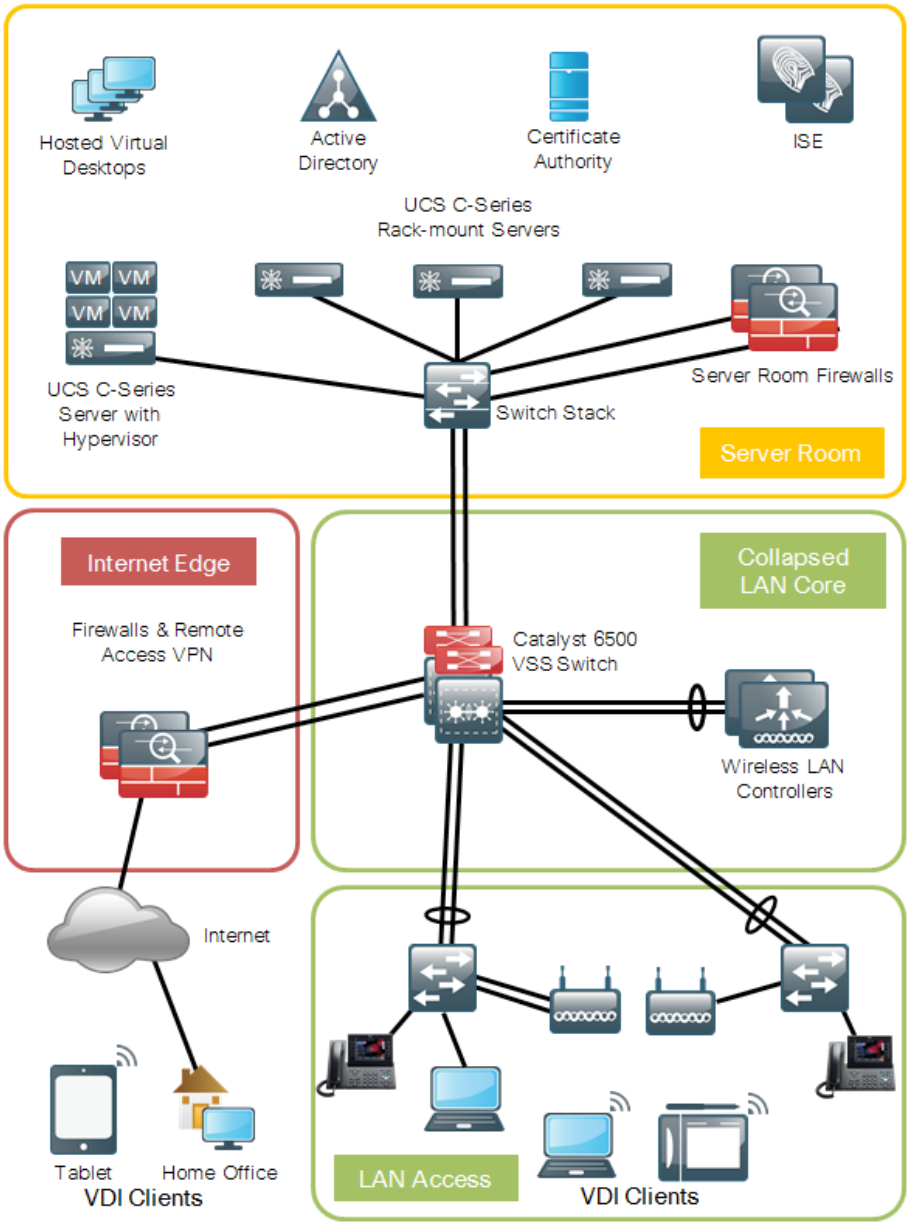
Managing the virtual machines on the physical servers and the connected networks requires a design that integrates all of these systems so that they work together without creating an operational burden on the IT staff who must maintain them. Using proven and tested designs lowers the time needed to deploy these new solutions and reduces the time required to deploy new applications.

In a VDI deployment, a worker's desktop operating system and applications run in a virtual machine on a server hosted in a data center or server room. A VDI client, which can be in the same building, the same network, or remotely accessing the network across the Internet, views and operates the worker's desktop. The organization can deploy VDI client software on desktops, laptops, or deploy dedicated appliances. When organizations also permit a Bring Your Own Device (BYOD) environment, workers can use personal laptops, tablets, and even smartphones, for similar remote desktop access.

In the data center or server room, this deployment uses Cisco UCS servers to host the virtual desktops and other data center services required to complete the solution, such as the Microsoft Active Directory servers, certificate authorities, and the Cisco Identity Solution Engine (ISE). Deploying the initial VDI solution with a Cisco UCS C-Series rack-mount server ensures that as an organization grows, the deployment can grow using advantages of unified computing, while integrating into the tested Cisco SBA data center architecture.

Cisco ASA Firewalls are used in the server room to implement security policies between the virtual desktop VLANs and organizational or customer confidential information running on application servers in the server VLANs. A separate set of Cisco ASA Firewalls are used in the Internet edge to isolate and protect the organization from Internet originated attacks. The firewalls also provide the remote access VPN termination point, allowing users to access the solution from remote locations.

Figure 1 - VDI solution architecture



This guide simplifies deployment, focuses on two vendors (Cisco and Citrix), and details the use of a non-high-availability, single server with local storage. Hypervisor modifications for performance and high availability setups are not covered for this basic deployment guide. The Citrix VDI-in-a-Box software used in this solution has the capability to easily add servers for high availability and scale as you grow.

Cisco Unified Computing System C-Series Rack-Mount Servers

Cisco UCS C-Series servers are rack-mount servers designed to operate in a standalone environment, or as part of the Cisco Unified Computing System. The Cisco UCS C-Series servers offer a wide array of processor, memory, network adapter, and disk options. They offer Cisco innovations such as extended memory and network-aware VN-Link technologies.

The Cisco Integrated Management Controller (Cisco IMC) is the management service for Cisco C-Series servers. Cisco IMC runs within the server and allows administrators to use a web-based GUI or Secure Shell (SSH) Protocol–based CLI to access, configure, administer, and monitor the server. Almost all tasks can be performed in either interface, and the results of tasks performed in one interface are displayed in the other. Cisco IMC is used to perform the following server management tasks, including (but not limited to):

- Power on, power off, power cycle, reset, and shut down the server
- Configure the server boot order
- View server properties and sensors
- Configure network-related settings, including network interface controller (NIC) properties and network security
- Configure communication services, including HTTP, SSH, Simple Network Management Protocol (SNMP), and Intelligent Platform Management Interface (IPMI) over LAN
- Update Cisco IMC firmware
- Monitor faults, alarms, and server status

Tech Tip

You use the anticipated quantities and types of workloads to choose an appropriately sized server. A guide and calculator for server sizing with VDI-in-a-Box workloads can be consulted at the Citrix web site, here:

http://www.citrix.com/products/vdi-in-a-box/resources-and-support.html

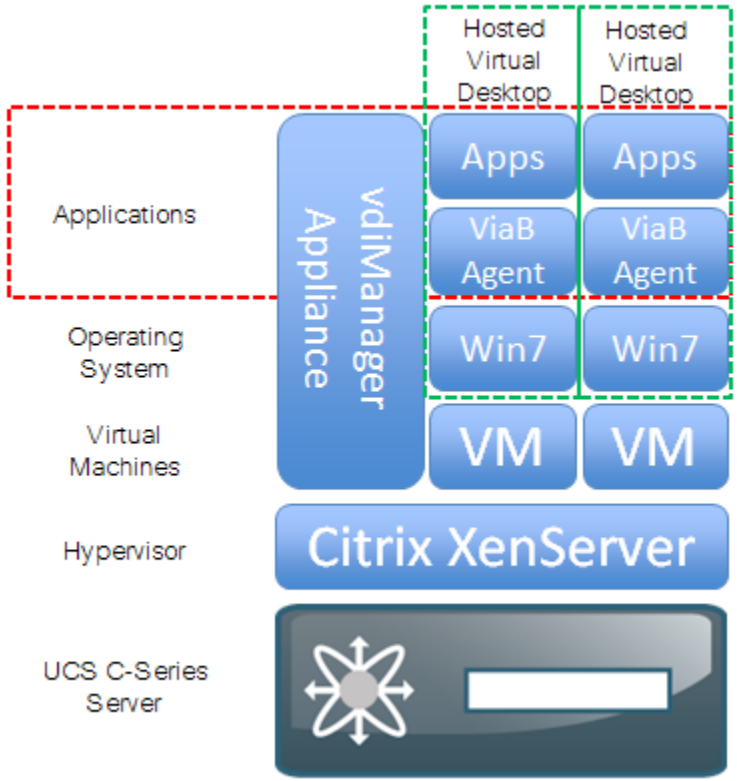
Citrix VDI-in-a-Box

Citrix is a computing virtualization provider, with technology solutions to equip organizations for optimizing the use of their existing IT assets and resources, as well as protecting the systems, data, and applications that run the business. As virtualization adoption increases, the benefits are making this compelling virtualization technology a mainstream mandate. Citrix XenServer technology allows virtual machines (VMs) to be easily created as needed, and migrated from one hardware platform to another.

This deployment guide uses Citrix VDI-in-a-Box — a single virtual appliance that provides all of the functionality needed to create, provision, manage, and load balance virtual desktops. VDI-in-a-Box has a built-in connection broker, load balancer, user manager, and desktop provisioning server, called vdiManager. It does not require separate shared storage, high-speed interconnects, or multiple management servers. The appliance runs on servers running a hypervisor, such as Citrix XenServer, Microsoft Hyper-V, or VMware ESXi. Citrix XenServer is chosen for the basic implementation in this deployment guide, easing deployment by using the minimum number of software suppliers.

Citrix vdiManager is the management component of the Citrix VDI-in-a-Box. Citrix vdiManager can run on a single physical server for a basic installation, or for high availability a collection of physical servers can run the vdiManager, referred to as a VDI-in-a-Box grid. For larger implementations, you can use the grid for one logical view of all vdiManager instances, which brokers client connections across servers in the grid for load balancing and high availability. For a basic VDI implementation for Cisco SBA, you use a single server.

Figure 2 - VDI-in-a-Box logical components



Tech Tip

For more information about the Citrix VDI-in-a-Box solution, see the Citrix VDI-in-Box product documentation site, here:

http://support.citrix.com/proddocs/topic/vdi/vdi-landing-page-main.html

Cisco and Citrix offer a solution, "Cisco Solution for Citrix VDI-in-a-Box," which is an all-in-one reference package that is simple and affordable, combines the Cisco UCS C-Series Server with Citrix VDI-in-a-Box software to deliver a rich end-user experience.

Tech Tip

For more information about Cisco solutions with Citrix, see the site here:

http://cisco.com/go/citrix

Citrix Receiver

Citrix Receiver helps provide VDI-in-a-Box desktop users with secure connections to a high-definition user experience. Although the desktops run on remote servers, the user experience is equivalent to that of a local Windows desktop. From the user's perspective, logging on to a virtual desktop is the same as logging on to a local desktop. The Citrix Receiver client runs on PCs, tablets, and smartphones. Microsoft Windows 7, Apple iOS, and Android Citrix Receiver access is tested in this guide to validate solution functionality.

Notes

Deployment Details

Process

Configuring Cisco UCS C-Series Server Hardware

1. Configure Cisco IMC management access

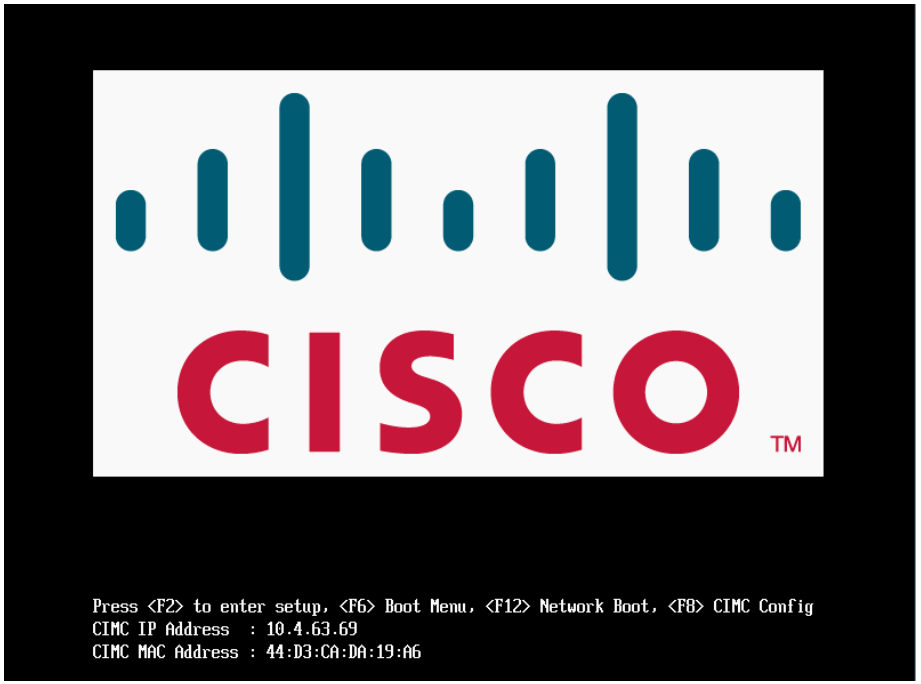
You can use the Cisco Integrated Management Controller (Cisco IMC) to set up the Cisco UCS C-Series Rack-Mount Server and complete the basic configuration to prepare for Ethernet communications. Cisco IMC is the management service built into and running within the server. Cisco IMC allows you to use a web-based GUI or SSH-based CLI to access, configure, administer, and monitor the server. Almost all tasks can be performed in either interface, and the results of tasks performed in one interface are displayed in the other.

Cisco UCS C-Series Rack-Mount Servers are connected to available Ethernet interfaces in the Cisco SBA data center infrastructure. Dual 10-Gigabit Ethernet ports are used for virtual desktop communication. An additional 100-Mbps Ethernet connection is used for the integrated management, and another Gigabit Ethernet connection is used for hypervisor management. Details for data center core port configurations are covered in the *Cisco SBA—Data Center Deployment Guide*.

Procedure 1 Configure Cisco IMC management access

Step 1: Connect a keyboard, video display, and mouse to the server for the initial setup, and then power up the server.

Step 2: When the server boots up, you have the option to set up BIOS, boot menu, network boot, and Cisco IMC Configuration. While in BIOS, press **F8**. The Cisco IMC Configuration starts.



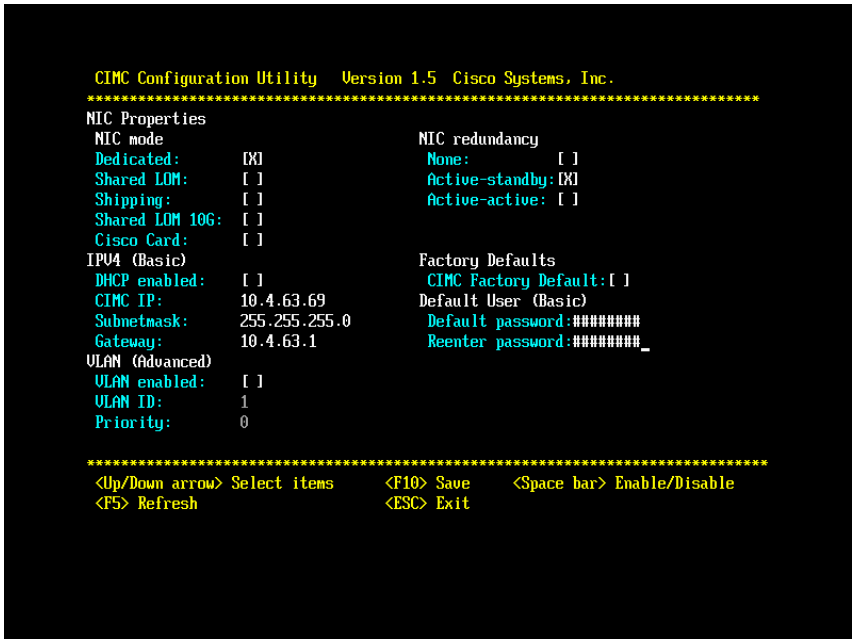
Step 3: Under NIC mode, press the **Spacebar**. This enables Dedicated.

Step 4: You either statically assign a management IP address or have a DHCP server servicing the VLAN or subnet connected to the server management interface for remote Cisco IMC access. This procedure assigns a static IP address to the server and requires the following information:

- IP address—10.4.63.69
- Subnet mask—255.255.255.0
- Default gateway—10.4.63.1
- Password

Step 5: Under IPV4 (Basic), press the **Spacebar**. This disables DHCP enabled.

Step 6: Enter values for **CIMC IP**, **Subnetmask**, and the default **Gateway**.



Step 7: Under NIC redundancy, verify that **Active-Standby** is enabled.

Step 8: If you are using a server with a single management NIC, like the Cisco C200 Series, select a **NIC redundancy** of **None**.

Step 9: Under Default User (Basic), enter a value for **Default password**. The default username is **admin**.

Step 10: Press **F10**. This saves the settings.

Step 11: Press **F5** (**Refresh**). The display is updated to reflect the latest configuration.

Step 12: Wait until the new settings appear, and then press **ESC** (**Exit**). The server reboots, and this interface becomes available from a web browser.

Process

Loading XenServer Hypervisor Software

1. Attach XenServer virtual media to server
2. Configure Citrix XenServer host

Procedure 1 Attach XenServer virtual media to server

This installation uses Citrix XenServer version 6.0.2 as the hypervisor for this installation of Citrix VDI-in-a-Box 5.1.

Tech Tip

Citrix XenServer hypervisor software can be downloaded from the Citrix website, here:

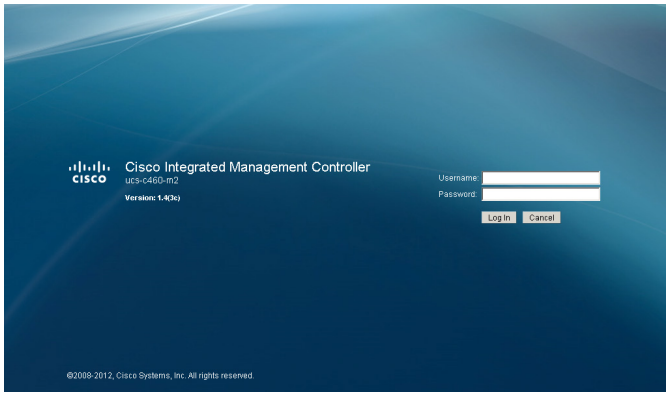
http://www.citrix.com/English/ss/downloads/index.asp

The software comes as an image in .ISO format, to be made available to the Cisco UCS server for loading. This can be accomplished through configuration with the Cisco IMC. You download the image and store it on the local management workstation.

Step 1: Open the Cisco IMC login page in a web browser, using the IP address assigned previously in the Cisco IMC configuration: http://10.4.63.69.

A security certificate warning may be received in your browser on initial login before you can connect to the login screen.

Step 2: Acknowledge and proceed past any browser certificate warnings, which vary by web browser. Acknowledgement allows you see the login screen and to proceed to the next step.



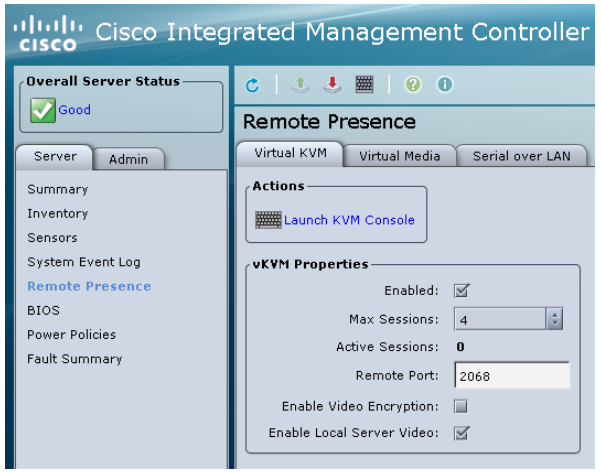
Step 3: Log in by using the default username **admin** and the password you configured earlier.

Tech Tip

You can launch the Cisco IMC GUI and manage the server from any remote host that meets these minimum requirements: Java 1.6 or later, HTTP and HTTPS enabled, and Adobe Flash Player 10 or later.

Step 4: On the Server tab, click **Remote Presence**.

Step 5: On the Virtual Media tab, verify that **Enabled** is selected.



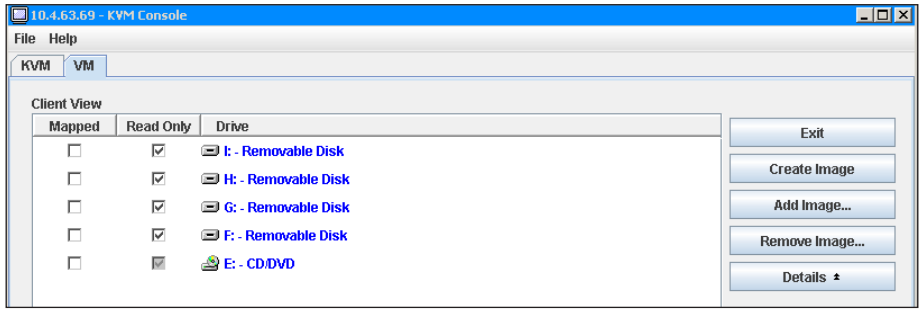
Tech Tip

If you do not select **Enabled** and you try to map a remote disk, an error is displayed, starting with "**Either Virtual Media is detached or**..."

Step 6: Click **Save Changes**.

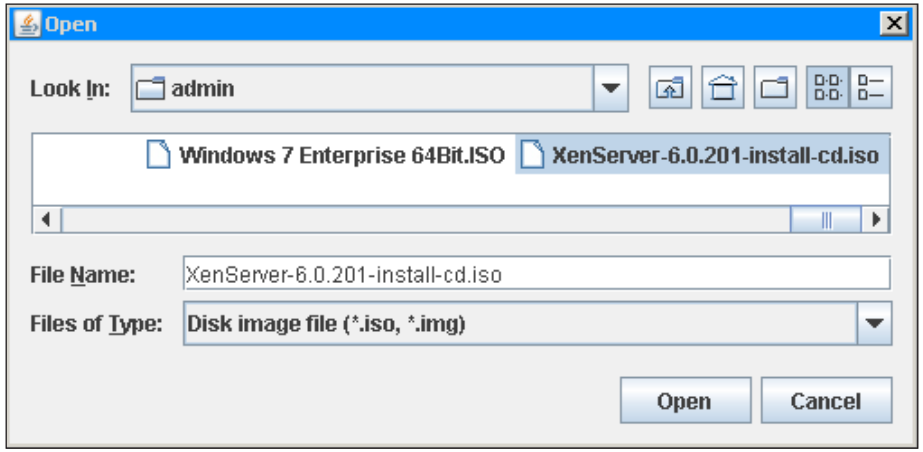
Step 7: Click the keyboard image button. A keyboard, video, and monitor (KVM) console launches, allowing manipulation of the server and its drive mappings.

Step 8: Click the **VM** tab of the KVM console.



Step 9: Click **Add Image**. The Open dialog box for selecting an image is displayed.

Step 10: Select a local copy of the XenServer .ISO installation image.



Step 11: Select the check box in the **Mapped** column for the ISO file. Do not click **Exit** when complete. Instead, proceed to the next step.

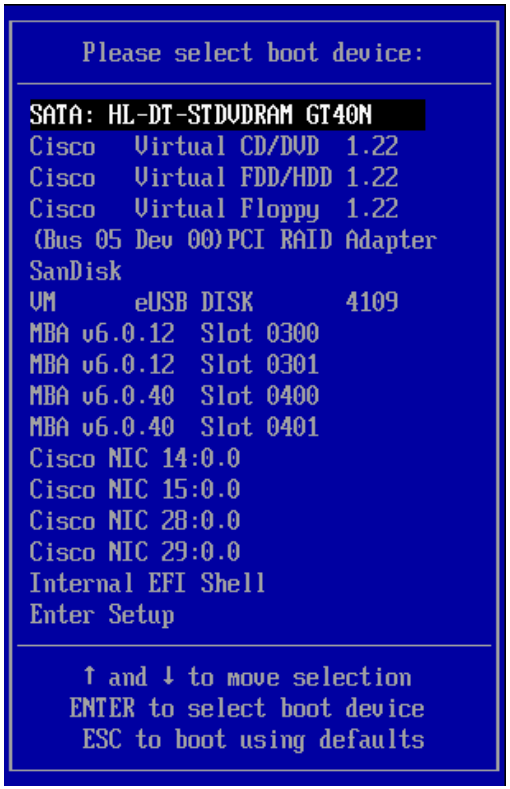
Step 12: Click on the **KVM** tab of the KVM console.

Step 13: Above the **KVM** and **VM** tabs, click **Macros**, and then select **Ctrl-Alt-Del**. A server reboot is initiated, while the mapped XenServer .ISO file is available.

You can observe the server boot process from the same KVM Console. On new servers without BIOS changes to the boot sequence, the default boot sequence starts with booting from the Cisco Virtual CD/DVD, if it's available.

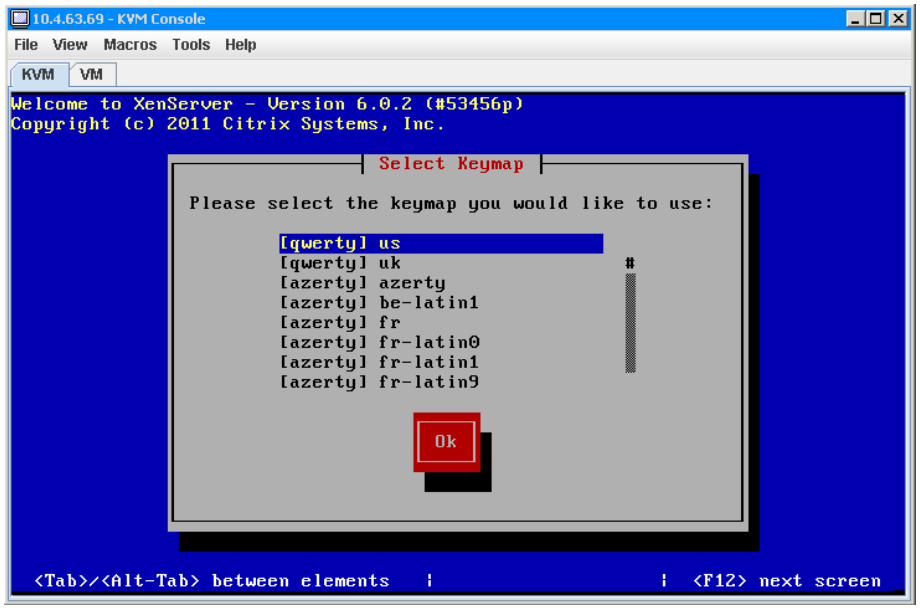
If the server does not boot from the XenServer ISO image, the following optional step can be used to force this boot behavior. Skip this step if you can see the XenServer installation begin, with a "Welcome to XenServer" screen.

Step 14: If you don't see the "Welcome to XenServer" screen, during the server's power-on self-test, press **F6** (**Boot Menu**). Use the arrow key to select **Cisco Virtual CD/DVD**, and then press **Enter**. Do not close the virtual media screen while it is in use.



Procedure 2 Configure Citrix XenServer host

After the boot sequence proceeds, a Citrix XenServer installation screen appears. Installation continues to proceed unassisted until the "Welcome to XenServer" screen is displayed.



This procedure assigns basic server network configuration options, and requires the following information:

- XenServer Management IP address—10.4.63.85
- Subnet mask—255.255.255.0
- Default gateway—10.4.63.1
- Hostname—viab-1
- DNS Server—10.4.48.10
- NTP Server—10.4.48.17

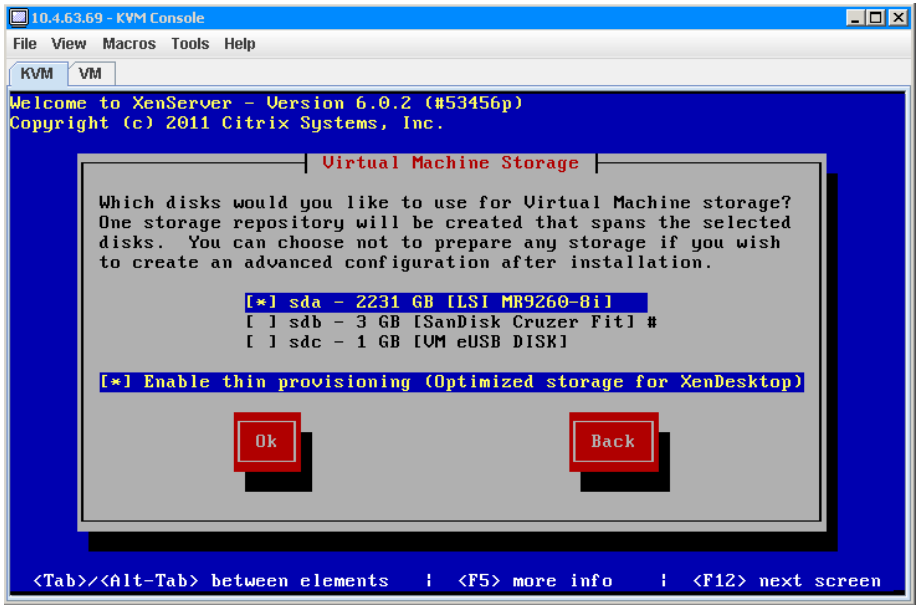
Step 1: Use arrows to highlight the correct keyboard, if it is different from the default, press **Tab** to highlight **Ok**, and then press **F12**.

Step 2: Press **F12**. This accepts the default at the "Welcome to XenServer Setup" dialog box that warns about disk erasure.

Step 3: At the End User License Agreement dialog box, **Tab** to **Ok**, and then press **F12**. This accepts the EULA.

Step 4: If a previous version of XenServer is detected on the hard disk, and the Action To Perform screen is displayed, select **Perform clean installation**, **Tab** to **Ok**, and then press **F12**.

Step 5: On the Virtual Machine Storage dialog box, use arrow keys and space bar to highlight and select the appropriate storage destination, **Tab** and press **spacebar** to select **Enable thin provisioning (Optimized storage for XenDesktop)**, and then **Tab** to **Ok** and press **F12**.



This option enables a Citrix XenDesktop performance enhancement, named IntelliCache, which saves I/O operations.

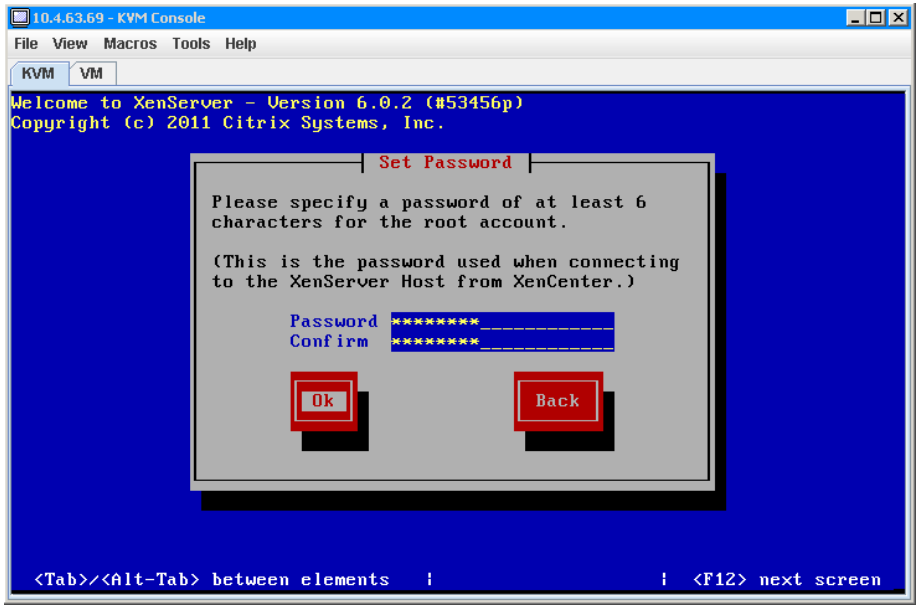
Step 6: For the **Select Installation Source** dialog box, select **Local media**, **Tab** to **Ok**, and then press **F12**.

Step 7: At the Supplemental Packs dialog box, **Tab** to select **No**, and then press **F12**.

Step 8: At the Verify Installation Source dialog box, select **Verify installation source**, **Tab** to **Ok**, and then press **F12**. There is a few minutes wait while the installation source files in the ISO image are verified.

Step 9: At Verification Successful box, press **F12**.

Step 10: At the Set Password dialog box, enter a password, confirm the password, **Tab** to **Ok**, and then press **F12**.



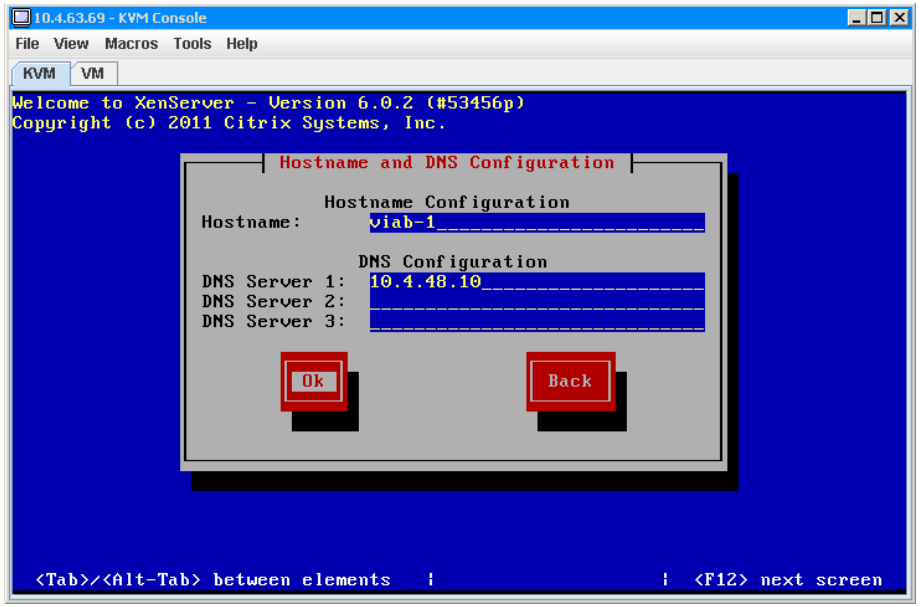
Step 11: When the Networking dialog box is displayed, select the primary interface that is connected into the management network, **Tab** to **Ok**, and then press **F12**.

Step 12: When a second Networking dialog box appears, **Tab** and press spacebar. This selects **Static configuration**.

Step 13: Enter the following values and then press **F12**.

- IP address—10.4.63.85
- Subnet mask—255.255.255.0
- Gateway—10.4.63.1

Step 14: At the Hostname and DNS Configuration dialog box, use **Tab** to enter the **Hostname** and the appropriate **DNS Server**, **Tab** to **OK**, and then press **F12**.



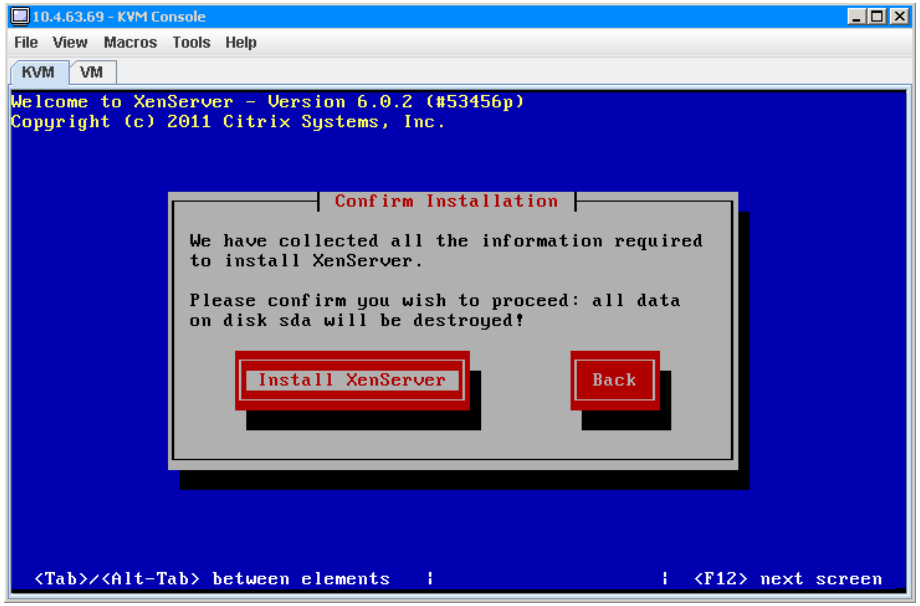
Step 15: At **Select Time Zone**, use arrows to select the geographical area, **Tab** to **Ok**, and then press **F12**.

Step 16: At the second **Select Time Zone** screen, pick a location in the same time zone as the server, **Tab** to **Ok**, and then press **F12**.

Step 17: At the **System Time** dialog box, select **Using NTP**, **Tab** to **Ok**, and then press **F12**.

Step 18: At the **NTP Configuration** screen, enter the address of the **NTP Server**, **Tab** to **Ok**, and then press **F12**.

Step 19: At the **Confirm Installation** dialog box, press Tab to highlight **Install XenServer**, and then press the spacebar. Note that **F12** does not continue to next screen for this dialog box, but instead returns you to the previous screen.



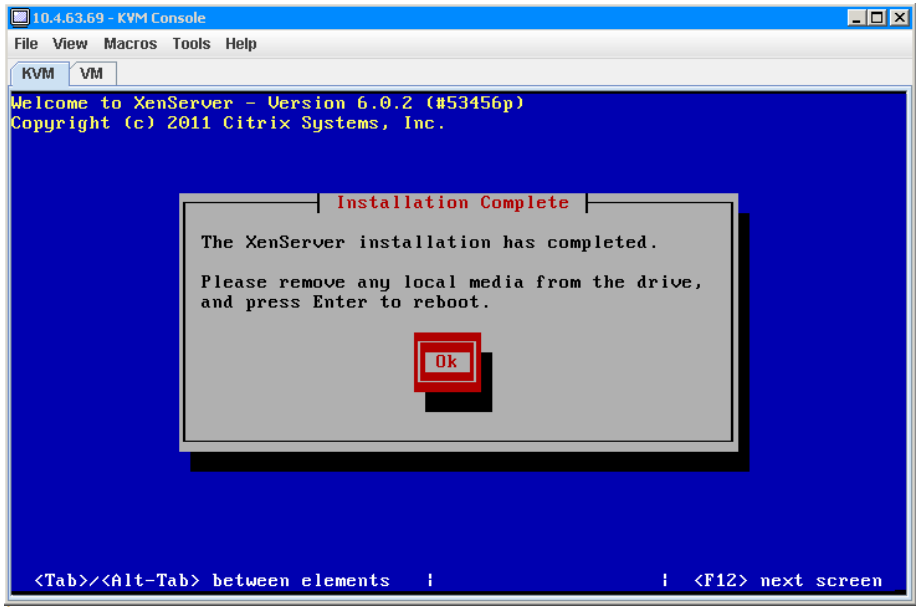
The XenServer host hypervisor continues to install for several minutes. When the installation is nearly complete, it asks for any additional components to add onto the installation.

Step 20: At the **New Media** dialog box, press **Tab** to highlight **Skip**, and then press the spacebar.

Tech Tip

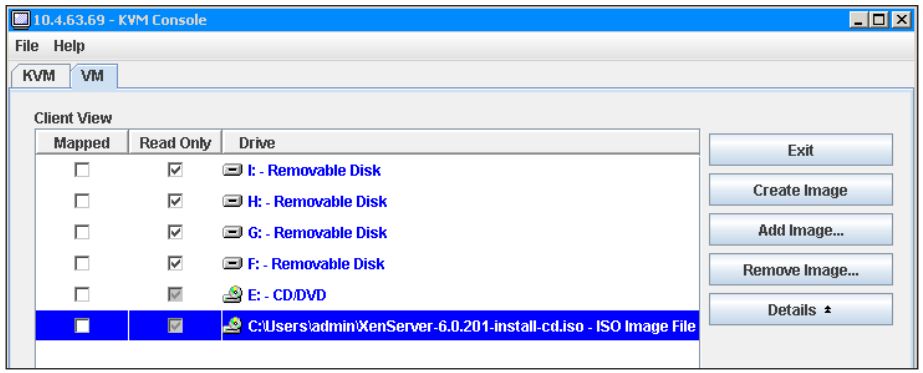
Note that pressing **F12** with the highlighted option instead of spacebar on this screen generates an error.

The Installation Complete dialog box appears, but do not press Enter.



Before you reboot, note that if the ISO installation image is still mapped to the server, the default is to boot from this image again. The next step validates the removal of the mapping, allowing the server to boot from the installation on the hard drive.

Step 21: Click the **VM** tab in the KVM Console and verify that the XenServer ISO Image File does not have a check mark in the **Mapped** column.

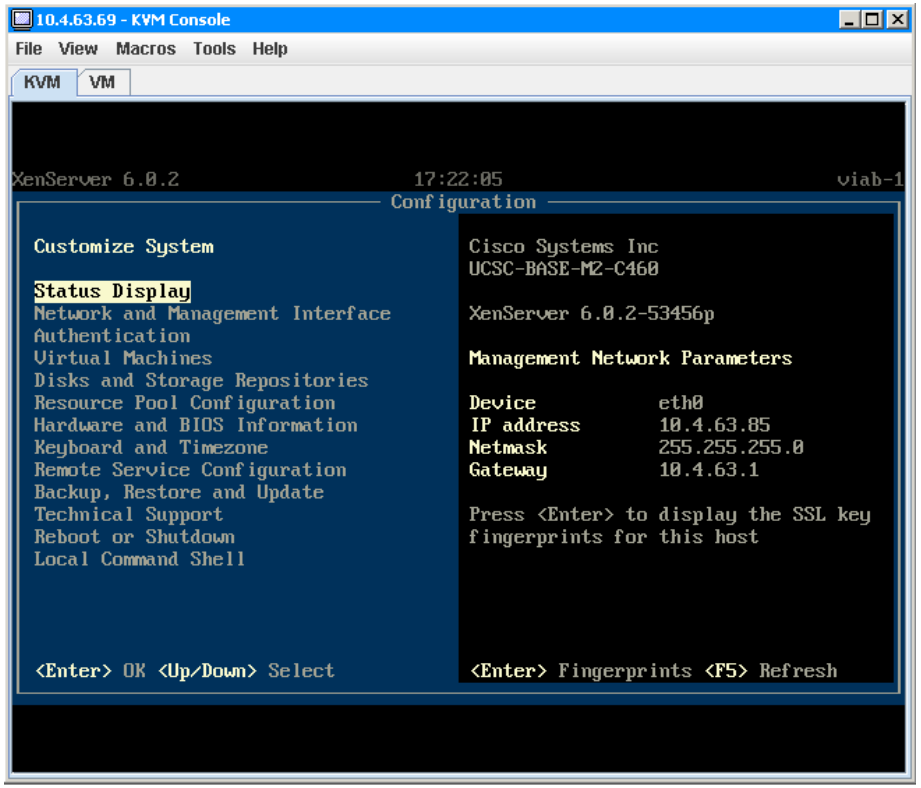


Step 22: Click the **KVM** tab on the KVM Console. This returns you to the Installation Complete screen.

Step 23: Select **OK** by pressing **Enter**. The server reboots and loads from the new XenServer installation.

It takes several minutes to load the Linux OS with Citrix components after the reboot. Upon completion, a graphical XenServer screen with progress bar is displayed.

The graphical screen is replaced by a text progress screen, as the server continues to boot into the XenServer host environment. Once the XenServer host is running, the status displays on the configuration screen of the KVM console.



Process

Installing Citrix XenCenter

1. Install XenCenter management tool
2. Enable XenCenter to manage XenServer
3. Create XenServer network connections

Procedure 1 Install XenCenter management tool

You use the Citrix XenCenter management tool to manage any virtual machines that will be generated and running on Citrix XenServer. Citrix XenCenter comes with Citrix XenServer, and the installation image can be obtained via web browser access to an automatically started web server, enabled as a result of the Citrix XenServer host installation.

Step 1: Open a web browser from the management workstation, and then connect to the IP address of the XenServer by typing the IP address, 10.4.63.85, as the browser URL destination.

The browser now displays the following:

Citrix Systems, Inc. XenServer 6.0.2, with hyperlinks to:

XenCenter CD image and XenCenter installer.

Step 2: Click **XenCenter installer**. The link to the XenCenter.msi file opens.

Step 3: Click **Save File**. This saves the XenCenter.msi file to the management workstation.

Step 4: Double-click the **XenCenter** icon for the downloaded file to launch the installation, and accept any security warning that may be displayed as part of the installation.

Step 5: On the **Citrix XenCenter Setup** dialog box, Click **Next**.

Step 6: Accept the default destination folder and installation user by clicking **Next**.

Step 7: On the **Ready to install Citrix XenCenter** dialog box, click **Install**.

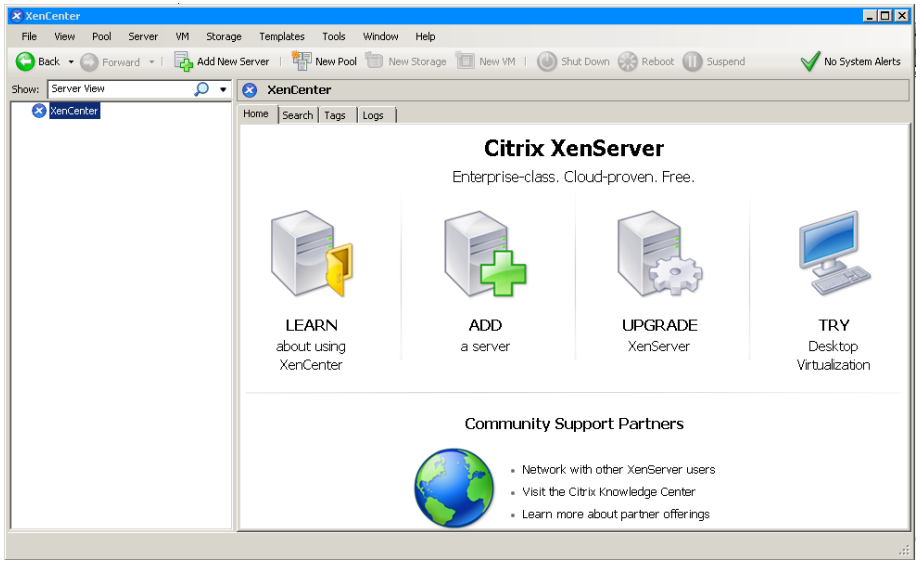
Step 8: Accept any security warnings as the Setup Wizard begins the installation.

Step 9: On the **Completed the Citrix XenCenter Setup Wizard** dialog box, click **Finish**.

Step 10: Citrix XenCenter is now installed on the management workstation.

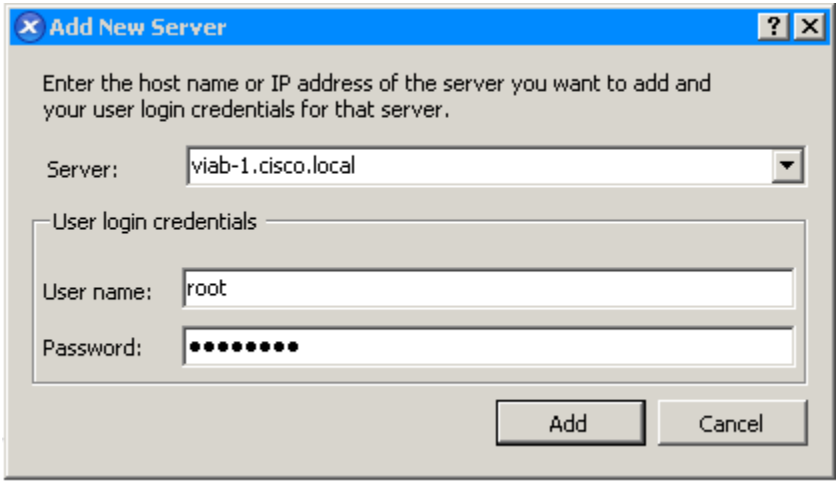
Procedure 2 Enable XenCenter to manage XenServer

Step 1: From the Windows Start menu on the management station, launch Citrix XenCenter. The main XenCenter window appears.

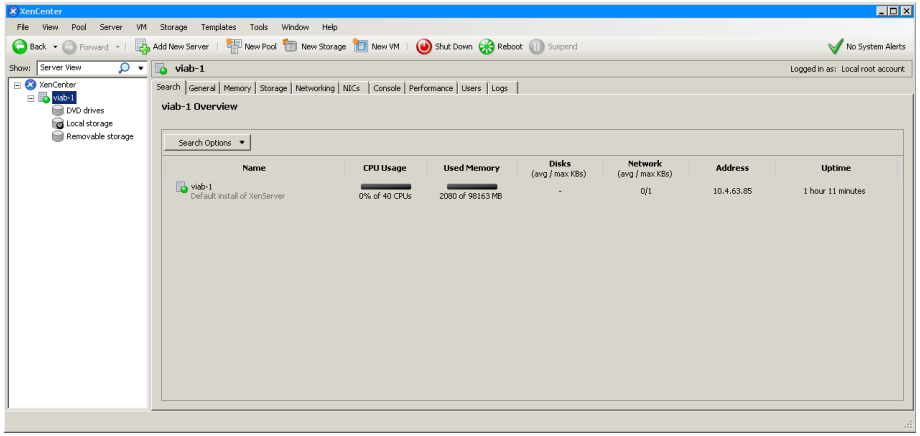


Step 2: Click **Add New Server**.

Step 3: In the Add New Server dialog box, enter the Citrix XenServer name and the root password configured during the XenServer installation.



Citrix XenCenter connects and synchronizes with the XenServer installation, and displays information for the server.



Procedure 3 Create XenServer network connections

The Cisco UCS C-Series server includes multiple Ethernet NIC connections. Two are associated for use together as dual active connections to the Cisco SBA data center, allowing resiliency and load sharing of desktops between links. Because the server is hosting client virtual desktop machines, its behavior can be characterized as being similar to the activity of many clients, and thus it is placed in the client VLAN in the data center. Traffic to and from the server network interfaces is tagged with the client data center VLAN 157.

Use Citrix XenCenter to configure the network, creating desktop VMs in later steps. To manage the server hardware and hypervisor, use NIC 0 and NIC 1 network interfaces. For traffic to the Citrix XenServer VMs, use 10Gbps NIC 4 and NIC 5 network interfaces.

Table 1 - Cisco UCS Server network interface assignments

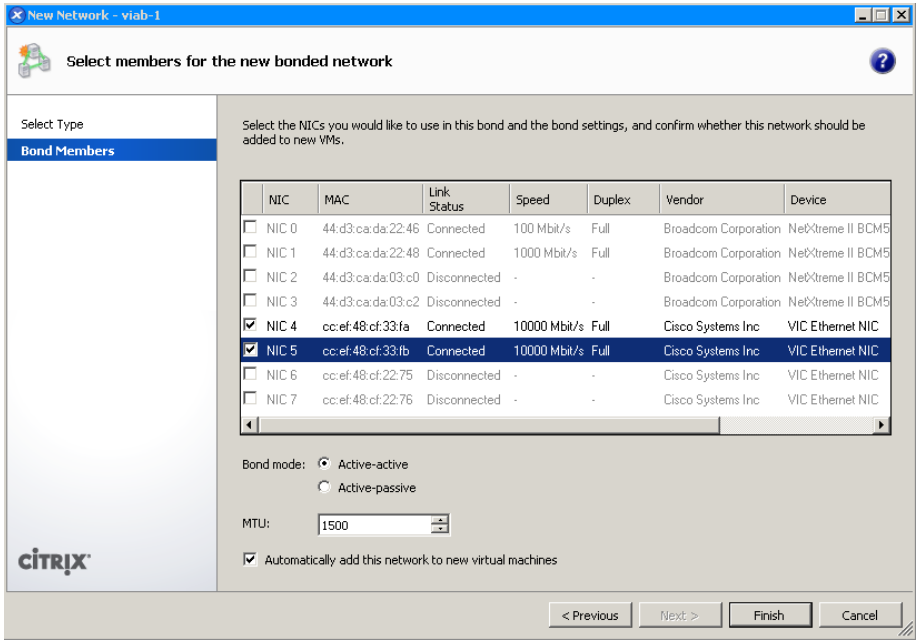
Cisco UCS interface	Type	Use	VLAN
NIC 0	100 Mbps Ethernet	CIMC	163 - Management
NIC 1	Gigabit Ethernet	Hypervisor	163 - Management
NIC 4	10-Gigabit Ethernet	VDI communication	157 - DC user
NIC 5	10-Gigabit Ethernet	VDI communication	157 - DC user

Step 1: In the XenCenter management console, highlight the installed XenServer instance, and then click the **NICs** tab. When the NICs are connected to data center switch ports that are enabled, the active network interfaces, NIC 4 and NIC 5, appear with a Link Status of **connected**.

Step 2: Click the **Networking** tab, and then click **Add Network**. A New Network dialog box appears.

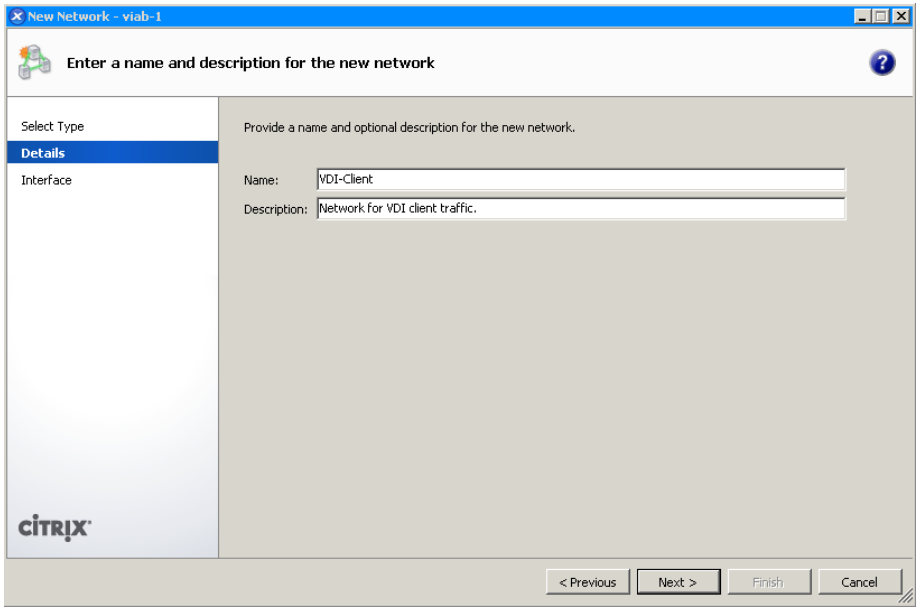
Step 3: Select **Bonded Network**, and then click **Next**.

Step 4: Select **NIC 4** and **NIC 5**, the two available Connected NICs, to bond. Leave Bond mode as **Active-active**, keep the default **MTU**, and enable **Automatically add this network to new virtual machines** by selecting the box next to the option.



Step 5: Click **Finish**. The new bonded network is displayed.

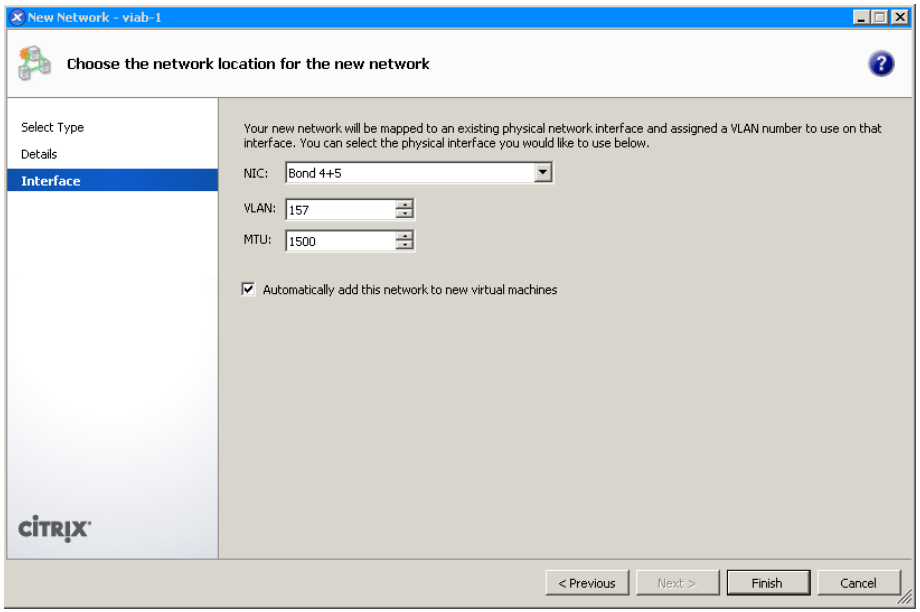
Step 6: On the Networking tab, click **Add Network** again. This time, select **External Network**, and then click the **Next**.



Step 7: Click **Details**, in the **Name box**, enter **VDI-Client**, in the **Description** box, enter **Network for VDI client traffic**, and then click **Next**.

Step 8: Click **Interface**.

Step 9: In the **NIC** list, choose **Bond 4+5**, in the **VLAN** list, enter **157**, in the **MTU** list, leave the default, and then enable **Automatically add this network to new virtual machines** by selecting the box next to the option.



Step 10: Click **Finish**. The newly created network interfaces are displayed.

Process

Installing Citrix VDI-in-a-Box Manager

1. Download and extract vdiManager
2. Create and configure a single-server grid

Citrix has a virtual appliance called VDI-in-a-Box Manager, also known as vdiManager, which manages virtual desktop creation and assignments for the Citrix XenServer host hypervisor. The vdiManager virtual appliance provides a central installation resource to create, provision, manage, and load balance virtual desktops. This deployment uses the Citrix VDI-in-a-Box version 5.1, which has built-in functionality that includes a connection broker, load balancer, user manager, and desktop provisioning server. Installation burden is eased by not having to install each function separately, and administrative and cost burdens are eased by not requiring separately provisioned shared storage, high-speed interconnects, or multiple management servers.

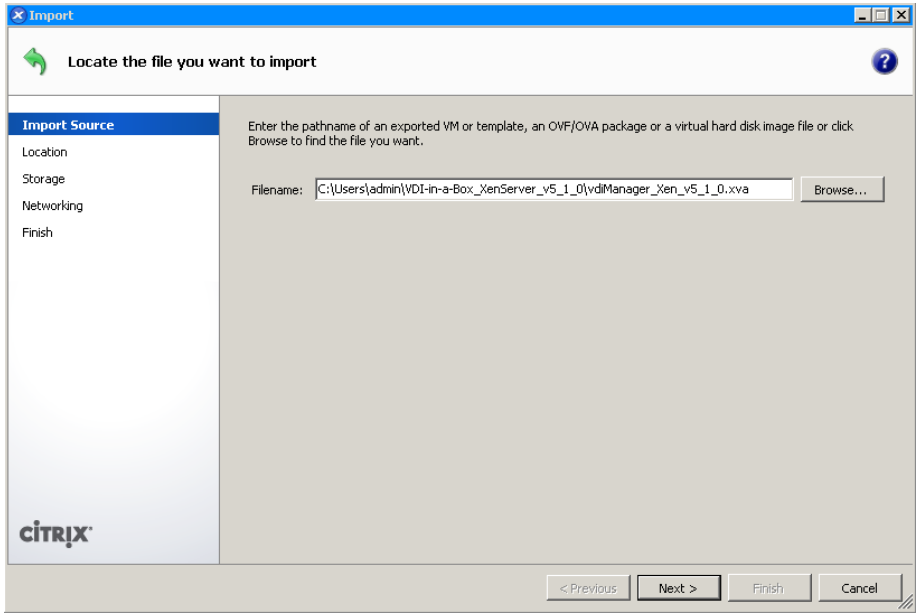
Procedure 1 Download and extract vdiManager

Step 1: From a web browser on the management station, navigate to https://www.citrix.com and download the VDI-in-a-Box version 5.1 for XenServer, called VDI-in-a-Box_XenServer_v5_1_x.zip.

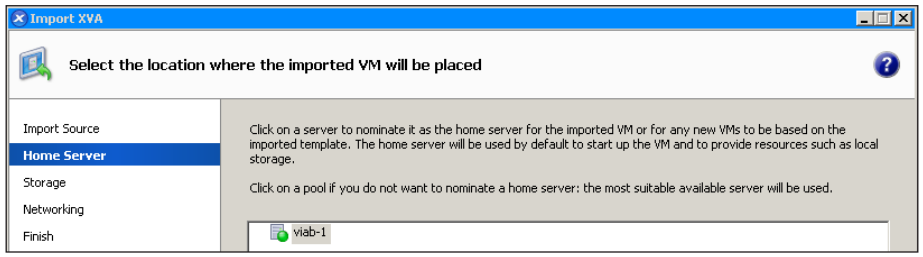
Step 2: Double-click on the .zip file icon. This opens and extracts the vdiManager_Xen_v5_1_x.xva file from the .zip file to the local hard drive.

Step 3: Return to the XenCenter management console, click **File**, and then click **Import**.

Click **Browse**, navigate to the extracted .xva file name, and then click **Next**.

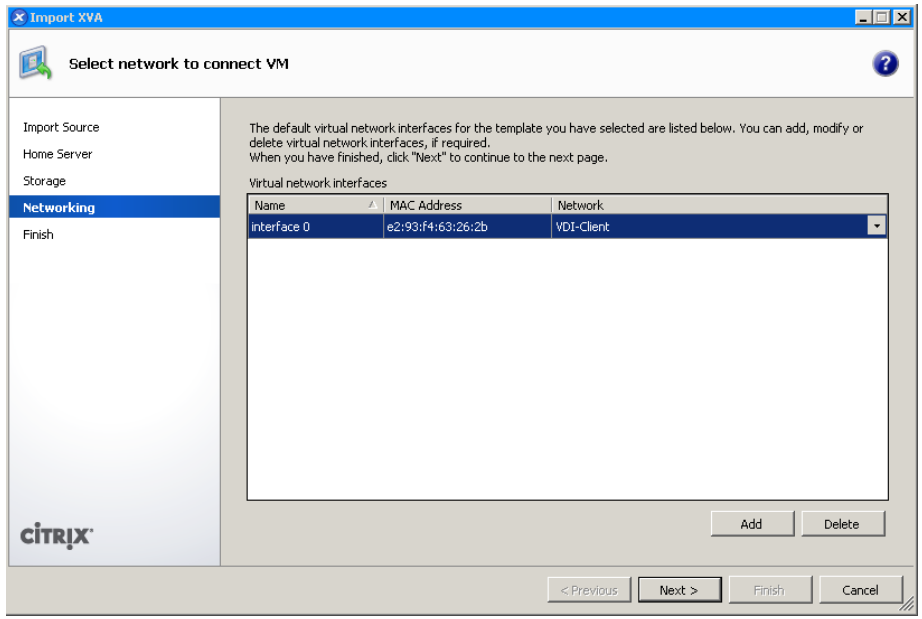


Step 4: Ensure the previously created XenServer host is highlighted as the **Home Server**, and then click **Next**.



Step 5: Select the default storage for the VMs on the UCS server, and then click **Import**. XenCenter prepares for the import, and the Select network to connect VM dialog box appears.

Step 6: Using the drop-down menu in the **Network** column, associate the **VDI-Client** network to the highlighted **interface 0** in the Name column.

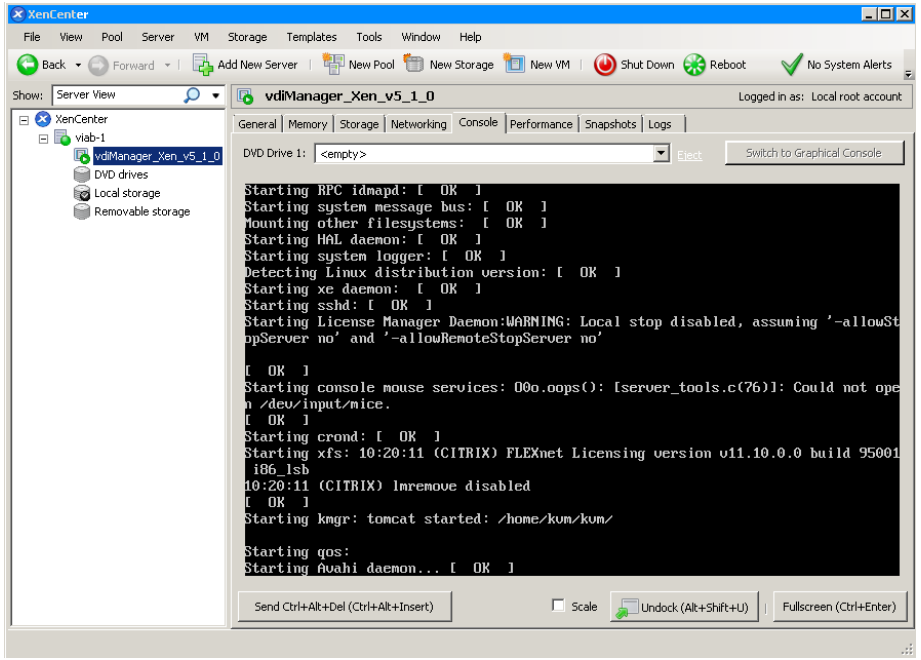


Step 7: On the Review the import settings dialog box, keep the default **Start VM(s) after import** selection, and then click **Finish**.

The operation takes several minutes to complete. You can view status at the bottom of the XenCenter screen, with text at the left bottom, and a progress bar at the right bottom. The vdiManager_Xen_v5_1_0 VM is displayed in the search tree on the left with a yellow status icon, signifying that the virtual machine has not started.

When the import is complete, and the virtual appliance is started, the VM status icon associated with the vdiManager changes to green.

Step 8: If you want to confirm the VM is operational, highlight the VM, and then click the **Console** tab. The following view of XenCenter shows an example confirmation that the vdiManager virtual appliance is running.



Procedure 2 Create and configure a single-server grid

Once the vdiManager is started and powered on in the XenServer host hypervisor, initial configuration of vdiManager is done by web browser. The IP address for the vdiManager is initially assigned via DHCP. This dynamic address will be changed to a static IP address in a later procedure, to allow VDI-in-a-Box users to access the VDI-in-a-Box service by a well-known IP address and Domain Name System (DNS) entry.

Step 1: In the Citrix XenCenter management window, click the **vdiManager_Xen_v5_1_X** server instance in the navigation tree, and then click the **Networking** tab. The IP Address column shows the address dynamically assigned to the vdiManager server when booting. This IP address is used in the next step.

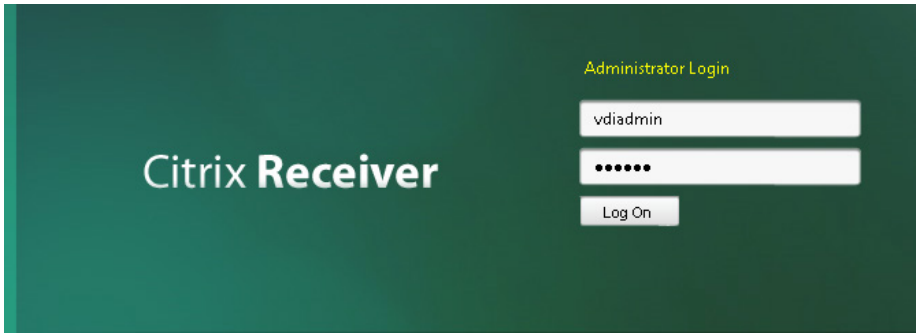
Step 2: In the web browser URL box, type the following, replacing the **10.4.57.39** address with the current dynamically assigned address obtained from the previous step:

https://**10.4.57.39**/admin/

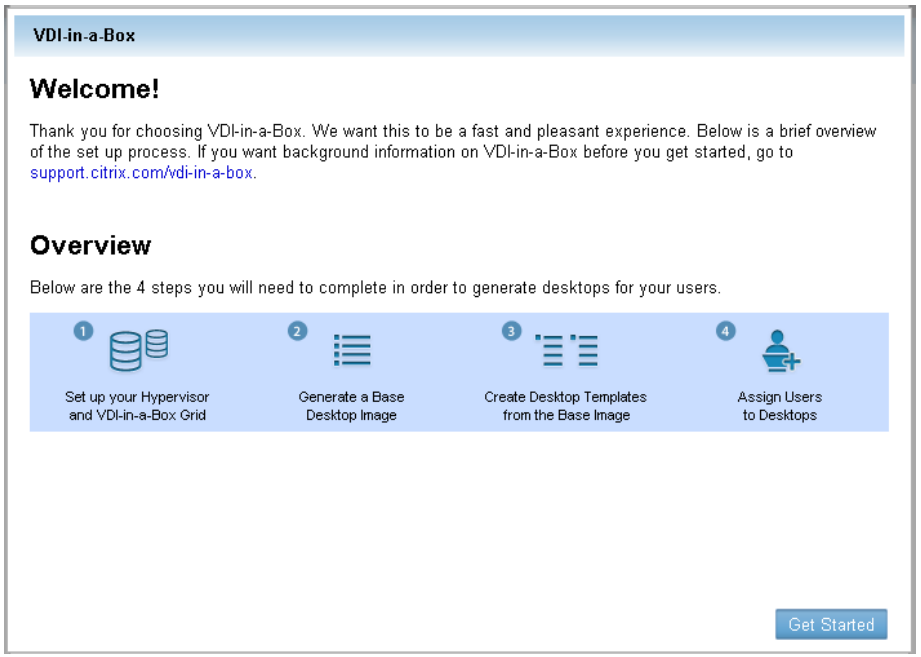
Step 3: Open the vdiManager Administrator Login page by pressing **Enter**.

Depending on browser configuration, there may be a number of security warnings. Respond to the warnings in order to allow the connection to succeed. When the connection is made, a login prompt is shown.

Step 4: At the Citrix Receiver Administrator Login prompt, enter the default **Username** and **Password** credentials, which are **vdiadmin** and **kaviza**, and then click **Log On**.



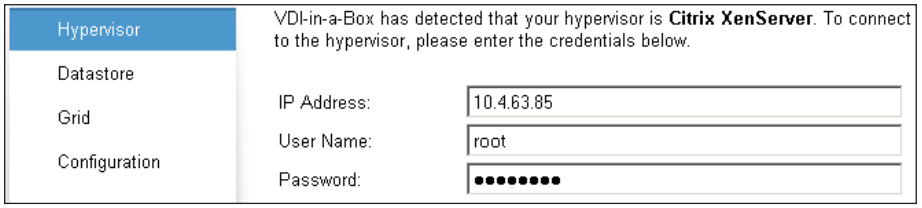
The VDI-in-a-Box Welcome! screen is displayed.



Step 5: Click **Get Started**, and then click **Continue**.

The Citrix VDI-in-a-Box virtual appliance detects that the host hypervisor it is running on is Citrix XenServer. Automating the installation process requires the IP address, user name, and password previously assigned to the XenServer host hypervisor.

Step 6: In the IP Address box, enter **10.4.63.85**, in the User Name box, enter **root**, in the Password box, enter the previously assigned password, and then click **Next**.



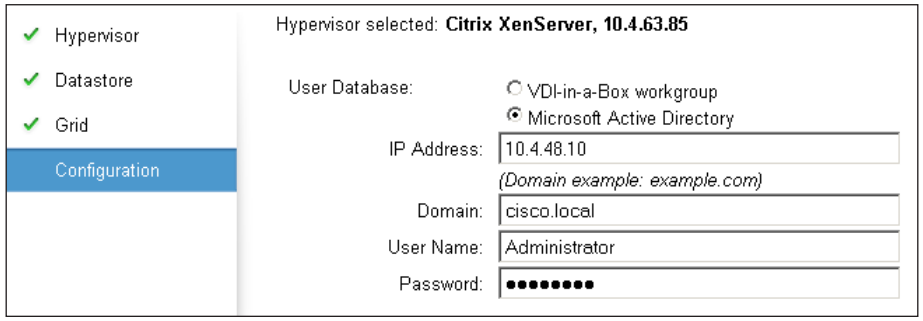
Step 7: In the **Datastore** list, choose the Cisco UCS local storage, in the **Network Label** list, choose **VDI-Client**, and then click **Next**.

Step 8: For the Grid option on the displayed window, select **Create a new VDI-in-a-Box grid**, and then click **Next**.

Step 9: This vdiManager becomes the only member of the single-server grid, and the next screen is displayed.

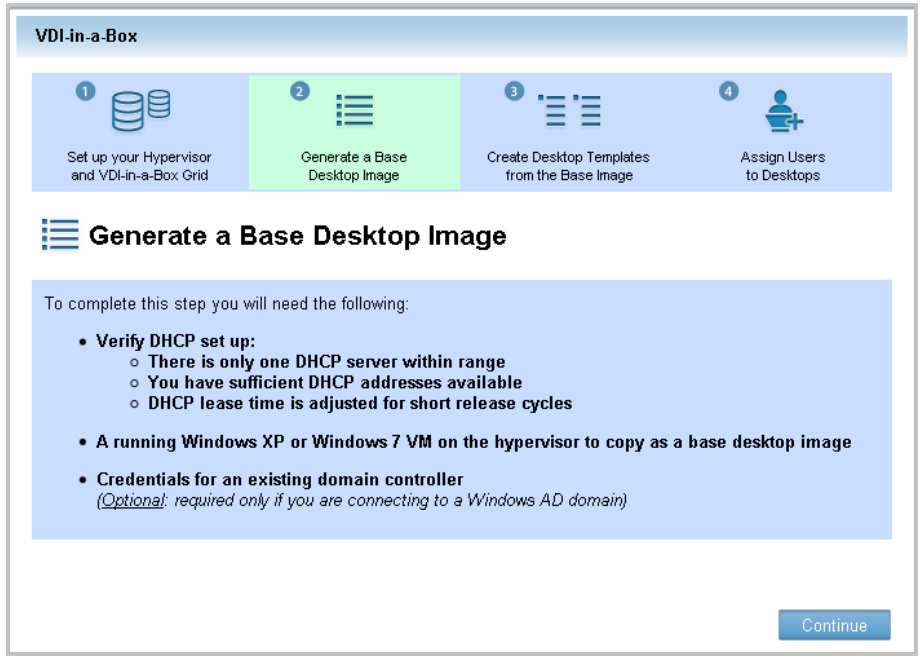
Step 10: For User Database, select **Microsoft Active Directory**. More fields become available to fill out.

Step 11: In the IP Address box, enter **10.4.48.10**, in the Domain box, enter **cisco.local**, in the User Name box, enter **Administrator**, in the Password box, enter the password, and then click **Next**.



Step 12: Click **Yes**, which acknowledges that a reserved IP address is used, and then click **Done**.

The Generate a Base Desktop Image screen is displayed.



Process

Creating First OS Image and Template for Virtualized Desktops

1. Create the first Windows 7 VM image
2. Customize Windows image
3. Import Windows machine to vdiManager
4. Create template from published image

Citrix VDI-in-a-Box Manager has the ability to assign virtual desktops to users requesting them based on templates for the virtual desktop use case. A typical use case includes virtual desktops for task workers, where an identical desktop is assigned to all workers at each login or an unchanging desktop minimally customized per worker is assigned at login. Another use case is for knowledge workers with personalized desktops. In the knowledge worker use case, you create a Personal Virtual Desktop (PVD) for each worker. The base windows image is the same at login, but any file changes, application additions, and user customizations persist across logins.

The host hypervisor is used to create the base desktop image which is the basis for the vdiManager templates. In the Cisco SBA basic implementation for VDI using Citrix VDI-in-a-Box, the Citrix XenServer host hypervisor is used to create the guest Windows 7 64-bit desktop virtual machine image. The image is imported by vdiManager to create templates to allow for multiple guest machines to run on the host hypervisor.

Procedure 1 Create the first Windows 7 VM image

A Microsoft Windows 7 64-bit installation ISO must be available on the Citrix XenCenter management machine to use the following steps successfully. Alternatively, a network file server (NFS) mount or other remote disk could be used, as appropriate for the installation. The installation from a locally stored ISO image is covered in this guide. Step-by-step details for the Windows installation are not covered, as this is open for customization by the administrator.

Step 1: Copy the Microsoft installation ISO file to management machine.

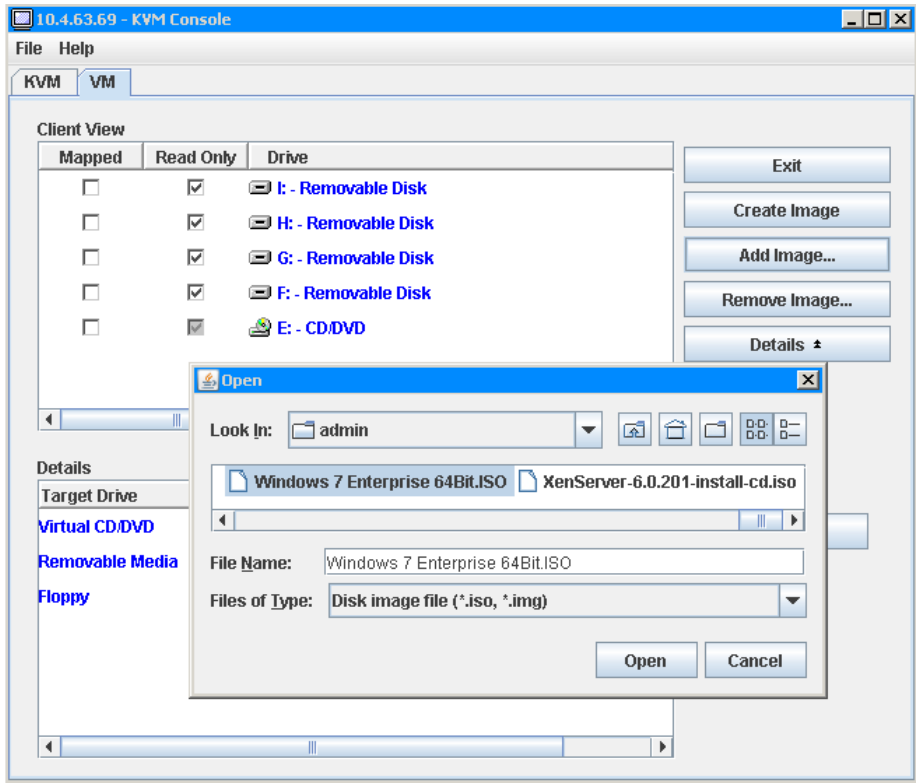
Step 2: If the Cisco UCS C-Series KVM Console is not already open, direct a web browser to the CIMC management address (for this example, 10.4.63.69), and then click the **Launch KVM Console** icon. The console opens.

Step 3: In the KVM console, click the **VM** tab.

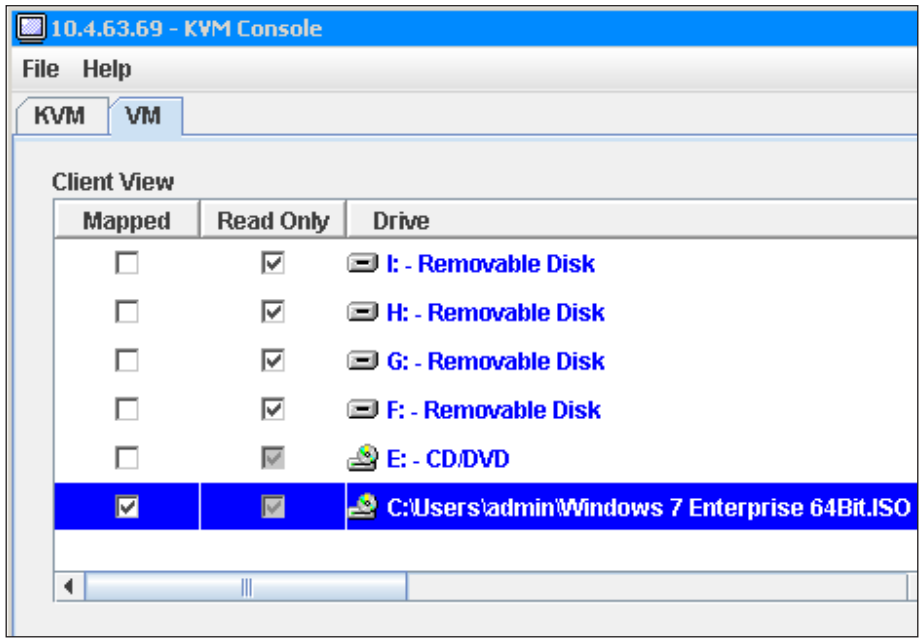
The Windows installation ISO file is mapped as a DVD drive available to the server, allowing the XenServer host to read it.

Step 4: Click **Add Image**.

Step 5: Navigate to the location of the stored Windows ISO image, select it, and then click **Open**.



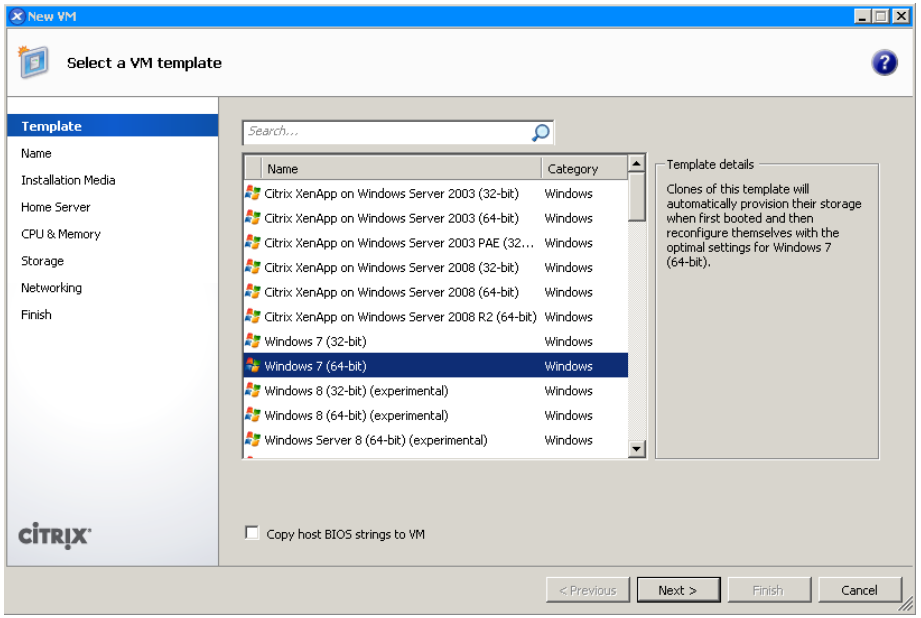
Step 6: Under **Mapped**, select the check box for the ISO image.



After using this mapping, you will remove the mapping for the ISO at the end of the procedure to avoid the ISO being used as a boot device in case the Cisco UCS server is reset.

Step 7: Open the Citrix XenCenter management application, and then click **New VM**. The New VM wizard opens.

Step 8: Select the **Windows 7 (64-bit)** provisioning template, and then click **Next**.



Step 9: For the virtual machine image, enter values for **Name** and **Description**. Cisco SBA uses Win7-64bit-VM and Windows 7 64-bit base VM image. Click **Next**.

Step 10: Select **Install from ISO library or DVD drive**, from the drop-down menu, choose **DVD drive 1 on viab-1**, and then click **Next**.

Using the DVD drive allows booting from the Cisco UCS attached media, which you previously configured.

Step 11: Verify the default action is to **Place the VM on this server** with the default Citrix XenServer host instance highlighted, and then click **Next**.

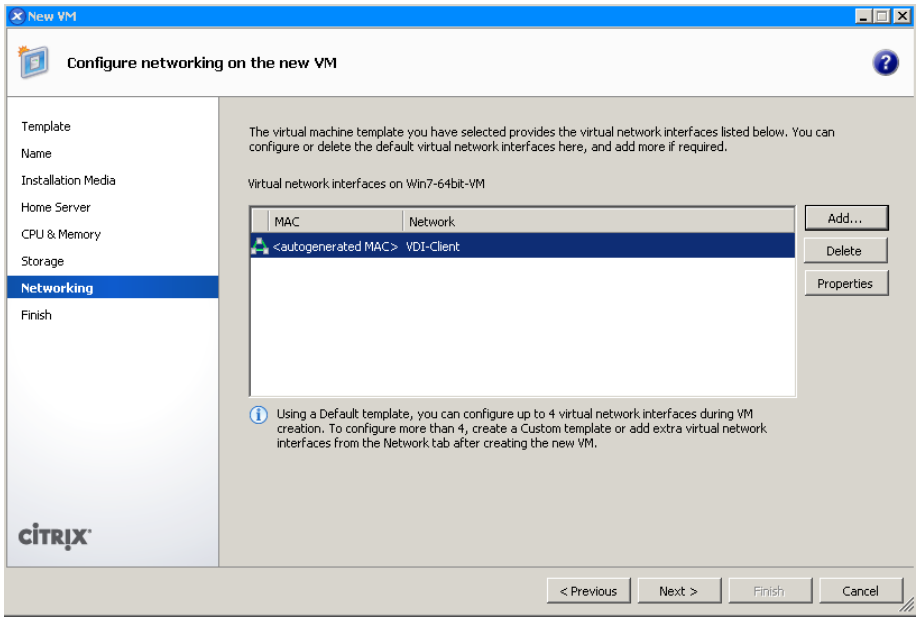
Step 12: In **vCPUs,** enter 1, in **Memory,** enter 2048 MB (these are the minimum values), and then click **Next**.

Step 13: Select the default **Use these virtual disks**, select the default highlighted local storage, and then click **Next**.

Step 14: Highlight all network interfaces, and then click **Delete**.

Step 15: Click **Add,** and in the Network column, click **VDI-Client**. Leave the remaining defaults, and then click **Add** again to confirm and continue.

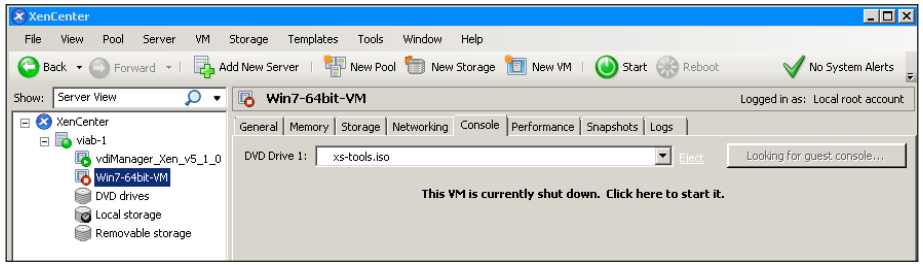
Step 16: Verify that the only Network listed in the Networking list is **VDI-Client**, and then click **Next**.



Step 17: Click **Finish**. This confirms the virtual machine creation.

XenCenter displays work status in the bottom of the screen. After finishing, it then displays the name previously given to the VM in the navigation tree. The VM is started, and the Windows 7 installation and base configuration completes, before allowing the vdiManager to create a template from the VM.

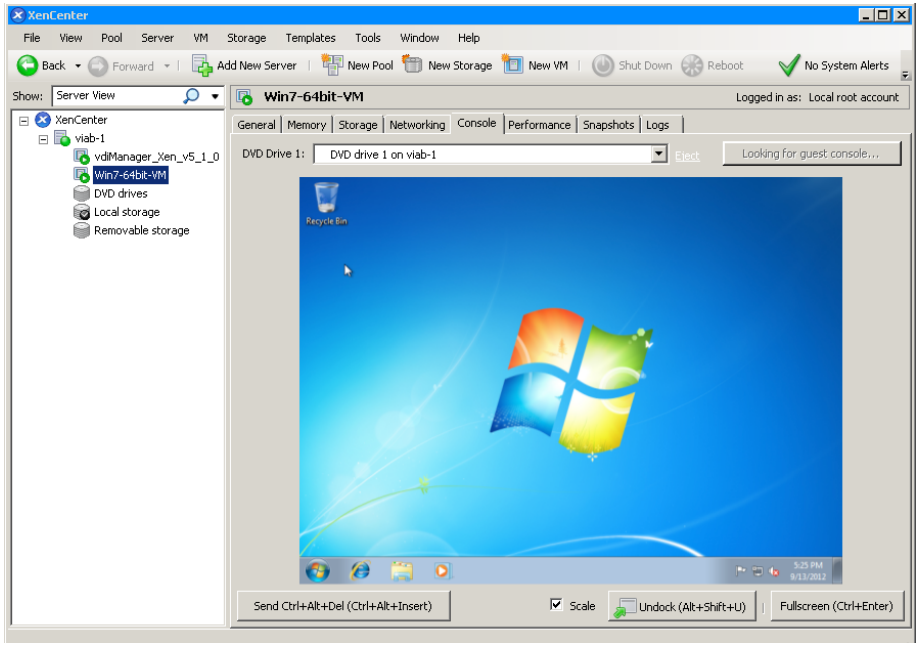
Step 18: Within XenCenter, click the newly created server, and then click the **Console** tab. You can now observe the VM boot process in the console window. Complete the Windows 7 installation from this window.



Reader Tip

The details required to complete a new Windows installation are not within the scope of this guide.

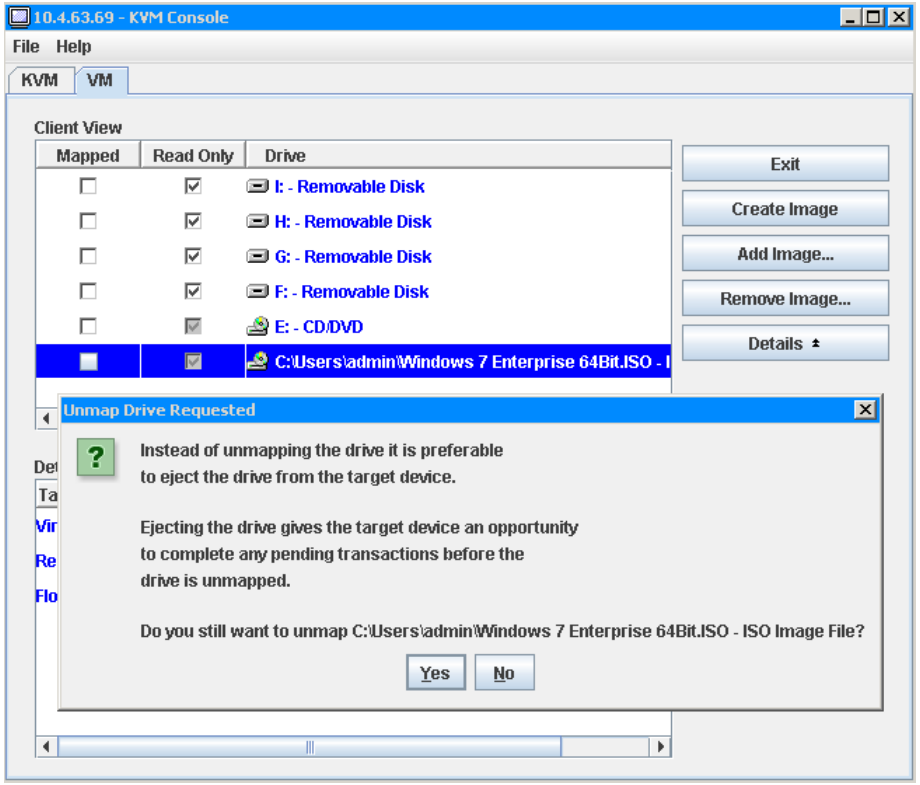
When the new installation is complete, the Windows desktop on the new guest VM is displayed.



Step 19: After the new Windows installation is complete, next to the **DVD Drive 1** menu, click the underlined **Eject** text.

Step 20: Return to the KVM tab of the VM Console window, and then clear the **Mapped** check box next to the Windows ISO image.

Step 21: When the Unmap Drive Requested warning message appears, click **Yes**.



Undesired behavior results if the ISO image is not unmapped from the server and the server reboots. In those circumstances, the server boots from the mapped ISO image, and attempts to install Windows on the Cisco UCS hardware to replace the Citrix XenServer installation.

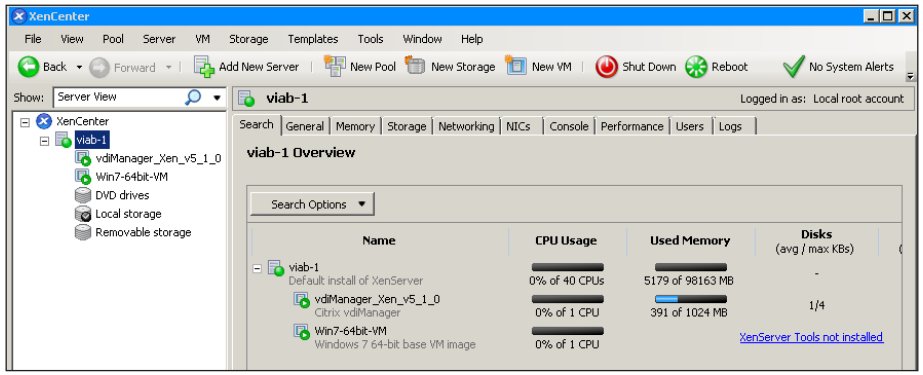
Step 22: For the highlighted Windows ISO file, click **Remove Image**. The ISO image, which is no longer needed, is disassociated from the Cisco UCS server.

Procedure 2 Customize Windows image

Once the Windows VM is running, there are some required customizations to be completed. XenServer Tools must be installed on each VM to have a fully supported configuration with enhanced disk and network performance.

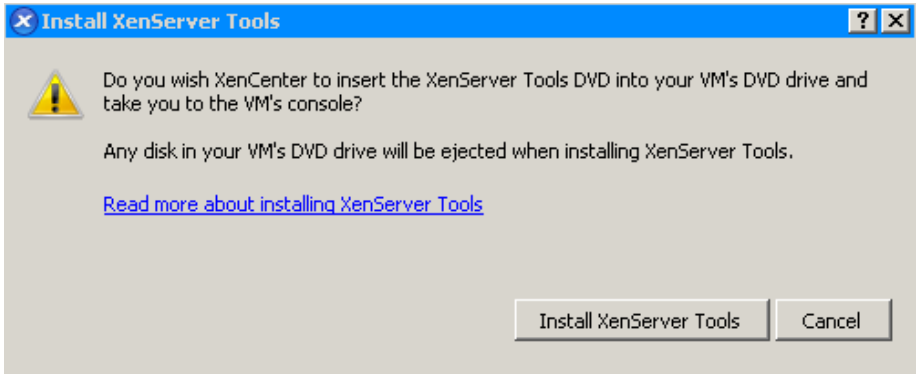
A valid Administrator account with password is required for later steps in this procedure.

Step 1: Return to the Citrix XenCenter Window, in the navigation pane, select the XenServer host, and then click the **Search** tab. Observe that the "XenServer Tools not installed" blue status text appears next to the new Windows guest VM.



Step 2: Click the **XenServer Tools not installed** link. The Install XenServer Tools setup wizard on the VM console opens.

Step 3: On the Install XenServer Tools dialog box, click **Install XenServer Tools**.



There is a pause before the next step.

Step 4: After the Windows CD Drive **AutoPlay** dialog appears on the VM **Console** tab, click the **Run xensetup.exe** AutoPlay option.

Step 5: When prompted, click **Yes** for User Account Control. This allows the program to make changes to the computer.

Step 6: Select the **I accept the terms in the License Agreement** check box, and then click **Next**.

Step 7: Click **Install**. This accepts the default destination folder.

Step 8: Ensure that the default **Reboot now** option is selected, and then click **Finish**. The installation of the required tools on the Windows machine completes. You can observe the reboot for tools installation on the VM console.

Step 9: At the prompt, click **Restart Now**.

Step 10: After the Windows VM has restarted, next to the DVD Drive 1 menu, click the underlined **Eject** text. The **xs-tools.iso** image disconnects.

Next, configure the Windows Firewall to permit inbound connections to support Citrix Receiver functionality.

Step 11: Log in to the VM console, click the desktop VM Windows **Start** button, and then click **Control Panel**. The Windows Control Panel opens.

Step 12: In the Control Panel, click **System and Security**.

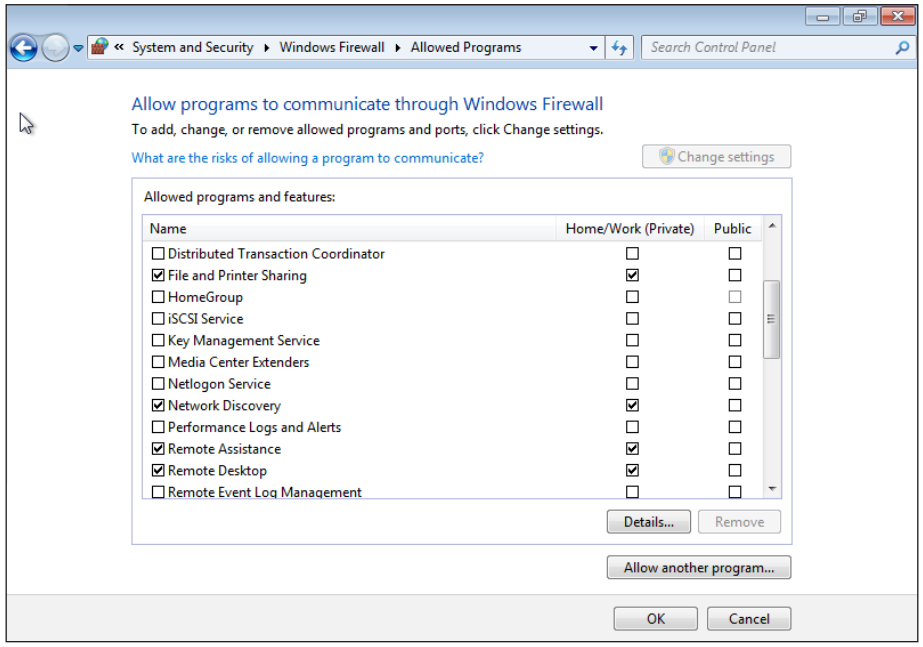
Step 13: Under the Windows Firewall section, click **Allow a program through Windows Firewall**.

Step 14: Permit changes by clicking **Change settings**, select the check boxes in the **Home/Work (Private)** column next to File and Printer Sharing and Remote Desktop. The services are enabled through Windows Firewall.

Step 15: If access is required in a Public network configuration, then also select the check boxes in the previous step for **Public** column next to the File and Printer Sharing and Remote Desktop.

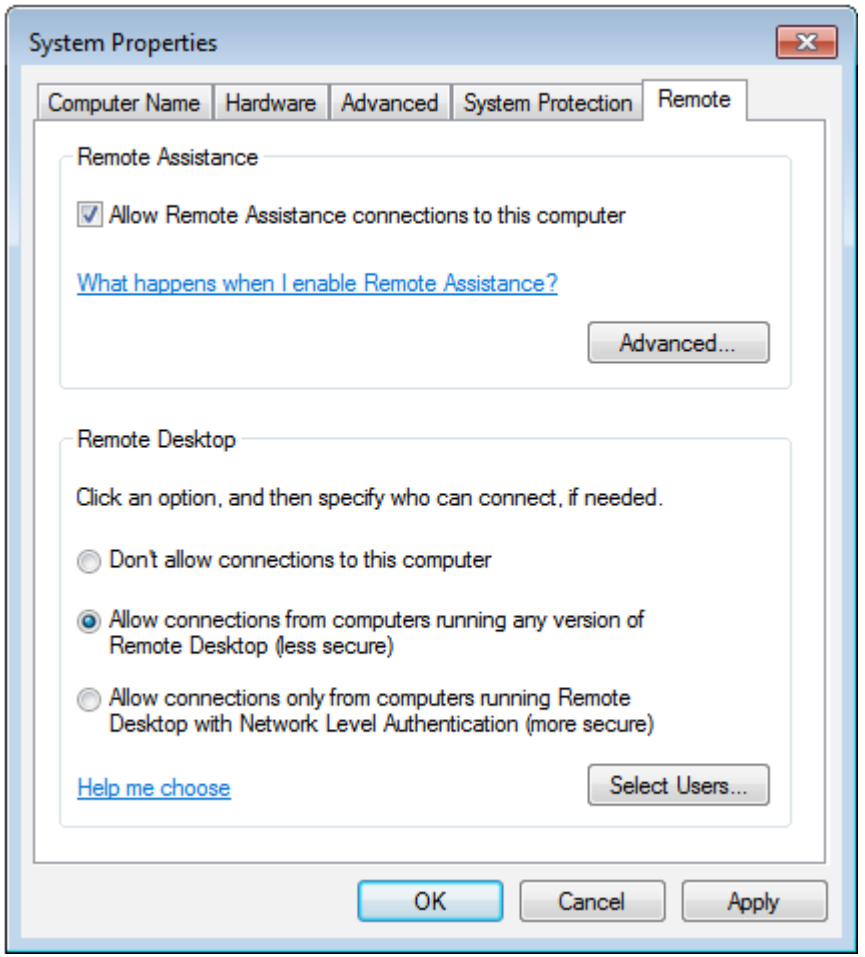
Step 16: Click **OK**.

The services are enabled through Windows Firewall.



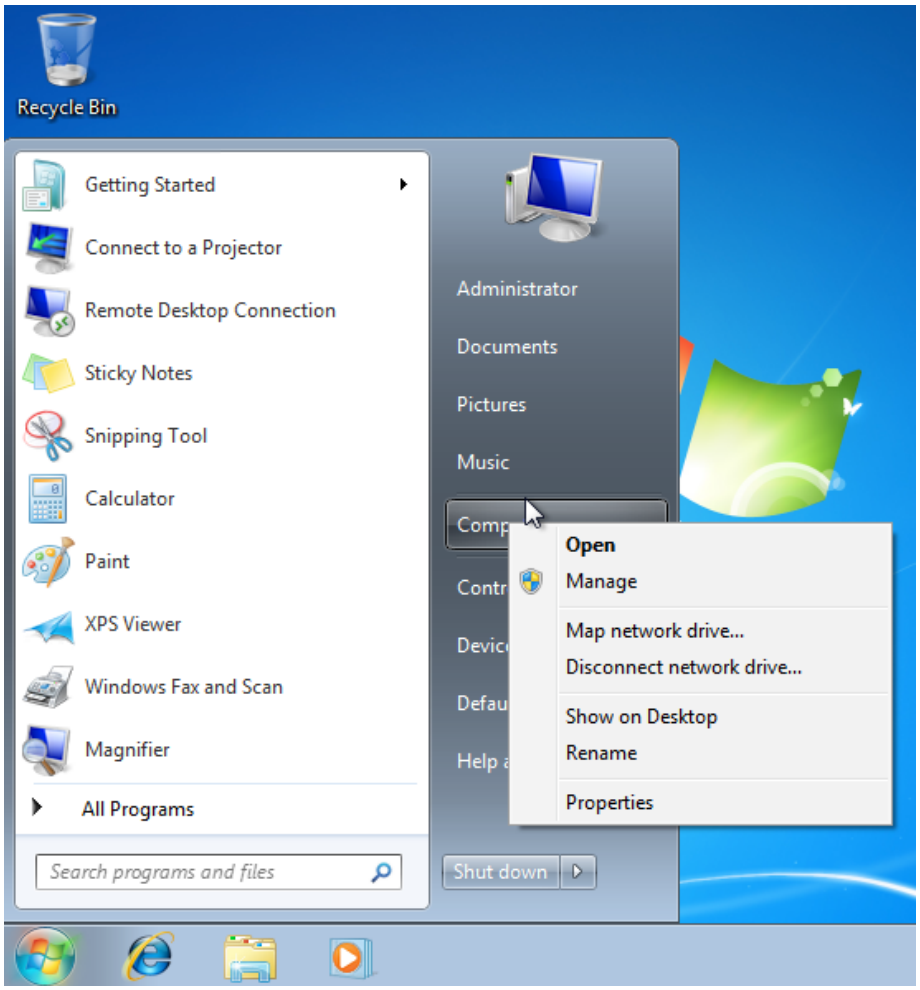
Step 17: Under the System section of the Control Panel, click **Allow Remote Access**.

Step 18: In System Properties, click the **Remote** tab, and then, under Remote Desktop, select **Allow connections from computers running any version of Remote Desktop (less secure)**.

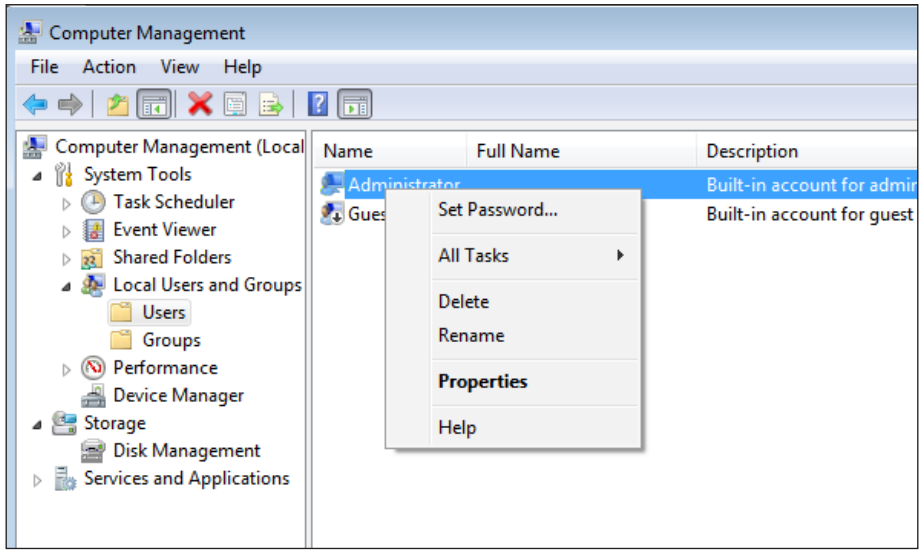


Step 19: Click **OK**.

Step 20: Click the Windows **Start** button, right-click **Computer**, and then click **Manage**.



Step 21: On the Computer Management screen, under System Tools, Local Users and Groups, open the **Users** folder, right-click the **Administrator** account, and then click **Properties**.



Step 22: If it is selected, clear the **Account is Disabled** check box, and then click **OK**.

Step 23: Right-click **Administrator** again, and then click **Set Password**.

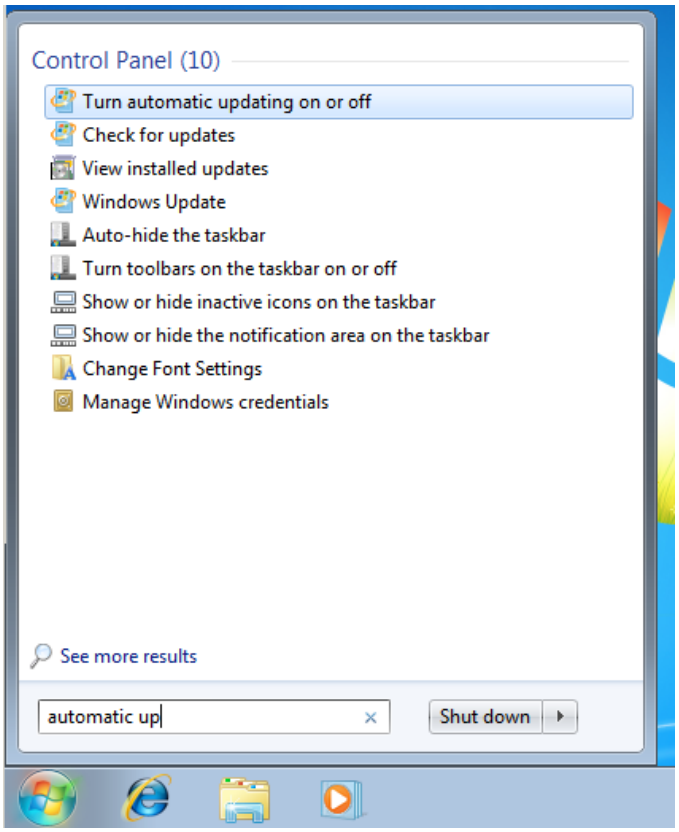
Step 24: At the warning, click **Proceed**, enter the password for the administrator in the **New password** and **Confirm Password** boxes, and then click **OK**.

Step 25: At the acknowledgement, click **OK**, and then close the Computer Management window. Initiate a Windows update , and apply any available Windows patches.

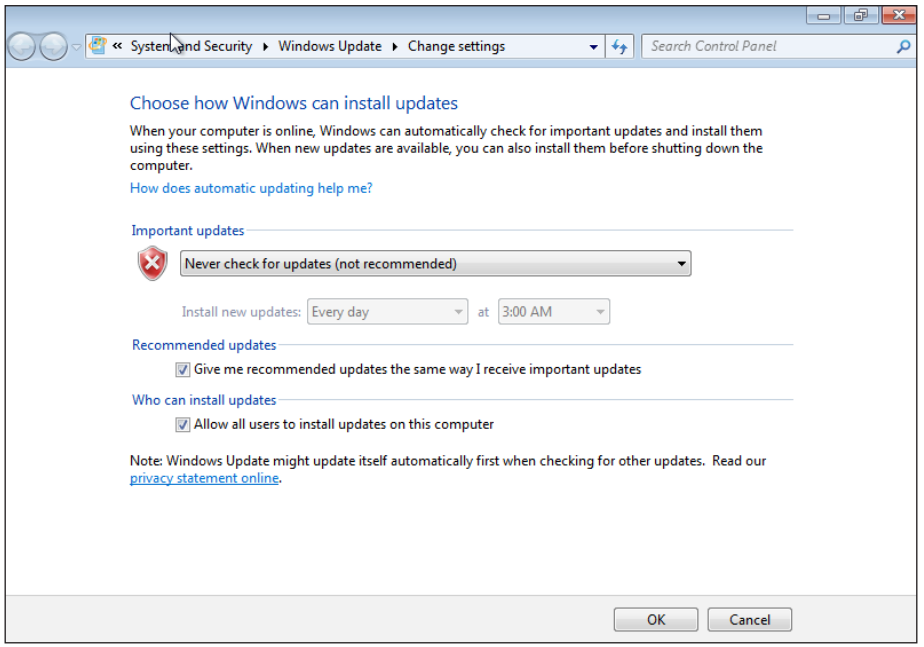
Caution

Not applying the latest Windows patches may keep the VM from fully booting, and may not allow required agent software to install.

After Windows updates are completed, the next step is to disable Automatic updates started by the Windows Update service, so that the Citrix VDI-in-a-Box installation can run to completion. Click the Windows **Start** button, in the search box, type **automatic up**, and then click **Turn automatic updating on or off**. The Change settings Control Panel opens.



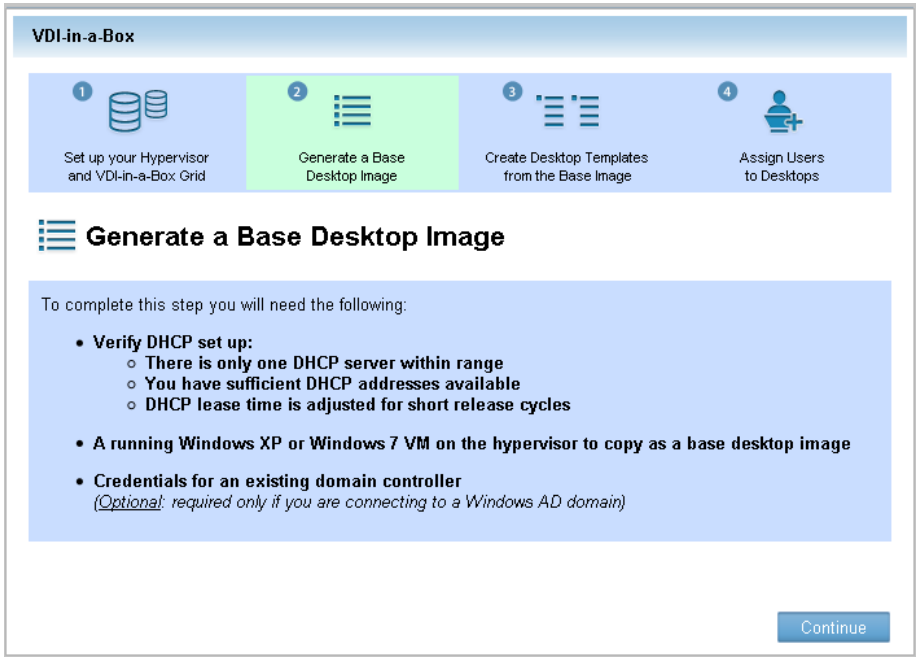
Step 26: Under Important updates, choose **Never check for updates (not recommended)** from the drop-down menu, and then select **OK**.



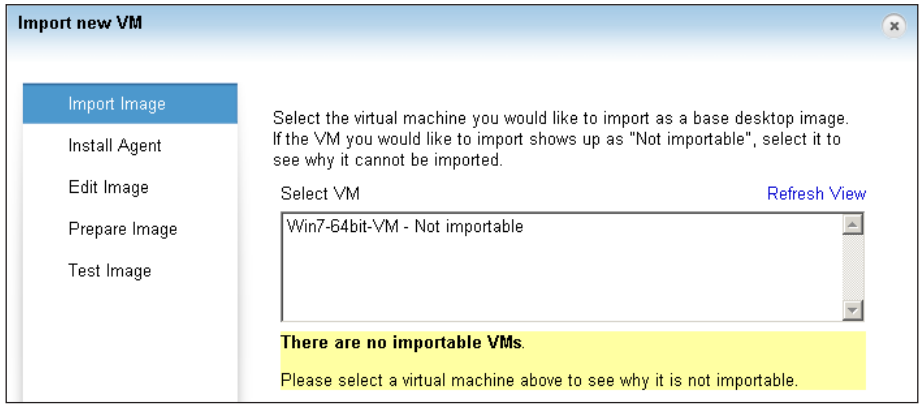
At this time, complete any additional customizations that you want to be replicated by all virtual desktops. Notably, a Windows machine needs to have a Microsoft Volume Activation key, since duplicate keys exist on all replicated virtual machines. All machines should be joined to a domain, and the domain configuration should be completed before proceeding.

Procedure 3 Import Windows machine to vdiManager

Step 1: Return to the web browser window showing the Citrix VDI-in-a-Box first setup procedure, click **Continue**, and then, in the new window, click **Refresh View**.

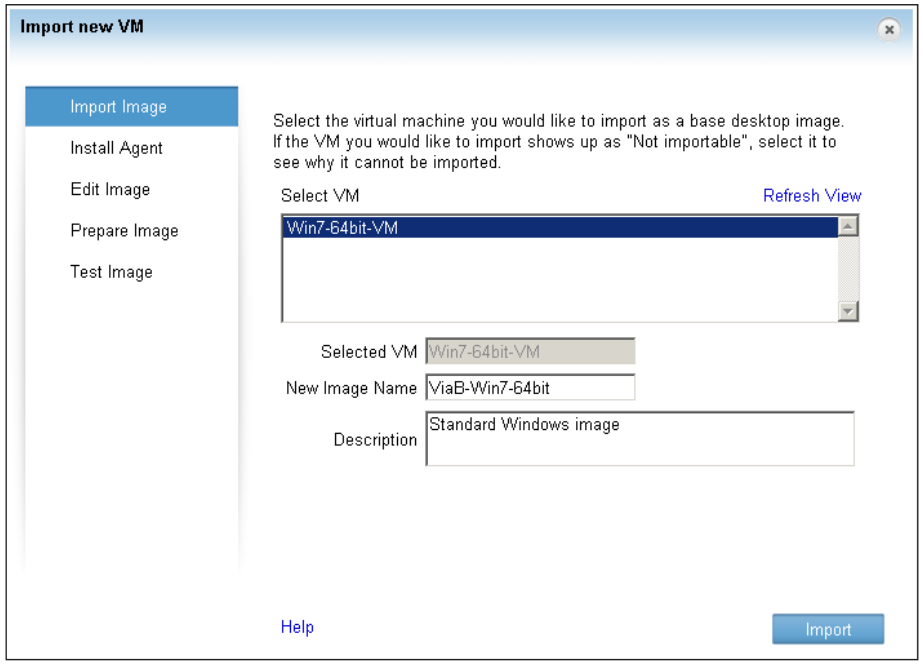


Step 2: If the following dialog box is displayed after clicking **Refresh View**, click the VM to get hints as to what still needs to be configured before the VM can be imported.



Step 3: On the new window, click **Refresh View**, and then select the Windows VM just created and configured, named Win7-64bit-VM in this example.

Step 4: Enter values for the **New Image Name** and **Description** boxes (Cisco SBA uses **ViaB-Win7-64bit** and **Standard Windows image**),and then click **Import**.

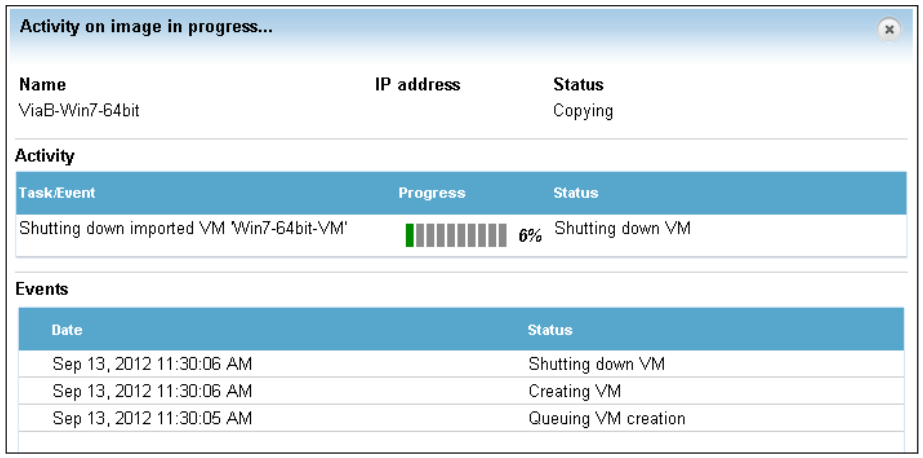


Step 5: In the Specify Administrator Credentials box, in the User Name box, enter **Administrator**, and then, in the Password box, enter the assigned password.

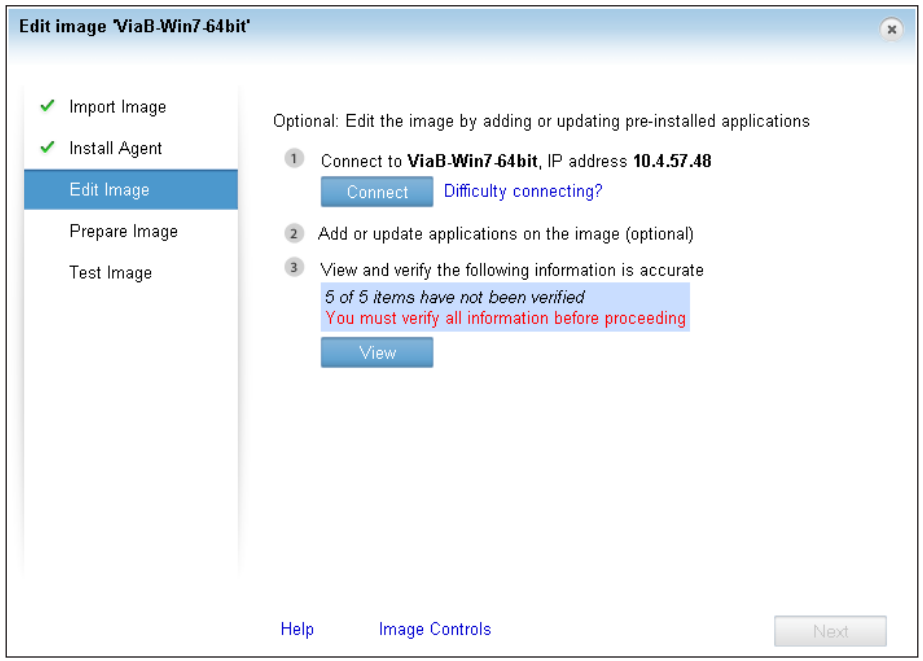
Tech Tip

If any changes to administration control need to be made to complete this step, the console is available in Citrix XenCenter for administrative activities.

Step 6: Click **Import**. The credentials are verified and progress screens are displayed.



The automated steps to import the Windows VM and install the agent take several minutes to complete. Wait for the steps to be completed before performing the Edit Image step.



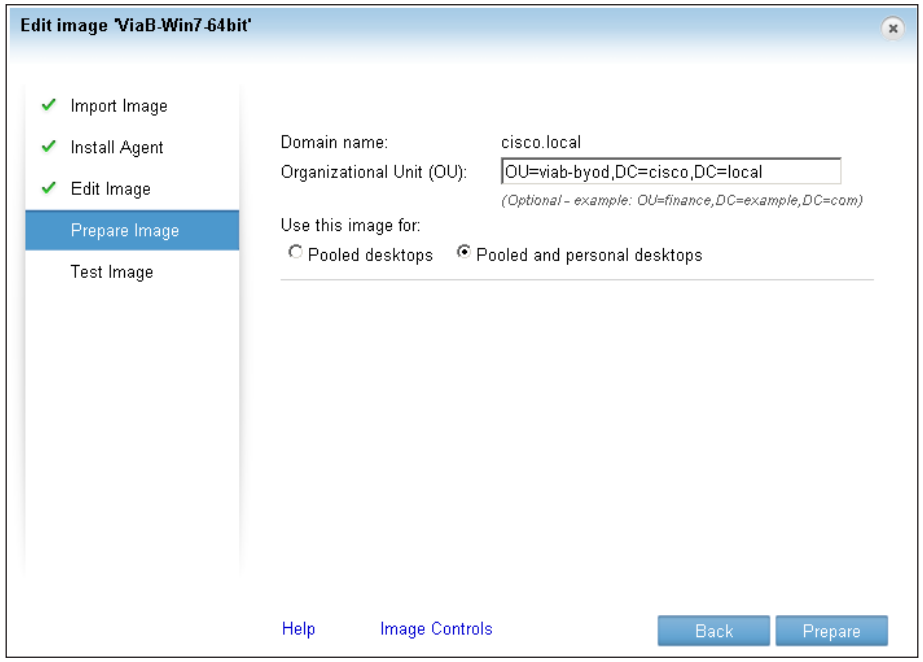
Step 7: If any of the automated installation does not complete, correct the problem before you complete the next two steps. For example, not applying Windows Updates may make the agent installation fail.

Step 8: Click the **View** button. This displays the View and Verify Information dialog box.

Step 9: On the View and Verify Information dialog box, verify all configuration details by selecting **Yes** next to all five items, and then click **Done**. The dialog box closes.

Step 10: Proceed past the Edit Image phase by clicking **Next**. The Prepare Image phase displays.

Step 11: In the Organizational Unit (OU) box, type the OU for Active Directory, select **Pooled and personal desktops**, and then click **Prepare**.

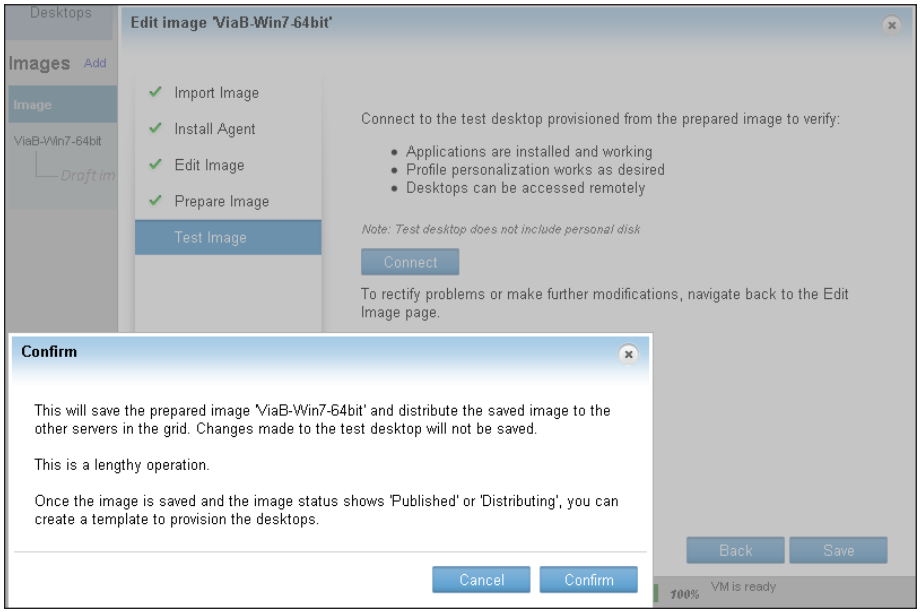


Step 12: Click **Confirm**. This acknowledges you are starting a lengthy process.

Activity status updates and eventually states VM Ready.

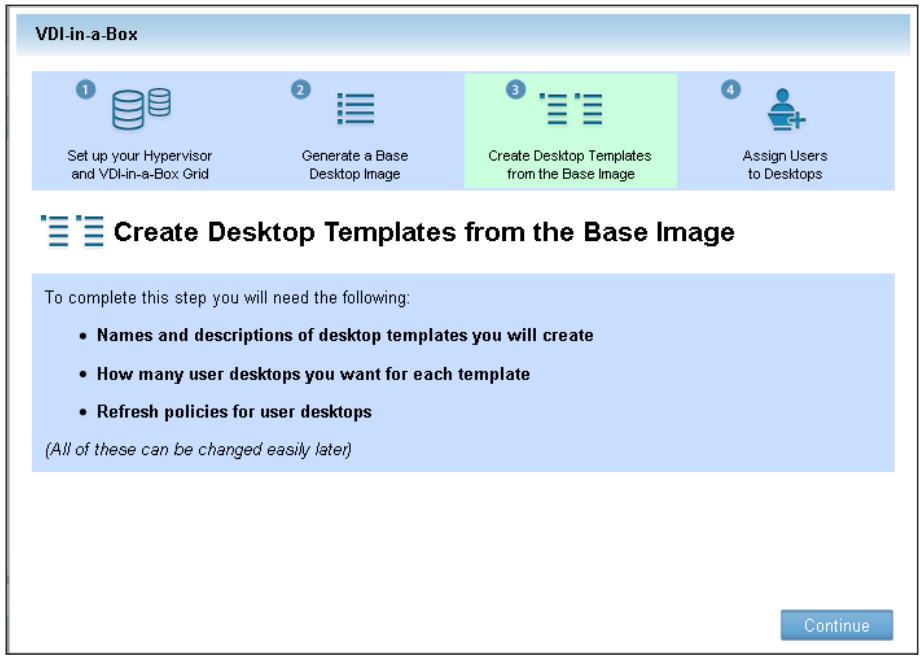
Step 13: If you need to test or change the VM image with either RDP or ICA clients, select **Connect**.

Step 14: Click **Save**, and then click **Confirm**. This acknowledges you are starting a lengthy operation.



Procedure 4 Create template from published image

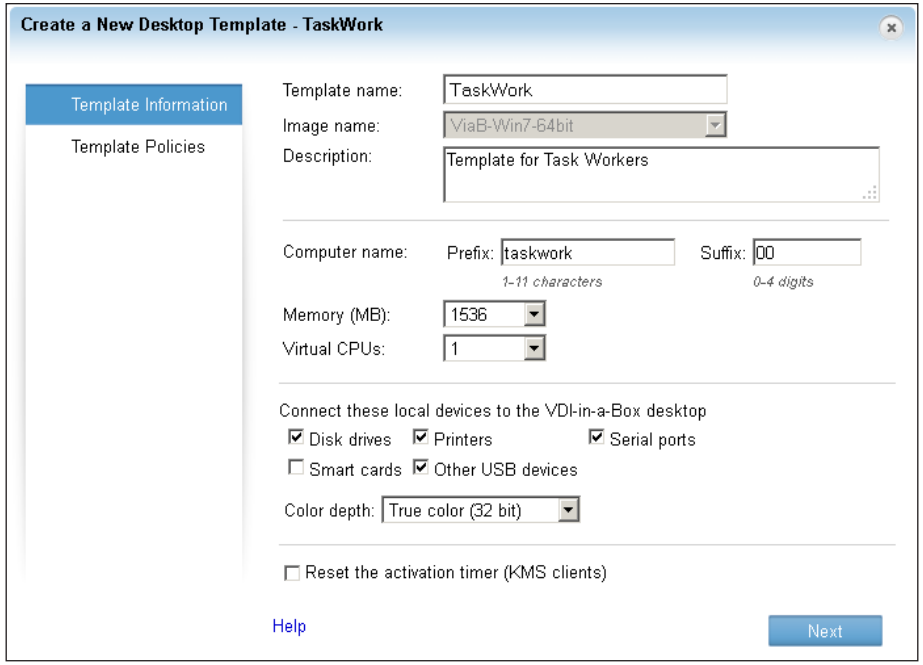
After the Base Desktop Image is created, it can be used to create desktop templates. The next screen starts this process.



Step 1: Click **Continue**. The template process begins.

Step 2: On the Template Information tab, enter the following values, and then make any additional updates you want to the template for the virtual machine:

- Template name—TaskWork
- Description—Template for Task Workers
- Prefix—taskwork
- Suffix—00
- Memory (MB)—1536



Tech Tip

Using less than 1536 MB of memory for Windows 7 virtual machines may keep them from becoming fully operational. The minimum memory required for allocation to the machine may increase beyond 1536 MB, dependent on application requirements.

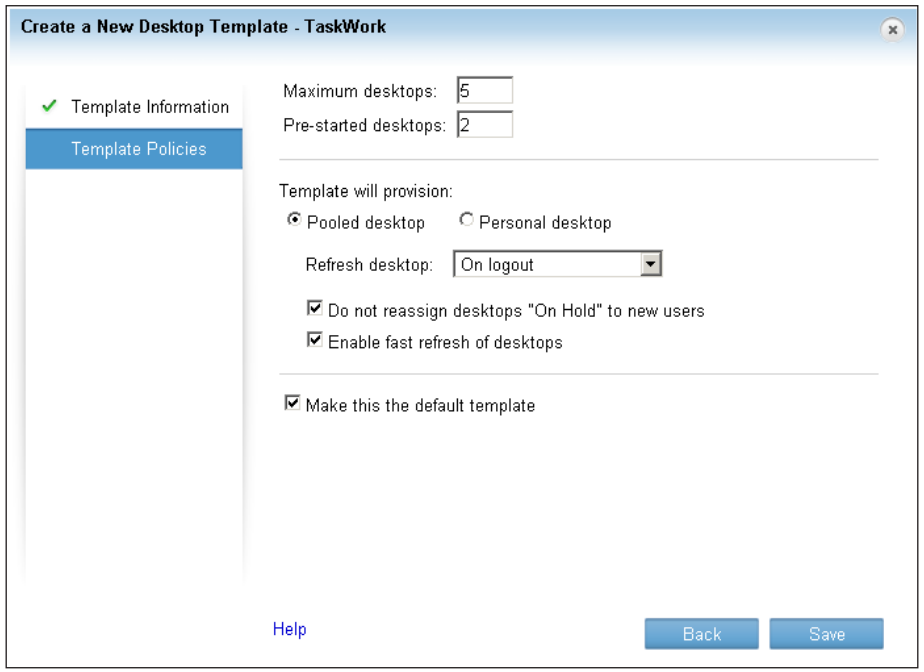
Step 3: Click **Next**. Template Policies displays.

The policy created for task workers has five desktops available, with two pre-started for performance reasons. The virtual desktops are a pooled resource, which do not have any personal disk space reserved.

Next, fill in the template policy.

Step 4: For **Maximum desktops**, enter 5, for **Pre-started desktops**, enter 2, and then keep the default selection for **Pooled desktop**.

Step 5: Select **Make this the default template**, click **Save**, and then click **Close**.



Two VMs are created and started, which you can observe in the XenCenter window.

Process

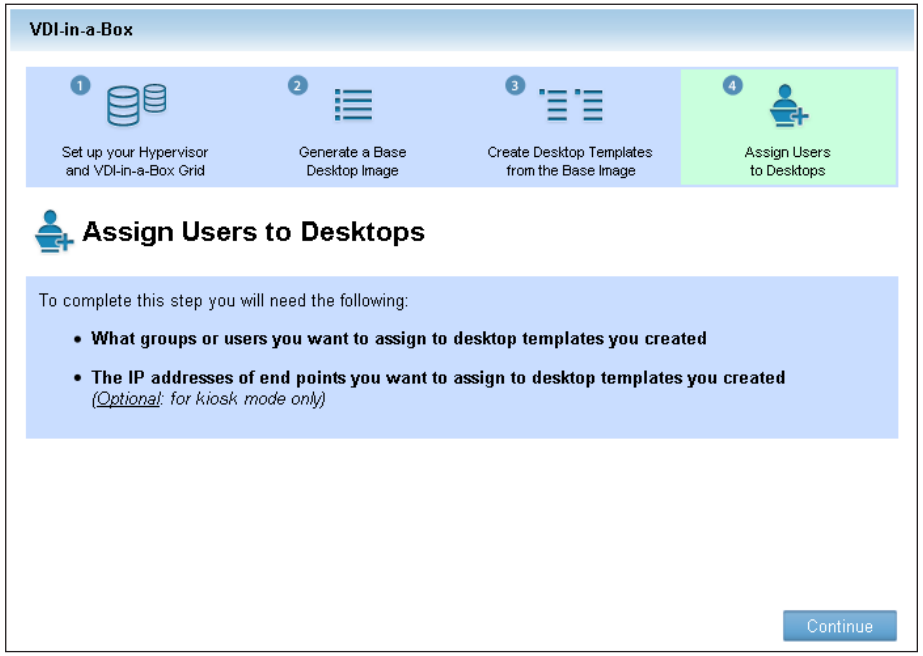
Assigning Users to Work Templates and Testing Citrix Receiver

1. Assign templates for use cases
2. Migrate vdiManager to static IP
3. Create and install SSL cert for vdiManager
4. Test connectivity to virtual desktops

Procedure 1 Assign templates for use cases

This procedure relies on information existing in Active Directory for user and group assignments. The existing viab-user group is used as the basis to assign the default TaskWork template to users.

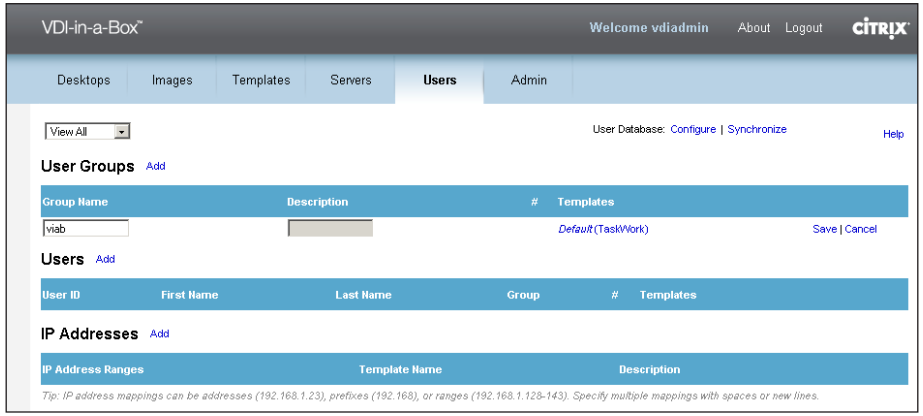
Step 1: Click **Continue**. This begins the Assign Users to Desktops stage of the VDI-in-a-Box installation.



The final pop-up window in the browser disappears and reveals the vdiAdmin screen behind it.

Step 2: Under the Users tab of the VDI-in-a-Box administration, next to User Groups, click **Add**, type the name of the Active Directory group you want to associate to allow access. Use **viab-users** for this example, and then press **Enter.**

This example uses beginning letters of **viab** as a search to find the **viab-users** group.

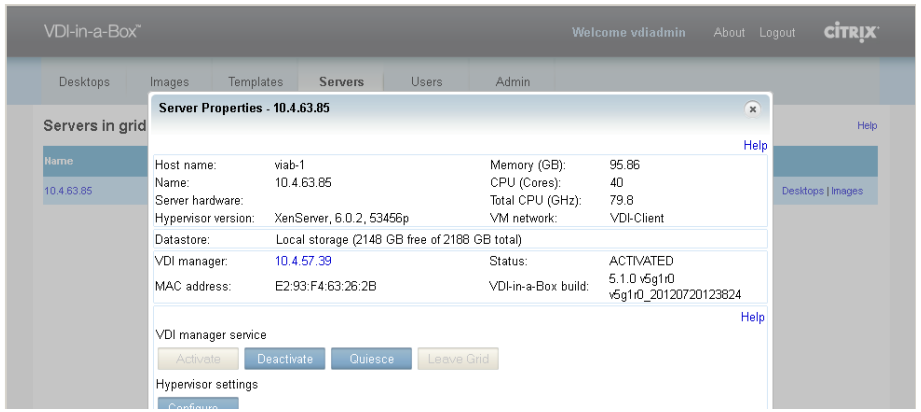


Users in the viab-users Active Directory group are assigned the default template upon login. Templates can also be configured for specific users or IP addresses.

Procedure 2 Migrate vdiManager to static IP

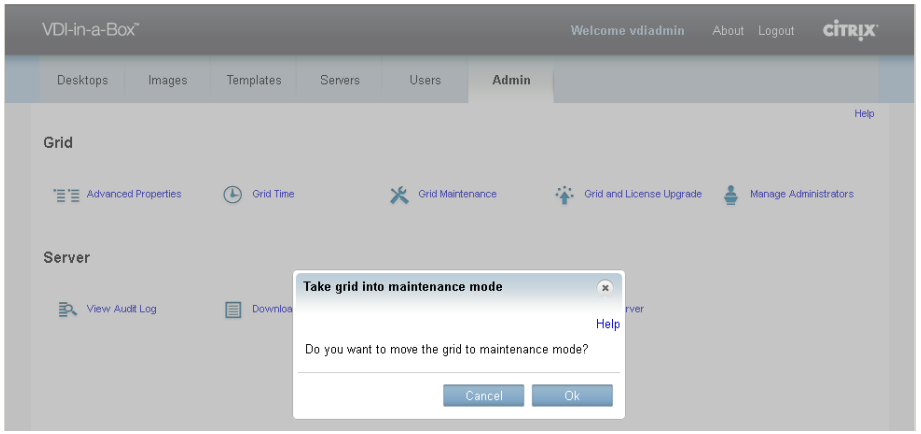
VDI-in-a-Box users need to have a consistent host name and IP address to use when connecting to the VDI-in-a-Box broker service, which assigns the virtual desktop. In this procedure, you migrate the IP address from the one assigned by DHCP to one that you statically assign. To make these changes, you must use maintenance mode for the grid containing the single server. Making these changes will disrupt active VDI-in-a-Box service. The warnings in the following steps that are related to these changes are safely ignored.

Step 1: Returning to the web browser display for vdiManager, click the **Servers** tab, click the active XenServer IP address under the **Name** column, and then, in the Server Properties box, click **Deactivate**.



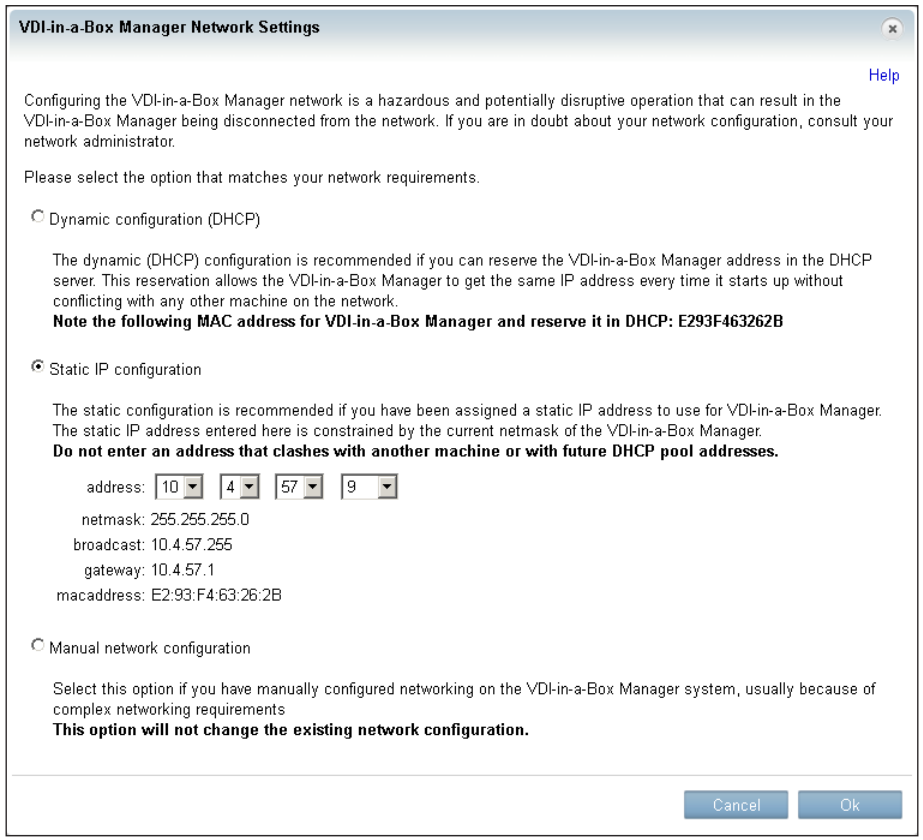
Step 2: Confirm the server deactivation and disconnect of sessions and shut down of VMs by clicking **Confirm**, and then wait for the server status display to show Deactivated.

Step 3: In vdiManager, click **Admin** tab, click **Grid Maintenance**, and then, in the **Take grid into maintenance mode** dialog box, click **Ok**.



Step 4: Click the **Servers** tab, click the XenServer IP address, and then, in the Server Properties box, click **Modify**. A VDI-in-a-Box Manager Network Settings window appears.

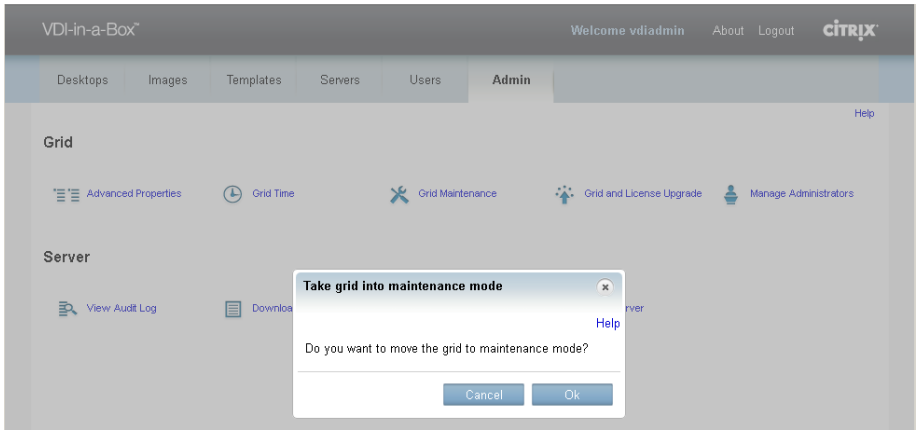
Step 5: Select **Static IP configuration**, use the pull-down selectors to change the DHCP address to the correct static IP address outside the DHCP scope, which is 10.4.57.9 for the Cisco SBA user VLAN, and then click **Ok**.



A progress screen is displayed while the vdiManager virtual appliance restart operation takes place, resulting in the restarted vdiManager server now available using the newly assigned static IP address. The open web browser session to vdiManager now automatically redirects to the new vdiManager IP address to allow the administrator to reconnect.

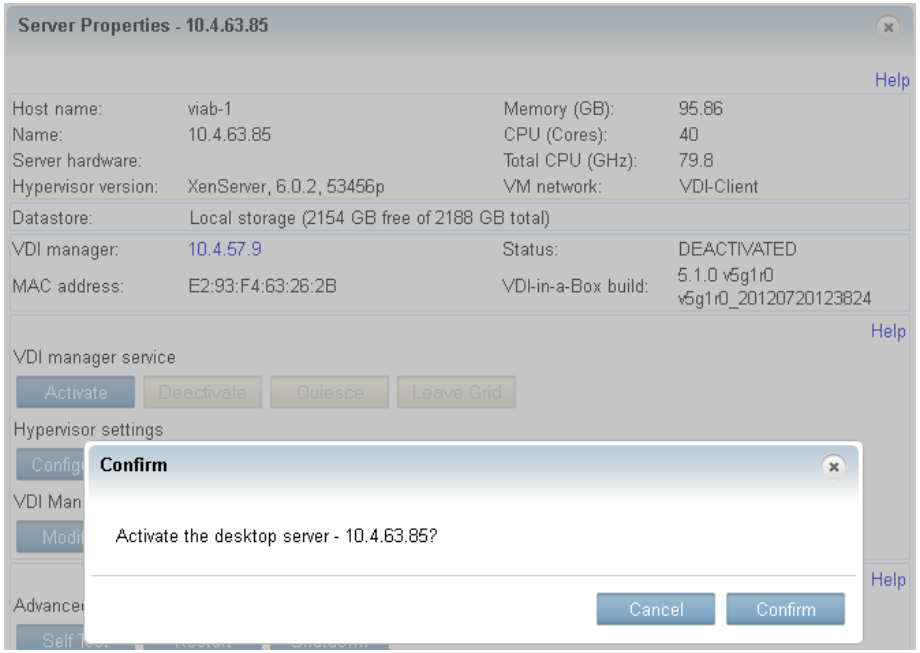
Step 6: Accept any browser security and certificate warnings required during the connection to the new IP address.

Step 7: On the new vdiManager display in the web browser, click the **Admin** tab, click **Grid Maintenance**, click the **Take grid into maintenance mode** dialog box, and then click **Ok**.



Step 8: Click the XenServer IP address again, in the Server Properties dialog box, click **Modify**. The VDI-in-a-Box Manager Settings window displays.

Step 9: For the VDI-in-a-Box manager service settings, click **Activate**, and then click **Confirm**.



The dialog box closes, and the server status transitions to Activated. The number of desktop VM templates that are configured to pre-start is also made available for use.

Procedure 3 Create and install SSL cert for vdiManager

To access their virtual desktop, remote devices run the Citrix Receiver client over Secure Sockets Layer (SSL) transport for secure connectivity to the vdiManager virtual appliance. To do so requires a certificate to be installed on the vdiManager, which the client validates with the appropriate Trusted Certificate Authority to make the connection. Without a valid and trusted certificate, the client may display an error message, such as, "Certificate provided by the server is not trusted. Account information cannot be added."

To address this situation, administrators should plan to request a certificate from their preferred certificate authority (CA).

Tech Tip

For more information about the certificate process in relationship to vdiManager, see:

http://support.citrix.com/article/CTX132235

In the Cisco SBA topology, the certificate request and installation for this procedure uses the local Microsoft Active Directory server as the root CA, for a non-vendor-specific certificate signing example. A Java utility named "keytool" is accessed at the Citrix VDI-in-a-Box Linux command line to manage the certificate request and installation process.

Step 1: Using an SSH terminal client, open a connection to the VDI-in-a-Box appliance by its DNS name or IP address, and then log in by using the default credentials of **kvm** with a password of **kaviza123**.

Step 2: Create a directory for key storage, and then change the local directory to the created directory location.

```
mkdir /home/kvm/keystore
cd /home/kvm/keystore
```

Step 3: Generate a server key.

```
keytool -genkey -alias vdimgr.cisco.local -keyalg RSA -keysize
2048 -keystore kmgr.keystore
```

where the **-alias** vdimgr.cisco.local parameter is the vdiManager DNS name.

The command triggers a prompt for a 6-character minimum length password to be entered, and then prompt for confirmation. After confirmation, there are a number of prompts for information related to the certificate, with the first question being the most critical. The prompt, "What is your first and last name?" is a request for the certificate Common Name (CN) field information, and needs to be interpreted as asking for the fully qualified domain name (FQDN) of the server.

Step 4: Answer the series of prompts.

```
What is your first and last name?
  [Unknown]:  vdimgr.cisco.local
What is the name of your organizational unit?
  [Unknown]:  SBA
What is the name of your organization?
  [Unknown]:  Cisco
What is the name of your City or Locality?
  [Unknown]:  San Jose
What is the name of your State or Province?
  [Unknown]:  CA
What is the two-letter country code for this unit?
  [Unknown]:  US
Is CN=vdimgr.cisco.local, OU=SBA, O=Cisco, L=San Jose, ST=CA,
C=US correct?
  [no]:  yes
Enter key password for <vdimgr.cisco.local>
        (RETURN if same as keystore password):
```

Step 5: Press **Enter**. The command completes and Linux prompt displays.

Step 6: Generate a Certificate Signing Request (CSR).

```
keytool -certreq -alias vdimgr.cisco.local -file kmgr.csr
-keystore kmgr.keystore
```

The command asks to enter the keystore password. Enter the password previously used.

Step 7: List the directory contents by typing the Linux **ls** command and pressing **Enter**, and then verify that both the kmgr.csr and kmgr.keystore files exist.

Step 8: Connect to the vdimgr.cisco.local machine by using a Stream Control Transmission Protocol (SCTP) utility, enter credentials by using the kvm username and kaviza123 password, retrieve the /home/kvm/keystore/ kmgr.csr file, and then store the file on the local management machine.

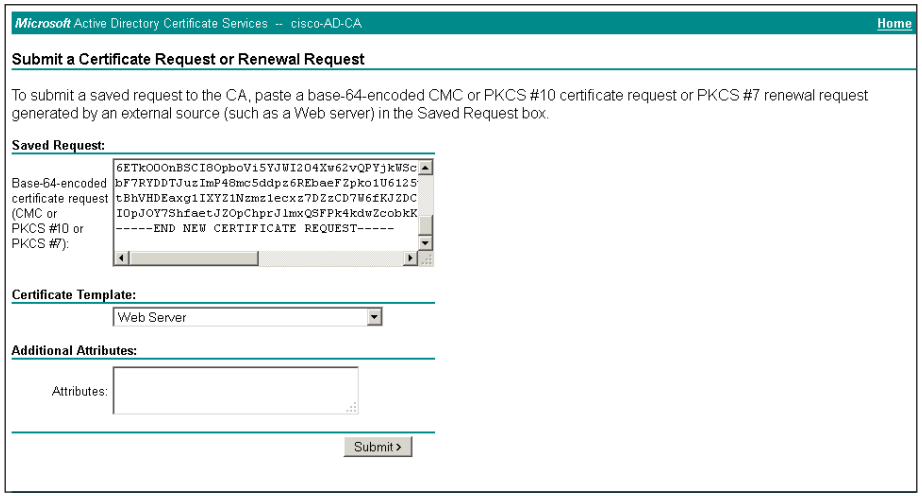
The information contained in the **kmgr.csr** file is used with the CA to request a certificate signing.

Step 9: Using the contents of the **kmgr.csr** file, connect to the CA and request a certificate signing. For the Microsoft Active Directory CA, use the following URL:

http://cacisco.local/certsrv/

Step 10: Click the **Request a certificate**, click **Submit an advanced certificate request** link, and then fill out the displayed web form by opening the kmgr.csr file with Notepad and pasting the contents into the Saved Request box.

Step 11: In the Certificate Template list, choose **Web Server**, and then click **Submit**.



Step 12: Click the **Download certificate** in order to download and save a certnew.cer file, containing the certificate information for the server.

Step 13: Click **Home**, click **Download a CA certificate, certificate chain, or CRL**, and then click **Download CA certificate**.

Step 14: Rename the file to certroot.cer, and then save it.

Step 15: Use the SCTP utility to copy the certnew.cer and certroot.cer files to the /home/kvm/keystore/ directory on the vdimgr.cisco.local machine. For credentials, enter the kvm username and kaviza123 password.

Step 16: Return to the SSH command line, and input the following two Linux commands:

```
keytool -import -trustcacerts -alias root -file certroot.cer -
keystore kmgr.keystore

keytool -import -trustcacerts -alias vdimgr.cisco.local -file
certnew.cer -keystore kmgr.keystore
```

Step 17: After each command, enter the password again, and then, in response to the query, "Trust this certificate?", enter **yes**. You receive the following replies:

- Certificate was added to keystore
- Certificate reply was installed in keystore

Step 18: Replace the existing self-signed certificate with the new certificate.

```
cd /home/kvm/kvm/install/servlet_container/conf
mv .keystore old.keystore
cp /home/kvm/keystore/kmgr.keystore .keystore
```

Step 19: The web server configuration must now be updated to use the password for the keystore.

Step 20: Edit the server.xml file with the vi editor.

```
sudo vi server.xml
```

Step 21: In the vi editing session, find the clientAuth line by using the following vi search.

```
/clientAuth=
```

Then, go to the end of the line found, by typing the following keys for a vi search.

```
/>
```

Cursor back a character over the slash character, and then enter insert mode by typing the keys.

```
hi
```

In vi insert mode, type space and the text keystorePass="password", where the password between the quotes is the one previously used for keystore.

The full line in the file should look like the following.

```
clientAuth="false" sslProtocol="TLS" URIEncoding="UTF-8"
keystorePass="password"/>
```

Step 22: Save and exit vi by typing two uppercase Z letters.

```
ZZ
```

Step 23: Restart the web server Tomcat services need by typing the following. This enables the new settings to take effect.

```
tc_start
```

The web server with correct certificates is now ready to be used.

Procedure 4 Test connectivity to virtual desktops

Download the appropriate Citrix Receiver for the remote client, and then install the Citrix Receiver application.

Android clients are available from Google Play, and iOS clients for the iPad are available at the Apple App Store. Windows clients are available from the Citrix website, here:

http://www.citrix.com

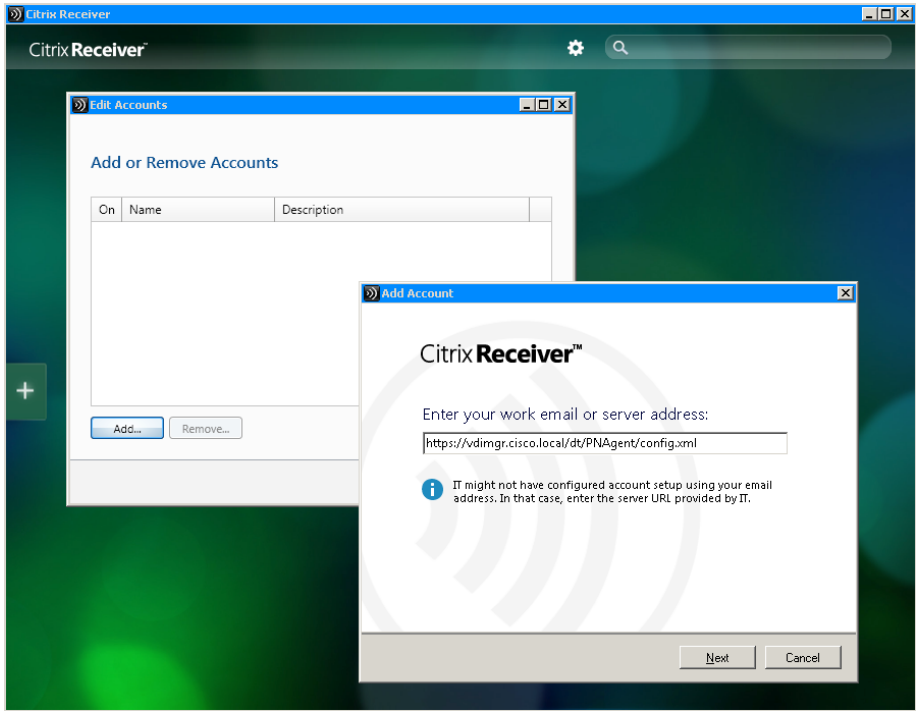
This guide uses the Windows version for testing in this procedure.

Step 1: Launch the Windows Citrix Receiver, click the **Settings** gear icon at the top, click **Accounts**, click **Add account**, and then click **Add**. The Add Account dialog box is displayed.

Step 2: In the **Enter your work email or server address** box, enter the following vdiManager virtual appliance URL:

```
https://vdimgr.cisco.local/dt/PNAgent/config.xml
```

Step 3: Click **Next**.



Step 4: When the account with check box is displayed, click **OK**.

The Please log on to vdimgr dialog box displays.

Step 5: For **Domain\User**, enter a user available in Active Directory, such as cisco\viab-user-1, enter the **Password** for that user, and then click **Log On**.

Step 6: In Citrix Receiver, click the **Add Apps** icon, and then click **All Applications**. The configured TaskWork group appears.

Step 7: Click the **TaskWork** icon. The Citrix Receiver client connects to the desktop virtual machine, generated as part of the template by that name, and the virtual desktop Windows screen displays.

Figure 3 - Example of Citrix Receiver Windows desktop screen

Figure 4 - Example of Citrix Receiver Android smart phone display

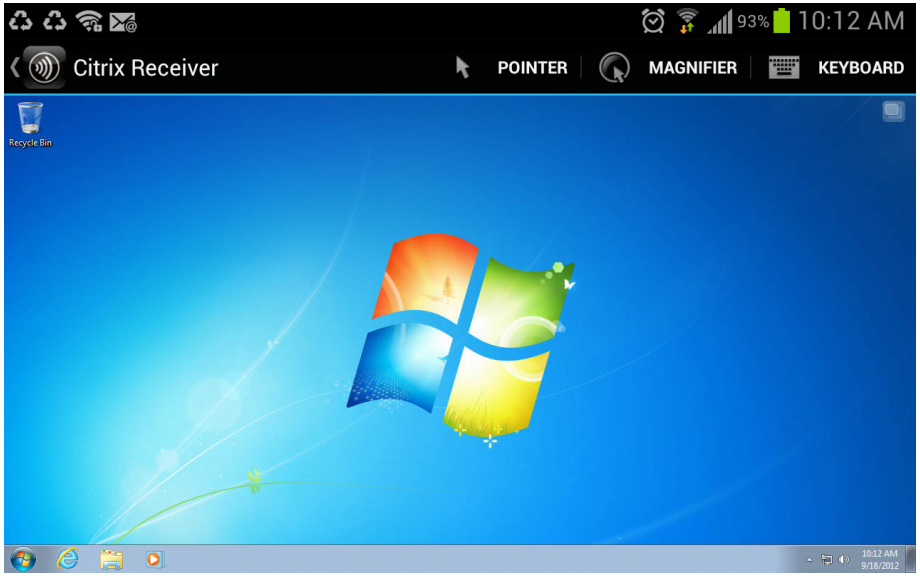
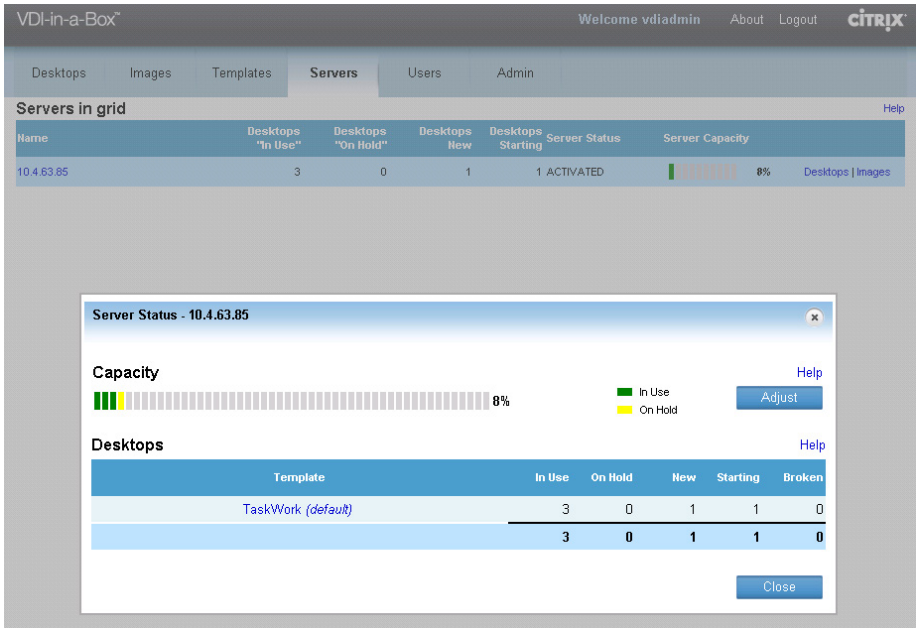
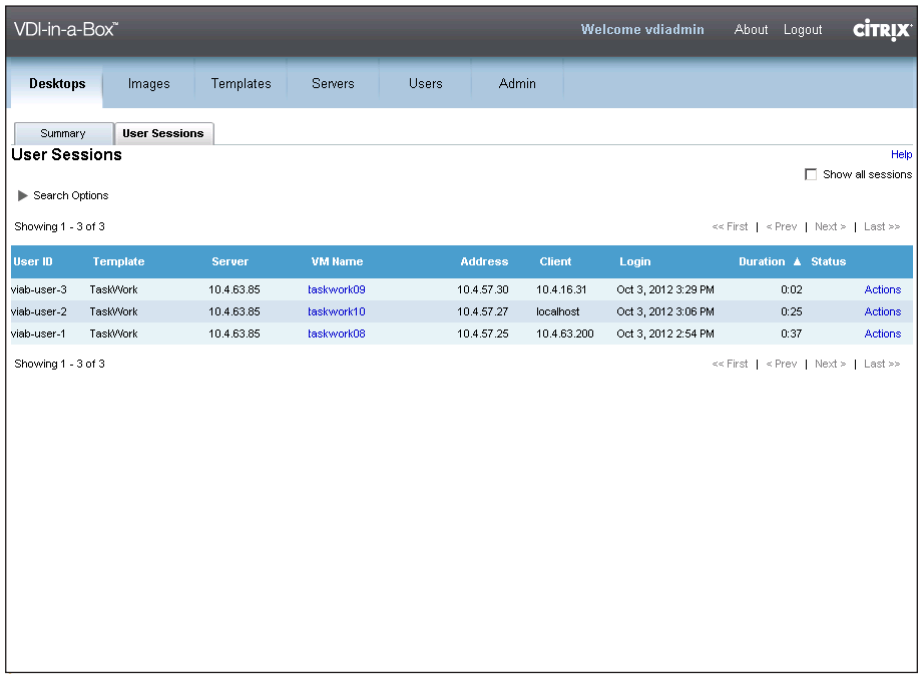


Figure 5 - Example of Citrix Receiver for iPad IOS display

Step 8: If you want to confirm that the VDI-in-a-Box service is operational and that the desktops are active, use the vdiManager application Servers and Desktops tabs.





Appendix A: Product List

Computing Resources

Functional Area	Product Description	Part Numbers	Software
UCS C-Series Rack-mount Servers	Cisco UCS EZ C260 Pack w/E7-2870 24x8GB DIMMs 1 VNIC	UCS-EZ-C260-E7192	1.4(3c) Cisco UCS Release
	300GB 6Gb SAS 10K RPM SFF HDD/hot plug/drive sled mounted(Quantity-8)	A03-D300GA2=	
Hypervisor	Citrix XenServer	XenServer	6.0.2
VDI	Citrix VDI-in-a-Box	VDI-in-a-Box	5.1

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