Oracle® Virtual Desktop Infrastructure

Getting Started Guide for Release 3.4
# Table of Contents

Preface ........................................................................................................................................... v
1. Getting Started With Oracle VDI ............................................................................................... 1
2. Before You Begin .......................................................................................................................... 3
3. Installing the Software .................................................................................................................. 7
4. Connecting the User Directory ..................................................................................................... 9
   4.1. Creating a Company ............................................................................................................... 9
   4.2. Testing the Company Configuration ..................................................................................... 12
5. Connecting the Virtualization Platform ....................................................................................... 15
6. Creating a Desktop Template ....................................................................................................... 19
   6.1. Using an Existing VirtualBox Virtual Machine ................................................................. 19
   6.2. Importing an Existing Virtual Machine into VirtualBox ..................................................... 19
   6.3. Creating a New Virtual Machine in VirtualBox ................................................................. 21
   6.4. Installing the VirtualBox Guest Additions ......................................................................... 26
   6.5. Additional Virtual Machine Preparation ......................................................................... 28
7. Creating the Desktops .................................................................................................................... 31
   7.1. Creating a Pool .................................................................................................................... 31
   7.2. Importing a Template into a Pool ...................................................................................... 33
   7.3. Setting Up Cloning .............................................................................................................. 36
   7.4. Assigning Users to Desktops .............................................................................................. 40
8. Connecting to a Desktop ............................................................................................................... 43
9. Managing Desktops .................................................................................................................... 45
Preface

The Oracle Virtual Desktop Infrastructure Getting Started Guide describes how to get started with Oracle Virtual Desktop Infrastructure (VDI) and is intended for administrators who are new to the product.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Documents

The documentation for this product and related products is available at:


Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td><strong>monospace</strong></td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>

Document Revision

Document generated on: 2012-10-02 (revision: 1397)
Chapter 1. Getting Started With Oracle VDI

This guide describes how to get started with Oracle Virtual Desktop Infrastructure (VDI) and is intended for administrators who are new to the product.

Oracle VDI provides access to virtualized desktops hosted in a data center. An Oracle VDI system consists of four elements:

- **Virtualization**: The virtualization platform (hypervisor) that runs the virtual desktops. Each desktop runs in a separate virtual machine.
- **Storage**: The storage space used to store the virtual disks used for the desktops.
- **Access**: The means for logging into virtual desktops and using them. Oracle VDI supports Oracle Sun Ray Clients and Remote Desktop Protocol (RDP) clients.
- **Management**: The Oracle VDI service that processes user requests for desktops and instructs the virtualization platform and storage to provide and start a virtual machine.

The key terminology used in this guide that you should understand is:

- **Virtual machine (VM)**: a software implementation of a computer that runs programs like a physical machine.
- **Desktop**: an instance of an operating system that runs in a virtual machine.
- **Desktop provider**: the encapsulation of the virtualization resources (hosts and storage) used to run virtual desktops.
- **Pool**: a group of desktops hosted by a desktop provider.
- **Template**: a desktop used in a pool for cloning operations.

Documentation for Oracle VDI and related products, such as Sun Ray Software, can be found at:

http://docs.oracle.com/cd/E26217_01

The guide takes you through the basics steps for configuring an Oracle VDI deployment using a single host. By the end of the guide, users should be able to access a windows desktop that has been cloned from a template.

The single host model used in this guide is suitable for evaluation deployments as it requires very few resources. However for larger deployments, multiple hosts are required to provide for scalability and resilience.

*Chapter 2, Before You Begin* contains important preparation information that is the foundation for the rest of this guide. Pay careful attention to the requirements.
Chapter 2. Before You Begin

This chapter covers the required prerequisites before you can proceed with the remaining steps in this guide.

Hardware

This guide uses a single host for a complete Oracle VDI deployment. The host provides everything needed to run and access virtual desktops, including the virtualization platform and storage.

The host must meet the following minimum hardware requirements:

- 8 gigabytes (GB) of random-access memory (RAM)
  8GB is sufficient to run approximately six virtual desktops.
- Quad core x86-64 (64-bit) central processing unit (CPU), with virtualization support (Intel VT-x or AMD-V)
- 100 gigabytes (GB) of free disk space
  In this guide, a local disk is used to store the virtual desktops. It is best to use a host with at least two disks, so that the storage can be separated from the operating system. Make sure the storage disk has enough capacity to store your virtual desktops.
- 1 gigabit (Gbit) network interface card (NIC)

These requirements assume that the host will be a dedicated host, used only for Oracle VDI.

Operating System

You can use either Oracle Linux or Oracle Solaris as the operating system for the host. For detailed system requirements, see the Oracle VDI Administrator's Guide. Make sure you check the requirements for both Oracle VDI hosts and Oracle VM VirtualBox hosts.

The following is a summary of the main requirements for Oracle Linux platforms:

- Oracle Linux release 5.6 or 5.7 is supported.
- You must use Oracle's Unbreakable Enterprise Kernel. Currently a single-host deployment is not possible on any other kernel.
- Ensure that yum is configured correctly and that it is working, so that any missing required packages can be installed automatically when you install Oracle VDI.

If you have not purchased Oracle Linux Support and your host has Internet access, you can resolve package dependencies by using the Oracle Public Yum Server. See http://public-yum.oracle.com for details of how to enable access to these repositories.

If the host does not have Internet access, you can configure yum to resolve package dependencies from the Oracle Linux installation DVD or ISO image. To do this:

1. Mount the DVD or ISO image in a location such as /mnt.

   Use the following command to mount the DVD media inserted in /dev/cdrom:
Other Host Requirements

- Use the following command to mount an ISO image file:
  ```bash
  # mount -o loop -t iso9660 /dev/cdrom /mnt
  ```

2. Create a file called `local.repo` in the `/etc/yum.repos.d` directory. The file name must have a `.repo` suffix.

3. Edit the `local.repo` file and insert the following text:
   ```
   [local]
   name=local DVD
   baseurl=file:///mnt/Server
   enabled=1
   gpgcheck=0
   ```

4. Clear the yum cache.
   ```bash
   # yum clean all
   ```

- The system must be running in runlevel 5 (full multi-user mode with an X-based login screen).
- The SELinux setting must be set to permissive or disabled.

The following is a summary of the main requirements for **Oracle Solaris** platforms:

- Oracle Solaris 10 release 09/10 (update 9) and later is supported. Oracle Solaris 11 is not supported.
- You must install the Entire distribution to get the libraries required by Oracle VDI.
- If you use Solaris zones, all the configuration steps in this guide must be performed in the global zone. Non-global zones are not supported.
- The system must be running in runlevel 3 (multi-user level with NFS resources shared).
- The `zfs_arc_min` parameter must be set in the `/etc/system` file. If this parameter is not set, set it to 1 GB to start with (you can adjust it later if the system performance is affected). You should also set the `zfs_arc_max` parameter to be the same value as `zfs_arc_min`. You set the parameter values in bytes as follows:
  ```
  set zfs:zfs_arc_min = 1073741824
  set zfs:zfs_arc_max = 1073741824
  ```

**Other Host Requirements**

You must be able to log in as the root user on the host.

SSH must be enabled on the host, and SSH must be configured to permit logins by the root user. If SSH is configured to use a non-standard port, make sure you know the port number.

To get your Oracle VDI system working quickly, it is best to disable the firewall on the host. If you prefer to have the firewall enabled, see the **Oracle VDI Administrator's Guide** for details of the ports you might need to open.

The host must have Domain Name System (DNS) entries that can be resolved by clients. DNS lookups and reverse lookups for the host must succeed.
Oracle VDI Software

You should download the Oracle VDI software archive to a temporary location on the host. Links to the software downloads and instructions for downloading can be found at:


Caution

If you are using Oracle Solaris, you must download release 3.4.1 or later in order to use a local disk as storage. Release 3.4.1 is only available to contracted customers that have registered with the My Oracle Support (MOS) service portal. To download this release, go to https://support.oracle.com and search for patch number 14226229 on the Patches and Updates tab. Alternatively, you can use a local ZFS storage pool on the host.

Typically, Sun Ray Clients are used to display Oracle VDI desktops. Sun Ray Clients are low-powered hardware devices. For ease and speed of access, this guide uses Oracle Virtual Desktop Client to access desktops. Oracle Virtual Desktop Client is a software alternative to using a Sun Ray Client. Links to the Oracle Virtual Desktop Client downloads and instructions for downloading can be found at:


After you download Oracle Virtual Desktop Client, install it. You do not have to install Oracle Virtual Desktop Client on the server, you can install it on your desktop PC or laptop. The client platform must be able to connect to your Oracle VDI host. For details on the supported platforms and for installation instructions, see the Release Notes for the version of the client you download at:

http://www.oracle.com/technetwork/server-storage/sunrayproducts/docs/index.html

Virtualization Platform

The default virtualization platform for Oracle VDI is Oracle VM VirtualBox and this is the platform used in this guide.

If you are familiar with VirtualBox and have an existing virtual machine, this guide shows you how to prepare the virtual machine for use as a desktop template.

If you have an existing virtual machine that was prepared in a different virtualization platform and you can export from that platform in Open Virtualization Format (OVF or OVA), this guide shows you how to import a machine into VirtualBox. You should copy all the exported files to a temporary location on the host.

If you are unfamiliar with VirtualBox, this guide takes you through the steps for creating a virtual machine, which requires the installation media. This guide uses Windows 7. The installation media can be a physical CD/DVD or it can be an ISO image. If you are using an ISO image, copy the image to a temporary location on the host. In order to avoid issues with things like Windows Activation, it is best to have a Windows volume license key for your selected desktop operating system.

User Directory

Typically, you configure Oracle VDI to use the information held in a corporate user directory. This guide assumes you are using Microsoft Active Directory but the steps in this guide for connecting to a user directory should work for any supported user directory. Details of the supported directories can be found in the Oracle VDI Administrator's Guide. Make a note of the URL used to access the directory, including whether SSL (LDAPS) is required for connections. You also need the distinguished name, for example
cn=Jane Doe, cn=Users, dc=example, dc=com, and password of a user that has read access to the directory.

Windows Domain

In this guide, you perform the steps needed to configure windows desktops for automatic logins and Oracle VDI Fast Preparation. These steps are optional, but they provide users with the best experience. With this configuration, when users log in to Oracle VDI, they are automatically logged in to their desktop and the desktop is joined to a Windows domain. For this to succeed, you need the following information:

• The credentials of a domain administrator with permission to create a computer account and join the domain.

• The distinguished name of the container that Active Directory uses for computers. The default container is ou=Computers.

• For Windows Server 2008 and later, whether the domain controllers are configured as read-only.

Once you have completed the preparation, you are ready to install the software. Chapter 3, *Installing the Software* shows you how to do this.
Chapter 3. Installing the Software

In this chapter, you install and configure Oracle VDI, install Oracle VM VirtualBox (VirtualBox), and then test the installation.

Installing Oracle VDI

Log in as root on the host. Change working directory to the directory containing the Oracle VDI software archive. Unzip the Oracle VDI software archive and install the software with the \texttt{vda-install} command, as follows:

- On Oracle Solaris hosts:
  
  \begin{verbatim}
  # unzip vda_<version>_solaris_amd64.zip
  # cd vda_<version>_solaris_amd64
  # ./vda-install
  \end{verbatim}

- On Oracle Linux hosts:
  
  \begin{verbatim}
  # unzip vda_<version>_linux.zip
  # cd vda_<version>_linux
  # ./vda-install
  \end{verbatim}

At the end of the installation, you are prompted to configure Oracle VDI. Press the Return key to start the configuration. A list of configuration types is displayed.

1 New Oracle VDI Center
2 Join Oracle VDI Center

Select (1/2):

Type 1 (for a new Oracle VDI Center) and press the Return key. A list of configuration settings is displayed.

Review the settings for a new Oracle VDI Center:

1. Name: VDI Center
2. Administrator Password: ********
3. DNS name of this host: vdi.example.com
4. Maximum number of sessions on this host: 100
5. User ID range start: 150000
6. Database: Embedded Oracle VDI

Do you want to create the Oracle VDI Center now? Enter 'c' to customize the settings. ([y]/c):

Generally, it is fine to accept the default settings. The main thing to check is that the DNS name shown is a fully-qualified DNS name. To accept the defaults and create the Oracle VDI Center, press the Return key. Otherwise type \texttt{c} and press the Return key to change the configuration settings. After a few minutes, the installation is complete.

Installing VirtualBox

Next, you need to install VirtualBox. Everything you need is contained in the extracted Oracle VDI software archive.

Unzip the VirtualBox software archive, change working directory to the extracted directory, and install the software with the \texttt{vb-install} script, as follows:

\begin{verbatim}
# unzip vbox_<version>.zip
# cd vbox_<version>
# ./vb-install
\end{verbatim}
VirtualBox consists of two components, a Base Pack and an Extension Pack. The VirtualBox software archive contains only the Extension Pack. However, the `vb-install` script downloads the VirtualBox Base Pack, and then installs both the Base Pack and the Extension Pack. If the Base Pack download fails, you must manually download it from http://download.virtualbox.org/virtualbox. Make sure you download the release that is bundled and supported with the release of Oracle VDI. Copy the Base Pack to the same folder as the `vb-install` script, and then run the script again.

The `vb-install` script prompts you for a user name, a password, and a port number to use for SSL connections. The defaults are to use the root user and port 443. It is best to use root as the user. If another process is using port 443, the `vb-install` script suggests another available port. If you plan to install Oracle Secure Global Desktop software on this host as well, choose a different port. After a few minutes, the installation is complete.

---

### Logging in to the Oracle VDI Web Administration Tool

Next, log in to the Oracle VDI web administration tool, Oracle VDI Manager. Using a browser, go to https://<host-name>:1801. The browser displays a security warning and prompts you to accept the security certificate. Accept the security certificate. A login page is displayed, as shown in Figure 3.1.

**Figure 3.1. Oracle VDI Manager Login Page**

![Oracle VDI Manager Login Page](image)

Log in with the user name `root` and root's password. You are logged in to Oracle VDI Manager and the Users page is displayed, as shown in Figure 3.2.

**Figure 3.2. Users Page**

![Oracle VDI Manager Users Page](image)

A "No Company" message is displayed because you have not yet configured a user directory. Chapter 4, *Connecting the User Directory* shows you how to do this.
Chapter 4. Connecting the User Directory

In this chapter, you connect Oracle VDI to a user directory. Oracle VDI can use the information held in Active Directory or an LDAP directory to authenticate users and assign desktops to them. Oracle VDI is designed to work with most popular user directories, but you might have to tune the LDAP configuration for your particular directory. The Oracle VDI Administrator's Guide has details of the supported user directories and the recommended tuning.

If you are using Active Directory, you can connect to the directory using either the LDAP protocol or the Kerberos protocol. This guide focuses on the LDAP protocol because it is simpler to configure and the configuration is the same for both Active Directory and other directory types. However, if you have a complex Active Directory structure containing forests, or you want to be able handle operations such as password expiry, then the Kerberos protocol is a better choice.

In Oracle VDI, a user directory is represented as a company. So you need to configure a company and then test that your configuration works.

4.1. Creating a Company

In Oracle VDI Manager, select Settings in the navigation tree on the left, and then select Company. The All Companies page is displayed, as shown in Figure 4.1.

Figure 4.1. All Companies Page

In the Companies table, click the New button. The New Company wizard is displayed in a new window. Click the Next button to move through the various steps of the wizard. On the Choose User Directory step, select LDAP, as shown in Figure 4.2.
Figure 4.2. Choose User Directory Step

On the Specify Connection step, select a Security Level and enter the required authentication details as follows:

- **Host and Port**: The fully-qualified DNS name or IP address of the directory. If the directory uses a non-standard port, change the port number.

- **Base DN**: The distinguished name (DN) of an LDAP object to use as the search base, for example `cn=Users,dc=example,dc=com`.

- **User DN**: The DN of a user that has read permissions in the user directory, for example `cn=Administrator,cn=Users,dc=example,dc=com`.

Most corporate user directories are configured for secure authentication, which uses SSL for encryption, and requires a user name and password. Simple authentication requires just a user name and password. Anonymous authentication requires no credentials.

Figure 4.3 shows a completed example for secure authentication.

Figure 4.3. Specify Connection Step

On the Specify Connection step, select a Security Level and enter the required authentication details as follows:
Click **Next**. If you selected secure authentication as the security level, the Verify Certificate step is displayed. Check that the directory's SSL certificate details are correct and click **Next**. On the Define Company step, enter the name of your company and the company's email domain name(s) in the **Name** and **E-Mail Domain Name** fields. **Figure 4.4** shows a completed example.

**Figure 4.4. Define Company Step**

On the Review step, check your configuration and then click **Finish** to create the company. The wizard is closed, a message is displayed on the All Companies page to confirm that the company has been created, and the new company is now listed in the Companies table, as shown in **Figure 4.5**.

**Figure 4.5. Company Added**

The All Companies page provides you with a summary of the company, and most importantly, reports the status of the connection to the user directory. You can change the company configuration at any time. In the Companies table, click the company name in the **Name** column and then select the **LDAP** tab, see **Figure 4.6**.
On this tab, you can change your LDAP configuration, for example by changing the security level or adding more LDAP servers for failover purposes. To access the settings for tuning your LDAP configuration, click Edit LDAP Configuration.

4.2. Testing the Company Configuration

Now that you have configured a company, it is important to test whether it works. For this you need to start Oracle Virtual Desktop Client. There should be an application icon for Oracle Virtual Desktop Client in the either the Start Menu (Windows platforms), the Launch Menu (Linux platforms), or the Applications folder (Mac OS X platforms). Click the Oracle Virtual Desktop Client application icon. The Connect Virtual Desktop Client screen is displayed, as shown in Figure 4.7. Enter the fully-qualified DNS name of your Oracle VDI host in the Server field and click Connect.

Figure 4.7. Connect Virtual Desktop Client Screen

Tip

Click Settings at the bottom of the screen to access additional configuration options, such as the screen resolution.
After a few moments, the Oracle VDI Desktop Login screen is displayed. Enter your Active Directory or LDAP user name and password, and a domain name (as shown in Figure 4.8), and then click Log In.

**Figure 4.8. Oracle VDI Desktop Login Screen**

![Desktop Login Screen](image)

After a few moments, the desktop selector screen is displayed together with a message to say that there are no desktops available to you, as shown in Figure 4.9. This confirms that you have a functioning Oracle VDI installation and that your company configuration is valid.

**Figure 4.9. Desktop Selector Screen**

![Desktop Selector Screen](image)

Click Logout. The next step is to connect Oracle VDI to the virtualization resources that will deliver the desktops to users. Chapter 5, *Connecting the Virtualization Platform*, shows you how to do this.
Chapter 5. Connecting the Virtualization Platform

In this chapter, you connect Oracle VDI to the virtualization platform that runs the desktops for users, in this case Oracle VM VirtualBox. To do this, you create a desktop provider in Oracle VDI Manager and then specify the virtualization resources (hosts and storage) you want to use.

Log in to Oracle VDI Manager, and select Desktop Providers in the navigation tree on the left. The All Desktop Providers page is displayed, as shown in Figure 5.1.

**Figure 5.1. All Desktop Providers Page**

In the Desktop Providers table, click the New button. The New Desktop Provider wizard is displayed in a new window. Click the Next button to move through the various steps of the wizard. On the Select Desktop Provider Type step, select Oracle VM VirtualBox, as shown in Figure 5.2.

**Figure 5.2. Select Desktop Provider Type Step**

On the Specify Hosts step, ensure the Specify New Host option is selected and click Next.

On the Specify New Host step, enter the details of your Oracle VDI host where you installed VirtualBox:

- **Host**: The fully-qualified DNS name or IP address of the VirtualBox host.
- **SSL Port**: The port number used for SSL connections to the VirtualBox host. This is port you specified when you installed VirtualBox. The default is port 443.
- **SSH Port**: The port used for SSH connections to the VirtualBox host. The default is port 22.
- **User Name** and **Password**: The credentials of a user with root access to the VirtualBox host. This is the user you specified when you installed VirtualBox. The default is root.

Figure 5.3 shows a completed example.
Click Next. On the Verify Certificate step, check that the SSH and SSL certificate details are correct and click Next. You are returned to the Specify Hosts step so that you can add more VirtualBox hosts if you want. A message is displayed to confirm that you have added the VirtualBox host. If you add multiple hosts to a desktop provider, Oracle VDI load balances them. As you only want to add a single host, select Select Existing Hosts and click Next, as shown in Figure 5.4.

On the Specify Storages step, ensure the Specify New Storage option is selected and click Next.

On the Specify New Storage step, enter the details of the storage that is used to store the virtual disks of the desktops. As Oracle VDI supports several different types of storage, the details you enter depend on the storage type selected. As you will be using a local file system for storage, select Local Storage from the Storage Type drop-down list. Enter the path to where you want to store the virtual disks in the Path field. Figure 5.5 shows a completed example.
Tip

On Oracle Solaris platforms, if the local storage option is not available, you can use a local ZFS pool instead. Select the Sun ZFS option, and enter the host and pool details.

Click **Next**. A desktop provider can only have one local storage and local storage cannot be mixed with any of the other supported storage types. For this reason, you cannot add any more storage to the desktop provider. Other storage types can be mixed and can have multiple storage hosts. If you add multiple storage hosts, Oracle VDI load balances the storage hosts. The Define Desktop Provider step is displayed. Enter a name for the desktop provider in the **Name** field, as shown in Figure 5.6. The name can be anything you like, for example, the location of your VirtualBox hosts.

**Figure 5.6. Define Desktop Provider Step**

Click **Next**. On the Review step, check your configuration and then click **Finish** to create the desktop provider. The wizard is closed, a message is displayed on the All Desktop Providers page to confirm that the desktop provider has been created, and the new desktop provider is now listed in the Desktop Providers table, as shown in Figure 5.7.

**Figure 5.7. Desktop Provider Added**

The All Desktop Providers page provides a management overview of the desktop provider, its overall status, the number of desktops, the CPU and memory load, and the storage usage. You can change the configuration of the desktop provider at any time. In the Desktop Providers table, click the desktop provider name in the **Name** column. The **Summary** tab is displayed, as shown in Figure 5.8.
From here you can monitor and configure the desktop provider. For example, the Host tab enables you to add and remove VirtualBox hosts, as well as monitor and maintain them. At the top of the page, click Desktop Providers to return to the All Desktop Providers page.

Now that you have connected Oracle VDI to the virtualization platform, the next step is to create the virtual machine that will be used as the template for creating desktops. Chapter 6, Creating a Desktop Template shows you how to do this.
Chapter 6. Creating a Desktop Template

This chapter takes you through the steps needed to prepare a virtual machine that can be used as a template for creating desktops.

If you have an existing VirtualBox virtual machine that you want to use as a desktop template, see Section 6.1, “Using an Existing VirtualBox Virtual Machine”.

If you have an existing virtual machine that was created in another virtualization platform such as VMware, and you can export that machine in Open Virtualization Format (OVF or OVA), see Section 6.2, “Importing an Existing Virtual Machine into VirtualBox”.

If you are unfamiliar with Oracle VM VirtualBox, see Section 6.3, “Creating a New Virtual Machine in VirtualBox”.

6.1. Using an Existing VirtualBox Virtual Machine

If you have an existing VirtualBox virtual machine that you want to use as a desktop template, perform the following preparation:

1. Start the virtual machine.

2. Install the VirtualBox guest additions, following the steps described in Section 6.4, “Installing the VirtualBox Guest Additions”.

   Make sure the version of the Guest Additions you install matches the VirtualBox version you installed in Chapter 3.

3. Configure the virtual machine operating system, as described in Section 6.5, “Additional Virtual Machine Preparation”.

4. Shut down the virtual machine.

5. Copy the virtual machine settings file and disk image to the /var/tmp directory on your Oracle VDI host.

6.2. Importing an Existing Virtual Machine into VirtualBox

If you use another virtualization platform and have an export of an existing virtual machine in Open Virtualization Format (OVF or OVA), you can import the virtual machine into VirtualBox and use this to prepare the desktop template. To import a virtual machine, you need to start VirtualBox. On the host where you installed Oracle VDI and VirtualBox, on the desktop select the Applications menu, then the System Tools menu, and then Oracle VM VirtualBox. Alternatively, you can run the VirtualBox command in a terminal. The Oracle VM VirtualBox Manager is displayed, as shown in Figure 6.1.
In the **File** menu, select **Import Appliance**. The Appliance Import wizard is displayed in a new window, as shown in **Figure 6.2**

**Figure 6.2. Appliance Import Wizard**

![Welcome to the Appliance Import Wizard!]

- **Welcome to the Appliance Import Wizard!**
  - This wizard will guide you through importing an appliance.
  - Use the **Next** button to go to the next page of the wizard and the **Back** button to return to the previous page. You can also press **Cancel** if you want to cancel the execution of this wizard.
  - VirtualBox currently supports importing appliances saved in the Open Virtualization Format (.ovf). To continue, select the file to import below:

  ![Choose...]

Click **Choose**, browse to the location containing the ".ovf" or ".ova" file of the virtual machine you want to import, and click **Open**. The Appliance Import Settings step is displayed as shown in **Figure 6.3**

![Figure 6.3. Appliance Import Settings step]
Make any adjustments you want to the displayed settings (you can also change the settings later) and click Import. The Appliance Import Wizard is closed and after a few moments, the imported virtual machine is listed in Oracle VM VirtualBox Manager.

After the import, select the imported virtual machine and in the toolbar click the Settings button. Review the virtual machine settings to make sure that the virtual machine has the hardware it needs to operate. Make sure that the virtual machine has a CD/DVD drive.

Once you have reviewed the settings, select the imported virtual machine and in the toolbar click the Start button. Verify that the virtual machine works.

Next, you need to install the VirtualBox Guest Additions, as described in Section 6.4, “Installing the VirtualBox Guest Additions”.

6.3. Creating a New Virtual Machine in VirtualBox

To create a new virtual machine, you need to start VirtualBox. On the host where you installed Oracle VDI and VirtualBox, select the Applications menu on the desktop, then the System Tools menu, and then Oracle VM VirtualBox. Alternatively, you can run the VirtualBox command in a terminal. The Oracle VM VirtualBox Manager is displayed, as shown in Figure 6.4.
Creating a New Virtual Machine in VirtualBox

**Figure 6.4. Oracle VM VirtualBox Manager**

In the toolbar, click the **New** button. The New Virtual Machine Wizard is displayed in a new window, as shown in **Figure 6.5**.

**Tip**

All the following steps for creating a virtual machine can be performed using the VirtualBox command line. However, if you are new to VirtualBox, you will probably find the Oracle VM VirtualBox Manager easier to use.

Click the **Next** button to move though the various steps of the wizard. The wizard enables you to configure the basic details of the virtual machine. On the VM Name and OS Type step, enter a descriptive name for the virtual machine in the **Name** field and select the operating system and version that you are going to install from the drop-down lists, as shown in **Figure 6.6**. It is important to select the correct operating system and version as this determines the default settings for VirtualBox uses for the virtual machine. You can change the settings later after you have created the virtual machine.
Creating a New Virtual Machine in VirtualBox

Figure 6.6. VM Name and OS Type Step

On the Memory step, you can simply accept the default. This is the amount of host memory (RAM) that VirtualBox assigns to the virtual machine when it runs. You can change the settings of the virtual machine later, when you import the template into Oracle VDI.

On the Virtual Hard Disk step, ensure Start-up Disk is selected (see Figure 6.7), select Create new hard disk and click Next. The Virtual Disk Creation Wizard is displayed in a new window so you can create the new virtual disk.

Figure 6.7. Virtual Hard Disk Step

On the following steps, select VDI (VirtualBox Disk Image) as the file type, Dynamically allocated as the storage details, and accept the defaults for the virtual disk file location and size, and then click Create to create the virtual disk.

When the virtual disk is created, the Virtual Disk Creation Wizard is closed and you are returned to the Summary step of the New Virtual Machine Wizard. Click Create to create the virtual machine. The wizard is closed and the newly-created virtual machine is listed in Oracle VM VirtualBox Manager, as shown in Figure 6.8.
Since you want to install an operating system in the virtual machine, you need to make sure the virtual machine can access the installation media. To do this, you edit the virtual machine settings. In Oracle VM VirtualBox Manager, select the virtual machine and then in the toolbar click the Settings button. The Settings window is displayed. In the navigation on the left, select Storage as shown in Figure 6.9.

In the Storage Tree section, select Empty below the IDE Controller. The CD/DVD Drive attributes are displayed. Click the CD/DVD icon next to the CD/DVD Drive drop-down list and select the location of the installation media, as follows:

- To connect the virtual CD/DVD drive to the host’s physical CD/DVD drive, select Host Drive <drive-name>.

To insert an ISO image in the virtual CD/DVD drive, select Choose a virtual CD/DVD disk file and browse for the ISO image.
Figure 6.10 shows an ISO image inserted in the virtual CD/DVD drive.

**Figure 6.10. Virtual Machine CD/DVD Drive Settings**

Click **OK** to apply the storage settings. The Settings window is closed. If you connected the virtual machine’s CD/DVD drive to the host’s physical CD/DVD drive, insert the installation media in the host’s CD/DVD drive now. You are now ready to start the virtual machine and install the operating system.

In Oracle VM VirtualBox Manager, select the virtual machine and click the **Start** button in the toolbar. A new window is displayed, which shows the virtual machine booting up. Depending on the operating system and the configuration of the virtual machine, VirtualBox might display some warnings first. It is safe to ignore these warnings. The virtual machine should boot from the installation media, as shown in Figure 6.11.
You can now perform all your normal steps for installing the operating system. Be sure to make a note of the user name and password of the administrator user account you create in the virtual machine, which you will need in order to log in to the virtual machine. Do not join the virtual machine to a Windows domain (it can be a member of a workgroup) as the domain configuration is performed later. The virtual machine might reboot several times during the installation. When the installation is complete, you might also want to let Windows Update to install any updates.

Next, you need to install the VirtualBox Guest Additions, as described in Section 6.4, “Installing the VirtualBox Guest Additions”.

### 6.4. Installing the VirtualBox Guest Additions

The VirtualBox Guest Additions consist of device drivers and system applications that optimize the operating system for better performance and usability. One of the usability features required in this guide is automated logons, which is why you need to install the Guest Additions in the virtual machine.

In the Window containing the running virtual machine, select **Install Guest Additions** from the **Devices** menu, as shown in **Figure 6.12**.

**Figure 6.12. Install Guest Additions Menu**
Installing the VirtualBox Guest Additions

When the AutoPlay window is displayed (prompting you to run the `VBoxWindowsAdditions.exe` program) as shown in Figure 6.13, close the window without installing the Guest Additions. Closing the window leaves the ISO image used to install the Guest Additions inserted in the virtual CD/DVD drive. You need to install the VirtualBox Guest Additions from the command line to get all the features we need.

**Figure 6.13. AutoPlay Window**

![AutoPlay Window](image)

In the virtual machine, on the Windows Start menu, type `run` in the search field and press Return. The Run dialog is displayed. Enter `D:\VBoxWindowsAdditions.exe /with_autologon` in the Open field, as shown in Figure 6.14, and press the Return key.

**Figure 6.14. Run Dialog With the Command for Installing the Guest Additions**

![Run Dialog](image)

When you are prompted, click Yes to install the Guest Additions. The VirtualBox Guest Additions Setup wizard is displayed in a new window, as shown in Figure 6.15.

**Figure 6.15. VirtualBox Guest Additions Setup Wizard**

![Setup Wizard](image)

Click the Next button to move though the various steps of the wizard. Accept all the default settings and then click Install to install the Guest Additions. If a Windows Security dialog is displayed that prompts you to install device software (see Figure 6.16 for an example), click Install.
When the Guest Additions installation is complete, ensure **Reboot now** is selected (see **Figure 6.17**) and click **Finish**.

Next, you need to perform some additional configuration in the virtual machine, as described in Section 6.5, "Additional Virtual Machine Preparation".

6.5. Additional Virtual Machine Preparation

In order to make automated logons work and to join the computer to a domain, you need to enable the built-in Administrator account and disable the Windows Secure Authentication Sequence (Ctrl+Alt+Del). To do this, you have to edit the local security policies in the virtual machine.

In the Windows Start menu, enter **run** in the search field and press the Return key. The Run dialog is displayed. Enter **Local Security Policy** in the Open field. The Local Security Policy window is displayed. Select **Local Policies** and then **Security Options**. Find the **Accounts: Administrator account status** policy. Double-click the policy, select **Enabled**, click **Apply**, and then click **OK**. Check that the policy is shown as enabled in the **Security Setting** column, as shown in **Figure 6.18**.
Next find the **Interactive logon: Do not require CTRL + ALT + DEL** policy. Double-click the policy, select **Enabled**, click **Apply**, and then click **OK**. Check that the policy is shown as enabled in the **Security Setting** column, as shown in Figure 6.19.

Close the Local Security Policy window. Now you need to create a password for the built-in Administrator account. Start the Windows Control Panel, select **User Accounts**, select the Administrator user, and set a password. Verify that the Administrator account works by logging out of Windows, and then log in again as the Administrator user.

Once you have logged in as the Administrator user, shut down the virtual machine using the Windows Shutdown menu.

**Tip**

You can also shut down the virtual machine from the VirtualBox menus. If you do this, make sure you **select the ACPI shutdown (send the shutdown signal)** option as this preserves the state of the virtual machine and causes the virtual machine to shut down normally. If you select the **Close (power off the machine)** option, you do not preserve the state and you close the virtual machine without a normal shutdown. This can damage the virtual machine.

The virtual machine is now ready to be used as a template for creating desktops. The next step is to create a pool that will be used to create, store, and manage those desktops. Chapter 7, *Creating the Desktops* shows you how to do this.
Chapter 7. Creating the Desktops

In Oracle VDI, desktops are organized into pools so that desktops with similar characteristics can be grouped and for ease of management. In this chapter, you create a pool. After creating the pool, you import a virtual machine so that it can be used as a template for cloning and then you enable cloning so that the pool is filled with desktops. Finally, you assign users to the pool so that they can access the desktops.

7.1. Creating a Pool

In Oracle VDI Manager, in the navigation tree on the left, select Pools, and then select the company you created. Pools are always linked to a company, so that users from different companies can only access the desktops that they are authorized to access. The Company Pools page is displayed, as shown in Figure 7.1.

In the Pools table, click the New button. The New Pool wizard is displayed in a new window. Click the Next button to move though the various steps of the wizard. On the Select Pool Type step, select the desktop provider you created in Chapter 5 from the Desktop Provider drop-down list and then select Dynamic Pool as the Pool Type, as shown in Figure 7.2.

The Desktop Provider setting links the pool to the virtualization resources you want to use to run the desktops. The Pool Type settings are a group of predefined configuration settings that make it easier for you to create the type of pool you want. You can change any of the configuration settings later. The key decisions about a pool are:

- **Desktop fulfillment**: Whether individual desktops are added to the pool manually, or whether desktops are automatically added in bulk by cloning a template.

- **Desktop type**: Whether desktops are manually assigned to individual users before they log in (personal desktops), or whether desktops are automatically assigned to users only when they log in (flexible desktops). Flexible desktops can be re-used or deleted once a user logs out. Personal desktops are never re-used.
Creating a Pool

The simplest option for administration and for testing purposes is the **Dynamic Pool** option. With this option, a template is cloned to fill the pool with desktops and the desktops are automatically assigned to users.

On the Select Template step, ensure *(None)* is selected from the **Template** drop-down list and that **none** is selected in the **System Preparation** drop-down list, as shown in Figure 7.3. If you were already using a template in another pool, this step in the wizard enables you to select that template. You configure the template and system preparation settings later, when you configure cloning for the pool.

**Figure 7.3. Select Template Step**

On the Select Pool Size step, leave the **Preferred Size** setting as the default and ensure that the **Enable Automatic Cloning** option is not selected, as shown in Figure 7.4. You configure these settings later, when you configure cloning for the pool.

**Figure 7.4. Select Pool Size Step**

On the Define Pool step, enter a name for the pool in the **Name** field. The name can be anything you like, for example it could contain the name of the operating system or the name of the department that will use the desktops.

**Figure 7.5. Define Pool Step**
On the Review Step, click Finish to create the pool. The wizard is closed, a message is displayed on the Company Pools page to confirm that the pool has been created, and the new pool is now listed in the Pools table, as shown in Figure 7.6.

**Figure 7.6. Pool Added**

The Company Pools page provides an overview of each pool, how many desktops it contains and how the desktops are assigned to users.

### 7.2. Importing a Template into a Pool

Next, you need to add your template to the pool so that it can be used to clone desktops.

In the Company Pools table, click the pool name in the **Name** column. The Summary tab is displayed. Click the **Template** tab. The Pool Templates page is displayed, as shown in Figure 7.7

**Figure 7.7. Template Tab**

In the Templates table, click the **Import Template** button. The Import Template window is displayed. On the **Folder** tab, you can import a template from the /var/tmp folder on this host, or from an NFS share either on this host or on another host. On the **Hypervisor** tab, you can import the template directly from a VirtualBox installation on this host or another host.

If you copied a virtual machine settings file and disk image to the /var/tmp folder, click the **Select Folder** button and, if not automatically loaded, select the settings file and disk image from the drop-down lists. Make sure the **Delete original desktop after successful import** option is *not selected*. Figure 7.8 shows an example.
If you followed the steps in Chapter 6 for importing an existing virtual machine into VirtualBox or for creating a new template in VirtualBox, click the Hypervisor tab. Select the template from the list of desktops for this host, and then make sure the Delete original desktop after successful import option is not selected. Figure 7.9 shows an example.

Click OK to start importing the template. The Import Template window is closed, and a message is displayed on the Template tab to say that the template is being imported, as shown in Figure 7.10.
Many of the actions that you perform in Oracle VDI result in jobs that run in the background. While the jobs are in progress, you can continue to perform other actions. Importing a template is one action that results in a job. In the top right-hand corner of Oracle VDI Manager, select **Jobs Running**. The Jobs Summary window is displayed, as shown in **Figure 7.11**.

**Figure 7.11. Jobs Summary Window**

The Jobs Summary window shows detailed information about the progress and status of each job. Some jobs can also be canceled. Close the Jobs Summary window.

Once the import template job is completed, the template is listed in the Templates table on the **Template** tab. If you click the arrowhead next to the template name in the **Name** column, you will notice that Revision 1 of the template has been created automatically and that this revision is marked as the master revision, as shown in **Figure 7.12**.

**Figure 7.12. Template and Revision**

When you use cloning, the desktops are created from the revision. A revision is simply a save point that records the exact state of a virtual machine. You can make changes to the template at any time, for example to install new software and test that it works as expected. Once you are happy with the changes, you create a new revision and mark it as the master (using the buttons on the **Template** tab) so that the new revision is used to clone new desktops. Later if you discover problems with the revision, you can simply go back to an earlier revision by marking the earlier revision as the master.

You can also make changes to the template from within Oracle VDI Manager. To do this, select the template (not the revision) and click the **Open Console** button. The Console page is displayed and from here you can start, stop, and connect to the virtual machine in much the same way as you did in Oracle VM VirtualBox Manager.
Next, you need to set up cloning so that the pool can be automatically filled with the required number of desktops. As part of this you also perform the configuration to enable the cloned desktops to join a Windows domain.

Click the Cloning tab for the pool, as shown in Figure 7.14.

In the Desktop Cloning group, select Enable Automatic Cloning and, if you want, change the name in the Name Pattern (see Figure 7.15). The name pattern is used to generate the name of the cloned virtual machine. This is also the name of the computer that is registered in the Windows domain.
Setting Up Cloning

Figure 7.15. Desktop Cloning Group

In the Cloning Metrics group, you configure the number of desktops in the pool, as follows:

- **Preferred Size:** The number of desktops the pool normally has. Set this to 2.
- **Maximum Size:** The maximum number of desktops in the pool. Set this to 3.
- **Free Desktops** and **Production Priority:** Leave these settings at the default.

Figure 7.16 shows a completed example.

Figure 7.16. Cloning Metrics Group

It is best to start with a small pool, because you can increase its size later once you are sure the pool is operating in the way you want. Once cloning starts, Oracle VDI clones a number of desktops equal to the preferred size setting. As desktops in the pool get used, Oracle VDI uses the free desktops setting to determine whether more desktops need to be cloned, but the number of desktops in the pool never exceeds the maximum size setting. When desktops are no longer in use, Oracle VDI automatically reduces the number of desktops to the preferred size.

In the Cloned Desktops group, select the template you imported into the pool from the Template drop-down list. The template you select does not have to be a template in the pool, it could be a template in another pool for the same company.

In order to deploy desktops that are cloned from a template, some kind of system preparation is required. You can use the Microsoft Windows System Preparation tool (known as SysPrep) or Oracle VDI Fast Preparation (known as FastPrep). SysPrep requires additional preparation in the template, which includes installing the Windows Deployment tools in the template and running the sysprep program to remove the unique information (such as the computer name) from the template. FastPrep is faster than SysPrep because it does not require this additional preparation, and it simply updates the computer name. In the Cloned Desktops group, click **Create** next to **System Preparation**. The Create System Preparation File window is displayed.

In the System Preparation drop-down list, select **Oracle VDI Fast Preparation** making sure that you select the option that matches the operating system of your template. In the remaining fields, enter the required details as follows:

- **Windows Domain:** The fully-qualified domain name of the Windows domain that the desktops will join.
• **Domain Administrator** and **Domain Administrator Password**: The credentials of a domain administrator with permission to create a computer account and join the domain. You can prefix the administrator name with the domain, for example my.domain.com\Administrator.

• **Computer Container DN**: The distinguished name of the container that Active Directory uses for computers. You can leave this field blank if the default container ou=Computers is used.

• **Read-only Domain Controller**: Only select this option if the domain controllers (Windows Server 2008 and later) are configured as read-only.

• **Desktop Administrator** and **Desktop Administrator Password**: The credentials of the administrator account in the template. These credentials are used to change the computer name, join a domain, and optionally execute the custom script. For Windows 7 and later, this must be the built-in Administrator account.

• **Custom Script**: Leave this field blank. You can use this field to specify a script that runs after FastPrep is complete.

Figure 7.17 shows a completed example.

**Figure 7.17. FastPrep Configuration**

Click **OK** to complete the FastPrep specification. The Create System Preparation File window is closed. A message is displayed to say that the system preparation file has been successfully added.

In the Cloned Desktops group, you can use the **Machine State** to specify the state you want the desktop virtual machines to be in immediately after they are cloned. Select **Running** from the drop-down list. If the virtual machines are powered off (the default), the desktops do not consume any system CPU and memory resources. You can use the **Available Running Desktops** setting to specify the number of running desktops that Oracle VDI keeps running for when users log in. If you provide running desktops, users are able to log in and start working quickly because they do not have to wait for the virtual machine to boot. Figure 7.18 shows a completed example.
The settings in the Desktop Recycling group control what happens to the desktops when they are no longer in use. When a desktop is no longer in use, it is automatically recycled by Oracle VDI. What happens to the recycled desktop is controlled by the Policy setting, as follows:

- **Reset to Snapshot**: The desktop is powered off and then reset to the snapshot that was taken just after the desktop was cloned (this is the default).
- **Reuse Desktop**: The desktop is reused and remains in its existing state.
- **Delete Desktop**: The desktop is deleted and, if this means the pool does not have the required number of desktops, a fresh desktop is cloned from the template.

A desktop is recycled, when it remains unused for the period of time configured in the Idle Timeout field. In Chapter 9, you see desktop recycling in action. To make recycling happen quickly, change the Idle Timeout to 3 minutes. Figure 7.19 shows a completed example.

Click Save. A message is displayed to confirm that the settings have been applied, and after a few moments, the top right hand corner should show that there are some jobs running, as shown in Figure 7.20.

In the top right-hand corner of Oracle VDI Manager, select Jobs Running. The Jobs Summary window is displayed. You should see that the jobs that are currently running are the desktops being cloned in the pool, as shown in Figure 7.21.
Close the Jobs Summary window. Click the Desktop tab. As the desktops are cloned, they are listed in the Desktops table. Initially the Desktop State column shows the desktops as Reserved. This indicates that Oracle VDI is working on the desktop, in this case, probably running the Oracle VDI fast preparation. The virtual machine state might change depending on the virtual machine state you selected on the Cloning tab. Eventually the Desktop State column shows that the cloned desktops are Available, as shown in Figure 7.22.

The Available state means that the desktops are ready to be used.

### 7.4. Assigning Users to Desktops

Next, you need to assign users to the pool so that they can access to the desktops in the pool.

Click the User Assignment tab for the pool, as shown in Figure 7.23.
To assign users to the pool, click the **Add** button in the Assigned Users and Groups table. The Assign Pool window is displayed, as shown in **Figure 7.24**.

**Figure 7.24. Assign Pool Window**

Oracle VDI enables you to assign users to a pool in several ways. The best option for administration is to search a user directory for users and groups. Assigning groups in the user directory to the pool is the most efficient, as this indirectly assigns the members of the group to the pool. Whenever the group membership changes, the users that can access the desktops are automatically updated.

To search the user directory, select **User or Group**, enter the user or group you want to search for in **Search Users and Groups** field, and then click **Search**. The search has the * wildcard built in and is not case sensitive. The search results are listed returned and listed in a table. The results are limited to the first 100 matches. **Figure 7.25** shows an example.

**Figure 7.25. Searching for a User**

However, for the purposes of this guide, the easiest option is to use the built-in custom group which enables any user in the user directory to access a desktop in the pool. To do this, select **Custom Group** and then select the box next to the Any User group, as shown in **Figure 7.26**.

**Figure 7.26. Any User Assignment**

Click OK. The Assign Pool window is closed. A message is displayed that confirms the assignment has been added, as shown in **Figure 7.27**.
Figure 7.27. User Assignment Added

Another option for assigning users to a pool is to use the smart card functionality of the Sun Ray environment. Oracle VDI refers to smart cards as tokens. If you assign tokens to a pool, a user can use a Sun Ray Client to automatically authenticate themselves to Oracle VDI and access their desktops.

In Oracle VDI Manager, you can also assign individual desktops to individual users on the Desktop tab for the pool. However, this converts the desktop from a flexible desktop (available for use by any user) to a personal desktop (only available for use by that user). It is best to use flexible desktops as much as possible as this simplifies desktop administration because most of the processing takes place automatically and in bulk. Personal desktops can only be administered manually and individually.

Now that you have assigned users to the pool, the next step is to log in and access a desktop. Chapter 8, *Connecting to a Desktop* shows you how to do this.
Chapter 8. Connecting to a Desktop

In this chapter, you connect to a desktop in the pool.

Now that the pool has been filled with desktops, you can log in to Oracle VDI and connect to a desktop. For this you need to start Oracle Virtual Desktop Client. On the Connect Virtual Desktop Client screen, enter the fully-qualified DNS name of your Oracle VDI host in the Server field and click Connect.

After a few moments, the Oracle VDI Desktop Login screen displays. Enter the Active Directory or LDAP user name and password of a user in the user directory, and a domain name, and then click Log In.

Figure 8.1. Oracle VDI Desktop Login Screen

After a few moments, your windows desktop should display and you should be automatically logged in to Windows. You might see a message in the Windows desktop that says your desktop is being prepared before the actual desktop is displayed. You can now use the desktop just like a regular computer.

If the user name you used had been assigned to more than one desktop or pool, a desktop selector screen is displayed after you log in to Oracle VDI. The desktop selector screen enables you to choose the desktop you want to use, as shown in Figure 8.2. If you configure support for multiple monitors, you can also connect to multiple desktops simultaneously.

Figure 8.2. Desktop Selector Screen
In the desktop, go to the Windows Control Panel, select **System and Security**, and **System**. Check the System information for the desktop. It should show that the computer is joined to the domain, and that the computer name is the name of the desktop in the pool. Check the name of the user in the Windows Start Menu. It should show the correct user name.

**Figure 8.3. Control Panel System Information**

In **Chapter 9, Managing Desktops** you learn about the key concepts for managing the desktops in a pool.
Chapter 9. Managing Desktops

In this chapter, you learn how to manage the desktops in a pool.

When you configure pools to use cloning to produce flexible desktops, Oracle VDI automatically manages the desktops in the pool for you. It is worthwhile taking the time to watch the life cycle of a desktop so that you understand the administration benefits of this approach.

While you are still logged in to your desktop, click the Desktop tab for the pool in Oracle VDI Manager. In the Desktop State column of the Desktops table, notice that the state of one of the desktops is now shown as Used and the name of the user that using the desktop is also displayed, as shown in Figure 9.1.

**Figure 9.1. A Desktop in Use in the Pool**

Now go back to your desktop and log out of Windows, using the normal Windows method for logging out. After you are logged out of Windows, you should be automatically logged out of Oracle VDI. In Oracle VDI Manager, go to the Desktop tab for the pool. After a few moments, the desktop state changes to Idle but the user is still assigned the desktop, as shown in Figure 9.2.

**Figure 9.2. An Idle Desktop in the Pool**

Although a user is assigned to the desktop, the assignment is temporary and the desktop is still a flexible desktop. If the user logs in again during the idle timeout period, they reconnect to the same desktop. Once
the desktop has remained in the Idle state for the idle timeout period, the user assignment is removed and the desktop is recycled. The desktop state is changed to Available and the desktop can then be used by any user assigned to the pool, as shown in Figure 9.3.

**Figure 9.3. Recycled Desktops**

On the Desktop tab, you can also perform manual actions on individual desktops. Select a desktop in the Desktop table and then click the **More Actions** drop-down list, as shown in Figure 9.4.

**Figure 9.4. Desktop Actions**

Select a desktop in the Available state, and then select the **Delete Desktop** action. After a few moments a new cloning job should start, because cloning is still enabled for the pool and the number of desktops in the pool is less than the pool’s configured preferred size.

In the Desktops table, click the name of a desktop in the Name column. The Desktop Summary page is displayed.
Here you can see detailed information about the desktop and the virtual machine. You can also change the configuration of the virtual machine and even connect to it.

In this guide, you have seen how to perform all the configuration needed for a single-host Oracle VDI deployment. The host can perform all the functions required to deliver virtual desktops to users, including cloning and storing the virtual desktops, as well as managing the connections to those desktops. Users can connect to their desktops using different Sun Ray Clients, including Oracle Virtual Desktop Client for iPad, and they can move between Sun Ray Clients (hotdesk) and reconnect to their desktop.

The single-host configuration demonstrated in this guide is suitable for evaluation deployments, but for a production deployment a minimum of two hosts configured in this way and joined together to form an Oracle VDI Center is required. It is also possible to use separate hosts for Oracle VDI, the virtualization platform, and the storage, so that a single Oracle VDI Center can host many thousands of desktops.