

Oracle® Enterprise Manager

Grid Control Quick Start Guide

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Preface

This Preface contains these sections:

- [Audience](#)
- [Documentation Accessibility](#)
- [Related Documentation](#)
- [Conventions](#)
- [Structure](#)

Audience

Oracle Enterprise Manager Grid Control Quick Start Guide is for a super administrator to efficiently perform common day-to-day administrative tasks with Enterprise Manager. It also provides recommended best practices for configuring Grid Control to achieve these tasks.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at

<http://www.oracle.com/accessibility/>

Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

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TTY Access to Oracle Support Services

Oracle provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, seven days a week. For TTY support, call 800.446.2398.

Related Documentation

For more information, see the following manuals in the Oracle Enterprise Manager 10g Release 2 documentation set:

- *Oracle Database 2 Day DBA*
- *Oracle Enterprise Manager Concepts*
- *Oracle Enterprise Manager Quick Installation Guide*
- *Oracle Enterprise Manager Grid Control Installation and Basic Configuration*
- *Oracle Enterprise Manager Advanced Configuration*
- *Oracle Enterprise Manager Configuration for Oracle Collaboration Suite*
- *Oracle Enterprise Manager SNMP Support Reference Guide*
- *Oracle Enterprise Manager Policy Reference Manual*
- *Oracle Enterprise Manager Metric Reference Manual*
- *Oracle Enterprise Manager Command Line Interface*
- *Extending Oracle Enterprise Manager*

The latest versions of this and other Oracle Enterprise Manager documentation can be found at

<http://www.oracle.com/technology/documentation/oem.html>

Oracle Enterprise Manager also provides extensive online help. Click **Help** on any Oracle Enterprise Manager page to display the online Help system.

Printed documentation is available for sale in the Oracle Store at

<http://oraclestore.oracle.com/>

To download free release notes, installation documentation, white papers, or other collateral, please visit the Oracle Technology Network (OTN). You must register online before using OTN; registration is free and can be done at

<http://otn.oracle.com/membership/>

If you already have a user name and password for OTN, then you can go directly to the documentation section of the OTN Web site at

<http://otn.oracle.com/documentation/>

Conventions

The following text conventions are used in this guide:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.

Convention	Meaning
<i>italic</i>	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.

Structure

This guide contains the following chapters and is organized as follows:

Chapter 1, "Introduction to Grid Control Quick Start Guide"

This chapter gives you a brief overview about this book and Enterprise Manager Grid Control.

Chapter 2, "Getting Started with Enterprise Manager"

This chapter contains information on how to get started with Enterprise Manager Grid Control by setting up accounts, roles, credentials, and notification schedules.

Chapter 3, "System Monitoring"

This chapter contains information on effective system monitoring with the help of alerts and notifications.

Chapter 4, "Managing Groups"

This chapter describes how you can use the group management system to combine targets into groups and manage them more effectively.

Chapter 5, "Managing Service Levels"

This chapter describes how you can monitor and manage application service levels at high standards of availability.

Chapter 6, "Job System"

This chapter describes how you can use the Job System to automate routine administrative tasks and synchronize components in your environment.

Chapter 7, "Configuration Management"

This chapter describes tools for configuration management and policy management.

Chapter 8, "Provisioning"

This chapter describes automated provisioning tools that help you dramatically reduce the time and expense to deploy new systems.

Chapter 9, "Information Publisher"

This chapter describes the powerful reporting feature of Enterprise Manager.

Chapter 10, "Extending Grid Control"

This chapter describes how Enterprise Manager Grid Control can be extended to monitor non-Oracle products by using Management Plug-ins.

Introduction to Grid Control Quick Start Guide

A super administrator for Oracle Enterprise Manager 10g Grid Control is responsible for its overall efficient operation and proper maintenance.

This chapter contains the following topics:

- [Scope of This Guide](#)
- [About Enterprise Manager](#)

Scope of This Guide

Oracle Enterprise Manager Grid Control Quick Start Guide is task-oriented and teaches you how to perform common day-to-day administrative tasks. The guide has been written with the assumption that Oracle Enterprise Manager has already been installed and configured to some extent. The goal of this guide is to give you adequate information to help you understand the concepts behind Oracle Enterprise Manager. The primary administrative interface used in this guide is Oracle Enterprise Manager Grid Control featuring all the self-management capabilities of the Oracle Enterprise Manager.

This guide is not an exhaustive discussion of all Oracle Enterprise Manager concepts. For this type of information, refer to *Oracle Enterprise Manager Concepts*. Additionally, for a complete discussion of tasks, refer to Oracle Enterprise Manager online help.

For information about database administration, see *Oracle Database Administrator's Guide*.

For information about application server administration, see *Oracle Application Server Administrator's Guide*.

For information about Collaboration Suite administration, see *Oracle Collaboration Suite Administrator's Guide*.

How to Use This Guide with Related Material

This guide is part of a comprehensive set of learning material to help you use Oracle Enterprise Manager. The learning material also includes an Oracle By Example (OBE) series, available on the Web, and an Oracle University instructor-led class.

Most chapters in *Oracle Enterprise Manager Grid Control Quick Start Guide* have an associated Oracle By Example lesson. The OBE helps you go through all tasks in the chapter with the help of annotated screen shots. In some cases, the OBE provides additional information to help you complete the task at hand.

The *Oracle Enterprise Manager 10g Grid Control (Release 2)* OBE series is listed at http://www.oracle.com/technology/obe/obe10gEMR2/quick_start/index.html

In addition, Oracle University provides a related instructor-led training (ILT) course called *Oracle Enterprise Manager 10g Grid Control Release 2*. You can locate this course by going to <http://education.oracle.com> and specifying the course number D17244GC20.

About Enterprise Manager

Oracle Enterprise Manager 10g, an industry-leading family of management products, is the solution customers need to manage their Oracle environments. Oracle Enterprise Manager 10g Grid Control (Oracle Grid Control) delivers centralized management functionality for the complete Oracle IT infrastructure, including systems running Oracle and non-Oracle technologies.

Oracle Enterprise Manager 10g Grid Control is a single, integrated solution for managing all aspects of the Oracle Grid and the applications running on it. Grid Control couples a potent, top-down monitoring approach to delivering the highest quality of service for applications with a cost-effective, automated configuration management, provisioning, and administration solution. This powerful combination provides unequalled management for enterprise environments of any size.

Getting Started with Enterprise Manager

Before you begin using Enterprise Manager, you need to establish standard administrative settings. System security is a major concern of any corporation. There are advantages of giving controlled access to the systems to various administrators but individually granting access to tens, hundreds, or even thousands of targets to every new member of the group is time-consuming and unreliable in terms of security. Enterprise Manager lets you easily and quickly set up roles and make other administrative settings before other users can use it.

The following sections help you get started with Enterprise Manager:

- [Accounts and Roles](#)
- [Notifications](#)
- [Preferred Credentials](#)

Accounts and Roles

Enterprise Manager roles allow you to group system and target privileges, and to grant these to administrators or other roles. Privileges give the administrator rights to perform certain management actions within Enterprise Manager. Roles help you limit target access and access to specific management features. Using roles and privileges, you can manage security across all functional areas of Enterprise Manager.

The main kinds of accounts are Super Administrator and Administrator. A Super Administrator account, called SYSMAN, is created by default while installing Oracle Enterprise Manager. A Super Administrator can then create, modify, or delete Enterprise Manager roles, perform almost any action on almost any target in the system, and see all Enterprise Manager configuration and system monitoring functions. The breadth of tasks available in Enterprise Manager depends on the privileges assigned to various roles.

A Super Administrator divides workload among her administrators by filtering target access, or filtering access to management tasks, or filtering both through the privileges she grants to roles. System privileges allow an administrator to perform systemwide operations, such as view or add targets, use beacons, monitor Enterprise Manager, and so on. Target Privileges allow an administrator to perform operations on a target.

Tip: For security reasons, Oracle recommends that the SYSMAN account be used only as a template to create other accounts, and not used directly.

Scenario: Accounts and Roles

Linda is a super administrator who needs to set up accounts for her team of administrators. She needs to first create roles and then assign them to various administrators. Each administrator might require a different set of privileges. For example, a database administrator requires access to managed databases, but not to the application server that uses the database. A Web administrator might require the privilege to manage beacons or create targets without requiring any privileges on the databases.

Creating an Administrator Account

This topic describes how to use Enterprise Manager to create an administrator account and assign privileges to it.

To create an administrator account:

1. Click **Setup** in the Grid Control console.
2. Select **Administrators** from the panel to the left.

The Administrators page appears. It lists existing accounts. You can search for a specific administrator account, create a brand new administrator account or one based on an existing account, view roles, system, and target privileges for an administrator, make changes to an existing administrator account, or remove an administrator.

3. Click **Create** to create a new administrator account.

This brings up the Create Administrator wizard. Using this wizard, you can specify details such as the role to apply to the account and the system and target privileges to be assigned to the role.

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. At the top, there are navigation tabs for Home, Targets, Deployments, and Alerts. Below these is a breadcrumb trail: Enterprise Manager Configuration | Management Services and Repository | Agents. A progress bar indicates the current step is 'Properties', followed by Roles, System Privileges, Targets, Target Privileges, and Review. The main content area is titled 'Create Administrator: Properties' and contains the following fields:

- Name: []
- Password: []
- Confirm Password: []
- E-mail Address: admin.admin@oracle.com

Below the E-mail Address field, there is a note: "Specify one or more e-mail addresses separated by a comma or space. If you are entering these for the first time, they will be used to create a default 24x7 notification schedule for this Administrator." and a checkbox labeled "Super Administrator".

4. Click **Continue**.
5. Click **OK**.

Notifications

A notification schedule is a rotating schedule used by Enterprise Manager to determine which notifications to send to which administrators. When an alert needs to

be e-mailed to an administrator, Enterprise Manager consults that administrator's notification schedule to determine the e-mail address to use.

When either a warning or critical metric threshold is exceeded, alerts are triggered and they, in turn, activate notification methods, if they have been set up. A notification method is a way to take the information from an alert and send notifications to another management system or ticketing system. Notification methods may include e-mail, SNMP traps, or custom scripts. The ready-to-use account, SYSMAN, is by default set up to receive all alerts.

See also "[Managing Alerts and Notifications](#)" on page 3-6.

Scenario: Notifications

When accounts have been created for administrators, they need to log in to Grid Control to customize their preferences. One of the administrators, Joe always receives alerts on his work account. When Joe is out of his office, he needs alerts to also be sent to his mobile device. Accounts can be set up for such alerts. Joe has a rotating schedule where every third week, he works late on Wednesday and Friday. Alerts need to be sent out taking his schedule into consideration.

Defining a Notification Schedule

This topic describes how to use Enterprise Manager to set up a notification schedule, including setting notification methods and defining a schedule by which to send out notifications.

To create a notification schedule:

1. Click **Setup** in the Grid Control console.
2. Click **Notification Methods** in the panel to the left.

The Notification Methods page appears. If you want notifications to be sent out using OS commands, PL/SQL procedures, or SNMP traps, you can define them on this page. For example, you can create a notification method to pass critical production alerts to the system administration tool HP OpenView round the clock. To do so, you can create an OS method that calls an HP OpenView perl script as `/bin/methods/hpovo.pl`.

3. Click **Apply**.
4. Click **Preferences** in the Grid Control console.

The General page appears. On this page, you can specify the e-mail addresses to which you want notifications sent.

5. Click **Schedule** under Notification in the panel to the left.

The Notification Schedule page appears.

6. Click **Define Schedule**.

The Edit Schedule Definition page appears. You can specify the frequency at which you want notifications to be sent to you, the time zone, the start date, and so on. You can also specify e-mail IDs at which you want notifications for a given time period to be sent.

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. At the top, there are navigation tabs for Home, Targets, Deployments, and Alerts. Below this is a 'Preferences' section with a sub-link for 'Notification Schedule'. The main heading is 'Edit Schedule Definition: E-mail Addresses'. A description states: 'Enter e-mail addresses in each time slot to specify how you should be notified. To fill in many time slots at once, use 'Batch Fill-in'.' Below this, the 'Rotation Frequency' is set to '4 Weeks', the 'Start Date' is 'Jan 10, 2006', and the 'Time Zone' is '(UTC-08:00) Canada Pacific Time'. A yellow box titled 'Optional Batch Fill-in' contains a 'Batch Fill-in' button and instructions: 'Click on Batch Fill-in to use the same e-mail addresses across the specified hours, days, and weeks.' The form includes fields for 'Start Time' (9:00 AM) and 'End Time' (5:00 PM), an 'E-mail Addresses' field containing 'linda.mcmanus@oracle.com', and checkboxes for 'Days of Week' (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday) and 'Weeks' (Week 1, Week 2, Week 3, Week 4). A 'View' dropdown is set to 'Week 1'. Below the form is a table showing the schedule for the first week:

	Monday	Tuesday	Wednesday	Thursday
12:00 am - 1:00 am	linda.mcmanus@	linda.mcmanus@	linda.mcmanus@	linda.mcmanus@

7. Click **Finish**.

The notification schedule is defined for the selected account.

Preferred Credentials

Preferred credentials simplify access to managed targets by storing encrypted target login credentials in the Management Repository. They help administrators manage multiple databases and targets without requiring them to manually enter their passwords each time they access a target or run jobs. Preferred credentials are specific to each user, thus ensuring the security of the managed enterprise environment. With preferred credentials set, you can access an Enterprise Manager target that recognizes those credentials without being prompted to log in to the target. You can set preferred credentials for the following target types:

- Hosts
- Databases
- Clusters
- Oracle Real Application Cluster (RAC) Databases
- Application Servers

Scenario: Preferred Credentials

Database administrators in Linda’s team need to provide database-level credentials to be able to monitor performance or do any administrative action through Grid Control. By setting up preferred credentials, they will be able to quickly access these areas without reentering their credentials. Also, the Oracle Enterprise Manager job system can use these credentials for scripts or jobs that run against these targets.

Setting Preferred Credentials

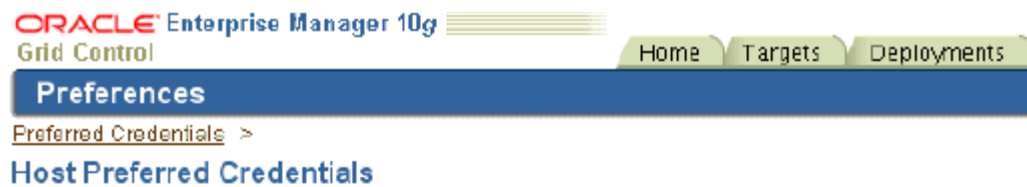
To set preferred credentials:

1. Click **Preferences** in the Grid Control console.
2. Click **Preferred Credentials** in the vertical navigation bar.

The Preferred Credentials page appears, providing a top-level view of all preferred credentials set for your Enterprise Manager environment. From this page, you can set preferred credentials for any managed target types listed in the Preferred Credentials table. Each row of the table provides a credential summary for a type of target.

3. Click the icon in the Set Credentials column for a selected target type.

The Preferred Credentials page for that target type appears. You can set default credentials and target credentials for the target type. The target credentials are selectively set for specific targets and override the default credentials.



To set preferred credentials for Host targets, update the appropriate fields in one of the tables below. Press **Apply** after making any changes.

TIP Normal credentials are used by Enterprise Manager functions that need operating system privileges. Privileged credentials are used by functions that do need administrator privileges. Credentials that require host credentials do not use the credentials set on this page; they instead use data from the Database Preferred Credentials page.

Default Credentials

Default credentials are used for Host targets that do not have credentials set in the Target Credentials table.

Normal Username	Normal Password	Privileged Username
<input type="text"/>	<input type="text"/>	<input type="text"/>

Target Credentials

Target credentials can be specified for each Host target. If set, target credentials override the default credentials.

Search

Name ▲	Normal Username	Normal Password	Privileged Username
dhcp-lexington-152-69-151-45.idc.oracle.com	<input type="text"/>	<input type="text"/>	<input type="text"/>

4. Click **Apply**.

The new credentials are applied to the targets and target type as specified.

Getting Started: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The following OBEs cover the tasks in this chapter with annotated screen shots:

- *Setting Up Enterprise Manager Grid Control:*
http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/creating_roles_administrators/creating_administrators_and_roles.htm
- *Notifications:*
http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/notification/notification.htm
- *Preferences:*
http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/preferred_credentials/preferred_credentials.htm

System Monitoring

Enterprise Manager Grid Control comes with a comprehensive set of performance and health metrics that enables automated monitoring of key components in your environment, such as applications, application servers, databases, as well as the back-end components on which they rely (hosts, operating systems, storage, and so on).

When a metric reaches the predefined warning or critical threshold, Enterprise Manager generates an alert, which shows up in the monitoring pages, as well as in the notifications that you define. In this way, you can monitor services, systems, groups, and any other target that you want to manage.

This chapter covers system monitoring in the following sections:

- [Custom Monitoring](#)
- [Managing Alerts and Notifications](#)

Custom Monitoring

Oracle Enterprise Manager provides predefined metric thresholds. While these values are acceptable for most monitoring conditions, your environment may require that you customize threshold values to more accurately reflect the operational norms of your environment. Setting accurate threshold values, however, may be based on rate or throughput for certain categories of metrics, such as performance metrics.

You can use monitoring templates, metric snapshots, and metric baselines to customize your metric threshold values to best reflect the health of the environment.

Scenario: Custom Monitoring

Linda is a manager in charge of a team of DBAs and System Administrators who maintain the system environment. Like many organizations, Linda maintains different environments, such as test and production. Linda would like to set up different monitoring levels for each of these environments. For Linda, the test environment is much easier to monitor because it does not use production systems.

Using Enterprise Manager's customizable monitoring features, Linda is able to use ready-to-use monitoring settings for her test environment, and set up custom thresholds for a standard set of metrics for her testing and production environments. Linda can also use her existing scripts, or user-defined metrics, to monitor her environments.

How to Customize Monitoring

This section describes how to use Enterprise Manager to set up ready-to-use monitoring, use monitoring templates, understand metrics and thresholds, set up corrective actions, and establish user-defined metrics.

Ready-to-Use Monitoring

Enterprise Manager's Management Agents automatically start monitoring their host systems as soon as they are deployed. Enterprise Manager provides auto-discovery scripts that enable these Agents to automatically discover all Oracle components and start monitoring them using a comprehensive set of metrics at Oracle-recommended thresholds. Thus, network components are monitored out-of-the-box. This monitoring functionality includes other components of the Oracle ecosystem such as NetApp Filer, BIG-IP load balancers, Checkpoint Firewall, and IBM WebSphere and BEA WebLogic application servers. Metrics from all monitored components are stored and aggregated in the Management Repository, providing administrators with an extensive source of diagnostic information and trend analysis data. When thresholds are violated, notifications are sent to administrators for rapid resolution.

Monitoring Templates

Monitoring templates simplify the task of standardizing monitoring settings across sets of systems by allowing you to specify the monitoring settings and policies once, and then apply them to your monitored targets. This makes it easy for you to apply standard monitoring settings to specific classes of targets consistently, throughout your enterprise.

For example, Linda can define one monitoring template for quality assurance databases and another monitoring template for production databases.

To create a monitoring template:

1. Click **Setup** in the Grid Control console.
2. Select **Monitoring Templates** from the panel to the left.

The Monitoring Templates page appears. Existing monitoring templates are listed on the page. You can apply, view, edit, or delete these templates. You can also create a fresh template or one that is based on an existing template.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Enterprise Manager Configuration | Management Services and Repository | Agents

Overview of Setup
Roles
Administrators
Notification Methods
Patching Setup
Blackouts
Registration
Passwords
Management Pack
Access
Monitoring Templates
Corrective Action
Library
Management Plug-ins

Monitoring Templates

Page Refreshed Jan

Monitoring Templates can be used to apply a subset of monitoring and policy settings to standardize monitoring across your enterprise. When a template is applied to not specified in the template remain unaffected on the target.

Template Name [Advanced Search](#)

Pending Apply Operations: 0

|

Select Name	Target Type	Pending Apply Operations	Owner	Last Modified By
<input checked="" type="radio"/> test	Database Instance	0	DEMO1	DEMO1
<input type="radio"/> dave	Database Instance	0	SUPER	SUPER

Related Links
[Past Apply Operations](#)

3. Click **Create** to create a new template.

This brings up a wizard where you can specify details such as the target on which to apply the template, select metric thresholds and policies, and also modify them, if need be.

4. Click **Continue**.
5. Click **OK**.

The new monitoring template appears in the list on the Monitoring Templates page. Having created a monitoring template for a database, Linda can select it and apply it as it is to other databases or after tweaking it suitably.

For another example of how to use monitoring templates, see "[Applying Policies Consistently Across Targets](#)" on page 7-4.

Metric Snapshot

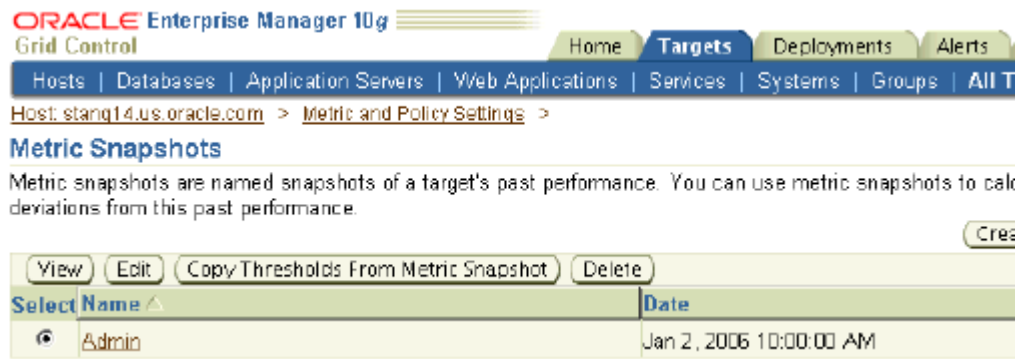
A metric snapshot is a named collection of target performance metrics that have been collected at a specific point in time. A metric snapshot can be used as an aid in calculating metric threshold values based on the target's past performance.

For example, Linda can create a metric snapshot for a target when she notices that its performance varies significantly from day to day and set thresholds accordingly, so that appropriate notifications can be generated.

To create a metric snapshot:

1. From any target home page such as the Host home page or the Oracle Database home page, click **Metric and Policy Settings**.
2. In the Metric and Policy Settings page that appears, click **Metric Snapshots** under Metric Thresholds Links.

The Metric Snapshots page appears, listing snapshots, if any have been created for the target. You can select a snapshot and view it, edit it, copy thresholds from it, or delete it. You can also create a new snapshot from this page.



3. Click **Create**.

The Create Metric Snapshot page appears. On this page, you can specify a date on which performance was acceptable for the target. The metric data of this date will be used to calculate thresholds.

Other values that you may specify are:

- Hour of Day: the metric snapshot value is calculated as the average value over the hour preceding the hour you specify here.
- Warning Percentage: the percentage to be used as the metric Low threshold value.
- Critical Percentage: the percentage to be used as the metric High threshold value.

4. Click **Go**.

The values are populated in the Metric data table. You can select some or all of the metrics, modify their values, adjust threshold values, change the date, and so on, until you get a snapshot that you want to save.

5. Click **OK**.

The metric snapshot is saved and listed in the Metric Snapshots page. Linda can see such a snapshot and set threshold values for various metrics accordingly. Notifications can be sent out based on this.

Metric Baselines

Metric baselines are statistical characterizations of system performance over well-defined time periods. Metric baselines can be used with databases or services to implement adaptive alert thresholds for certain performance metrics as well as provide normalized views of system performance. Adaptive alert thresholds are used to detect unusual performance events. Baseline normalized views of metric behavior help administrators explain and understand such events.

For example, Linda notices that her database I/O runs at X% in the morning and X+5% from 10 a.m. to 2 p.m. Traditional thresholds would have to stay at X+5% and would not catch the lower behavior in the morning. She can set up a static metric baseline for this.

To create a static metric baseline:

1. From the Targets page, click either **Databases** or **Services**.
2. Select an operating 10.2 database or service.
3. Click **Metric Baselines** under Related Links.

The Metric Baselines page appears. It offers you options to select an active baseline, disable metric baselines, and register metrics. This page also provides you links to pages that enable you to view baseline normalized metrics, and create a new static metric baseline or manage existing baselines. Enterprise Manager provides charts that graphically display the values of observed performance and workload metrics normalized against the baseline. Using these charts, statistically significant values are easily seen as *blips* in the charts. These charts allow administrators to easily perform time-correlation of events. For example, performance events can be related to significantly increased demand or significantly unusual workload.

4. Select the Static metric baseline option.
5. Click **Manage Static Metric Baselines** under Related Links.
6. Click **Create** on the page that appears.

The Create Static Metric Baseline page appears.

7. Specify a name, a time period and grouping, and click **OK**.

The static metric baseline created appears listed in the Metric Baselines page. Linda can then set up adaptive alert thresholds for certain performance metrics as well as view baseline normalized metrics.

User-Defined Metrics

User-defined metrics allow you to extend the reach of Enterprise Manager's monitoring to conditions specific to particular host or database environments through custom scripts or SQL queries and function calls. You can continue to use even legacy custom scripts after deploying Enterprise Manager.

For example, Linda might have a Perl script that she wants to use to monitor a specific condition. She can associate this script with a user-defined metric, which will then work like any other metric.

To set up user-defined metrics:

1. In the Related Links section of any Host or Database target homepage, click **User-Defined Metrics**.

The User-Defined Metrics summary page appears displaying a list of existing user-defined metrics. From this page, you can edit, view, or delete user-defined metrics. You can also create a new metric afresh or one based on existing metrics.



2. Click **Create**.

The Create User-Defined Metric page appears. On this page, you can specify a SQL command or a custom script for this metric. The script must contain code to check the status of the monitored object, to evaluate the results, and to return script results to Enterprise Manager. You can set thresholds against which to compare the value returned by your script so that alerts and notifications may be sent accordingly. You can also specify a schedule for the metric to start collecting data.

3. Click **OK**.

The User-Defined Metric summary page appears with the new user-defined metric appended to the list.

Similarly, Linda can create metrics from her library of custom monitoring scripts and thereby optimize the monitoring features of Enterprise Manager. Likewise, she can easily integrate existing SQL queries or function calls currently used to monitor database conditions into Enterprise Manager's monitoring framework.

Managing Alerts and Notifications

When a metric threshold value is exceeded, an alert is generated. An alert indicates that either a warning or critical threshold for a monitored metric has been exceeded. An alert also includes information such as the name of the target, the threshold violated, and so on.

When an alert is generated, you can have notifications sent to the appropriate administrators. Enterprise Manager supports notifications through e-mail (including

e-mail-to-page systems), SNMP traps, or by running custom scripts. You can also define automatic response actions for particular alerts by setting up corrective actions.

When bringing down a target for maintenance, you can use the Blackout feature to avoid alerts on those targets.

Scenario: Managing Alerts and Notifications

As a super administrator, Linda would like to keep members in her team notified about various thresholds for the health of various targets. Instead of sending out these notifications manually, she can set up notification rules so that the DBAs on her team receive appropriate alerts. She can then set up a corresponding notification method to notify system administrators for critical alerts and identify which targets need to be assigned notification methods for passing alert information to third-party tools, like HP OpenView.

For example, all test system alerts should be sent to the DBA owners. If any production systems go down, then those alerts also need to be sent to the system administrators who use a third-party tool that is tied to their ticketing system.

There are certain alerts that are fairly simple to fix with a predefined corrective action. For instance, when a listener goes down, Linda can run a script to bring it back up. By using corrective actions, she can set up automated responses to particular alerts, thus reducing the time it takes to respond to down targets or poor performance.

Linda also knows that her team brings down the testing databases at midnight on the last Friday of every month for maintenance. Linda can set up blackout periods to correspond with this planned down-time so that erroneous alerts are not triggered for these down targets.

How to Manage Alerts and Notifications

This section describes in detail how to use Enterprise Manager to set up custom notifications and define corrective actions.

Custom Notifications

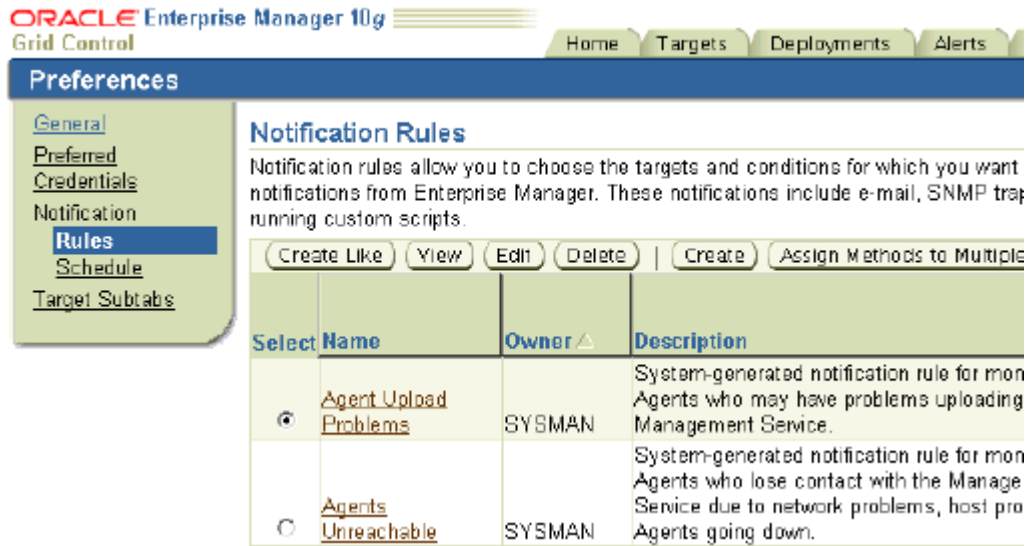
Enterprise Manager supports various notification mechanisms through notification methods. The notifications mechanisms can also be integrated with third-party system tools, systems, and applications that typically constitute the management framework of an enterprise. A notification method is used to specify the particulars associated with a specific notification mechanism, for example, which SMTP gateway(s) to use for e-mail, which OS script to run to log trouble-tickets, and so on. Super Administrators perform a one-time setup of the various types of notification methods available for use. Once these are defined, other administrators can create notification rules that specify the set of criteria that determines when a notification should be sent and how it should be sent. The criteria defined in notification rules include the targets, metrics, and severity states (clear, warning, or critical) and the notification method that should be used when an alert occurs that matches the criteria.

For example, Linda can define a notification rule that specifies that e-mail should be sent to her when CPU utilization on any host target is at critical severity, or another notification rule that creates a trouble-ticket through OpenView or Tivoli when any database is down.

To create a notification rule:

1. Click **Preferences** in the Grid Control console.
2. Click **Rules** under Notification in the panel to the left.

The Notification Rules page appears. Enterprise Manager Grid Control provides Oracle-recommended ready-to-use SYSMAN rules. These as well as any existing notification rules are listed on this page. From this page, you can edit, view, or delete notification rules, create a new rule, create a rule based on an existing one, or assign methods to multiple selected rules.



3. Click **Create**.

The Create Notification Rule page appears. On this page, you can specify a target type on which to apply the rule, the availability states and jobs for which you want to receive notifications, the metrics and policies to be associated with the rule, and the notification method for the rule.

If advanced notification methods, such as SNMP traps, custom scripts, or PL/SQL procedures, have been defined in the Scripts and SNMP Traps section on the Notification Methods page, they appear here and can be selected.

- 4. If you want other administrators to be able to use this rule, select the **Make Public** checkbox.
- 5. Click **OK**.

The new notification rule is included in the list on the Notification Rules page. Once Linda defines such a rule, she can make it public, so that other administrators can see it and use it if they want to. Alternatively, Linda can also assign notification rules to other administrators such that they receive notifications for alerts as defined in the rule.

Corrective Actions

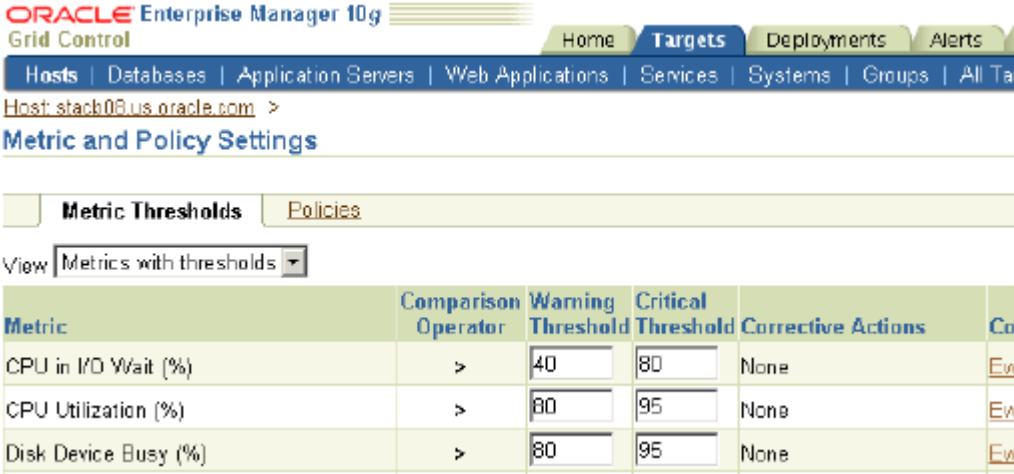
Corrective actions allow you to specify automated responses to alerts. Corrective actions ensure that routine responses to alerts are automatically executed, thereby saving administrator time and ensuring that problems are dealt with before they noticeably impact users. For example, if Enterprise Manager detects that a component, such as the SQL*Net listener, is down, a corrective action can be specified to automatically start it back up. A corrective action is thus any task that you specify that will be executed when a metric triggers a warning or critical alert severity. By default, the corrective action runs on the target on which the alert is triggered. Administrators can also receive notifications for the success or failure of corrective actions.

Linda finds that conditions triggering some alerts and policy violations can be remedied without manual intervention. She can associate corrective actions to such alerts.

To set up a corrective action:

- 1. In the Related Links section of a target home page, click **Metric and Policy Settings**.

The Metric and Policy Settings page appears. It has two tabs: Metric Thresholds and Policies. The Metric Thresholds page lists metrics associated with the target whereas the Policies page lists the policies associated with the target. You can add a corrective action for a metric from the Metric Thresholds page and for a policy from the Policies page.



- 2. Click the pencil icon for a specific metric or a policy to edit it.
The Edit Advanced Settings page appears for a metric. The Edit Policy Rule Settings page appears for a policy.
- 3. In the Corrective Actions section on either of these pages, click **Add**.
For a metric, if you click Add next to Warning, the corrective action is set for Warning, but not Critical, alerts on the metric.
- 4. On the Add Corrective Action page, select the task type and click **Continue**. The task type helps you specify if you want to create a new corrective action, reuse one already defined on this target, or apply one from your library.
The Create Corrective Action page appears. On this page, you can specify the parameters that you want to associate with the corrective action. You can also specify specific credentials to be applied to each target when the corrective action runs.
- 5. Click **Continue**.
The corrective action is created and set for the selected metric or policy. This frees up valuable time that Linda can spend on other administrative tasks.

System Monitoring: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *System Monitoring* OBE covers the tasks in this chapter with annotated screen shots. It is located at http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/enterprise_manager_configuration/enterprise_configuration_and_policies.htm

Managing Groups

The Enterprise Manager Grid Control group management system lets you combine targets into logical sets, called groups. This enables you to organize, manage, and effectively monitor the potentially large number of targets in your enterprise.

This chapter covers the group management system in the following sections:

- [Types of Groups](#)
- [The Group Home Page](#)

Types of Groups

Enterprise Manager groups can include:

- Targets of the same type, such as:
 - All hosts in your data center
 - All of your production databases
- Targets of different types, such as:
 - The database, application server, listener, and host that are used in your application environment
 - Targets operating within a particular data center region

A redundancy group is a group that contains members of the same type that function collectively as a unit. It functions like a single logical target that supports a status (availability) metric. A redundancy group is considered up (available) if at least one of the member targets is up. Redundancy groups support all group management features. Do not use redundancy groups if the group you want to model is a Real Application, a Clusters database, a host cluster, an HTTP server high-availability group, or an OC4J high availability group. Instead, you can use the following specialized target types for this purpose: a cluster, a cluster database, an HTTP HA group or an OC4J HA group.

A system is another special type of group. For more information, see "[System Management](#)" on page 5-1.

Scenario: Types of Groups

Linda has many different groups that her team manages. One of these groups contains an entire test application stack and a group of production databases. Linda further needs to break them into logical groups to simplify management and set up administrative tasks for both the groups.

Defining a Group

This topic describes the procedure that Linda can follow to define the groups relating to the environments she needs to manage.

To define a group:

1. From the Targets page, select the **Groups** subtab.
2. Click **Add**.

The Create Group wizard appears. You create a group by specifying a name and a time zone for it first and then specifying target members, the charts that you want displayed, the columns of data and the format in which it will be displayed on the dashboard.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments
Hosts | Databases | Application Servers | Web Applications | Services | Systems | **Groups** | All Targets | Collab

Create Group

Members Charts Columns Dashboard

* Name

Members

Remove | Add

Select All | Select None


Select	Name ▲	Type
<input type="checkbox"/>	App	Group
<input type="checkbox"/>	bcn1	Beacon

Time Zone

Time Zone

3. Click **OK**.

The Groups page appears. The list of groups includes the group you just created. You can click the name of the group to bring up its home page. You can see the dashboard of the group by clicking Launch Dashboard.

ORACLE Enterprise Manager 10g  Grid Control [Customize](#) | [Help](#)

Group: All Prod DBs Page Refreshed: Jun 13, 2006 2:23:48 AM PDT [Refresh](#)

Target	Type	Status	Alerts ▾	Policy Violations	Wait Time (%)
Finance	Database Instance		0 1	14 10 5	
enirep	Database Instance		0 9	14 11 4	
SSIEBPP	Database Instance		0 0	0 0 0	
infraDB.us.oracle.com	Database Instance		0 0	9 17 3	
HR	Database Instance		0 0	0 0 0	
anorep	Database Instance		0 0	10 15 3	

Alerts 2 8 13

Previous 1-10 of 24

Severity	Target	Date ▾	Message	Latest Comment
	enirep	Dec 20, 2005 11:24:59 PM	10 object(s) are invalid in the XDB schema.	ANA : SR 999
	enirep	Dec 20, 2005 11:24:59 PM	39 object(s) are invalid in the SYS schema.	
	enirep	Dec 20, 2005 11:24:59 PM	40 object(s) are invalid in the DM5YS schema.	

Linda can similarly create groups for all the environments she needs to work on.

The Group Home Page

The Group home page is the central location for monitoring group information. You can use the Group home page to see an Availability pie chart that depicts the current status of all members so that you can easily assess the percentages of available and unavailable members. You can quickly drill down for information if any member target is down. You can get a list of open alerts and policy violations, categorized by severity and recency, so you can quickly focus on the most critical problems first. You can see summaries of recent configuration changes across all members in the group and of Critical Patch Advisories for Oracle homes within the group.

You can also use this page to access the Policy Trend Overview page, which provides a comprehensive view of the group for compliance with policy rules over a period of time. Using policy charts, you can assess trends in policy violations. This page also leads to the Security at a Glance page, which provides an overview of the security of the group and shows statistics about security policy violations and critical security patches that have not been applied.

ORACLE Enterprise Manager 10g
Grid Control

Home | Targets | Deployments

Hosts | Databases | Application Servers | Web Applications | Services | Systems | **Groups** | All Targets | Collaborations

Group: Group_Prod

Page Refreshed Feb 19, 2006 8:56:33

Home | Charts | Administration | Members

Status Status History

91% Up(43) 9% Down(5)

Configuration Changes
Configuration changes detected for the last 7 days

Category	Changes
All Target Types	198
OC4J	90
Oracle Application Server	44

Alerts

Severity	Current	Last
✘	6	
⚠	0	
Total	6	

Policy Violations

Severity	Current	Last 24
✘	27	
⚠	0	
i	0	
Total	27	

[Policy Trend Overview](#)

Security Policy Violations

Severity	Current	Last 24

Scenario: The Group Home Page

Linda needs to be able to assess the health of different groups with quick access to Grid Control functionality around these targets. She can do this by using the Group home page, where she can see a combined picture of the availability of various members in a group, how they are performing, the trends of policy violations, recent configuration changes and so on.

Administering Groups

Linda wants to set up jobs to be executed on all or some members of a group. This topic describes how she can do this from the Group home page.

To set up a job for a group:

1. Click the name of the group from the Groups page.

The home page of the selected group appears. It shows a summary of how the various members in the group are performing. The Charts page shows charts for the group as configured while defining the group. The Administration subtab helps you set up and execute various administrative tasks on the group. The Members page lets you see the members of the group and also modify the membership.

2. Click the **Administration** subtab.

You can use the Administration page to create and view the status of jobs and blackouts, to view a summary of deployed components, and so on.

3. Select a job type from the Create Job list and click **Go**.

This brings up the Create Job wizard, which you can use to specify a job to be applied on the members of a specified target type within the selected group.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Job Activity | Job Library

Create 'OS Command' Job

Cancel

General Parameters Credentials Schedule Access

* Name: PROD_JOB

Description:

Target Type: OC4J

Changing the target type will cause any specified Targets, Parameters and Credentials to be removed.

Targets

Add individual targets or one composite target, such as a Group.

Remove | Add

Select All | Select None

Select	Name	Type	Host	Time Zone
<input type="checkbox"/>	Group_Prod	Group		Pacific Standard Time

4. Click **Parameters**.

You can specify parameters, if applicable, to the job. For an OS Command job, you can specify either a single command or an OS script as a parameter. By default, '/bin/sh' is used for UNIX systems and 'cmd' for Windows environments. You can specify an interpreter for scripts that use another executable, such as Perl.

5. Click **Credentials** if you want to specify separate credentials for the job.

See the section "[Preferred Credentials](#)" on page 2-4.

6. Click **Schedule** if you want the job to be executed at a specified time and not immediately.

7. Click **Access** to specify the roles or administrators who can access the job.

8. Click **Submit** to finish creating the job.

Alternatively, if you would like to save the job and not submit it for execution, click Save to Library.

Linda can similarly create other jobs for members of specific target types in various groups of the environment she manages.

For more information on jobs, see [Chapter 6, "Job System"](#).

Managing Groups: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Groups* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/groups/groups.htm

Managing Service Levels

In an enterprise, a service is an entity that provides a useful function to the end-users, for example, e-mail, ERP, CRM applications, online banking, online store, online stock trading, and so on. Typically, when any of these services is being used, some common issues faced by users are the availability of a service, completion of critical activities, and performance of the service. You can solve these issues by defining one or more service models that represent the business functions or applications that run in your enterprise. Monitoring a service helps you ensure that your operational goals and Service-Level Agreements (SLAs) are met.

The critical and complex nature of today's business applications has made it very important for IT organizations to monitor and manage application service levels at high standards of availability. Because these services form an important type of business delivery, monitoring these services and quickly correcting problems before they can have a detrimental impact on business operations is crucial in any enterprise. Enterprise Manager Grid Control provides a comprehensive service modeling and monitoring solution that helps you effectively manage services from the overview level down to the individual component level.

This chapter covers service management in the following sections:

- [System Management](#)
- [Service Modeling](#)
- [Service Monitoring](#)
- [Problem Diagnosis](#)

System Management

A system is a logical grouping of targets that collectively host one or more services. The targets within a system can have relationships or associations with each other. A system can support one or more services.

In Enterprise Manager Grid Control, systems constitute a target type. For example, to monitor an e-mail application in Enterprise Manager, you would first create a system, such as Mail System, that consists of the database, listener, application server, and host targets on which the e-mail application runs. You would then create a service target to represent the e-mail application and specify that it runs on the Mail System target.

Scenario: System Management

Linda needs to understand all the components (technology stack) of the application service and their respective relationships in order to maintain SLAs. She can do this by creating systems and associating services with them.

Creating a System

Enterprise Manager systems enable administrators to logically organize distributed targets for efficient and effective management and monitoring.

This topic presents the procedure that Linda can use to create systems and efficiently work with services by associating them with systems.

To create a system:

1. From the Targets page, select the **Systems** secondary tab.
2. Click **Add**.

The Create System wizard appears.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Hosts Databases Application Servers Web Applications Services **Systems** Groups All Targets

Create System

Components Topology Charts Columns Dashboard

* Name

Components

Add

Select Name	Type
No Targets Selected..	

Time Zone

Time Zone

3. Specify a time zone and components for the system, the associations between the components, the charts that you want displayed, the columns of data, and the format in which it will be displayed on the dashboard.
4. Click **OK**.

The Systems page appears. The list of systems includes the system you just created. You can click the name of the system to bring up its home page. You can see the dashboard of the system by clicking Launch Dashboard.

ORACLE Enterprise Manager 10g
Grid Control

System: Credit History System Page Refreshed Jun 13, 2006 2:51:38 AM PDT
Refresh

Target Type	Status	Alerts
Single Sign-On Server	↓ ↑	0 0
Listener	↓ ↓	0 0
Oracle Internet Directory	↓ ↑	0 0
Oracle Application Server	↓ ↑	0 0
Database Instance	↓ ↑	0 0
Oracle HTTP Server	↓ ↑	0 0
OC4J	↓ ↑	0 0

Alerts ↓ 1 ● 0 ● 0

Severity	Target	Date	Message	Latest Comment
↓	LISTENER_SFM1_26_stacq04.us.oracle.com	Jun 12, 2006 1:27:11 PM	The listener is down: TNS-12541: TNS:no listener.	

Linda can similarly create systems for all the environments that she needs to work on.

Service Modeling

Grid Control lets you define one or more services that represent the business functions or applications that run in your enterprise. Some examples of services include CRM applications, online banking, and e-mail services. Some simpler forms of services are business functions that are supported by protocols such as DNS, LDAP, POP, or SMTP.

Some types of service models that you can define are: Generic Service, Web Application, and Aggregate Service. A Generic Service is the simple service model you can create in Enterprise Manager. You can define one or more service models by defining service tests that represent a critical business function. An Aggregate Service is a service combined logically with one or more other services. The availability, performance, and usage of an Aggregate Service are determined by the availability, performance, and usage of its constituent services. A Web application is a special type of service that models a Web-based application or a Web site. A Web application target consolidates all the components of your Web application and determines the availability, performance and usage of the application.

You can also monitor these services. SLAs are used to evaluate service availability, performance, and usage. By constantly monitoring the service levels, IT organizations can identify problems and their potential impact, diagnose root causes of service failure, and fix these in compliance with the SLAs. Monitoring a service helps you ensure that your operational goals and SLAs are met.

Some of the concepts that you need to understand while working with services are discussed here.

Availability: The availability of a service is a measure of the end users' ability to access the service at a given point in time, and might differ from service to service.

Availability is based on the successful execution of service tests. The availability of a service can also be based on the underlying system that hosts the service. The service is considered available as long as all or at least a single transaction from the key beacon finishes.

Service Tests: A service can have one or more tests associated with it. These tests are used to monitor the service remotely. Transactions are service tests that are used to test the Web application performance and availability. Important business activities for the Web application are recorded as transactions, which are used to test availability and performance of a Web application. A transaction is considered available if it can be successfully executed by at least one beacon.

A list of some service tests and what they determine follows:

- DNS - Availability and performance of a DNS (domain name system) service
- Custom Script - Availability and performance of a service by using a custom script or executable
- FTP - Availability and performance of an FTP (File Transfer Protocol) service
- Web Transaction - Availability and performance of a Web application
- HTTP Ping - Availability and performance of a Web URL
- Host Ping - Responsiveness of a network host through ICMP (Internet Control Message Protocol)
- IMAP - Availability and performance of an IMAP (Internet Message Access Protocol) service
- DB SQL Timing - Availability and performance of a JDBC (Java Database Connectivity) connection to a database
- LDAP - Availability and performance of an LDAP (Lightweight Directory Access Protocol) service
- NNTP - Availability and performance of an NNTP (Network News Transfer Protocol) newsgroup service
- Oracle SQL Timing - Availability and performance of a connection to an Oracle database
- POP - Availability and performance of a POP (Post Office Protocol) service
- Port Checker - Ability of a network client to make connections to a set of ports on a given host
- SMTP - Availability and performance of an SMTP (Simple Mail Transfer Protocol) service
- TNS Ping - Responsiveness of a database through the TNS (Transparent Network Substrate) protocol
- SOAP - Availability and response time of a Web service

Performance and Usage Metrics: You can define metrics to measure the performance and usage of the service. Performance indicates the response time of the service as experienced by the end user. Usage metrics are based on the user demand or load on the system. Performance metrics are collected for service tests when the service tests are run by beacons. A beacon is a function within the Management Agent that executes tests at regular intervals. You can calculate the minimum, maximum, and average response data collected by two or more beacons. You can also collect performance metrics for system components, and then calculate the minimum, maximum, and average values across all components. Usage metrics are collected

based on the usage of the system components on which the service is hosted. You can monitor the usage of a specific component or statistically calculate the minimum, maximum, and average values from a set of components. You can also set thresholds on these metrics and receive notifications and alerts.

Service-Level Agreements (SLAs): Service-level parameters are used to measure the quality of the service. These parameters are usually based on actual SLAs or on operational objectives. The Service-Level Management feature enables you to monitor your enterprise against your SLAs to verify that you are meeting your needs for availability and performance within the business hours of the service. For SLAs, you may want to specify the levels according to operational or contractual objectives. By monitoring against service levels, you can ensure the quality and compliance of your business processes and applications.

Scenario: Service Modeling

Though Linda is a DBA manager, her team is responsible for meeting their application's Service Level Agreement (SLA). Her SLA covers application availability and performance from four major development centers. She wants to define a service model and monitor these business applications from within Grid Control. Before she can do that, she must define a system (the tech stack that supports the service) and then define its availability, performance and usage parameters, and service-level rules.

Defining a Service

You can define a service by creating one or more service tests that simulate common end-user functionality. Using these service tests, you can measure the performance and availability of critical business functions, receive alerts when there is a problem, identify common issues, and diagnose causes of failures. This topic describes the procedure that Linda can follow to define and monitor a service.

A service, like other targets, is discovered when you install the Oracle Agent software on the host where it resides.

To manually define a service:

1. From the Targets page, select the **Services** secondary tab.
2. If your service is not listed on the page, select the type of service from the Add list and click **Go**.

The relevant wizard appears. For example, if you select the Generic Service type, the Create Generic Service wizard appears.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Hosts | Databases | Application Servers | Web Applications | **Services** | Systems | Groups | All Targets

General Availability Service Test Beacons Performance Metrics Usage Metrics

Create Generic Service: General

Cancel

Define a service to model and monitor a business process or application.

* Name

Time Zone Use System Time Zone
Select the time zone for this service. Monitored data will be displayed using the selected time zone.

System

Select a system target that hosts this service, then mark the system's key components -- the targets critical for running this service.

System: None

Time Zone

Component	Type	Key Component
No system selected.		

Tip
A "system" is the infrastructure for one or more services, such as other targets.
The system components may be used for availability, or, in case of a root cause analysis.

- On the General page, specify the time zone and a name for the service.
If you would like to associate an existing system with this service, click Select System. If you have not yet defined the system, you will need to create it before associating it with the service. Associating a system with a service is not mandatory, but it is recommended. Features like Root Cause Analysis depend on key system components being correctly defined.
- On the Availability page, specify the availability type for the service.
- On the Service Test page, select a service test to monitor the availability of this service.
Based on the test type you select, you need to specify relevant test parameters. A service can have one or more tests associated with it. These tests are used to monitor the service remotely, and to determine the availability and performance of the service. There are various protocols you can use while defining a service test.
- On the Beacons page, add beacon locations from which the service will be monitored, and designate at least one beacon as key.
A service is considered available if the test executes successfully on at least one key beacon. Beacons marked as key are used to determine the availability of the service.
- On the Performance Metrics page, specify if you want to define metrics based on the service test or on the system, and then define the metrics that will be used to measure the performance of your service.
Performance metrics help you assess the performance of the service for each of the remote beacons. In general, the local beacon should have a very efficient and consistent response time because it is local to the Web application host. Remote

beacons provide data to reflect the response time experienced by the end users of your application.

8. On the Usage Metrics page, define usage metrics based on the metrics of one or more system components. Usage metrics can be defined only for services that are associated with a system.
9. Review your selections and click Finish.

Linda may define other kinds of services similarly.

Editing a Service-Level Rule

A service level is a measure of service quality and is defined as the percentage of time during business hours that a service meets specified availability and performance criteria. It is defined by a service-level rule, which is created automatically for every service.

This topic describes the procedure that Linda can follow to edit a service-level rule that has been automatically defined for a service that she has created.

To edit a service-level rule:

1. From the Targets page, select the **Services** secondary tab.
2. Select the service for which you want to edit the service-level rule.
3. In the service home page, click **Edit Service Level Rule** in the Related Links section.

The Edit Service Level Rule page appears. Default values are used for some rule parameters. However, you must edit the service-level rule for each service to accurately define the assessment criteria that are appropriate for your service.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Hosts | Databases | Application Servers | Web Applications | **Services** | Systems | Groups | All Targets

Web Application: CreditHistoryApp >

Edit Service Level Rule

Service Level is a measure of service quality. Service Level is calculated as percentage of time during business service meets specified availability and performance criteria. The actual Service Level will be calculated for different periods, but the same criteria will apply for all these time periods.

Expected Service Level

Specify the percentage of time during business hours that you expect your service to meet the availability as described below.

Expected Service Level

Actual Service Level

Business Hours			Availability Criteria	
Days	<input checked="" type="checkbox"/> Monday	<input checked="" type="checkbox"/> Tuesday	For Service Level calculations, during which the Service will be	
	<input checked="" type="checkbox"/> Thursday	<input checked="" type="checkbox"/> Friday	<input checked="" type="checkbox"/> Up	<input type="checkbox"/> Under Blackout
	<input type="checkbox"/> Sunday	<input type="checkbox"/> Saturday	<input checked="" type="checkbox"/> Unknown (Pending, Ager	
Start Time	<input type="text" value="00"/> : <input type="text" value="00"/>	End Time	<input type="text" value="24"/> : <input type="text" value="00"/>	
Service Time Zone	(UTC-08:00) US Pacific Time (PST)			

Performance Criteria

Optionally select performance metrics that will be evaluated when computing Service Level. A critical alert metrics will count as a Service Level violation.

- Specify the percentage of time during business hours that you expect your service to meet the availability and performance criteria.

By default, a service is expected to meet the specified criteria 85% of the time during defined business hours.

- Specify the following parameters for the actual service level:
 - Business Hours:** Times during which the service must function without availability or performance issues.
 - Availability Criteria:** Availability states for which the service is considered up. You can choose Under Blackout or Unknown as factors not impacting service availability. Selecting Under Blackout enables you to specify service blackout time (planned activity that renders the service as technically unavailable) as available service time. Selecting Unknown enables you to specify the time for which a service is unmonitored because the Management Agent is unavailable.
 - Performance Criteria:** Performance metrics affecting the service level. The service level is affected when a critical alert is triggered for the specified performance metric.
- Click OK.

Service Monitoring

Monitoring a service helps you ensure that your operational goals and SLAs are met. By analyzing data on response time recorded when users access your Web application service, you can track end-user experience across all the URLs within a Web

application and locate performance bottlenecks that directly affect your end users. To monitor a service, you need to define service tests that simulate activity or functionality that is commonly accessed by end users of the service, designate the geographical locations from which these service tests will be executed, run the service tests on Enterprise Manager beacons, and then analyze results using a variety of monitoring mechanisms. Some of these are briefly discussed in the following paragraphs.

Services Dashboard

Using the services dashboard, administrators can determine whether service levels are compliant with business expectations and goals. The services dashboard enables administrators to browse through all service-level information from a central location. An enterprise might want to put all their services into a single dashboard so that it is easy to interpret the status. The dashboard illustrates the availability status of each service, performance and usage data, as well as service-level statistics. You can easily drill down to the root cause of the problem or determine the impact of a failed component on the service itself.

Services Dashboard

Page Refreshed On Mar 5, 2006 03:21:0 PM PST [Refresh](#)

Service	Status	Performance	Usage	Components	Service Level		
					Last 24 Hours	Last 7 Days	Last 31 Days
PlantsByWebSphere		 269.00 HomePage - Perceived... 730.00 PurchaseTransaction... 25.00 Browse Trans - Perc...	No Metrics Available		100.00%	96.34%	81.45%
EM Website		 772.00 Perceived TotalTime...	 230442.00 Active Pages		100.00%	100.00%	99.91%
Loan Eval 2		 98.16 Applications Process...	 98.37 Loan Approved (%) 66998.00 No of Loan Approvals		100.00%	100.00%	100.00%

Service Topology

Services can be very complex. Having a service topology view can make it easier to view the dependencies between the services and their components. Upon service failure, the potential causes of failure, as identified by Root Cause Analysis, are highlighted in the topology view. In the topology viewer, you can view dependent relationships between services and systems. A service topology is most valuable against an aggregate service.

Reports

Enterprise Manager provides ready-to-use reports that are useful for monitoring services and Web applications. You can also set the publishing options for reports so that they are sent out through e-mail at a specified period of time. Some of the reports that can be generated include Web Application Alerts, Web Application Transaction Performance Details, and Service Status Summary.

Notifications, Alerts, and Baselines

Using Grid Control, you can monitor a service and resolve problems before users are impacted. Each service definition has performance and usage metrics that have corresponding critical and warning thresholds. When a threshold is reached, Grid Control displays an alert. There is a standard set of notification rules that specifies the alert conditions for which notifications should be sent to the appropriate administrators. Apart from these standard sets of rules, you can define and set up

schedules so that administrators are notified when the specified alert conditions are met.

Problem Diagnosis

Grid Control offers you several tools to help diagnose service problems and determine the potential causes.

The Root Cause Analysis (RCA) feature in Grid Control provides you with the ability to analyze service failures by filtering the availability, performance, and configuration data of the system components used by the affected service. This helps you eliminate problems that may appear to be causes of the service failure, but that are only side effects or symptoms of the actual root cause of the problem.

You can also access the RCA information from the topology viewer, which shows a graphical representation of the hierarchical levels displaying relationships between components. Lines between the services and system components represent the associated failure. Comprehensive diagnostic tools enable you to quickly drill down into the Oracle Application Server stack and monitor response times in various application server and database components. RCA automates an otherwise difficult manual task by providing you with the ability to traverse a large, dependent topology and quickly identify problem areas, and notifying you of specific possible causes of service failure.

For Web application services, when the performance is slow, you can trace problematic transactions as required using Interactive Transaction Tracing. You can record the transaction using an intuitive playback recorder that automatically records a series of user actions and navigation paths. You can play back transactions interactively, and perform an in-depth analysis of the response times across all tiers of the Web application for quick diagnosis.

The Interactive Transaction Tracing facility complements the Transaction Performance Monitoring and End-User Performance Monitoring features by helping you diagnose the cause of a performance problem. Once a problem is resolved, you can also run Interactive Transaction Tracing to verify that the problem has been satisfactorily repaired.

The Request Performance Diagnostics feature of Grid Control is instrumental to the application server and back-end problem diagnosis process. It provides in-depth historical details on the J2EE and database performance of all URL requests. By examining the detailed J2EE and database breakdown and analyzing the processing time of a request, you can determine whether the problem lies within a servlet, JSP, EJB method, or specific SQL statement. Using this information, you can easily isolate the cause of the problem and take necessary action to quickly repair the appropriate components of your Web application.

Scenario: Problem Diagnosis

Linda needs to be able to trace a problem with one of her services down to the specific component in the technology stack. She can use RCA to be able to focus on the problem component.

Running a Root Cause Analysis

RCA evaluates a key component's availability status to determine whether or not it is a cause of service failure. You can specify additional conditions, or component tests, for RCA to consider. When a service fails, RCA returns a list of potential causes on the

service home page. Potential root causes include failed subservices and failed key system components. In this topic, Linda can learn how to perform RCA on a failed service.

To run an RCA:

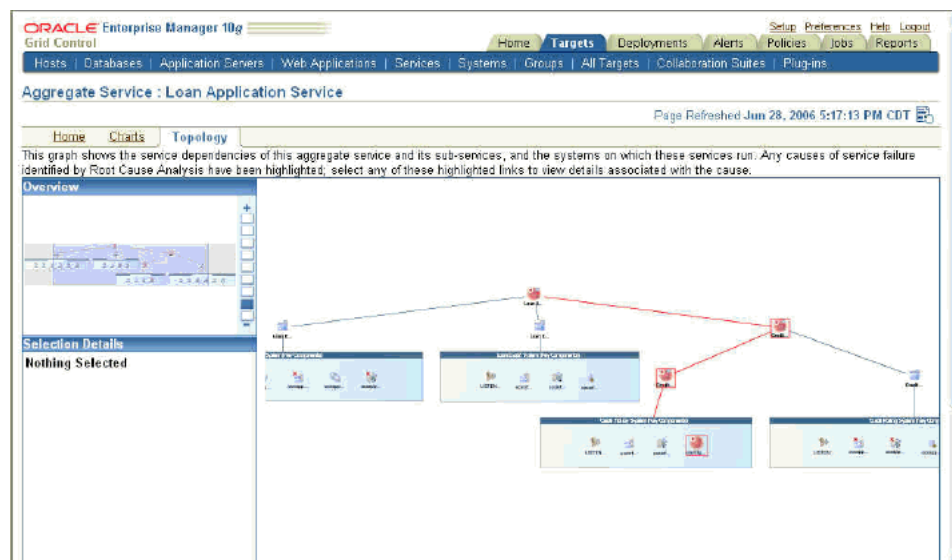
1. From the Targets page, select the **Services** secondary tab.
2. Select the service on which you want to run the RCA.

The service home page opens.

3. Click Monitoring Configuration and then **Root Cause Analysis Configuration**.
4. If the current mode is set to Manual, click **Set Mode Automatic** to enable RCA when the state of the service and its components change.

When you initiate RCA manually, RCA does not store the results for you, thus providing no history for later reference.

5. Click the link in the Component Tests column of the table for the key component you want to test, and add appropriate tests for the components.
6. After a while, go back to the service home page and look under the Possible Causes of Service Failure heading. If you see an RCA Details link, click it to see the Root Cause Analysis Details page.
7. Click a message in the Causes of Failure table to display the alert details for the specific cause.



8. You can also view the RCA feature using the service topology viewer that enables you to see a graphical representation of the service and its relationship to other services, systems and infrastructure components, with the causes identified by RCA highlighted in the display.

Note: The topology viewer is supported only on Internet Explorer 5.5 and higher on Microsoft Windows, using Adobe SVG Viewer 3.0. Other browsers and Adobe SVG Viewer 6.0 are not supported.

Linda can thus use the topology viewer and RCA to isolate the component causing the service to fail.

Services and Systems: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Service Level Management* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/system_services/system_services.htm

Job System

Today's IT environments are composed of many sets of components. You need to minimize the time needed to support those IT components and eliminate the human error associated with component maintenance. The Enterprise Manager Grid Control Job System provides the capacity to automate routine administrative tasks and synchronize components in your environment so you can manage them more efficiently.

The following sections help you work with the Job System:

- [Jobs](#)
- [Job Activity](#)

Jobs

A job is a schedulable unit of work that you define to automate commonly run tasks. A job is defined by its name, description, owner, parameters, targets, and schedule. Jobs are composed of steps.

The Enterprise Manager Job System supports the automation of many administrative tasks, for example, backup, cloning, and patching, and enables users to create their own jobs using their own custom OS and SQL scripts. One of the advantages of the system is that you can schedule a job to start immediately or start at a later date and time. You also have the option to have the job run once or at a specific interval, for example, three times every month. Job results are displayed on the target's home page.

Multi-task jobs allow you to create complex jobs consisting of one or more distinct tasks. Because multitask jobs can run against targets of the same or different type, they can perform spontaneous operations on one or more targets of the same or different type.

Scenario: Jobs

Linda can set up various administrative jobs for her environments and schedule them to run at a later stage. One of the jobs that she would like to schedule is to back up some of her databases. This involves other tasks, such as shutting down listeners and the databases. Linda can make use of a multitask job for this purpose.

Scheduling a Multitask Job

A job can be defined from the Job Activity page, Job Library page, or from other pages of Enterprise Manager. All job runs and executions can be displayed on the Job Activity page, and all library jobs can be displayed on the Job Library page.

In this topic, Linda will see how to define a backup job for a database.

To define a backup job:

1. Click the Jobs tab from the Grid Control console.
2. Select Multi-Task in the Create Job list and click Go.

The Create Multi-Task Job wizard appears.

3. In the General page, specify a name for the task, and in the Targets field, select Different targets for different tasks.

For each task that you create within this multitask job, you can specify a type of target and pick either individual targets or a group. If a selected group contains targets of different types, tasks are run on only the applicable targets. For example, a Shutdown Listener job type will only be run on Listener targets even though the group may contain targets of other types.

4. Click the Tasks subtab.

You can click Add to add several tasks in this page. For example, to create a job to back up a database, Linda can make use of a multi-task job as follows:

- a. Create a task to shut down listeners by using the OS Command type of task, specifying the Target Type as Listener and the following command as the parameter:

```
%OracleHome%/bin/lsnrctl stop
```

- b. Create a task to shut down databases by using the Shutdown Database type of task.

- c. Create a task to back up databases by using the RMAN Script type of task. You can build a dependency between this task and the previously added one by selecting the Condition as On Success and the Depends On task as Shutdown Database. An RMAN script you could use is as follows:

```
backup device type disk tag '%TAG' database include current controlfile;
```

- d. Create a task to start up databases by using the Shutdown Database type of task.

- e. Create a task to start up listeners by using the OS Command type of task, specifying the Target Type as Listener and the following command as the parameter:

```
%OracleHome%/bin/lsnrctl start
```

The Tasks page in the Create Multi-Task Job wizard appears listing all the tasks created.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Job Activity | Job Library

Create 'Multi-Task' Job

Cancel

General Tasks Schedule Access

Tasks

The Tasks are run in sequence.

Edit Remove Move Up Move Down | Type OS Command Add

Select	Name	Type	Condition	Depends On
<input type="radio"/>	SHUTDOWN_LISTENERS	OS Command	Always	
<input type="radio"/>	SHUTDOWN_DATABASES	Shutdown Database	Always	
<input checked="" type="radio"/>	BACKUP_DATABASES	RMAN Script	On Success	SHUTDOWN_DATABASES
<input type="radio"/>	STARTUP_DATABASES	Startup Database	Always	
<input checked="" type="radio"/>	STARTUP_LISTENERS	OS Command	Always	

5. Click Schedule to specify a schedule to run the multitask job.
6. Click Access to grant other administrators access to this job.
7. Click Save to Library to save the job in the library.

Linda can later select this job and edit or submit it.

Job Activity

Job executions are usually associated with one target, for example, a backup job on a particular database. Some executions have multiple targets, for example, comparing hosts. Other executions have no targets, for example, the RefreshFromMetaLink job. When you submit a job to many targets, it would be tedious to examine the status of each execution of the job against each target. With the Job System, you can easily get these answers viewing the "job run." A job run is the sum of all job executions of a job that ran on a particular scheduled date.

In addition to supporting the standard job operations of create, edit, create like, and delete, the Job System allows you to suspend and resume jobs, as well as retry failed executions. For example, you may need to suspend a job if a needed resource was unavailable, or the job needs to be postponed. Once you suspend a job, any scheduled executions do not occur until you decide to resume the job. When analyzing a failed execution, it is useful to be able to retry a failed execution after the cause of the problem has been determined rather than create a new job.

After you submit jobs, the status of all job executions across all targets is automatically rolled up and available for review on the Grid Control Console Home page and on the Job Activity page. This information is particularly important when you are examining jobs that execute against hundreds or thousands of systems and want a quick way to determine the job executions that have failed.

Scenario: Job Activity

Linda would like to see if her backup job completed. If it did not complete, she would like to examine which step of the job failed and why.

Monitoring a Job

In this topic, Linda will see how to analyze and monitor the jobs that she had submitted.

To monitor a job:

1. Click the Jobs tab from the Grid Control console.

The Job Activity page appears. By default, it shows a list of Active jobs. You can select a job, view its results, create another job like it, or copy it to a library. You can also, edit, suspend, resume, stop, or delete it. You can also click a job to go to its home page and see details.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments

Job Activity | Job Library

Job Activity

Status: Active Name: Go Advanced Search

View: Runs

View Results Edit Create Like Copy To Library Suspend Resume Stop Delete | Create

Select	Name	Status (Executions)	Scheduled	Targets
<input checked="" type="radio"/>	TEST123	1 Running	Mar 3, 2006 9:20:00 PM Each target's timezone	16
<input type="radio"/>	STAGE-IMAGE-DDFC8FF82626AD17E040578C67158458	1 Suspended	Mar 2, 2006 5:59:27 AM (UTC-08:00)	stacbl4.t

2. To narrow down the listing of jobs, specify search criteria and click Go.

You can search for jobs by name or criteria. You can also choose to view either executions or runs. You can also specify advanced search options, such owner, job type, target type and so on.

3. Click the job that you want to inspect.

The Job Run page appears showing details of executions on various targets. You can perform various operations from this page, the way you can from the Job Activity page.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Job Activity | Job Library

Job Run: TEST123

Page Refreshed Apr 7, 2006 9:44:21 AM UTC [Suspend Job](#) [Stop Job](#) [Delete Run](#) [Create Link](#)

Scheduled Mar 3, 2006 9:20:00 PM Each target's timezone Type OS Com
Targets 16 targets Owner SUPER Description

Executions

Targets

Status All

[Go](#)

[Suspend](#) [Retry](#) [Stop](#)

[Show All Details](#) | [Hide All Details](#)

Select	Details	Targets	Status	Started	Ended
<input type="radio"/>	Show	nhaba- pc2.us.oracle.com	Running	Apr 2, 2006 3:01:05 AM PDT	
<input type="radio"/>	Show	klmicha- sun.us.oracle.com	Initialization Error	Mar 9, 2006 1:40:40 PM EST	Mar 9, 2006 1:40:41

4. Select a failed execution and click Suspend so that you can examine it.
5. Click the failed execution to see its details.
6. Remedy any problems that you can identify and click Retry.

Linda can similarly ensure that the job runs successfully on all the targets on which she wants it to run.

Job System: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Creating Jobs* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/jobs/creating_jobs.htm

Configuration Management

With today's complex IT infrastructures, most of an administrator's time may be spent trying to keep the underlying software up to date. Operating systems, applications, and other software must be installed, propagated, patched to the latest level, and duplicated. Without automation and central management, deployment management could present a huge obstacle to the growth and maintenance of your enterprise.

With Enterprise Manager Grid Control, monitoring, managing, and maintaining your IT infrastructure is simplified through its powerful tools for configuration management and policy management.

This chapter covers configuration management in the following sections:

- [Configuration Information](#)
- [Configuration Comparison](#)
- [Policy Management](#)

Configuration Information

The Oracle Management Repository stores host configurations, client configurations and database configurations that are collected by the Oracle Management Agent. The set of all of the host configurations, database configurations, and client configurations stored in a Management Repository is referred to as the enterprise configuration.

Host configuration consists of the configuration information that Enterprise Manager collects for a host that is a managed target, including the hardware, the operating system information, installed Oracle software and patches, and operating system-registered software. Client configuration information includes these as well as network data and browser-specific information. Database configuration information for an Oracle database includes information pertaining to the database, instances, high availability and licensing information as well as parameters and other values pertaining to initialization, system global area, tablespaces, datafiles, control files, redo logs and rollback segments.

Grid Control offers several summary views of your enterprise that you can use to monitor the state of your host and target configurations. Sometimes, you may want to search your enterprise configuration to identify hosts that have not had operating system patch 105181-05 installed, hosts that have an Oracle version 9.0.1.0.0 database installed, Oracle home directories where specific databases are installed, and so on. Enterprise Manager lets you perform such user-defined searches and also lets you use or customize predefined searches.

Scenario: Configuration Information

Linda would like to examine configuration data while creating a complete inventory of hardware and software in her managed environment. She needs to adhere to standards like ITIL or CoBiT. She wants to update all OSs and Oracle homes to her company's standards, but every machine seems to be at different level of configuration. Once all of her systems meet the company standards, she must maintain a 90% level of compliance.

Collecting Configuration Information

The Configuration page of a host shows summaries of various hardware, operating systems, database installations and application server installations in the enterprise. You can perform various configuration operations from this page and also can drill down to host pages.

To work with host configuration information:

1. Click **Targets** in the Grid Control console.
2. Select a host to go to its home page.
3. Click the **Configuration** subtab to see the configuration details of the host.

On this page, you can see hardware, operating systems, Oracle software, OS-Registered software on the system.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Ta

Host: stang13.us.oracle.com

Latest Data Collected From Target **Mar 19, 200**

Home Performance Targets **Configuration**

Save History Compare Configuration Compare t

Hardware		Operating System	
System Configuration	1686	Operating System	Red Hat Enterprise Linux AS 2.4.21 37.ELsmp (32-bit)
Hardware Provider	Intel Based Hardware	Packages	1053
Number of CPUs	1	Related Link	Operating System Details
Memory Size (MB)	5769		
Related Link	Hardware Details		

Oracle Software	
Product	Oracle Home
Oracle Enterprise Manager Grid Console 10.2.0.1.0	/private/home/oracle/102gc/oms10g_oms10g

4. Click various links for more details.
5. Click **Save** to save the configuration.

A saved configuration serves as a record of what the configuration was like at a certain point in time or it can be used as a benchmark to evaluate other hosts in the enterprise.

6. Opt to save it to the Enterprise Manager Repository or to a file that can later be shared with a wider group, and click **OK**.

Linda can use this configuration to evaluate and update other hosts in her environment so that they are all similarly configured.

Configuration Comparison

Enterprise Manager lets you compare these configurations and determine differences between two or more hosts or databases. The Generic Compare wizard enables you to compare various types of configurations with one or more other configurations.

Scenario: Configuration Comparison

Linda is having a problem with a production box that was functioning properly when it was tested in QA. She had configured it to work just like the QA box but some changes have crept in. She wants to compare the QA computer and her production computer to be able to determine the cause for the difference in performance.

Comparing Configuration Information

This topic describes the procedure that Linda can follow to compare two hosts.

To compare configurations of two hosts:

1. Click **Compare Configuration** under Configuration in the Deployments page.

The Compare Configurations: First Configuration page appears.

2. Select a configuration and click **Continue**.

The Compare Configurations: Second Configuration page appears. This page appears also when you click the Compare Configuration button in the Configuration page of a host.

3. Select another configuration and click **Compare**.

The Comparison Results Summary page appears providing a comparison of various configurations details for the selected hosts.

ORACLE Enterprise Manager 10g

Grid Control Home Targets Deployments Alerts Policies Jobs Reports

General | Provisioning

Comparison Results Summary

First Host: **apbderac1.au.oracle.com** Date: Feb 22, 2006 5:55:21 PM EST

Second Host: **apbderac5.au.oracle.com** Date: Feb 22, 2006 5:56:04 PM EST

Hardware & Operating System

Comparison Result /	apbderac1.au.oracle.com	apbderac5.au.oracle.com
Different	i686, 1 CPUs, 2001 MB Memory	i686, 1 CPUs, 2001 MB Memory
Different	Red Hat Enterprise Linux AS release 3 (Taroon Update 4) 2.4.21-2? 0.2.ELora4wl (32-bit)	Red Hat Enterprise Linux AS release 3 (Taroon Update 4) 2.4.21-2? 0.2.ELora4wl (32-bit)

Oracle Software

Compare Products

Product	apbderac1.au.oracle.com	apbderac5.au.oracle.com
Oracle Clusterware 10.2.0.1.0	✓	✓
Oracle Database 10g 10.2.0.1.0	✓	✓
Oracle Management Agent 10.2.0.0.0	✓	✓

OS-Registered Software

4. Click the **Different** link in the Hardware and Operating Systems table to see what is different between the selected hosts.

This might help you isolate the reason for differences in the performance of the two hosts.

Linda can compare the QA box with the production box to identify in what ways they are different and then explore if those differences are responsible for a difference in the performance of the two machines.

Policy Management

Policies define the optimal configurations of systems. Whether you use the policies defined by Oracle or configure policies to meet your particular system requirements, any deviations to your systems or applications are reported. Examples of deviations include inappropriate settings and incorrect system configurations.

You can configure the existing policy rule settings. You can enable or disable a policy evaluation, change the importance for the compliance score calculation, assign a corrective action, prevent template override, override default parameter values (when possible), and exclude objects from the evaluation of a policy.

You can investigate policy violations by studying the statistics in the All Targets Policy Violations section on the Enterprise Manager Grid Control home page. The policy violations with Critical severity or those that have the biggest impact on your enterprise should be dealt with first. You can also check security-related violations reported in the Security Policy Violations section. Noncompliance with these policy rules can greatly impact the security of your enterprise. Ideally, you should address targets that have the lowest compliance scores. You can also investigate the policy violations of a particular target by examining the Policy Violations section in the home page for that target.

Scenario: Policy Management

Linda would like to have consistent configuration on all her machines. She has a standard for everything from host hardware up to the software patch level that she needs to enforce, and wants to be alerted when something breaks the standard.

Applying Policies Consistently Across Targets

To apply a policy for a target, you can select the policy and associate it with a target. You can easily apply a policy consistently across several targets by setting up a monitoring template for it and applying the template to multiple targets.

To apply a policy consistently for multiple targets:

1. Click **Setup** and then **Monitoring Templates** in the Enterprise Manager Grid Control console.
The Monitoring Templates summary page appears.
2. Click **Create**.
3. Select a target that is representative of the targets on which you want to enable specific policies.
4. In the Policies page, select and enable the policies that you want to associate with the target. You can enable a policy by clicking the pencil icon to access the Edit Policy Rule Settings page, and then setting Policy Evaluation to Enabled.
5. Select the policies that you do not want to include in the template and click **Remove from Template**.
6. Click **Add Policies to Template** to add policies from the policy library or from another target.
7. From the Monitoring Templates home page, select the monitoring template you just created and click **Apply**.
The Apply Monitoring Template page appears.
8. Select all targets for which you want to enable the selected policies and click **OK**.

9. Select the **Policies** tab from the Grid Control console.

The Policy Violations page appears listing all the policies, violations, and compliance scores.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Host: **stang13.us.oracle.com**

Latest Data Collected From Target **Mar 19, 200**

Home Performance Targets Configuration

Save History Compare Configuration Compare t

Hardware

System Configuration	i686
Hardware Provider	Intel Based Hardware
Number of CPUs	1
Memory Size (MB)	5769
Related Link	Hardware Details

Operating System

Operating System	Red Hat Enterprise Linux AS 2.4.21 37.ELsmp (32-bit)
Packages	1053
Related Link	Operating System Details

Oracle Software

Product	Oracle Home
Oracle Enterprise Manager Grid Console 10.2.0.1.0	/private/home/oracle/102gc/oms10g (oms10g)
Oracle Management Agent 10.2.0.1.0	/private/home/oracle/102gc/agent10g (agent10g)

Related Link [Search Oracle Products Installed in Oracle Homes](#)

OS-Registered Software

Linda can watch for policy violations in this manner.

Improving the Compliance Score

The Compliance Score indicates the percentage to which a target has been compliant with the goals defined by management policies. A compliance score summarizes all existing management policies into a useful metric that can be monitored showing the level of compliance of a target.

The compliance score is a combination of severity, importance, and the percentage of objects found to be non-compliant. The severity level refers to the seriousness of the violation. A Critical severity denotes a violation that needs immediate attention. A Warning warns of serious consequences if the violation is not dealt with in a timely manner. An Informational severity imparts knowledge about an object that is violating best practices. The importance level denotes the impact of the policy violation against this target. A High importance level indicates that the system could be compromised if a security policy rule violation is ignored.

You can influence how a compliance score is calculated by configuring a policy to have an importance level of high, normal, or low so the policy best meets the needs of your environment.

To ensure that the compliance score correctly reflects the environment:

1. From the policy violations page, click a violation count link that you think might not contribute meaningfully to the compliance score.

The Policy Violation Details page appears. It shows the violations against the policy. You can temporarily suppress a violation so that it does not have any impact on the compliance score.

2. To edit the policy, click **Edit Policy Rule Settings** in the Related Links section.

The Edit Policy Settings page appears.



3. Set Policy Evaluation to **Disabled**.

Enterprise Manager will not evaluate the disabled policy for the target although the underlying metric collection continues.

4. For another policy, you can change the Compliance Score Setting to **Low** if you want its influence on the score to be minimal.

When the policy violations page is refreshed, it may show a better compliance score. Linda can similarly configure policies to achieve a compliance score to meet the needs of her environment.

Configuration Management: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Configuration Management* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/enterprise_manager_configuration/enterprise_configuration_and_policies.htm

Provisioning

System administrators spend a significant amount of their time installing and configuring new software. Enterprise Manager Grid Control's automated provisioning and cloning tools dramatically reduce the time and expense to deploy new systems and allow you to scale-out to more systems at minimal incremental cost. The cloning tools help you propagate a fully patched and tested Oracle home to multiple hosts, clone database instances to create backups of important databases, and create new single-node Real Application Clusters (RAC) by cloning an existing RAC Oracle home. The provisioning tools allow administrators to store preconfigured and certified base images in a central software library, from which they can deploy fully configured Linux systems to bare metal, or standardize the deployment of "gold images." These new systems can be deployed with any desired software configuration.

The provisioning application facilitates the provisioning of images on machines across an enterprise. It provides the user interface, business logic, and provisioning repository that help you automate the process of installing an operating system (OS), Oracle software, and other third-party software on any hardware server in a computer grid, for example, a server farm or data center. The hardware servers are provisioned using a managed set of pre-packaged and preconfigured bundles containing very specific versions of the operating system, Oracle software, and other third-party software.

This chapter covers provisioning in the following sections:

- [Patching](#)
- [Cloning](#)
- [Images](#)
- [Provisioning](#)
- [Deployment Procedure Manager](#)

Patching

Manually applying software patches to maintain the latest and most secure IT environment can become a full-time job. With the deployment management tools of Enterprise Manager Grid Control, you can quickly see the patches available for the components in your enterprise, find out which have not been applied and which are critical, and then bring those components up to the latest patch level with just a few clicks.

The enriched patching application offers an "end-to-end" patching solution that works seamlessly across a wide range of product patches and customer environments. The patching application automates the deployment of patches for the Oracle Database,

including Clusterware and RAC, as well as Oracle Application Server and Oracle Collaboration Suite.

Using a direct link to the Oracle MetaLink patch repository, the Critical Patch Facility identifies the critical patches that have been released for the Oracle software running in your specific systems, and notifies administrators of only those patches that are applicable to their environment. Once a patch is identified, Grid Control can download and deploy it to multiple targets automatically.

You can also download patches from the Oracle MetaLink Web site:

<http://metalink.oracle.com>

Scenario: Patching

Linda needs to create an image from a host server running an Oracle home to new target servers in her environment. Before creating the image, she wants to patch the live database on the host server to the desired level.

Applying a Patch

You can use Enterprise Manager to simplify the staging and application of Oracle patches and patch sets. Applying a patch is the process of installing the staged patch in the Oracle home on the host. You can use Enterprise Manager to stage and apply a patch on any host on which the Oracle Management Agent is running. Enterprise Manager stages an Oracle patch by downloading it from the Oracle MetaLink Web site and copying it to a directory on a host.

Enterprise Manager also enables you to apply a patch from an already staged patch. It also helps to customize the patching operation, by allowing you to specify any pre-patching or post-patching scripts that you may want to execute.

Let us see how Linda can select the patch required for the Oracle home and apply it.

To apply a patch:

1. Click **Deployments**.

Notice the link at the top that shows the number of Critical Patch Advisories that are applicable to Oracle homes.

2. Click the **Critical Patch Advisories** link.

The Critical Patch Advisories page appears. You can see a list of advisories, affected homes, and patches applicable to Oracle homes.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies

General | Provisioning

Critical Patch Advisories for Oracle Homes

The critical patch advisories indicate that one or more Oracle Homes has security and/or reliability vulnerabilities. The advisories list the advisories that affect Oracle Homes. Remedies list the fixes for the advisories.

Page Refreshed Mar 27, 2006 1:10:39 A

Patch Advisories Affected Homes Remedies

Patch Advisories

Show Remedies

Select Advisory	Impact	Abstract	Affected Hosts	At
Ⓢ Critical Patch Update January 2006	Security	Oracle Critical Security Update	4	4

Patchsets to Apply

Patchset	Product	Release	Platform	Advisory
No patchsets found				

Interim Patches to Apply

Patch	Product	Interim Patch Applicable on	Platform	Advisory
4751932	Oracle Database	10.1.0.5	Linux x86	Critical Patch Update 2006

- Click the **Affected Homes** subtab to see whether the Oracle home from which you want to create a default image is listed as affected or not.
- Select the host and click **Show Remedies**.
Advisories and remedies for the selected home appear, indicating the patches that you need to apply to the home.
- To see if any patches are applicable to a database on the home, go to the home page of the database instance.
- Click **Maintenance** and then **Apply Patch**.
The Patch Wizard appears showing a list of applicable patches.
- Select the patch that you want to apply.
To check if you are selecting the correct patch, you may view the its details or its related Readme by clicking the relevant buttons on this page.
- Specify the destination targets on which you want to apply the patch.
- Specify credentials for the selected targets.
The Patch wizard uses these credentials to stage the patch in the Oracle home or the staging directory of the selected host.
- Specify whether you want the patch to only be staged or to be both staged and applied.
- Specify whether you want the patching job to be executed immediately or at a later time.
If you want it to execute at a later time, specify details such as the date, time, and time zone.
- Review the specifications made and click **Finish** to submit the patching job.

Linda can similarly patch her database so that it is ready to be included in a default image.

Cloning

Enterprise Manager Grid Control gives you powerful cloning tools that simplify deployment management for your enterprise. Cloning saves time, reduces costly configuration and deployment expenditures, and increases the reliability for your IT infrastructure components.

Scenario: Cloning

Linda would like to clone an Oracle clustered home and extend it to include to newly cloned home.

Cloning an Oracle Clustered Home to Extend It

Installed Oracle homes of most Oracle products can be cloned as is, and do not require any additional support files to perform the cloning operation. However, if you want to clone a Database 9.2.0.*n* home or an Application Server 9.0.4.*n* home, you must patch Grid Control with the appropriate platform-specific Clone Support Files before starting the cloning operation. While Grid Control is packaged with Clone Support Files for these products, it is recommended that you always check for the latest version on Oracle MetaLink.

Enterprise Manager enables you to deploy one or more Oracle Clusterware 10.2 instances similar in configuration to a source instance. Let us see how Linda can take advantage of this feature.

To clone an Oracle clustered home:

1. On the Deployments page, click Clone Oracle Home.

The Clone Oracle Home wizard appears listing all the existing clonable Oracle homes for all products.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets **Deployments** Alerts

General | Provisioning

Source Home Source Settings Product Settings Destinations Pre/Post Scripts Sched

Clone Oracle Home: Source Settings

Source Host **stacg14.us.oracle.com** Cancel

Source Home Location **/scratch/sdata/product/10.1.0/Db_10.2**

Cluster Details

This is to allow you to decide whether this home should be treated as part of a cluster.

Source Home is clustered

Existing Member Nodes **Not Available**

Working Directory

A working directory on the source host, is required to stage files for cloning. Supply the name of an existing

2. Select the Oracle home that you want to clone. It can be an installed Oracle home or packaged in a software library. It must be a RAC (version 10.1 or 10.2) or Oracle Clusterware (version 10.2) Oracle home.
3. Specify whether you want the selected Oracle home to be treated as a cluster or not. Also, specify a working directory and files to be excluded from the cloning operation if you selected an installed Oracle home.

4. Select the option to specify that you want to clone the clustered home to extend the cluster, and not create a new cluster. In the Destination Node Specification table, specify the public node name, private node names, and virtual IPs for each destination node or host. Ensure that the Oracle home location and name is the same as the source.
5. Specify the destination Oracle home information along with the destination host credentials. Ensure that the credentials are valid and are identical for each host.
6. Specify the scripts or commands to be executed before and after the cloning operation. If you do not want to customize the cloning operation, you can leave this page blank. You may choose to execute these scripts with sudo privileges if the host credentials previously specified have sudo privileges on the destination host. If the root script is not run through this job, you must run it manually for the cloning operation to complete.
7. Schedule the job to run immediately or at a later point in time.
8. Review your selections and click **Finish**.

An Oracle Enterprise Manager job is submitted to clone the Oracle clustered home.

Images

An image can be seen as a managed set of software components, directives and other collateral packaged together to make an independent deployable unit. Software components include the operating system software, Oracle software, and other third-party software applications. Software components are individually maintained within the Oracle Software Library and represent the primary building blocks that may be combined with other components as needed, to specify the complete software configuration that may be provisioned. Directives are a set of executable instructions used for provisioning. Any image should contain references to staging, preinstall or postinstall directives.

Scenario: Images

Linda needs to create an image of an Oracle home so that she can then use it to provision new servers in her environment.

Creating a Default Image

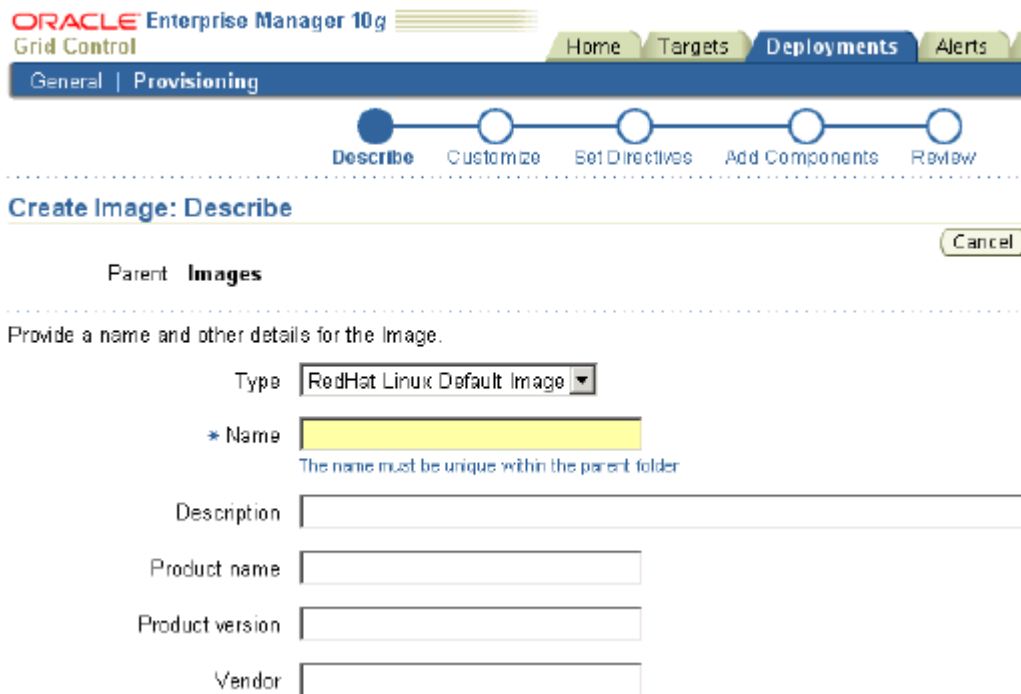
A default image is a special type of image that consists of a minimum set of operating system installer files required to install the OS and Enterprise Management Agent on a bare-metal computer, so that it can communicate with the OMS Server.

Let us see how Linda can create a gold image that she can later use for provisioning new machines.

To create a default image:

1. On the Provisioning page of the Deployments page, click Images.
2. Click Create Image.

The Create Image wizard appears.



ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

General | Provisioning

Describe Customize Set Directives Add Components Review

Create Image: Describe Cancel

Parent Images

Provide a name and other details for the Image.

Type

* Name
The name must be unique within the parent folder

Description

Product name

Product version

Vendor

3. Select the type of image as Default Image and provide other details.
4. Configure the image by specifying details such as the reference installation host server from which to use the OS information and the RPM repository.
5. Customize the image instance by modifying or removing pre-defined properties or adding new ones.
6. Directives are automatically created for the default image. Edit these directives or add new ones.
7. Review the selections made and click Finish.

An Enterprise Manager job is submitted to create the default image.

Linda can use a default or gold image thus created to set up other servers in her environment.

Provisioning

Once the default image is created, it can be staged for installation on any new computer that boots over the network. The IP address needs to be mentioned while staging the default image. This ensures that any computer that comes up in the specified range will use this default image for installation.

The provisioning application enables you to add staging servers, boot servers, RPM repositories, default images, software libraries, and network configurations. It also lets you stage the default image onto the staging server, which keeps it ready for installation. When a new computer is plugged in and booted over network, the boot server directs the computer to install the default image.

For more information about provisioning, read the white papers at

<http://www.oracle.com/technology/products/oem/index.html>

Deployment Procedure Manager

Multitier software systems are very complex, with similar components installed over a number of machines yet functioning as a single system. Upgrading the system together is particularly challenging. It must take into account the workflow within the system. Deployment Procedure Manager addresses this requirement by providing a framework for automating, orchestrating, and tracking tasks that can be run on multiple homes.

Deployment Procedure Manager allows you to perform complex software life cycle management activities such as provisioning, patching, upgrading and so on from the Grid Control console. It provides a framework for automating, coordinating, and tracking tasks that can be executed on multiple Oracle homes. The Deployment Procedure Manager coordinates individual installers, upgrade assistants, custom scripts, and utilities to enable you to upgrade your entire system from a single console.

The workflow of all the tasks that need to be performed for a particular life cycle management activity is encapsulated in a Deployment Procedure. A Deployment Procedure is a hierarchical sequence of provisioning steps, where each step may contain a sequence of other steps. It provides a framework where specific applications and procedures can be built.

You can customize and tailor standard procedures that Oracle provides. The Deployment Procedure Manager operates on targets managed by agents with versions of 10.2.0.2 or higher.

Provisioning: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Provisioning* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/provisioning/provisioning.htm

Information Publisher

Information Publisher, Enterprise Manager's powerful reporting framework, makes information about your managed environment available to audiences across your enterprise. Strategically, reports are used to present a view of enterprise monitoring information for business intelligence purposes, but can also serve an administrative role by showing activity, resource utilization, and configuration of managed targets. IT managers can use reports to show availability of sets of managed systems. Executives can view reports on availability of applications (such as corporate e-mail) over a period of time.

The reporting framework enables you to create and publish customized reports. Intuitive HTML-based reports can be published through the Web, stored, or e-mailed to selected recipients. Information Publisher comes with a comprehensive library of predefined reports that allow you to generate reports without additional setup and configuration.

This chapter covers Information Publisher in the following sections:

- [Report Definitions](#)
- [Report Schedules](#)
- [Report Publishing](#)

Report Definitions

A report definition tells the reporting framework how to generate a specific report by defining report properties such as report content, user access, and scheduling of report generation.

Information Publisher comes with a comprehensive library of predefined report definitions, allowing you to generate fully formatted HTML reports presenting critical operations and business information without any additional configuration or setup.

Enterprise Manager Grid Control comes with more than a hundred reports. The supplied report definitions are organized by functional category with each category covering key areas. The categories are as follows:

- Deployment and Configuration
- Enterprise Manager Setup
- Monitoring
- Security
- Storage

Scenario: Report Definitions

Linda needs to provide various reports on her managed systems. She can use reports as they are for many of her requirements but for some she needs to customize them. She would like to create a report about the top 20 alerts and policy violations. Instead of creating a new report from scratch, she can select the Alerts and Policy Violations report that most closely meets her needs and then customize it.

Customizing a Report Definition

Although the predefined report definitions that come with Information Publisher cover the most common reporting needs, you may want to create specialized reports. If a predefined report comes close to meeting your information requirements, but not quite, you can use the Create Like function of Information Publisher to create a new report definition based on one of the existing reports definitions.

Let us see how Linda can customize a provided report.

To customize a report:

1. Click **Reports** to go the reports home page.
A list of existing reports appear. You can see their details by clicking on any one of them.
2. Select a report that you want to customize and click **Create Like**.
The Create Report Definition wizard appears.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments

Create Report Definition

General Elements Schedule Access

* Title: 20 Most Common Alerts and Policy Violations

Category: Monitoring Add Category

Subcategory: Alerts and Policy Violations Add Subcategory

Targets

Either the report viewer can select a target, or your report definition can specify the target. An element-specific target is specified below.

A target will be selected by the report viewer when viewing the report
Target Type: Any Limits the report viewer's choice of targets

Use the specified target
Target: Leave blank if this report has no report-wide target

Privileges

3. On the General page, specify a name for the report and categorize it, associate a target with the report or opt to allow target selection while generating the report, and specify display options and other parameters.

For example, you may want to select the first option under Targets, if you want to view a report, such as a memory consumption report, and then specify targets to diagnose a problem. You may want to select the second option if you want to

regularly view data on two specific database instances. A report owner can choose to share a view of the report with other users.

If you are a system administrator managing a number of hosts, you need to share availability information with the DBA using your machines, but you do not want them to have access to your targets in Grid Control. In this case, you can create a report displaying host information and share either snapshots (via scheduling) or real-time data (via granting report access) with the DBAs.

4. On the Elements page, specify elements to be included in the report.

Elements are predefined content building blocks that allow you to add a variety of information to your report. Some examples of reporting elements are charts, tables, and images. If required, also modify the parameters of each element and the layout of these elements on the report. To customize an element, you can specify whether it should inherit or overwrite the report-level target. For example, if you are creating a report that shows performance information for a database instance, each element should inherit and show data from the same target. If you are creating report to compare a user-supplied host and a baseline host, showing key performance indicators of the two hosts side-by-side, half of the elements should inherit the user selection, and half of them should hard-code the baseline host as a target.

5. Click **Preview** to see how the report will look and make additional changes, if required.
6. Click **OK**.

The customized report appears in the Report Definition list under the Category and Subcategory you specified on the General page.

Report Schedules

Enterprise Manager enables you to view reports interactively or schedule generation of reports on a flexible schedule. For example, you might want to generate an "Inventory Snapshot" report of all of the servers in your environment every day at midnight.

Scenario: Report Schedules

Linda wants to send out a report of the top 20 alerts and policy violations to her team of DBAs twice a week.

Scheduling a Report

Let us take a closer look at the Schedules page of the Report Definition wizard to address Linda's need.

To schedule a report:

1. From the Reports home page, select the report that you want to modify and click **Edit**.
The Edit Report Definition wizard appears.
2. Click the **Schedule** subtab.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts

Edit Report Definition: "Test-20 Most Common Alerts and Policy Violations"

General Elements **Schedule** Access

You can optionally schedule a report so that it can be e-mailed and/or so that copies can be saved. A job is scheduled for the report. The scheduled report is run using the target privileges of the report owner (DEMO1).

Schedule Report
When checked, the General option "Run report using target privileges of the report owner (DEMO1)" must also be checked

Schedule

Type One Time (Immediately) One Time (Later) Repeating

Save Copies of Report

Save a copy of report each time the scheduled report completes

E-mail Report

E-mail report each time the scheduled report completes

3. Select the **Schedule Report** option.

4. Specify the type of schedule.

This can be either one-time—immediately or at a specified time in the future—or repeating. You can specify a variety of additional options for a repeating schedule, such the frequency, the specific day of week or date in a month, and the date or recurrences until which the report should continue to be generated.

5. Opt to save copies of the report each time it is generated, if required.

6. Specify one or more e-mail addresses at which to send the report when it is generated, if required.

7. Specify a purge policy.

A purge policy allows you to specify how many report copies to store at any single time. For example, some customers might only want to store reports generated within the last 30 days, while others might want to keep at the most only 10 copies at a time.

8. Click **OK**.

The report will now be generated as scheduled.

Report Publishing

Information Publisher facilitates easy report sharing with the entire user community. Information Publisher honors Enterprise Manager roles and privileges, ensuring that only Enterprise Manager administrators can create reports on the information they are allowed to see. When sharing reports, administrators can allow report viewers to see the report with viewer's privileges or owner's privileges.

Scenario: Report Publishing

Linda's managers do not want to use Grid Control just to be able to see these reports. She would like to publish the reports to a secure URL. She wants to share the report with the managers, and send it to them by e-mail every day at 8 AM. She wants to

provide her managers and customers with a URL, where they can access the report. For this, she can make use of the Enterprise Manager Reports Website.

Publishing a Report

Enterprise Manager administrators can share reports with other administrators and roles. Sometimes, you may also need to share reports with non-Enterprise Manager administrators, such as customers and business executives. To facilitate information sharing with these users, Enterprise Manager renders a separate reporting web site that does not require user authentication.

Let us see how Linda can share a report.

To publish a report:

1. From the Reports home page, select the report that you want to share and click **Edit**.

The Edit Report Definition wizard appears.

2. Click the **Access** subtab.

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. The main title is "Edit Report Definition: 'Test-20 Most Common Alerts and Policy Violations'". Below the title, there are tabs for "General", "Elements", "Schedule", and "Access". The "Access" tab is selected. Underneath, there is a section titled "Administrators and Roles" with a description: "This report definition can be edited by the report owner and all super administrators. The reports can be viewed by all super administrators, and by the administrators and roles defined below." Below this is an "Add" button and a table with columns "Select Name", "Type", and "Description". The table currently shows "No Data Found". Below the table is a section titled "Enterprise Manager Reports Website" with a description: "The Reports website allows report viewing by people who are not Enterprise Manager Administrators. People who are not administrators can view only reports that have the 'Allow viewing without logging in to Enterprise Manager' option checked." Below this is another description: "Enterprise Manager administrators can view reports either from the Enterprise Manager Reports website or from the Reports tab. When logged in, administrators will see all reports for which they have access." At the bottom, there is a checkbox labeled "Allow viewing without logging in to Enterprise Manager" with a note: "Use this option with care as it allows anyone to view the report".

3. Click **Add** to specify the Enterprise Manager administrators or roles who can view the generated report.
4. Select the **Allow viewing without logging in to Enterprise Manager** option to make the report visible on the Enterprise Manager Reports Web site.
5. Click **OK**.

The customized report appears in the Report Definition list under the Category and Subcategory you specified on the General page.

Information Publisher: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Information Publisher* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/information_publishers/information_publishers.htm

Extending Grid Control

Oracle Grid Control provides the richest and most comprehensive monitoring and management for Oracle components – from Oracle Database instances to Oracle Real Application Clusters to Oracle Application Server Farms and Clusters. In addition, to support the wide variety of applications built on Oracle, Grid Control continues to expand its monitoring scope by offering management plug-ins for non-Oracle components, such as third-party databases, third-party middleware, storage and network devices, thus providing Oracle customers a single integrated monitoring solution for any application built on Oracle.

Enterprise Manager can monitor the most common hardware and applications (target types) used in enterprise environments. Considering the complexity of today's data centers and the heterogeneous nature of products, Enterprise Manager provides a modular way to extend monitoring capabilities called Management Plug-ins. Management Plug-ins enable Grid Control to monitor and manage third-party components. These can be developed by Oracle, its partners or its customers.

This chapter consists of the following sections:

- [Management Plug-ins](#)
- [Scenario: Management Plug-ins](#)
- [Deploying, Adding, and Monitoring a Microsoft SQL Server Management Plug-in](#)
- [Adding and Monitoring a BEA WebLogic Management Plug-in](#)

Management Plug-ins

By using Management Plug-ins, you can centralize all your management information in the console, map the complete topology of your applications, and perform comprehensive root cause analysis. By default, Enterprise Manager management and monitoring functionality is automatically extended to target instances of the type defined by your Management Plug-in.

Ready-to-use Management Plug-ins are available from the Oracle Technology Network (OTN) at the Oracle Enterprise Manager 10g Grid Control Extensions Exchange located at:

<http://www.oracle.com/technology/products/oem/extensions/index.html>

This site is your central information source for all Enterprise Manager extensibility information. Partners can build plug-ins for their products, and post the plug-ins there. Customers who want to monitor their custom applications can download documentation and tutorials on how to build custom plug-ins. In addition to tutorials and the latest documentation, you can download ready-to-use Management Plug-ins

developed by Oracle as well as third-party integrators. Because this list is continually being updated, you should check the Extensions Exchange site regularly.

Management Plug-ins that are currently available include:

- BEA WebLogic Plug-In
- Check Point Firewall Plug-in
- EMC Celerra Plug-in
- F5 BIG-IP Local Traffic Manager Plug-in
- IBM DB2 Database Plug-in
- IBM WebSphere Plug-in
- Juniper Netscreen Firewall Plug-in
- Microsoft SQL Server Plug-in
- Microsoft Active Directory Plug-in
- Microsoft BizTalk Server Plug-in
- Microsoft Commerce Server Plug-in
- Microsoft Internet Information Services (IIS) Plug-in
- Microsoft Internet Security and Acceleration (ISA) Server Plug-in
- Microsoft .NET Framework Plug-in
- NetApp Filer Plug-in

Some of these, namely F5 BIG-IP v4.5, BEA WebLogic, IBM WebSphere, and NetApp Filers, are shipped with Enterprise Manager Grid Control 10gR2 and therefore not available on the download page.

In this chapter, we will examine how to work with the SQL Server and BEA WebLogic Management Plug-ins.

Scenario: Management Plug-ins

Linda is responsible for managing many different applications running on a heterogeneous technology stack, including Oracle Database, Oracle Application Server, Microsoft SQL Server and BEA WebLogic. She is already monitoring the Oracle Database and Application Server with Enterprise Manager, and she would also like to incorporate SQL Server and WebLogic into her Grid Control environment. These plug-ins will help Linda seamlessly monitor and manage BEA WebLogic and Microsoft SQL Server with the similar, rich management functionality available for other Oracle products. In addition, the plug-ins also enable Linda to centralize all of the monitoring information in the Grid Control Console, model and view the complete topology of her applications, and perform comprehensive root cause analysis.

Deploying, Adding, and Monitoring a Microsoft SQL Server Management Plug-in

The System Monitoring Plug-in for the Microsoft SQL Server extends Oracle Enterprise Manager Grid Control to add support for managing Microsoft SQL Server instances. By deploying the plug-in within your Grid Control environment, you can monitor SQL Server instances, gather configuration data and track configuration changes for SQL Server instances, raise alerts and violations based on thresholds set

on monitoring and configuration data, and provide comprehensive reports for the user interface based on the gathered data.

Let us see how Linda can download the Microsoft SQL Server Management Plug-in, and deploy and start managing SQL Server instances from the Grid Control console.

To deploy and monitor the Microsoft SQL Server Management Plug-in:

1. Locate and download the Management Plug-in from OTN. The Microsoft SQL Server Management Plug-In can be downloaded from:
http://www.oracle.com/technology/products/oem/extensions/plugin-ms_sql.html
2. After logging in to Enterprise Manager as the super administrator, click **Setup** at the upper-right corner of the Grid Control console and then click **Management Plug-ins** from the panel on the left.

The Management Plug-ins page appears. This page is used to define new Management Plug-ins, to import Management Plug-ins from or export Management Plug-ins to a Management Plug-in Archive, or to deploy a Management Plug-in into your system.

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. The top navigation bar includes 'Home', 'Targets', 'Deployments', and 'Alerts'. Below this, there is a breadcrumb trail: 'Enterprise Manager Configuration | Management Services and Repository | Agents'. A progress indicator shows three steps: 'Select Targets' (active), 'Deployment Verification', and 'Review'. The main content area is titled 'Deploy Management Plug-in: Select Targets'. It displays the following information:

- Name: **microsoft_sqlserver_database**
- Version: **2.0.1.0.0**

Below this information, there is a text block explaining that Management Plug-ins are composed of a set of files that implement a new target type. Below the text, there is a section for 'Deployment Agents' with a table listing two agents:

Agent Name	Agent ID
stmpi2.idc.oracle.com:1830	stmpi2
stmpi7.idc.oracle.com:1838	stmpi7

3. Click **Import** to import the plug-in you just downloaded.
4. Browse to the folder where the plug-in archive file is located and click OK to import it.

The Management Plug-in is extracted from the archive file and imported into the Management Repository, and is ready to be deployed to Management Agents within your Enterprise Manager environment.

5. From the Management Plug-ins page, select your plug-in and click the Deploy icon on that row.

The Deploy Management Plug-in wizard appears.

6. Specify one or more agents that will monitor your target and click **Finish**.

Ensure that your preferred credentials are set on these agents.

7. You now need to specify which SQL Server instances the agent should monitor. Specify a new instance to be monitored by selecting **Microsoft SQL Server** in the Add list on the home page of the agent and clicking **Go**.

8. Specify properties for the SQL Server database and click **OK**.
For more details, refer to the *Microsoft SQL Server Installation Guide*. If you want to test the connection to the database, you can click Test Connection before clicking OK. The newly added target appears in the list of monitored targets on the home page of the agent.
9. Navigate to the SQL Server Plug-in home page.
The Status field tells you whether the target is currently up or down. The Availability field brings up a graph of the target's availability over the past 24 hours. The Alerts section appears if the warning threshold or critical threshold has been exceeded for any of metrics that are being collected.
10. Click the **All Metrics** link under Related Links to view a single, comprehensive list of all the metrics available for the particular target.
You can click on any metric to drill-down to see its history.
11. From the target home page, select the **Reports** tab and click the **View Report** arrow to see a list of the kinds of reports you can generate about the SQL Server instance.
For example, the Microsoft SQLServer Space Usage report displays information about storage space used by various databases managed by Microsoft SQLServer.
12. From the target home page, click the **View Configuration** link under Related Links.
On this page, you can see detailed SQL Server configuration information, including server, database and registry settings. You can also view configuration history, take configuration snapshots, or compare configurations between different SQL Server instances. All configuration changes that occurred since EM started monitoring this SQL Server instance are automatically tracked.

Linda can similarly include non-Oracle products into the monitoring framework of Grid Control.

Adding and Monitoring a BEA WebLogic Management Plug-in

The BEA WebLogic plug-in is shipped with Enterprise Manager Grid Control 10gR2 and therefore not available on the OTN download page.

The BEA WebLogic plug-in enables customers to leverage their investment in Oracle Enterprise Manager to manage BEA WebLogic Servers. This plug-in helps customers seamlessly monitor and manage BEA WebLogic with the similar, rich management functionality available for other Oracle products. Customers can get the full benefit of the service dashboard, system dashboard, and topology views for environments that include BEA WebLogic. This Plug-in offers a complete, cost-effective, and easy-to-use solution for application performance management and BEA WebLogic infrastructure management, by providing unique functionality such as early and automatic identification of performance bottlenecks and aggregated metrics for BEA WebLogic Cluster monitoring.

Application performance management enables application owners to actively monitor end-user performance. BEA WebLogic Management allows administrators to scalably, comprehensively, and cost-effectively manage the BEA WebLogic environments. JMX standard-based monitoring architecture for BEA WebLogic allows comprehensive monitoring of WebLogic components, J2EE applications and user defined metrics in J2EE applications. IT organizations can now integrate the management of the JMX-enabled applications into their environment managed by Oracle Enterprise

Manager, significantly reducing the time spent on monitoring and increasing the speed of resolution.

A BEA WebLogic server domain is the basic unit of administration for your WebLogic platform applications. The basic domain infrastructure consists of one Administration Server and optional managed servers and clusters. Let us look at how Linda can add a BEA WebLogic server domain and its clusters and managed servers, and then monitor them.

To add and monitor a BEA WebLogic managed server:

1. Click **Targets** and then **Application Servers**.

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. The top navigation bar includes 'Home', 'Targets', 'Deployments', 'Alerts', 'Policies', 'Jobs', and 'Reports'. The 'Application Servers' page is active, showing a search bar and a table of application servers. The table has columns for 'Select Name', 'Type', 'Status', and 'Status Details'. The table lists 'All Application Servers', 'Farm101202', and 'Farm101202_Cluster101202'.

Select Name	Type	Status	Status Details
☾ All Application Servers			
☾ Farm101202	Oracle Application Server Farm	n/a	30 (↑30)
☾ Farm101202_Cluster101202	Oracle Application Server Cluster	n/a	8 (↑8)

2. Select **BEA WebLogic Server Domain** from the Add list and click **Go**.

A wizard appears where you can specify details about the BEA WebLogic Administration Server and choose the clusters and managed server to add to Grid Control for central monitoring.

3. From the Application Servers page, click the newly added BEA WebLogic server domain to go to its home page.

You can get a cumulative view about status, alerts, policy violations, jobs, and blackouts across all members of the domain. You can start or stop members of the domain and navigate to members of the domain. In addition to the home page, it also has an Administration tab and a Members tab.

4. Click **Members** and then click a cluster within the BEA WebLogic server domain to go to the cluster home page.

This page is also accessible from the Application Servers home page. The page is similar to the domain home page and provides cumulative information about members in the cluster. It also has a Metrics tab and a J2EE tab. A BEA WebLogic server cluster has a state: it can be up or down. If at least one server within the cluster is up, then the cluster is considered up.

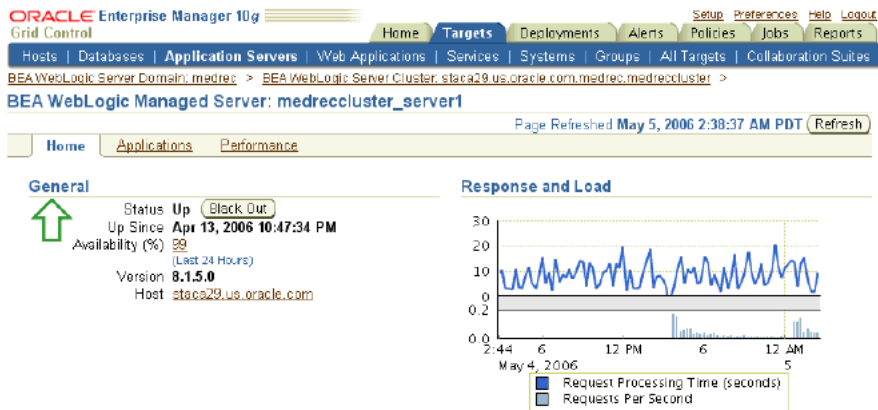
5. Click **J2EE Applications**.

The page displays a list of all J2EE applications deployed to the cluster. If you sort by Application Name, you can easily determine if one server in the cluster is incurring more load or performing less optimally than another. You can drill down to investigate the problem or launch BEA's administration console directly from the Grid Control console to tune the application for better performance.

6. Click a server to see the home page of a BEA WebLogic managed server.

On this page, you can see the status of the server, its version, host, and outstanding alerts. Grid Control monitors over 150 performance metrics for BEA

WebLogic, some of which include resource usage, the number of active sessions, top servlets, top JSPs, and JVM performance metrics.



In addition to the monitoring capabilities that Linda attains by adding BEA WebLogic to Grid Control, she can also leverage additional features by creating a service based on those applications deployed to BEA. For each service created, she can set an expected service level and monitor it, analyze end-user performance statistics as real users log in and navigate the application, monitor performance of previously recorded transactions to discover performance problems before end users do, model and view the complete topology of her application, and perform comprehensive root cause analysis.

Extending Grid Control: Oracle By Example Series

Oracle By Example (OBE) has a series on the *Oracle Enterprise Manager Grid Control Quick Start Guide*.

The *Management Plug-ins* OBE covers the tasks in this chapter with annotated screen shots. It is located at

http://www.oracle.com/technology/obe/obe10gEMR2/Quick_Start/extensibility/extensibility.htm

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