

Enterprise Manager for Oracle VDI

Plug-in User's Guide for Release 3.5



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Enterprise Manager for Oracle VDI: Plug-in User's Guide for Release 3.5

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Preface

This document is part of the documentation library for Oracle Virtual Desktop Infrastructure (VDI) release 3.5, which is available at:

<http://www.oracle.com/technetwork/server-storage/virtualdesktop/docs/index.html>

The documentation library consists of the following items:

Oracle Virtual Desktop Infrastructure Release Notes

The release notes provide a summary of the new features, changes, fixed bugs and known issues in Oracle VDI.

Oracle Virtual Desktop Infrastructure Getting Started Guide

The getting start guide describes how to get started with Oracle VDI and is intended for administrators who are new to the product.

Oracle Virtual Desktop Infrastructure Administrator's Guide

The administrator's guide is a comprehensive guide to how to install, configure, and administer Oracle VDI. Troubleshooting information is also included.

Enterprise Manager Plug-in User's Guide for Oracle Virtual Desktop Infrastructure

The plug-in user's guide is intended for administrators who are familiar with Oracle VDI and require access to the comprehensive monitoring capabilities of Oracle Enterprise Manager.

Oracle Virtual Desktop Infrastructure Security Guide

The security guide is a supplemental guide to the security aspects of Oracle VDI. It addresses the security concerns of Oracle VDI system administrators.

Audience

The Oracle VDI documentation is written for system administrators who want to install and configure Oracle VDI in order to deploy desktops to users. It is assumed that readers are familiar with web and virtualization technologies and have a general understanding of operating systems such as UNIX (including Linux) and Windows.

Documentation for Additional Supporting Software

The documentation for additional supporting software used with Oracle VDI is available as follows:

- Sun Ray Software and Sun Ray Clients, including Oracle Virtual Desktop Client

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

- Oracle VM VirtualBox

<http://www.oracle.com/technetwork/server-storage/virtualbox/documentation/index.html>

- Oracle Secure Global Desktop

<http://www.oracle.com/technetwork/server-storage/securedesktop/docs/index.html>

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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.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Document Revision

Document generated on: 2013-03-25 (revision: 2304)

Chapter 1. Introduction to the Oracle VDI Plug-in

This guide is intended for administrators who are familiar with Oracle VDI and require access to the comprehensive metrics and performance data that Oracle Enterprise Manager collects for all managed Oracle systems. The main objective of the Enterprise Manager Plug-in for Oracle VDI is to make system monitoring easier for the administrator, for example:

- centralized monitoring of all Oracle VDI resources in a single view
- integration with monitoring and management of other Oracle enterprise systems
- comprehensive data collection and storage over time
- performance analysis and visualization for early detection of potential threats as well as troubleshooting in case of failure

1.1. About this Document

The *Enterprise Manager Plug-in Guide for Oracle VDI* describes how to install and use the Enterprise Manager Plug-in for Oracle VDI in order to monitor Oracle VDI resources from within Oracle Enterprise Manager. The Enterprise Manager Plug-in for Oracle VDI enables Oracle VDI integration by adding specific targets and a set of specific monitoring pages. A description of these monitoring target pages and their integrated navigation tree is provided in [Chapter 3, Monitoring Oracle VDI Targets](#).

1.2. About the Oracle VDI Plug-in

Oracle Virtual Desktop Infrastructure (VDI) is a virtualization technology for deploying and managing server-hosted desktop operating systems that users can access from a wide range of client devices. Oracle VDI provides centralized system administration, flexibility in the choice of desktop operating systems and virtualization platforms, and high availability of desktop systems. With the Enterprise Manager Plug-in for Oracle VDI, the entire installation can be monitored from a central management console.

1.2.1. Overview

The Enterprise Manager Plug-in for Oracle VDI adds support for monitoring Oracle VDI resources, which include the Oracle VDI Center and its hosts, companies, desktop pools, desktop providers, hypervisor hosts and storage. These resources are called *targets* in Oracle Enterprise Manager. Multiple Oracle VDI Centers can be added and monitored through the plug-in. The Oracle Enterprise Manager Monitoring Agent periodically retrieves metrics and configuration data to display them on the monitoring page of each target. In addition to the information retrieved at regular intervals, the target pages also contain a number of graphs with historical data, showing the evolution of certain metrics over time.

For the most detailed information, the menu on the monitoring target pages provides access to the raw metric data as collected by the Monitoring Agent. On the built-in Oracle Enterprise Manager *All Metrics* page, you can access all metric values collected for each target, as well as real-time values.

The Enterprise Manager Plug-in for Oracle VDI only adds monitoring capability. It does not allow Oracle VDI resources to be managed directly from within Oracle Enterprise Manager.

1.2.2. Plug-in Architecture

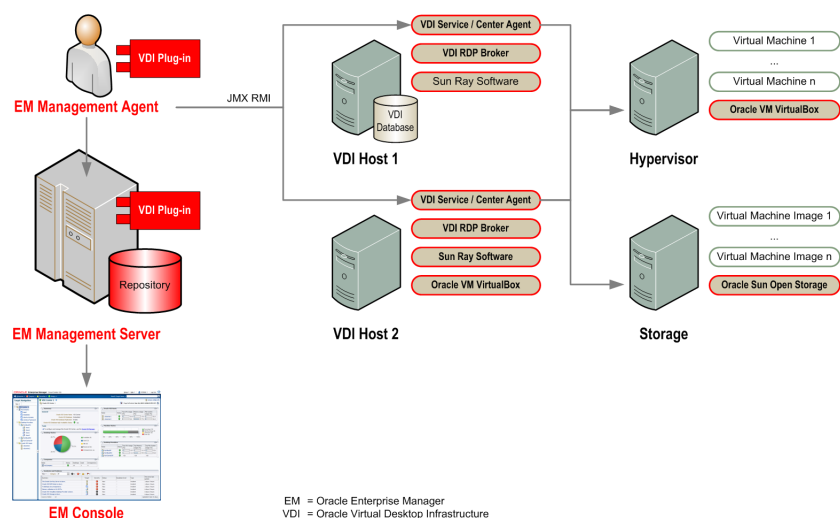
When the Enterprise Manager Plug-in for Oracle VDI is [installed and deployed](#), the Management Agent establishes a secure communication channel to an Oracle VDI Center Agent. It retrieves metric and configuration data through the Oracle VDI Center Agent.

This architecture simplifies the Oracle Enterprise Manager setup. No configuration changes are required on any Oracle VDI host. The Management Agent may run on a host that is not part of the Oracle VDI environment. For example, it could run on the Oracle Enterprise Manager host itself. A single Management Agent is sufficient to monitor an entire Oracle VDI installation.

To [configure an Oracle VDI Center target](#), you provide the fully qualified domain name of an Oracle VDI Center host and the login credentials of an Oracle VDI administrator account. With this information, the Management Agent connects to the Oracle VDI Center Agent. It reads the configuration of the entire Oracle VDI Center and automatically creates monitoring targets in Oracle Enterprise Manager for each component.

Because the majority of the monitoring information is stored in the Oracle VDI database, which is available to all Oracle VDI hosts, the Management Agent communicates almost exclusively with the Oracle VDI Center Agent that it initially connected to. The Oracle VDI host running this agent is called the preferred host. If that agent should become unavailable, the Management Agent automatically falls back to the agent on the next available Oracle VDI host. In normal circumstances, the Management Agent only communicates with other Oracle VDI Center Agents to retrieve information that is not stored in the shared database. For example, to check the status of services running locally on an Oracle VDI host.

Figure 1.1. Architecture Overview of the Enterprise Manager Plug-in for Oracle VDI



1.2.3. Metric Collection

The Enterprise Manager Plug-in for Oracle VDI is also deployed on the Oracle Management Server (OMS). At regular intervals, the Management Agent uploads collected data to the OMS, which stores it in the Management Repository. The data is visualized on the Oracle VDI target pages in the Oracle Enterprise Manager Console. Each Oracle VDI component has a corresponding target page, which displays the most recently uploaded data, as well as graphs with historical data showing the evolution of certain metrics over time. For example, the CPU and memory consumption of a desktop provider in the past 24 hours.

Information displayed on the target pages is always retrieved from the Management Repository. There is no communication with the Management Agent when the monitoring data is loaded. For real-time values, use the target's menu to display the *All Metrics* page. It shows raw metric data as collected by the Management Agent, and the time when the data was last uploaded to the OMS. If you select a metric, its values are retrieved in real-time from the Management Agent (unless otherwise noted on the page).

The default collection interval for Oracle VDI metrics is 15 minutes. Critical metrics, such as the status of services (up or down), are collected every 5 minutes. Configuration data and other values that do not

change frequently are collected every 24 hours. The Oracle Enterprise Manager Console allows the user to change the collection interval for each target metric individually. For instructions to customize the collection schedule, see "Collection Intervals" in [Section 4.3, "Metrics Collection"](#).

1.2.4. Events and Incidents

Monitoring metrics over time allows you to identify potential bottlenecks and take preventive or corrective actions. Critical failures may also occur, and require immediate attention. Oracle Enterprise Manager supports the concept of events. An event is a significant occurrence outside normal operating conditions on a managed target. For example, events are automatically triggered when an Oracle VDI component, such as a single host or an essential service, is detected as being down.

For all metrics a threshold can be defined. Crossing a threshold triggers a corresponding event. Each event is associated with a severity level: fatal, critical, warning or clear. Examples of events include very high CPU utilization on a particular host, and a large number of unresponsive desktops in a pool. The Enterprise Manager Plug-in for Oracle VDI includes [predefined thresholds](#) for the many of the collected metrics. These defaults can be changed as required for every metric.

1.3. Versions Supported

The Enterprise Manager Plug-in for Oracle VDI is intended for the following versions:

- Oracle Enterprise Manager release 12.1.0.1.0 and later
- Oracle Virtual Desktop Infrastructure release 3.5 and later

Chapter 2. Installing the Oracle VDI Plug-in

In this chapter, you install the Oracle VDI plug-in in Oracle Enterprise Manager, and deploy it on the Management Server(s) so that it is ready to accept new Oracle VDI targets. For detailed steps to perform the actions in this chapter, you are directed to use the instructions already provided in the [Oracle Enterprise Manager Cloud Control Administrator's Guide](#).

2.1. Prerequisites

Before you install the Enterprise Manager Plug-in for Oracle VDI, verify that your environment meets these requirements:

- The Oracle Enterprise Manager installation must be running.
- At least one active Management Server (OMS) and Monitoring Agent must be set up.

For details about the Oracle Enterprise Manager system components, and instructions to install and configure your environment in order to meet these prerequisites, consult the Oracle Enterprise Manager documentation on the Oracle Technology Network (OTN): <http://www.oracle.com/technetwork/oem/enterprise-manager/documentation/index.html>.

It is best to keep the Oracle Enterprise Manager and Oracle VDI components separate on their respective hosts. There is no need to install a Management Agent on any of the Oracle VDI hosts, because the Enterprise Manager Plug-in for Oracle VDI enables remote communication between the Management Agent and the Oracle VDI hosts.

2.2. Importing and Deploying the Plug-in

The Enterprise Manager Plug-in for Oracle VDI is distributed through the Oracle Enterprise Manager Store. For detailed steps on how to import and deploy the plug-in, see the *"Plug-in Manager"* chapter in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*: http://docs.oracle.com/cd/E24628_01/doc.121/e24473/plugin_mgr.htm.

The following is a summary of the process to follow:

1. Download the plug-in to the Oracle Enterprise Manager repository.

When this step is complete, you can see in the Plug-in Manager in the Oracle Enterprise Manager Console, that Oracle VDI is now listed among the plug-ins available in your environment.

2. Deploy the plug-in to a Management Server.

This extends the capabilities of the Management Server (OMS) to manage a new category of targets; in this case an Oracle VDI Center with its associated Oracle VDI targets. The OMS receives three components for each plug-in: management components, discovery components and monitoring components.

3. Deploy the plug-in to a Management Agent.

This transfers the discovery and monitoring components to the Management Agent, enabling it to discover Oracle VDI targets, and collect monitoring information from the discovered targets.

When these steps have been completed successfully, the Oracle VDI plug-in has been deployed and is ready to accept monitoring targets.

2.3. Configuring Oracle VDI Targets

After the Oracle VDI plug-in is deployed, Oracle Enterprise Manager recognizes monitoring targets of the type *Oracle VDI Center*. When you add an Oracle VDI Center target, all the other types of targets associated with the Oracle VDI Center, such as companies, pools and desktop providers, are added automatically and are displayed in a tree structure under their Oracle VDI Center. It is possible to add and monitor multiple Oracle VDI Center targets.



Caution

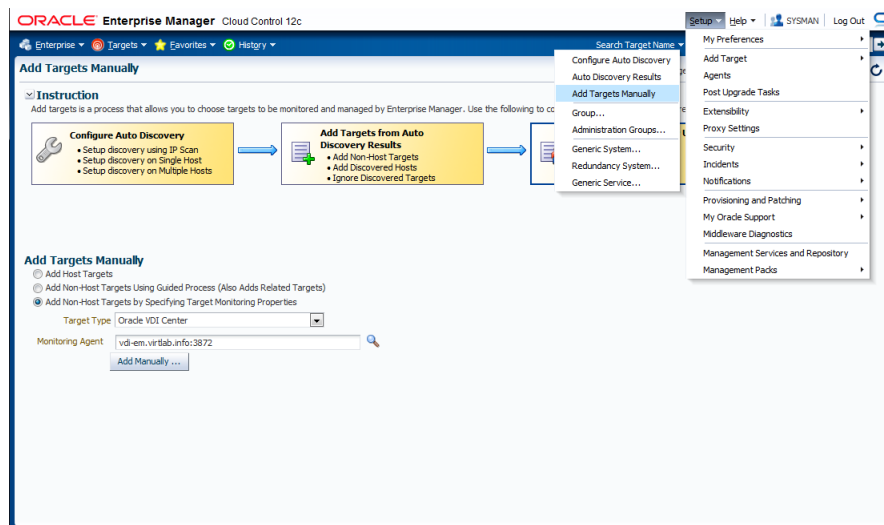
For monitoring, an Oracle VDI administrator account with *company monitor* and *provider monitor* privileges is required. For instructions to configure accounts and roles, see [Oracle VDI Administrators](#) in the Oracle Virtual Desktop Infrastructure Administrator's Guide.

Adding an Oracle VDI Center Target:

1. Log on to the Oracle Enterprise Manager Console: <https://myserver.example.com:7803/em>.
2. In the **Setup** menu in the top-right corner, select **Add Target**, and then select **Add Targets Manually**.

The Add Targets Manually page is displayed.

Figure 2.1. Manual Addition of an Oracle VDI Center Target in Oracle Enterprise Manager



3. Select **Add Non-Host Targets by Specifying Target Monitoring Properties**.
4. In the **Target Type** list, select Oracle VDI Center. Click the search icon to select the **Monitoring Agent**.

The Agent **Search and Select** dialog box is displayed.

5. Select the Management Agent on your Oracle Enterprise Manager host and click **Select**.
In the Add Targets Manually page, your selection appears in the **Monitoring Agent** box.
6. Click **Add Manually** to open the properties page for the Oracle VDI Center target you wish to add.
7. Enter the following properties:

- A name to identify the monitoring target.
- The host name or IP address of a host in your Oracle VDI Center.

If the Oracle VDI Center Agent does *not* use the standard port 11174, enter `<hostname>:<port>`.

- The credentials of an Oracle VDI administrator account with *company monitor* and *provider monitor* privileges.

Figure 2.2. Monitoring Details of the Oracle VDI Center

8. Click **Submit**.

A job is started to add the new Oracle VDI Center monitoring target. A job activity page is displayed, where you can track its progress.

9. When the job finishes, verify the status of the new targets.

In the **Targets** menu, select **All Targets** and verify that your Oracle VDI Center and associated Oracle VDI targets appear in the table. If the target status is *up*, then the Enterprise Manager Plug-in for Oracle VDI is properly collecting monitoring data for your Oracle VDI targets.

2.4. Refreshing an Oracle VDI Center Target

Naturally, your Oracle VDI installation evolves over time, and resources may be added, removed or replaced. To keep the monitoring accurate in Oracle Enterprise Manager, you need to synchronize the Oracle VDI Center targets when infrastructure changes are made.

Refreshing an Oracle VDI Center Target:

1. Log on to the Oracle Enterprise Manager Console: <https://myserver.example.com:7803/em>.
2. Open the Oracle VDI Center home page.
3. In the Oracle VDI Center target page menu, select **Refresh Oracle VDI Center**.

A confirmation window is displayed.

4. Click **OK** to start the target synchronization job.

After the job is completed, obsolete targets are removed and new targets are added to the navigation tree of the Oracle VDI Center home page.

Chapter 3. Monitoring Oracle VDI Targets

When an Oracle VDI Center is configured as a target, it appears in the list of all targets that are monitored by Oracle Enterprise Manager. To access the target pages of the Enterprise Manager Plug-in for Oracle VDI, click the Oracle VDI Center in this list.

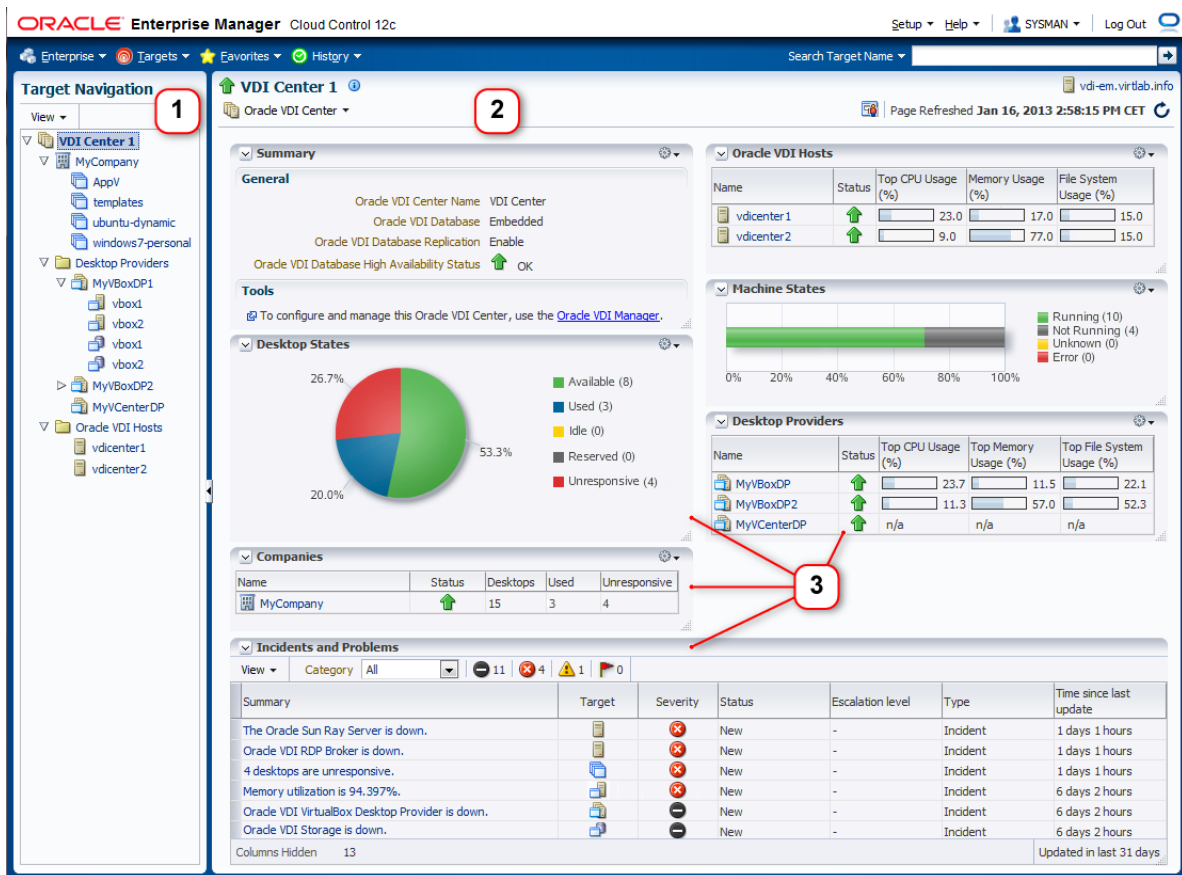
The plug-in adds a target page for each of the target types described in [Section 3.2, "Oracle VDI Monitoring Target Pages"](#). The Oracle VDI target pages also feature a navigation tree, described in [Section 3.1, "Target Page Layout and Navigation"](#), which provides easy switching between target pages and drill-down into the details of child targets of an Oracle VDI Center.

3.1. Target Page Layout and Navigation

An Oracle VDI deployment consists of different types of resources, and usually several of each type. A single Oracle VDI Center contains one or more hosts, at least one company with its desktop pools, a number of desktop providers that may also contain several hosts, and possibly different types of storage. Because the number of components involved increases quickly, it is difficult to monitor the entire environment from Oracle VDI Manager. The Enterprise Manager Plug-in for Oracle VDI groups all these separate monitoring targets together in a unified view, making the monitoring of your Oracle VDI environment a much easier job.

Target Page Layout

[Figure 3.1](#) illustrates how an Oracle VDI target page is constructed. The Target Navigation pane (labeled "1" in the screenshot) is located on the left hand side and can be hidden. The content pane (labeled "2" in the screenshot) is the main part of the screen and displays the target monitoring data, logically grouped in a number of information panels (labeled "3" in the screenshot). The content pane changes based on the item selected in the navigation tree.

Figure 3.1. Target Monitoring with the Enterprise Manager Plug-in for Oracle VDI



Navigation Pane

In order to make the various monitoring targets available in a single view, the Enterprise Manager Plug-in for Oracle VDI adds a navigation pane with a tree structure, as shown in Figure 3.1. It looks similar to the navigation mechanism provided in Oracle VDI Manager. When you add an Oracle VDI Center target to Oracle Enterprise Manager for monitoring, the plug-in detects and adds all child targets associated with the Oracle VDI Center. The result is a hierarchical view of all targets, displayed in the Target Navigation pane.

By selecting a node in the tree, you open the target page of each individual resource. The icons in the Target Navigation panel identify the type of target, as shown in the following table:

Table 3.1. Oracle VDI Icons in Target Navigation Panel

Icon	Monitoring Target Type
	Oracle VDI Center
	Oracle VDI host
	Oracle VDI company
	Oracle VDI pool
	Oracle VDI desktop provider
	Oracle VDI VirtualBox hypervisor

Icon	Monitoring Target Type
	Oracle VDI storage

Oracle VDI Target Pages

To present the data of each Oracle VDI target in the most clear and useful way possible, the Enterprise Manager Plug-in for Oracle VDI provides a specific target page for the different categories of Oracle VDI resources. You select the individual resource, or a parent resource, in the Target Navigation pane on the left hand side. If the selected resource is a parent node, it typically displays accumulated metrics and data from its nested child targets. [Section 3.2, “Oracle VDI Monitoring Target Pages”](#) describes the content of the various target pages.

In general, the panels in the left column of the target page display information related to desktops and sessions, along with a summary and configuration details of the monitoring target. The panels in the right column are more focused on hardware and performance. Incidents and problems are displayed near the bottom of the page.

3.2. Oracle VDI Monitoring Target Pages

This section provides a detailed description of the monitoring data collected for each target type. It also explains how this information is displayed in various panels, which are combined to form the Oracle VDI target pages.

Metrics collection is an asynchronous operation. Live data, such as desktop states or CPU load, are updated every 5 or 15 minutes by default depending on their importance. This means that related targets, meaning parent or child targets, may show different values at the same point in time. Configuration data is collected every 24 hours. The collection schedule can be altered by the Oracle Enterprise Manager administrator, as described in "Collection Intervals" in [Section 4.3, “Metrics Collection”](#).

3.2.1. About Monitoring Panels

This section provides a detailed description of the different panels that appear in multiple target pages. Panels that are specific to one target page, are described in the target page overviews in the sections that follow.

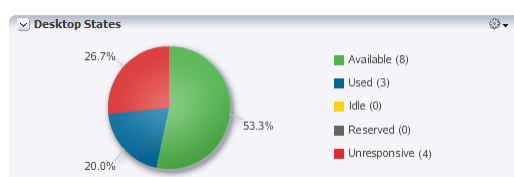
Summary

Every Oracle VDI target page has a Summary panel. It contains general configuration information and, if applicable, hardware configuration details of the host. Click **Oracle VDI Manager** to access the administration tool for the Oracle VDI Center.

Desktop States

In the Desktop States panel, current information for the desktop states is displayed as a pie chart. For each desktop state, a total count is shown in brackets in the legend. Possible desktop states are: *available*, *used*, *idle*, *reserved* and *unresponsive*.

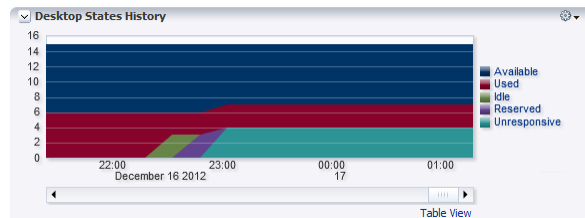
Figure 3.2. Desktop States Monitoring Panel



Desktop States History

In the Desktop States History panel, the state of desktops is shown in a stacked area chart on a time scale. The number of desktops in each state are stacked, so that the highest value represents the total number of desktops in the company. The chart shows the history of desktop states over a period of time. The time period can be modified by zooming in or out. You control the zoom level by clicking the magnifying glass icon to the left of the scroll bar or by dragging the edges of the slider on the scroll bar.

Figure 3.3. Desktop States History Monitoring Panel



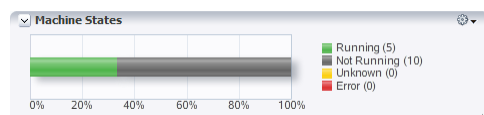
Desktops are in an *available*, *used*, *idle*, *reserved* or *unresponsive* state, and individual graphs are displayed if you move the mouse pointer over the colored area or legend item.

Click **Table View** to display the chart values in a pop-up window as a table, where each row represents a measure recorded at a specific time and date.

Machine States

In the Machine States panel, current information for the virtual machine states is displayed on a horizontal bar with a percentage scale. For each virtual machine state, a total count is shown in brackets in the legend. Possible machine states are: *running*, *not running*, *unknown* and *error*.

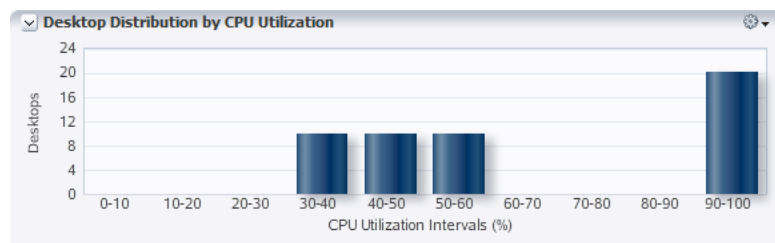
Figure 3.4. Machine States Monitoring Panel



Desktop Distribution by CPU Utilization

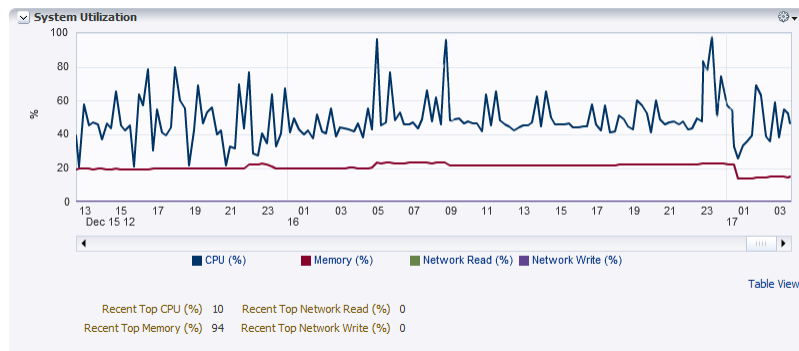
In the Desktop Distribution panel, the total number of desktops is broken down by the percentage of CPU load. The diagram displays the number of desktops for each 10% interval of CPU activity.

Figure 3.5. Desktop Distribution by CPU Utilization Monitoring Panel



System Utilization

The System Utilization line chart displays four major performance parameters of a host or a group of hosts: CPU usage, memory usage, network read bandwidth and network write bandwidth. The chart shows the history of these parameters over a period of time. The time period can be modified by zooming in or out. You control the zoom level by clicking the magnifying glass icon to the left of the scroll bar or by dragging the edges of the slider on the scroll bar.

Figure 3.6. System Utilization Monitoring Panel

The values used to plot the line graphs are typically averages based on metrics collected from different servers. The highest value among the metrics from all servers is called the *top* value, and the most recently collected top values are displayed below the chart.

The target type determines whether top values are displayed. For example, CPU utilization always has a top value because a single host likely has multiple cores. However, in a single host configuration there is no top value for memory because it is treated as one global entity.



Note

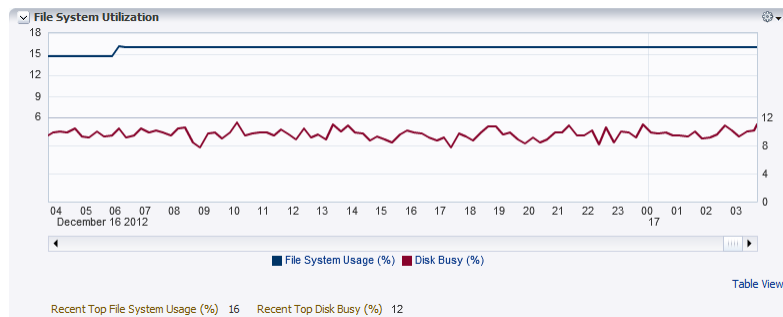
Incidents and problems related to these metrics are triggered by top values that exceed a threshold and not by their totals or averages.

Individual graphs are displayed if you move the mouse pointer over the line or legend item.

Click **Table View** to display the chart values in a pop-up window as a table, where each row represents a measure recorded at a specific time and date.

File System Utilization

The File System Utilization line chart displays two major disk activity parameters of a host or a group of hosts: file system usage and disk busy percentage. The chart shows the history of these parameters over a period of time. The time period can be modified by zooming in or out. You control the zoom level by clicking the magnifying glass icon to the left of the scroll bar or by dragging the edges of the slider on the scroll bar.

Figure 3.7. File System Utilization Monitoring Panel

Individual graphs are displayed if you move the mouse pointer over the line or legend item.

Click **Table View** to display the chart values in a pop-up window as a table, where each row represents a measure recorded at a specific time and date.

Incidents and Problems

The Incidents and Problems table shows any event from a target or resource that exceeds a threshold, stops working, or disappears from monitoring. For each event, the default table shows when it occurred and which monitoring target is impacted, provides a short description, and indicates the severity. See [Section 3.3, “Predefined Incidents and Problems”](#) for additional information.

Figure 3.8. Incidents and Problems Monitoring Panel

Summary	Target	Severity	Status	Escalation level	Type	Time since last update
The Oracle Sun Ray Server is down.		New	New	-	Incident	0 days 13 hours
Oracle VDI RDP Broker is down.		New	New	-	Incident	0 days 14 hours
4 desktops are unresponsive.		New	New	-	Incident	0 days 13 hours
Memory utilization is 94.397%		New	New	-	Incident	0 days 13 hours
Oracle VDI VirtualBox Desktop Provider is down.		New	New	-	Incident	0 days 13 hours
Oracle VDI Storage is down.		New	New	-	Incident	0 days 13 hours

In the **View** menu, in the top-left corner of the panel, you can configure which columns are displayed in the table.

Warnings, which are the lowest severity category, are not escalated from child targets to parent targets.

Click the event description in the Summary column to display all details of the incident or problem in Oracle Enterprise Manager's built-in Incident Manager.

3.2.2. Monitoring an Oracle VDI Center

The Oracle VDI Center is the main target node in the Target Navigation panel, to which all other Oracle VDI targets are hierarchically connected. Its monitoring page is designed to provide an overview of the most important metrics and configuration data, enabling you to quickly determine the general status of the entire Oracle VDI environment. Several areas of this monitoring page provide links to child targets, such as companies and desktop providers, which enable you to drill-down quickly into the details of components that require investigation.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary panel shows configuration details such as the Oracle VDI Center target name and the Oracle VDI database setup and status.

Click **Oracle VDI Manager** to access the administration tool for the Oracle VDI Center.

Desktop States

Refer to the functional description of the [Desktop States panel](#) in [Section 3.2.1](#).

The chart applies to all desktops in the entire Oracle VDI Center.

Companies

All companies that are configured in the Oracle VDI Center are displayed in a table, showing the total number of desktops for each company, and how many of them are in use or unresponsive. Oracle VDI companies that are down, appear at the top of the table.

Click the name of an Oracle VDI company to access its target page directly.

Oracle VDI Hosts

All hosts that are part of the Oracle VDI Center are displayed in a table with their respective CPU usage, memory usage and file system usage. Oracle VDI hosts that are down, appear at the top of the table.

Click the name of an Oracle VDI host to access its target page directly.

Machine States

Refer to the functional description of the [Machine States panel](#) in [Section 3.2.1](#).

The chart applies to all virtual machines in the Oracle VDI Center.

Desktop Providers

All desktop providers that are managed within the Oracle VDI Center are displayed in a table with their respective top CPU usage, memory usage and file system usage. Oracle VDI desktop providers that are down, appear at the top of the table.

Click the name of an Oracle VDI desktop provider to access its target page directly.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the entire Oracle VDI Center.

3.2.3. Monitoring an Oracle VDI Host

An Oracle VDI host is a host that runs the Oracle VDI software, and manages user connections to virtual desktops. Although single-host configurations are possible, Oracle VDI Centers configured for high-availability and failover always consist of multiple hosts. For the desktop sessions as well as for the Oracle VDI configuration, an Oracle VDI host runs a number of services. These services and desktop sessions constitute the most important monitoring data provided specifically on the Oracle VDI host target page.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary section for an Oracle VDI host target is subdivided as follows:

- **General Information:** the host's name, Oracle VDI version and operating system
- **Tools:** a link to the administration tool for the Oracle VDI Center
- **System Information:** details of the host's hardware configuration

Services

The Oracle VDI and remote connection services configured on this host are displayed in a table with clear status indication. If a host is database master or replication host, or primary or secondary Sun Ray server, this is shown in the Information column.

Desktop sessions are in an *active*, *disconnected* or *critical* state. Critical sessions are remote connections with a packet loss of 10 percent or more.

Session States History

The state of desktop sessions is shown in a line chart on a time scale. The chart shows the history of session statistics over a period of time. The time period can be modified by zooming in or out. You

control the zoom level by clicking the magnifying glass icon to the left of the scroll bar or by dragging the edges of the slider on the scroll bar.

Desktop sessions are in an *active*, *disconnected* or *critical* state. Critical sessions are remote connections with a packet loss of 10 percent or more.

System Utilization

Refer to the functional description of the [System Utilization panel](#) in [Section 3.2.1](#).

The chart indicates system load on the selected Oracle VDI host.

File System Utilization

Refer to the functional description of the [File System Utilization panel](#) in [Section 3.2.1](#).

The chart applies to the selected Oracle VDI host's file system.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the selected Oracle VDI host.

3.2.4. Monitoring an Oracle VDI Company

Oracle VDI companies provide access to user directories and contain pools of desktops for these users. An Oracle VDI Center can contain multiple companies. Users and virtual desktops are separated by company. Virtualization hosts and storage are part of the underlying infrastructure, and can be shared between companies. The Oracle VDI company target page contains monitoring information only from the pools, desktops, users and groups associated with it.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary section for an Oracle VDI company target is subdivided as follows:

- **General Information:** the company name and total number of desktops in its pools
- **Tools:** a link to the administration tool for the Oracle VDI Center
- **User Directory:** details of the directory service configured for this company

Desktop States

Refer to the functional description of the [Desktop States panel](#) in [Section 3.2.1](#).

The chart applies to all desktops associated with the selected Oracle VDI company.

Pools

All desktop pools that are configured for the selected Oracle VDI company are displayed in a table, showing the total number of desktops in each pool, how many are in use or unresponsive, and the desktop provider type that hosts the desktops. Oracle VDI pools which are down, appear at the top of the table.

Click the name of an Oracle VDI pool to access its target page directly.

Desktop States History

Refer to the functional description of the [Desktop States History panel](#) in [Section 3.2.1](#).

The chart shows the history of desktop states within the selected company.

Machine States

Refer to the functional description of the [Machine States panel](#) in [Section 3.2.1](#).

The chart applies to all virtual machines in the selected company.

Desktop Distribution by CPU Utilization

Refer to the functional description of the [Desktop Distribution by CPU Utilization panel](#) in [Section 3.2.1](#).

The graph applies to all desktops in the selected company.

System Utilization

Refer to the functional description of the [System Utilization panel](#) in [Section 3.2.1](#).

The chart indicates system load based on metrics collected from all hosts and storages that are used by the company's pools.

File System Utilization

Refer to the functional description of the [File System Utilization panel](#) in [Section 3.2.1](#).

The chart applies to the storage available to all desktops in the pools that belong to the company.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the selected company.

3.2.5. Monitoring an Oracle VDI Pool

A pool is a collection or container of desktops. At the same time, a pool is a functional and logical subdivision of the company, which encompasses all desktops in all its pools. Typically, you create different pools for different types of users or different categories of desktops. The Oracle VDI pool monitoring data recorded for desktops is a subset of the same metrics displayed in the parent target page of the company.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary section shows configuration details such as the Oracle VDI pool target name, the associated desktop provider and type, and the desktop assignment method. The information displayed depends on the type of desktop provider associated with the desktop pool: an Oracle VDI VirtualBox desktop provider returns the most detailed information.

Click **Oracle VDI Manager** to access the administration tool for the Oracle VDI Center.

Desktop States

Refer to the functional description of the [Desktop States panel](#) in [Section 3.2.1](#).

This panel is displayed only for VirtualBox, Microsoft Hyper-V, VMware vCenter and Generic pools.

The chart applies to all desktops present in the selected Oracle VDI pool.

Microsoft Remote Desktop providers report Session states instead of Desktop states.

Desktop States History

Refer to the functional description of the [Desktop States History panel](#) in [Section 3.2.1](#).

This panel is displayed only for VirtualBox, Microsoft Hyper-V, VMware vCenter and Generic pools.

The chart shows the history of desktop states within the selected pool.

Microsoft Remote Desktop providers report Session states history instead of Desktop states history.

Machine States

Refer to the functional description of the [Machine States panel](#) in [Section 3.2.1](#).

This panel is displayed only for VirtualBox, Microsoft Hyper-V and VMware vCenter pools.

The chart applies to all virtual machines in the selected pool.

Desktop Distribution by CPU Utilization

Refer to the functional description of the [Desktop Distribution by CPU Utilization panel](#) in [Section 3.2.1](#).

This panel is displayed only for VirtualBox pools.

The graph applies to all desktops in the selected pool.

System Utilization

Refer to the functional description of the [System Utilization panel](#) in [Section 3.2.1](#).

This panel is displayed only for VirtualBox pools.

The chart indicates system load based on metrics collected from all hosts and storages that are used by the company's pools.

File System Utilization

Refer to the functional description of the [File System Utilization panel](#) in [Section 3.2.1](#).

This panel is displayed only for VirtualBox pools.

The chart applies to the storage available to all desktops in the pool.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the selected pool.

3.2.6. Monitoring an Oracle VDI VirtualBox Desktop Provider

A desktop provider is the collection of virtualization resources (CPU, memory and storage) that are used to run the desktops. For the Oracle VDI VirtualBox desktop provider, all virtualization and storage hosts are treated as separate monitoring targets in the Enterprise Manager Plug-in for Oracle VDI. The desktop provider target page displays their cumulated metrics.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary section for an Oracle VDI VirtualBox desktop provider target contains the name of the desktop provider and the number of running desktops.

Click **Oracle VDI Manager** to access the administration tool for the Oracle VDI Center.

Hosts and Storages

All virtualization and storage hosts that are part of the Oracle VDI VirtualBox desktop provider are displayed in a table with their respective top CPU usage, memory usage and file system usage. hosts or storages which are down, appear at the top of the table.

Click the name of a virtualization or storage host to access its target page directly.

System Utilization

Refer to the functional description of the [System Utilization panel](#) in [Section 3.2.1](#).

The chart indicates system load based on metrics collected from all VirtualBox hypervisors and storages configured for the desktop provider.

File System Utilization

Refer to the functional description of the [File System Utilization panel](#) in [Section 3.2.1](#).

The chart applies to the selected Oracle VDI VirtualBox desktop provider hosts' file systems.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the selected Oracle VDI VirtualBox desktop provider.

3.2.7. Monitoring an Oracle VDI VirtualBox Hypervisor

An Oracle VDI VirtualBox hypervisor target page provides a detailed view on the configuration details and monitoring data of an individual VirtualBox hypervisor. An Oracle VDI VirtualBox desktop provider may consist of multiple VirtualBox hypervisors. If so, the VirtualBox desktop provider target page displays data cumulated from the hosts, and each VirtualBox hypervisor has its own target page.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary section for an Oracle VDI VirtualBox target is subdivided as follows:

- **General Information:** the host name and the number of desktops it hosts
- **Tools:** a link to the administration tool for the Oracle VDI Center
- **System Information:** details of the Oracle VDI VirtualBox hypervisor's hardware configuration

Machine States

Refer to the functional description of the [Machine States panel](#) in [Section 3.2.1](#).

The chart applies to all virtual machines on the selected VirtualBox hypervisor.

System Utilization

Refer to the functional description of the [System Utilization panel](#) in [Section 3.2.1](#).

The chart indicates system load on the selected VirtualBox hypervisor.

File System Utilization

Refer to the functional description of the [File System Utilization panel](#) in [Section 3.2.1](#).

The chart applies to the selected VirtualBox hypervisor's file system.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the selected VirtualBox hypervisor.

3.2.8. Monitoring Oracle VDI Storage

An Oracle VDI VirtualBox desktop provider has a separate child monitoring target for its storage. Storage targets are created for all Oracle VDI storage types, including local storage on the VirtualBox hypervisor. The Oracle VDI storage target page provides a detailed view on the configuration details and monitoring data of the individual Oracle VDI storage. Cumulated data from all storages that belong to the VirtualBox desktop provider is displayed on the parent target page.

Target Page Information

This target page provides the following resource details and monitoring data:

Summary

The Summary section for an Oracle VDI storage target is subdivided as follows:

- **General Information:** the host name, storage type, repository and the number of desktops it offers storage to
- **Tools:** a link to the administration tool for the Oracle VDI Center
- **System Information:** details of the storage host's hardware configuration

File System Usage

Current information on the available disk space is presented on a horizontal bar with a percentage scale. The amount of free and used space in gigabytes is shown in brackets in the legend. The chart applies to all virtual machines associated to which the selected storage host provides disk capacity.

System Utilization

Refer to the functional description of the [System Utilization panel](#) in [Section 3.2.1](#).

The chart is displayed only for Sun ZFS storages with 2009.09 firmware or later (AMBER_COMSTAR_Q3 subtype), and indicates system load on the selected Oracle VDI storage host.

File System Utilization

Refer to the functional description of the [File System Utilization panel](#) in [Section 3.2.1](#).

The chart is displayed only for Sun ZFS storages with 2009.09 firmware or later (AMBER_COMSTAR_Q3 subtype), and applies to the selected storage host's file system.

Incidents and Problems

Refer to the functional description of the [Incidents and Problems panel](#) in [Section 3.2.1](#).

The table shows incidents and problems for the selected Oracle VDI storage.

3.2.9. Monitoring Other Oracle VDI Desktop Providers

The Enterprise Manager Plug-in for Oracle VDI does not create new target pages for desktop provider types other than Oracle VDI VirtualBox. However, these other desktop provider types do appear in the Target Navigation pane as child targets of the Oracle VDI Center, and there is monitoring data available for each of them, as collected and presented by Oracle Enterprise Manager.

As a minimum, these target pages display the overall status of the desktop provider, along with a table of incidents and problems. The monitoring targets that are presented this way are:

- Microsoft Hyper-V desktop provider
- VMware vCenter desktop provider
- Microsoft Remote Desktop Services provider
- Sun Ray Kiosk desktop provider
- Generic desktop provider

3.3. Predefined Incidents and Problems

The Enterprise Manager Plug-in for Oracle VDI adds thresholds for a lot of the metrics it collects. The default severity level for predefined Oracle VDI incidents is *Critical*, with the exception of system service failures, which trigger a *Fatal* event. The plug-in comes with event-driven problem prevention and detection. The predefined incidents and problems eliminate a lot of initial configuration time. The administrator can customize all metric thresholds and events to suit the requirements of the Oracle VDI installation, as described in "Collection Intervals" in [Section 4.3, "Metrics Collection"](#).

The plug-in provides predefined incidents and problems for all Oracle VDI targets, grouped in the following categories:

Table 3.2. Categories of Predefined Incidents and Problems

Category	Incidents and Problems
Availability	<ul style="list-style-type: none"> • Critical system services down • Monitoring targets down
Utilization	<ul style="list-style-type: none"> • Host or storage memory utilization above 90% • Host or storage top network utilization (read or write) above 90% • Host or storage file system utilization above 90%
Load	<ul style="list-style-type: none"> • Host or storage top CPU utilization above 90% • Host or storage disk busy value above 90%
Error	<ul style="list-style-type: none"> • One or more desktops unresponsive or with machine state error • The number of critical sessions for a host is 5 or greater

For more information about incident management in Oracle Enterprise Manager, and for instructions to customize events and configure notifications, refer to the *Oracle Enterprise Manager Cloud Control Administrator's Guide*, [Chapter 3: "Using Incident Management"](#).

The default threshold for hardware-related events is set to 90%. To avoid false positives, the default setting requires that events occur twice before an alert is sent. Events related to system service availability generate alerts immediately. This behavior can be customized entirely by the Oracle Enterprise Manager administrator, as described in "Collection Intervals" in [Section 4.3, "Metrics Collection"](#).

If a value changes after triggering an event, no new incident is reported. The original alert remains unchanged and the user can drill down into the recently updated values.

Chapter 4. Oracle VDI Plug-in Troubleshooting and Tuning

This chapter provides basic information and links to additional resources to assist you in properly configuring the Enterprise Manager Plug-in for Oracle VDI and tweaking its performance and operation to suit your requirements. If the plug-in is not working as expected, check this chapter first.

4.1. Plug-in Activity Logging

When troubleshooting the Enterprise Manager Plug-in for Oracle VDI, the following logs may contain useful information:

- Oracle Management Server (OMS) logs

The OMS log files contain information about the Oracle Enterprise Manager Console and the Oracle VDI target pages.

In a typical Oracle Enterprise Manager installation, the default location is:

`/u01/app/oracle/Middleware/gc_inst/em/EMGC_OMS1/sysman/log/`

- Oracle Management Agent logs

The Management Agent log files contain information about any metric collection errors.

In a typical Oracle Enterprise Manager installation, the default location is:

`/u01/app/oracle/Agent/agent_inst/sysman/log/`

For details about Oracle Enterprise Manager logging, refer to the *Oracle Enterprise Manager Cloud Control Administrator's Guide*, [Chapter 24: "Locating and Configuring Enterprise Manager Log Files"](#).

4.2. Plug-in Installation and Configuration

Oracle Enterprise Manager

If you encounter problems during plug-in installation, verify that all prerequisites are met. See [Section 2.1, "Prerequisites"](#).

Refer to the Oracle Enterprise Manager documentation: <http://www.oracle.com/technetwork/oem/enterprise-manager/documentation/index.html>.

The following documents are particularly useful if you need to install a new Oracle Enterprise Manager host:

- [Oracle Enterprise Manager Cloud Control Basic Installation Guide](#)
- [Oracle Enterprise Manager Command Line Interface Guide](#)

Plug-in Connectivity

If you encounter problems when [adding Oracle VDI targets](#), verify the settings for the communication between the Management Agent and the Oracle VDI Center Agent.

- It is recommended to configure a dedicated Oracle VDI administrator account for the Oracle Enterprise Manager agent. Verify that the administrator account exists on all Oracle VDI hosts. Use Oracle VDI Manager or the `vda` command to make sure that the administrator account been assigned the *company monitor* and *provider monitor* roles.

- Verify the status of the Oracle VDI Center, as follows:

Although plug-in connectivity is not affected as long as the Oracle VDI Center Agent is running and reachable, it is best that all Oracle VDI Center hosts are working properly. Perform the following steps on each host in the Oracle VDI Center:

1. Log in to an Oracle VDI Center host.
2. Check the status of the Oracle VDI Center Agent.

Run the following command as root: `/opt/SUNWvda/sbin/vda-center agent-status`.

The Oracle VDI Center Agent must be up and healthy.

The output also contains the Agent address (hostname and port), which is critical for the plug-in connection. The standard port is 11174. If a non-standard port is used, it must be supplied with the Oracle VDI Host name during the configuration of the Oracle VDI Center target.

See also [Checking the Status of the Oracle VDI Center Agent](#) in the Oracle Virtual Desktop Infrastructure Administrator's Guide.

3. Check the status of the hosts in the Oracle VDI Center.

Run the following command as root: `/opt/SUNWvda/sbin/vda-center status`.

For more information about statuses, see [Checking the Status of the Oracle VDI Center](#), in the Oracle Virtual Desktop Infrastructure Administrator's Guide.

If hosts or services report errors, their corresponding targets may be displayed as down in Oracle Enterprise Manager.

If targets are shown as down in the Oracle Enterprise Manager Console, this could be due to a timeout in the communication between the Management Agent and the Oracle VDI Center Agent. If such timeout errors occur, the All Metrics page probably displays metric collection exceptions and zero values for affected targets. The timeout errors are logged in the Management Agent logs. See [Section 4.1, "Plug-in Activity Logging"](#).

If timeout errors occur in the plug-in connection, try to resolve them by increasing the connection timeout. The default timeout is 30 seconds.

Steps:

1. Select the Oracle VDI Center target.
2. In the target menu, select **Target Setup**, then select **Monitoring Configuration**.

The Monitoring Configuration page is displayed.

3. Set the new **Connection Timeout** in milliseconds, and click **OK** to complete the operation.

When this field is left blank, the default connection timeout is applied.

Oracle VDI Updates

As your Oracle VDI installation evolves over time, the plug-in should be made aware of these changes. If the monitoring targets in Oracle Enterprise Manager appear to be out of sync, refresh the Oracle VDI targets. The procedure is described in [Section 2.4, "Refreshing an Oracle VDI Center Target"](#)

If the password is changed for the administrator account used by the Enterprise Manager Plug-in for Oracle VDI, you must change the monitoring credentials accordingly in Oracle Enterprise Manager.

1. Select the Oracle VDI Center target.
2. In the **Setup** menu in the top-right corner, select **Security**, then select **Monitoring Credentials**.

The Monitoring Credentials page is displayed.

3. Select **Oracle VDI Center** and click **Manage Monitoring Credentials**.
4. Select your Oracle VDI Center target and click **Set Credentials**.

The Enter Monitoring Credentials window is displayed.

5. Enter the Oracle VDI administrator user name and password, confirm the password, and click **Save** to store the new credentials.

Oracle VDI Preferred and Fallback Hosts

The preferred host is initially the one specified to configure the Oracle VDI Center target. It serves as the main point of contact for the Management Agent. Other members of the Oracle VDI Center are added as fallback hosts. If the hosts in an Oracle VDI Center change, the list of Oracle VDI Hosts is updated accordingly when the Oracle VDI Center target is refreshed. When monitoring an Oracle VDI Center that consists of multiple hosts, you can configure the preferred and fallback hosts by setting the order in which the Management Agent contacts them.

1. Select the Oracle VDI Center target.
2. In the target menu, select **Target Setup**, then select **Monitoring Configuration**.

The Monitoring Configuration page is displayed.

3. Set the **Oracle VDI Hosts** in the desired order, separated by a space, and click **OK** to complete the operation.

4.3. Metrics Collection

Collection Intervals

Configuration data is only retrieved once a day. As a result, these metrics may be unavailable up to 24 hours after target discovery.

All metrics collection intervals are configurable. If you wish to set a different collection schedule, proceed as follows:

1. Select a target using the navigation tree.
2. In the target menu, select **Monitoring**, then select **Metric and Collection Settings**.

The Metric and Collection Settings page is displayed.

3. If necessary, change the **View** to **All Metrics**.
4. In the **Collection Schedule** column, click the collection interval you want to change.

The Edit Collection Settings page is displayed.

5. Set the new collection frequency. Click **Continue** to complete the operation.

Raw Metric Data

The monitoring data displayed in the target pages is retrieved from the Management Repository. This is not real-time information. To see the raw metric data as collected by the Monitoring Agent, open the *All Metrics* page for the selected target:

1. Select a target using the navigation tree.
2. In the target menu, select **Monitoring**, then select **All Metrics**.

The All Metrics page is displayed.

Event Thresholds

Many metrics collected by the Enterprise Manager Plug-in for Oracle VDI have predefined thresholds and incident messages. When a threshold is crossed, an incident is reported by means of an alert message in the Incidents and Problems panel of the affected target. Some metrics, such as the System Utilization data, have no predefined threshold, which means they cannot trigger an alert.

You can add or change thresholds as follows:

1. Select a target using the navigation tree.
2. In the target menu, select **Monitoring**, then select **Metric and Collection Settings**.

The Metric and Collection Settings page is displayed.

3. If necessary, change the **View** to **All Metrics**.
4. Add or change the necessary **Warning** and **Critical Thresholds** in the respective columns, and click **Continue** to complete the operation.

Chapter 5. Uninstalling the Oracle VDI Plug-in

If so required, the Enterprise Manager Plug-in for Oracle VDI can be removed entirely from the Oracle Enterprise Manager system. To upgrade the plug-in, simply deploy the new version. Uninstallation is not required before an upgrade.

When you uninstall the Enterprise Manager Plug-in for Oracle VDI, it is best to unconfigure the monitoring targets first and then undeploy the plug-in and remove it from the Oracle Enterprise Manager repository.

5.1. Unconfiguring Oracle VDI Targets

Before you undeploy the Enterprise Manager Plug-in for Oracle VDI, it is best that you unconfigure the Oracle VDI targets in order to stop the monitoring. You only need to unconfigure the Oracle VDI Center target. All associated targets are unconfigured automatically in the process.

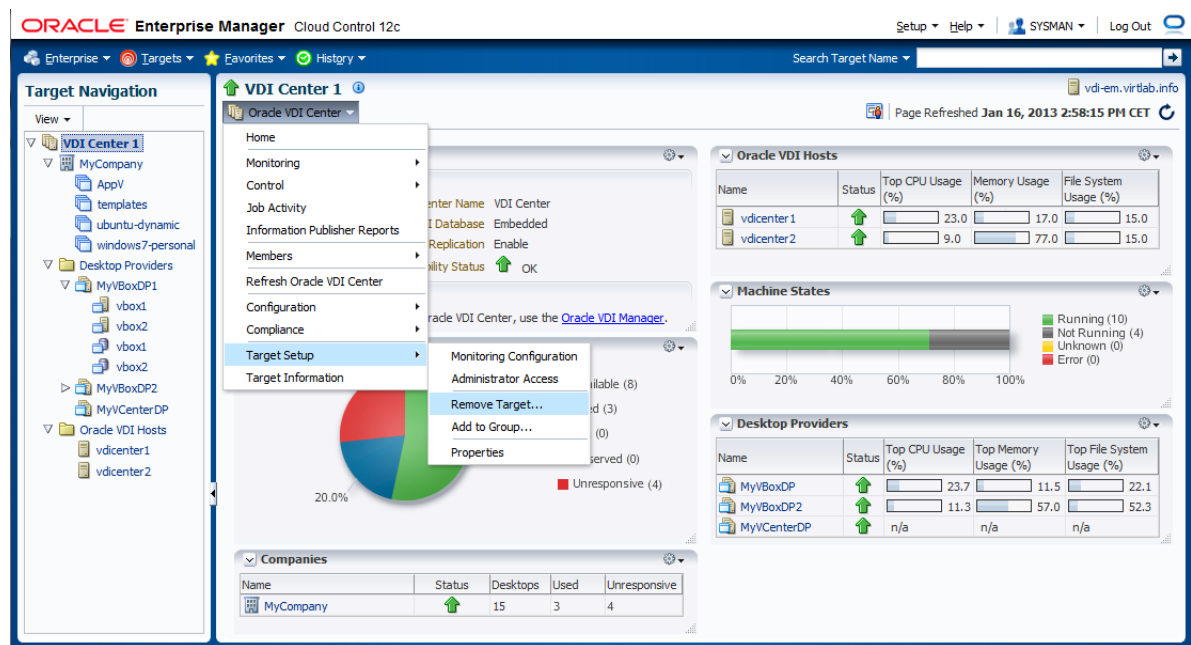
Unconfiguring an Oracle VDI Center Target:

1. Log on to the Oracle Enterprise Manager Console: <https://myserver.example.com:7803/em>.
2. In the **Targets** menu, select **All Targets**.

The All Targets page is displayed. It lists all targets that are monitored by Oracle Enterprise Manager.

3. In the target list, click the Oracle VDI Center target to open its home page.

Figure 5.1. Unconfiguring the VDI Center Target through its Home Page



4. In the **Oracle VDI Center** menu, located under the home page title, select **Target Setup** and then select **Remove Target**.

A confirmation window is displayed.

5. Click **OK** to unconfigure the Oracle VDI Center target from Oracle Enterprise Manager.

All children of the Oracle VDI Center target, such as companies, desktop providers, desktop pools, and so on, are unconfigured at the same time.

6. Repeat these steps for each Oracle VDI Center target.

5.2. Undeploying the Plug-in

When you undeploy the Enterprise Manager Plug-in for Oracle VDI, you disable Oracle Enterprise Manager's capabilities to monitor Oracle VDI targets. For detailed steps to undeploy the plug-in, see the "Plug-in Manager" chapter in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*: http://docs.oracle.com/cd/E24628_01/doc.121/e24473/plugin_mngr.htm#CJGEFADI.

The following is a summary of the process to follow:

1. Undeploy the plug-in from a Management Agent.

Once you have undeployed the plug-in from the Management Agent, you can undeploy it from the Management Server.

2. Undeploy the plug-in from a Management Server (OMS).

The OMS no longer has the capabilities to manage targets of the type Oracle VDI Center, or any of its associated Oracle VDI targets.

3. Optionally, remove the plug-in from the Oracle Enterprise Manager repository.

See [Section 5.3, "Removing the Plug-in"](#).

5.3. Removing the Plug-in

If necessary, you can remove the Enterprise Manager Plug-in for Oracle VDI entirely from the Oracle Enterprise Manager system.

Removing the Oracle VDI Plug-in from the Oracle Enterprise Manager Repository:

1. Log on to the Oracle Enterprise Manager Console: <https://myserver.example.com:7803/em>.
2. In the **Setup** menu in the top-right corner, select **Extensibility**, and then select **Self Update**.

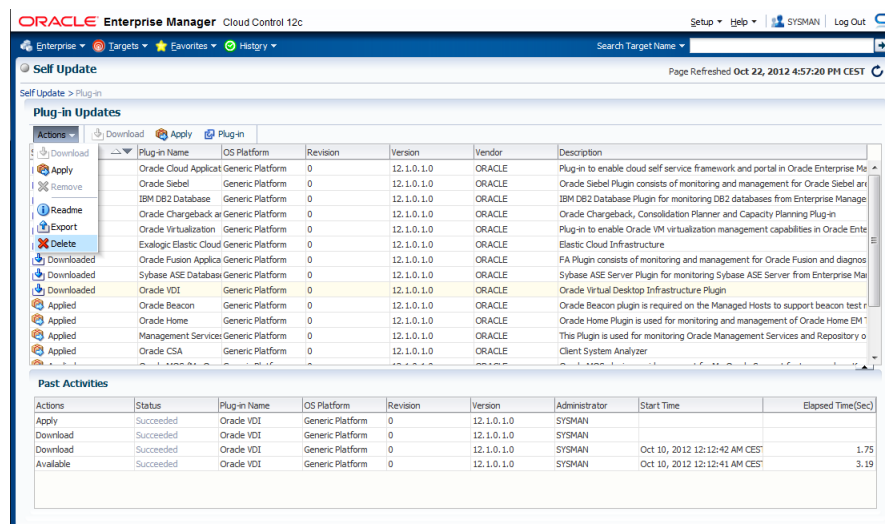
The Self Update home page is displayed.

3. Click the **Plug-in** folder.

The **Plug-in Updates** table is displayed.

4. In the table, select the Oracle VDI Plug-in.

Figure 5.2. Removing the Oracle VDI Plug-in from the Repository



5. In the **Actions** menu, select **Delete**.

A confirmation window is displayed.

6. Click **Delete** to confirm that you wish to delete the plug-in.

A message is displayed to confirm that the plug-in has been deleted.

7. Click **OK**.

The Oracle VDI Plug-in has been uninstalled from your Oracle Enterprise Manager system.

