Oracle® VM

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Oracle VM Manager User's Guide, Release 2.1

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Preface

This preface includes the following topics:

Audience

This document is intended for users of Oracle VM Manager.

Documentation Accessibility

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Related Documents

For more information, see the following documents in the Oracle VM Release 2.1 documentation set:

- *Oracle VM Server Quick Start Guide*
- *Oracle VM Manager Installation Guide*
- *Oracle VM Manager Release Notes*
- *Oracle VM Server User's Guide*
- *Oracle VM Server Installation Guide*
- *Oracle VM Server Release Notes*
- *Oracle VM Managing Oracle Enterprise Linux with Oracle Enterprise Manager 10g Grid Control Guide for Linux*
- *Oracle VM Manager Web Services API Reference*

Conventions

The following text conventions are used in this document:

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

What's New in Oracle VM Manager

This preface introduces the new features and enhancements of Oracle VM Manager in the 2.1.x releases since the initial release version of 2.1. This information is useful to users who have used a previous release of Oracle VM Manager.

New Features in Release 2.1.5

The new features and enhancements in Oracle VM Manager Release 2.1.5 include:

Web Services API

A Web services Application Programming Interface (API) to enable integration of third party products with Oracle VM Manager. See Appendix C, "Web Services API".

Server Pool Management UI Enhancements

The server pool management pages in the user interface have been improved. See Chapter 3, "Managing Server Pools".

New Features in Release 2.1.2

The new features and enhancements in Oracle VM Manager Release 2.1.2 include:

Server Pool Wizard

If it is the first time you log in to Oracle VM Manager after installation, you are prompted to follow the Wizard to create a server pool containing only one physical server which will act as the Server Pool Master, the Virtual Machine Server, and the Utility Server. See Section 2.3, "Using the Wizard to Create a Server Pool".

High Availability (HA) for Server Pools and Virtual Machine Servers

In Release 2.1.2, various levels of high availability is implemented.

You can enable high availability for server pools and virtual machines when creating them. See Section 3.6, "Enabling High Availability (HA)" and Section 6.3, "Creating a Virtual Machine".

You can also enable high availability when importing virtual machine templates and images. See Section 5.1, "Importing Virtual Machine Templates" and Section 5.2, "Importing Virtual Machine Images".

You can choose to migrate the running virtual machines when restarting, shutting down, or deleting an Oracle VM Server. See Section 4.3, "Restarting a Server", Section 4.4, "Shutting Down a Server", and Section 4.5, "Deleting a Server".

Virtual Machine Conversions, V2V and P2V

Oracle VM allows you to convert a VMware virtual machine to an Oracle VM virtual machine (known as V2V), or to convert a Linux host to an Oracle VM virtual machine or template (known as P2V).

To convert a VMware virtual machine to an Oracle VM virtual machine (V2V), see Section 5.2.1, "Importing a Virtual Machine Image".

To convert a Linux host to an Oracle VM virtual machine or template (P2V), see Section 5.1.1.3, "Converting a Linux or Windows Host to a Virtual Machine Template (P2V)" and Section 5.2.1.3, "Converting a Linux or Windows Host to a Virtual Machine (P2V)".

Keyboard Layout Selection

Oracle VM Manager provides a keyboard selection when you create a virtual machine from installation media, or when you change configurations of a virtual machine. See Section 6.3.2, "Creating a New Virtual Machine from Installation Media" and Section 6.7.5, "Profiles".

Rate Limit of Virtual Network Interface (VIF)

You can set up the rate limit of a virtual network interface (VIF) to customize the network traffic threshold. See Section 6.7.2, "Network".

Priority Class of Virtual Disk

The enhanced virtual disk feature enables you to set up the priority class of a virtual disk. See Section 6.7.3, "Storage".

New Features in Release 2.1.1

The new features and enhancements in Oracle VM Manager Release 2.1.1 include:

Network Bootable (PXE boot) Virtual Machines

Oracle VM Manager provides a new way of creating virtual machines in Release 2.1.1. Besides creating virtual machines from templates and installation media, you can create network bootable (PXE boot) virtual machines. See Section 6.3.3, "Creating a Network Bootable (PXE boot) Virtual Machine".

Hot Plugging Memory, Virtual Network Interface (VIF), and Virtual Disk

Some changes in the configuration of a virtual machine take effect immediately without restarting the virtual machine. See Section 6.7, "Editing Virtual Machine Configuration".

Virtual Network Interface (VIF) Type

You can select the virtual network interface (VIF) type for a virtual machine. See Section 6.7.2, "Network".

Preferred Server

When creating a virtual machine, you can select a preferred server for a virtual machine. See Step 2 in Section 6.3.1, "Creating a New Virtual Machine Based on Virtual Machine Template".

Boot Source

After creating a virtual machine, you can choose to start the virtual machine from hard disk (HDD), CD-ROM, or through Preboot Execution Environment (PXE). See Section 6.7.3, "Storage".

Refresh Automatically

On the Virtual Machines page, you can choose to either refresh Web pages manually, or refresh every 30 seconds automatically. See Section 6.4.1, "Starting a Virtual Machine".

Deleting Related Directories

You can choose to either delete or retain the related directories when deleting a server pool. See Section 3.7, "Deleting a Server Pool".

1

Overview of Oracle VM Manager

This chapter gives an overview of Oracle VM Manager. It includes the following topics:

1.1 What Is Virtualization?

Virtualization is the ability to run multiple *virtual* machines on a single piece of hardware. The hardware runs software that enables you to install multiple operating systems capable of running simultaneously and independently, in their own secure environment, with minimal impact on performance. Each virtual machine has its own virtual CPU, network interfaces, storage, and operating system.

1.2 Why Virtualize?

With increased server provisioning in the datacenter, several factors play a role in stifling growth. Increased power and cooling costs, physical space constraints, man power, and interconnection complexity all contribute significantly to the costs and feasibility of continued expansion.

Commodity hardware manufacturers have begun to address some of these concerns by shifting their design goals. Rather than focusing solely on raw gigahertz performance, manufacturers have enhanced the feature sets of CPUs and chip sets to include lower wattage CPUs, multiple cores per CPU die, advanced power management, and a range of virtualization features. By employing appropriate software to enable these features, several advantages are realized:

- **Server Consolidation**: By combining workloads from a number of physical hosts into a single host, a reduction in servers can be achieved as well as a corresponding decrease in interconnect hardware. Traditionally, these workloads would need to be specially crafted, partially isolated and well behaved, but with new virtualization techniques none of these requirements are necessary.
- **Reduction of Complexity**: Infrastructure costs are massively reduced by removing the need for physical hardware, and networking. Instead of having a large number

of physical computers, all networked together, consuming power and administration costs, fewer computers can be used to achieve the same goal. Administration and physical setup is less time consuming and costly.

- **Isolation**: Virtual machines run in sand-boxed environments. They cannot access each other, so if one virtual machine performs poorly, or crashes, it does not affect any other virtual machine.
- **Platform Uniformity**: In a virtualized environment, a broad, heterogeneous array of hardware components is distilled into a uniform set of virtual devices presented to each guest operating system. This reduces the impact across the IT organization: from support, to documentation, to tools engineering.
- **Legacy Support**: With traditional bare-metal operating system installations, when the hardware vendor replaces a component of a system, the operating system vendor is required to make a corresponding change to enable the new hardware to function properly (for example, an ethernet card). As an operating system ages, the operating system vendor may no longer provide hardware enabling updates. In a virtualized operating system, the hardware remains constant for as long as the virtual environment is in place, regardless of any changes occurring in the real hardware, including full replacement.

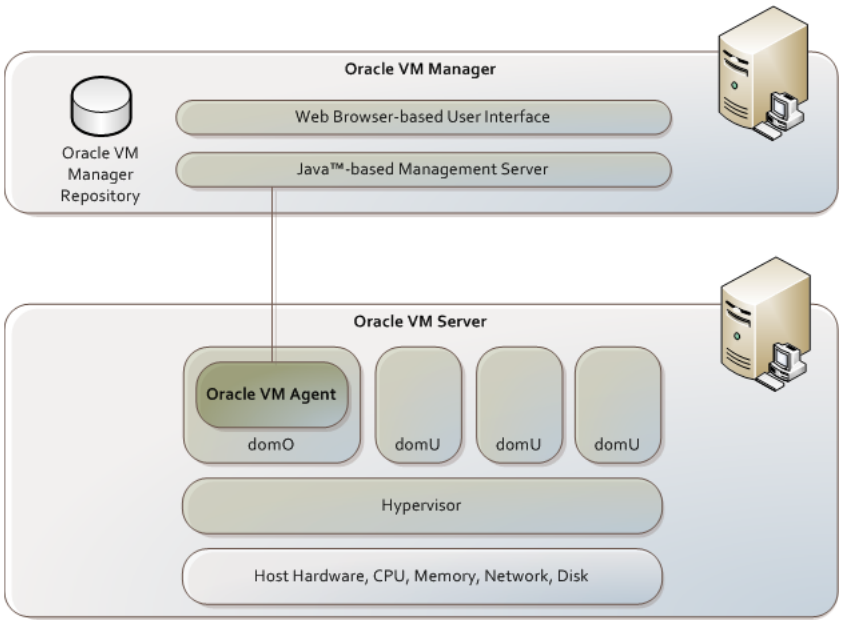
1.3 Introduction to Oracle VM

Oracle VM is a platform that provides a fully equipped environment to better leverage the benefits of virtualization technology. Oracle VM enables you to deploy operating systems and application software within a supported virtualization environment. The components of Oracle VM are:

- **Oracle VM Manager**: Provides the user interface, which is a standard ADF (Application Development Framework) web application, to manage Oracle VM Servers, virtual machines, and resources. Use Oracle VM Manager to:
  - Create virtual machines from installation media or from a virtual machine template
  - Delete virtual machines
  - Power off virtual machines
  - Import virtual machines
  - Deploy and clone virtual machines
  - Perform live migration of virtual machines
  - Import and manage ISOs
  - Create and manage virtual machine templates
  - Create and manage shared virtual disks
- **Oracle VM Server**: A self-contained virtualization environment designed to provide a lightweight, secure, server-based platform to run virtual machines. Oracle VM Server is based upon an updated version of the underlying Xen hypervisor technology, and includes Oracle VM Agent.
- **Oracle VM Agent**: Installed with Oracle VM Server. It communicates with Oracle VM Manager to manage virtual machines.

Figure 1–1, "Oracle VM Architecture" shows the components of Oracle VM.

Figure 1–1 Oracle VM Architecture

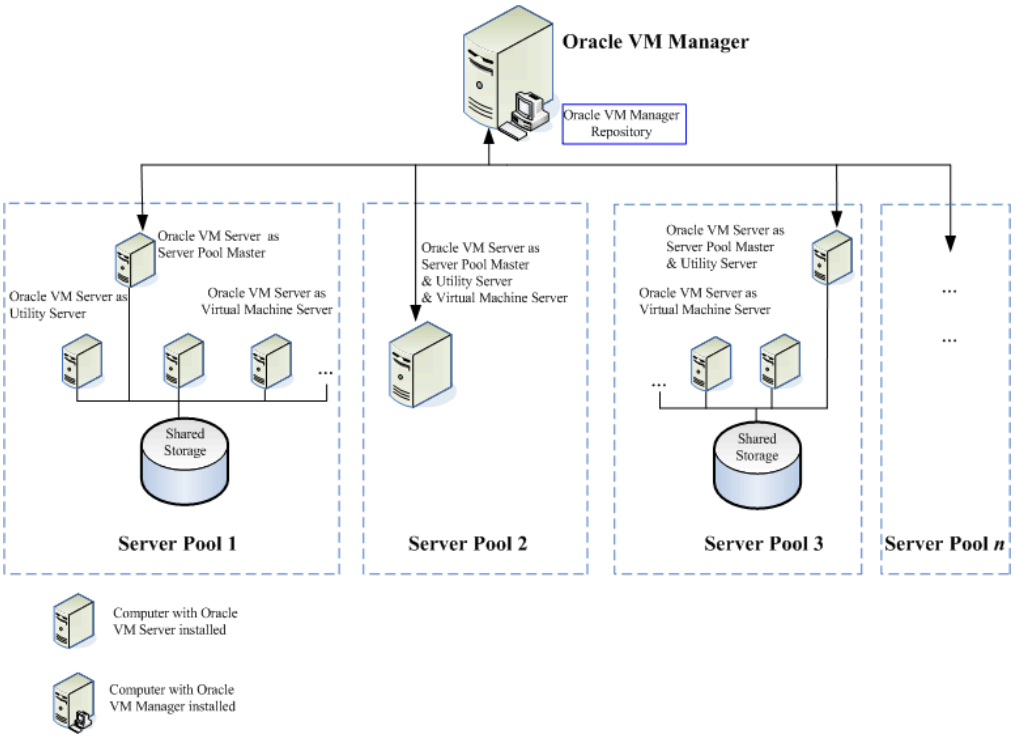


This book discusses Oracle VM Manager. See the *Oracle VM Server Installation Guide* and the *Oracle VM Server User's Guide* for information on installing and using Oracle VM Server.

1.4 Configuration of Oracle VM Manager

This section describes the configuration structure of Oracle VM Manager.

Figure 1–2 Deployment View of Oracle VM Manager



As shown in Figure 1–2, when you deploy Oracle VM Manager, the following components are involved:

- The Oracle VM Manager Host

  The host machine on which Oracle VM Manager is installed is known as an Oracle VM Manager host. It provides the interface where most of the virtual machine management tasks are performed. Its main function is to forward operational commands from users to other, possibly remote, servers and display their results.

- Servers

  An Oracle VM Server, once added to a server pool, is assigned with one, two, or even all three functions, namely, Server Pool Master function, Utility Server function, and Virtual Machine Server function.

  Oracle VM Agent provides the interface to each server function. Therefore, if An Oracle VM Server is assigned as a Server Pool Master only, then the Server Pool Master agent component is activated. Otherwise, if it is assigned as both a Server Pool Master, and a Utility Server, their respective agent components are activated, and so on.

  An Oracle VM Server can perform one, two, or all of the three functions described below:

  – Server Pool Master function

    The Server Pool Master is the core of the server pool operations. It acts as the contact point of the server pool to the outside world, and also as the dispatcher to other servers within the server pool.

    The load balancing is implemented by the Server Pool Master. For example, when you start a virtual machine, the Server Pool Master will choose a Virtual

Machine Server with the maximum resources available to run the virtual machine.

There is only one Server Pool Master in a server pool.

– Utility Server function

The Utility Server is responsible for I/O intensive operations such as, copying, or moving files. Its function focuses on the creation and removal operations of virtual machines, servers, and server pools.

There can be one or more Utility Servers in a server pool. When there are several Utility Servers, the Server Pool Master chooses the Utility Server with the maximum CPU resources available to conduct the task.

– Virtual Machine Server function

The primary function of the virtual machine server is to run virtual machines, thus acting as a hypervisor. Oracle VM Agent is set up on the Virtual Machine Server to establish communication between the Server Pool Master, other Utility Severs, and Virtual Machine Servers.

There can be one or more Virtual Machine Servers in a server pool. When there are several Virtual Machine Servers, the Server Pool Master chooses the Virtual Machine Server with the maximum resources available (for example, memory) to start and run the virtual machine.

- Server Pools

A server pool is an autonomous region that contains one or more Oracle VM Servers. A server pool presents a unified view of the storage in which the virtual machines reside. Each server pool must have its own shared storage.

The server functions described above can be deployed in a server pool in a variety of ways as shown in Figure 1–2. For example, in Server Pool 1, each one of the three functions is implemented on an individual Oracle VM Server. In Server Pool 2, all of the three functions are performed by a single Oracle VM Server.

In medium to large scale environments with more than just a few virtual machines in a Server Pool, it is recommended that the Server Pool Master and Utility Server functions reside together or individually on a separate and dedicated physical server that does not host any guest virtual machines, as illustrated in Server Pool 3. This is to prevent any significant Server Pool Master or Utility Server usage from impacting the performance of the workloads hosted in the guest virtual machines.

- Storage

A storage resource is mounted to store virtual machines, external resources, and other data files that are shared among Oracle VM Servers in the server pool. In order to perform Live Migration of virtual machines between separate physical machines in the server pool, each machine involved must have shared access to storage.

1.5 Roles in Oracle VM Manager

As a user of Oracle VM Manager, you can have one of three roles: `User`, `Manager`, or `Administrator`.

- User

A `User` creates and manages virtual machines, and also imports resources.

- Manager

  A `Manager` manages the server pools, resources, and servers. A manager also has all the privileges of the `User` role.

- Administrator

  An `Administrator` performs administration tasks such as managing user accounts, importing resources, and approving imported resources. An `Administrator` also has all privileges of the `User` role and the `Manager` role.

Table 1–1 briefly lists the available functions for each user role.

Table 1–1 Available Functions for Each Role

Roles	Available Functions
User	■ Importing resources. See Chapter 5, "Managing Resources". ■ Managing virtual machines, including all the operations described in Chapter 6, "Managing Virtual Machines".
Manager	■ Managing server pools, including all the operations described in Chapter 3, "Managing Server Pools". ■ Managing servers, including all the operations described in Chapter 4, "Managing Servers". ■ Managing resources, including all the operations described in Chapter 5, "Managing Resources". ■ Managing virtual machines, including all the operations described in Chapter 6, "Managing Virtual Machines".
Administrator	■ Managing server pools, including all the operations described in Chapter 3, "Managing Server Pools". ■ Managing servers, including all the operations described in Chapter 4, "Managing Servers". ■ Managing resources, including all the operations described in Chapter 5, "Managing Resources". ■ Managing virtual machines, including all the operations described in Chapter 6, "Managing Virtual Machines". ■ Managing users and groups, including all the operations described in Chapter 7, "Managing Users and Groups".

1.6 Main Features of Oracle VM Manager

Oracle VM Manager provides the following main features:

- Virtual machine life cycle management. This includes creating virtual machines from either installation media or from templates, starting, logging in, shutting down, and deleting virtual machines.
- Importing virtual machines
- Cloning virtual machines
- Deploying virtual machines
- Migrating virtual machines
- Creating and configuring server pools
- Managing servers
- Managing resources, including ISO files, virtual machine templates, virtual machine images, and shared virtual disks

- Managing Oracle VM Manager users, and groups

2

Getting Started with Oracle VM Manager

This Chapter describes how to start using Oracle VM Manager. It includes the following sections:

- Registering an Account with Oracle VM Manager
- Logging In to Oracle VM Manager
- Using the Wizard to Create a Server Pool

After you install Oracle VM Manager, go to one of the following Web sites to log into Oracle VM Manager:

- For local access: http[s]://127.0.0.1:*port*/OVS
- For remote access: http[s]://*hostname*:*port*/OVS

Where, *hostname* refers to the host name or IP address of the Oracle VM Manager host. For example, to connect to Oracle VM Manager using the standard port of 8888 on a host named example.com, use:

http://example.com:8888/OVS

To connect to Oracle VM Manager using the Secure Sockets Layer (SSL) port of 4443 on a host named example.com, use:

https://example.com:4443/OVS

2.1 Registering an Account with Oracle VM Manager

You can obtain an account using one of the following ways:

- If you have configured the default administration account *admin* when you installed Oracle VM Manager, you can use this account to log in to Oracle VM Manager directly. By default, this account is granted the *administrator* role.
- Contact the administrator of Oracle VM Manager to create an account with any role you need, including *administrator*, *manager*, and *user*.
- If you only want to use the basic functions as a common user, such as creating and using virtual machines, or importing resources, you can register a new account by yourself. After registering the account, you need to ask the administrator to assign some server pools and groups to your account. By default, the account you register is granted the *user* role.

For more information about the roles, see Section 1.5, "Roles in Oracle VM Manager".

To register a new account with Oracle VM Manager:

1. On the Oracle VM Manager Login page, click **Register**.

2. The User Information screen is displayed. Enter your personal account information.
   - Username

     Enter a descriptive user name you use for login.
   - Password

     Enter the password for the account.
   - Retype Password
   - First Name
   - Last Name
   - Email

   Click **Next**.
3. Confirm your account details.

An account is created, and a confirmation message is displayed on the Oracle VM Manager Login screen.

Before using any features, you need to ask the administrator to assign some server pools and groups to your account. For more information on editing users, see Section 7.2.3, "Editing a User".

Now you can use the new account to log in to Oracle VM Manager.

2.2 Logging In to Oracle VM Manager

To open the Login page of Oracle VM Manager, enter either of the following addresses in a Web browser:

- For local access: http[s]://127.0.0.1:*port*/OVS
- For remote access: http[s]://*hostname*:*port*/OVS

Where, *hostname* refers to the host name or IP address of the Oracle VM Manager host. For example, to connect to Oracle VM Manager using the standard port of 8888 on a host named example.com, use:

http://example.com:8888/OVS

To connect to Oracle VM Manager using the Secure Sockets Layer (SSL) port of 4443 on a host named example.com, use:

https://example.com:4443/OVS

On the Oracle VM Manager Login page, enter your user name and password to log in. Now you can create virtual machines, import resources, and so on.

After logging in, the available tabs vary, depending on the role of your account, as shown in Table 2–1, " Available Tabs for Each Role". If you want to change the role of your account, contact the administrator. Only administrators can change the roles of accounts.

Table 2–1 Available Tabs for Each Role

Role	Available Tabs
User	■ Virtual Machines ■ Resources

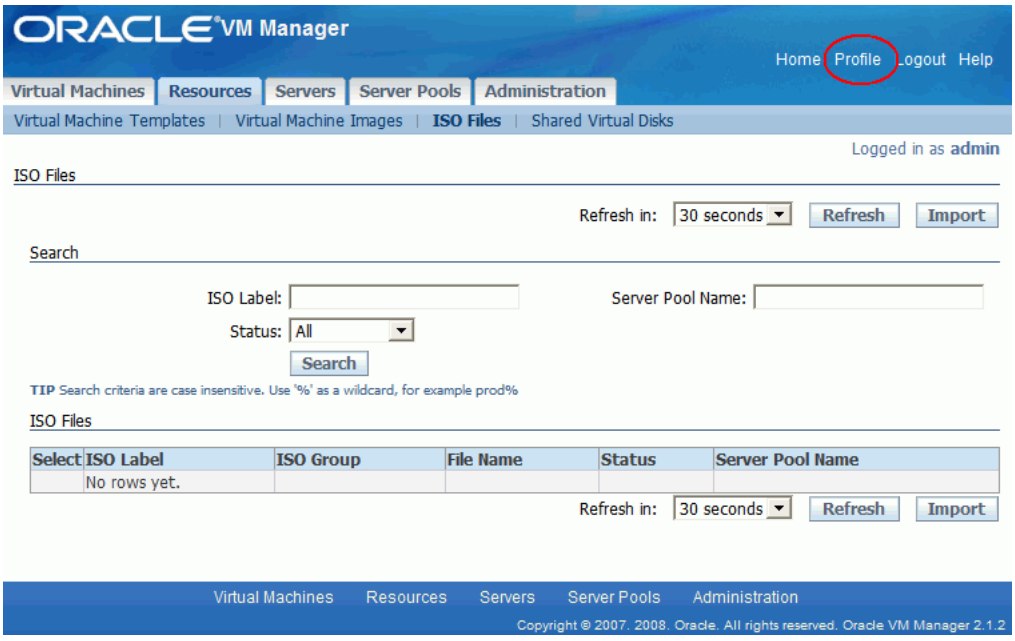
Table 2–1 (Cont.) Available Tabs for Each Role

Role	Available Tabs
Manager	▪ Virtual Machines ▪ Resources ▪ Servers ▪ Server Pools
Administrator	▪ Virtual Machines ▪ Resources ▪ Servers ▪ Server Pools ▪ Administration

To change your account information, such as e-mail address and password, click **Profile** on the upper-right part of any page.

If you forget your password, click **Forgot Password** on the Login page and submit your account name. A new password will be sent to your registered e-mail address.

Figure 2–1 Profile Link



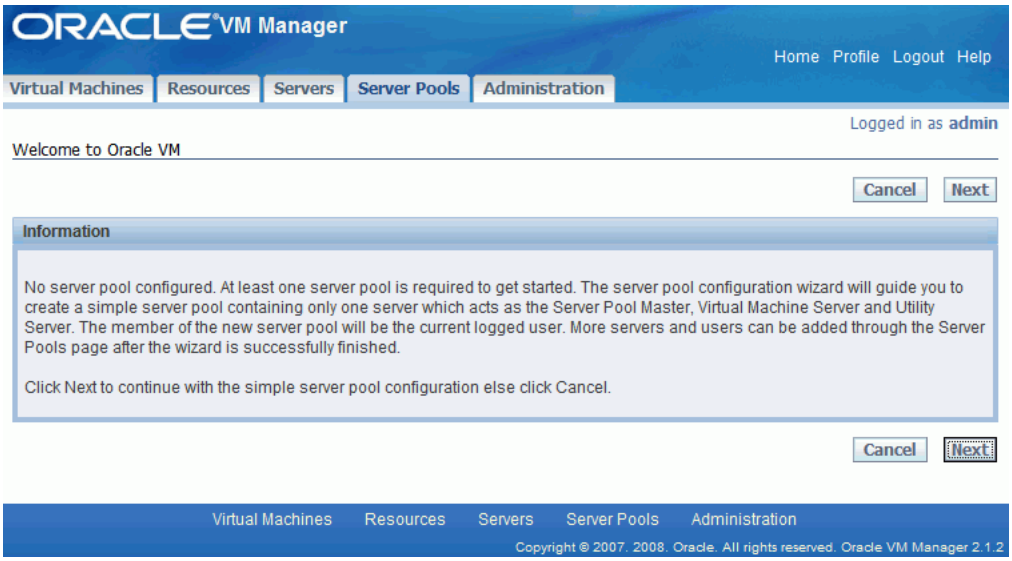
2.3 Using the Wizard to Create a Server Pool

After installation, you can log in to Oracle VM Manager, and follow the Wizard to create a server pool containing a physical server which will act as the Server Pool Master, the Virtual Machine Server, and the Utility Server.

To create a server pool by following the Wizard:

1. On the Welcome page, click **Next**.

Figure 2–2 Welcome Page



2. On the Server Information page, enter the server pool information:

   - Enter the name of the server pool in the **Server Pool Name** field.
   - Select whether to enable HA with the **High Availability Mode** check box. To use HA, you must enable HA in the server pool, and on each virtual machine. For information about HA, see Section 3.6, "Enabling High Availability (HA)". For more information on how to set up HA prerequisites, see the *Oracle VM Server User's Guide*.

   Enter the following information about the Oracle VM Server in the **Server Details** box:

   - Server Host/IP

     Enter the host name, or IP address of the Oracle VM Server, for example:

     `192.168.2.20`

     or

     `hostname.example.com`

   - Server Name

     Enter a name for the Oracle VM Server. This must be unique.

   - Server Agent Password

     Enter the password to access Oracle VM Agent installed on the Oracle VM Server.

   - Server Username

     Enter the username to log in to the Oracle VM Server.

   - Server Password

     Enter the password to log in to the Oracle VM Server.

   - Location

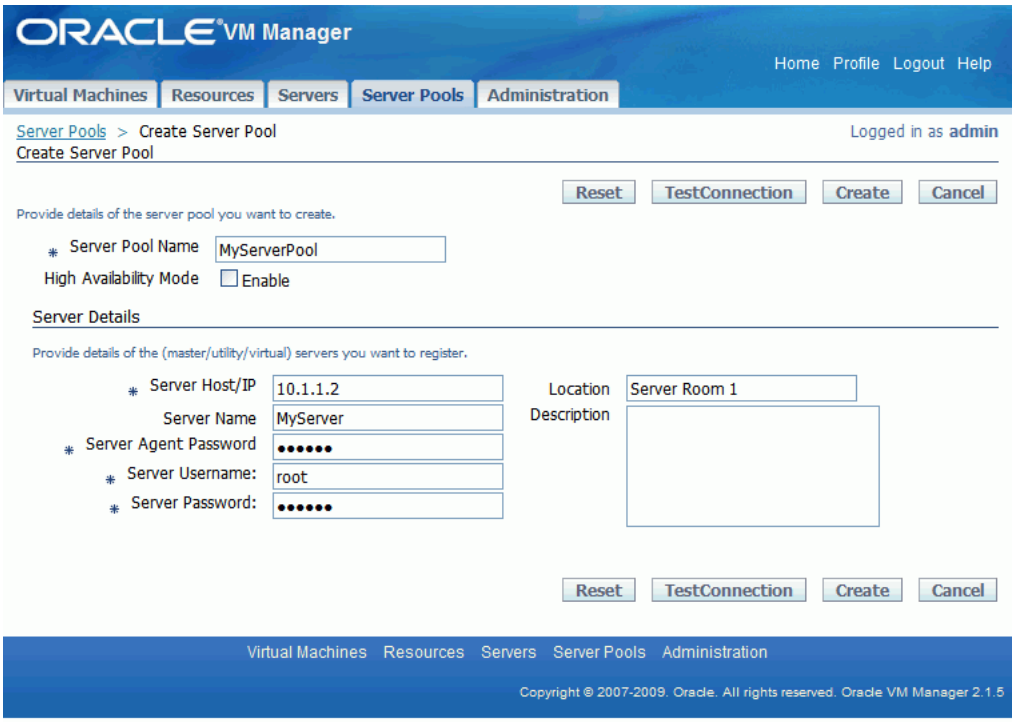
     The location of the Oracle VM Server. For example, `Server Room 1`.

   - Description

A description of the Oracle VM Server.

To test the connection to the Oracle VM Server click **Test Connection**. If the information is incorrect, or the Oracle VM Server is not available, you cannot add it to the server pool.

Figure 2–3 Adding Servers to a Server Pool



Click **Create** to create the server pool.

Now you have created a server pool, you can continue to add more Virtual Machine Servers and Utility Servers, or add more users to the server pool. For more information on creating server pools and adding servers, see Section 3.2, "Creating a Server Pool" and Section 4.1, "Adding a Server".

Once the server pool is created, you can start importing resources, or creating virtual machines. See Chapter 5, "Managing Resources" and Chapter 6, "Managing Virtual Machines".

3

Managing Server Pools

A server pool is logically an autonomous region that contains one or more physical servers. It presents a unified view of the storage in which the virtual machines reside.

Before creating a server pool, ensure you have:

- Oracle VM Servers that you will deploy as the Server Pool Master, the Utility Server, or the Virtual Machine Server.
- A repository that is used for live migration of virtual machines and for local storage on the Oracle VM Servers. For information on managing repositories, see the *Oracle VM Server User's Guide*.
- IP addresses or host names of these servers.
- Passwords to access Oracle VM Agent installed on these servers.

This chapter describes how to manage server pools. It includes the following sections:

> **Note:** Functions described in this chapter are only available to users who are granted the `Manager` or `Administrator` role.

3.1 Designing a Server Pool

This section guides you through the ways of designing a server pool to meet your requirements.

Before creating a server pool, you need to consider how many physical servers will be contained in the server pool, and what functions each physical server will perform. The more virtual machines you will run in the server pool, the more resources these virtual machines will consume, therefore the more physical servers are needed to provide sufficient resources for the server pool.

A server pool is scalable. If you find a server pool does not have sufficient resources, such as CPU and memory, to run the virtual machines and the applications inside, you can expand the server pool by adding more Virtual Machine Servers.

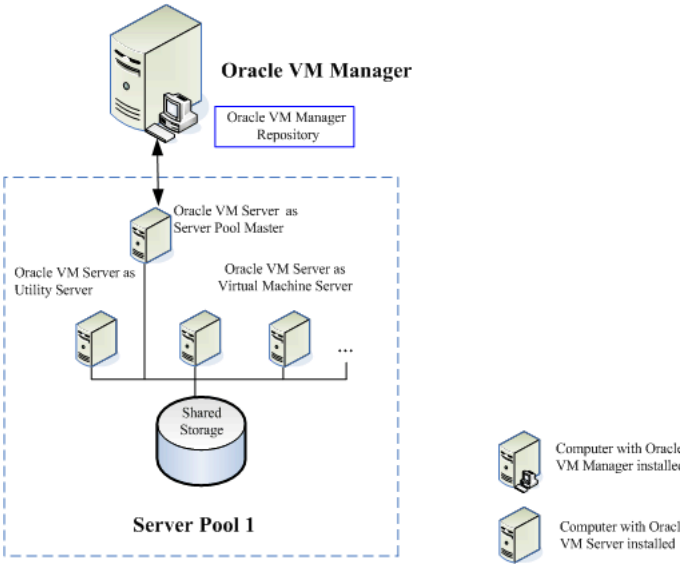
There are three typical server pool configurations: separate configuration, all-in-one configuration, and two-in-one configuration.

- Separate Configuration

  In separate configuration, one single Oracle VM Server functions as a Server Pool Master, one or more Oracle VM Servers function as Utility Servers, and one or more Oracle VM Servers function as Virtual Machine Servers.

  This configuration is recommended when there is a large number of virtual machines running on the server, or when applications on the virtual machines consume most of the hardware resources. It ensures that the performance of the hosted virtual machines is not impacted by any significant management activity handled by the Server Pool Master or Utility Servers.

Figure 3–1 The Separate Configuration

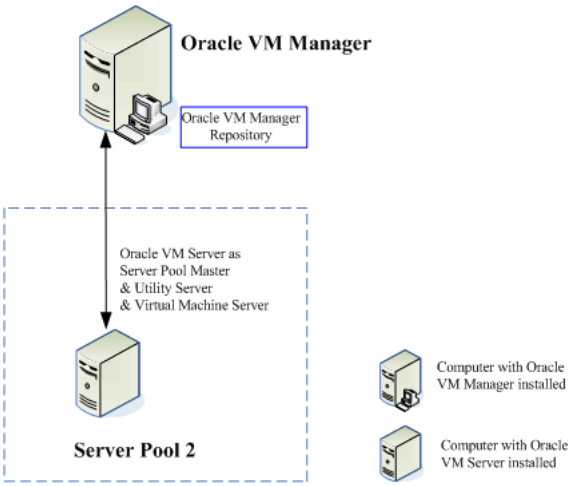


- All-in-One Configuration

  In the all-in-one configuration, a single Oracle VM Server acts as the Server Pool Master, the Utility Server, and the Virtual Machine Server at the same time.

  This configuration is recommended when there are only a few virtual machines running. In this case, the hardware resources of the Oracle VM Server are sufficient to support the virtual machines and the management activity handled by the Server Pool Master and Utility Server.

Figure 3–2 The All-in-One Configuration

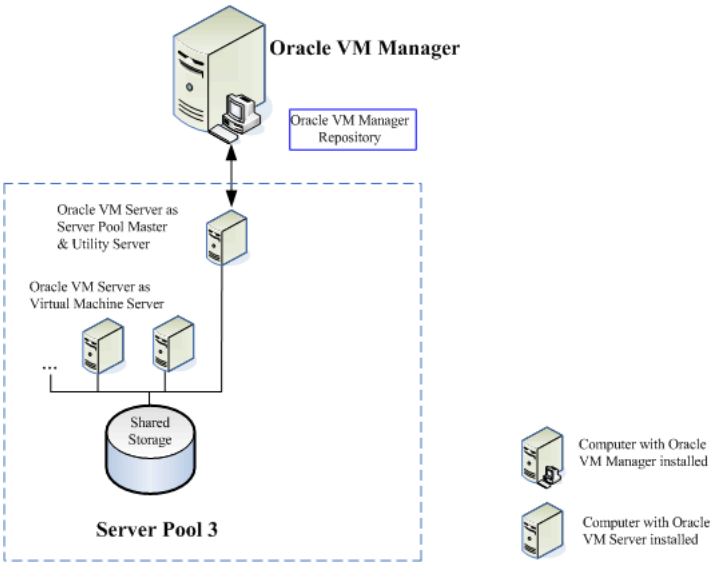


- Two-in-One Configuration

  In the two-in-one configuration, the Server Pool Master function, and the Utility Server function are grouped together on the same Oracle VM Server, while the Virtual Machine Server function is implemented separately on different Oracle VM Servers.

  Compared with the two structures described earlier, this configuration serves well for a scenario where the server pool resource consumption is moderate. Since virtual machines use more hardware resources than other servers, you can typically deploy both the Server Pool Master and Utility Server on the same Oracle VM Server.

Figure 3–3 The Two-in-One Configuration

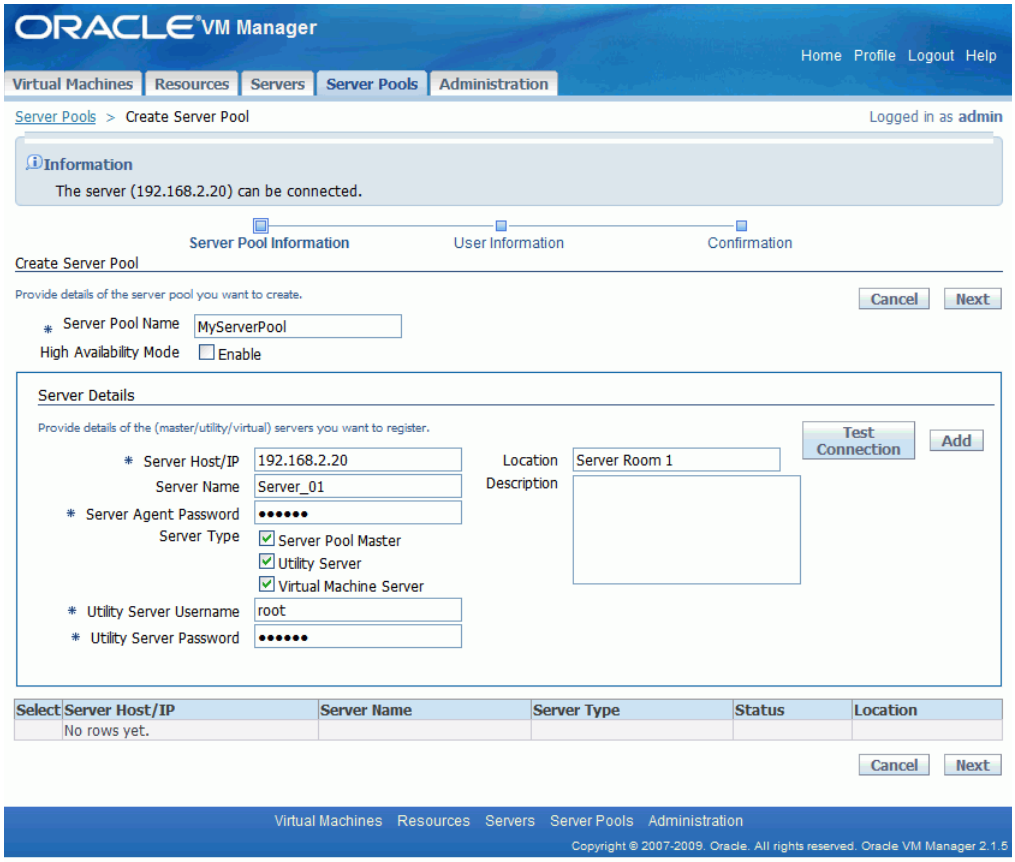


3.2 Creating a Server Pool

To create a server pool, perform the following:

1. On the Server Pools page, click **Create Pool**. The Create Server Pool page is displayed.

Figure 3–4 Adding Servers to a Server Pool



2. Enter the Oracle VM Server information and add the Oracle VM Server to the server pool. You can add multiple Oracle VM Servers to a server pool.

   A server pool consists of at least one Server Pool Master, one Utility Server, and one Virtual Machine Server. See Section 3.1, "Designing a Server Pool".

   Note: If you have registered a physical server to Oracle VM Manager, you cannot register it again, as this may result in duplicate host names or IP addresses.

   Enter the name of the server pool in the **Server Pool Name** field.

   A server pool name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) character. The maximum length of a server pool name is 200 characters.

   Select whether to enable HA with the **High Availability Mode** check box. To use HA, you must enable HA in the server pool, and on each virtual machine. For information about HA, see Section 3.6, "Enabling High Availability (HA)". For more information on how to set up HA prerequisites, see the *Oracle VM Server User's Guide*.

Enter the following information on the Oracle VM Server in the **Server Details** box:

- Server Host/IP

  Enter the host name, or IP address of the Oracle VM Server, for example:

  `192.168.2.20`

  or

  `hostname.example.com`

- Server Name

  Enter a name for the Oracle VM Server. This must be unique.

  An Oracle VM Server name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) character. The maximum name length is 200 characters.

- Server Agent Password

  Enter the password to access Oracle VM Agent installed on the Oracle VM Server.

- Server Type

  Select the checkbox for each role the Oracle VM Server should perform in the server pool:

  – Server Pool Master

  – Utility Server

  – Virtual Machine Server

  If you select **Utility Server**, you must enter the Oracle VM Server login credentials in the **Utility Server Username** and **Utility Server Password** fields. The user must have read/write privileges for the /OVS folder.

- Location

  The location of the Oracle VM Server. For example, `Server Room 1`.

- Description

  A description of the Oracle VM Server.

To test the connection to the Oracle VM Server click **Test Connection**. If the information is incorrect, or the Oracle VM Server is not available, you cannot add it to the server pool.

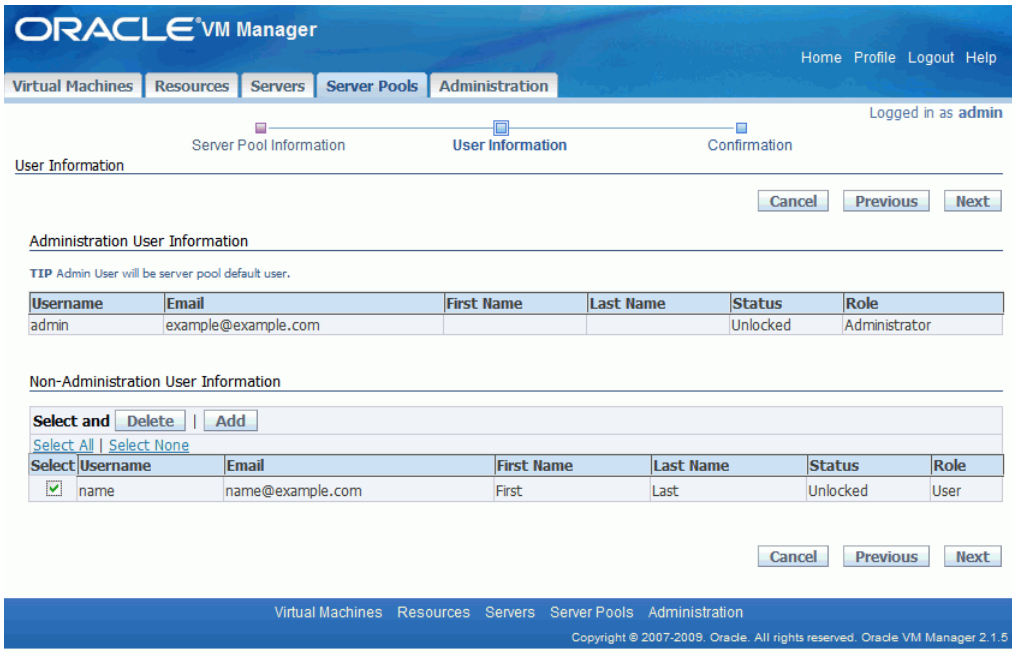
When you have entered the information about the Oracle VM Server, click **Add**. The Oracle VM Server is added to the server pool and listed in the table at the bottom of the screen. You can select it, and then edit it or delete it with the **Edit** and **Delete** buttons.

To add more Oracle VM Servers to the server pool, enter the parameters for each Oracle VM Server, and click **Add**.

After adding the Oracle VM Server, click **Next** to proceed to the next page.

3. On the User Information page, select the users from the **Non-Administration User Information** table for which you want to grant access to the server pool. Users with the Administrator role are automatically granted access to the server pool.

Figure 3–5 Adding Users to a Server Pool



To add new users, see Section 7.2.1, "Creating a User". To change a user role, see Section 7.2.4, "Changing a Role".

After adding users, click **Next** to proceed to the next page.

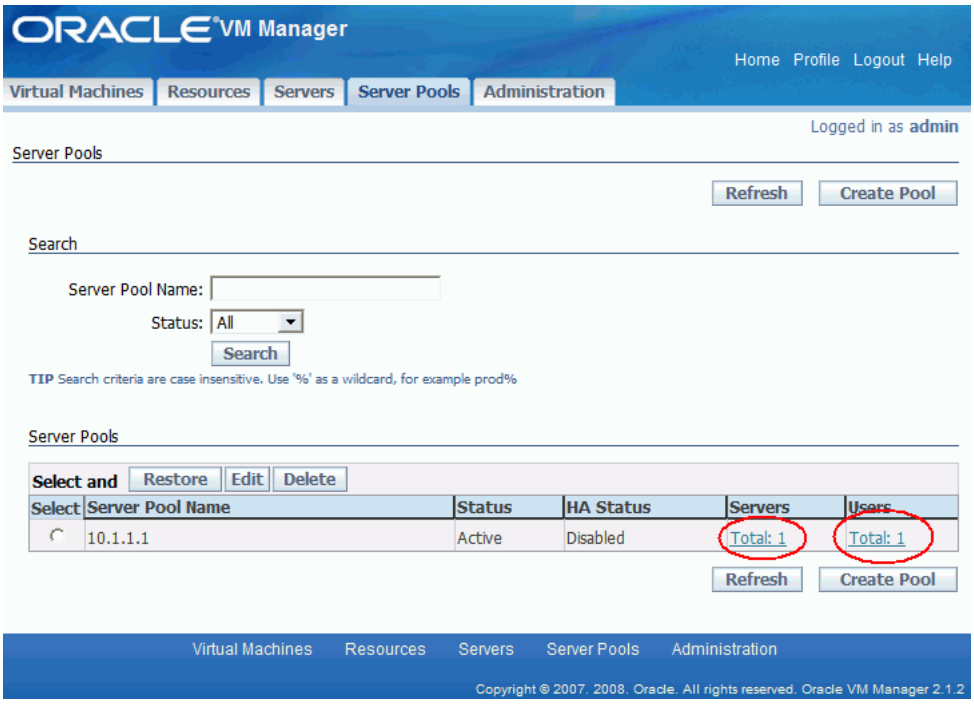
4. On the Confirmation page, confirm the information you have entered for the server pool. Click **Confirm** to create the server pool.

   The Server Pools page is displayed and the new server pool is listed in the **Server Pools** table.

3.3 Editing a Server Pool

You can change the server pool name, check HA infrastructure and enable or disable HA. You can also edit the servers in a server pool, and add or remove users.

Figure 3–6 Editing Server Pool Page Links

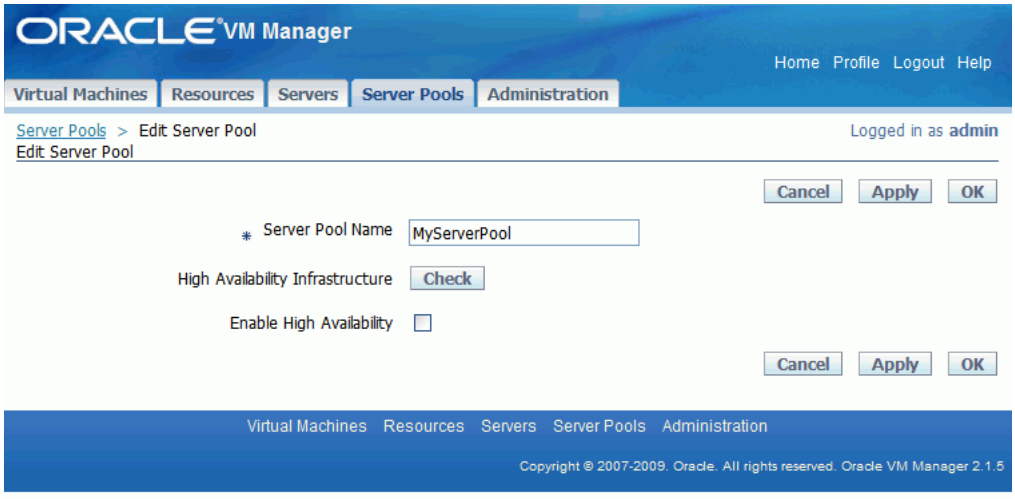


3.3.1 Editing Server Pool

To edit a server pool:

1. Select the server pool in the **Server Pools** table and click **Edit**. The Edit Server Pool page is displayed.

Figure 3–7 Editing a Server Pool



2. Change the server pool name in the **Server Pool Name** field.

   An Oracle VM Server name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) character. The maximum name length is 200 characters.

3. To check the HA infrastructure click **Check** in the **High Availability Infrastructure** field.
4. Enable or disable HA with the **Enable High Availability** check box.
5. Click **OK** or **Apply** to save your changes.

3.3.2 Editing Server Pool Servers

To edit the servers in a server pool, click the **Servers** link in the **Server Pools** table. For more information, refer to Chapter 4, "Managing Servers".

3.3.3 Editing Server Pool Users

To add or remove users from the server pool:

1. Click the **Users** link in the **Server Pools** table. The **Edit User Information for the Server Pool** screen is displayed.
2. Select the users from the **Non-Administration User Information** table for which you want to grant access to the server pool. Users with the Administrator role are automatically granted access to the server pool. Click **Apply**.

To add new users, see Section 7.2.1, "Creating a User". To change a user role, see Section 7.2.4, "Changing a Role".

3.4 Searching Server Pools

To search server pools, perform the following:

1. Enter the server pool name in the **Server Pool Name** field. Use `%` as a wildcard. All available server pools are displayed if you leave the **Server Pool Name** field empty.
2. Select the server pool status in the **Status** drop down. The server pool status reflects the status of the Server Pool Master.
   - Active

     The server pool is available.
   - Inactive

     The server pool is not available.
3. Click **Search**. The search results are displayed in the **Server Pools** table.

3.5 Restoring a Server Pool

If the server pool data on the server pool master is damaged, you can restore this data by synchronizing it with the data from the Oracle VM Manager database.

Note: When you restore a server pool, all the data stored in the server pool master will be deleted, and will be synchronized with the latest information from the Oracle VM Manager database.

To restore a server pool, select it, and click **Restore**.

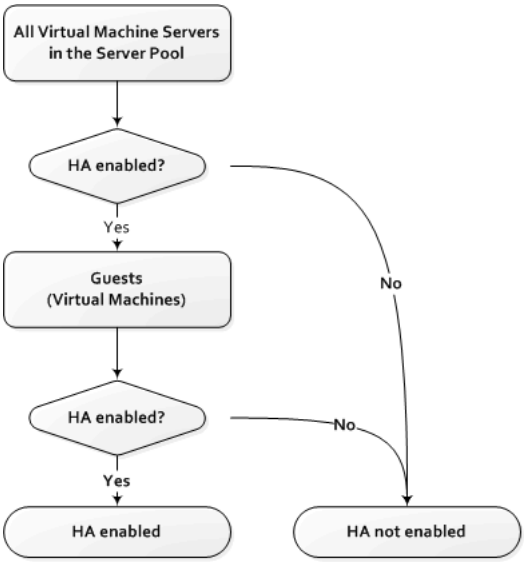
3.6 Enabling High Availability (HA)

You can set up HA in Oracle VM to guarantee the availability of virtual machines if the Virtual Machine Server they are running on fails or restarts. When a Virtual Machine Server is restarted or shut down, the virtual machines running on it are either restarted on, or migrated to, another Virtual Machine Server.

You manage HA with Oracle VM Manager. To implement HA, you must create a cluster of Virtual Machine Servers in a server pool and have them managed by Oracle VM Manager. HA cannot be implemented with Oracle VM Server alone.

To use HA, you must first enable HA on the server pool, then on all virtual machines, as shown in Figure 3–8, "Enabling HA". If you enable HA in the server pool and then for virtual machines, when a Virtual Machine Server is shut down or fails, the virtual machines are migrated or restarted on another available Virtual Machine Server. HA must be enabled for **both** the server pool **and** for virtual machines. If HA is not enabled for both, HA is disabled.

Figure 3–8 Enabling HA



If HA is enabled, when you restart, shut down, or delete the Virtual Machine Server in Oracle VM Manager, you are prompted to migrate the running virtual machines to another available Virtual Machine Server. If you do not migrate the running virtual machines, Oracle VM Agent attempts to find an available Virtual Machine Server on which to restart the virtual machines. The Virtual Machine Server is selected using the preferred server setting for the server pool when you create a virtual machine in Oracle VM Manager:

- **Auto** selects an available Virtual Machine Server.
- **Manual** selects an available preferred Virtual Machine Server.

If you do not select a preferred server when creating a virtual machine in Oracle VM Manager, **Auto** is set as the default.

If there is no preferred Virtual Machine Server or Virtual Machine Server available, the virtual machines shut down (Power Off) and are restarted when a Virtual Machine Server becomes available.

If the Server Pool Master fails, HA also fails for the Virtual Machine Servers running in that server pool.

The possible HA scenarios are:

- If you shut down or restart a Virtual Machine Server in Oracle VM Manager, you are prompted which virtual machines to migrate to another available Virtual Machine Server. Any virtual machines which are not migrated, are restarted on an available Virtual Machine Server.
- If you shut down or restart a Virtual Machine Server at the Oracle VM Server command-line, Oracle VM Agent restarts the virtual machines on an available Virtual Machine Server.
- If a Virtual Machine Server fails, all running virtual machines are restarted automatically on another available Virtual Machine Server.
- If a Virtual Machine Server fails and no other Virtual Machine Servers are available, all running virtual machines are restarted when a Virtual Machine Server becomes available.

In all the above scenarios, if any virtual machines running on the Virtual Machine Server are not HA-enabled, they are shut down (Powered Off).

Figure 3–9 shows a Virtual Machine Server failing and the virtual machines restarting on other Virtual Machine Servers in the server pool.

Figure 3–9 HA in Effect for a Virtual Machine Server Failure

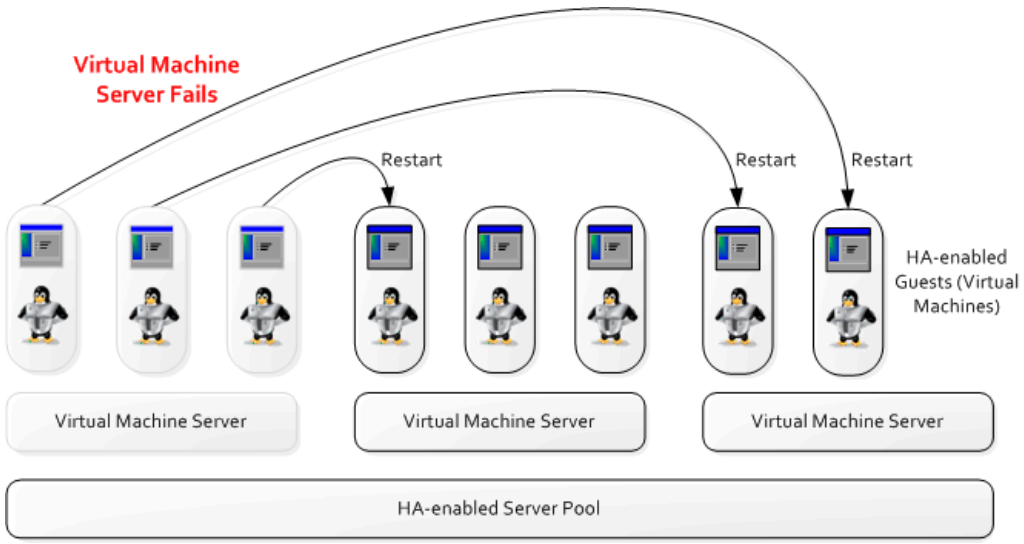
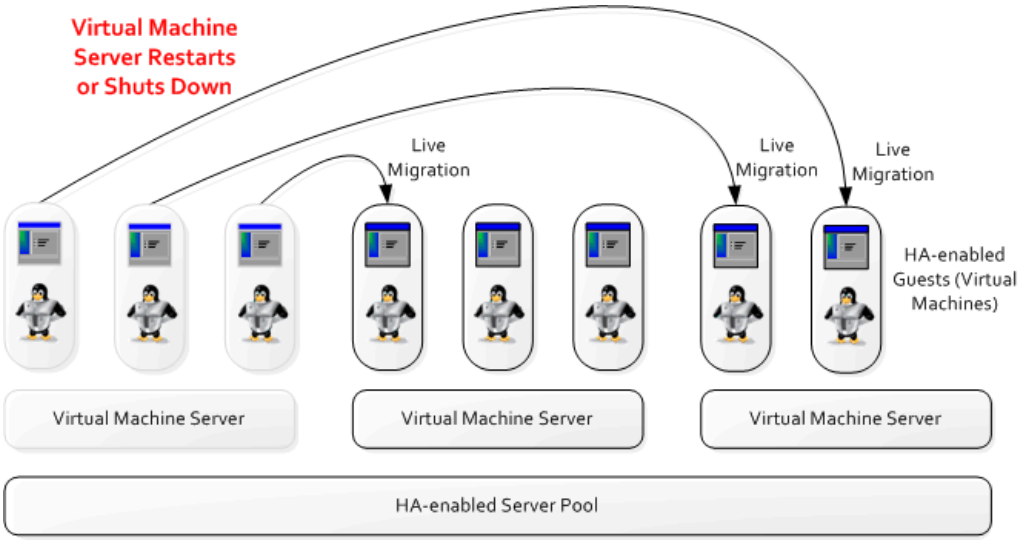


Figure 3–10 shows a Virtual Machine Server restarting or shutting down and the virtual machines migrating to other Virtual Machine Servers in the server pool.

Figure 3–10 HA in Effect for a Virtual Machine Server Restart or Shut Down



3.7 Deleting a Server Pool

To delete a server pool, perform the following:

1. On the **Server Pools** page, select the server pool you want to delete, and click **Delete**.
2. On the **Delete Confirmation** page, select **Remove all the working directories from the server pool** if you want to delete all the related directories. If you do not select this option, only the server pool data is removed from the database, while the relevant directories and files of the server pool remain on the server. Select **Force Remove** to force the removal of the servers if one or more servers are unavailable.

> **Caution:** After you delete all the directories, all the servers and virtual machines on the server pool are then deleted as well. Ensure that the server pool is no longer in use before deleting it.

4

Managing Servers

There is at least one physical server in a server pool. You can change the parameters or functions of a server, restart it, shut it down, or delete it.

A server pool is expandable. When more virtual machines are running on the server pool and consuming more resources, you can add more Virtual Machine Servers to expand the resources for the server pool, such as the number of CPUs and the size of memory. When there are several Virtual Machine Servers, Server Pool Master chooses the Virtual Machine Server with the maximum resources available (including memory and CPU) to start and run the virtual machine.

You can also add more Utility Servers to enhance the processing ability of the server pool. When there are several Utility Servers, Server Pool Master chooses the Utility Server with the maximum CPU resources available to conduct the task.

However, you can not add more Server Pool Masters, as a server pool can have only one Server Pool Master.

Before you add servers to an existing server pool, you must:

- Identify the IP address, or host name of the computer that functions as the Utility Server or Virtual Machine Server.
- Identify the password to access Oracle VM Agent that has been installed on the computer.

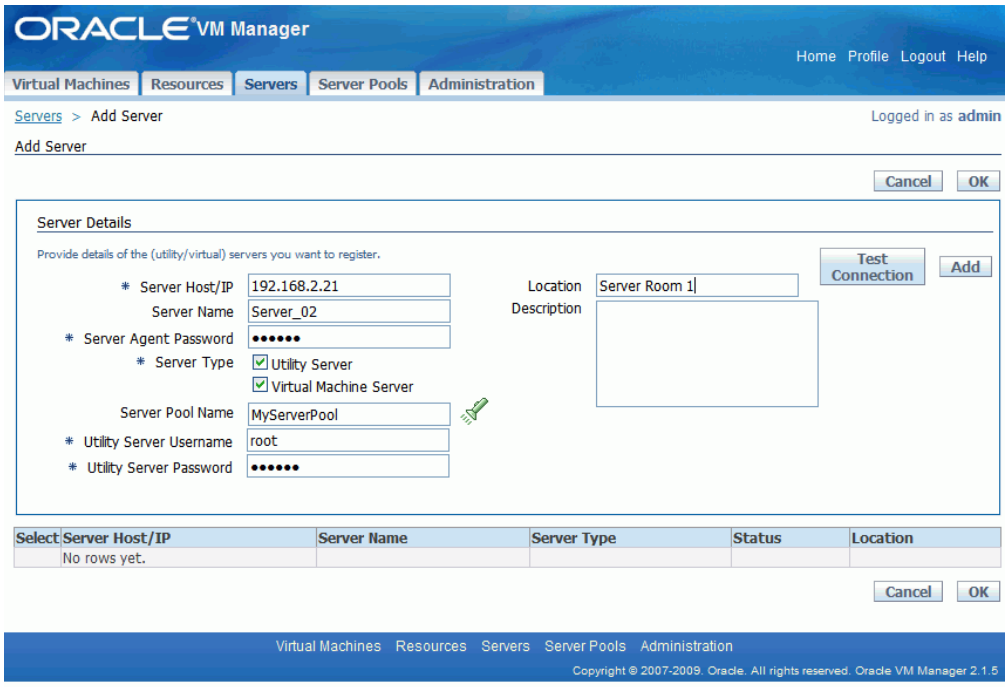
This chapter describes how to manage servers. It includes the following sections:

4.1 Adding a Server

To add a Utility Server, or a Virtual Machine Server to an existing server pool, perform the following:

1. On the Servers page, click **Add Server**. The Add Server page is displayed.

Figure 4–1 Add Server Page



2. Enter the Oracle VM Server parameters. For information about these parameters, refer to Section 3.2, "Creating a Server Pool". In addition to the parameters in Section 3.2, "Creating a Server Pool", you must select a server pool for the Oracle VM Server. Select the search icon in the **Server Pool Name** field to search for a server pool.

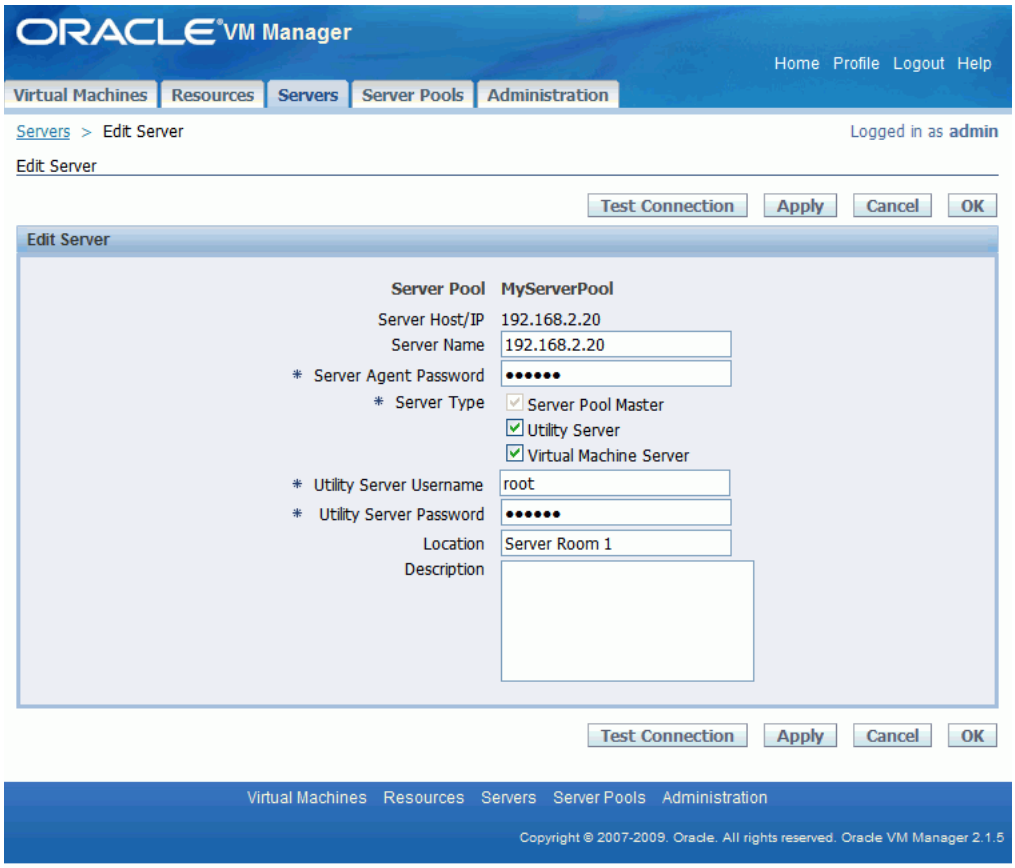
   After adding the server, click **OK**.

   Note: If you have already registered a physical Oracle VM Server in Oracle VM Manager, you cannot register it again, as this may result in host name or IP address duplication.

4.2 Viewing and Editing a Server

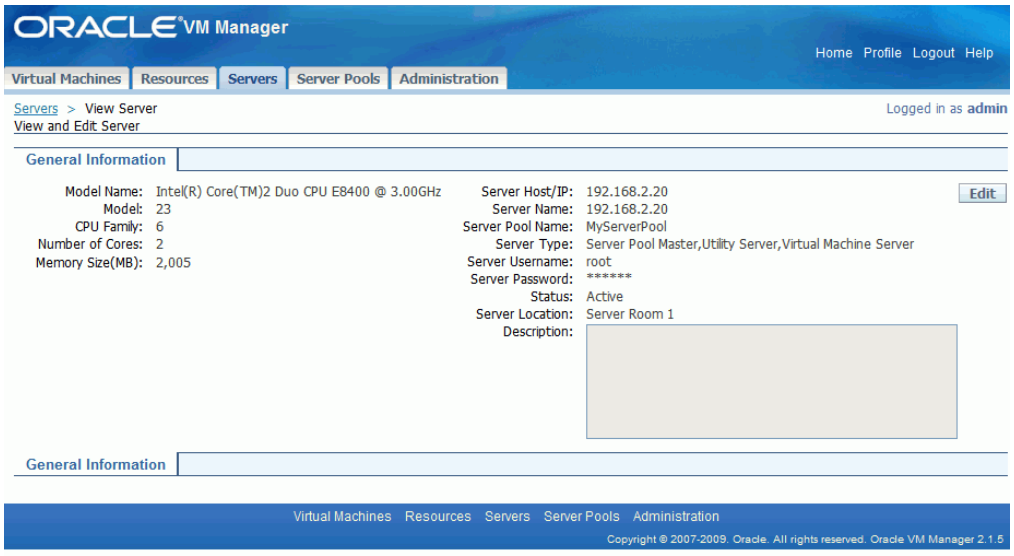
To edit an existing Oracle VM Server, select the server, and click **Edit**.

Figure 4–2 Editing a Server



You can also click the Oracle VM Server link to view general information about the Oracle VM Server. For information about the parameters, see Section 3.2, "Creating a Server Pool".

Figure 4–3 Viewing and Editing a Server



4.3 Restarting a Server

You can remotely restart the physical server with Oracle VM Server installed.

To restart a server:

1. On the Servers page, select the server, and click **Reboot**.
2. If there are virtual machines running on the server, you are prompted to migrate them to another server. Select the virtual machine you want to migrate, and then click **Migrate**. For information on migrating virtual machines, see Section 6.9, "Migrating a Virtual Machine".

   If you restart the server without migrating the running virtual machines, the running virtual machines will be shut down, or be restarted, depending on whether high availability is enabled. If you have enabled high availability for both the server pool and virtual machines, the virtual machines will restart on other available servers; otherwise, they will be shut down. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".

Click **Refresh** periodically until the server status changes from `Rebooting` to `Active`.

During the restarting process, the server may be temporarily unavailable, and all virtual machines involved are shut down.

4.4 Shutting Down a Server

You can remotely shut down the physical server that performs as the Oracle VM Server.

To shut down a server:

1. On the Servers page, select the server, and then click **Power Off**.
2. If there are running machines on the server, you are prompted to migrate them to another server. Select the virtual machine you want to migrate, and then click **Migrate**. For information on migrating virtual machines, see Section 6.9, "Migrating a Virtual Machine".

   If you shut down the server without migrating the running virtual machines, the running virtual machines will be shut down, or be restarted, depending on whether high availability is enabled. If you have enabled high availability for both the server pool and virtual machines, the virtual machines will restart on other available servers; otherwise, they will be shut down. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".

Click **Refresh** periodically until the server status changes from `Shutting Down` to `Unreachable`.

After you shut down the server, virtual machines based on this server cannot be used.

4.5 Deleting a Server

To delete an Oracle VM Server, select it, and then click **Delete**.

If there are running machines on the server, you are prompted to migrate them to another server. Select the virtual machine you want to migrate, and then click **Migrate**. For information on migrating virtual machines, see Section 6.9, "Migrating a Virtual Machine".

You cannot delete a server without migrating any running virtual machines, or shutting them down.

Caution: When you delete an Oracle VM Server, all virtual machines on the server are no longer available. Ensure that the server is no longer in use before you delete it.

5

Managing Resources

Resources include virtual machine templates, virtual machine images, ISO files, virtual disks, and converted virtual machines.

- Virtual machine templates

  Virtual machine templates imported to Oracle VM Manager are used to create virtual machines.

- Virtual machine images

  Virtual machine images imported to Oracle VM Manager are used directly, without the process of creating.

- ISO files

  ISO files imported to Oracle VM Manager are used to create virtual machines from installation media.

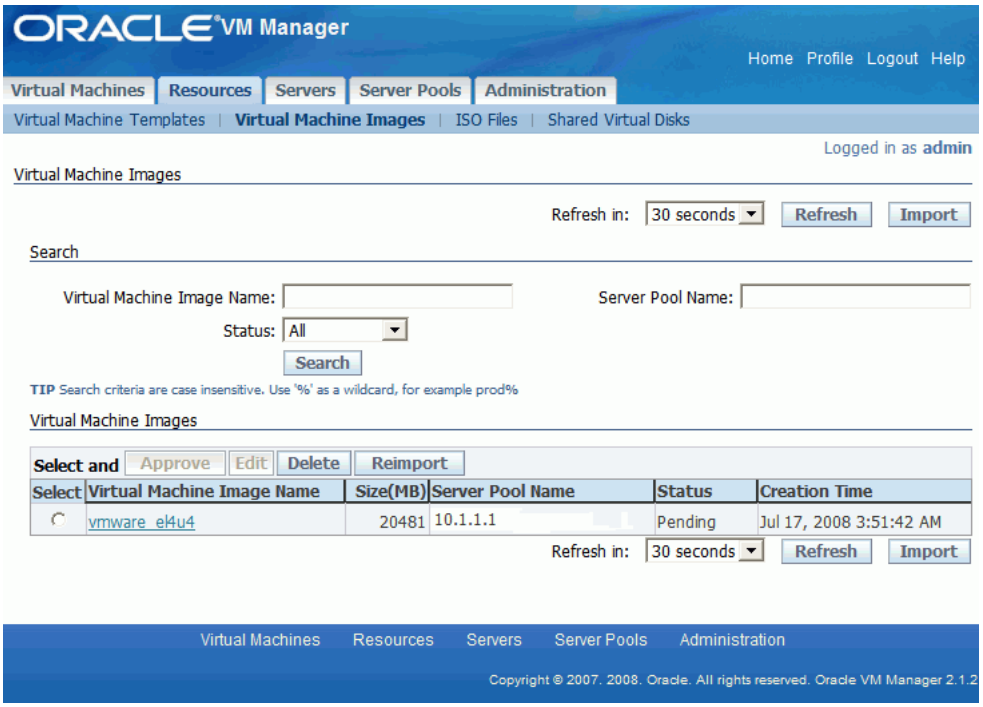
- Shared virtual disks

  Shared virtual disks extend the storage capability of your virtual machine.

This chapter describes how to manage resources. It includes the following sections:

> **Note:** Only an `Administrator` or `Manager` can approve, edit, and delete the imported virtual machine templates, virtual machines, and ISO files.

Figure 5–1 Resources Page



5.1 Importing Virtual Machine Templates

Virtual machine templates are shared among users to create new virtual machines. New virtual machines will inherit the same contents and configurations from the template.

Typically, a virtual machine template contains basic configurations, such as the number of virtual CPUs, the size of memory, virtual disks, virtual network interfaces (VIFs), and so on. It may also contain some applications installed beforehand.

You can obtain a virtual machine template by:

- Saving an existing virtual machine as template. For more information, refer to Section 6.8.3, "Saving a Virtual Machine as a Template". You can then use the virtual machine template directly without importing it.
- Downloading Oracle VM templates at:

  `http://www.oracle.com/technology/products/vm/templates.html`

  The password for the *root* user of all Oracle VM templates is *ovsroot*. The password for the *oracle* account in the OVM_EL4U5_X86_HVM_ORACLE_11G template is *oracle*. For more information on how to use these templates, see

  `http://download.oracle.com/otn_software/virtualization/README.templates`

  Before using the downloaded templates, you must import them into Oracle VM Manager.

This section includes the following topics:

- Importing a Virtual Machine Template
- Statuses of Virtual Machine Templates

- Reimporting a Virtual Machine Template
- Approving the Imported Virtual Machine Template
- Editing a Virtual Machine Template
- Deleting a Virtual Machine Template

5.1.1 Importing a Virtual Machine Template

Note: Before you import a virtual machine template, rename the configuration file of the virtual machine to `vm.cfg`.

Depending on where your virtual machine templates are located, on the Virtual Machine Server, on other computers, or on the Internet, you can import virtual machine templates from the server pool or download them from external source. You can also convert a Linux or Windows host to a virtual machine template (P2V).

- Selecting from the Server Pool
- Downloading from External Source
- Converting a Linux or Windows Host to a Virtual Machine Template (P2V)

5.1.1.1 Selecting from the Server Pool

If you already have some virtual machine templates on your Server Pool, you can discover and register them in Oracle VM Manager directly.

Before importing, make sure the component files of the virtual machine template are stored in the folder /OVS/seed_pool/*template_name* on the Virtual Machine Server, and make sure the configuration file is named `vm.cfg`.

When importing, Oracle VM Agent can update the directory information in the vm.cfg file automatically. If you need to modify the vm.cfg file, refer to Appendix A, "Preparing Virtual Machines For Importing".

To select an existing virtual machine template from the server pool, and register it in Oracle VM Manager, perform the following:

1. On the Resources page, click **Virtual Machine Templates**, and then click **Import**.
2. Select **Select from Server Pool (Discover and register)**. Click **Next**.
3. On the General Information page, enter or select the following general information:
   - Server Pool Name

     Select the server pool on which the imported virtual machine template will be located.
   - Virtual Machine Template Name

     Select the virtual machine template to be imported.
   - Operating System

     Select the guest operating system of the virtual machine template.
   - Virtual Machine System Username

     Enter the user name used to log in to the virtual machine template.

- Virtual Machine System Password

  Enter the password used to log in to the virtual machine template.

- Description

  Enter a description of the virtual machine template.

Click **Next**.

4. Confirm the information you have entered.
5. After importing, the status of the virtual machine template is `Pending`. You need to approve it to make it available for creating virtual machines. See Section 5.1.4, "Approving the Imported Virtual Machine Template".

5.1.1.2 Downloading from External Source

To download a virtual machine template from outside of the server pool, such as OTN:

`http://www.oracle.com/technology/software/products/virtualization/vm_templates.html`

Or your own HTTP/FTP server, perform the following:

1. On the Resources page, click **Virtual Machine Templates**, and then click **Import**.
2. Select **Download from External Source (HTTP and FTP)**. Click **Next**.
3. On the General Information page, enter or select the following general information:

   - Server Pool Name

     Select the server pool on which the imported virtual machine template will be located.

   - Virtual Machine Template Name

     Enter a name for the imported virtual machine template. This must be unique. The name will be used as the name of the directory under /OVS/seed_pool, where the files associated with this virtual machine template are stored.

     A template name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) and hyphen (-) characters. The maximum name length is 48 characters.

   - Operating System

     Select the guest operating system of the virtual machine template.

   - Virtual Machine System Username

     Enter the user name used to log in to the virtual machine template.

   - Virtual Machine System Password

     Enter the password used to log in to the virtual machine template.

   - Description

     Enter a description of the virtual machine template.

   Click **Next**.

4. On the Import Information page, enter the URL where the virtual machine template is located. For example, enter either of the following:

   `http://host/vm`

```
ftp://username:password@host/vm
```

When using a proxy, select **Use Proxy,** and enter the proxy address.

Click **Next**.

5. Confirm the information.
6. After importing, the status of the virtual machine template is `Pending`. You need to approve it to make it available for creating virtual machines. See Section 5.1.4, "Approving the Imported Virtual Machine Template".

5.1.1.3 Converting a Linux or Windows Host to a Virtual Machine Template (P2V)

You can convert a Linux or Windows host to an Oracle VM virtual machine template (Physical to Virtual, P2V). The conversion process is similar to downloading a template from external source.

Before conversion, you need to restart the Linux or Windows computer with the Oracle VM Server CD, and use P2V utility to start the conversion. For more information on how to use the P2V utility, see the ***Oracle VM Server User's Guide***.

During the conversion, you are prompted to enter the number of virtual CPUs and memory size, and this information is configured in the vm.cfg file. The disk size in the virtual machine is determined by the size of the disks you have chosen to be included in the virtual machine. Make sure the Virtual Machine Server has sufficient resources for the conversion (disk space).

The converted virtual machine template is a hardware virtualized machine (HVM).

To convert a Linux or Windows host to a virtual machine template:

1. On the Resources page, click **Virtual Machine Templates**, and then click **Import**.
2. Select **Linux/Windows P2V Import**. Click **Next**.
3. On the General Information page, enter the following general information:
   - Server Pool Name

     Select the server pool on which the converted virtual machine template will be located.
   - Virtual Machine Template Name

     Enter a name for the converted virtual machine template. This must be unique. The name will be used as the name of the directory under /OVS/seed_pool, where the files associated with this virtual machine template are stored.

     A template name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) and hyphen (-) characters. The maximum name length is 48 characters.
   - Operating System

     Select the guest operating system of the virtual machine template.
   - Virtual Machine System Username

     Enter the user name used to log in to the virtual machine template.
   - Virtual Machine System Password

     Enter the password used to log in to the virtual machine template.
   - Description

Enter a description of the virtual machine template.

Click **Next**.

4. On the Import Information page, enter the host name or IP address of the Linux or Windows host. For example, enter:

   ```
   hostname.example.com
   ```

   When using a proxy, select **Use Proxy**, and enter the proxy address.

   Click **Next**.

5. Confirm the information.

6. After importing, the status of the virtual machine template is `Pending`. You need to approve it to make it available. See Section 5.1.4, "Approving the Imported Virtual Machine Template".

5.1.2 Statuses of Virtual Machine Templates

The imported virtual machine template can be one of the following statuses.

- Importing: This status indicates that the virtual machine template is in the process of being imported.
- Pending: This status indicates that the virtual machine template has been imported successfully, and is waiting for the approval of the `Manager`.
- Import Error: This status indicates that there were some errors during importing. Reimport the template, or delete it.
- Active: This status indicates that the virtual machine template has been approved, and is available for creating virtual machines.
- Inactive: This status indicates that the virtual machine template is imported, but not available.
- Creating: This status indicates that the virtual machine template is in the process of being created from a virtual machine. See Section 6.8.3, "Saving a Virtual Machine as a Template".
- Create Error: This status indicates that there were some errors during the creating process. Delete it and try again to save a virtual machine as the template.

5.1.3 Reimporting a Virtual Machine Template

If an error occurs during downloading from an external source, check if the URL or proxy URL is correct, and then reimport the virtual machine template.

To reimport a virtual machine template:

1. On the Virtual Machine Templates page, select the virtual machine template you want to reimport, and click **Reimport**.
2. Enter the URL. When using a proxy, select **Use Proxy**.
3. Click **Reimport**.

5.1.4 Approving the Imported Virtual Machine Template

After importing, the status of virtual machine templates is `Pending`. After the `Manager` or `Administrator` approves them, the status changes to `Active` and the virtual machine now becomes an available template.

To approve an imported virtual machine template, you must have the `Manager` or `Administrator` role. On the Virtual Machine Templates page, select the template you want to approve, and then click **Approve**.

5.1.5 Editing a Virtual Machine Template

To edit a virtual machine template, perform the following:

1. On the Virtual Machine Templates page, select the template you want to update, and click **Edit**.
2. Update the template parameters. Click **Apply**.

   For more information about the template parameters, refer to Section 5.1.1, "Importing a Virtual Machine Template".

5.1.6 Deleting a Virtual Machine Template

To delete a virtual machine template, perform the following:

1. On the Virtual Machine Templates page, select the template you want to delete, and click **Delete**.
2. When prompted, confirm the delete operation.

5.2 Importing Virtual Machine Images

You can import virtual machines from outside of Oracle VM Manager, and use them directly.

Oracle VM Manager allows you to import both Oracle VM virtual machines and VMware virtual machines. When you import VMware virtual machines, Oracle VM Manager converts them to Oracle VM virtual machines automatically (Virtual to Virtual, V2V).

This section includes the following topics:

5.2.1 Importing a Virtual Machine Image

Note: Before you import an Oracle VM virtual machine, make sure the configuration file is named `vm.cfg`.

Depending on where your virtual machines are located, on the Virtual Machine Server, on other computers, or on the Internet, you can import a virtual machine image from different resources. You can also convert a Linux or Windows host to a virtual machine (Physical to Virtual, P2V).

- Downloading from External Source
- Converting a Linux or Windows Host to a Virtual Machine (P2V)

When importing a VMware virtual machine, make sure you have enough free disk space in the /OVS/tmp directory to convert the VMware virtual machine to an Oracle VM virtual machine. Oracle VM requires at least twice the disk space of the VMware virtual machine.

5.2.1.1 Selecting from the Server Pool

If you already have some virtual machine images on your Server Pool, you can discover and register them in Oracle VM Manager directly, without going through the downloading or copying process.

Before importing, make sure the component files of the virtual machine are stored in the folder /OVS/running_pool/*virtual_machine_name* on the Virtual Machine Server, and make sure the configuration file is named `vm.cfg`.

When importing, Oracle VM Agent updates the directory information in `vm.cfg` automatically. If you need to modify the `vm.cfg` file, refer to Appendix A, "Preparing Virtual Machines For Importing".

To discover and select an existing virtual machine image from the Server Pool, and register it in Oracle VM Manager, perform the following:

1. On the Resources page, click **Virtual Machine Images**, and then click **Import**.
2. Select **Select from Server Pool (Discover and register)**. Click **Next**.
3. On the General Information page, enter the following general information:
   - Server Pool Name

     Select the server pool on which the imported virtual machine will be located.
   - Sharing

     Select whether you want to share this virtual machine.

     `private`: This indicates that the virtual machine can only be used by the user who imports it.

     Shared (`group_name`): This indicates that the virtual machine can be used by members of this specific group.
   - Virtual Machine Image Name

     Select the virtual machine to be imported.

     Oracle VM Agent identifies the hypervisor type of the virtual machine directory, which can be Oracle VM or VMware. If both Oracle VM and VMware virtual machines are stored in the same directory, Oracle VM Agent only identifies the Oracle VM virtual machine, and ignores other types of virtual machines. If only the VMware virtual machine is detected, V2V (virtual machine to virtual machine) conversion is started.
   - Enable High Availability

     You can enable high availability for the imported virtual machine. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".
   - Operating System

     Select the guest operating system of the imported virtual machine.

- Virtual Machine System Username

  Enter the user name used to log in to the virtual machine.

- Virtual Machine System Password

  Enter the password used to log in to the virtual machine.

- Console Password

  Set the password for the VNC login to access the virtual machine.

- Confirm Console Password

Click **Next**.

4. Confirm the information.
5. After importing, the status of the virtual machine is `Pending`. You need to approve it to make it available. See Section 5.2.4, "Approving the Imported Virtual Machine Image".

   If the status turns out to be `Import Error`, click the error log link to check the detailed information.

5.2.1.2 Downloading from External Source

To download a virtual machine image from outside of the Server Pool, such as OTN:

```
http://www.oracle.com/technology/software/products/virtualization/vm_
templates.html
```

Or your own HTTP/FTP server, perform the following:

1. On the Resources page, click **Virtual Machine Images**, and then click **Import**.
2. Select **Download from External Source (HTTP and FTP)**. Click **Next**.
3. On the General Information page, enter the following general information:

   - Server Pool Name

     Select the server pool on which the imported virtual machine will be located.

   - Sharing

     Select whether you want to share this virtual machine, or keep it private.

     `Private`: This indicates that the virtual machine can only be used by the user who imports it.

     Shared (`group_name`): This indicates that the virtual machine can be used by members of a specific group.

   - Virtual Machine Image Name

     Enter a new name for the imported virtual machine. This must be unique. The name will be used as the name of the directory under /OVS/running_pool, where the files associated with this virtual machine are stored.

     A virtual machine image name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) and hyphen (-) characters. The maximum name length is 48 characters.

   - Enable High Availability

You can enable high availability for the imported virtual machine. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".

- Operating System

  Select the guest operating system of the imported virtual machine.

- Virtual Machine System Username

  Enter the user name used to log in to the virtual machine.

- Virtual Machine System Password

  Enter the password used to log in to the virtual machine.

- Console Password

  Set the password for the VNC login to access the virtual machine.

- Confirm Console Password

Click **Next**.

4. On the Import Information page, enter the URL of the folder where the virtual machine you want to import is located. For example, enter either of the following:

   ```
   http://example.com/vm
   ftp://username:password@example.com/vm
   ```

   If you are importing a VMware virtual machine, enter the URL of the .vmx file. For example, enter:

   ```
   ftp://username:password@example.com/vm/vm.vmx
   ```

   Oracle VM Manager first copies the necessary files of the virtual machine, then converts the virtual machine to an Oracle VM virtual machine, and finally generates the vm.cfg file. After conversion, the VMware virtual machine will be deleted.

   When using a proxy, select **Use Proxy**, and enter the proxy address.

   Click **Next**.

5. Confirm the information.

6. After importing, the status of the virtual machine is `Pending`. You need to approve it to make it available. See Section 5.2.4, "Approving the Imported Virtual Machine Image".

   If the status turns out to be `Import Error`, click the error log link to check the detailed information.

5.2.1.3 Converting a Linux or Windows Host to a Virtual Machine (P2V)

You can convert a Linux or Windows host to an Oracle VM virtual machine template (Physical to Virtual, P2V). The conversion process is similar to downloading a template from external source.

Before conversion, you need to restart the Linux or Windows computer with the Oracle VM Server CD, and use P2V utility to start the conversion. For more information on how to use the P2V utility, see the ***Oracle VM Server User's Guide***.

During the conversion, you are prompted to enter the number of virtual CPUs and memory size, and this information is configured in the vm.cfg file. The disk size in the virtual machine is determined by the size of the disks you have chosen to be included

in the virtual machine. Make sure the Virtual Machine Server has sufficient resources for the conversion (disk space).

The converted virtual machine is a hardware virtualized machine (HVM).

To convert a Linux or Windows host to a virtual machine:

1. On the Resources page, click **Virtual Machine Images**, and then click **Import**.
2. Select **Linux/Windows P2V Import**. Click **Next**.
3. On the General Information page, enter the following general information:
   - Server Pool Name

     Select the server pool on which the imported virtual machine will be located.
   - Sharing

     Select whether you want to share this virtual machine, or keep it private.

     `Private`: This indicates that the virtual machine can only be used by the user who imports it.

     Shared (`group_name`): This indicates that the virtual machine can be used by members of a specific group.
   - Virtual Machine Image Name

     Enter a name for the imported virtual machine. This must be unique. The name will be used as the name of the directory under /OVS/running_pool, where the files associated with this virtual machine are stored.
   - Enable High Availability

     You can enable high availability for the imported virtual machine. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".
   - Operating System

     Select the guest operating system of the imported virtual machine.
   - Virtual Machine System Username

     Enter the user name used to log in to the virtual machine.
   - Virtual Machine System Password

     Enter the password used to log in to the virtual machine.
   - Console Password

     Set the password for the VNC login to access the virtual machine.
   - Confirm Console Password.

   Click **Next**.
4. On the Import Information page, enter the host name or IP address of the computer. For example, enter:

   ```
   hostname.example.com
   ```

   When using a proxy, select **Use Proxy**, and enter the proxy address.

   Click **Next**.
5. Confirm the information.

6. After importing, the status of the virtual machine is `Pending`. You need to approve it to make it available. See Section 5.2.4, "Approving the Imported Virtual Machine Image".

   If the status turns out to be `Import Error`, click the error log link to check the detailed information.

5.2.2 Statuses of Virtual Machine Images

The imported virtual machine can be one of the following statuses:

- Importing: This status indicates that the virtual machine is in the process of being imported.
- Pending: This status indicates that the virtual machine has been imported successfully, and is waiting for the approval of the `Manager`.
- Import Error: This status indicates that there were some errors during the importing process. Click the link to check the error log. You may need to reimport the virtual machine, or delete it.

5.2.3 Reimporting a Virtual Machine Image

If an error occurs during downloading from an external source, check if the URL or proxy URL is correct, and then reimport the virtual machine.

To reimport a virtual machine:

1. On the Virtual Machine Images page, select the virtual machine you want to reimport, and click **Reimport**.
2. Enter the URL. When using a proxy, select **Use Proxy**.
3. Click **Reimport**.

5.2.4 Approving the Imported Virtual Machine Image

The process of approving and managing virtual machine images is similar to that of virtual machine templates. For more information, refer to Section 5.1.4, "Approving the Imported Virtual Machine Template".

After approving, click the **Virtual Machines** tab, and you can find the virtual machine is displayed in the Virtual Machines list.

You can change the preferred server and other configurations of the imported virtual machine. See Section 6.7, "Editing Virtual Machine Configuration".

5.2.5 Editing a Virtual Machine Image

To edit a virtual machine image, perform the following:

1. On the Virtual Machine Images page, select the virtual machine you want to update, and click **Edit**.
2. Update the virtual machine parameters. Click **Apply**.

   For more information about the virtual machine parameters, refer to Section 5.2.1, "Importing a Virtual Machine Image".

5.2.6 Deleting a Virtual Machine Image

To delete a virtual machine image, perform the following:

1. On the Virtual Machine Images page, select the virtual machine you want to delete, and click **Delete**.
2. If prompted, confirm the delete operation.

5.3 Importing ISO Files

You can import ISO files to provide installation media for creating virtual machines. This section includes the following topics:

- Importing an ISO File
- Statuses of ISO Files
- Reimporting an ISO File
- Approving the Imported ISO File
- Changing Status of an ISO File
- Deleting an ISO File

5.3.1 Importing an ISO File

Common rules about ISO files management:

- Any user can import an ISO file.
- The `Administrator` or server pool `manager` approves the imported ISO files.
- All ISO files of one image should belong to the same ISO group.
- All users in the same server pool can share ISO files on the server pool.

Depending on where your ISO files are located, on the Virtual Machine Server, on other computers, or on the Internet, you can import ISO files from different resources as follows:

- Selecting from the Server Pool
- Downloading from External Source

5.3.1.1 Selecting from the Server Pool

If you already have some ISO files on your Server Pool, you can discover and register them in Oracle VM Manager directly.

Before importing, make sure the ISO files are in the folder /OVS/iso_pool/*iso_group_name* on the Virtual Machine Server. You can also download ISO files from other computers, or from the Internet, and then copy them to this folder.

To select an existing ISO file on the Server Pool, and register it in Oracle VM Manager, perform the following:

1. On the Resources page, click **ISO Files**, and then click **Import**.
2. Select **Select from Server Pool (Discover and register)**. Click **Next**.
3. On the General Information page, select the following ISO file information:
   - Server Pool Name

     Select the server pool on which the ISO file is stored.
   - ISO Group

     Select the ISO group. One ISO group may contain multiple ISO files.

- ISO Label

  Select the ISO file you want to import.

Click **Next**.

4. Confirm the information.
5. After importing, the status of the ISO file is `Pending`. You need to approve it to make it available to use. See Section 5.3.4, "Approving the Imported ISO File".

5.3.1.2 Downloading from External Source

To download an ISO file from outside of the Server Pool, such as your own HTTP or FTP server, or from the Internet, perform the following:

1. On the Resources page, click **ISO Files**, and then click **Import**.
2. Select **Download from External Source (HTTP and FTP)**. Click **Next**.
3. On the General Information page, enter the following ISO file information:
   - Server Pool Name

     Select the server pool on which the ISO file is to be used and stored.

   - ISO Group

     Enter the name of the ISO group. One ISO group may contain multiple ISO files. The name will be used as the name of the directory under /OVS/iso_pool, where the ISO files of this group are stored.

   - ISO Label

     Enter the ISO label used to identify the imported ISO file. For example, enter `CD1`.

     An ISO label must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) and hyphen (-) characters. The maximum label length is 100 characters.

   - URL

     Enter the path where the ISO file is located. You can import the ISO file through an FTP service or through an HTTP web service. For example, enter an address similar to the following:

     http://example.com/el5_img/disc1.iso

     ftp://username:password@example.com/el5_img/disc1.iso

     When using a proxy, select **User Proxy** and enter the proxy address. For example, enter a proxy address similar to the following:

     http://example.com:8888

   Click **Next**.
4. Confirm the information.
5. After importing, the status of the ISO file is `Pending`. You need to approve it to make it available for creating virtual machines. See Section 5.3.4, "Approving the Imported ISO File".

5.3.2 Statuses of ISO Files

The imported ISO file can be one of the following statuses:

- Importing: This status indicates that the ISO file is in the process of being imported.
- Pending: This status indicates that the ISO file has been imported successfully, and is waiting for the approval of the `Manager`.
- Import Error: This status indicates that there were some errors during the importing process. Reimport the ISO file, or delete it.
- Active: This status indicates that the ISO file has been approved, and is available for creating virtual machines.
- Inactive: This status indicates that the ISO file is imported successfully, but not available.

5.3.3 Reimporting an ISO File

If an error occurs during external import, check if the URL or proxy URL is correct, and then reimport the ISO file.

To reimport an ISO file:

1. On the ISO Files page, select the ISO file you want to reimport, and click **Reimport**.
2. Enter the URL. When using a proxy, select **Use Proxy**.
3. Click **Reimport**.

5.3.4 Approving the Imported ISO File

The process of approving, and managing ISO files is similar to that of virtual machine templates. For more information, refer to Section 5.1.4, "Approving the Imported Virtual Machine Template".

5.3.5 Changing Status of an ISO File

To change the status of the ISO files, perform the following:

1. Select the ISO file and click **Edit**.
2. Select the status. It can be **Active** or **Inactive**. Click **Apply**.

Only active ISO files are available to users.

Note: Only an `administrator` or server pool `manager` of the server pool can approve, and manage the imported ISO files and virtual machines.

5.3.6 Deleting an ISO File

If you do not need an ISO file, or there are errors during the ISO file importing process, you can delete it.

To delete an ISO file, from the ISO page, select the ISO file you want to delete, and click **Delete**.

5.4 Managing Shared Virtual Disks

You can create shared virtual disks, and use them to expand your virtual machines storage capacity. The available virtual disks can also be used by other users in the group.

Oracle VM now only supports using files as virtual disks, namely, the prefix of the disk in the configuration file can only be `file`. Physical devices can be used, but cannot be changed through Oracle VM Manager. The following is an example:

```
disk = [ 'file:/tmp/para_seed/system.img,hda,w', ]
```

For more information on how to assign shared hard disks to a virtual machine, refer to Section 6.7.3, "Storage".

This section includes the following topics:

5.4.1 Creating a Shared Virtual Disk

To create a shared virtual disk, perform the following:

1. On the Resources page, click **Shared Virtual Disk**, and then click **Create Shared Virtual Disk**.
2. On the Add Shared Virtual Disks page, enter or select the following parameters:
   - Virtual Disk Name

     Enter the disk name.

     A disk name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) and hyphen (-) characters. The maximum name length is 200 characters.
   - Virtual Disk Size (MB)

     Allocate at least 1024 MB for the virtual disk.
   - Server Pool Name

     Select the server pool on which the shared virtual disk can be used, and shared.
   - Group Name

     Select the group that can use this shared virtual disk. You can select one of the following groups:
     - **My Workspace**: The virtual disk will be a private one, and only you can use it.
     - `group_name`: Select a specific group with whom you want to share this virtual disk. If the virtual disk is available after creation, any member of this group can use it.
3. Confirm the information you have entered.

5.4.2 Searching a Shared Virtual Disk

You can search shared virtual disks for a particular server pool and group.

To search a shared virtual disk, perform the following:

1. The search criteria include: virtual disk name, server pool name, group name, status. Use % as a wildcard.
2. Click **Search** to view the shared virtual disks.

5.4.3 Deleting a Shared Virtual Disk

Note: Make sure no application is using the virtual disk before you delete it.

To delete a shared virtual disk, perform the following:

1. Select the shared virtual disk, and click **Delete**.
2. Confirm the delete operation.

After you delete the virtual disk, all the files on it will be deleted as well.

6 Managing Virtual Machines

A virtual machine contains a guest operating system and some preinstalled applications. It runs on a Virtual Machine Server.

Before you create a new virtual machine, ensure that the following resources are available:

- A server pool
- A Virtual Machine Server to run the virtual machine
- Imported ISO files for creating virtual machines from installation media, or imported virtual machine templates for creating virtual machines based on templates

This chapter describes how to create and use virtual machines. It includes the following sections:

> **Note:** As a user with the `User` role, you can only manage your virtual machines, and cannot manage virtual machines created by other users. Only the `Manager` or the `Administrator` can manage all the virtual machines in the server pool.

6.1 Overview of Virtual Machines

Virtual machines in Oracle VM Manager have various types and statuses during the life cycle.

This section introduces:

6.1.1 Virtual Machine Types

This section describes the following types of virtual machines in Oracle VM Manager:

- Private Virtual Machine

  By default, a virtual machine belongs to the user who created it. Only the user who created the virtual machine can view and manage the virtual machine. The **My Workspace** group contains all the private virtual machines which the user has created.

- Shared Virtual Machine

  You can share virtual machines with members of specific groups. For example, when you deploy a virtual machine, you can grant access rights to members of another group. Such a virtual machine is then known as a shared virtual machine.

- Public Virtual Machine

  Virtual machines that are shared among all users are known as public virtual machines. Everyone can view and deploy public virtual machines.

Note: Users with the **User** role and **Manager** role may be restricted from accessing some specific virtual machines.

6.1.2 Virtual Machine Statuses

The status of a virtual machine reflects the operation process which the virtual machine is undergoing.

The status of a virtual machine can be one of the following:

6.1.2.1 Creating

When the creation of a virtual machine is triggered, its status is set to `Creating`. This status indicates that the virtual machine is being created, and cannot be used.

6.1.2.2 Initializing and Running

When you start a virtual machine, the status changes from `Powered Off` to `Initializing`. Periodically refresh the virtual machine until the status changes from `Initializing` to `Running`. Now, you can log on to the running virtual machine, or perform live migration.

6.1.2.3 Pausing, Paused and Unpausing

After you pause a running virtual machine to stop it temporarily, its status changes from `Running` to `Pausing`. Periodically refresh the virtual machine until the status changes from `Pausing` to `Paused`.

When you unpause the virtual machine, the status changes from `Paused` to `Unpausing`. Periodically refresh the virtual machine until the status changes from `Unpausing` to `Running`.

6.1.2.4 Suspending, Suspended and Resuming

After you suspend a running virtual machine, its status changes from `Running` to `Suspending`. Periodically refresh the virtual machine until the status changes from `Suspending` to `Suspended`.

When you resume the suspended virtual machine, the status changes from `Suspended` to `Resuming`. Periodically refresh the virtual machine until the status changes from `Resuming` to `Running`.

6.1.2.5 Shutting Down and Powered Off

After you shut down a virtual machine, its status changes from `Running` to `Shutting Down`. Periodically refresh the virtual machine until the status changes from `Shutting Down` to `Powered Off`.

A virtual machine with the `Powered Off` status is available for deploying, cloning, or starting.

6.1.2.6 Saving

When you save a virtual machine as a template, the status of the original virtual machine is set to `Saving`. Periodically refresh the virtual machine until the status changes from `Saving` to `Powered Off`.

6.1.2.7 Cloning

During the cloning process, the status of the original virtual machine, based on which you clone the virtual machines, is set to the `Cloning` status. Periodically refresh the virtual machine until the status changes from `Cloning` to `Powered Off`.

6.1.2.8 Migrating

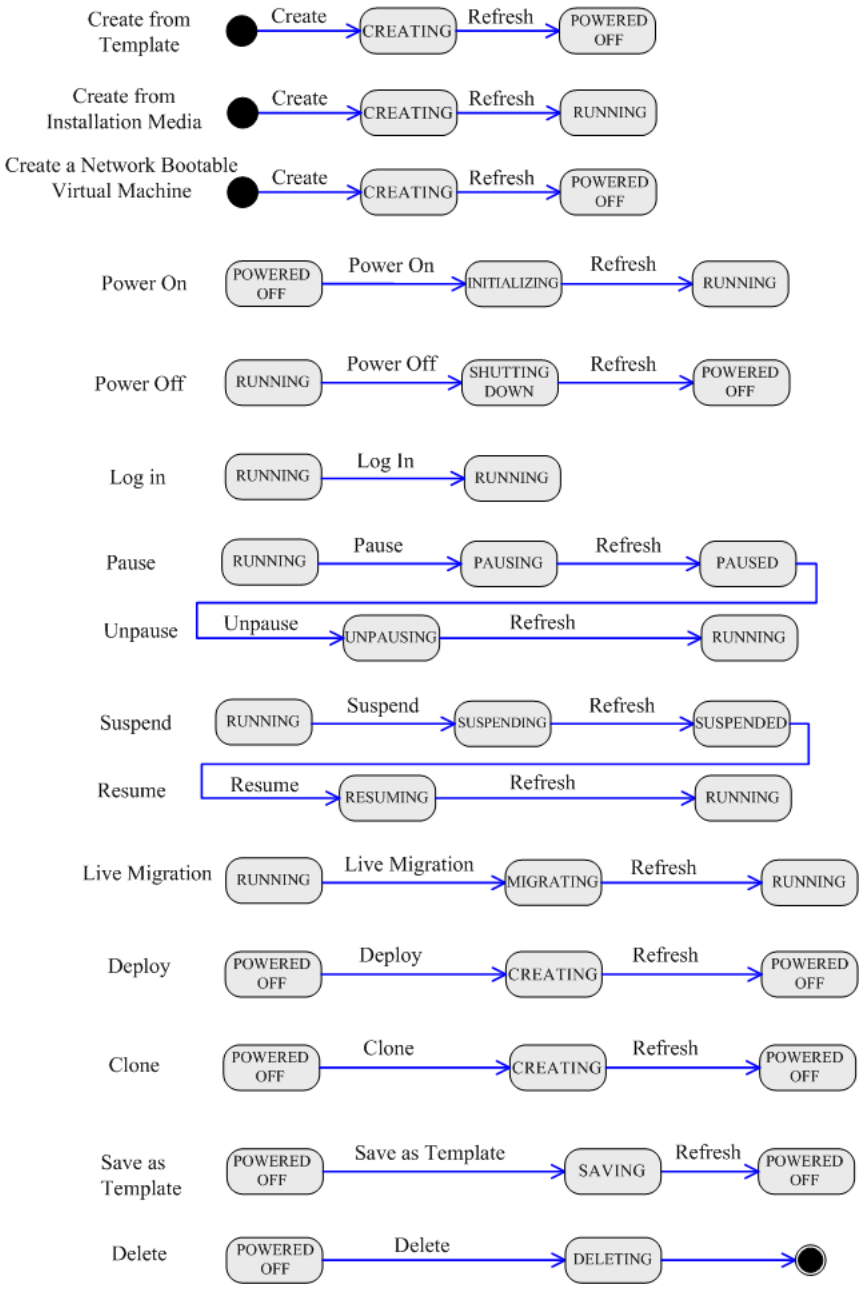
When you perform live migration, the status of the virtual machines changes from `Running` to `Migrating`. Periodically refresh the virtual machine until the status changes from `Migrating` to `Running`.

6.1.2.9 Error

The `Error` status indicates that there are some errors with the virtual machine, and it cannot be used. To solve the problem, perform the following:

1. On the Virtual Machines page, click the **Show** link of the virtual machine and check the error log information for more details. See Appendix D.6, "The Status of the Virtual Machine Is "Error"".
2. Shut down the virtual machine, and then retry your operation.
3. If the error persists, delete the virtual machine and create a new one.

Figure 6–1 Virtual Machine Status Mechanism



6.1.3 Life Cycle Management of a Virtual Machine

Typically, the life cycle of a virtual machine consists of the following process:

1. Create a virtual machine. See Section 6.3, "Creating a Virtual Machine".

2. Start the virtual machine. See Section 6.4.1, "Starting a Virtual Machine".
3. The virtual machine is now running, and you can access it using the Console. See Section 6.5, "Connecting to a Virtual Machine's Console".
4. To reduce system resource consumption, shut down the virtual machine when it is not in use. See Section 6.4.2, "Shutting Down a Virtual Machine".
5. When you no longer require the virtual machine, delete it. See Section 6.10, "Deleting a Virtual Machine".

The life cycle of a virtual machine created from template is slightly different from the one created from installation media, as shown in Figure 6–2 and Figure 6–3.

Figure 6–2 Life Cycle of a Virtual Machine Created from Template

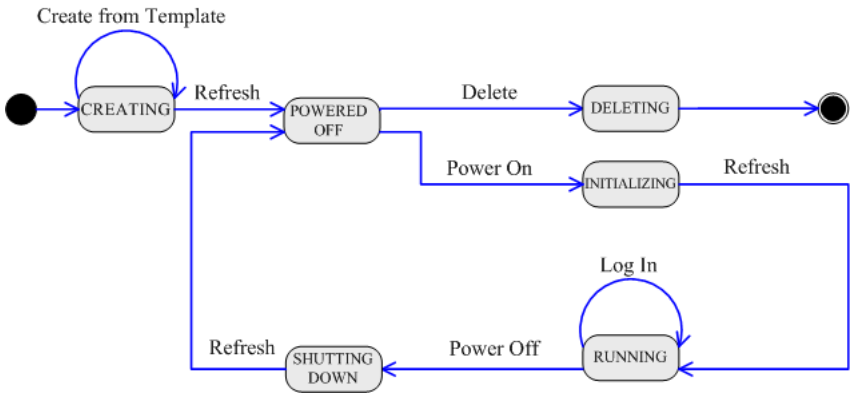
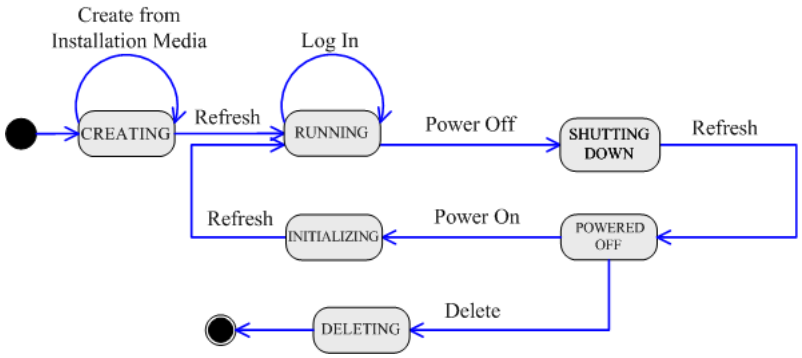


Figure 6–3 Life Cycle of a Virtual Machine Created from Installation Media



During the life cycle of the virtual machine, the following actions can be taken:

- To view virtual machine error logs, see Section 6.1.4, "Viewing Virtual Machine Error Logs".
- To stop the virtual machine temporarily, see Section 6.4.3, "Pausing and Unpausing a Virtual Machine".
- To move data stored in the memory to the hard disk, and suspend the virtual machine, see Section 6.4.4, "Suspending and Resuming a Virtual Machine".
- To modify configurations of the virtual machine, see Section 6.7, "Editing Virtual Machine Configuration".
- To deploy the virtual machine to another server pool, and share it with other group members, see Section 6.8.1, "Deploying a Virtual Machine".

- To create multiple copies of the virtual machine, and share them with other users, see Section 6.8.2, "Cloning Virtual Machines".
- To save the virtual machine as a template, based on which other users can create their virtual machines, see Section 6.8.3, "Saving a Virtual Machine as a Template".
- To move the virtual machine to another server pool with applications on the virtual machine running, see Section 6.9, "Migrating a Virtual Machine".
- To delete the virtual machine when it is stuck in a certain status, see Section 6.10.2, "Deleting a Virtual Machine Stuck in a Certain Status".

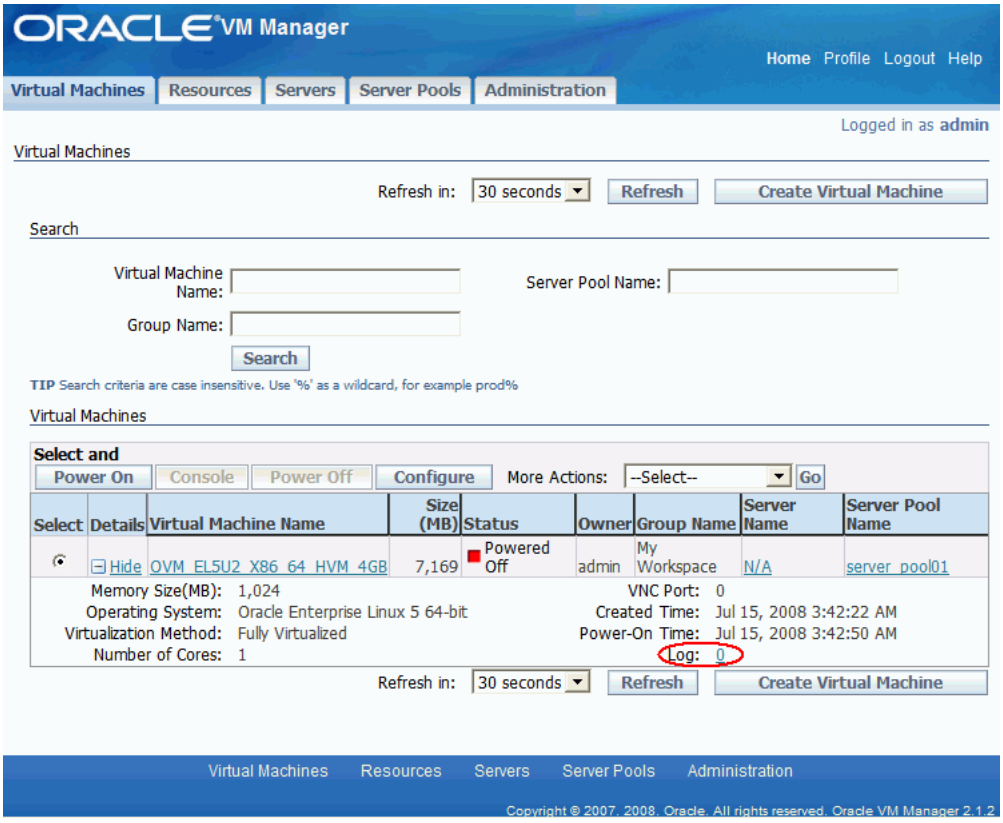
6.1.4 Viewing Virtual Machine Error Logs

The errors that occur when you create or run a virtual machine are logged in Oracle VM Manager. The error log provides you with essential details for troubleshooting.

To view the error log information, go to the Virtual Machines page, click the **Show** link, and then click the **Log** link. The number displayed here reflects the number of log items.

The error log information includes: operation, operation details, start time, and status. Appendix D.6, "The Status of the Virtual Machine Is "Error"" describes the error logs and how to solve the problems.

Figure 6–4 Error Log



6.2 Supported Guest Operating Systems

An operating system installed inside a virtual machine is known as a guest operating system. Oracle VM supports a variety of guest operating systems. For information on supported guest operating system, see *Oracle VM Server User's Guide*.

6.3 Creating a Virtual Machine

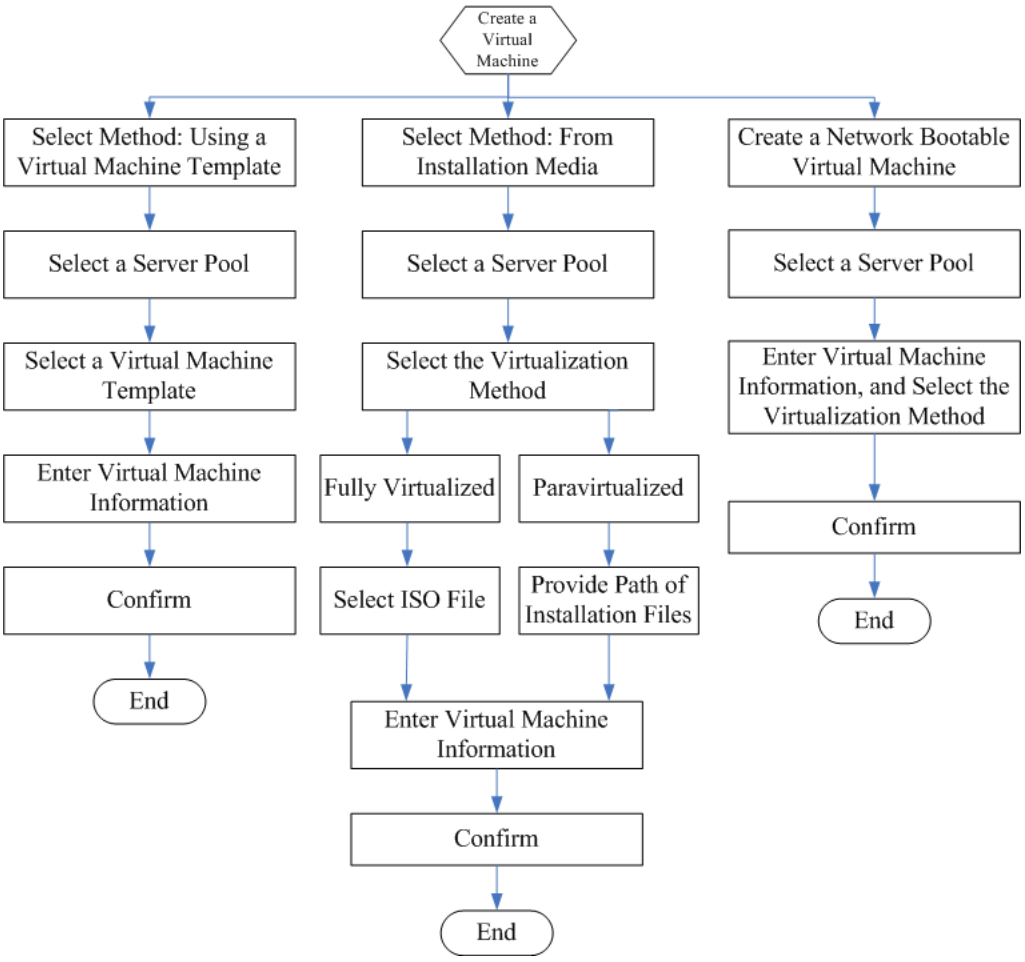
Depending on what resources you have, you can obtain a virtual machine by using one of the following methods:

- If you have imported some virtual machine templates, you can create a new virtual machine by using a virtual machine template. See Section 6.3.1, "Creating a New Virtual Machine Based on Virtual Machine Template".
- If you have imported some ISO files, you can create a new virtual machine from the installation media, and then install the guest operating system by using the ISO files. See Section 6.3.2, "Creating a New Virtual Machine from Installation Media".
- If you want to start the virtual machine using Preboot Execution Environment (PXE) over a network, you can create a network bootable (PXE boot) virtual machine. See Section 6.3.3, "Creating a Network Bootable (PXE boot) Virtual Machine".
- You can also import a prebuilt virtual machine image directly. See Section 5.2.1, "Importing a Virtual Machine Image".

Before creating a new virtual machine, you must have a server pool that contains a Virtual Machine Server. See Section 3.2, "Creating a Server Pool" for information on creating server pools, and Section 4.1, "Adding a Server" for information on adding more Virtual Machine Servers.

Figure 6–5 shows the basic steps required to create a new virtual machine.

Figure 6–5 Basic Steps to Create a New Virtual Machine



6.3.1 Creating a New Virtual Machine Based on Virtual Machine Template

Typically, a virtual machine template can contain:

- An operating system
- The basic configuration, such as the number of virtual CPUs, the amount of memory, the size of disk, and so on
- Preinstalled applications

For information on how to obtain virtual machine templates, see Section 5.1, "Importing Virtual Machine Templates".

You can create a virtual machine by cloning a template. The virtual machine will then inherit all the content and configuration from the template.

To create a virtual machine based on a template, perform the following:

1. Select **Create virtual machine based on virtual machine template**. Click **Next**.
2. Select the server pool where the virtual machine is to be located, and select the preferred server.

   A preferred server is a Virtual Machine Server that provides resources such as memory, CPUs, virtual network interfaces (VIFs), and disk for the virtual machine. If you select only one Virtual Machine Server as the preferred server, the virtual

machine then always starts from and runs on this server. If you select multiple preferred servers, each time the virtual machine starts, it will choose to run on the one with the maximum resources available (including memory and CPU).

When creating a virtual machine, there are two ways to select a Virtual Machine Server for the virtual machine:

- Auto: In the Auto mode, when the virtual machine starts, Oracle VM automatically assigns a Virtual Machine Server with the maximum resources available to run the virtual machine. The virtual machine then runs on this Virtual Machine Server temporarily, until it is shut down.
- Manual: In the Manual mode, you select one or more Virtual Machine Servers as the preferred servers. The virtual machine then starts from and runs on the preferred server with the maximum resources available.

Note: If none of the preferred servers can provide sufficient resources, the virtual machine may fail to start.

Click **Next** to proceed to the next page.

3. Select the template, which the virtual machine is based on. Click **Next**.
4. Enter the virtual machine name, and set the console password. The name will be used as the name of the directory under /OVS/running_pool, where the files associated with this virtual machine are stored.

   If you want to enable high availability (HA) for this virtual machine, select **Enable High Availability**. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".
5. Optionally, click **Add Row** to add more virtual network interfaces. By default, virtual network interfaces are named *VIF0*, *VIF1*, *VIF2*, and so on. You can rename them *after* creating the virtual machine. See Section 6.7.2, "Network".

   Oracle VM automatically assigns a random MAC address to the virtual network interface.

   Select a bridge for the virtual network interface. By default, the number of bridges is the same as that of physical adaptors, and the bridges are named after physical adaptors. For example, if the Virtual Machine Server has several physical adaptors, *eth0*, *eth1*, *eth2*, and so on, the bridges are then named *xenbr0*, *xenbr1*, *xenbr2*, and so on.

   When creating a virtual machine, you can set a maximum of *three* virtual network interfaces. After the virtual machine is created, you can set a maximum of *eight* virtual network interfaces. See Section 6.7.2, "Network".

   Click **Next** to proceed to the next page.
6. Confirm the virtual machine information.
7. The process of creating a virtual machine takes time. Click **Refresh** periodically until the status of the virtual machine changes from `Creating` to `Powered Off`. You can choose to refresh manually, or to refresh every 30 seconds.

   If the status turns out to be `Error`, refer to Section 6.1.2.9, "Error" for how to solve this problem.

Now you can start and log in to the virtual machine. By default, the virtual machine is private. Only you can access it.

In the virtual machine list, click **Show** to view the detailed information of the virtual machine.

Some parameters of the virtual machine, such as the virtual network interface and the boot source, are set by default. You cannot change them during the process of creating the virtual machine. If you want to change them *after* creating the virtual machine, see Section 6.7, "Editing Virtual Machine Configuration".

6.3.2 Creating a New Virtual Machine from Installation Media

If you have ISO files available, you can create a virtual machine from installation media, and configure the parameters manually. To create a virtual machine from installation media:

1. Select **Create from installation media**. Click **Next**.
2. Select the server pool where the virtual machine is to be located, and select a Virtual Machine Server on which the virtual machine will run.

   Select `Auto` to assign a Virtual Machine Server automatically to the virtual machine, or select `Manual` to specify one or more preferred servers manually. For more information on the preferred server, see Step 2 in Section 6.3.1, "Creating a New Virtual Machine Based on Virtual Machine Template".

   Click **Next** to proceed to the next page.
3. Select the virtualized method: **Fully Virtualized**, or **Paravirtualized**.

   - Fully Virtualized

     Select an ISO file from the list. For more information on supported guest operating systems, see *Oracle VM Server User's Guide*.

     If you require more than one ISO file to create the virtual machine, select the first ISO file here. After creating the virtual machine, you need to log in to the virtual machine to install the guest operating system. See Section 6.5.2, "Logging In to a Virtual Machine".

     See Also: For more information on importing ISO files, refer to Section 5.3.1, "Importing an ISO File".

     Note: Do not use an ISO image that has Oracle VM Server installed on it. Otherwise, after creating the virtual machine, you will not be able to start it.

     In the fully virtualized method, also known as the hardware virtualized machine (HVM), the unmodified guest operating system runs on the virtual machine. It traps and emulates every I/O and hardware instruction.

     To apply the fully virtualized mode, you must have either an Intel processor with Virtualization Technology (VT) extension, or an AMD processor with Secure Virtual Machine (SVM) extension (also called AMD-V) available on the host. A complete list of compatible processors is available at:

     `http://wiki.xensource.com/xenwiki/HVM_Compatible_Processors`

Note: Make sure the CPU and operating system support HVM, and you have enabled it in the BIOS. For more information, see Appendix D.3, "Cannot Create a Virtual Machine from Installation Media".

If the CPU does not support HVM, use the paravirtualized method to create the virtual machine.

- Paravirtualized

  Before you create the virtual machine using the paravirtualized method, mount the ISO file on an NFS share, or HTTP or FTP server:

  ```
  # mkdir mount-point
  # mount -o loop,ro cd1.iso mount-point
  ```

  Where, *mount-point* refers to the directory to which you want to mount the files. If you have multiple ISO files, you can mount each ISO file and copy the contents into a single directory, and then mount that directory.

  In the `Resource Location` field, enter the full path of the *mount point*. HTTP, FTP, and NFS are supported. For example, enter a path similar to the following:

  ```
  http://example.com/EL5-x86
  ```

  In the paravirtualized method, the guest operating system is recompiled before being installed on a virtual machine. Also, the virtual machine does not need to trap privileged instructions. Trapping is a method used to handle unexpected conditions, or conditions that are not allowed, which is time-consuming and can impact operating system performance. Without trapping privileged instructions, the paravirtualized operating system runs at near native speed.

4. Enter the following information for the virtual machine:

   - Virtual Machine Name

     Enter the name of the virtual machine. This must be unique. The name will be used as the name of the directory under /OVS/running_pool on the Virtual Machine Server, where the files associated with this virtual machine are stored.

     A virtual machine name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) character. The maximum name length is 200 characters.

   - Number of Virtual CPUs

     Select an appropriate number of virtual CPUs for the virtual machine according to the operating system and application consumptions. You can allocate a maximum of 32 virtual CPUs. The larger number you select, the more CPU resources the virtual machine can get.

     If the sum of virtual CPUs on all the running virtual machines exceeds that of physical CPUs, each virtual CPU will get that fraction of CPU time. For example, if the sum of virtual CPUs on all the running virtual machines is 8, and you have 4 physical CPUs on the Virtual Machine Server, then each virtual CPU will get 4/8, namely 50%, of CPU time, given that all the virtual CPUs are fully utilized at the same time.

- Keyboard Layout

  Select an appropriate keyboard you need to use to interact with the virtual machine.

- Memory Size (MB)

  Allocate an appropriate amount of memory for the virtual machine. Allocate at least 256 MB of memory. When allocating memory, consider the following:

  – Memory consumption of applications that will run on the virtual machine

  – Memory consumption of applications that are running and will run on the Virtual Machine Server

  – Memory resources to be allocated to other virtual machines

- Virtual Disk Size (MB)

  Allocate at least 1024 MB of virtual disk. When allocating disk, consider the following:

  – Disk consumption of applications that will run on the virtual machine

  – Disk consumption of applications that are running and will run on the Virtual Machine Server

  – Disk resources to be allocated to other virtual machines

- Console Password

  Set the console password for connecting to the virtual machine by using VNC.

- Confirm Console Password

  Re-enter the console password.

If you want to enable high availability (HA) for this virtual machine, select **Enable High Availability**. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".

Click **Next** to proceed to the next page.

5. Optionally, click **Add Row** to add more virtual network interfaces (VIFs). By default, virtual network interfaces are named *VIF0*, *VIF1*, *VIF2*, and so on. You can rename them *after* creating the virtual machine. See Section 6.7.2, "Network".

   Oracle VM automatically assigns a random MAC address to the virtual network interface.

   Select a bridge for the virtual network interface. By default, the number of bridges is the same as that of physical adaptors, and the bridges are named after physical adaptors. For example, if the Virtual Machine Server has several physical adaptors, *eth0*, *eth1*, *eth2*, and so on, the bridges are then named *xenbr0*, *xenbr1*, *xenbr2*, and so on.

   When creating a virtual machine, you can set a maximum of *three* virtual network interfaces. After the virtual machine is created, you can set a maximum of *eight* virtual network interfaces. See Section 6.7.2, "Network".

   Click **Next** to proceed to the next page.

6. Confirm the virtual machine information you have entered.

7. The process of creating a virtual machine takes time. Click the **Refresh** button periodically until the status of the virtual machine changes from `Creating` to `Running`. You can choose to refresh manually, or to refresh every 30 seconds.

If the status turns out to be `Error`, refer to Section 6.1.2.9, "Error" for how to solve this problem.

Now you can log in to the virtual machine and install the guest operating system. See Section 6.5, "Connecting to a Virtual Machine's Console". By default, the virtual machine is private. Only you can access it.

In the virtual machine list, click **Show** to view the detailed information of the virtual machine.

Some parameters of the virtual machine, such as the virtual network interface and the boot mode, are set by default. You cannot change them during the process of creating the virtual machine. If you want to change them *after* creating the virtual machine, see Section 6.7, "Editing Virtual Machine Configuration".

6.3.3 Creating a Network Bootable (PXE boot) Virtual Machine

If you have neither virtual machine templates nor ISO files for the moment, you can create a network bootable (PXE boot) virtual machine that has the minimum configuration information, then start the virtual machine through Preboot Execution Environment (PXE) over a network later to install the guest operating system.

To create a network bootable (PXE boot) virtual machine, perform the following:

1. Select **Create a network bootable virtual machine (pxeboot)**. Click **Next**.
2. Select the server pool where the virtual machine is to be located, and select a Virtual Machine Server on which the virtual machine will run.

   Select `Auto` to assign a Virtual Machine Server automatically for the virtual machine, or select `Manual` to specify one or more preferred servers manually. For more information on the preferred server, see Step 2 in Section 6.3.1, "Creating a New Virtual Machine Based on Virtual Machine Template".

   Click **Next** to proceed to the next page.
3. Enter the following information for the virtual machine:
   - Virtual Machine Name

     Enter the name of the virtual machine. This must be unique. The name will be used as the name of the directory under /OVS/running_pool, where the files associated with this virtual machine are stored.

     A virtual machine name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) character. The maximum name length is 200 characters.
   - Virtualization Method

     Select `Fully Virtualized`, or `Paravirtualized`. See Step 3 in Section 6.3.2, "Creating a New Virtual Machine from Installation Media" for information on the difference between fully virtualized and paravirtualized.
   - Operating System

     Select the guest operating system of the virtual machine.
   - Number of Virtual CPUs

     Select an appropriate number of virtual CPUs for the virtual machine according to the operating system and application consumptions. You can allocate a maximum of 32 virtual CPUs. The larger number you select, the more CPU resources the virtual machine can get.

If the sum of virtual CPUs on all the running virtual machines exceeds that of physical CPUs, each virtual CPU will get that fraction of CPU time. For example, if the sum of virtual CPUs on all the running virtual machines is 8, and you have 4 physical CPUs on the Virtual Machine Server, then each virtual CPU will get 4/8, namely 50%, of CPU time, given that all the virtual CPUs are fully utilized at the same time.

- Memory Size (MB)

  Allocate an appropriate amount of memory for the virtual machine. Allocate at least 256 MB of memory. When allocating memory, consider the following:

  - Memory consumption of applications that will run on the virtual machine
  - Memory consumption of applications that are running and will run on the Virtual Machine Server
  - Memory resources to be allocated to other virtual machines

- Virtual Disk Size (MB)

  Allocate at least 1024 MB of virtual disk. When allocating disk, consider the following:

  - Disk consumption of applications that will run on the virtual machine
  - Disk consumption of applications that are running and will run on the Virtual Machine Server
  - Disk resources to be allocated to other virtual machines

- Console Password

  Set the console password for connecting to the virtual machine by using VNC.

- Confirm Console Password

  Re-enter the console password.

If you want to enable high availability (HA) for this virtual machine, select **Enable High Availability**. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".

Click **Next** to proceed to the next page.

4. Optionally, click **Add Row** to add more virtual network interfaces (VIFs). By default, virtual network interfaces are named *VIF0*, *VIF1*, *VIF2*, and so on. You can rename them *after* creating the virtual machine. See Section 6.7.2, "Network".

   Oracle VM automatically assigns a random MAC address to the virtual network interface.

   Select a bridge for the virtual network interface. By default, the number of bridges is the same as that of physical adaptors, and the bridges are named after physical adaptors. For example, if the Virtual Machine Server has several physical adaptors, *eth0*, *eth1*, *eth2*, and so on, the bridges are then named *xenbr0*, *xenbr1*, *xenbr2*, and so on.

   When creating a virtual machine, you can set a maximum of *three* virtual network interfaces. After the virtual machine is created, you can set a maximum of *eight* virtual network interfaces. See Section 6.7.2, "Network".

   Click **Next** to proceed to the next page.

5. Confirm the virtual machine information you have entered.

6. The process of creating a virtual machine takes time. Click the **Refresh** button periodically until the status of the virtual machine changes from `Creating` to `Powered Off`. You can choose to refresh manually, or to refresh every 30 seconds.

   If the status turns out to be `Error`, refer to Section 6.1.2.9, "Error" for how to solve this problem.

Before starting the virtual machine, you need to configure the DHCP and TFTP server first, and then start the virtual machine remotely over the network to install the guest operating system.

By default, the network bootable (PXE boot) virtual machine starts through PXE.

In the virtual machine list, click **Show** to view the detailed information of the virtual machine.

Some parameters of the virtual machine, such as the virtual network interface and the boot source, are set by default. You cannot change them during the process of creating the virtual machine. If you want to change them *after* creating the virtual machine, see Section 6.7, "Editing Virtual Machine Configuration".

6.4 Starting and Shutting Down a Virtual Machine

After a virtual machine is created, you can start it or shut it down. When a virtual machine is running, you can pause it or suspend it to stop it temporarily.

- Starting a Virtual Machine
- Shutting Down a Virtual Machine
- Pausing and Unpausing a Virtual Machine
- Suspending and Resuming a Virtual Machine

6.4.1 Starting a Virtual Machine

Starting a virtual machine is analogous to starting a computer by pressing the **Power On** button.

> **Note:** Ensure that the virtual machine status is `Powered Off` before you start it.

To start a virtual machine:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the virtual machine you want to start.
3. Click the **Power On** button.

Periodically, click the **Refresh** button until the virtual machine status changes from `Initializing` to `Running`. You can choose to refresh manually, or to refresh every 30 seconds.

6.4.2 Shutting Down a Virtual Machine

When you do not use the virtual machine and log out, shut it down to release system resources.

Note: Shut down the virtual machine only when the virtual machine status is `Running`.

To shut down a virtual machine, perform the following:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the virtual machine you want to shut down. The virtual machine status should be `Running`.
3. Click **Power Off**.

Note that if you have enabled high availability for this virtual machine, you need to shut it down by clicking the **Power Off** button; otherwise, if you shut down the virtual machine through the guest operating system, high availability will take effect, and the virtual machine will restart instead of shutting down.

6.4.3 Pausing and Unpausing a Virtual Machine

Pausing a virtual machine allows you to save the virtual machine at a certain processing point, and resume it again quickly.

When you pause a virtual machine, the state of the virtual machine is saved, and the running operations will not be restarted as long as they have no persistent communication with other computers. All the settings in the virtual machine, and all the devices, such as CPUs, VIFs, amount of memory, and so on, remain the same. But the processes of the virtual machine are no longer scheduled by Oracle VM Server to be run on any CPU. Therefore if the virtual machine is running a server such as a Web server, it will appear to the clients that the virtual machine is shut down.

Note: Pause the virtual machine only when the virtual machine status is `Running`.

To pause a running virtual machine:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the virtual machine you want to pause.
3. Select **Pause**, and click **Go**.

To unpause the virtual machine, select **Unpause** and click **Go**. Unpausing a virtual machine is much faster than starting a virtual machine.

After unpausing, the applications resume from where they were paused, and the virtual machine content remains unchanged.

6.4.4 Suspending and Resuming a Virtual Machine

Use the Suspend function to save the status information of a running virtual machine to the disk. You can suspend a virtual machine when you need to back up the current status information, and restore it quickly.

After you suspend the virtual machine, all the status information is saved to the disk, and virtual machine is no longer running, thus the memory allocated to the virtual machine will be released for other virtual machines to use. When the virtual machine is suspended, the network connections will no longer be available.

Note: Suspend the virtual machine only when the virtual machine status is `Running`.

To suspend a running virtual machine:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the virtual machine you want to suspend.
3. Select **Suspend**, and click **Go**.

To resume the virtual machine, select **Resume** and click **Go**.

6.5 Connecting to a Virtual Machine's Console

If it is the first time you attempt to access a virtual machine, you need to install a plug-in to enable the **Console** button in Oracle VM Manager. After installing the plug-in, you can log in to the virtual machine.

- Installing the Console Plug-In
- Logging In to a Virtual Machine

6.5.1 Installing the Console Plug-In

The plug-ins you need to install vary, depending on which browser and operating system you are using to access Oracle VM Manager.

If you are using a Mozilla Firefox browser on Linux, download the Console Plug-in at: `http://oss.oracle.com/oraclevm/manager/RPMS`, and install it on the computer where your browser is running.

To install the Console Plug-in, perform the following:

1. Install the Console Plug-in using the command:

   ```
   # rpm -ivh ovm-console-version.rpm
   ```

   Where, *version* refers to the ovm-console version. It can be *1.0.0-2.x86_64* or *1.0.0-2.i386*.

2. If you have no standard installation of Mozilla Firefox, copy files:

   ```
   # cp /opt/ovm-console/etc/mozpluggerrc /etc/
   # cp /opt/ovm-console/bin/* /usr/bin
   # cp /opt/ovm-console/lib/mozilla/plugins/ovm-console-mozplugger.so
   /opt/firefox/plugins
   ```

   Where, */opt/firefox/plugins* refers to the Firefox plug-in folder.

3. Restart Mozilla Firefox.

If you are using Internet Explorer (IE) on Windows, you need to download and install the TightVNC-Java applet on the Oracle VM Manager host. For information on installing the TightVNC-Java applet, see *Oracle VM Manager Installation Guide*.

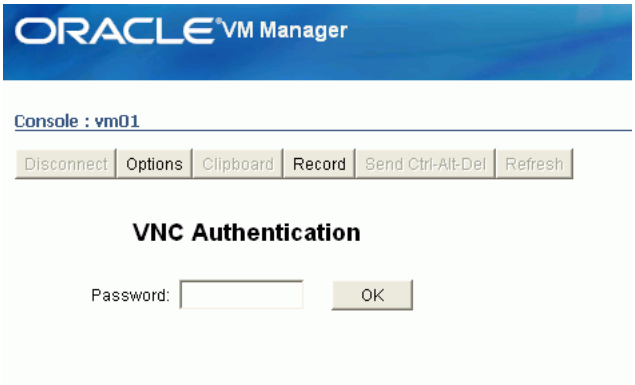
6.5.2 Logging In to a Virtual Machine

The virtual machine is now running, and the Console Plug-in has been installed, and you can log in to it by using the Console.

To log in to the virtual machine, perform the following:

1. On the Virtual Machines page, select the running virtual machine, and then click **Console**.
2. A VNC Authentication is displayed. Enter the console password, and click **OK**.

Figure 6–6 VNC Authentication



3. Enter the user name and password of the guest operating system to log in to the virtual machine.

After the VNC authentication, you may need to continue with some further tasks before you can use the virtual machine, depending on the method by which you created the virtual machine.

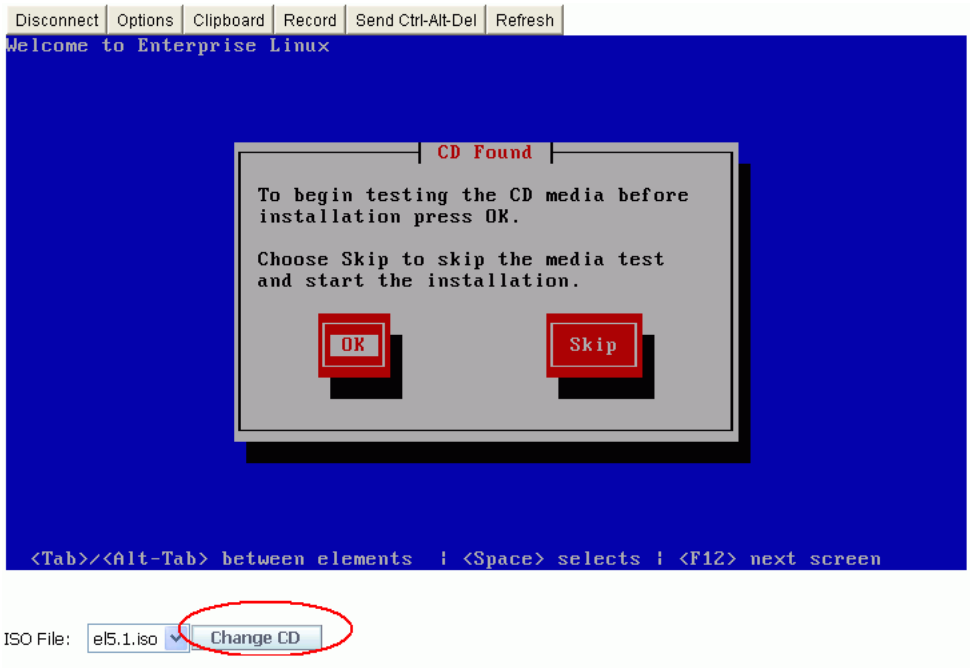
- If you created this virtual machine based on a template, you can directly use the guest operating system and applications installed in advance, without any further configurations.
- If you created this virtual machine using the fully virtualized method, the installation of the guest operating system is triggered after your first login. Follow the installation wizard to install the guest operating system.

  If you need more ISO files to complete the installation, select the next ISO file and then click **Change CD** to continue the installation, as shown in Figure 6–7, "Changing CD". Repeat this step until all the ISO files are installed.

  For information on the supported guest operating systems, see *Oracle VM Server User's Guide*.

  For more information on creating virtual machines using the fully virtualized method, refer to Section 6.3.2, "Creating a New Virtual Machine from Installation Media".

Figure 6–7 Changing CD



6.6 Viewing Details of a Virtual Machine

To view more details of the virtual machine:

1. Click the **Virtual Machines** tab.
2. In the **Details** column, click the **Show** link. You can see information such as, memory size, operating system, virtualization method, number of virtual CPUs, VNC port, creation time, power-on time, and a link to the log file.

   If the virtual machine is running or shutting down, you can click the link of the VNC port number to open the VNC Authentication window and log in.

   You can also click the link of the log number to view error log information. For more information about the error log, see Appendix D.6, "The Status of the Virtual Machine Is "Error"".

To view or change more configurations of the virtual machine, see Section 6.7, "Editing Virtual Machine Configuration".

6.7 Editing Virtual Machine Configuration

When creating a virtual machine, you can configure some of the parameters, such as the number of virtual CPUs, the size of memory, and so on; while the other parameters, such as boot source and the type of virtual network interfaces (VIFs), are assigned default settings by Oracle VM Manager, and you cannot configure them when creating the virtual machine. If needed, you can configure such parameters *after* the virtual machine is created.

To modify configurations of the virtual machine:

1. Click the **Virtual Machines** tab.
2. In the Virtual Machines table, you can

- Select the virtual machine you want to configure, and then click the **Configure** button.
- Or click the name of the virtual machine directly.

On the Edit page, you can modify the following information:

- General
- Network
- Storage
- Preferred Server
- Profiles

Some parameters, including the increased memory size, and the modified network information and virtual disk, can take effect immediately without restarting the virtual machine; for the other modified parameters to take effect, you need to restart the virtual machine.

6.7.1 General

On the General page, you can modify the general parameters of the virtual machine, including:

- Virtual Machine Name

  Enter a new name for the virtual machine.

  A virtual machine name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) character. The maximum name length is 200 characters.

- Maximum Memory Size (MB)

  Enter the maximum size of memory that the virtual machine can consume. The default maximum size of memory is the same as the size you allocated when creating the virtual machine.

  Change the maximum memory size only when the status of the virtual machine is `Powered Off`.

- Memory Size (MB)

  Increase or decrease the memory size of the virtual machine. Allocate at least 256 MB memory.

  Increased memory takes effect immediately without restarting the virtual machine. If you decrease the size of memory, you need to restart the virtual machine for the change to take effect.

- Number of Virtual CPUs

  Change the number of virtual CPUs. Restart the virtual machine for the changes to take effect.

- Enable High Availability

  You can enable high availability (HA) to guarantee the availability of virtual machines in case of the physical server failure or restart.

  To make high availability take effect, you must enable high availability for both the server pool and the virtual machine. For more information about high availability, see Section 3.6, "Enabling High Availability (HA)".

To enable high availability for this virtual machine, select **Enable High Availability**.

- Description

  A description of the virtual machine.

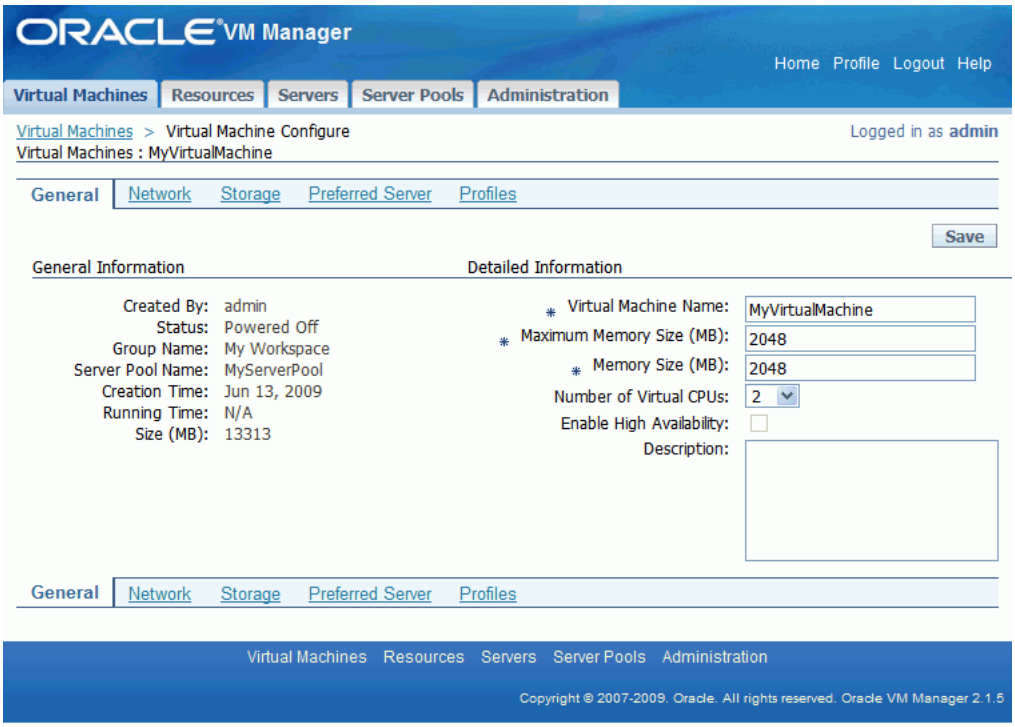
Click **Save** to save the configurations you have modified.

There is some other information you can view on this page, as shown in Table 6–1.

Table 6–1 General Information

Item	Description
Created By	The user who now owns this virtual machine
Status	The current status of the virtual machine. For more information on the status, see Section 6.1.2, "Virtual Machine Statuses".
Group Name	The group to which the virtual machine belongs.
Server Pool Name	The server pool in which the virtual machine is located
PVDriver Initialized	Whether PVDriver is initialized on the hardware virtualized machine (HVM) or not. Paravirtualized virtual machines (PV) do not have this parameter. The status can be one of the following: ■ **True**: PVDriver is installed on this hardware virtualized machine (HVM). ■ **False**: PVDriver is not installed on this hardware virtualized machine (HVM); or it is installed but not initialized. ■ **Unknown**: The virtual machine is shut down; Oracle VM Manager cannot detect the status of PVDriver; or you need to upgrade Oracle VM Agent to support this feature.
Creation Time	The time when the virtual machine was created
Running Time	How long the virtual machine has been running
Size (MB)	The total size of the virtual machine

Figure 6–8 General Information



6.7.2 Network

On the Network page, you can add, edit, or delete virtual network interfaces. You can set a maximum of eight virtual network interfaces.

Select Virtual Machine Type

If the virtual machine is a fully virtualized (hardware virtualized) machine, you can configure the virtual network interface (VIF) type to be either:

- **Fully Virtualized**
- **Paravirtualized**

The paravirtualized driver, also known as the netfront driver, can be used with either a paravirtualized machine, or a fully virtualized machine. The fully virtualized driver, also known as the ioemu driver, can only be used with a fully virtualized machine. Both drivers contain the BIOS and device emulation code to support fully virtualized machines.

For fully virtualized machines, the type can be either **Fully Virtualized** (ioemu) or **Paravirtualized** (netfront), and the default is **Fully Virtualized** (ioemu). For paravirtualized machines, the default is **Paravirtualized** (netfront), and this cannot be changed.

After you configure the virtual network interface type for one virtual network interface, all the virtual network interfaces in the virtual machine will be set to the same type.

Add a Virtual Network Interface (VIF)

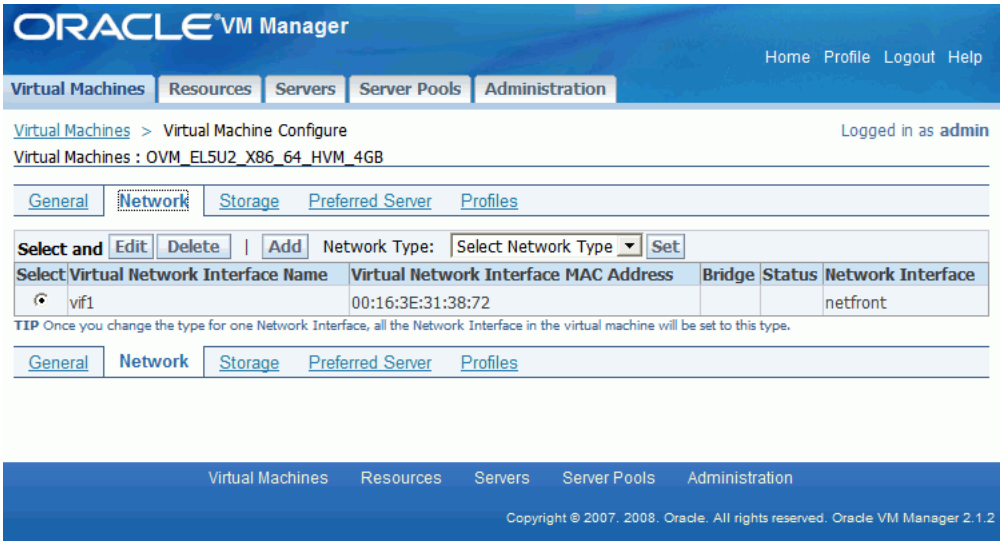
To add a VIF:

1. Click **Add**.
2. Enter a name, and then select a bridge.
3. In Oracle VM, all the virtual network interfaces (VIFs) share the physical network interface card (NIC) to communicate with the outside. If you have several VIFs, and you want to control how much bandwidth is granted to each VIF, you can configure the rate limit.

   Select **Enable Rate Limit**, and enter the rate value. The network traffic through the virtual network interface will not exceed the limit. The change will take effect without restart.

You can also edit or delete an existing VIF on this page.

Figure 6–9 Network Information



6.7.3 Storage

There are two ways to expand the storage capacity of a virtual machine: by creating non-sharable virtual disks, or by adding shared virtual disks.

Oracle VM Manager only supports file-based disks. Physical disks are not supported.

> **Note:** For a hardware virtualized machine (HVM), you can attach up to four IDE disks (including CD-ROM and shared virtual disks), and seven SCSI disks.
>
> A paravirtualized machine (PV) has no such limitation. But you need to restart it for the disk changes to take effect.

Use Non-sharable Virtual Disks

To create a non-sharable virtual disk:

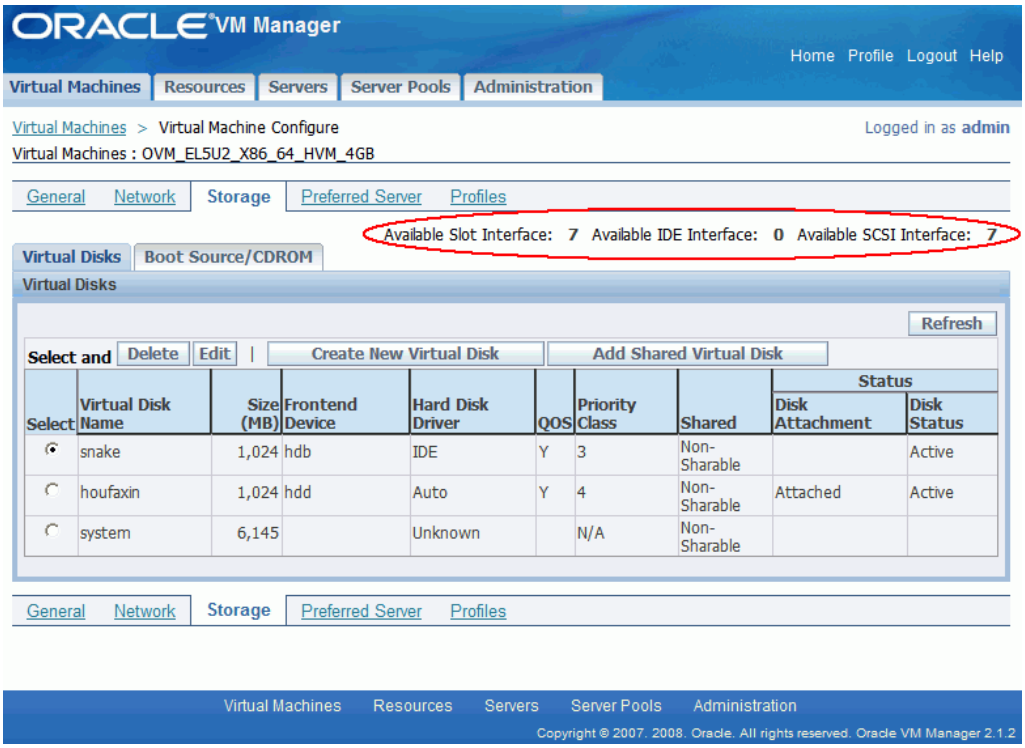
1. Click the **Create New Virtual Disk** button.
2. Enter the disk name and size. Allocate at least 1024 MB to the virtual disk.

   For a hardware virtualized machine (HVM), if you select **Auto**, Oracle VM Agent first selects **IDE** as the type of the hard driver. If the IDE disks have reached the

maximum of four, Oracle VM Agent then selects **SCSI**. If the SCSI disks have reached the maximum of seven, you cannot add any more disks. To verify how many interfaces are available, see the message on the upper right of the page, as shown in Figure 6–10.

For a paravirtualized machine (PV), there is no limitation.

Figure 6–10 Available Disk Interfaces



If you want to prioritize the virtual disk, you can enable disk priority with the **QoS Enabled** check box, and select an appropriate priority class. The priority class ranges from 0 to 7. The priority class *0* has the highest priority, and *7* the lowest.

Rather than being confined to a particular virtual machine, the priority of a virtual disk is global on the entire Oracle VM Server. Virtual disks of the same priority class take the same priority on the Oracle VM Server, even if they belong to different virtual machines.

There are three IO scheduling classes: Idle, Best Effort, and Real Time. Oracle VM adopts the Real Time scheduling class. The Real Time scheduling class is given the first access to the disk, regardless of what else is going on in the system. The eight priority levels are defined denoting how big a time slice a given process will receive on each scheduling window.

3. Click **Next**, and confirm the information you have entered.

The new virtual disk can only be used by this virtual machine. You cannot share it.

To delete the non-sharable virtual disk, select it, and then click the **Delete** button. After you delete the virtual disk, all the files on it will be deleted as well.

To delete shared virtual disks, see Section 5.4.3, "Deleting a Shared Virtual Disk".

Use Shared Virtual Disks

Shared virtual disks can only be shared among virtual machines within the same server pool. For information on how to create shared virtual disks, see Section 5.4.1, "Creating a Shared Virtual Disk".

To assign a shared disk to the virtual machine:

1. Click the **Add Shared Virtual Disk** button.
2. From the **Available Shared Virtual Disks** column, double-click the disk name to move it to the **Selected Shared Virtual Disks** column.
3. Click **Apply** or **OK**.

The selected virtual disk is displayed in the virtual disk table.

To release a virtual disk assigned to the virtual machine, move the virtual disk from the **Selected Shared Virtual Disks** column to the **Available Shared Virtual Disks** column, and click **Apply** or **OK**. The virtual disk is removed from the virtual disk table. Now you can assign it to another virtual machine.

Virtual Disks Table

Table 6–2 displays the information you can view on the Virtual Disks Table.

Table 6–2 Column Headers in the Virtual Disks Table

Column Header	Description
Virtual Disk Name	The name of the virtual disk.
Size	The size of the virtual disk.
Frontend Device	The name of the disk displayed in the virtual machine.
Hard Disk Driver	The type of the hard disk. For a hardware virtualized machine (HVM), it can be **IDE**, **SCSI**, or **Auto**. For a paravirtualized machine (PV), it can be **IDE**, **SCSI**, **XVD**, or **Auto**.
QoS	Whether the QoS is enabled or not.
Priority Class	If QoS is enabled, the value of the priority class is displayed here.
Shared	Whether the virtual disk is shared or not.
Status - Disk Attachment	Whether the disk is attached to the virtual machine or not. It can be either of the following statuses: ▪ **Attached**: The disk is attached to the virtual machine. It works well. ▪ **Detached**: The disk is not attached to the virtual machine, due to the lack of disk interfaces. For example, you create an IDE disk, but now the number of IDE disks exceeds four, no more IDE interface available for this disk. Therefore the disk is detached. It is also possible that Oracle VM Agent cannot connect to the disk. In this case, you need to edit the storage and save your changes. Oracle VM Agent will then reconnect to the disk.

Table 6–2 (Cont.) Column Headers in the Virtual Disks Table

Column Header	Description
Status - Disk Status	The status of the disk can be one of the following: ■ **Creating**: The disk is being created. It may take a few minutes. ■ **Active**: The disk is now available. ■ **Deleting**: The disk is being deleted. ■ **Error**: Some errors occur to the disk. You need to delete it and create a new one.

Boot Source/CDROM

- Boot Device

  You can choose to start the virtual machine from any of the following:

  – HDD: Start the virtual machine from the hard disk.

  – CDROM: Start the virtual machine from the CD-ROM. This option is only available to hardware virtualized machines (HVM).

  – PXE: Start the virtual machine through Preboot Execution Environment (PXE).

- CD-ROM

  Select the ISO file from which to start installing the guest operating system of the virtual machine. This option is only available to hardware virtualized machines (HVM).

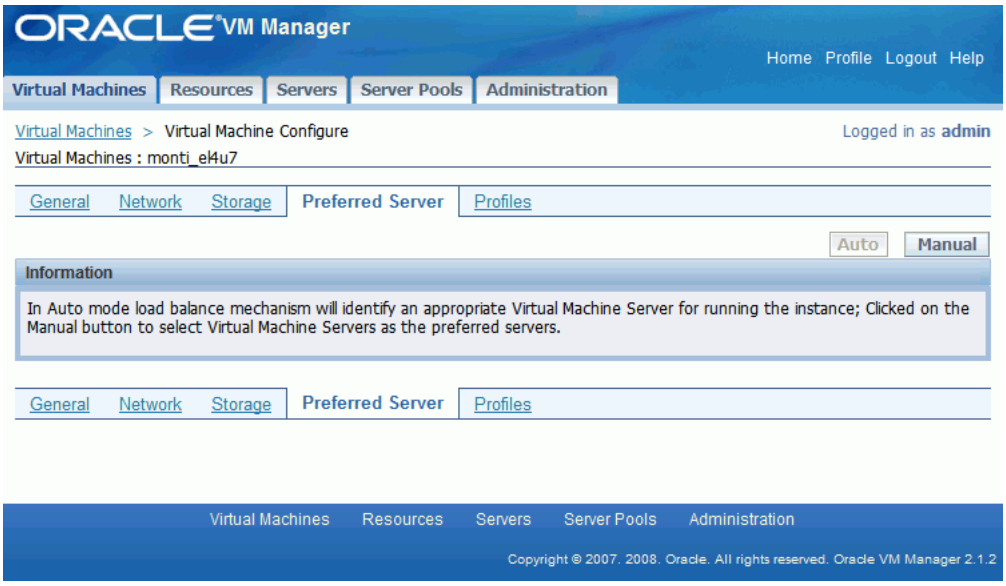
6.7.4 Preferred Server

You can choose the Manual mode to run the virtual machine on a specified server, or choose the Auto mode to allow Oracle VM to assign a Virtual Machine Server automatically to run the virtual machine. For more information about the preferred server, see Step 2 in Section 6.3.1, "Creating a New Virtual Machine Based on Virtual Machine Template".

Note: If none of the preferred servers can provide sufficient resources, the virtual machine may fail to start.

When the virtual machine is `Powered Off` or `Suspended`, you can switch between the Auto mode and the Manual mode.

Figure 6–11 Preferred Server Information



6.7.5 Profiles

On the Profiles page, you can set up or modify the user name and password for login, boot source, operating system, and keyboard.

Login/Password

- Virtual Machine System Username

  Enter the user name used to log in to the guest operating system.

- Virtual Machine System Password

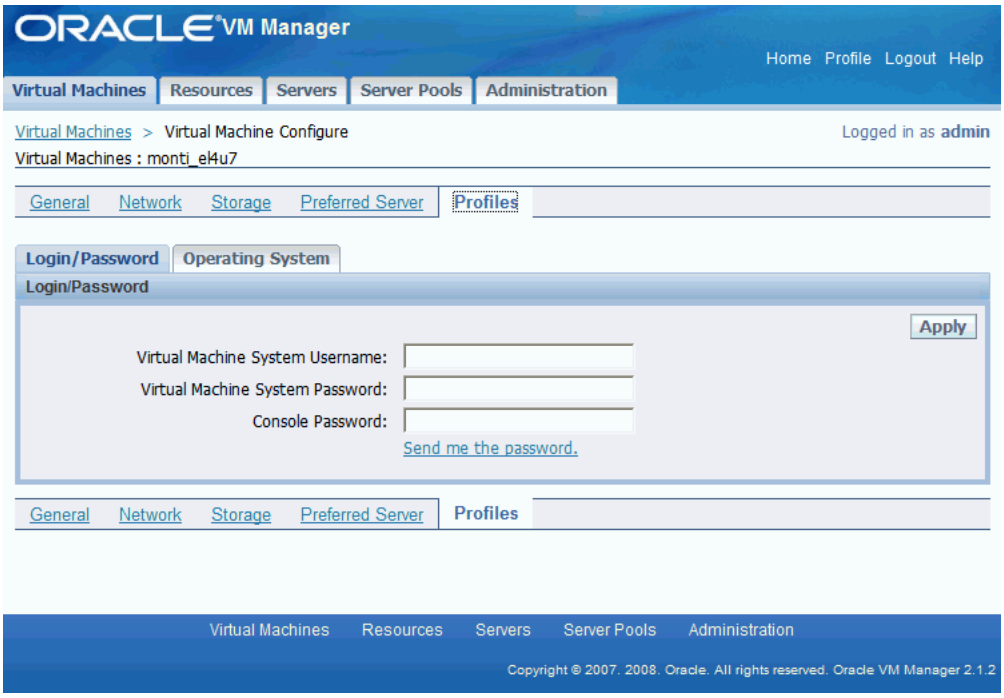
  Enter the password used to log in to the guest operating system.

- Console Password

  Reset the password for the VNC Authentication.

Click **Send me the password** if you want these passwords to be sent to your registered e-mail.

Figure 6–12 Profile Information - Login/Password

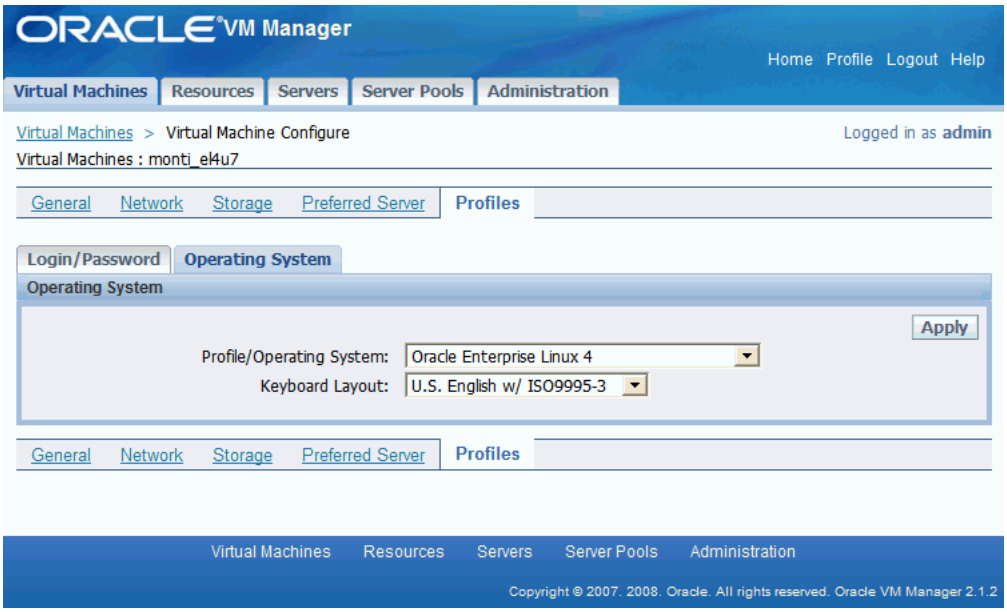


Operating System and Keyboard

You can select an operating system, according to which Oracle VM optimizes the virtual machine profile, such as the configuration information in the vm.cfg file, and the timer mode for hardware virtualized machines (HVM). There are other behaviors controlled by selecting the operating system type, for example, Windows guests get to use USB tablet emulation instead of mouse emulation. By selecting the appropriate operating system, you can run the virtual machine with a better performance.

You can change the keyboard for the virtual machine on this page. Select an appropriate keyboard you need to use to interact with the virtual machine.

Figure 6–13 Profile Information - Operating System



6.8 Reproducing Virtual Machines

Oracle VM Manager enables you to reproduce one or multiple virtual machines easily based on an existing virtual machine.

Use one of the following to reproduce virtual machines:

- Deploying a Virtual Machine
- Cloning Virtual Machines
- Saving a Virtual Machine as a Template

6.8.1 Deploying a Virtual Machine

By deploying a virtual machine, you can clone a new virtual machine to a specific server pool, and share it with other users, or keep it private. After deploying a virtual machine, the original virtual machine remains in the original server pool. You can only deploy virtual machines to the server pools and groups to which you belong.

> **Note:** Make sure the status of virtual machine is `Powered Off` before you deploy the virtual machine.

To deploy a virtual machine:

1. Click the **Virtual Machines** tab.
2. Select the virtual machine you want to deploy. In the More Actions list, select **Deploy**, and click **Go**. You can only deploy one virtual machine at a time.
3. Enter the name of the new virtual machine.
4. Select the group with whom you want to share the virtual machine.
   - Public Group

Deploy the virtual machine to the public group, so that all Oracle VM Manager users can use this new virtual machine.

- My Workspace

  Deploy the virtual machine to a server pool that only you are allowed to use and make it private.

- `group_name`

  Share the new virtual machine with members of a specific group.

5. If you have selected **My Workspace** or a specific group, continue to select a server pool to which you want to deploy this virtual machine.
6. On the Confirm Information page, confirm the virtual machine information and click **Confirm**.
7. The virtual machine is deployed. This process may take some time. After you deploy the virtual machine, click the **Refresh** button periodically until the status of the new virtual machine changes from `Creating` to `Powered Off`. You can choose to refresh manually, or to refresh every 30 seconds.

   If the status is set to `Error`, see Section 6.1.2.9, "Error" to assist solving the error.

Note: If you deploy a virtual machine to the Public Group, the deployed virtual machine image is compressed and copied to the /OVS/publish_pool of the Oracle VM Server. The deployed virtual machine cannot be Powered On. To make this virtual machine available to all users, download or copy the virtual machine image, uncompress it and import it as a virtual machine image or template. Alternatively, you can select the deployed virtual machine and deploy it again to My Workspace, or another group.

Now you have finished deploying the virtual machine. To start the new virtual machine, see Section 6.4.1, "Starting a Virtual Machine".

You can change the preferred server and other configurations of the new virtual machine. See Section 6.7, "Editing Virtual Machine Configuration".

6.8.2 Cloning Virtual Machines

Cloning a virtual machine is a process to create one or more copies of an existing virtual machine. By cloning a virtual machine, you can save multiple copies to another server pool and share them with other users.

Note: Make sure the status of the virtual machine is `Powered Off` before you clone the virtual machine.

To clone a virtual machine:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the virtual machine you want to clone. In the More Actions list, select **Clone,** and click **Go**.
3. Enter the required information.

   - Virtual Machine Name Prefix

Enter the prefix used to name the virtual machine copies. For example, if you enter `vm`, the virtual machine copies will be named `vm0`, `vm1`, `vm2`, and so on.

- Number of Copies

  Enter the number of copies you want to clone. For example, if you enter **5**, five copies of the virtual machine will be created.

  You can clone a maximum of 10 copies.

- Server Pool Name

  Select the server pool where the cloned virtual machine copies will be located.

- Group Name

  Select the group who can use the cloned virtual machines copies.

4. This process may take some time. When the status of the original virtual machine changes from `Cloning` to `Powered Off`, click **Refresh** to check the latest virtual machine status. You can choose to refresh manually, or to refresh every 30 seconds. When the status of the cloned virtual machine changes from `Creating` to `Powered Off`, the cloning process is complete.

   If the status turns out to be `Error`, see Section 6.1.2.9, "Error" for how to solve the problem.

Now you have created multiple copies of the virtual machine. You can change the preferred server and other configurations of the cloned virtual machines. See Section 6.7, "Editing Virtual Machine Configuration".

6.8.3 Saving a Virtual Machine as a Template

You can save a virtual machine as a template, to enable other users to create their new virtual machines based on this template. For more information on this, refer to Section 6.3.1, "Creating a New Virtual Machine Based on Virtual Machine Template".

Note: Make sure the status of the virtual machine is `Powered Off` before you save the virtual machine as a template.

To save a virtual machine as a template, perform the following:

1. Click the **Virtual Machines** tab.
2. Select the virtual machine you want to deploy as a template. In the More Actions list, select **Save As Template**, and click **Go**. You can only save one virtual machine at a time.
3. Enter the template name, and click **Confirm**.
4. The status of the original virtual machine changes from `Powered Off` to `Saving`.

   This process may take some time. When the status returns to `Powered Off`, click the **Resources** tab, and then click the **Virtual Machine Templates** tab. Refresh the virtual machine periodically until the status changes from `Creating` to `Active`. You can see the new virtual machine template.

Now you can use the new template to create virtual machines.

6.9 Migrating a Virtual Machine

Live migration is a process to migrate a running virtual machine from one Virtual Machine Server to another, while applications on the existing virtual machine continue to run. Live migration ensures high availability of virtual machines. This feature is important, and useful, when the existing Virtual Machine Server may be out of commission, or on a planned shutdown for maintenance purposes.

Cross-server-pool live migration is not allowed. You can only migrate virtual machines from one Virtual Machine Server to another within the same server pool. You must use identical computers to perform live migrations, that is, the computer make and model number of both the source computer and the destination computer must be identical.

You must create a shared virtual disk before migrating the virtual machine.

To migrate a virtual machine:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the running virtual machine. In the More Actions list, select **Live Migration**, and click **Go**.
3. Select the Virtual Machine Server to which you want to migrate the virtual machine. Click **Next**.
4. Check the virtual machine information, and click **Confirm**.

The virtual machine is migrated.

6.10 Deleting a Virtual Machine

When you delete a virtual machine, all the files and data associated with this virtual machine will be removed from Oracle VM Manager. Before deleting a virtual machine, make sure you do not need it any longer.

Note: Delete the virtual machine only when the virtual machine status is `Powered Off` or `Error`.

The process of deleting a normal virtual machine is different from that of deleting a virtual machine stuck in a certain status.

- Deleting a Virtual Machine in "Powered Off" or "Error" Status
- Deleting a Virtual Machine Stuck in a Certain Status

6.10.1 Deleting a Virtual Machine in "Powered Off" or "Error" Status

To delete a virtual machine in the `Powered Off` or `Error` status:

1. On the Virtual Machines page, select the virtual machine you want to delete.
2. In the More Actions list, select **Delete**, and click **Go**.
3. Confirm the delete action.

6.10.2 Deleting a Virtual Machine Stuck in a Certain Status

When a virtual machine gets stuck in any status such as `Shutting Down` or `Creating`, you need to shut down the virtual machine, and then delete it.

To delete a virtual machine stuck in a certain status:

1. Click the **Virtual Machines** tab.
2. On the Virtual Machines page, select the virtual machine, and then click **Power Off**.
3. After the status changes to `Powered Off`, delete the virtual machine.

7

Managing Users and Groups

This chapter describes how to manage users and groups as an `administrator`. It includes the following sections:

- The Default Account
- Managing Users
- Managing Groups

Note:

- Functions described in this chapter are only available to `administrators`.
- A small mistake made by an `administrator` may cause serious damage to the entire Oracle VM Manager environment. Please minimize the number of administrators when creating the accounts.

7.1 The Default Account

Oracle VM Manager provides a default account. The default user name is `admin` (lowercase). The password is set when you install Oracle VM Manager.

7.2 Managing Users

You can create new users, delete obsolete users, change the users' role, and reset the user password. This section includes the following topics:

- Creating a User
- Viewing Details
- Editing a User
- Changing a Role
- Deleting a User

7.2.1 Creating a User

To create a user, perform the following:

1. On the Administration page, click the **User** tab and then click the **Create** button.
2. Enter the following user information:

- Username

  Enter an account name for the user.

  You cannot use `manager`, or `user` as the user name.

  An account name must consist of alphanumeric characters, and must not contain spaces or special characters, except the underscore (_) and hyphen (-) characters. The maximum name length is 100 characters.

- Password

  Set the password used by the user to log in to Oracle VM Manager.

- Retype Password
- First Name
- Last Name
- Email

  Enter the user's e-mail address. If the user forgets the password, a new password will be sent to this e-mail.

- Status

  Select the account status. It can be **Locked** or **Unlocked**.

  The account is available only when the status is **Unlocked**.

  To lock this account, select **Locked**.

- Role

  Grant the user one of the three roles: `User`, `Manager`, or `Administrator`. For more information about the roles, refer to Section 1.5, "Roles in Oracle VM Manager".

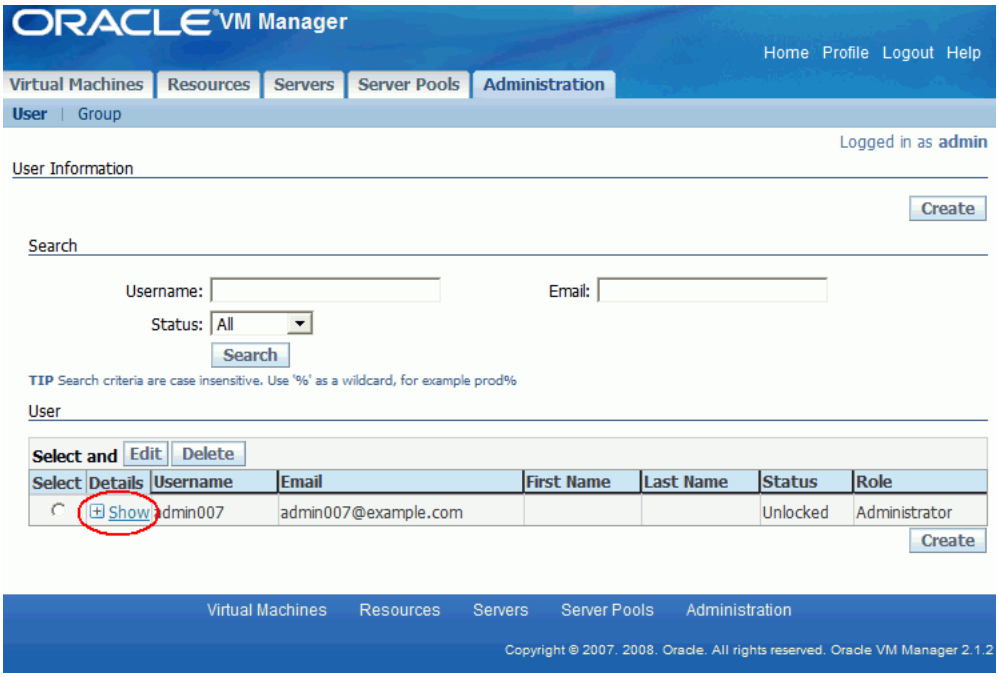
3. Select server pools for the user.
4. Select groups for the user. One user can join multiple groups.
5. Click **Confirm**.

7.2.2 Viewing Details

To view a user's detailed information, perform the following:

1. On the Administration page, click the **User** tab.
2. Click the **Show** link, and you can view the server pools that the user is allowed to use, and the groups to which the user belongs.

Figure 7–1 Viewing Details of User



7.2.3 Editing a User

Edit the user information when you want to:

- Change the user information, such as e-mail address.
- Change the account status to either lock or unlock the account.
- Change the role.
- Add the user to some groups, or server pools.
- Remove the user from some groups, or server pools.

To edit a user, perform the following:

1. On the Administration page, search and select the user you want to edit, and click the **Edit** button.
2. On the Edit page you can update the user information, change the user's role, add the user to groups or server pools, or remove the user from groups or server pools.

   The account status can be `Locked` or `Unlocked`. By default, the status is `Unlocked`. If you lock an account, the user cannot use it any more.
3. Click **Apply**.

7.2.4 Changing a Role

When a user's role has changed, for example, a common user is assigned as an `administrator`, you need to change the user's role in Oracle VM Manager.

For more information about roles, refer to Section 1.5, "Roles in Oracle VM Manager".

To change the user role, perform the following:

1. On the Administration page, select the target user, and click the **Edit** button.
2. Select the role accordingly, and then click the **Apply** button.

7.2.5 Deleting a User

To delete a user, perform the following:

1. On the Administration page, search and then select the users you want to delete. Click the **Delete** button.
2. Confirm the users you want to delete.

7.3 Managing Groups

There are many users in the Oracle VM Manager system, and it is time-consuming to assign privileges individually to each user. The **group** function enables you to add some specific users to a group. After you assign some privileges to the group, all members of this group will have the group privileges. This will facilitate the job for administrators.

This section includes the following topics:

7.3.1 Default Groups

There are two default groups: **Public Grou**p and **My Workspace**.

- The **Public Group** contains all public virtual machines. All users can deploy and view virtual machines in the **Public Group**.
- The **My Workspace** group only contains private virtual machines. Only the virtual machine owner can manage virtual machines in **My Workspace**.

7.3.2 Creating a Group

When there are a large number of users, you can combine specific users into a group, or groups. For example, you can combine users who belong to the same server pool into one group.

To create a group, perform the following:

1. On the Administration page, click the **Group** tab.
2. Click the **Create** button, enter the group name and description.
3. Select users for the group. Double-click the user name in the **Available User**s column to add it to the **Selected Users** column.
4. Click **Confirm**.

7.3.3 Adding a User to a Group

To add a user to a new group, perform the following:

1. On the Administration page, click the **User** tab.
2. Search and select the user you want to add to the group, and click **Edit**.

3. In the Group area, double-click the group in the **Available Groups** column to move it to the **Selected Groups** column.
4. Check the **Group** section. Make sure the group you have selected shows up in the **Selected Groups** column.
5. Click **Apply**.

7.3.4 Editing a Group

To edit a group, select the group you want to update, and click the **Edit** button to update the group information. You can also add users to the group, or remove users from the group.

7.3.5 Deleting a Group

To delete a group, perform the following:

1. On the Administration page, select the group you want to delete, and click the **Delete** button.
2. Confirm the group you want to delete.

After you delete a group, all users in this group will still remain in the system. If you want to delete users along with the group, see Section 7.2.5, "Deleting a User".

A

Preparing Virtual Machines For Importing

If you have prebuilt Oracle VM virtual machines, you can import them into Oracle VM Manager to use as virtual machines, or templates.

Before you import a virtual machine, you must have an Oracle VM Server and store the virtual machine files in the correct directory of the Oracle VM Server, according to your needs. Oracle VM Agent updates the directory information in the vm.cfg file automatically when importing virtual machines.

For information about Oracle VM Servers, refer to Section 1.4, "Configuration of Oracle VM Manager", and Section 3.2, "Creating a Server Pool".

If you want to import a prebuilt virtual machine as a template, copy the virtual machine files to the Oracle VM Server directory:

/OVS/seed_pool/*vm_name*/

If you want to import a prebuilt virtual machine as a private virtual machine (it is not shared with others), copy the virtual machine files to the Oracle VM Server directory:

/OVS/running_pool/*vm_name*/

To move the virtual machine to the correct location for importing:

1. Log in to the Oracle VM Server.
2. Download, or copy the virtual machine to the correct directory for your needs. For example, to download the virtual machine `XEN_EL4U5_X86_HVM` from `http://example.com/seeds/` as a template:
   - If the virtual machine is compressed, run the `wget` command to download it:

     ```
     # cd /OVS/seed_pool
     # wget http://example.com/seeds/XEN_EL4U5_X86_HVM.tgz
     ```

     Uncompress the virtual machine:

     ```
     # cd /OVS/seed_pool
     # tar -xzvf XEN_EL4U5_X86_HVM.tgz
     ```

   - If the virtual machine is not compressed, run the `wget -r` command to download it:

     ```
     # cd /OVS/seed_pool
     # wget -r http://example.com/seeds/XEN_EL4U5_X86_HVM/
     ```

A directory named XEN_EL4U5_X86_HVM is created under the /OVS/seed_pool/ directory, and the virtual machine files are extracted and ready to be imported as a template in Oracle VM Manager.

B

Backing Up and Restoring Oracle VM Manager

Back up Oracle VM Manager before you:

- Uninstall Oracle VM Manager.
- Move the Oracle VM Server from one computer to another.
- Make any major change in Oracle VM Manager.

This Appendix includes the following topics:

B.1 Backing Up Oracle VM Manager

Before backup, make sure the status of all Oracle VM Servers is `Running`.

To back up Oracle VM Manager, perform the following:

1. Log in to the Oracle VM Server as the *root* user.
2. Back up the Oracle VM Manager resources stored in the following directories:
   - `/OVS/running_pool` for virtual machine images
   - `/OVS/seed_pool` for virtual machine templates
   - `/OVS/iso_pool` for ISO files

   Skip this step if you have enabled the storage backup mechanism.
3. Back up the existing Oracle VM Manager data by using the following commands:

   ```
   # cd /opt/ovs-manager-2.1/bin
   # sh backup.sh
   ```

   Enter `1` to back up the data.

   ```
   Please enter the choice: [1|2]
   1. Back up Oracle VM Manager,
   2. Restore Oracle VM Manager
   ```

   Enter the database information, and the path for the dump and log files.

   ```
   Back up data now ...
   Please enter the password for database account 'OVS':
   Please specify the path for dump file?
   Please specify the path for log file?
   ```

Oracle VM Manager is backed up.

B.2 Restoring Oracle VM Manager

To restore Oracle VM Manager:

1. Log in to the Oracle VM Server as the *root* user.
2. Save or copy the Oracle VM Manager resources into the following directories respectively:
   - `/OVS/running_pool` for virtual machine images
   - `/OVS/seed_pool` for virtual machine templates
   - `/OVS/iso_pool` for ISO files
3. Restore the backup data of the Oracle VM Manager by using the following commands:

   ```
   # cd /opt/ovs-manager-2.1/bin
   # sh backup.sh
   ```

   Enter `2` to restore the data.

   ```
   Please enter the choice: [1|2]
   1. Back up Oracle VM Manager,
   2. Restore Oracle VM Manager
   ```

   Enter the database information, and the path for the dump and log files.

   ```
   Please enter the password for database account 'SYS':
   Please enter the password for database account 'OVS':
   Please specify the path for dump file?
   Please specify the path for log file?
   ```

   For example, enter:

   ```
   Please enter the password for database account 'SYS':
   Please enter the password for database account 'OVS':
   Please specify the path for dump file?/dump
   Please specify the path for log file?/log
   ```

Oracle VM Manager is restored.

C

Web Services API

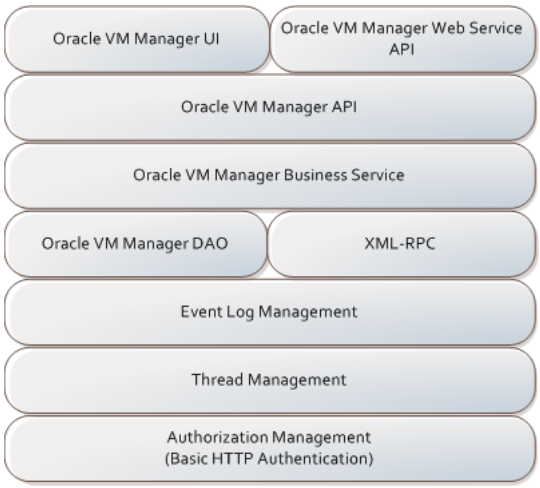
Oracle VM Manager provides a Web services Application Programming Interface (API) to enable integration of third party products with Oracle VM Manager. You can use the API to perform any of the operations in Oracle VM Manager, for example, to create a server pool, add servers, and create virtual machines. You can use any language that supports Web services to access the API, for example Java or Python.

This Appendix describes the Oracle VM Manager Web services API and contains:

C.1 Web Services API

Oracle VM Manager acts as an administration platform for Oracle VM Servers connected on a network to direct actions to the virtual machines, virtual servers and the server pool. Oracle VM Manager provides the management environment for Oracle VM. A Web services API is available for Oracle VM Manager. The Oracle VM Manager Web services API architecture is shown in Figure C–1, "Oracle VM Manager Web Services API Architecture".

Figure C–1 Oracle VM Manager Web Services API Architecture

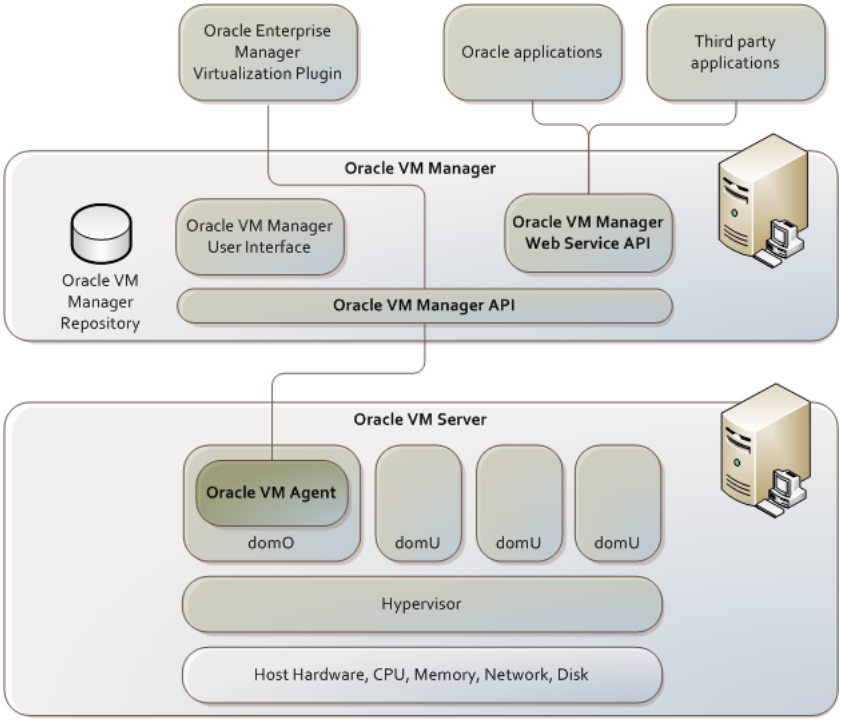


The Oracle VM Manager API provides a complete set of interfaces to Oracle VM Manager. The Oracle VM Manager API is accessed through the Oracle VM Manager Web services API using the SOAP protocol.

The Oracle VM Manager Web service API provides all the operations necessary, including life-cycle operations, to monitor and manage virtual infrastructure components, like server pools, virtual servers, virtual machines, networks, storage, and so on.

The Oracle VM Manager Web services API is implemented as shown in Figure C–2, "Oracle VM Manager Web Services API Implementation".

Figure C–2 Oracle VM Manager Web Services API Implementation



The Oracle VM Manager API is used by the Oracle VM Manager UI layer, and by the virtualization management component of Oracle Enterprise Manager. The Web services API can be used by Oracle applications as well as third party applications.

C.2 Creating a Web Service Client

You can use any programming language that supports Web services to create a Web services client. Most example code in this Chapter is written in Java and created using Oracle JDeveloper, although you can use the language and development tool of your choice.

To use Web services in Java, you can create SOAP messages directly, or generate proxy classes for each Web service. In Oracle JDeveloper, use the Web service WSDL URL to automatically generate proxy classes.

C.2.1 Creating a Proxy Class in Java

The examples given here use Oracle JDeveloper and the Java wsimport utility to create proxy classes in Java.

C.2.1.1 Using Oracle JDeveloper

To create a proxy class for an Oracle VM Manager Web service in Java using Oracle JDeveloper, use the Web service WSDL URL feature.

Example C–1 Retrieving a Server Pool by Name Using Oracle JDeveloper

An Oracle JDeveloper proxy class for retrieving a server pool using its name might look similar to:

```
public ServerPool getServerPoolByName(String poolName) throws Exception{
     String username = "myuser";
     String password = "mypassword";

     //ServerPoolServiceSoapHttpPortClient is generated by Jdeveloper.
     server.ServerPoolServiceSoapHttpPortClient myPort =
        new server.ServerPoolServiceSoapHttpPortClient();
     myPort.setMaintainSession(true);
     myPort.setUsername(username);
     myPort.setPassword(password);
     ServerPool thePool = myPort.getServerPoolByName(poolName);
     return thePool;
 }
```

Example C–2 Importing a Guest Virtual Machine or Template Using Oracle JDeveloper

An Oracle JDeveloper proxy class for importing a guest virtual machine, or template, might look similar to:

```
/**
 * @param args
 */
public static void main(String[] args) {
    try {
        oracle.ovs.api.ResourceServiceSoapHttpPortClient myPort = new
oracle.ovs.api.ResourceServiceSoapHttpPortClient();
        System.out.println("calling " + myPort.getEndpoint());

        /* External Template Importing **/
        VirtualMachineTemplate vmt = new VirtualMachineTemplate();
```

```
        /* set template name **/
        vmt.setImgName("MyTemplate");
        /* set download url **/
        vmt.setDownloadURL("http://example.com/OEL5");
        /* set proxy url(optional) **/
        vmt.setProxyURL("http://proxy.example.com:80");
        /* set vm username **/
        vmt.setVmUsername("myuser");
        /* set vm password **/
        vmt.setVmPassword("mypassword");
        /* set operating system type **/
        vmt.setOsType("Enterprise Linux 5");
        /* set description **/
        vmt.setDescription("My description.");
        /* start importing **/
        myPort.registerExternalTemplate("example.com", vmt);

        /* Internal Image Importing **/
        VirtualMachineImage vmi = new VirtualMachineImage();
        /* set vm name **/
        DiscoveredVirtualMachineImage[] unregisteredImages =
myPort.getAllDiscoverableImages("example.com");
        /* find unregistered vm **/
        if (unregisteredImages.length > 0) {
            vmi.setImgName(unregisteredImages[0].getImgName());
        }
        else {
            return;
        }

        /* set vm username **/
        vmi.setVmUsername("myuser");
        /* set vm passwd **/
        vmi.setVmPassword("mypassword");
        /* set vnc password **/
        vmi.setVncPassword("mypassword");
        /* set operating system type **/
        vmi.setOsType("Enterprise Linux 4 64-bit");
        /* set description **/
        vmi.setDescription("My description.");
        /* start importing **/
        myPort.registerInternalImage("example.com", vmi);

    } catch (Exception ex) {
        ex.printStackTrace();
    }
}
```

Example C–3 Creating a Guest Virtual Machine From a Template Using Oracle JDeveloper

An Oracle JDeveloper proxy class for creating a guest virtual machine from a template might look similar to:

```
public static void main(String[] args) {
    try {
        LifecycleServiceSoapHttpPortClient myPort =
           new LifecycleServiceSoapHttpPortClient();
        System.out.println("calling " + myPort.getEndpoint());
        // Add your own code here
```

```
        myPort.setUsername("myuser");
        myPort.setPassword("mypassword");

        TemplateVmConfig templateVMConfig= new  TemplateVmConfig();
        templateVMConfig.setServerPoolName("example.com");
            //your serverpoolName
        templateVMConfig.setTemplateName("myTemplate");//your templateName

        NICConfig nic = new NICConfig();
        nic.setName("VIF0");
        nic.setIpAddress("ioemu");

       nic.setBridge("xenbr0");
        nic.setMacAddress("00:16:xx:xx:xx:xx");
        NetworkConfType confType = new NetworkConfType();
        confType.setType("Dynamic");
        nic.setNetworkConfType(confType);

        //nic.set
        NICConfig[] vifs = new NICConfig[]{nic};
        templateVMConfig.setVif(vifs);

        templateVMConfig.setVmName("MyGuestVirtualMachine");

        templateVMConfig.setConsolePassword("mypassword");
        templateVMConfig.setHaEnable(false);

        myPort.createVmBasedOnTemplate(templateVMConfig);
    } catch (Exception ex) {
        ex.printStackTrace();
    }
}

public LifecycleService _port;
public VirtualMachine createVmBasedOnTemplate(TemplateVmConfig templateVMConfig)
throws java.rmi.RemoteException{
    ServiceFactory factory = ServiceFactory.newInstance();
    _port = ((LifecycleService_Service)factory.loadService(LifecycleService_
Service.class))
            .getLifecycleServiceSoapHttpPort();
   return _port.createVmBasedOnTemplate(templateVMConfig);
}
```

C.2.1.2 Using wsimport

To create a proxy class for an Oracle VM Manager Web service in Java using the wsimport utility:

```
$ JAVA_HOME/bin/wsimport -d <dir-for-compiled classes> -keep -s
<dir-for-generated-source> -p com.oracle.ovm.manager.ws.vms -wsdllocation
http://ovm_host:port/OVSWS/nameService.wsdl <path-to-wsdl-file-in-local-host>
```

For example, to create a proxy class for the ServerPool Web service, you might enter:

```
$ JAVA_HOME/bin/wsimport -d <dir-for-compiled classes> -keep -s
<dir-for-generated-source> -p com.oracle.ovm.manager.ws.vms -wsdllocation
http://example.com:8888/OVSWS/ServerPoolService.wsdl
<path-to-wsdl-file-in-local-host>
```

Example C–4 Retrieving a Server Pool by Name Using wsimport

A wsimport proxy class for retrieving a server pool using its name might look similar to:

```
public ServerPool getServerPoolByName(String poolName) throws Exception{
     String url = "http://example.com:8888/";
     String contextPath = "OVSWS";
     String user = "myuser";
     String password = "mypassword";
     ServerPoolService_Service sps_service =
         new ServerPoolService_Service(new URL(url + contextPath +
            "/ServerPoolService.wsdl"),
         new QName("http://oracle.ovs.api/", "ServerPoolService"));
     sps = sps_service.getServerPoolServiceSoapHttpPort();

     BindingProvider bp = (BindingProvider) sps;
     Map<String, Object> rc = bp.getRequestContext();
     rc.put(BindingProvider.ENDPOINT_ADDRESS_PROPERTY, url + contextPath +
         "/ServerPoolServiceSoapHttpPort");
     rc.put(BindingProvider.SESSION_MAINTAIN_PROPERTY, new Boolean(true));
     rc.put(BindingProvider.USERNAME_PROPERTY, user);
     rc.put(BindingProvider.PASSWORD_PROPERTY, password);

     GetServerPoolByNameElement req = new GetServerPoolByNameElement();
     req.setPoolName(poolName);
     GetServerPoolByNameResponseElement res = sps.getServerPoolByName(req);
     ServerPool thePool = res.getResult();
     return thePool;
 }
```

C.2.2 Creating a Proxy Class in Python

To create a proxy (stub) class for an Oracle VM Manager Web service using Python:

```
$ wsdl2py -b http[s]://ovm_host:port/OVSWS/nameService.wsdl
```

For example, to create a proxy class for the ServerPool Web service, you might enter:

```
$ wsdl2py -b https://ovm.example.com:4443/OVSWS/ServerPoolService.wsdl
```

Example C–5 Retrieving a Server Pool by Name using Python

A Python proxy class for retrieving a server pool using its name might look similar to:

```
import ServerPoolService_client as c

class ServerPoolManagementPort:

    def __init__(self, urlbase, auth):
        self.wspath = "/ServerPoolServiceSoapHttpPort"
        self.loc = c.ServerPoolServiceLocator()
        self.srv = self.loc.getServerPoolServiceSoapHttpPort(url = urlbase +
            self.wspath, auth = auth)
    def getServerPoolByName(self, poolName):
        """
        Return instance os a specific server pool managed by the system, by its
            name.
        @param poolName:
        @type poolName: str
        @return: ServerPool
        """
```

```
        request = c.ServerPoolService_getServerPoolByName()
        request._poolName = poolName
        response = self.srv.getServerPoolByName(request)
        return response._result
```

To call this code, including authentication with the Web service, you might use:

```
from ServerPoolManagementPort import *
from ZSI.auth import AUTH
auth=(AUTH.httpbasic, 'myuser', 'mypassword')
spm = ServerPoolManagementPort(urlbase = 'https://ovm.example.com:4443/OVSWS/',
                  auth = auth)
serverpool = spm.getServerPoolByName('myserverpool')
```

C.3 Authentication and Security

The Oracle VM Manager Web services use HTTP basic authentication to authenticate users and control access. HTTP basic authentication requires that the server requests a username and password from the Web services client, and verifies that the username and password are valid by comparing them against a valid Oracle VM Manager user.

SSL is enabled by default for Web services, and secures the data during transmission at transport level. For each Web service call, the server authenticates the log in credentials for valid Oracle VM Manager users in the basic header.

If you need to set up SSL for Web services after the original Oracle VM Manager installation, you can use the script:

```
# /opt/ovs-manager-2.1/bin/secure_ws.sh
```

This script generates the keystore for Oracle VM Manager Web services and configures OC4J.

To perform the authentication with Oracle VM Manager, you must pass the Oracle VM Manager login credentials to the Oracle VM Manager Web service from a Web services client.

Example C–6 Authentication in Java

To perform HTTP basic authentication from a Java Web services client:

1. Change the URL to the Web service from http to https. For example, https://ovm.example.com:4443. This is the URL used to obtain the SOAP HTTP port in step 3.
2. Add the following two system properties to the client-side Java to perform the SSL handshake:

   ```
   -Djavax.net.ssl.trustStore=/path/ovmm_client_trust.jks    <=== this contains
   the manager's cert
   -Djavax.net.ssl.trustStorePassword=truststorepasswd
   ```

3. Obtain the SOAP HTTP port, with code similar to the following:

   ```
   ServerPoolService_Service sps_service =
           new ServerPoolService_Service(new URL(url + contextPath +
                   "/ServerPoolService.wsdl"),
           new QName("http://oracle.ovs.api/", "ServerPoolService"));
   //Note, the URL here is the URL mentioned in Step 1. It is the HTTPS URL.
   ServerPoolService sps = sps_service.getServerPoolServiceSoapHttpPort();

   BindingProvider bp = (BindingProvider) sps;
   ```

```
Map<String, Object> rc = bp.getRequestContext();
rc.put(BindingProvider.ENDPOINT_ADDRESS_PROPERTY, url + contextPath +
     "/ServerPoolServiceSoapHttpPort");
rc.put(BindingProvider.SESSION_MAINTAIN_PROPERTY, new Boolean(true));
rc.put(BindingProvider.USERNAME_PROPERTY, myuser);
rc.put(BindingProvider.PASSWORD_PROPERTY, mypassword);
```

4. You must also generate a keystore and proxy on the Web services client. For example, you could use:

```
# java -Djavax.net.ssl.trustStore=/Users/myuser/ssl/client.keystore
-Djavax.net.ssl.keyStore=/Users/myuser/ssl/client.keystore
-Djavax.net.ssl.trustStorePassword=mypassword
-Djavax.net.ssl.keyStorePassword=mypassword
-jar $ORACLE_HOME/webservices/lib/wsa.jar
-genProxy
-wsdl https://ovm.example.com:4443/OVSWS/AdminServiceSoapHttpPort?WSDL
```

5. To set the login credentials on the Web services client, you could use:

```
System.setProperty("javax.net.ssl.trustStore",
"/Users/myuser/ssl/client.keystore");
System.setProperty("javax.net.ssl.keyStore",
"/Users/myuser/ssl/client.keystore");
System.setProperty("javax.net.ssl.trustStorePassword", "mypassword");
System.setProperty("javax.net.ssl.keyStorePassword", "mypassword");
...
```

Example C–7 Authentication in Python

An Python proxy class to authenticate and retrieve a server pool might look similar to:

```
import ServerPoolService_client as c
from ZSI.auth import AUTH
loc = c.ServerPoolServiceLocator()
auth = (AUTH.httpbasic, 'myuser', 'mypassword')
srv = loc.getServerPoolServiceSoapHttpPort(auth=auth)
req = c.ServerPoolService_getServerPoolByName()
req._poolName = 'myserverpool'
resp = srv.getServerPoolByName(req)
serverPool = resp._result
```

C.4 Web Service Locations

Each Oracle VM Manager Web service URL has the syntax:

http[s]://*ovm_manager_host*:*port*/OVSWS/*WS_name*.wsdl

SSL is enabled by default for Web services, and secures the data during transmission at transport level. Although you can access the Web services without using SSL, Oracle recommends you use SSL for increased security.

A test page is available for each Web service that enables you to test a Web service and values for the Web service parameters. The Web service test page URL has the syntax:

http[s]://*ovm_manager_host*:*port*/OVSWS/*WS_name*SoapHttpPort

When you open a Web service test page in a browser, you must authenticate with the Web service by entering an Oracle VM Manager administrator username and password. When you have authenticated, a form is displayed that enables you to input parameters and invoke different methods in the Web service. This form also contains a

link named **Service Description** that displays the WSDL for the Web service. The following is the syntax for the WSDL URL:

http[s]://*ovm_manager_host*:*port*/OVSWS/*WS_name*SoapHttpPort?WSDL

or

http[s]://*ovm_manager_host*:*port*/OVSWS/*WS_name*.wsdl

The Web service test page also contains a link to the documentation for the Web service. The syntax for the Web service documentation is:

http[s]://*ovm_manager_host*:*port*/OVSWS/*WS_name*SoapHttpPort?*WS_ name*SoapHttpPortstub.html

For example, if your Oracle VM Manager host is ovm.example.com, and its port is 4443 and SSL is enabled, then the following URL is the location for the LifecycleService:

https://ovm.example.com:4443/OVSWS/LifecycleService.wsdl

And the location of the test page for LifecycleService is:

https://ovm.example.com:4443/OVSWS/LifecycleServiceSoapHttpPort

The corresponding LifecycleService documentation URL is:

https://ovm.example.com:4443/OVSWS/LifecycleServiceSoapHttpPort?LifecycleServiceSoapHttpPortstub.html

C.5 Web Services

The Oracle VM Manager Web services available are:

- LifecycleService: Manages the lifecycle of virtual machines.
- ResourceService: Manages resources.
- PluginService: Manages the plug in.
- ServerPoolService: Manages servers and server pools.
- VirtualMachineService: Manages virtual machines.
- AdminService: Manages users and groups.

C.5.1 LifecycleService

The LifecycleService Web service manages the lifecycle of virtual machines. You can use this Web service to create a virtual machine, enable HA, perform live migration, attach CDs and disks, and so on.

The LifecycleService Web service is located at:

http[s]://*ovm_manager_host*:*port*/OVSWS/LifecycleService.wsdl

The methods available in this Web service are:

- addDisk
- addNIC
- attachCDtoVM
- attachSharedVirtualDisk
- changeNetworkType
- clone

- createVmBasedOnISO
- createVmBasedOnPXE
- createVmBasedOnTemplate
- deploy
- detachCD
- detachSharedVirtualDisk
- disableHA
- enableHA
- getConsolePassword
- getKeyboardLayoutArray
- getVMGroupByVMId
- liveMigrate
- liveMigrateAll
- removeDisk
- removeNIC
- resetStatus
- setBootPriority
- setConsolePassword
- setCPUCores
- setDynamicMemory
- setGuestCredential
- setMaximumMemory
- setNetworkInsideGuest
- setOperatingSystem
- setPreferredServers
- setVMConfigParam
- setVMDescription
- setVMKeyboardLayout

More detailed information on the functions available in this web service is available in the *Oracle VM Manager Web Services API Reference*.

C.5.2 ResourceService

The ResourceService Web service manages resources. You can use this Web service to import and manage ISO files, templates, virtual machines, and shared virtual disks.

The ResourceService Web service is located at:

http[s]://*ovm_manager_host*:*port*/OVSWS/ResourceService.wsdl

The methods available in this Web service are:

- ValidateVMConfig

- approveISOResource
- approveImage
- approveTemplate
- deleteISO
- deleteImage
- deleteSharedVirtualDisk
- deleteTemplate
- getAllDiscoverableISO
- getAllDiscoverableImages
- getAllDiscoverableTemplates
- getAllISOResources
- getAllImageResources
- getAllSharedVirtualDisks
- getAllTemplateResources
- getISOResource
- getISOResourceByGroupName
- getISOResourceByGroupNameAndISOName
- getISOResourceByISOName
- getImageResource
- getImageResourceByName
- getSharedDiskResource
- getSharedDiskResourceByName
- getTemplateResource
- getTemplateResourceByName
- registerExternalISO
- registerExternalImage
- registerExternalTemplate
- registerISO
- registerInternalISO
- registerInternalImage
- registerInternalTemplate
- registerSharedVirtualDisk

More detailed information on the functions available in this web service is available in the *Oracle VM Manager Web Services API Reference*.

C.5.3 PluginService

The PluginService Web service manages the plug in. You can use this Web service to set or get plug in scope properties.

The PluginService Web service is located at:

http[s]://*ovm_manager_host*:*port*/OVSWS/PluginService.wsdl

The methods available in this Web service are:

- disposePlugin
- getDaemonManager
- preparePlugin

More detailed information on the functions available in this web service is available in the *Oracle VM Manager Web Services API Reference*.

C.5.4 ServerPoolService

The ServerPoolService Web service manages servers and server pools. You can use this Web service to create and manage servers and server pools.

The ServerPoolService Web service is located at:

http[s]://*ovm_manager_host*:*port*/OVSWS/ServerPoolService.wsdl

The methods available in this Web service are:

- addMembers
- checkHAAbility4ServerPoolById
- checkServerConnection
- checkVirtualServerCompatibility
- createServerPool
- deleteServerPool
- getAgentVersion
- getAllMembers
- getAllServerPools
- getClusterRootByServerPoolId
- getMasterAgentStatus
- getMasterServer
- getMinSupportedOVSAgentVersion
- getNetworkBridges
- getNetworkBridgesByServerIP
- getServer
- getServerByName
- getServerPool
- getServerPoolById
- getServerPoolByName
- getServerPoolMetricsByServerPoolId
- getServerPools
- get StorageResositoriesByServerPoolId

- getVirtualServerById
- getVirtualServerByName
- getVirtualServerByServerPool
- getVirtualServerMetrics
- getVirtualServers
- rebootServer
- refreshServerPool
- removeMember
- restoreVirtualServerPoolByManagerData
- shutdownServer
- updateServerPool
- updateUserList4ServerPool
- updateUtilityServerPassword
- updateVirtualServer
- updateVirtualServerAgentPassword
- updateVirtualServerById
- validateAddMembers
- validateCreateServerPool
- validateDeleteServerPool
- valicateRebootServer
- validateRemoveMember
- validateShutdownServer
- validateUpdateUtilityServerPassword
- validateUpdateVSAgentPassword

More detailed information on the functions available in this web service is available in the *Oracle VM Manager Web Services API Reference*.

C.5.5 VirtualMachineService

The VirtualMachineService Web service manages virtual machines. You can use this Web service to create and manage virtual machines.

The VirtualMachineService Web service is located at:

http[s]://*ovm_manager_host*:*port*/OVSWS/VirtualMachineService.wsdl

The methods available in this Web service are:

- createPropertiesFileOnVirtualMachine
- deleteVMByVMId
- getAllAlertAssociatedWithImg
- getAllOperatingSystemArray
- getAllVMs

- getAssociatedPool
- getAssociatedServer
- getLastAlertAssociatedWithDisk
- getLastAlertAssociatedWithImg
- getRealPath
- getVM
- getVMByName
- getVncPassword
- pauseVMByVMId
- powerOffVMByVMId
- powerOnVMByVMId
- queryCdromArray
- queryLocalDiskInfo
- queryLocalDisks
- queryNetworkInterfaceCardArray
- queryPreferredServer
- querySharedDiskInfo
- querySharedVirtualDiskArray
- queryVMMetricArrayVyVMIds
- queryVMMetricByVMId
- queryVMStatusArrayByVMIds
- queryVMStatusByVMId
- rebootVMByVMId
- resumeVMByVMId
- saveAsTemplate
- setVMName
- suspendVMByVMId
- unpauseVMByVMId
- unregisterVMByVMId
- update
- uploadVirtualMachine

More detailed information on the functions available in this web service is available in the *Oracle VM Manager Web Services API Reference*.

C.5.6 AdminService

The AdminService Web service manages users and groups. You can use this Web service to create and manage users and groups.

The AdminService Web service is located at:

http[s]://*ovm_manager_host*:*port*/OVSWS/AdminService.wsdl

The methods available in this Web service are:

- createGroup
- createUser
- createUserGroup
- createUserSite
- findAllOVMGroup
- findAllOVMRole
- finalAllOVMUser
- findAllOVMUserGroup
- findAllOVMUserRole
- findAllOVMUserSite
- findUserById
- isAdminUser
- login
- logout
- searchUsers

More detailed information on the functions available in this web service is available in the *Oracle VM Manager Web Services API Reference*.

D

Troubleshooting

This appendix describes some problems you may encounter when using Oracle VM Manager, and explains how to resolve them. It includes the following topics:

- Log Files
- Cannot Log In to Oracle VM Manager
- Cannot Create a Virtual Machine from Installation Media
- No Sufficient Space in Repository for Creating a Virtual Machine
- The Virtual Machine Stuck in Certain Status
- The Status of the Virtual Machine Is "Error"
- Cannot Access Virtual Machine Console
- Cannot Perform Live Migration
- Cannot Change CD in the Virtual Machine
- Cannot Import External Resources
- Remote Host Identification Error in Server Pool

Find additional information on the following Oracle support-oriented Web sites:

- Oracle MetaLink, available at `http://metalink.oracle.com`
- Oracle Virtualization Forum, available at `http://forums.oracle.com/forums/forum.jspa?forumID=482`

D.1 Log Files

Oracle VM Manager log files are stored in the directory:

/var/log/ovm-manager/

Table D–1, " Log Files" lists the log files it contains.

Table D–1 Log Files

Log File	Description
ovm-manager.log	The Oracle VM Manager installation log.
db.log	The Oracle Database log. When you install Oracle VM Manager on an existing database, the log information is stored here.

Table D–1 (Cont.) Log Files

Log File	Description
oc4j.log	The Oracle Containers for J2EE (OC4J) installation log. When oc4j.log exceeds 10 MB, a new log file oc4j.log.1. is generated to store the logs in oc4j.log. Subsequently, the oc4j.log is cleared to record new log information.
upgrade_*oldversion*_*newversion*.log.log	The Oracle VM Manager upgrading log.

D.2 Cannot Log In to Oracle VM Manager

It may take a very long time to log in, or it is stuck in the Login page. This may be caused by lack of memory for OC4J.

To solve this problem:

1. Log in to the computer where Oracle VM Manager is installed, and run the following command to check the log information:

   ```
   # cat  /var/log/ovm-manager/oc4j.log | grep "heap"
   ```

   If OC4J runs out of memory, the following information is displayed:

   ```
   Internal Exception: java.lang.OutOfMemoryError: Java heap space
   ```

2. Run the following command to restart OC4J:

   ```
   # service oc4j stop
   # service oc4j start
   ```

If OC4J runs out of memory, you need to increase the OC4J memory size. Follow these steps to do it:

1. View the OC4J configuration information:

   ```
   # vi /opt/oc4j/bin/oc4j
   ```

2. Locate the following line, and increase the memory size to an appropriate value, such as 512:

   ```
   OC4J_JVM_ARGS="-XX:PermSize=256m -XX:MaxPermSize=512m"
   ```

3. Restart OC4J:

   ```
   # service oc4j stop
   # service oc4j start
   ```

D.3 Cannot Create a Virtual Machine from Installation Media

The following message is displayed: "Error: There is no server supporting hardware virtualization in the selected server pool. "

To solve this problem, ensure that the Virtual Machine Server supports hardware virtualized machine (HVM).

Follow these steps to check:

1. Run the following command to check if HVM is supported by the CPU:

   ```
   # cat /proc/cpuinfo |grep -E 'vmx|smx'
   ```

If any information that contains vmx or smx is displayed, it means that the CPU supports HVM. Here is an example of the returned message:

```
flags : fpu tsc msr pae mce cx8 apic mtrr mca cmov pat pse36 clflush dts acpi
mmx fxsr sse sse2 ss ht tm pbe nx lm constant_tsc pni monitor ds_cpl vmx est
tm2 cx16 xtpr lahf_lm
```

2. Ensure that you have enabled HVM in the BIOS.
3. Run the following command to check if the operating system supports HVM:

```
# xm info |grep hvm
```

The following is an example of the returned message:

```
xen_caps : xen-3.0-x86_64 xen-3.0-x86_32p hvm-3.0-x86_32 hvm-3.0-x
```

If the CPU does not support HVM, use the paravirtualized method to create the virtual machine. See Section 6.3.2, "Creating a New Virtual Machine from Installation Media".

D.4 No Sufficient Space in Repository for Creating a Virtual Machine

A message similar to the following is displayed:"Error: The largest virtual disk that can be allocated is: 4815 MB."

To solve this problem, decrease the disk size, or add a new repository.

Adding a New Repository

Before adding a new repository, ensure that all the Oracle VM Servers in the same server pool share the same repository, and mount it to the /OVS folder on each server.

To add a new repository:

1. Run the following command on Virtual Machine Server:

```
# /usr/lib/ovs/ovs-makerepo source shared description
```

The source parameter is the block device or NFS path to the file system to be added. The shared parameter sets whether the file system is to be shared between computers. Enter a 1 to have the file system shared, or a 0 to make it non-shared. The description parameter is the text displayed in Oracle VM Manager.

For example, run the following command:

```
# /usr/lib/ovs/ovs-makerepo /dev/sdc1 1 A new repository
```

You will get one repository in /etc/ovs/repositories:

```
# cat /etc/ovs/repositories
# This configuration file was generated by ovs-makerepo
# DO NOT EDIT
C860A37B7E4D437A93CA4116A79BD9C8 /dev/sdc1
```

The makerepo script identifies the file system or shared virtual disk as a repository, and updates the repository configuration to enable it.

2. Use the **df** command to review the usage and mount point:

```
# df
```

The following is an example of the returned information:

```
Filesystem           1K-blocks      Used Available Use% Mounted on
/dev/sda1              9920592    848376   8560148  10% /
tmpfs                   262232         0    262232   0% /dev/shm
/dev/sdb1            234380284 161920232  72460052  70% /OVS
/dev/sdc1            292977372   5167844 287809528   2%
/OVS/C860A37B7E4D437A93CA4116A79BD9C8
```

The /OVS/seed_pool, /OVS/running_pool, and /OVS/iso_pool directories will be created automatically under the newly added repository.

3. Repeat the preceding steps on all Virtual Machine Servers to make sure the added repository has mounted correctly on each server.

   When you create a virtual machine, Oracle VM Manager will choose a Virtual Machine Server with the maximum available disk size from /OVS or /OVS/*uuid* to run it.

D.5 The Virtual Machine Stuck in Certain Status

For Oracle VM Manager Release 2.1.1 and Release 2.1.2 Users

To solve this problem, reset the status to **Powered Off**, and then delete the virtual machine directly. See Section 6.10.2, "Deleting a Virtual Machine Stuck in a Certain Status" for more information.

For Oracle VM Manager Release 2.1 Users

To solve this problem, change the status manually as follows:

1. Make sure that the virtual machine in the target server has been shut down. Use **xm list** or **virsh list** to check the virtual machine name and ID.
2. If the virtual machine is running, use **xm shutdown** *vm_id* or **virsh shutdown** *vm_id* to shut it down, where *vm_id* refers to the virtual machine name or ID.
3. Use **xm list** or **virsh list** to check if the virtual machine has been shut down. If it is still running, use **xm destroy** *vm_id*, or **virsh destroy** *vm_id* to shut it down.
4. Log in as **oracle** (or **root** first, then **su - oracle**) to the computer where Oracle VM Manager is installed, and run the following commands to change the virtual machine status to `Powered off` in Oracle XE database:

   ```
   export ORACLE_HOME='/usr/lib/oracle/xe/app/oracle/product/10.2.0/server'
   export ORACLE_SID=XE
   $ORACLE_HOME/bin/sqlplus / as sysdba
   SQL> update ovs.ovs_vm_img t set t.status='Powered Off' where t.img_name like
   'vm_name';
   SQL> commit;
   SQL> quit
   ```

   vm_name refers to the virtual machine name.

5. Retry your operation, or delete the virtual machine directly.

D.6 The Status of the Virtual Machine Is "Error"

To view more details, click the **Virtual Machines** tab, and then click the **Show** link of the virtual machine. Click the number after the Log item to display the error log. The error log information includes: operation, operation details, start time and status.

The following are some error log items and solutions:

- Error: HVM guest support is unavailable: is VT/AMD-V supported by your CPU and enabled in your BIOS?
- Failed:<Exception: cannot find host server for vm('/OVS/running_pool/vm_name')>
- Failed:<Exception: Could not find '/OVS/running_pool/vm_name' in any storage repository.>
- Failed:<Exception: /opt/ovs-agent-2.2/utils/rcp.py /OVS/running_pool/vm_name/ root@example.com:/OVS/running_pool/vm_name password=>encounter 'permission denied'! >
- Failed:<Exception: return=>failed:<Exception: xm create '/OVS/running_pool/vm_name/vm.cfg'=>Error: Domain 'vm_name' already exists with ID '6' >>
- Failed:<Exception: vm('/OVS/running_pool/vm_name') status ('RUNNING') not in ('DOWN', 'ERROR')>
- Failed:<Exception: no server selected to run vm('/OVS/running_pool/vm_name') memory=512>
- Failed:<Exception: return=>failed:<Exception: xm create '/OVS/running_pool/vm_name/vm.cfg'=>Error: Device 0 (vif) could not be connected. Could not find bridge device null >>
- Failed:<Exception: no pxe bootable vif found.>
- Failed:<Exception: failed:<Exception: virt-install --paravirt --name=vm_name --ram=256 --vcpus=1 --file /OVS/running_pool/vm_name/System.img --file-size=1 --vnc --vnclisten=0.0.0.0 --vncpasswd=/tmp/tmp01TOh4 --noautoconsole --location=nfs:host:/mnt=>mount: can't get address for host umount: /var/lib/xen/xennfs.mkvX0Q: not mounted ERROR: Unable to mount NFS location! >>
- winxp_build failed:<Exception: return=>failed:<NameError: global name 'xen_handle_vif_qos' is not defined>>

D.6.1 Error: HVM guest support is unavailable: is VT/AMD-V supported by your CPU and enabled in your BIOS?

Possible Cause

The Virtual Machine Server does not support HVM.

Solution

Verify that the Virtual Machine Server supports HVM, and has HVM enabled in BIOS. See Appendix D.3, "Cannot Create a Virtual Machine from Installation Media".

If the Virtual Machine Server does not support HVM, you can create the virtual machine from installation media.

D.6.2 Failed:<Exception: cannot find host server for vm('/OVS/running_pool/vm_name')>

Possible Cause

- No Virtual Machine Server available to run the virtual machine.
- Insufficient memory on the Virtual Machine Server.

Solution

1. Ensure that at least one Virtual Machine Server is available to run the virtual machine.
2. Ensure that the Virtual Machine Server has sufficient memory.

   To release server memory, you can:

   - Shut down other running virtual machines.
   - Decrease the virtual machine memory, and restart the virtual machine. See Section 6.7, "Editing Virtual Machine Configuration".

D.6.3 Failed:<Exception: Could not find '/OVS/running_pool/vm_name' in any storage repository.>

Possible Cause

The virtual machine has been removed from the Virtual Machine Server.

Solution

Remove the virtual machine in Oracle VM Manager, and create a new one.

D.6.4 Failed:<Exception: /opt/ovs-agent-2.2/utils/rcp.py /OVS/running_pool/vm_name/ root@example.com:/OVS/running_pool/vm_name password=>encounter 'permission denied'! >

Possible Cause

You have entered an incorrect user name or password when creating the Utility Server.

Solution

Enter correct user name and password for the Utility Server. See Section 3.2, "Creating a Server Pool".

D.6.5 Failed:<Exception: return=>failed:<Exception: xm create '/OVS/running_pool/vm_name/vm.cfg'=>Error: Domain 'vm_name' already exists with ID '6' >>

Possible Cause

The virtual machine has been started already.

Solution

Use the command **xm list** to check the virtual machine status. Refresh the virtual machine periodically.

D.6.6 Failed:<Exception: vm('/OVS/running_pool/vm_name') status ('RUNNING') not in ('DOWN', 'ERROR')>

Possible Cause

The status in Oracle VM Manager has not been synchronized with the status data in the database.

Solution

Shut down the virtual machine, and then start it.

D.6.7 Failed:<Exception: no server selected to run vm('/OVS/running_pool/vm_name') memory=512>

Possible Cause

There is insufficient memory on this Virtual Machine Server.

Solution

Decrease the virtual machine memory, and then restart the virtual machine. Or shut down other running virtual machines to release more memory.

D.6.8 Failed:<Exception: return=>failed:<Exception: xm create '/OVS/running_pool/vm_name/vm.cfg'=>Error: Device 0 (vif) could not be connected. Could not find bridge device null >>

Possible Cause

No bridge for this virtual machine.

Solution

Select a bridge for it. See Section 6.7.2, "Network".

D.6.9 Failed:<Exception: no pxe bootable vif found.>

Possible Cause

Invalid VIF type for the virtual machine.

Solution

When starting a hardware virtualized machine through PXE, the VIF type must be **Fully Virtualized** (ioemu). Select a valid VIF type for the virtual machine. See Section 6.7.2, "Network".

D.6.10 Failed:<Exception: failed:<Exception: virt-install --paravirt --name=vm_name --ram=256 --vcpus=1 --file /OVS/running_pool/vm_name/System.img --file-size=1 --vnc --vnclisten=0.0.0.0 --vncpasswd=/tmp/tmp01TOh4 --noautoconsole --location=nfs:host:/mnt=>mount: can't get address for host umount: /var/lib/xen/xennfs.mkvX0Q: not mounted ERROR: Unable to mount NFS location! >>

Possible Cause

The resource location you entered is incorrect.

Solution

Delete the virtual machine, and create a new one. Make sure you enter a correct resource location when creating a paravirtualized machine.

D.6.11 winxp_build failed:<Exception: return=>failed:<NameError: global name 'xen_handle_vif_qos' is not defined>>

Possible Cause

The current Oracle VM Manager fails to detect the API **xen_handle_vif_qos**.

Solution

Upgrade both Oracle VM Manager and Oracle VM Server to 2.1.2 to support this feature.

D.7 Cannot Access Virtual Machine Console

If your operating system is Linux, and you are using Mozilla Firefox to access the virtual machine, download and install the Console Plug-in. See Section 6.5.1, "Installing the Console Plug-In".

If Oracle VM Manager is upgraded from the Release 2.1, rather than a fresh installation, you may encounter the following error when accessing the virtual machine console:

```
java.lang.ClassNotFoundException: VncViewer.class
```

This is caused by the delay in cache refresh. To solve this problem, shut down all the Web pages, and open a new one to access the virtual machine console.

D.8 Cannot Perform Live Migration

The following message is displayed:

Error: Server is not ready for live migration.

To solve this problem, you must use identical computers to perform live migrations, that is, the computer make and model number must be identical.

D.9 Cannot Change CD in the Virtual Machine

To change the CD in a virtual machine:

1. Unmount the first CD:

   ```
   # umount mount-point
   ```

2. Select the second ISO file, and click **Change CD**.
3. Mount the second CD:

   ```
   # mount /dev/cdrom mount-point
   ```

D.10 Cannot Import External Resources

Cannot Import Due to Invalid URL

The following information is displayed: "The URL is invalid", or "The proxy URL is invalid".

To solve this problem, log in to the Virtual Machine Server, and run the following command to test the network connection:

```
# wget url
```

Here, *url* refers to the link for downloading the resource.

If the resource is from the Internet, you may need a proxy before running the **wget** command. Contact your network administrator to get the proxy, an then run the following commands to configure the proxy:

```
# export http_proxy=http://host:port/
# export ftp_proxy=http://host:port/
```

Here, *host* refers to the host name or IP address of the proxy server, and *port* refers to the port number of the proxy.

Cannot Import Due to NFS Disk

The following information is displayed:

Cannot obtain memory size from vm.cfg.

This error may occur when there are two or more Utility Servers in a server pool, and the disk is shared by the Network File System (NFS) mode.

To solve this problem, click the **Next** button periodically.

D.11 Remote Host Identification Error in Server Pool

If you reinstall the Oracle VM Server software, or change the *root* user's password of an Oracle VM Server in a server pool, communication from the server pool to that server may fail.

If you reinstall the Oracle VM Server software (not upgraded), the RSA key is likely to change, even if you use the same IP address and host name. You may see an error similar to:

```
REMOTE HOST IDENTIFICATION HAS CHANGED
```

or

```
Host key verification failed
```

Workaround: Remove the Oracle VM Server from the server pool, and add the Oracle VM Server again.

E

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Glossary

Domain

A configurable set of resources, including memory, virtual CPUs, network devices and disk devices, in which virtual machines run. A domain is granted virtual resources and can be started, stopped and rebooted independently.

See also **dom0** and **domU**.

dom0

An abbreviation for *domain zero*. The management domain with privileged access to the hardware and device drivers. Dom0 is the first domain started by the Oracle VM Server at boot time. Dom0 has more privileges than domU. It can access the hardware directly and can manage the device drivers for other domains. It can also start new domains.

domU

An unprivileged domain with no direct access to the hardware or device drivers. Each domU is started by Oracle VM Server in dom0. The xm command-line tool is used to interact with each domU.

Guest

A guest operating system that runs within a domain in Oracle VM Server. A guest may be paravirtualized or hardware virtualized. Multiple guests can run on the same Oracle VM Server.

Hardware virtualized machine

A virtual machine with an unmodified guest operating system. It is not recompiled for the virtual environment. There may be substantial performance penalties running as a hardware virtualized guest. Enables Microsoft Windows™ operating system to be run, as well as legacy operating systems. Hardware virtualization is only available on Intel VT or AMD SVM CPUs.

Host computer

The physical computer on which Oracle VM Server is installed.

Hypervisor

The hypervisor, monitor, or Virtual Machine Manager (VMM). It is the only fully privileged entity in the system. It controls only the most basic resources of the system, including CPU and memory usage, privilege checks, and hardware interrupts.

Management domain

See **dom0**.

Oracle VM Agent

An application installed with Oracle VM Server. It communicates with Oracle VM Manager for management of virtual machines. Oracle VM Manager manages the virtual machines running on Oracle VM Server by communicating with Oracle VM Agent. It contains three components: Server Pool Master, Utility Server, and Virtual Machine Server.

Oracle VM Server

A self-contained virtualization environment designed to provide a lightweight, secure, server-based platform for running virtual machines. Oracle VM Server is based upon an updated version of the Xen hypervisor technology. Includes Oracle VM Agent to enable communication with Oracle VM Manager.

Oracle VM Manager

Provides the user interface, which is a standard ADF (Application Development Framework) web application, to manage Oracle VM Server pools. Manages virtual machine lifecycle, including creating virtual machines from templates or from installation media, deleting, powering off, uploading, deployment and live migration of virtual machines. Manages resources including ISO files, templates and shared virtual disks. Also provides an API via a web service to Oracle VM Server.

Paravirtualized machine

A virtual machine with a kernel that is recompiled to be made aware of the virtual environment. Runs at near native speed, with memory, disk and network access optimized for maximum performance.

Preferred Server

A Virtual Machine Server that provides resources such as memory, CPU, network interface cards (NICs), and disk to the virtual machine. If you select only one Virtual Machine Server as the preferred server, the virtual machine always starts from and runs on this server. If you select multiple preferred servers, each time the virtual machine starts, it runs on the machine with the maximum available resources.

QEMU

Also referred to as qemu-dm, which is the process name. The virtualization process which allows full virtualization of a PC system within another PC system.

Server Pool

Logically an autonomous region that contains one or more physical Oracle VM Servers. Presents a unified view of the storage where the virtual machines reside, and groups the users of these virtual machines into a single community called a *group*, in which each user is a server pool member.

Server Pool Master

A component of Oracle VM Agent. An application that acts as the contact point to Oracle VM Manager, and to other Oracle VM Agents. Provides virtual machine host load-balancing, and local persistency for Oracle VM Server.

There is only one Server Pool Master in a server pool. A physical server can perform as the Server Pool Master, Utility Server and Virtual Machine Server simultaneously.

Utility Server

A component of Oracle VM Agent. An application that handles I/O intensive operations for virtual machines, server pools and servers, for example, copying, moving and renaming files.

There can be more than one Utility Server in a server pool. A physical server can perform as the Server Pool Master, Utility Server and Virtual Machine Server simultaneously.

vif

A virtual network interface for bridging network interfaces between domUs and dom0. When a domU is started it is assigned a number. This number is used to bridge the network interface from eth*n* to vif*n.0*.

Virtual disk

A file or set of files, usually on the host file system although it may also be a remote file system, that appears as a physical disk drive to the guest operating system.

Virtual Machine (VM)

A guest operating system and the associated application software that runs within Oracle VM Server. May be paravirtualized or hardware virtualized machines. Multiple virtual machines can run on the same Oracle VM Server.

Virtual Machine Manager (VMM)

See **Hypervisor**.

Virtual Machine Server

A component of Oracle VM Agent. An application which runs Oracle VM Server virtual machines. It can start and stop virtual machines, and collect performance data for the host and guest operating systems. Enables communication between the Server Pool Master, Utility Server and Virtual Machine Servers.

There can be more than one Virtual Machine Server in a server pool. A physical server can perform as the Server Pool Master, Utility Server and Virtual Machine Server simultaneously.

Virtual Machine Template

A template of a virtual machine. Contains basic configuration information such as the number of CPUs, memory size, hard disk size, and network interface card (NIC). Create virtual machines based on a virtual machine template using Oracle VM Manager.

VMM

See **Virtual Machine Manager (VMM)**.

Xen™

The Xen hypervisor is a small, lightweight, software virtual machine monitor, for x86-compatible computers. The Xen hypervisor securely executes multiple virtual machines on one physical system. Each virtual machine has its own guest operating system with almost native performance. The Xen hypervisor was originally created by researchers at Cambridge University, and derived from work done on the Linux kernel.

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