Oracle® Enterprise Manager

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Preface

This manual introduces Oracle Enterprise Manager and describes the concepts required to use the product effectively to manage your Oracle environment.

Note that later versions of this and other Enterprise Manager books may be available on the Oracle Technology Network:

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

Audience

This manual is intended for all users of Oracle Enterprise Manager.

Documentation Accessibility

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Structure

The following preface and chapters discuss in greater detail Enterprise Manager functionality and applications:

What's New in Enterprise Manager 10.2

Presents an overview of the new features in Oracle Enterprise Manager 10g Release 3 (10.2.0.3).

Part I, "General Grid Control Features"

Contains the chapters that describe general features of Grid Control that may apply to any target type.

Chapter 1, "**Introduction**" Introduces, at a high-level, and puts into business-use context the features and benefits of using Enterprise Manager Grid Control.

Chapter 2, "**Setting Up Enterprise Manager**" Explains the options within the Grid Control Setup and Preferences pages, such as roles, privileges, connection settings, and so on.

Chapter 3, "**Licensable Management Options**" Describes the different management packs, plug-ins, and connectors that you can license for Enterprise Manager.

Chapter 4, "**System Monitoring**" Describes how Enterprise Manager monitors the performance and availability of the targets within your Oracle environment.

Chapter 5, **"Group Management"** Describes Enterprise Manager group management functionality.

Chapter 6, "Managing Deployments" Describes how you can use Grid Control to manage all the deployments in your enterprise, including hardware/software configurations, patching, cloning, provisioning, and policy management.

Chapter 7, "**Information Publisher**" Explains report definitions, customizing reports, the elements of a report, and out-of-box reports.

Chapter 8, **"Managing Compliance"** Describes how Enterprise Manager Grid Control verifies that applications in your enterprise comply with preestablished standards.

Chapter 9, **"Job System"** Explains how the Enterprise Manager Job System provides the capacity to automate administrative tasks and synchronize systems.

Chapter 10, **"Extending Enterprise Manager"** Introduces Enterprise Manager framework extensions such as adding new target types or directly accessing information stored in the Management Repository.

Chapter 11, "Managing from Anywhere Using EM2GO" Introduces the mobile management application designed for the Oracle Environment.

Part II, "Managed Targets"

Contains the chapters that describe the Grid Control features for specific target types, such as services, databases, application servers, and more.

Chapter 12, "Service Management" Explains how Enterprise Manager monitors and manages services and Web applications to determine the availability, performance, usage, and overall effectiveness of business implementations.

Chapter 13, "Database Management" Specifies the features Enterprise Manager includes to monitor, manage, administer, and maintain Oracle Databases.

Chapter 14, "Application Server Management" Describes how Enterprise Manager provides an easy way to centrally manage your middle-tier Oracle Application Server environment.

Chapter 15, "**Oracle Collabsuite Management**" Describes the new capabilities for Collaboration Suite management, including service and system monitoring, service topology, monitoring dashboards, and client data collection.

Chapter 16, "**Identity Management**" Describes how you can use Grid Control to manage your Identity Management targets.

Chapter 17, **"Host and Third-Party Target Management"** Describes Grid Control's built-in features for managing host targets, as well as out-of-box third-party targets from non-Oracle vendors such as BEA and IBM.

Chapter 18, **"E-Business Suite Management"** Introduces the Grid Control Plug-in for Oracle Applications, which helps you monitor E-Business Suite components using Grid Control.

Glossary

Provides definitions of terms specific to Enterprise Manager.

Related Documents

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

- Oracle Enterprise Manager Grid Control 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 Policy Reference Manual
- Oracle Enterprise Manager Metric Reference Manual
- Extending Oracle Enterprise Manager
- Oracle Enterprise Manager Command Line Interface
- SNMP Support Reference Guide

The latest versions of this and other Enterprise Manager books 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.

Updated Terminology

In previous versions of Oracle Enterprise Manager, Service Level Management was known as either Application Service Level Management or Application Performance Management.

Conventions

The following text conventions are used in this document:

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

What's New in Enterprise Manager 10.2

Enterprise Manager Grid Control 10g Release 2 (10.2) includes many new features that add to your ability to monitor and manage your enterprise:

Grid Management Features

- System Monitoring: Lights-out, comprehensive monitoring of all components of the Oracle ecosystem. New features include administrator control of metric collection schedules, Corrective Actions that enable automated responses to alerts, enhancements to SQL-based User-Defined Metrics, Monitoring Templates that enable administrators to apply standardized monitoring settings across their enterprise, and a rich set of out-of-box monitoring reports.
- *Compare Monitoring Templates:* See at a glance how metric and policy settings defined in a template differ from those defined on destination targets..
- Bare-Metal Provisioning: Automatically deploy new fully configured systems, including operating systems and software images. Clone existing installations and software images (such as Oracle Cluster Ready Services (CRS), Oracle Real Application Clusters (RAC), and Oracle Application Server).
- Oracle Real Application Clusters Provisioning and Conversion: Automatically configure Oracle RAC database instances to dynamically increase database capacity to meet your needs; convert non-RAC databases to Oracle RAC databases.
- Cloning: Simplify deployment of Oracle solutions by cloning fully patched and tested Oracle homes to multiple hosts; clone database instances to create backups of important databases; create new single-node Oracle RAC by cloning an existing RAC Oracle home.
- Lights-Out Patching: Quickly identify available patches for the components in your enterprise. Find out which have not been applied and which are critical. Bring those components up to the latest patch level with just a few clicks.
- Policy-Based Monitoring: Apply consistent, proactive management practices across your enterprise using policies and management templates.
- Policy Groups: Policy groups are standards by which targets are measured. The rules within a policy group are managed as a set, that is, they are viewed, maintained, evaluated, and reported, in the context of a group. In contrast, policy rules are not evaluated as a set. Policy rules are viewed, maintained, and evaluated as standalone entities. Oracle provides the following policy groups: Secure Configuration for Oracle Database, Secure Configuration for Oracle Real Application Cluster, and Secure Configuration for Oracle Listener.

- Security Assessment: Automatically assess the security vulnerabilities in your enterprise using the Critical Patch Facility, which provides notifications and a direct link to Oracle Support. Enhanced security rules harden the infrastructure database and host. Violation score reporting helps administrators prioritize security operations.
- *Job System:* More powerful, feature-rich job system allows you to schedule and run multi-task jobs across multiple targets, as well as receive notifications.
- Group Management: Enhanced group management features enable administrators to manage many components as one. Group pages roll up critical management information, such as overall status and group status history, open alerts and alert history, open policy violations and policy trend overview charts, and out-of-box group performance charts. Simplifies common administrative tasks, such as running jobs, executing custom SQL or host commands, and scheduling maintenance windows. A group "dashboard" enables proactive monitoring of status and alerts across all group members as they occur.

Service Management Features

- Services: Define services to represent the business functions or applications that run in your enterprise. Measure the performance and availability of these services, receive alerts when there is a problem, identify common issues, and diagnose causes of failures.
- *Service and System Topologies:* Easily define, visualize, and manage key business functions and the assets that they rely upon.
- Service Level Management: Allows you to define service-level goals for availability and performance and more quickly resolve problems through rules, reports, and historical monitoring.
- Dashboards: Offer "at-a-glance" monitoring of all critical indicators for your services and systems.
- Root Cause Analysis: Diagnose service problems quickly using the Root Cause Analysis engine.

Enterprise Reporting Features

- Out-of-Box Reports: Easy-access out-of-box reports for all Oracle components; reports on configuration, performance, service level, and audit.
- *Graphical Report Creation:* Easy-to-use tool to create custom reports.
- Complete Repository Access: Create reports using any data collected and stored in the Management Repository.
- Report Publishing: Proactively deliver specialized management information to users, managers, and executives using out-of-box reports, custom reports, and secure publishing features, with views accessible by any reporting product.

Database Management Features

- Oracle Real Application Clusters Management: Enhanced monitoring of Oracle RAC databases and clusters to include Interconnect monitoring, cluster cache coherency diagnostics, CRS monitoring, a graphical topology view; provision Oracle RAC deployments, convert single instances, and add nodes to existing clusters.
- Transportable Tablespaces: Allows an administrator to move tablespaces between databases.

- *Fast-Start Failover:* Allows Data Guard to rapidly and automatically fail over to the standby database without requiring manual intervention, significantly improving the degree of availability as well as the disaster resilience for the system infrastructure.
- *Restore Points:* Guaranteed recovery of the database to a particular point in time when used with Flashback Database or Flashback Table.
- *Enhanced Backup Management:* Provides a single view of all backups run against the databases in a domain.
- Access Advisor Enhancements: Enhanced to expose more powerful features of the Access Advisor, including template support, tuning of a single statement, journaling, recommendation implementation status, and action implementation status.
- Automatic Segment Advisor: Proactively identifies segments that have significant
 wasted space due to data fragmentation, which are good candidates for Online
 Segment Shrink. You no longer need to run Segment Advisor to determine what
 segments have data fragmentation.
- Online Segment Shrink Enhancements: Extends Online Segment Shrink capability to large object (LOB) segments and index-organized table (IOT) overflow segments. Online Segments Shrink capability is now extended to all types of segments, further reducing the need to perform other more advanced reorganization methods such as Online Redefinition.
- Oracle Streams: Share message information within a database or from one database to another. Control what information is put into a stream, how the stream flows from database to database, what happens to messages in the stream, and how the stream terminates.
- Adaptive Alert Thresholds: Computes statistical alert thresholds using either static (user-defined) or dynamic (self-adjusting) baselines. Dynamic statistical baselines can significantly improve the accuracy of performance alerting, while reducing exposure to the "false positives" commonly incurred under fixed threshold schemes.

Application Server Management Features

- Extended Middle Tier Management: Allows administrators to discover OracleAS Farms, OracleAS Clusters, Oracle HTTP Server High Availability Groups and OC4J High Availability Groups as composite targets and perform management and administration operations on them. Also supports discovery, management, and administration of Oracle BPEL Process Manager targets and Oracle BPEL Processes. Allows creation of infrastructure services and aggregate services. Also allows viewing of partner links associated with a BPEL process and adding of SOAP tests for them to test their availability.
- Log File Rotation Jobs: Supports scheduled rotation of log files of OracleAS components to a default or user-defined location. Allows adding of a log rotation job as part of a multi-task job and saving of this job to the library.
- MQ Series Support: Supports discovery and monitoring of IBM WebSphere MQ Queue Managers and IBM WebSphere MQ Clusters. Also allows monitoring of their logical objects such as Queues and Channels.
- JBoss Application Server Management: Supports discovery, management, and administration of JBoss Application Servers and JBoss Partitions. Also allows refreshing of JBoss Partition membership to reflect the current deployment state.

- Automatic Creation of System and Services: Supports automatic creation of a system and service from a J2EE or Web application after checking for dependencies. Allows creation of a service with a new or existing system based on the dependency mapping available. Also allows update of an existing service and system.
- Configuration Management: Extended configuration management support for OracleAS deployments. Collect, search, track, compare, and report on all OracleAS hardware and software installation configurations. Maintain a central inventory of software configuration data of core components for all OracleAS instances. Also provides this support for BEA WebLogic Managed Server, Apache HTTP Server, and IBM Websphere Application Server deployments.
- *Topology Views:* Provides graphical topology view of AS Farms, Clusters, and ASs, with current status, alerts and policy violations, and performance metrics. View by host, by request routing overview, or request routing details.
- Custom Aggregate Monitoring: Define monitoring criteria for OracleAS Farms and Clusters using customizable aggregate metrics based on the statistical aggregation of individual metrics of cluster members. View aggregate metrics as an overlay of "top best," "top worst," or "peak threshold" values for individual metrics.
- *J2EE Application Monitoring:* Hierarchical J2EE application view at the OracleAS cluster level shows performance across the OC4J instances on which it is deployed. Ability to plug customer application JMX MBeans into Grid Control.
- Backup and Restore: Supports full and incremental online backup of middle tier installations. Automatically recover instances to the last full backup, then apply incremental backups.
- *OPMN Jobs:* Supports immediate or scheduled full process control (start, stop, restart) of OPMN managed components from Grid Control.
- Provisioning "Gold" Images: Save standard reference images of application server targets to the central Software Library and deploy to target locations. Standardize the deployments of the application server targets in your enterprise. Create and extend OracleAS Cluster environments by creating new clusters or adding nodes to existing clusters.
- Cloning: Extended cloning support for different types of middle-tier installations, including WebCache, J2EE and WebCache, Portal and Wireless, Business Intelligence, Forms and Reports Services, and Business Intelligence and Forms.

Collaboration Suite Management Features

- Centralized Management: Single target subtab for Collaboration Suite from which you can view your Collaboration Suite deployment(s) and navigate to specific components.
- *Automatic Discovery:* Collaboration Suite server targets, such as SMTP servers and Calendar servers, are automatically discovered and monitored in Grid Control.
- Service Monitoring: In addition to monitoring server components, Grid Control also monitors Collaboration Suite services from the end-user perspective.
- *Custom Service Modeling:* Fast setup of services using a simple customization user interface.
- *Topology Viewer:* Service topology view of your Collaboration Suite deployment showing relationships between different services in Collaboration Suite.
- *Root Cause Analysis:* Detects the potential root causes of any service outage.

- Dashboards: Services Dashboard for monitoring service availability, performance, usage, and service-level compliance. System Dashboard for monitoring exceptions in your Collaboration Suite system.
- *Client System Analyzer:* Collects Windows client data and checks for minimum Collaboration Suite requirements.

Broader System Coverage

- Host Management: Out-of-box operating system, hardware, and software monitoring of the hosts on which your applications and services reside. Increased coverage for hardware monitoring, process and file-level monitoring, remote command shells, and remote file editing.
- *Linux Host Administration:* Host administration features for RedHat and SuSE Linux provide you the ability to administer the most important host functions easily. Using the centralized console, it is faster and less error prone to set up a server or troubleshoot problems. Operators with the appropriate privileges can set up and administer System Services, for example, start and stop individual services, and Network Setup, for example, NFS client configuration.
- *Enterprise Storage Reports:* Reports on allocation, utilization, roll-ups by location, line of business, application, and vendor.
- *Support for Network Devices and Storage:* Monitor network and storage devices, such as F5 Server Load Balancers and NetApp Filer network storage.
- Support for Non-Oracle Middleware: Support for discovery, performance monitoring, reporting, alerts, process control, and synthetic transactions for third-party application servers and application server clusters, such as IBM WebSphere and BEA WebLogic.
- *External Product Integration:* Integrate external products using command line interface, notifications, and bi-directional messages.
- *E-Business Suite Management:* Plug-in available to enable Grid Control to manage the Oracle Applications Manager, part of the E-Business Suite.

New Management Packs, Plug-ins, and Connectors

In addition to the six management packs available in the previous release, Enterprise Manager 10.2 offers eight new management options: three standalone management packs, five system monitoring plug-ins, and five management connectors.

- New Management Packs:
 - Oracle Service Level Management Pack
 - Oracle Configuration Pack for Non-Oracle Systems
 - Oracle Provisioning Pack
- New Management Plug-ins:
 - System Monitoring Plug-in for Hosts
 - System Monitoring Plug-in for Non-Oracle Databases
 - System Monitoring Plug-in for Non-Oracle Middleware
 - System Monitoring Plug-in for Network Devices
 - System Monitoring Plug-in for Storage
- New Management Connectors:

- Management Connector for NEC Management Platforms
- Management Connector for Hitachi Management Platforms
- Management Connector for Fujitsu Management Platforms
- Management Connector for Microsoft Operations Manager Management Platforms
- Management Connector for Remedy Management Platforms

Part I

General Grid Control Features

This part contains chapters that describe general Grid Control features. These functions and tools are not necessarily specific to any particular target type, and may be used to manage most target types—databases, application servers, a services, hosts, or other managed targets.

Part I contains the following chapters:

- Chapter 1, "Introduction"
- Chapter 2, "Setting Up Enterprise Manager"
- Chapter 3, "Licensable Management Options"
- Chapter 4, "System Monitoring"
- Chapter 5, "Group Management"
- Chapter 6, "Managing Deployments"
- Chapter 7, "Information Publisher"
- Chapter 9, "Job System"
- Chapter 10, "Extending Enterprise Manager"
- Chapter 11, "Managing from Anywhere Using EM2GO"

|

Introduction

The Oracle Grid offers a proven solution that allows businesses to heighten application performance and deliver unparalleled IT infrastructure reliability. Businesses of all sizes attain measurable IT cost savings by extending the availability of computing resources, cultivating more productive and effective administrators, and achieving higher quality of service—all direct benefits of the Oracle Grid. A critical ingredient to achieving the full benefits of the Oracle Grid is employing the right solution for managing the grid systems and, most importantly, the applications that run on those systems.

Oracle Enterprise Manager 10g Grid Control is Oracle's 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 unequaled management for any size Oracle data center.

This chapter provides an overview of Enterprise Manager 10g Grid Control Release 2 (10.2), its rich functionality, and the unique benefits it offers to Oracle customers.

Quality of Service: Bridging the Business with IT Infrastructure

Until recently, business success measurements and IT infrastructure performance were rarely mentioned in the same conversation. Corporations treated the two distinctly—in part because of traditional organization structures—but mostly because existing management tools offered point solutions that only addressed a portion of the larger need. IT management priorities focused primarily on maintaining individual IT systems performance, largely disconnected from real business objectives and needs. Now companies realize that in order to manage bottom line profits and differentiate the quality of service they offer, they must gain insight into how businesses are affected by IT performance. This requirement has mandated innovation in management solutions, where tools must go beyond discrete systems management to focus on delivering application availability and performance levels that align with business priorities. Few management solutions—because of their limited view of the application and its life cycle—are up to the task.

Extended Application Server Management

Oracle Enterprise Manager 10g Grid Control, a critical element of the Oracle Grid platform, manages service level performance from a business perspective. By leveraging its "best-of-breed" system monitoring solution—including out-of-box support for databases, application servers, hosts, firewalls, load balancers, and storage—it provides a top-down approach to managing applications. This solution is unique because of its deep system-specific coverage and the range of applications supported. No other solution offers the same level of depth, integration, and precision for Oracle customers.New functionality in Grid Control Release 2 extends the Release 1 application service level management solution with rich graphical modeling and monitoring, crisp and workflow-driven dashboards, and root-cause diagnostics, which take administrators from an end-user application availability issue through the entire application stack to pinpoint the offending IT infrastructure component. Additionally, complementary functionality allows administrators to quickly identify and triage impacted applications when low-level system issues surface.

Using the new features available in Grid Control Release 2, administrators can model and relate system components within the IT infrastructure that provide the backbone for service offerings. Leveraging these system components, they can define applications, or services, that depend upon those systems, and select business transactions that are measured to determine availability and performance of those services. Grid Control supports over 20 different transaction protocols, including custom scripts, dramatically extending the breadth of coverage to meet the application monitoring needs of nearly every environment.

Using Grid Control's graphical monitoring dashboards, administrators, managers, and business owners gain real-time understanding of the status of the business's most important services in a single view. Monitoring dashboards provide top-level views of individual or groups of services, as well as system-level views describing the relationships and status of IT system components. Brought together with newly introduced root-cause availability management capabilities, dashboards dramatically reduce the time it takes to resolve issues that directly impact performance. Service and system "dashboards" are available out-of-box for Oracle packaged applications, such as the Oracle Collaboration Suite—and for the upcoming releases of Oracle Applications and Fusion.



Grid Control							Help
Services Dashboard			Page Refi	reshed On Oct 9, 20	005 2:56:22 AM PD	т	Refresh
Service	Status	Performance	Usage	Components	Service Level Last 24 Hours	Last 7 Days	Last 31 Days
sl_service1	♣	300148.00 Active Pages 86.64 CPU Idle Time (%) 1.00 Status	89.28 CPU Utilization (%) 5.00 CPU in I/O Wait (%) 1.80 Memory Usage (%)	1 down 9 up	100.00%	53.38%	53.38%
Internet Directory Service 1	Ŷ	5.32 LDAP Average B	No Data Active Data Ba No Data Directory Oper No Data Server Load	1 up	100.00%	100.00%	100.00%
PetStore Webapp	Ŷ	0.00 DNS Time (ms) 48.69 CPU Idle Time (%)	58.95 Memory Utilization (2 up	100.00%	100.00%	100.00%

Lowering Management Costs Through the Grid

The number of systems and diversity of services in the Grid can be small or quite large. Historically, the cost of managing large sets of systems has increased linearly, or more, with each new system added to the enterprise. It's simply not possible to maintain management costs in the Grid environment with traditional management solutions that do not scale. The fundamental value proposition of Grid Control is to maintain management costs at a flat or near flat rate as the number of managed systems increases. There are a number of things that make this possible.

Knowing What You Have and What You Are Running

For years, IT departments have relied upon the knowledge of key individuals who manually installed, configured, and maintained the systems running throughout an enterprise. Keeping systems up and running was often a finely-tuned recipe book of details written in a language only those closely involved could understand. Yet, as distributed systems evolved and service architectures became more complex and heterogeneous, manual solutions were no longer viable from a cost-effective standpoint—and more pressingly, from a quality of service standpoint. Administrators are now responsible for far more systems, and the relationships between those systems are much too complicated to track manually. Firewalls, switches, load-balancers, application servers, databases, and clusters are all distributed and connected through complex rules that demand reliable, automated configuration management.

Grid Control's configuration management solution is designed to eliminate the costs and errors that plague traditional manual configuration management solutions. Grid Control centrally tracks hardware, software installation (including patch levels), and software configuration data for every service and system that it manages. This detailed information is regularly and automatically collected and updated as changes occur. Central storage of enterprise configuration information lays the foundation for defining, deploying, auditing, enforcing, and maintaining the systems throughout the Grid.

Certified Configurations: Bringing Harmony to an Ever-Changing Data Center

IT professionals will agree—the fewer variations in the types of systems deployed and the configurations used to deploy them, the easier systems are to manage and the more reliable they will be. That said, it is impossible to expect, even with the most mature business practices, that all systems can follow the same standards of deployment. Using a robust configuration management solution, administrators can rely upon automated tools to ensure that all systems deployed follow specified practices and rules. This way, only pre-tested, pre-certified configurations can enter the production "food chain" of a busy data center.

Grid Control allows administrators to define rules (or policies)—most of which are available out-of-box—that are responsible for governing the configuration of all the systems and software running across the enterprise. And because the natural configuration life cycle of any system means it will be changed—through installation of patches, adding files and directories, changing ports, editing its dependencies, and so on—once a system is rolled out, Grid Control continually audits it against its predefined policies. All changes are tracked so that administrators know when they are happening, who is making them, what changes are acceptable, and what changes must be corrected. This level of security and compliance through proactive auditing and enforcement is necessary to keep harmony in the continual flux that defines most data centers. It is also critical to maintaining order and meeting compliance standards as new systems are brought on line, existing systems are upgraded, or patches are applied.

Error-Free Automated Provisioning: Linux, Oracle RAC, Certified Images, Patches, Upgrades

Systems administrators can spend up to 25% of their time installing and configuring new software. Using Grid Control's automated provisioning tools, businesses can reduce the time spent deploying new software by up to 90%. Grid Control allows administrators to store base images in a central library—pre-configured and

certified—from which new deployments can be based. Newly available with Release 2, administrators are able to deploy fully configured Linux systems from bare metal. These systems can be deployed with any desired software configuration, certified to the appropriate version and patch level—all with a few simple clicks. This capability is extraordinarily powerful for Oracle Real Application Clusters (RAC) and application cluster environments where adding capacity can be done quickly and without errors. Specific capabilities designed for Oracle RAC and cluster systems, minimizing the number of steps and complexities involved, are available with Release 2.



GracLe Enterprise Manager 10g	Home Targets Deployments Alerts Policies Jobs Reports
General Provisioning	
Source Home Source Settings Product Settings Destination	ns Pre/Post Scripts Schedule More
Clone Oracle Home: Product Settings	
Product Oracle Database 10g 10.2.0.1.0 Source Host stacd29.us.oracle.com Source Home Location /private/oraclehomes/db10.2	Cancel) (Back Step 3 of 7 Next)
Cluster Cloning Modes	
\overline{A} clustered home may be cloned to either form a new cluster or to extend the source cluster. If extending t the same as the source.	he source cluster, the Oracle home location and Oracle home name will be taken to be
O Clone to a new cluster	
New Oracle Home Location /private/oraclehomes/db10	
New Oracle Home Name OraDb10g_home1	
Extend the source cluster	
Member Nodes stang07, stacd12	
Destination Node Specification	
Enter the destination hosts and the respective node names.	
Host	Public Node Name
stang05.us.oracle.com 🕺	stang05
Add Another Row	
TIP Node name is usually the short hostname of the machine.	
	Cancel) (Back Step 3 of 7 Next)
<u>Home</u> <u>Targets</u> <u>Deployments</u> <u>Alerts</u> <u>Policies</u> <u>Jobs</u> <u>Re</u>	ports Setup Preferences Help Logout

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Patch Management

Historically, managing the patches for any IT environment has been extremely tedious and difficult to control. In a Grid environment, where the number of systems and changes to those systems is widespread, manual patch management can become a full-time, often unproductive, job.

Using a direct link to Oracle, Grid Control proactively and regularly queries Oracle*MetaLink* for critical patches that have been released and notifies administrators through advisories of patches that should be applied. By correlating the available patches with the specific systems and software running on a particular site, administrators are notified of only applicable patches. When querying MetaLink directly, patches can be found either in the context of a specific target or, if desired, the administrator can query for a specific patch. Once the necessary patch is located, Grid Control can download and deploy it. Optionally, Grid Control can execute an end-user provided script to install the patch to all systems that require it. Each of these steps allows for quicker application of patches across the customer's enterprise. Grid Control extends this valuable patch management functionality to include support for OS patches—a critical component of systems maintenance and the biggest impediment preventing the installation of important software for system repair.

ORAC Grid Con	L€ Enterprise Ma trol	nager 10 <i>g</i>					Home	argets Deployments Alerts	Setup Preferences Help Policies Jobs Re	2 Logout
Genera	I Provisioning								,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Potob: 0	Colort Potob			Select Patc	h Select Destination Set Credent	ials Stage	or Apply Schedule	Summary		
Paten. a	Select Fatch								(Cancel) Step 1 o	of 6 Next
To look up Next.	patches at OracleA	MetaLink, ente	er search	criteria and click Se	arch. This may take a few moments	depending on	the number of matche	s found. From Search Results, sel	ect the patch to be applied	i and clici
Searc	h by Criteria								Search bu	Alumbar
		Product Fa	mily Or	acle Database	•				Search by	Number
		Pro	duct an	Y						
		Rele	ease an	У						
			(Fin	d patches matching the	release, and the most recent patchset for th	e release.)				
		Patch	form Sc	atchsets 💌	tom (SBABC 22 kit)					
		Fiat	(if y	ou run a 32-bit Oracle p	roduct on a 64-bit operating system, choose	a 32-bit platform	m.)			
		Langu	Jage Ar	1y	•					
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		End I	Date 🗌	ample: 12/10/02)						
			(Exe	ample: 12/15/02)						
					(Search) (Clear)					
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Viev	v Details) (View Re	adMe)						Sector Previous Sector Sect	ious 10 121-129 of 129 💌	Next 🛇
Selec	Patch Number (Created On	Type	Product	Platform	Release Or	terim Patch Applicab n	Description		Status
	4205997	Feb 25,	Patchset	Workspace	Generic Platform	10.1.0.3		WORKSPACE MANAGER RE	LEASE 10.1.0.5.0	available
0	4205000	2005 Eeb 25	Detabase	Manager	Consula Distform	0.000		PATCHSET WORKSPACE MANAGER RE	1 EASE 9 2 0 5 0	
	4205996	2005	Patchsei	Manager	Generic Platform	9.2.0.6		PATCHSET	EE/16E 0.2.0.0.0	available
0	<u>4449379</u>	Jun 29, 2005	Patchset	HTML DB	Generic Platform	10.1.0.3		PATCH SET FOR HTML DB (P 1.6.1.00.03)	ATCH SET VERSION	available
0	4469554	Jul 1, 2005	Patchset	Workspace Manager	Generic Platform	9.0.1.5		WORKSPACE MANAGER RE PATCHSET	LEASE 9.0.1.6.1	available
0	<u>4469558</u>	Jul 1, 2005	Patchset	Workspace Manager	Generic Platform	9.2.0.5		WORKSPACE MANAGER RE PATCHSET	LEASE 9.2.0.5.1	available
0	4469559	Jul 1, 2005	Patchset	Workspace Manager	Generic Platform	10.1.0.4		WORKSPACE MANAGER RE PATCHSET	LEASE 10.1.0.5.1	available
0	<u>765363</u>	Jun 8, 2002	Patchset	t Oracle Text	Solaris Operating System (SPARC 32-bit)	8.1.5.1		8.1.5.1:Oracle Context patchse	t for server version 8.1.5.1	available
0	<u>953969</u>	Jun 8, 2002	Patchset	Oracle Text	Solaris Operating System (SPARC 32-bit)	8.1.7.0		8.1.7.0:Intermedia Text Patchs	et 8.1.7.0.1	available
0	<u>969660</u>	Jun 8, 2002	Patchset	t Oracle Text	Solaris Operating System (SPARC 32-bit)	8.1.6.0		8.1.6.0:Oracle interMedia Patc	h Set release 8.1.6.0.1	available
									(Cancel) Step 1 of	if 6 Ne <u>x</u> t

Figure 1–3 Searching for Patches in the Context of a Specific Target

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

Using Grid Control to find, download, and deploy patches increases an administrator's efficiency by automating mundane, repetitive, day-to-day maintenance tasks as much as possible, allowing them more time for proactive systems work.

Management for the Complete Oracle Grid Environment

While Enterprise Manager 10g Grid Control provides the richest, most comprehensive management for Oracle products, it is also clear that there is no such thing as an Oracle-only environment. Customers have a wide variety of platforms, hardware, network, storage, and software components delivering critical functionality to the Oracle Grid, and they look for a single tool to monitor and manage this environment. With the latest release of Grid Control, there are two complementary initiatives that target extending the solution so customers can better leverage existing investments:

- Extending Grid Control's scope through native management extensions, and partner and custom plug-ins.
- Developing valuable integration solutions with existing management solutions to allow customers to leverage these investments without losing the unique value they gain from Grid Control.

Extensions and Management Plug-ins

With Release 2, Grid Control dramatically broadens the reach of its management solution. New extensions and plug-ins enable customers to leverage their investment in Grid Control to manage all the pieces of the application solution in a vendor-neutral way-components such as firewalls, server load balancers, and non-Oracle databases and application servers. For instance, with Release 2, customers running BEA WebLogic or IBM WebSphere will be able to seamlessly monitor and manage these system components with the similar, rich management functionality available for Oracle products. Grid Control also includes extensions of the core Grid Control product for F5 server load balancers and NetApp Filers. Over the coming months, many more extensions will be generally released and available as easy-to-implement plug-ins to Release 2. These plug-ins will be both Oracle-developed (e.g., Checkpoint firewall, SQL Server, and others) and developed in partnership by third-party vendors, with support and validation by Oracle to provide a single console for primary monitoring and management of the Oracle Grid. In addition to the management plug-ins available out-of-box, Grid Control offers an open Command Line Interface and illustrative examples for easily adding new targets and customizing management solutions for customer-specific environments. This extended breadth of coverage gives customers the ability to use Grid Control for central management of their complete environment.

ORACLE Enterprise Manager 10g	Hon	ne Targets	Deployment	s Alert	Setup Preferences Help Loquut s Policies Jobs Reports
Collaboration Suites Hosts Databases Application Servers Web Applications Servi	ces Systems	Groups All Ta	argets		
BEA WebLogic Server Domain: medrecdomain >					
BEA WebLogic Server Cluster: stado65.us.oracle.com.medrecdomain.MedR	ecCluster				
		Data F	Retrieved Oct 9), 2005 3:4	0:41 AM PDT Launch Dashboard
Home Metrics Administration Members J2EE Applications					
Status	Alerts				
Status History					Alert History
Status Up	Severity	Current	Last 24	hours	
Members 2 (1) 2)	×	0		0	
Up Since Oct 7, 2005 4:45:41 AM	4	0		0	
Availability (%) <u>100.00</u> (Last 24 Hours)	Total	0		0	
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	Severity	Current	Cleared	New	Distinct Rules Violated
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	4	U	U	U	U
	Tatal	U	U	U	0
	TULAI	U	U	U	0
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Related Links					
Access Administer WebLogic Server Dom Target Properties	ain	Re	<u>ports</u>		
<u>Home</u> <u>Targets</u> <u>Deployments</u> <u>Alerts</u> <u>Policies</u> <u>Jo</u>	ibs <u>Reports</u> <u>S</u>	Getup Preferen	ces <u>Help</u>	Logout	
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Figure 1–4 Monitoring BEA WebLogic Application Server Cluster

Corporation of the construction of the constru

Oracle Integrated Management Partnerships

In addition to extending the direct reach of Grid Control, bi-directional integration support for other leading management solutions is a key priority. Customers who have invested in non-Oracle management solutions derive increased value from Oracle's integration efforts. Direct integration between Grid Control Release 2 and products by HP, Micromuse, and EMC SMARTS are currently supported. As an example, the integration between HP OpenView Operations and Grid Control provides both depth and breadth of management capabilities based on a common view of management data. This new level of integration allows customers to seamlessly leverage Oracle's strength in database, application server, and applications management and HP OpenView's strength in host and network management.

Other complementary partnerships designed to deliver unique capabilities to Oracle customers (including storage management and the ability to dynamically flex data center capacity) are underway and will be announced shortly.

Conclusion

Grid computing is poised to revolutionize the economics of delivering applications and services across the enterprise. Enterprise Manager 10g Grid Control Release 2 allows customers to deliver heightened application performance and realize dramatic savings in IT administration and maintenance costs. Enterprise Manager's robust service level management functionality brings together business priorities with IT application performance requirements in ways it never has before. Rich configuration management and provisioning functionality eliminate the error-prone, manual tactics that plague most data centers and drive up the overall cost of management. In a time when administration resources are at a premium, and businesses are forced to tightly control IT spending budgets, Enterprise Manager 10g is a must-have tool for small and large enterprises that want to make the Grid a reality for their IT department.

Setting Up Enterprise Manager

Before you begin using Enterprise Manager, establish standard administrative settings in the Setup and Privileges pages, such as roles, notifications, passwords, templates, plug-ins, and more. These settings will help you manage user administration, communication, notification, standard actions and access, and security.

This chapter contains the following sections:

- Grid Control Setup
- Grid Control Preferences

Grid Control Setup

The Grid Control Setup area allows you to configure the following:

- Roles
- Administrators
- Notification Methods
- Patching Setup
- Blackouts
- Registration Passwords
- Management Pack Access
- Monitoring Templates
- Corrective Action Library
- Management Plug-ins
- Client System Analyzer in Grid Control

ORACLE Enterpris	se Manager 10 <i>g</i> Home Targets Deployments Alerts Policies Jobs Reports
Enterprise Manager	Configuration Management Services and Repository Agents
Overview of Setup	Overview of Setup Setup allows you to access general Enterprise Manager configuration and system monitoring functions. Depending on the system and target privileges that have been granted, you can access setup functions for the following administrative area(s):
Roles Administrators Notification Methods	Enterprise Manager Con∯guration: lets you perform administrative operations such as adding new Administrators, managing Monitoring Templates, and establishing Blackouts. Your administrator privileges determine which configuration operations are displayed. See <u>Introduction to Setting Up Enterprise Manager</u> for more information.
Patching Setup Blackouts Registration	Management Services and Repository: lets you monitor system performance and access diagnostic information for the Oracle Management Services and Management Repository. You can view:
Passwords Management Pack Access Monitoring	 The overall health of Enterprise Manager. The status and performance of the Repository DBMS Jobs that handle Enterprise Manager's maintenance and monitoring functionality. The health and configuration of all Management Services.
Templates Corrective Action Library	 Performance errors for the DBMS jobs and Management Service components (Repository Metrics). See <u>Monitoring The Management System</u> for more information.
<u>Management Plug-</u> ins	Agents: lets you view general configuration, status, and performance information of the Oracle Management Agents that have been installed and configured for managed hosts. See <u>About Oracle Management Agents</u> for more information.
<u>Client System</u> Analyzer in Grid <u>Control</u>	Only Super Administrators can access Setup functions for all administrative areas.
	Home Targets Deployments Alerts Policies Jobs Reports Setup Preferences Help Logout

Figure 2–1 Grid Control's Overview of Setup Page

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Roles

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

Creating roles is an easy way to grant a predefined set of privileges to a group of administrators. If you change a role, the changes are automatically propagated to all administrators who are assigned that role.

Roles can be based on:

- Geographic location. For example, you can define a role for UK administrators to manage UK systems.
- Line of business. For example, you can define a role for administrators of the human resource systems.
- Any other IT model.

Administrators

Administrators are database users defined in the Management Repository who can log in to Enterprise Manager to perform management tasks. The breadth of management tasks available in Enterprise Manager depends on the privileges and roles assigned to the administrators.

There are two types of accounts:

Super Administrator Account

Administrator Account

Super Administrator Account

Enterprise Manager is installed with a default super administrator account named SYSMAN. During the installation, you are prompted provide a password for SYSMAN. You use the SYSMAN account for the initial login to Enterprise Manager. The super administrator account cannot be deleted or renamed.

The super administrator account can manage all other administrator accounts and set up all administrator credentials. The super administrator can:

- Create Enterprise Manager privileges and roles
- Perform the initial setup of Enterprise Manager, for example, defining e-mail configurations and defining global notifications rules
- Add targets to Enterprise Manager
- Perform any action on any target in the system

Oracle recommends that you create an administrator account for each individual user. The super administrator account should not be used to conduct daily administration tasks.

Administrator Account

Administrator accounts provide users permission to perform administrative tasks and access administrative information. You can set up each administrator account to have its own:

- E-mail address
- Notification rules
- Privileges
- Role, or set of privileges

See Also: "About Administrators and Roles" in the Enterprise Manager online help

Notification Methods

Notification Methods allow you to define different mechanisms for sending notifications. These include e-mail, SNMP traps, or running custom scripts—or all three. Once defined, these methods can then be used with Notification Rules for sending notifications to administrators as a result of alert occurrences.

See Also: "Notifications" in Chapter 4, "System Monitoring"

Patching Setup

On the Patching Setup page, specify parameters that allow you to configure and use Grid Control's patching features. These features simplify the staging and application of Oracle patches and patch sets to any host on which the Oracle Management Agent is running. They also allow you to collect information about Oracle critical patch advisories that are relevant to your enterprise.

You can use this page to set your *MetaLink* credentials, set patch cache size, turn on patch set validation, configure proxy and connection details, as well as offline patching settings.

See Also: "Patching" in Chapter 6, "Managing Deployments"

Blackouts

Blackouts allow Enterprise Manager administrators to suspend any data collection activity on one or more monitored targets, thus allowing Enterprise Manager administrators to perform scheduled maintenance on targets. For example, you can stop data collections during periods where a managed target is undergoing routine maintenance, such as a database backup or hardware upgrade. If you continue monitoring during these periods, the collected data will show trends and other monitoring information that are not the result of normal day-to-day operations. To get a more accurate, long-term picture of a target's performance, you can use blackouts to exclude these special-case situations from data analysis.

A blackout can be defined for individual target(s), a group of multiple targets that reside on different hosts, or for all targets on a host. The blackout can be scheduled to run immediately or in the future, and to run indefinitely or stop after a specific duration. Blackouts can be created on an as-needed basis, or scheduled to run at regular intervals. If, during the maintenance period, the administrator discovers that he needs more (or less) time to complete his maintenance tasks, he can easily extend (or stop) the blackout that is currently in effect.

See Also: "Blackouts" in Chapter 4, "System Monitoring"

Registration Passwords

Set registration passwords to secure Management Agents against any Management Service that uses the central Management Repository.

When defining registration passwords, you may specify an expire date after which the password will be invalid, or you may specify that the password can only be used one time, after which it is deleted automatically from the repository.

Management Pack Access

Oracle offers a number of management options, or "Management Packs," that bring together a set of technologies related to a specific area of Enterprise Manager.

Each pack has several premium features bundled as part of that pack. Having a pack licensed or unlicensed on a target has a very significant impact on the user experience because the corresponding links, which need the pack, are enabled or disabled accordingly.

See Also: Chapter 3, "Licensable Management Options"

Monitoring Templates

Monitoring templates simplify the task of setting up monitoring for large numbers of targets by allowing administrators to specify the monitoring settings once, then apply them as often as needed. You can create, edit, and save a monitoring template that contains your enterprise's standards for monitoring—metrics, thresholds, corrective actions and/or policy rules. Once defined, you can propagate these standards by applying the template to managed targets.

See Also: "Monitoring Templates" in Chapter 4, "System Monitoring"
Corrective Action Library

Corrective Actions allow administrators to specify automated responses to alerts or policy violations. Corrective Actions ensure that routine responses to alerts or policy violations are automatically executed, thereby saving administrator time and ensuring problems are dealt with before they noticeably impact end users.

Corrective actions share many features in common with the Job System. By default, the corrective action will run on the target on which the alert or policy violation has triggered. Alternatively, a corrective action can be specified to contain multiple tasks, with each task running on a different target. Administrators can also receive notifications for the success or failure of corrective actions.

Use this page to display and manage corrective actions. The library allows administrators to re-use library corrective actions that have been created.

See Also: "Defining Corrective Actions" in Chapter 8, "Managing Compliance"

Management Plug-ins

A Management Plug-in is a target type provided by the user or a third party to extend Enterprise Manager's set of predefined target types. This page is used to define new Management Plug-ins, 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 Tool Center is the central access point for all of the functionality available to you to operate on your Management Plug-ins. Any Management Plug-ins that have been imported into the Management Repository are listed on this page. Certain operations allow you to operate on multiple Management Plug-ins simultaneously (delete and export); some operations only allow you to operate on a single Management Plug-in at a time (deploy and undeploy); and import allows you to add Management Plug-ins to the table on this page. You also can search through the Management Plug-ins using the search criteria at the top of the page.

See Also: "Developing Management Plug-ins" in Chapter 10, "Extending Enterprise Manager"

Client System Analyzer in Grid Control

The Client System Analyzer (CSA) allows Web server administrators to collect and analyze end-user client data. End-users can directly access CSA or may be redirected to it from other applications.

An instance of the Client System Analyzer application is pre-installed with Grid Control. The application is run by the Oracle Management Services' web servers. It can be used to collect client information for any system that can reach the Oracle Management Services URLs. This option allows administrators to collect client data without setting up a separate web application.

See Also: "Client Configurations" in Chapter 6, "Managing Deployments"

Grid Control Preferences

The Grid Control Preferences area allows you to set options for the following:

General

- Preferred Credentials
- Notification
- Target Subtabs

General

You can specify one or more e-mail addresses and associated message formats for your Enterprise Manager account.

Specify the e-mail addresses and message formats you want associated with your Enterprise Manager account. All e-mail notifications you receive from Enterprise Manager will be sent to the e-mail addresses you specify.

Preferred Credentials

Preferred credentials simplify access to managed targets by storing target login credentials in the Management Repository. With preferred credentials set, users can access an Enterprise Manager target that recognizes those credentials without being prompted to log into the target. Preferred credentials are set on a per user basis, thus ensuring the security of the managed enterprise environment.

The Preferred Credentials page provides 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 listed in the Preferred Credentials table. Each row of the table provides a credential summary for each target. Targets are organized according to target type.

Notification

From Preferences, you can set up notification rules and the schedule.

Notification Rules

If you want to define a target or set of targets, the target availability states for which you would like to receive notifications, the metrics you want to monitor for thresholds, the policies you want to monitor for thresholds, the job status changes you want to monitor, and the notification action you want to take when a threshold is exceeded or a job's status changes, click the **Create** button.

Use the Notification Rules page to create, view, or edit notification rules. You can choose the targets and conditions for which you want to receive notifications from Enterprise Manager. The methods for sending notifications include e-mail, SNMP traps, running custom scripts, PL/SQL procedures, or all four.

See Also: "Notifications" in Chapter 4, "System Monitoring"

Notification Schedule

Use the notification schedule page to select a user for which a notification schedule needs to be set. An e-mail address must be defined for the administrator prior to defining a notification schedule. For each administrator for which a notification schedule has been specified, all specifics pertaining to their schedule are displayed.

See Also: "Notifications" in Chapter 4, "System Monitoring"

Target Subtabs

Use the Target Subtabs page to select and order the categories subtabs that appear within the Targets tab. The categories you create appear as subtabs under the Targets page.

Licensable Management Options

In addition to the six management packs available in the previous release, Enterprise Manager 10.2 offers eight new management options: three new standalone management packs and five types of system monitoring plug-ins. This chapter describes these management options in the following sections:

- Oracle Management Packs
- Application Management Packs
- Oracle Linux Management Pack
- Oracle Management Plug-ins
- Oracle Management Connectors

Oracle Management Packs

Oracle offers several "Management Packs" that bring together a set of technologies related to a specific area of Enterprise Manager. Each pack has several premium features bundled as part of that pack.

You can grant and revoke access to packs for various databases and application servers in your Enterprise Manager repository by using the Management Pack Access option available from Grid Control's Setup page. When you enable/disable access to a pack, the corresponding features and functions are enabled/disabled. The ability to modify this Management Pack Access functionality is available only to Super Administrators.

When one or more packs on a target monitored by Enterprise Manager are not licensed, access to premium functionality for that target is disabled. For example, the **Black Out** button located on a target's home page, which you can use to move the target to the blackout state, is enabled when the Oracle Diagnostics Pack or the Oracle Diagnostics Pack for Application Server is licensed for that target.

To determine the packs used by the current page and to know what packs need to be licensed for any link on this page to be enabled, click the show/hide icon located in the footer of any Enterprise Manager Grid Control page. Enterprise Manager displays this information for all pages the user navigates to during that session.

This section includes descriptions for the following types of management packs:

- Oracle Database Management Packs
- Oracle Application Server Management Packs
- Oracle Standalone Management Packs

Oracle Database Management Packs

Enterprise Manager offers four database management packs.

- Oracle Diagnostics Pack
- Oracle Tuning Pack
- Oracle Configuration Management Pack for Database
- Oracle Change Management Pack

Oracle Diagnostics Pack

Oracle Diagnostics Pack 10g for the database offers a complete, cost-effective, and easy-to- use solution for managing the performance of Oracle Database environments by providing unique functionality such as automatic identification of performance bottlenecks, guided problem resolution, and comprehensive system monitoring.

Feature	Benefit
Automatic Workload Repository (AWR)	Provides Oracle Database 10g built-in, automatic capture of statistics data to be used for real-time and historical performance analysis. Snapshot data, active session history data, and workload reports are part of AWR.
Performance Monitoring and Diagnostics	Measures performance and diagnoses poor performance with associated drill-downs on the Performance page. This includes historical analysis and alert threshold integration.
Automatic Database Diagnostic Monitor (ADDM)	Provides Oracle Database 10g built-in functionality for out-of-the-box automatic performance analysis based on AWR data.
Operating System Monitoring	Monitors the operating system and hardware in the drill-downs from Grid Control host monitoring pages.
Adaptive Metric Thresholds	Captures "baselines" of workload performance metrics during "normal" performance and compares against the same metrics during poor performance to diagnose the causes.
	Sets adaptive thresholds using a pre-defined baseline to accurately detect alert conditions when a system has predictably varying workloads.
Advanced Alert Management	Includes notification methods, rules, and schedules, metric history and associated drill-downs, ability to set blackouts, associate corrective actions with an alert, user-defined metrics, monitoring templates, adaptive metric thresholds, setting metric baselines, and Memory Access Mode.
Memory Access Mode	For slow or hung systems, retrieves performance statistics directly from the Shared Global Area (SGA), which avoids the computation associated with parsing and executing SQL statements. This remediates severe cases of library cache contention that can prevent the instance from being monitored in SQL Mode.

Table 3–1 Feature Highlights of Diagnostics Pack

Note: A management pack license is required to use the functionality above with command-line APIs or through Enterprise Manager.

Generation of alerts (via Enterprise Manager or directly by the server in Oracle 10*g*) is not part of this pack; it is free with the database.

Oracle Tuning Pack

Oracle Tuning Pack 10g offers a set of groundbreaking technologies that automate the application tuning process, thereby significantly lowering database management costs while enhancing performance and reliability. This significantly improves resource utilization and ensures best application performance without manual intervention.

Table 3–2 Feature Highlights of Tuning Pack

Feature	Benefit
SQL Tuning Advisor	Includes the ability to analyze SQL statements and make recommendations for better execution, such as applying SQL Profiles or recommending rewriting of the SQL.
SQL Access Advisor	Recommends schema changes needed to improve database performance; for example, creation of new indexes and materialized views.
Reorganize Objects	Provides the Schema Object Reorganization wizard to reorganize database objects.
SQL Tuning Sets	A SQL Tuning Set (STS) is a database object that captures and manages SQL workloads. It includes one or more SQL statements along with associated execution context (that is, user schema, list of bind values, and so forth) and execution statistics (that is, elapsed time, CPU time, and so forth).

Note: A management pack license is required to use the functionality above with command-line APIs or through Enterprise Manager.

Oracle Tuning Pack 10g requires an Oracle Diagnostics Pack 10g license. Therefore, customers interested in using any of the Oracle Tuning Pack 10g functionality must license both of these packs.

Oracle Configuration Management Pack for Database

This pack automates the time-consuming, costly, and often error-prone process of software configuration, software and hardware inventory tracking, patching, and policy management, ensuring consistency across deployments.

Feature	Benefit
Configuration Management	Provides hardware and software configuration data collection, search, comparison, and analytical reporting.
Patching	Includes Critical Patch Advisories, which alert you to critical patches that need to be applied.
Policy and Security Management	 Ensures consistency of deployments, system security, and adherence to operation standards.
	 Includes policy violation notifications and Enterprise Security Advisor.

 Table 3–3
 Feature Highlights of Configuration Management Pack for Database

Feature	Benefit
Policy Groups	Provides structured collection of security configuration rules against which targets can be measured or judged. This release provides the following out-of-box policy groups:
	 Secure configuration for the Oracle Database
	 Secure configuration for the Oracle Listener
	 Secure configuration for Oracle Real Application Clusters
	This feature is accessible from the Policy Group sub-tab under the Compliance tab.

 Table 3–3 (Cont.) Feature Highlights of Configuration Management Pack for Database

Oracle Change Management Pack

This pack enables database administrators to evaluate, plan for, and implement database schema changes to support new application requirements without error and data loss while minimizing downtime. Enables rapid response to new requirements, significantly improves the implementation of complex changes, and ensures that application code is synchronized with detailed baselines.

 Table 3–4
 Feature Highlights of Change Management Pack

Feature	Benefit
Baselines	Captures database and schema definitions.
Comparisons	Compares baseline with database, or database with database, schema with schema.
Synchronization	Propagates database objects with or without data, and updates database object definitions.

Oracle Application Server Management Packs

Enterprise Manager offers two application server management packs:

- Oracle Diagnostics Pack for Application Server
- Oracle Configuration Management Pack for Application Server

Oracle Diagnostics Pack for Application Server

This pack ensures high availability of mission-critical applications by reducing the complex tasks of diagnosing and correcting application performance problems, lowering the costs of managing web-based applications spanning multiple systems.

Table 3–5 Feature Highlights of Diagnostics Pack for Application Server

Feature	Benefit
Transaction Tracing Diagnostics	 Interactively traces transactions through all three tiers: client, mid-tier, and database.
	 Provides detailed traces of network, JSP, EJB, and JDBC/SQL calls.
Historical Performance Analysis	 Provides transaction performance.
	 Provides end-user page performance.

Feature	Benefit
Page Performance Diagnostics	 Provides a complete URL call processing stack.
	 Provides drill-downs to JSP, servlet, EJB method to SQL code.
	 Correlates middle-tier performance to application component metrics.
Complete Application Server Monitoring	 Provides historical monitoring and availability for all Application Server components.
	 Provides "top" views (for example, "Top JSPs," "Top EJBs," an so forth).
Advanced Alert Management	Provides notification methods, rules, and schedules, metric history and associated drill-downs, ability to set blackouts, associate corrective actions with an alert, user-defined metrics, and monitoring templates are part of this feature.

Table 3–5 (Cont.) Feature Highlights of Diagnostics Pack for Application Server

Oracle Configuration Management Pack for Application Server

This pack automates the time-consuming, costly, and often error-prone process of software configuration, software and hardware inventory tracking, patching, and policy management, ensuring consistency across deployments.

Table 3–6 Feature Highlights of Configuration Management Pack for Application Server

Feature	Benefit
Configuration Management	Collects, searches, compares, and analytically reports hardware and software configuration data.
Patching	Includes Critical Patch Advisories, which alert you to critical patches that need to be applied.
Policy and Security Management	 Ensures consistency of deployments, system security, and adherence to operation standards.
	 Includes policy violation notifications and Enterprise Security Advisor

Oracle Management Pack for Identity Management

The Management Pack for Identity Management enables enterprises to proactively monitor the availability, performance, load, and security metrics of Identity servers. Administrators can monitor Identity service transaction performance externally from the end-user perspective, define service levels on Identity Services, and track service levels in real time.

Enterprise Manager 10.2.0.3 adds management capabilities for the following Identity Management products and associated systems:

- Oracle Access Manager (OAM)
 - Access Manager Identity System
 - Access Manager Access System
- Oracle Identity Manager (OIM)
 - Identity Manager System
- Oracle Identity Federation (OIF)
 - Identity Federation System

Feature	Benefit
Discovery and System Modeling	Discovers Identity Server components and creates a system with all of the associated infrastructure components.
Monitoring and Diagnostics	Receives real-time metrics and historical data as well as alert notifications.
Configuration	Tracks configuration metrics, takes configuration snapshots, and compares configurations.
Service Level Management for Identity Services	Monitors identity services using beacon transactions and service dashboards.

Table 3–7 Feature Highlights of Management Pack for Identity Management

Oracle SOA Management Pack

The Oracle Service-Oriented Architecture (SOA) Management Pack delivers comprehensive management capabilities for a SOA-based environment. By combining SOA runtime governance, business-IT alignment, and SOA infrastructure management with Oracle's rich and comprehensive system management solution, Enterprise Manager Grid Control significantly reduces the cost and complexity of managing SOA-based environments.

Feature	Benefit
Centralized Management Console	Provides administrators managing SOA environments with a consolidated browser-based view of the entire enterprise, thereby enabling them to monitor and manage all of their components from a central location.
Discovery and Service Modeling	Provides discovery of BPEL processes deployed on the Orazcle BPEL server and dependent partner links. Service modeling offers out-of-the-box automated system modeling capabilities for the SOA infrastructure.
Runtime Governance	Defines SOAP tests to measure and record availability and performance of the partner link (or any Web service) for historical trending, troubleshooting, and root cause analysis purposes. Also provides an error hospital of process instances with drilldowns into instance details.
Infrastructure Management	Monitors the availability and peformance of the SOA infrastructure components. Both current and historic availability of targets (such as BPEL PM server) are recorded for troubleshooting and root cause analysis.
Business-IT Alignment	Enables enterprises to consolidate their IT and business management tools into a unified system. BAM-EM integration unites business KPIs and system metrics in one system for correlation and trending.
Service Level Management	Enables administrators to monitor services from the end-user's perspective using service tests or synthetic transactions, model relationships between services and underlying IT components, and report on achieved service levels.
Historical Analysis and Reporting	Stores the collected metric and configuration data in a central repository, thereby enabling administrators to analyze metrics through various historical views and facilitate strategic trend analysis and reporting.

Table 3–8 Feature Highlights of SOA Pack

Oracle Standalone Management Packs

Enterprise Manager offers the following standalone management packs.

- Oracle Configuration Management Pack for Non-Oracle Systems
- Oracle Provisioning Packs
 - Oracle Provisioning Pack for Database
 - Oracle Provisioning Pack for Application Server
 - Oracle Provisioning Pack for Non-Oracle Systems
- Oracle Service Level Management Pack

Oracle Configuration Management Pack for Non-Oracle Systems

This pack offers a complete, cost-effective, and easy-to-use solution for managing the configurations of non-Oracle targets.

Table 3–9	Feature Highlights of Configuration Management Pack for Non-Oracle
Systems	

Feature	Benefit
Configuration Management	Collects, searches, compares, and analytically reports hardware and software configuration data.
Policy Management	Ensures consistency of deployments and adherence to operation standards. Includes policy violation notifications.

Oracle Provisioning Packs

These packs automate deployment of software, applications, and patches. These packs provide functionality for "bare-metal" provisioning of operating systems and software images, cloning of existing installations and software images (such as Oracle Clusterware, Real Application Clusters, and Oracle Application Servers), and patching. Critical data center operations become easy and scalable, resulting in lower operational risk and cost of ownership.

Feature	Benefit
Patching	 Provices end-to-end patching of Oracle products across a wide-range of product patches and customer environments.
	 Provides automated Linux host patching.
	 Critical Patch Advisories alert you to critical patches that need to be applied, and the Critical Patch Facility helps you automate the downloading and deployment of patches.
Provisioning	 Creates and maintains a library of reference software images.
	 Deploys operating systems and software to bare metal servers.
	 Provides a provisions standard, or "gold," images of Oracle Database, Oracle Real Application Clusters (RAC), and Oracle Application Server.
	 Extends RAC clusters or Oracle Application Server middleware.
	 Provides out-of-box and custom reporting on provisioning and deployments.

 Table 3–10
 Feature Highlights of Provisioning Packs

Feature	Be	Benefit		
Cloning	•	Clones databases and Oracle homes.		
	•	Converts single-instance databases to RAC.		
Policy and Security Management	•	Ensures consistency of deployments, system security, and adherence to operation standards.		
	•	Includes policy violation notifications and Enterprise Security Advisor.		

 Table 3–10 (Cont.) Feature Highlights of Provisioning Packs

Oracle Service Level Management Pack

This pack offers a comprehensive monitoring solution that helps IT organizations achieve high availability and performance, and optimized service levels for their business services. It actively monitors and reports on the availability and performance of services, including end-user business functions, Web applications, and infrastructure components. Using service tests or synthetic transactions executed from remote user locations, businesses can monitor services from the end user's perspective and its correlation to the underlying IT infrastructure. Additionally, the Service Level Management Pack assesses the business impact of any service problem or failure, and indicates whether service-level goals have been met.

Feature	Benefit
Service Modeling	Models critical business functions based on a wide range of supported protocols.
Complete Service Monitoring	Monitors service availability, performance, usage, and service level compliance.
Beacons	Measures availability and performance from representative key user locations.

 Table 3–11
 Feature Highlights of Service Level Management Pack

Note: Integrate with Oracle Enterprise Manager 10g Diagnostics Pack for Application Server for complete end-to-end Service Level Management.

Application Management Packs

Enterprise Manager offers two Application Management packs:

- Oracle Application Management Pack for PeopleSoft Enterprise
- Oracle Application Management Pack for Siebel

Oracle Application Management Pack for PeopleSoft Enterprise

Table 3–12	Key Features of	⁴ Application	Management	Pack for	PeopleSoft	Enterprise

Feature	Benefit
Automatic Discovery	Discovers PeopleSoft Enterprise components and creates a system with all of the associated infrastructure components.

Feature	Benefit		
Monitoring and Diagnostics	Receives real-time metrics, Tuxedo queues, and historical data as well as alert notifications. Also examines log files for information pertinent to identifying problem root causes.		
Configuration Management	Tracks configuration parameters, takes configuration snapshots, and compares configurations.		
Service Level Management	Monitors PeopleSoft Enterprise applications using beacon transactions and service dashboards.		
Administration	Starts and stops PeopleSoft components, defines PeopleSoft domains, and clears cache.		

 Table 3–12 (Cont.) Key Features of Application Management Pack for PeopleSoft

Oracle Application Management Pack for Siebel

 Table 3–13
 Key Features of Application Management Pack for Siebel

Feature	Benefit	
Automatic Discovery	Discovers Seibel components and creates system and services targets with all of the associated infrastructure components.	
Monitoring and Diagnostics	Receives real-time metrics and historical data as well as alert notifications. Also examines log files for information pertinent to identifying problem root causes. Analyzes SARM data to identify transaction bottlenecks.	
Configuration Management	Tracks configuration parameters, takes configuration snapshots, and compares configurations.	
Service Level Management	Monitors Seibel applications using beacon transactions and service dashboards.	
Administration	Starts and stops the Siebel Server and server components .	

Oracle Linux Management Pack

This pack provides a complete solution for monitoring and managing Linux hosts.

Table 3–14 Key Features of Linux Management Pack

Feature	Benefit		
Linux Provisioning	Deploys Linux Operating System to bare metal servers.		
Linux Patching	Provides automated Linux host patching.		
Configuration Management	Provides hardware and software configuration data collection, search, comparison, and analytical reporting.		
Policy Management	Ensures consistency of deployments and adherence to operation standards. Includes policy violation notifications.		
Performance Monitoring	Provides real-time and historical performance monitoring.		
Advanced Alert Management	Provides notification methods, rules, and schedules, metric history and associated drill-downs, ability to set blackouts, associate corrective actions with an alert, user-defined metrics, and monitoring templates.		
Administration	Provides remote administration capabilities for Linux hosts.		

Oracle Management Plug-ins

Enterprise Manager offers several categories of management plug-ins that expand your system monitoring coverage to include additional target types, including hosts, non-Oracle databases, non-Oracle middleware, network devices, and storage:

- System Monitoring Plug-in for Hosts
- System Monitoring Plug-ins for Non-Oracle Databases
 - Oracle System Monitoring Plug-in for IBM DB2
 - Oracle System Monitoring Plug-in for Microsoft SQL Server
- System Monitoring Plug-ins for Non-Oracle Middleware
 - Oracle System Monitoring Plug-in for IBM WebSphere
 - Oracle System Monitoring Plug-in for IBM WebSphere MQ
 - Oracle System Monitoring Plug-in for JBoss
 - Oracle System Monitoring Plug-in for BEA WebLogic
 - Oracle System Monitoring Plug-in for Microsoft .NET
 - Oracle System Monitoring Plug-in for Microsoft BizTalk Server
 - Oracle System Monitoring Plug-in for Microsoft Internet Information Services
 - Oracle System Monitoring Plug-in for Microsoft Commerce Server
 - Oracle System Monitoring Plug-in for Microsoft Internet Security and Acceleration Server
 - Oracle System Monitoring Plug-in for Microsoft Active Directory
- System Monitoring Plug-ins for Network Devices
 - Oracle System Monitoring Plug-in for Check Point Firewall
 - Oracle System Monitoring Plug-in for Juniper Netscreen Firewall
 - Oracle System Monitoring Plug-in for F5 Load Balancer
- System Monitoring Plug-ins for Storage
 - Oracle System Monitoring Plug-in for NetApp Filer
 - Oracle System Monitoring Plug-in for EMC NS Series NAS

Each plug-in provides one or more features for its respective target type, as described in Table 3–15.

Table 3–15Feature Highlights of Management Plug-	-ins
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Feature	Benefit
Performance Monitoring	Provides real-time and historical performance monitoring. Reduces the complex tasks of diagnosing and correcting performance problems for your targets.
Advanced Alert Management	Provides notification methods, rules, and schedules, metric history and associated drill-downs, ability to set blackouts, associate corrective actions with an alert, user-defined metrics, and monitoring templates.
Configuration Management	Provides configuration data collection, search, comparison, and historical change tracking.

Feature	Benefit
Task Automation	Enables you to automate common administrative functions across one or several middleware components via the Job System.
Groups and Systems	Enables you to collectively manage several distributed, middleware components as easily as a single component.

Table 3–15 (Cont.) Feature Highlights of Management Plug-ins

Oracle Management Connectors

Enterprise Manager 10g Release 3 delivers Management Connectors to enable bi-directional integration between Enterprise Manager and other management tools and help desk systems. By seamlessly integrating different tools within the IT environment, organizations can streamline key support processes, consolidate monitoring information in their tool of choice, reduce the total cost of ownership, and perform cross-platform diagnostics and root cause analysis.

Table 3–16 and Table 3–17 list the key features of Management Connectors for Remedy Help Desk and Microsoft Operations Manager (MOM).

 Table 3–16
 Feature Highlights of Management Connectors for Remedy Help Desk

Feature	Benefit	
Automatic and Manual Ticket Creation	Automatically or manually opens Remedy service requests in response to Enterprise Manager alerts.	
Automatic and Manual Ticket Creation	Automatically or manually opens Remedy service requests in response to Enterprise Manager alerts.	
Ticket Templates	Enables administrators to specify which Remedy fields should be populated, and what data these fields should be populated with. The connector includes several of out-of-box templates based on the default Remedy configuration.	
In-context Launch	In Enterprise Manager, the service request information is displayed in context of the alert, allowing administrators to launch the Remedy Web Console to view or update the request details. In Remedy, a link to the alert details is provided, enabling the support operator to navigate to the Metric Details page in the Enterprise Manager Console.	

Table 3–17	Feature Highlights of	Management	Connectors	for MOM
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Feature	Benefit
Forward MOM Events to Enterprise Manager	Enables administrators to forward MOM events to Enterprise Manager, thereby enabling better correlation of IT problems across the technology stack.
Synchronization	Automatically updates Enterprise Manager when MOM changes occur.

System Monitoring

Because of the size, complexity, and criticality of today's enterprise IT operations, the challenge for IT professionals is to be able to maintain high levels of component availability and performance for both applications and all components that make up the application's technology stack. Monitoring the performance of these components and quickly correcting problems before they can impact business operations is crucial. Enterprise Manager provides comprehensive, flexible, easy-to-use monitoring functionality that supports the timely detection and notification of impending IT problems across your enterprise.

This chapter covers the following topics:

- Systems Monitoring: Breadth and Depth
- Monitoring Basics
- Monitoring Templates
- User-Defined Metrics
- Accessing Monitoring Information

Systems Monitoring: Breadth and Depth

Enterprise Manager system monitoring features provide increased out-of-box value, automation, and grid monitoring support to enable IT organizations to maximize operational efficiencies and provide high quality services. For applications that are built on Oracle, Enterprise Manager offers the most comprehensive monitoring of the Oracle Grid environment—from Oracle Database instances to Oracle Real Application Clusters to Oracle Application Server Farms and Clusters. To support the myriad and variety of applications built on Oracle, Enterprise Manager expands its monitoring scope to non-Oracle components, such as third-party application servers, hosts, firewalls, server load balancers, and storage.

Enterprise Manager provides the most comprehensive management features for all Oracle products. For example, Enterprise Manager's monitoring functionality is tightly integrated with Oracle Database 10g manageability features such as server-generated alerts. These alerts are generated by the database itself about problems it has self-detected. Server-generated alerts can be managed from the Enterprise Manager console and include recommendations on how problems can be resolved. Performance problems such as poorly performing SQL and corresponding recommendations that are generated by the database's self-diagnostic engine, called Automatic Database Diagnostic Monitor (ADDM), are also captured and exposed through the Enterprise Manager console. This allows Enterprise Manager administrators to implement ADDM recommendations with ease and convenience. Enterprise Manager also makes it easy to expand the scope of system monitoring beyond individual components. Using Enterprise Manager's group management functionality, you can easily organize monitorable targets into groups, allowing you to monitor and manage many components as one.

Monitoring Basics

System monitoring functionality permits unattended monitoring of your IT environment. Enterprise Manager comes with a comprehensive set of performance and health metrics that allows 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).

The Management Agent on each monitored host monitors the status, health, and performance of all managed components (also referred to as targets) on that host. If a target goes down, or if a performance metric crosses a warning or critical threshold, an alert is generated and sent to Enterprise Manager and to Enterprise Manager administrators who have registered interest in receiving such notifications. Systems monitoring functionality and the mechanisms that support this functionality are discussed in the following sections.

When it is not practical to have a Management Agent present to monitor specific components of your IT infrastructure, as might be the case with an IP traffic controller or remote Web application, Enterprise Manager provides Extended Network and Critical URL Monitoring functionality. This feature allows the Beacon functionality of the Agent to monitor remote network devices and URLs for availability and responsiveness without requiring an Agent to be physically present on that device. You simply select a specific Beacon, and add key network components and URLs to the Network and URL Watch Lists. More information about using this feature is available in the Enterprise Manager online help.

Out-of-Box Monitoring

Enterprise Manager's Management Agents automatically start monitoring their host's systems (including hardware and software configuration data on these hosts) as soon as they are deployed and started. 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. 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 a rich source of diagnostic information and trend analysis data. When critical alerts are detected, notifications are sent to administrators for rapid resolution.

Out-of-box, Enterprise Manager monitoring functionality provides:

- In-depth monitoring with Oracle-recommended metrics and thresholds.
- Access to real-time performance charts.
- Collection, storage, and aggregation of metric data in the Management Repository. This allows you to perform strategic tasks such as trend analysis and reporting.
- E-mail notification for detected critical alerts.

Enterprise Manager can monitor a wide variety of components (such as databases, hosts, and routers) within your IT infrastructure.

Some examples of monitored metrics are:

- Archive Area Used (Database)
- Component Memory Usage (Application Server)
- Segments Approaching Maximum Extents Count (Database)
- Network Interface Total I/O Rate (Host)

Some metrics have associated predefined limiting parameters called thresholds that cause alerts to be triggered when collected metric values exceed these limits. Enterprise Manager allows you to set metric threshold values for two levels of alert severity:

- Warning Attention is required in a particular area, but the area is still functional.
- Critical Immediate action is required in a particular area. The area is either not functional or indicative of imminent problems.

Hence, thresholds are boundary values against which monitored metric values are compared. For example, for each disk device associated with the Disk Utilization (%) metric, you might define a warning threshold at 80% disk space used and critical threshold at 95%.

Note: Enterprise Manager also allows you to define your own target types. See Chapter 10, "Extending Enterprise Manager" for information on creating new monitorable target types for your environment.

Metric Thresholds

As mentioned earlier, some metric thresholds come predefined out-of-box. 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 more challenging for certain categories of metrics such as performance metrics.

For example, what are appropriate warning and critical thresholds for the Response Time Per Transaction database metric? For such metrics, it might make more sense to be alerted when the monitored values for the performance metric deviates from normal behavior. Enterprise Manager provides features to enable you to capture normal performance behavior for a target and determine thresholds that are deviations from that performance norm.

Note: Enterprise Manager administrators must be granted OPERATOR or greater privilege on a target in order to perform any metric threshold changes.

Metric Snapshots A metric snapshot is a named collection of a target's 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.

The key in defining a metric snapshot for a target is to select a date during which target performance was acceptable under typical workloads. Given this date, actual values of the performance metrics for the target are retrieved and these represent what is normal or expected performance behavior for the target. Using these values, you can

then use Enterprise Manager to calculate warning and critical thresholds for the metrics that are a specified percentage 'worse' than the actual metric snapshot values. These represent values which, when crossed, could indicate performance problems. After thresholds are calculated, you can still edit the calculated values if needed.

You can define a metric snapshot for a target based on a date and (optionally) time. If you only specify a date, the metric snapshot is the set of average daily values of the target's performance metrics for that date. If you also specify an hour within the date, then the metric snapshot is the set of Low and High metric values for the preceding hour.

Metric snapshots apply to all monitored targets except 10.2 or higher databases, Services, and Web applications. For these targets, the Metric Baseline feature is supported.

Metric Baselines Metric baselines are statistical characterizations of system performance over well-defined time periods. Metric baselines can be used 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.

Metric baselines are well defined time intervals (baseline periods) over which Enterprise Manager has captured system performance metrics. The underlying assumption of metric baselines is that systems with relatively stable performance should exhibit similar metric observations (that is, values) over times of comparable workload. Two types of baseline periods are supported: moving window baseline periods and static baseline periods. Moving window baseline periods are defined as some number of days prior to the current date (example: Last 7 days). This allows comparison of current metric values with recently observed history. Moving window baselines are useful for operational systems with predictable workload cycles (example: OLTP days and batch nights).

Static baselines are periods of time that you define that are of particular interest to you (example: end of the fiscal year). These baselines can be used to characterize workload periods for comparison against future occurrences of that workload (example: compare end of the fiscal year from one calendar year to the next).

Adaptive Thresholds

Once metric baselines are defined, they can be used to establish alert thresholds that are statistically significant and adapt to expected variations across time. For example, you can define alert thresholds to be generated based on significance level, such as the HIGH significance level thresholds are values that occur 5 in 100 times. Alternatively, you can generate thresholds based on a percentage of the maximum value observed within the baseline period. These can be used to generate alerts when performance metric values are observed to exceed normal peaks within that period.

Baseline Normalized Views

Enterprise Manager provides charts which 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 allow administrators to easily perform time-correlation of events. For example, performance events can be related to significantly increased demand or significantly unusual workload.

Metric baselines are supported for databases (version 10.2 or higher) and for Services and Web Application target types.

Alerts

When a metric threshold value is reached, an alert is generated. An alert indicates a potential problem; either a warning or critical threshold for a monitored metric has been crossed. An alert can also be generated for various target availability states, such as:

- Target is down.
- Oracle Management Agent monitoring the target is unreachable.

When an alert is generated, you can access details about the alert from the Enterprise Manager console. See "Accessing Monitoring Information" on page 4-8 for more information on viewing alert information.

Enterprise Manager provides various options to respond to alerts. Administrators can be automatically notified when an alert triggers and/or corrective actions can be set up to automatically resolve an alert condition.

Notifications

When a target becomes unavailable or if thresholds for performance are crossed, alerts are generated in the Enterprise Manager console and notifications are sent to the appropriate administrators. Enterprise Manager supports notifications via e-mail (including e-mail-to-page systems), SNMP traps, and/or by running custom scripts.

Enterprise Manager supports these various notification mechanisms via notification methods. 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 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, you can define a notification rule that specifies e-mail should be sent to you when CPU Utilization on any host target is at critical severity, or another notification rule that creates a trouble-ticket when any database is down. Once a notification rule is defined, it can be made public for sharing across administrators. For example, administrators can subscribe to the same rule if they are interested in receiving alerts for the same criteria defined in the rule. Alternatively, an Enterprise Manager Super Administrator can assign notification rules to other administrators such that they receive notifications for alerts as defined in the rule.

Notifications are not limited to alerting administrators. Notification methods can be extended to execute any custom OS script or PL/SQL procedure, and thus can be used to automate any type of alert handling. For example, administrators can define notification methods that call into a trouble ticketing system, invoke third-party APIs to share alert information with other monitoring systems, or log a bug against a product.

Customizing Notifications

Notifications that are sent to Administrators can be customized based on message type and on-call schedule. Message customization is useful for administrators who rely on both e-mail and paging systems as a means for receiving notifications. The message formats for these systems typically vary—messages sent to e-mail can be lengthy and can contain URLs, and messages sent to a pager are brief and limited to a finite number of characters. To support these types of mechanisms, Enterprise Manager allows administrators to associate a long or short message format with each e-mail address. E-mail addresses that are used to send 'regular' e-mails can be associated with the 'long' format; e-mail addresses that are used to send pages can be associated with the 'short' format. The 'long' format contains full details about the alert; the 'short' format contains the most critical pieces of information.

Notifications can also be customized based on an administrator's on-call schedule. An administrator who is on-call might want to be contacted by both his pager and work e-mail address during business hours and only by his pager address during off hours. Enterprise Manager offers a flexible notification schedule to support the wide variety of on-call schedules. Using this schedule, an administrator defines his on-call schedule by specifying the e-mail addresses by which they should be contacted when they are on-call. For periods where they are not on-call, or do not wish to receive notifications for alerts, they simply leave that part of the schedule blank. All alerts that are sent to an administrator automatically adhere to his specified schedule.

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 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 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 has triggered. Administrators can also receive notifications for the success or failure of corrective actions.

A corrective action can also consist of multiple tasks, with each task running on a different target. For example, if an Oracle Application Server's J2EE container (called an OC4J container) triggers a warning alert indicating it is approaching its limit on the number of requests it can handle, a corrective action can be defined to automatically start up another OC4J container on another host, thereby sharing application load among different containers. As shown by this example, corrective actions can be used to dynamically allocate resources as demand increases, thereby preventing performance bottlenecks before they impact overall application availability.

Corrective actions for a target can be defined by all Enterprise Manager administrators who have been granted OPERATOR or greater privilege on the target. For any metric, you can define different corrective actions when the metric triggers at warning severity or at critical severity.

Corrective actions must run using the credentials of a specific Enterprise Manager administrator. For this reason, whenever a corrective action is created or modified, the credentials that the modified action will run with must be specified.

Blackouts

Blackouts allow you to support planned outage periods to perform emergency or scheduled maintenance. When a target is put under blackout, monitoring is suspended, thus preventing unnecessary alerts from being sent when you bring down a target for scheduled maintenance operations such as database backup or hardware upgrade. Blackout periods are automatically excluded when calculating a target's overall availability.

A blackout period can be defined for individual targets, a group of targets or for all targets on a host. The blackout can be scheduled to run immediately or in the future,

and to run indefinitely or stop after a specific duration. Blackouts can be created on an as-needed basis, or scheduled to run at regular intervals. If, during the maintenance period, you discover that you need more (or less) time to complete maintenance tasks, you can easily extend (or stop) the blackout that is currently in effect. Blackout functionality is available from both the Enterprise Manager console as well as via the Enterprise Manager command-line interface (EMCLI). The EMCLI is often useful for administrators who would like to incorporate the blacking out of a target within their maintenance scripts. When a blackout ends, the Management Agent automatically re-evaluates all metrics for the target to provide current status of the target post-blackout.

If an administrator inadvertently performs scheduled maintenance on a target without first putting the target under blackout, these periods would be reflected as target downtime instead of planned blackout periods. This has an adverse impact on the target's availability records. In such cases, Enterprise Manager allows Super Administrators to go back and define the blackout period that should have happened at that time. The ability to create these retroactive blackouts provides Super Administrators with the flexibility to define a more accurate picture of target availability.

Monitoring Templates

Monitoring templates simplify the task of standardizing monitoring settings across your enterprise by allowing you to specify the monitoring settings once and apply them to your monitored targets. This makes it easy for you to apply specific monitoring settings to specific classes of targets throughout your enterprise. For example, you can define one monitoring template for test databases and another monitoring template for production databases.

A monitoring template defines all Enterprise Manager parameters you would normally set to monitor a target, such as:

- Target type to which the template applies.
- Metrics (including user-defined metrics), thresholds, metric collection schedules, and corrective actions.

When a change is made to a template, you can reapply the template across affected targets in order to propagate the new changes. You can reapply the monitoring templates as often as needed. For any target, you can preserve custom monitoring settings by specifying metric settings that can never be overwritten by a template.

Comparing Differences Between Targets and Monitoring Templates

Deciding how and when to apply a template is simplified by using the Compare Monitoring Template feature. This feature allows you to see at a glance how metric and policy settings defined in a template differ from those defined on the destination target. Compare Monitoring Template is especially useful when working with aggregate targets such as groups and systems. For example, after you apply a Monitoring Template to a group, you want to verify that the group members now have the same monitoring settings as the template. The Compare Monitoring Template feature makes checking simple. You can also schedule this as a report, allowing you to check periodically if the group members still follow the template settings.

User-Defined Metrics

User-defined metrics allow you to extend the reach of Enterprise Manager's monitoring to conditions specific to particular environments via custom scripts or SQL

queries and function calls. Once a user-defined metric is defined, it will be monitored, aggregated in the repository, and can trigger alerts like any other metric in Enterprise Manager. There are two types of user-defined metrics: Operating System and SQL.

- Operating System (OS) User-Defined Metrics: Accessed from Host target home pages, these user-defined metrics allow you to implement custom monitoring functions via OS scripts.
- SQL User-Defined Metrics: Accessed from the Database target home pages, these user-defined metrics allow you to implement custom database monitoring using SQL queries or function calls.

Creating a User-Defined Metric

To monitor a particular condition (example: check successful completion of monthly system maintenance routines), you can write a custom OS script to monitor that condition, then register it as a user-defined metric in Enterprise Manager. Each time the metric is evaluated by Enterprise Manager, it uses this script to evaluate the condition. SQL user-defined metrics do not use external scripts: you enter SQL directly into the Enterprise Manager console at the time of metric creation. Once a user-defined metric is defined, all other monitoring features, such as alerts, notifications, historical collections, and corrective actions are automatically available to it.

If you already have your own library of custom monitoring scripts, you can leverage Enterprise Manager's monitoring features by integrating these scripts with Enterprise Manager as OS user-defined metrics. Likewise, existing SQL queries or function calls currently used to monitor database conditions can be easily integrated into Enterprise Manager's monitoring framework as SQL user-defined metrics. For more information about user-defined metrics, see *Oracle Enterprise Manager Advanced Configuration*.

Accessing Monitoring Information

All monitoring information is accessed via the Enterprise Manager console, providing quick views into the health of your monitored environment.

Enterprise Manager Console Home Page

The Enterprise Manager console home page shown in Figure 4–1 gives you an at-a-glance view of the overall status of your monitored environment. As shown in the following figure, the home page summarizes key monitoring areas such as availability across all managed targets, open alerts, policy violations, and recent problems with job executions. Links on this page allow you to drill down to detailed performance information.

The Resource Center is your central access point to Enterprise Manager documentation as well as the comprehensive technical resources of the Oracle Technology Network (OTN).

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	III		

Figure 4–1 Enterprise Manager Console

From the home page, you can easily access alert information. For example, you can click on the Down link in the All Targets Status legend to determine which targets are currently down. Under All Target Alerts, you can click on the Warning alerts value to access a list of warning alerts for all monitored targets (Figure 4–2).

Figure 4–2 Warning Alerts Page

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CRACLE Enterprise Manager 10g Setup Preferences Help Logout Grid Control Targets Deployments Alerts Policies Jobs Reports Targets Down Critical Warning Errors Blacked Out Unknown Availability											
Warping Alerts											
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Select	All Select None			=							
Select	t Target	Туре	Open Since ▽	Message							
	<u>demo demo1</u>	Database Instance	Sep 22, 2005 11:05:46 PM BST	Metrics "Global Cache Average Current Get Time" is at 1.16667							
	<u>demo demo2</u>	Database Instance	Sep 22, 2005 10:16:05 PM BST	Metrics "Database Time Spent Waiting (%)" is at 86.51498 for event class "Other"							
	stanb12.us.oracle.com:1830	Agent	Sep 22, 2005 4:23:50 PM PDT	Agent Virtual Memory Growth is 1.17%							
	stacg04.us.oracle.com:1830	Agent	Sep 22, 2005 4:21:49 PM PDT	Agent Virtual Memory Growth is 1.83%							
	Customer Service Rep Portal Service	Web Application	Sep 22, 2005 4:20:26 PM GMT	browse from London_stacz61 violated the threshold; Metric: [HTTP Transaction] Perceived To							
	Inxmain2_stadf18.us.oracle.com	Database Instance	Sep 22, 2005 4:16:40 PM PDT	Metrics "Database Time Spent Waiting (%)" is at 30.44041 for event class "Other"							
	Customer Service Rep Portal Service	Web Application	Sep 22, 2005 4:11:50 PM GMT	browse from Austin_stacb08 violated the threshold; Metric: [HTTP Transaction] Perceived To							
	Inxmain_stadf18.us.oracle.com	Database Instance	Sep 22, 2005 4:07:53 PM PDT	Metrics "Database Time Spent Waiting (%)" is at 32.17254 for event class "Other"							
	ap137nap	Network Appliance Filer	Sep 22, 2005 3:37:01 PM PDT	CPU Utilization is 94% ,crossed warning (80) or critical (95) threshold.							
	ap121nap	Network Appliance Filer	Sep 22, 2005 2:46:43 PM PDT	Snapshot /vol/scmback2/.snapshot is 226.61% full ,crossed warning (95%) or critical (%) t							
	ap137nap	Network Appliance Filer	Sep 22, 2005 1:03:05 PM PDT	Flexible Volume /vol/slotvol60/ is 96% full ,crossed warning (95%) or critical (98%) thres							
	stams03.us.oracle.com	Host	Sep 22, 2005 11:55:35 AM PDT	Scanned /u01/home/oracle/agent10g/sysman/log/emagent.log from line 24 to 26. Found 3 occur							
	emrep	Database Instance	Sep 22, 2005 7:56:26 AM PDT	Metrics "Current Open Cursors Count" is at 2040							
	8.02.0										

The most recent alerts are listed first. You can change the sorting methodology by clicking on the appropriate column header. By clicking on a specific alert message, you can drill down to explicit details about the metric in alert (Figure 4–3).

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Copyright © 199 Oracle, JD Edw About Oracle	Home 36, 2005, Oracle. All rights reso ards, PeopleSoft, and Retek ar <u>e Enterprise Manager</u>	Targets <u>Deploγme</u> erved. e registered trademarks of Ο	nts <u>Alerts</u> <u>Policies</u> racle Corporation and/or its aff	<u>Jobs</u> <u>Rep</u> illiates. Other nar	orts <u>Setup</u> nes may be trade	Preference	s <u>Help</u> espective own	Logout ers.		
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Figure 4–3 Warning Alert: Metric Details

By default, metric values shown on this page reflect the last 24 hours of collected data. You can also select another time period or specify a custom time period with which to view metric data and easily assess if the problem occurred recently or across a long time period. Because Enterprise Manager collects and aggregates metric data in the Management Repository, you can click on the Compare Targets related link to display metric data for more than one target simultaneously, thus allowing you to compare performance across multiple targets (Figure 4–4).

Figure 4–4 Compare Targets

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ORACLE: Enterprise Manager 10g Grid Control Hosts Databases Application Servers Web Ap Host: stadr18.us.oracle.com > All Metrics > Filesystem S Filesystem Space Available (%): Mount Po	Home Targets Deployments Alerts plications Services Systems Groups All Targets Space Available (%) > Mount Point / > ipt /: 1 ast 24 hours	Setup Preferences Help Logout Policies Jobs Reports						
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Last Known Value 59 Average Value 59.3 High Value 60 Low Value 59 ■ Warning Threshold 65 ■ Critical Threshold 35 Occurrences Before Alert 1 Corrective Action Warning and Critical	100 80 60 40 20 0:45 9 12 AM 3 6 9 22 Sep 21, 2005 22 stadr18.us.oracle.com stacg04.u	12 PM 3 6 s.oracle.com						
Alert History								
Comment for Most Recent Alert		Add Comment						
Severity Timestamp ♥ Message ① Sep 13, 2005 7:59:08 PM Filesystem / threshold	has 61% available space, fallen below warning (65) or critical (35)	Last Comment Details Case Created: 226872						
TIP Click on the details icon for user comments ar	id system notifications.	120012						
Related Links								
Compare Objects Mount Point	Compare Targets Metric and Polic	cy Settings						
Home Targets Deployments Alerts Policies Jobs Reports Setup Preferences Help Logout Copyright © 1996, 2005, Oracle. All rights reserved. Oracle, DE Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. About Oracle Enterprise Manager								

The Alert History table shows alerts generated over the selected time period. You can view explicit details about a specific alert in this table by clicking on the eyeglasses icon in the Details column. Figure 4–5 shows the Alert Details page.

Figure 4–5 Alert Details

🕲 Oracle Enterprise Manager (ANA) - Alert Details - Netscape											
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Hosts Databases Application Servers Web Applications Services Systems Groups All Targets											
Host: stadr18.us.oracle.com > All Metrics > Filesystem Space Available (%) > Mount Point / >											
Alert Details											
Page Refreshed Sep 22, 2005 7:06:29 PM PDT (Refresh Mount Point / Severity 1 Warning Timestamp Sep 13, 2005 7:59:08 PM Administrator < SYSTEM> Message Filesystem / has 61% available space, fallen below warning (65) or critical (35) threshold.											
New Comment				Add Comment							
Timestamp ▽	Туре	Administrator	Message								
Sep 14, 2005 12:00:00 PM		300036	Case Created: 226972								
Sep 13, 2005 8:00:13 PM	Notification	<system></system>	Called PL/SQL procedu (Rule Owner=SYSMAN	re SYSMAN.em_helpdesk_notification.HandleNotification , Rule Name=PeopleSoft HelpDesk Case Creation - Host)							
Sep 13, 2005 8:00:12 PM	Notification	<system></system>	E-mail for corrective act Owner=DEMO8, Rule N	ion sent to emadmin@oracle.com (Rule lame=Host alerts)							
Sep 13, 2005 8:00:11 PM	Notification	<system></system>	The following notification PL/SQL procedures, an	ns will be sent: 1 e-mail messages, 0 SNMP traps, 1 d 0 OS Commands.							
Sep 13, 2005 8:00:11 PM	Notification	<system></system>	The following notification messages, 0 SNMP tra	ns will be sent for the Corrective Action: 1 e-mail ps, 0 PL/SQL procedures, and 0 OS Commands.							
Sep 13, 2005 8:00:11 PM	Notification	<system></system>	E-mail sent to emadn Name=Host alerts)	nin@oracle.com (Rule Owner=DEMO8, Rule							
Sep 13, 2005 7:59:11 PM	Corrective Action	<system></system>	Execution created for Cor	rrective Action CHECK FILES							
Home Targets Deployments Alerts Policies Jobs Reports Setup Preferences Help Logout Copyright © 1996, 2005, Oracle. All rights reserved. Oracle, JD Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. About Oracle Enterprise Manager											

The Alert Details page shows all notifications for an alert, any corrective actions that have been executed, and any custom notifications, for example, the opening of a case ticket for an alert. On this page, you also have the option of adding annotations or comments for other administrators to see.

Group Management

This chapter introduces the concept of group management and contains the following sections:

- Introduction to Groups
- Managing Groups
- Out-of-Box Reports
- Redundancy Groups

Introduction to Groups

Today's IT operations can be responsible for managing a great number of components, such as databases, application servers, hosts, or other components, which can be time consuming and impossible to manage individually. The Enterprise Manager Grid Control group management system lets you combine components (called targets in Enterprise Manager) into logical sets, called groups. This enables you to organize, manage, and effectively monitor the potentially large number of targets in your enterprise.

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

Note: An Enterprise Manager "System," used specifically to group the components on which a service runs, is a special kind of Enterprise Manager group. Many of the functions and capabilities for groups and systems are similar. See Chapter 12, "Service Management" for a detailed explanation of systems and how they are used.

Managing Groups

By combining targets in a group, Enterprise Manager offers a wealth of management features that enable you to efficiently manage these targets as one group. Using the Group pages, you can:

- View a summary status of the targets within the group.
- Monitor outstanding alerts and policy violations for the group collectively, rather than individually.
- Monitor the overall performance of the group through performance charts.
- Perform administrative tasks, such as scheduling jobs for the entire group, or blacking out the group for maintenance periods.

You can also customize the console to provide direct access to group management pages.

Group Home Page

The Group Home page, shown in Figure 5–1, is the central location for monitoring information. The Group Home page provides the following features:

- Availability pie chart that provides at-a-glance information on the current status across all members so you can easily assess the percentage of members that are up, and the percentage of members that are unavailable. You can quickly drill down for information if any member target is down.
- Roll-up of open alerts and policy violations, categorized by severity, so you can quickly focus on the most critical problems first. Alerts and violations that have occurred within the last 24 hours highlight problems that recently occurred.
- Access to 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 such as increased or decreased number of policy
 violations, changes in the overall group compliance score, and the percentage of
 members in compliance with your enterprise's policy rules.
- Access to the Security at a Glance page, which provides an overview of the security health of the group. This shows statistics about security policy violations and critical security patches that have not been applied.
- Summary of recent configuration changes across all members in the group, so you can easily determine if a new problem is related to any recent changes.
- Summary of Critical Patch Advisories for Oracle homes within the group.

Group: Pro	duction Dat	tabases							
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Figure 5–1 Group Home Page

Figure 5–2 shows the Policy Trend Overview page that you can access from the Group Home page.





See Also: "Group Home Page" in the Enterprise Manager online help

Group Charts Page

The Group Charts page, shown in Figure 5–3, enables you to monitor the collective performance of the group. Out-of-box performance charts are provided based on the type of members in the group. For example, when databases are part of the group, a Wait Time (%) chart is provided that shows the top databases with the highest wait time percentage values. You can view this performance information over the last 24 hours, last 7 days, or last 31 days. You can also add your own custom charts to the page.





See Also: "Group Charts Page" in the Enterprise Manager online help

Group Administration Page

The Group Administration page, shown in Figure 5–4, provides a central point for performing common administrative tasks for the group. For example, you can:

- Run jobs or find out the status of currently running jobs against the group.
- Define planned outage windows, called blackouts, on the members of the group to perform maintenance tasks.
- Run SQL commands collectively against the database member targets of the group.
- View the most recent backup for each database in the group.
- View the last 100,000 bytes of the alert log for all databases in the group.
- Use a deployment summary to easily obtain hardware and software inventory information across all member targets.

oup: Produ	uction Databases					
				Page Refreshe	d Sep 7, 2005 12:13:04 PM PDT	Refresh Launch Dashboard
<u>Home</u> <u>C</u>	harts Administration	Members				
Job Activity				Blackouts		
	Create Job	OS Command	✓ G0)			Create
Job execution	s scheduled to start no more	e than 7 daγs ago		C1 1		
Status	Submitted to the Gr	oup Submit	ted to any member	Status	Submitted to the Group	Submitted to any Memb
Scheduled		4	4	Scheduled	U	
Running		0	0	Active	U	
Suspended		0	0			
Problem		0	0			
Database O Execute SQ Alert Log Co Deployment	perations L Intent ts Summary	<u>View Backup Rep</u>	o <u>rt</u>	Configurati	on Searches	
Mary Databa	na landalladinga 🛛 🙀					
View Databa	se installations 🎽			Database Fe	ature Usage 🛛 🔽 (Go
I Software T	argets Without Inventory:3 o	of 4				
Database Ins	stallations \triangle	Targets Inst	Interim Patches Allations Applied			
Oracle Databa	ase 10a 10.2.0.0.0	1	1 No			

Figure 5–4 Group Administration Page

See Also: "Group Administration Page" in the Enterprise Manager online help

Group Members Page

The Group Members page, shown in Figure 5–5, summarizes information about the member targets in the group. It includes information on their current availability status, roll-up of open alerts and policy violations, and key performance metrics based on the type of targets in the group.

You can visually assess availability and relative performance across all member targets. You can sort on any of the columns to rank members by a certain criterion (for example, database targets in order of decreasing wait time percentage). Default key performance metrics are displayed based on the targets you select, but you can customize these to include additional metrics that are important for managing your group.

Figure 5–5 Group Members Page

Group: Production Database	es										
			Page Refreshe	d Sep 7, 200	5 12:07:55 PI	M PDT (Refr	esh) (Launch	Dashboard			
Home Charts Administration Members											
Search All Customize Columns											
Name 🛆	Туре	Status	Alerts	Policy Violations	Wait Time (%)	Compliance Score (%)	Deployment Type	Location			
db10.2_Inmain	Database Instance	٢	0 4	<u>21 26 41</u>	<u>92.97</u> 🗸	84					
Finance	Database Instance	۲	32	<u>14</u> <u>14</u> <u>7</u>	<u>8.37</u> 🗸	88	Production	Redwood Shores			
orcl.us.oracle.com	Database Instance	•	0 56	181	 ✓ 	96					
Sales	Database Instance	۲	0 1	<u>10</u> <u>10</u> <u>2</u>	0 🗸	93	Production	Redwood Shores			
Home Charts Administr	ation Members										

See Also: "Group Members Page" in the Enterprise Manager online help

System Dashboard

The System Dashboard, shown in Figure 5–6, enables you to proactively monitor the status and alerts in the group as they occur. The color-coded interface is designed to

highlight problem areas using the universal colors of alarm—targets that are down are highlighted in red, metrics in critical severity are shown as red dots, metrics in warning severity are shown as yellow dots, and metrics operating within normal boundary conditions are shown as green dots.

Using these colors, you can easily spot the problem areas for any target and drill down for details as needed. An alert table is also included to provide a summary for all open alerts in the group. The alerts in the table are presented in reverse chronological order to show the most recent alerts first, but you can also click on any column in the table to change the sort order.

You can customize the dashboard according to your needs. You can specify which key metrics should be included in the dashboard and the display names to be used for these metrics. You can also customize the refresh interval to ensure that you always receive timely information about alerts as they are detected. You can launch the System Dashboard in context from any Group Home page. However, using reporting framework features, you can also make the System Dashboard publicly available for any user that has access to a web browser and the Enterprise Manager Reports Web site.



Grid Control	Manager 10 <i>g</i>											Customize Help
Group: Finance_Group Page Refreshed Oct 5, 2005 12:37:50 PM PD										1 PDT Refresh		
Target	Туре	Status $ abla$	Alerts	Policy Violations	Wait Time (%)	CPU Utilization (%)	Total Disk I/O Per Second	Total Disk I/O Per Second	Memory Utilization (%)	Response Time (msec)	Connections Established (per min)	Connections Refused (per min)
stadr18.us.oracle.com:3872	Agent	Ŷ	<u>1</u> 0	000	-	-	-	-	-	-		-
stadr18.us.oracle.com	Host	1	<u>3</u> <u>24</u>	<u>5</u> <u>3</u> 0	-	0	۰	۰	۰	-	-	-
LISTENER stadr18.us.oracle.co	om Listener	1	0 0	<u>1</u> <u>4</u> 0		1.2	-	-	-	٠	٥	•
Finance	Database Instance	1	0 6	1 8 1	٠			-	-		-	-
Alerts 🜷 0 🥘 <u>4</u> 🥥 <u>30</u>									<u> </u>			
											1 10 -524	No. 4 10 (2)
	1										ous 1-10 of 34	Next IU 🗵
Severity Target	Date 🗸	Me	ssage									Latest Comment
stadr18.us.oracle.cc	am Sep 29, 2005 2:50	:40 PM Scar occu Thra <sc 14:: 14:: thra for <sc 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14:: 14::</sc </sc 	nned /scr urences c ad for U heduler> 34:20 Thr e#19480 ads exha Upload M heduler> 14:59 Thr	atch/akhilani/ of the pattern: pload Manage error Creatin read-7496388 (>: 2005-09-2 austed (00951 anager, O5 th error Creatin read-7496388	oracle/p : ERROF ig Threa 8 <schi 9 14:35); <line ig Threa 8 <schi 8 <schi< td=""><td>oroduct/agent1 R; <line#19477 areads exhaust ad for Upload M eduler> Error C ::32 Thread-749 #19481>: 2000 xxhausted (009 ad for Upload M edu; truncated</line#19477 </td><td>0g/sysman/k >: 2005-09- ed (00951); anager, OS k reating Thre 963888 <sch 5-09-29 14:3 51); <line#1 anager, OS k 12 cross</line#1 </sch </td><td>og/emagent. -29 14:27:18 <line#19478 threads exha ad for Uploa heduler> Erro 37:57 Thread 19482>: 2009 threads exha ad warning (</line#19478 </td><td>log from line 19 Thread-74963t 3>: 2005-09-29 austed (00951); d Manager, OS or Creating Thru 1-74963888 <5t 5-09-29 14;42; austed (00951); 0) or critical ()</td><td>477 to 19488. 388 <schedule 14:27:39 Thre line#19479; threads exhau ead for Upload theduler> Erro 21 Thread-749 line#19483; threshold.</schedule </td><td>Found 12 r> Error Creating ad-74963888 >: 2005-09-29 isted (00951); Manager, OS r_Creating Thread 63888 2: 2005-09-29</td><td>: The following notifications will be sent: 0 e- mail messages, 0 SNMP traps, 1 PL/SQL procedures, and 0 OS Commands.</td></schi<></schi </line </schi 	oroduct/agent1 R; <line#19477 areads exhaust ad for Upload M eduler> Error C ::32 Thread-749 #19481>: 2000 xxhausted (009 ad for Upload M edu; truncated</line#19477 	0g/sysman/k >: 2005-09- ed (00951); anager, OS k reating Thre 963888 <sch 5-09-29 14:3 51); <line#1 anager, OS k 12 cross</line#1 </sch 	og/emagent. -29 14:27:18 <line#19478 threads exha ad for Uploa heduler> Erro 37:57 Thread 19482>: 2009 threads exha ad warning (</line#19478 	log from line 19 Thread-74963t 3>: 2005-09-29 austed (00951); d Manager, OS or Creating Thru 1-74963888 <5t 5-09-29 14;42; austed (00951); 0) or critical ()	477 to 19488. 388 <schedule 14:27:39 Thre line#19479; threads exhau ead for Upload theduler> Erro 21 Thread-749 line#19483; threshold.</schedule 	Found 12 r> Error Creating ad-74963888 >: 2005-09-29 isted (00951); Manager, OS r_Creating Thread 63888 2: 2005-09-29	: The following notifications will be sent: 0 e- mail messages, 0 SNMP traps, 1 PL/SQL procedures, and 0 OS Commands.
stadr18.us.oracle.cd	am 5ep 29, 2005 2:23	Scan Scan 0000 Three 13:: 4lin three for <500	nned /scr and for U heduler> 12:31 Thr e#19449 ads exha Upload M heduler>	atch/akhilani/ of the pattern: pload Manage error Creatin read-7496388 >: 2005-09-2 austed (00951 anager, OS th error Creatin	oracle/p ERROF r, OS th g Threa 8 <schi 9 13:17 9 13:17 y; <line areads e g Threa</line </schi 	voduct/agent11 R; <line#19446 Inreads exhaust Ind for Upload M eduler> Error C 116 Thread-749 #19450>: 2009 Intaking (009 Ind for Upload M</line#19446 	Dg/sysman/k >: 2005-09- ed (00951); anager, OS I reating Thre 963888 <sch 5-09-29 13;1 51); <line#1 anager, OS I</line#1 </sch 	og/emagent. -29 13:10:54 <line#19447 threads exha ed for Uploa heduler > Erro 19:14 Thread 19451 >: 200 threads exha</line#19447 	log from line 19 Thread-74963i 7>: 2005-09-29 austed (00951); d Manager, OS or Creating Thread d-74963888 <so 5-09-29 13:23: austed (00951);</so 	446 to 19476. 388 <schedule 13:12:10 Thre line#19448; threads exhau ad for Upload theduler > Erro 52 Thread-749 line#19452;</schedule 	Found 31 r> Error Creating ad-74963888 s: 2005-09-29 (sted (00951); Manager, 05 r Creating Thread 63888 s: 2005-09-29	: The following notifications will be sent: 0 e- mail messages, 0 SNMP traps, 1 PL/SQL procedures, and 0 OS Commands.

Out-of-Box Reports

Enterprise Manager provides several out-of-box reports for groups as part of the reporting framework, called Information Publisher. These reports display important administrative information, such as hardware and operating system summaries across all hosts within a group, and monitoring information, such as outstanding alerts and policy violations for a group.

You can access these reports from the **Reports** link in the Related Links section of all Group pages. Figure 5–7 shows the Availability History report for a specified group over the last 31 days.
Availability History (Group)					
Group Finance_Group Fime Period Last 31 Days PDT Set	Time Period)			(Printable Page
This report shows the avilability histor	v for the selected o	roun		Page Refreshed Oct 26, 2005 5:37:	44 PM PDT 🖹
Summary	y for the selected g	roup.	Availability State		
Total Members 4 Critical Alerts 1,300 Warning Alerts 75 Metric Errors 1,530			100%	Target Up(4)	
Target	Туре∠	Status			
stadr18.us.oracle.com:3872	Agent	Û			
Finance	Database Instance	• ①			
stadr18.us.oracle.com	Host	仓			
LISTENER_stadr18.us.oracle.com	Listener	Û			
Availability History					
Name	Туре		Status History		
▼ Finance_Group	Group				
LISTENER stadr18.us.oracl	e.com Listener		(1)		
Finance	Database	Instance	0		
stadr18.us.oracle.com	Host		0		
stadr18.us.oracle.com:3872	Agent		0		
			Sep 25, 2005 5:37:45 Pr	4 PDT Oct 26, 2005 5:37:45 PM PDT	

Figure 5–7 Availability History Report



Redundancy Groups

A redundancy group is a group that contains members of the same type that function collectively as a unit. A type of redundancy group 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.

You can create and administer a redundancy group from the All Targets page. Redundancy groups support all group management features previously discussed.

Do not use redundancy groups if the group you want to model is an Oracle Real Application Clusters database, host cluster, HTTP server high availability group, or OC4J high availability group. Instead, you can use the following specialized target types for this purpose:

- Cluster
- Cluster Database
- HTTP HA Group
- OC4J HA Group

Managing Deployments

This chapter explains how Enterprise Manager Grid Control simplifies the monitoring and management of the deployments in your enterprise, and contains the following sections:

- Deployments Overview
- Hardware and Software Configurations
- Patching
- Cloning
- Provisioning

Deployments Overview

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, cloning, patching, bare metal provisioning, and policy management.

The following sections describe how your enterprise (and administrators) can benefit from Grid Control's deployment management features.

Note: To view a summary of deployments:

- 1. Navigate to the Grid Control Home page.
- 2. In the Deployments Summary section, set the View menu to Hardware, Operating System, Database Installations, or Application Server Installations.

Hardware and Software Configurations

Use Grid Control to view, save, track, compare, and search the configuration information stored in the Management Repository for individual hosts, databases, application servers, clients, and the entire enterprise.

This section contains the following subsections:

Collected Configurations

- Viewing Configurations
- Comparing Configurations
- The Enterprise Configuration
- Client Configurations
- Accessing Configuration Pages in Grid Control

Collected Configurations

Enterprise Manager Grid Control collects configuration information for all hosts and the managed targets on those hosts that have a running Management Agent. The agent periodically sends the configuration information to the Management Repository over HTTP or HTTPS, allowing you to view up-to-date configuration information for your entire enterprise through Grid Control.

Target Type	lected Configuration Information	
Host ¹	•	Hardware (includes memory, CPU, I/O device, and network information)
	•	Operating system (includes installed patches and patch sets)
	•	Oracle software (includes installed products and their components, patch sets, and interim patches applied using OPatch)
	•	Other software (includes all software registered with the operating system)
Database ²	•	Database and instance properties
	•	Initialization and System Global Area parameters
	•	Tablespace, datafile, and control file information
	•	Redo logs, rollback segments, and high availability information
	•	Licensing information
Application Server	•	Installation type and version
	•	Repository information
	•	URLs (for Management Agent and Application Server Control)
	•	Component information (includes HTTP Server, OC4J, and Web Cache)
	•	OPMN information (includes ports, SSL information, and log levels)
Client ³	•	Hardware
	•	Operating system (includes properties, file systems, patches)
	•	Software registered with the operating system
	•	Network data (includes latency and bandwidth to the Web server)
	•	Client-specific data that describes configuration for the browser used to access the client configuration collection applet
		Other client-oriented data items

Table 6–1 Collected Configurations for Various Targets

Target Type	Collected Configuration Information
Enterprise ⁴	Summary views for hardware, operating systems, Oracle Databases, Oracle Application Servers, and Oracle Collaboration Suite.
	Table 6–3 contains details on these summary views.

Table 6–1 (Cont.) Collected Configurations for Various Targets

¹ The default collection period for host configuration information is 24 hours.

² The default collection period for database configuration information is 12 hours.

³ Refer to "Client Configurations" in this chapter for more information.

⁴ Refer to "The Enterprise Configuration" in this chapter for more information.

Viewing Configurations

Using Grid Control, you can perform the following actions for targets such as hosts, databases, application servers, and clients:

- View the last collected and saved configuration
- Save configurations to a configuration file or to the Management Repository
- Search collected configuration data
- View the history of configuration changes
- Compare configurations (refer to "Comparing Configurations" in this chapter for more detailed information)

See Also: Grid Control online help for the pages described in Table 6–2

Target Type	Instructions for Viewing Configuration
Host	From the Home page for that host, click the Configuration subtab.
Database	From the Database Home page, click the Maintenance subtab, then click the Last Collected Configuration link under Software Deployments, Configuration.
Application Server	From the Application Server Home page, click the Administration subtab, then click the Last Collected Configuration link under Configuration.
Client	From the Deployments tab, click the Client Configurations link.
Enterprise	From the Deployments tab, select a summary view from the View list under Deployment Summary. Summary views are provided in Table 6–3.

Table 6–2 Viewing Configurations for Various Targets

Figure 6–1 Host Configuration Page

ORACLE Enterprise Manager 10g		Hon	ne Targets Deployment	Setup Preferences s Alerts Policies Job:	es <u>Help Loqout</u> s Reports
Collaboration Suites Hosts Databases Application Servers	Web Applications Services S	ystems Groups All Targe	ets		
lasti ilimthn0E us stasla som					
Host: IIInrbhub.us.oracle.com					
			Latest Data Collected From	Farget Oct 13, 2005 5:37:46 AM	I PDT (Refresh
Home Performance Targets Configuration					
		(Sour) (H	liston.) Compore Configurat	ion) (Compore to Multiple Co	nfigurations (lab)
		Jave (H	Compare configurat	Compare to Multiple Co	ningui acions(job)
Hardware	Operating System				
System Configuration i686 Hardware Provider Intel Based Hardware Number of CPUs 2 Memory Size (MB) 5897 Related Link <u>Hardware Details</u>	Operating Sy Pack Related	stem Red Hat Enterprise Lin ages <u>1117</u> Link <u>Operating System Detai</u>	nux AS release 3 (Taroon Up <u>ils</u>	date 4) 2.4.21 27.ELsmp (32-t	vit)
Oracle Software					
Product △	Oracle H	ome		Installation Time	
Oracle Application Server 10g 10.1.2.0.0	/home/sa	bburi/OraMid (OraMid)		Oct 5, 2005 12:28:59	AM
Oracle Application Server 10g 10.1.2.0.0	/home/sa	<u>bburi/installs/oracluster (oraclu</u>	ister)	Oct 4, 2005 6:11:16 P	M
Oracle Application Server 10g 10.1.2.0.2	/home/sa	bburi/midtier (oracleas_midtier)		Aug 31, 2005 1:35:11	AM
Oracle Application Server Integration B2B 10.1.2.0.2	/home/sa	bbun/OraMid (OraMid)		Oct 10, 2005 2:27:55.	AM
Oracle Application Server Integration InterConnect 10.1.2.0.2	/home/sa	bbun/OraMid (OraMid)		UCI 5, 2005 3:39:52 AM	
Oracle Application Server Integration InterConnect 10.1.2.0.2	/home/sa	bburi/midtier (oracleas_midtier)	1	Aug 31, 2005 3:13:42	AM
Uracle BPEL Process Manager 10.1.2.0.0	/nome/sa	bburi/installs/oracluster (oraclu	isterj	Uct 4, 2005 6:44:55 P	IM .
Uracle Database TUg TU.T.U.2.U	/private/s	nej 🐴	Apr 19, 2005 6:32:321	PIVI	
Oracle Management Agent 10.2.0.1.0	/scratch/s	sabburi/mm9_agent/agent10g (;	agent10g1)	Oct 7, 2005 6:03:50 A	м
OS-Registered Software				0.0.1.1.1.10.00017	No. 42 C
Breduct (Vender	Location	Installation Time	O Previous 1-10 of 1117	Next IU
4Suite 0 11 1 14	Ped Hat Jpc	Location N/A	Mar 8, 2005 10:32:09	AM	
20ne 4 13h-08	Red Hat Inc.	N/A	Mar 8, 2005 10:32:03	AM	
acl 2 2 3.1	Red Hat Inc	N/A	Mar 8, 2005 10:32:04	AM	
alchemist 1 0 27-1	Red Hat Inc	N/A	Mar 8, 2005 10:32:05	AM	
alchemist-devel 1 0 27-1	Red Hat Inc	N/A	Mar 8, 2005 10:38:46	AM	
am-utils 5:6.0.9-2	Red Hat, Inc.	N/A	Mar 8, 2005 10:36:33	AM	
amanda 2.4.4p1-0.3E	Red Hat, Inc.	N/A	Mar 8, 2005 10:36:32	AM	
amanda-client 2.4.4p1-0.3E	Red Hat, Inc.	N/A	Mar 8, 2005 10:36:35	AM	
amanda-devel 2.4.4p1-0.3E	Red Hat, Inc.	N/A	Mar 8, 2005 10:38:51	AM	
amanda-server 2.4.4p1-0.3E	Red Hat, Inc.	N/A	Mar 8, 2005 10:46:30	AM	
				© Previous 1-10 of 1117	💌 <u>Next 10</u> 🤅
Home Performance Targets Configuration					

Comparing Configurations

Grid Control gives you the tools to perform comparisons between configurations of the same target type. These comparisons are useful for quickly finding similarities and differences between two or more configurations.

You can compare:

- Two configurations in the Management Repository
- Two saved configuration files
- One configuration to multiple configurations
- A configuration in the Management Repository to a saved configuration file

When two target configurations are compared, all categories of collected configuration information are included. Grid Control presents the summary results of the comparison in a tabular format. More detailed information is available by drilling down from those summary results.

Comparisons between multiple configurations must be performed using the Enterprise Manager Job System.

See Also: "About Comparisons" in the Grid Control online help

The Enterprise Configuration

Grid Control offers several summary views of your enterprise that you can use to monitor the state of your host and target configurations. "Enterprise" refers to the complete set of hosts and targets for which configuration information is stored in the Management Repository. You can also search enterprise configuration information using predefined or custom searches.

Viewing the Enterprise Configuration

Table 6–3 lists the available enterprise configuration summary views.

Summary View	Description					
Hardware	Shows the different types of host hardware and the number of hosts using each hardware type.					
	From the summary view, you can drill down to:					
	 A list of hosts using each hardware type 					
	 The operating system running on each host 					
Operating Systems	Shows the different types of operating systems, the number of hosts running each type, and whether any operating system patches were applied.					
	From the summary view, you can drill down to:					
	 A list of hosts running each operating system 					
	 A list of the operating system patches, and whether or not they have been applied 					
Database and Application Server Installations	Shows the different versions of Oracle Databases or Application servers, respectively, the number of targets and installations for each version, and whether or not any interim patches were applied using OPatch.					
	From the summary view for each database or application server version, you can drill down to:					
	• A list of the instances					
	 A list of the installations and Oracle home directories 					
	 More information about the unique interim patches applied using OPatch 					
Collaboration Suite Installations	Shows the different versions of Oracle Collaboration Suite components, the number of targets and installations for each version, and whether or not any interim patches were applied using OPatch.					
	From the summary view, you can drill down to more information about Oracle Collaboration Suite components.					

Table 6–3 Enterprise Configuration Summary Views

See Also: "Viewing the Enterprise Configuration" in the Grid Control online help

Searching the Enterprise Configuration

In some cases, you may want to search your enterprise configuration to get answers to specific questions about your enterprise, such as:

Which hosts have not had operating system patch 105181-05 installed?

• Which hosts have an Oracle version 9.0.1.0.0 database installed, and in what Oracle home directories are those databases installed?

Enterprise configuration searches query the enterprise configuration views in the Management Repository to find configuration information that satisfies the specified search criteria.

Enterprise Manager provides two types of enterprise configuration searches:

Predefined Searches

Although these searches are predefined, you can modify the search criteria for each search, allowing you the flexibility to create specific search queries. Based on your search criteria, Grid Control creates the SQL query that searches the enterprise configuration views in the Management Repository.

Enterprise Manager provides the following predefined enterprise configuration searches:

- Search Oracle products, patch sets, and interim patches installed in Oracle homes
- Search software registered with the host operating system
- Search initialization parameter settings and setting changes
- Search tablespaces, datafiles, and recommended database settings
- Search database feature usage
- Search host operating system components, patches, property settings, and property changes
- Search host operating system and hardware summaries
- Search host file systems and network interface card configurations
- Search policy library
- User-Defined Searches

With a user-defined search, you specify the SQL query that searches the enterprise configuration views in the Management Repository. If you do not want to create the entire SQL query yourself, you can choose one of the predefined searches, make changes to the search criteria, then click **Search Using SQL** to display the SQL query that is executed. You can execute the query, view the results, then modify it and execute it again until it returns the desired results.

See Also: "Searching the Enterprise Configuration" in the Grid Control online help

Client Configurations

A "client" represents an end-user or customer system—a system that is not part of your own IT infrastructure. A "client configuration" represents the configuration data collected about the end-user's system. These configurations differ from the internal deployments that you manage using Grid Control.

The Client System Analyzer (CSA) application allows Web server administrators to collect and analyze data from end-user systems. The client data is collected by an applet, diagnosed, and sent back to the CSA application. You can either use the CSA application that comes pre-installed with Grid Control, or you can deploy CSA independently to your Web server.

Client System Analyzer in Grid Control

Using the pre-installed application allows you to collect client data without having to set up a separate Web server. The Management Agents collect, analyze, and upload the client data to the Management Repository. End users do not need login credentials to access Grid Control. Example usage scenarios include:

- End-users who call the Help Desk may be asked to navigate to the Out-Of-Box CSA page so that their system information is uploaded. The Technical Support Representative can then review the system information and offer solutions.
- The client's application can be changed to provide an "Upload my system information" link to the Client System Analyzer in the Grid Control application. The link can specify certain configuration parameters, such as the URL to return to after the Client System Analyzer runs.
- The client's application can be modified to redirect its users to the Client System Analyzer in the Grid Control page during login or at other points in the application. Collected information can then be used from within Grid Control to obtain various bits of information about the client systems. Examples include most popular browser versions, or systems that do not have a necessary Operating System patch applied or do not have enough RAM.

Client System Analyzer Deployed Independently

CSA can be deployed independently to any J2EE-capable Web server. This deployment strategy is appropriate when:

- Clients accessing CSA cannot reach or have limited access to a Grid Control deployment; for example, due to a firewall.
- Further customization to the CSA application is required, such as:
 - Custom rules can be supplied to the CSA application so that the end users have immediate feedback as to whether their systems satisfy certain constraints.
 - The behavior of the applet can be changed to collect additional information or to present end users with additional or different user interfaces.
 - The load on the Management Service Web servers needs to be reduced.

Both pre-installed and standalone types of deployments assign a configurable identifier called a Client Configuration Collection Tag to every client configuration collection. After the client configuration data has been collected by the client configuration collection applet and written to the Web server directory specified by the CSA application, you must configure Grid Control to collect the client configuration data and upload it to the Management Repository.

See Also: "Viewing a Client Configuration" in the Grid Control online help

"Configuring Enterprise Manager to Collect Client Configurations" in the Grid Control online help

Accessing Configuration Pages in Grid Control

To access the configuration pages in Grid Control, click the **Deployments** tab, then click the links found under the Configuration section:

- Search
- Compare Configurations

- Compare to Multiple Configurations (Job)
- View Saved Configurations
- Import Configuration
- Host Configuration Collection Problems
- Refresh Host Configuration
- Configuration History

These links take you to pages where you can search, view, and compare configurations for your various targets.

Patching

Manually applying software patches to maintain the latest and most secure IT environment can become a full-time job. With Enterprise Manager Grid Control's deployment management tools, you can quickly see the patches available for the components in your enterprise, find out which have not been applied and which are critical, 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 Oracle RAC, as well as Oracle Application Server and Oracle Collaboration Suite.

Using a direct link to Oracle's *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.

Enterprise Manager Grid Control provides the following patching features:

- Accessing Patching Pages in Grid Control
- Patching Oracle Software
- Linux Host Patching
- Managing Critical Patch Advisories

Accessing Patching Pages in Grid Control

To access the patching pages in Grid Control:

- Click the **Deployments** tab, then click the links found under the Patching section:
 - Patch Oracle Software
 - View Patch Cache
 - Patch Linux Hosts
- Click Setup, then click Patching Setup from the navigation pane. From this page, you can configure your settings for *MetaLink* and patching, proxy connection, and offline patching.

Patching Oracle Software

Grid Control's patching tools simplify the patching of Oracle software products. Some key features are listed in Table 6–4.

Feature	Description
Critical Patch Advisories	Lists all critical advisories with their corresponding areas of impact.
	Critical Patch Advisories also provides support for "remedies," in that you can select an advisory and view the calculated remediation paths from the context of that advisory, as well as the affected Oracle homes.
Online Patching	Allows you to connect to Oracle <i>MetaLink</i> through Grid Control, search and download the required patches, and apply.
Offline Patching	Allows you to perform all the patching activities from the Patch Cache. Even when you are not connected to Oracle <i>MetaLink</i> , you can search, download, and apply patches.
Oracle <i>MetaLink</i>	Searches the Oracle <i>MetaLink</i> Web site for Oracle patches and patch sets. Or use Grid Control to search after you provide your Oracle <i>MetaLink</i> Web site user name and password.
Patching Setup	Helps you configure MetaLink, patching, proxy connection, and offline patching settings.
	Note that if you are accessing a proxy server to get to Oracle <i>MetaLink</i> , you will need to provide proper authentication and credentials.
Stage and Apply	Helps you stage patches and apply them to the required Oracle homes. Also helps customize your patching operation by allowing you to specify custom pre/post-patching scripts that you may want to execute.
Standalone Database Patching	When patching standalone database by targets, provides additional options that allow you to shut down the database, apply SQL scripts (and start the database in Upgrade mode), and start up the database again.
Information Publisher	Provides a powerful central reporting framework that produces detail and summary reports on patch deployments and non-compliant installations. Supports both out-of-box and ad hoc reporting to satisfy different customer needs.
Shared Agent Patching	Automates patch applications on shared agents when they are NFS-mounted. During Shared Agent Patching, patches the central location where the agent is installed, shuts down and starts up the shared agents, and executes any pre/post-patching scripts (if specified).
Patching Validation	Helps you view the status of all the available patches and patch sets, then validate or invalidate particular patches.
Oracle Home Credentials	Allows you to override the preferred credentials required to access the selected Oracle homes. When overriding, you can choose to either specify one set of credentials for all Oracle homes, or specify different credentials for each home.

 Table 6–4
 Features for Patching Oracle Software

Grid Control Grid Control General Provisioning	Setup Preferences Help Loquut Home Targets Deployments Alerts Policies Jobs Reports
Select Patch Select Destination Set Credentials	Stage or Apply Schedule Summary
Patch: Stage or Apply Select option to stage the patch or apply the patch. © Stage	Cancel) Back Step 4 of 6 Next
The patch will be downloaded to the EMStagedPatches/4163362 subdirectory of the Oracle he Apply Patch: Apply Steps	ome.
The patch will be downloaded to the EMStagedPatches/4163362 subdirectory and then applie Be sure to review the patch ReadMe to determine the steps to apply the patch. Custom script: Apply Patch from Staged Location (optional)	d to the Oracle home. s can be optionally executed in the Pre-Patch and Post-Patch steps (View ReadMe)
Staged Location	
Custom Pre-Command/Script	🗆 Use sudo
Edit default bourne shell script to apply the patch	
Custom Post-Command/Script	🗆 Use sudo
IIP There are variables for target properties that can be used for parameters to any of the Hide Variables for Target Properties %oraclehome% The current home location being patched. The Oracle Home can be acces %emd_root% Target agent home location %perlbin% Location of perl binary used by Agent	e scripts above or for any directory location. ssed from the pre/post script by explicitly passing it to the script
Home Taraets Deployments Alerts Policies Jobs	Cancel Back Step 4 of 6 Next Reports Setup Preferences Help Logout

Figure 6–2 Stage or Apply Page in the Patch Wizard

Linux Host Patching

The "Patch Linux Hosts" tool, a powerful new feature in Grid Control, facilitates the automated management of Linux hosts in an enterprise. Use this feature to keep the Linux hosts in your enterprise up to date with vital software updates from your Linux vendor.

Patch Linux Hosts uses a reference-based grouped patching model, where you can create one or more reference package repositories containing up-to-date versions of various packages, and associate a group of Linux hosts with these package repositories.

The Patch Linux Hosts tool uses package repositories to patch the hosts as well as to monitor the deviation of the packages installed on the hosts. You can create different groups suited to your administrative needs and even associate different package repositories with different priorities for each group. You can independently control when and how often to update the hosts in the group, and how to determine their compliance with respect to the package repositories.

Note: To use this feature, make sure you have the following:

- Licenses for the Oracle Database Configuration Pack or Oracle Application Server Configuration Pack
- License for the Oracle Provisioning Pack
- "Operator" privileges on the host that you want to patch

Some additional patching features include:

Linux Host Patching Groups: You can group a set of Linux hosts together to update all at once. Each group is associated with one or more package repositories that contain all the certified and appropriate versions of the software packages for the hosts of that group. Each group is configured with an update schedule for a recurring job to run to update the hosts with the associated package repositories.

See Also: "Creating a New Linux Host Group" in the Grid Control online help

- **Compliance:** The compliance page contains information on the number of hosts in a group that are in compliance, as well as the number of "rogue" packages on a particular host. You can see metrics and charts to measure compliance for all Linux Host Patching Groups, as well as historical compliance data.
- Emergency Patching: This feature gives you the option of performing "forced" updates, outside of the established schedule, to immediately respond to critical bugs or security alerts for all configured Linux hosts.
- Undo Patching: This features adds flexibility by allowing you to roll back software to its previous stable version, or even de-install the unstable version completely if that software version was found to be unsuitable or to have a bug or security vulnerability.

Managing Critical Patch Advisories

You can use Grid Control to manage Oracle Critical Patch Advisories.

Some Oracle software patches have been identified as critical. To help ensure a secure and reliable configuration, all relevant and current critical patches should be applied to the appropriate Oracle homes in your enterprise.

To promote critical patch application, Grid Control performs an assessment of vulnerabilities by examining your enterprise configuration to determine which Oracle homes have not applied one or more of these critical patches. Grid Control provides a list of critical patch advisories and the Oracle homes to which the critical patches should be applied.

From the summary of patch advisories, you can navigate for more information about a particular patch, and get a list of the Oracle homes to which the patch has not been applied. Then you can launch the Grid Control Patch tool to download and deploy the patches to multiple targets.

See Also: "Managing Critical Patch Advisories" in the Grid Control online help

Applying Critical Patches in Offline Mode

The Critical Patch Facility enables administrators to simply download the Critical Patch metadata from *MetaLink* and upload it to the repository. This metadata can then be used by the "RefreshFromMetalink" job for performing Critical Patch calculations in offline mode. Administrators will be alerted to security updates—even if the Management Service is not connected to *MetaLink*.

Some data centers are not connected to the outside world. The Critical Patch Facility's offline mode makes it easy to keep your environment patched to the latest level. Subsequent patching can be done in offline mode as well, using the patch cache feature.

Accessing Critical Patch Advisories Pages in Grid Control

To access the Critical Patch Advisories pages in Grid Control:

- Click the **Deployments** tab, then click the link for the number of Patch Advisories in the Critical Patch Advisories for Oracle Homes section.
- Navigate to Grid Control Home page, then click the link for the number of Patch Advisories in the Critical Patch Advisories for Oracle Homes section.

This takes you to the Patch Advisories page, where you can view advisories, patch sets, and patches to apply, as well as affected Oracle homes and available "remedies."

Cloning

Enterprise Manager Grid Control gives you powerful cloning tools that simplify deployment management for your enterprise. Use cloning to 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 Oracle Real Application Clusters (RAC) by cloning an existing RAC Oracle home. Cloning saves time, reduces costly configuration and deployment expenditures, and increases reliability for your IT infrastructure components.

This section covers the following areas:

- Accessing Cloning Pages in Grid Control
- Cloning Oracle Homes
- Cloning Databases
- Cloning Oracle Real Application Clusters
- Out-of-Box Clonable Oracle Homes

Accessing Cloning Pages in Grid Control

To access the cloning pages in Grid Control, click the **Deployments** tab, then click the links found under the Cloning section:

- Clone Database
- Clone Oracle Home

These links invoke the cloning wizard, which guides you through the steps necessary to clone a database or an Oracle home.

Cloning Oracle Homes

You can use the Enterprise Manager Job System to clone existing Oracle home directories. Once you have configured an Oracle home into a desirable state—where you have chosen particular install options, applied required patches, and tested it—you can clone that Oracle home to one or more hosts using Grid Control's "Clone Oracle Home" tool.

There are many advantages to cloning an Oracle home:

- Saves time. When cloning a source Oracle home, all source home patches and settings are seamlessly cloned to the new home. Cloning is much faster than manually creating new homes and applying all source home patches and settings.
- **Clone to multiple destinations.** The Job System allows you to clone a source home to multiple hosts and homes in a single cloning job. This is more efficient

than connecting to each host, then running Oracle Universal Installer to install the homes.

- Reduces risk of errors. Cloned homes match the source home exactly; manually
 installing and patching homes can introduce discrepancies. For cloning, you do
 not have to remember all the settings and patches you used on the original source
 Oracle home.
- Web-based operation. Clone directly from Grid Control using a Web browser.

Note: You can clone any Oracle home that Enterprise Manager recognizes as a clonable home. See "Out-of-Box Clonable Oracle Homes" in this chapter for more information.

Cloning Databases

In addition to Oracle homes, you can clone Oracle Database instances. Once you have configured an Oracle Database into a desirable state, you can clone that database instance using Grid Control's "Clone Database" tool.

The Clone Database tool clones a database instance to an existing Oracle home. If you want to create a new Oracle home to clone the instance to, use the Clone Oracle Home tool to create a new Oracle home, then use the Clone Database tool to clone the instance to that cloned home.

There are many advantages to cloning an Oracle Database instance.

- Provides infrastructure for Data Guard management. Data Guard embeds
 Database Cloning to create a standby database (a clone of the primary database) as
 part of the Data Guard management process.
- Provides a testing environment for database application developers. The cloned database can be used for testing and debugging purposes while the original database is kept available.
- **Provides high availability for the source database while it is cloned.** The source database instance is kept up and running during the cloning operations.
- Saves time. You do not need to install a new database instance, then import the data to create an identical database. Also, you can clone the same instance to multiple Oracle homes using the saved working directory without connecting to the source database instance again.
- Backs up the whole database and restores it at any time. The saved working directory contains everything needed to restore the target database. You can save the backup on disk and create a new database from it at any time. No existing target database instance is required.

See Also: "About Cloning" in the Grid Control online help

Cloning Oracle Real Application Clusters

The Clone Oracle Home tool supports cloning of a RAC Oracle home in a multi-node Oracle RAC environment to a new single-node cluster.

In this scenario, the RDBMS Oracle RAC home will be cloned to form a single-node Oracle RAC cluster. The prerequisite is that the target node must already have Cluster Ready Services (CRS) installed on it. Since only single-node cloning is supported, you are not required to specify the node names. The Oracle RAC installation script (and consequently the Oracle RAC cloning script) identifies the node name from the host name.

If you clone an Oracle RAC home to multiple targets, each target constitutes a separate single-node Oracle RAC cluster.

Out-of-Box Clonable Oracle Homes

The Clone Oracle Home tool helps you to clone any Oracle home that Enterprise Manager recognizes as a clonable home.

Grid Control recognizes most Oracle products as "out-of-box clonable." This means that the 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. Figure 6–5 lists the Oracle products and versions that are "out-of-box clonable."

 Table 6–5
 Out-of-Box Clonable Oracle Products

Oracle Product	Versions
Database	10.1.x and 10.2
Oracle RAC Database	10.1.x and 10.2
Application Server	10.1.2.0.0, 10.1.2.0.2
Oracle Clusterware	10.2

If you want to clone the Oracle home of a database or application server that is not in Table 6–5 (for example, Oracle Database 9.2.0.x or Oracle Application Server 9.0.4.x), you must patch Grid Control with the appropriate "Clone Support Files" before starting the cloning operation. These Clone Support Files, available from Oracle*MetaLink*, are released as one-off patches that must be applied to Grid Control.

Downloading Clone Support Files

To locate these clone support files at OracleMetaLink:

- 1. Go to http://metalink.oracle.com and navigate to the Advanced Search option under Patches and Updates.
- 2. Select the Enterprise Manager Grid Control (emgrid) product from the list.
- 3. Select the appropriate release, platform, and patch type.
- **4.** Enter "Clone Support Files" in the Description field, and click **Search.** The Patch Release Notes include instructions for installing the updated clone support files in the Management Service home.

Provisioning

System administrators spend a significant amount of their time installing and configuring new software. Enterprise Manager Grid Control's automated provisioning tools dramatically reduce the time and expense to deploy new systems and allows you to scale-out to more systems at minimal incremental cost.

Enterprise Manager Grid Control's provisioning tools allows administrators to store pre-configured and certified base images in a central software library, from which they can deploy fully configured Linux systems to bare metal, or standardize deployment of "gold images." These new systems can be deployed with any desired software configuration, certified to the appropriate version and patch level—all with a few simple clicks.

This section contains the following subsections:

- Accessing Provisioning Pages in Grid Control
- Provisioning the Operating System
- Provisioning the Software Library
- Cloning Gold Images
- Provisioning Concepts

Accessing Provisioning Pages in Grid Control

Use the provisioning application to add staging servers, boot servers, Red Hat Package Manager (RPM) repositories, default images, software libraries, and network configurations to set up your provisioning environment.

To access the provisioning application, in Grid Control:

- 1. Click the **Deployments** tab.
- 2. Click the **Provisioning** subtab.

Provisioning the Operating System

Operating system provisioning is the simplest way to deploy stable, high-performing, cost-effective systems. Grid Control provides "bare-metal" provisioning of the Linux operating system using a standardized PXE booting process. The provisioning application also facilitates the deployment of additional software on top of the operating system. Grid Control provisioning is template-based and can assign hardware profiles, storage layouts, and network configurations to the new machines. You can also use vendor-provided scripts to provision third-party hardware, such as storage disks or load balancers.

Provisioning the Software Library

You can use the provisioning application to put together a default image of the minimum set of software packages required to provision a bare-metal hardware server. The provisioning application uses the Grid Control Job System to stage the default image onto the staging server in preparation for installation. The default image can be installed on any new machine that boots over the network. When a new machine is plugged in and the network booted, the boot server directs the machine to install the specified default image. After installation, the hardware server is configured with the operating system defined in the default image. Provisioning also deploys a Management Agent to the new hardware server so that it can communicate with the central Management Service.

Figure 6–3 Provisioning Software Library

ORAC Grid Cor	LC Enterprise Manager 10g					Hom	ne Targets D	Setup Preferences Help Logout Deployments Alerts Policies Jobs Reports
Provisi	oning							
Provision	a full stack of coffware from the operating syste	m up to the application	onto a hardi	wara c	orvor		Bog	To Defreched October 10, 2005 9:46:55 AM RDT Petrech
Co	a full stack of software non-the operating syste	acc Suites Accir	onto a naro	Hordy	erver. Voro Clu	otor Quite	Linotonoo Adm	inistration
	Components Directives Networks images Suites Assignments naroware Cluster Suite Instance Administration							
Define a	and configure the set of software components th	at may be included in an	image.					
View	Latest Version 🛛 🔽 🔽 🔽 💽	learch						
(View	(Edit) (Activate) (Deactivate) (Delete) (Pror	note)(Demote)(Create	Folder) C	reate (Component)		
Select	Name	Туре	Revision	Status	Maturity	Product nar	ne Product versio	n Description
0	🔻 Components							Components
0	App Server Gold Images							iAS components certified for redeployment
0	Clusterware Gold Images							Clusterware components certified for redeployment
0	🔻 Database Gold Images							Database components certified for redeployment
۲	Oracle DB 10g - 10.2	Oracle Database Clone	0.2	Active	Beta	Oracle DB	10.2.0.1	
0	Oracle DB 9i	Oracle Database Clone	0.1 4	Active	Production	Oracle DB	9.2.0.4	Production db for sales team
0	Disk Layouts							Disk layout library
0	Hardware Profiles							Hardware profile library
0	Home-Grown Application Gold Images							Home-grown app components certified for redeployment
0	Sales Tracking Application	Generic Component	0.1	Active	Production	SalesApp	3.0	Used by Jim's team
0	Sales Tracking Application (older version)	Generic Component	0.1	Ready	Production	SalesApp	2.2	Used by Jim's team prior to systems update
0	► OS Gold Images							Operating system components certified for redeployment
View	(Edit)(Activate)(Deactivate)(Delete)(Pror	note Demote Create	Folder C	reate (Component)		
Co	mponents <u>Directives</u> <u>Networks</u> Ima	<u>ges Suites Assig</u>	<u>inments</u>	Hardv	<u>vare Clu</u>	ister <u>Suite</u>	e Instance <u>Adm</u>	inistration
	Home Targ	ets Deployments /	Alerts Po	licies	Jobs R	eports Set	up Preferences	Help Logout

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See Also: Chapter 9, "Job System"

Cloning Gold Images

Cloning is an effective way to deploy tested and approved software images (commonly referred to as "gold images") from either a reference host or the centralized software library. You can use cloning to standardize the deployment of Oracle Database and Oracle Application Server instances—in both clustered and non-clustered environments.

For Oracle Application Server environments, the cloning feature has been enhanced to handle different types of middle-tier installations, including J2EE and WebCache, Portal and Wireless, and Business Intelligence middle tiers. Cloning allows you to deploy pre-patched software to multiple hosts in an efficient and scalable way.

One of Grid Control's most powerful features is the ability to create and extend Oracle Real Application Clusters and Oracle Application Server Cluster environments. From a single gold image of Oracle Clusterware and a single gold image of Oracle Real Application Clusters, you can build new clusters or add nodes to existing clusters. You can also easily convert a single instance database to a Oracle RAC database. Similarly, you can extend middleware by cloning application servers.

GRACLE Enterprise Manager 10g	Setup Preferences Help Logout
General Provisioning	Tiome raigets Deproyments Alerts Fonces jobs Reports
Source Home Source Settings Product Settings Destinations	s Pre/Post Scripts Schedule More
Clone Oracle Home: Product Settings	
Froduct Uracle Uatabase Ng 10.2.0.7.0 Source Host stact29.us.oracle.com Source Home Location /private/oraclehomes/db10.2	(Cance) (Back Step 3 of / Next)
Cluster Cloning Modes	
A clustered home may be cloned to either form a new cluster or to extend the source cluster. If extending th the same as the source.	e source cluster, the Oracle home location and Oracle home name will be taken to be
Clone to a new cluster New Oracle Home Location /private/oraclehomes/db10	
New Oracle Home Name OraDb10g_home1	
 Extend the source cluster Member Nodes stang07, stacd12 	
Destination Node Specification	
Enter the destination hosts and the respective node names.	
Host P	ublic Node Name
stang05.us.oracle.com 🚀 st	ang05
Add Another Row	
IIP Node name is usually the short hostname of the machine.	
	Cancel Back Step 3 of 7 Next
Home Targets Deployments Alerts Policies Jobs Rep Copyright © 1996, 2005, Oracle. All rights reserved. About Oracle Enterprise Manager ▷Show Management Pack Information	orts Setup Preferences Help Logout

Figure 6–4 Using Cloning to Extend an Oracle RAC Cluster

Provisioning Concepts

Table 6–6 describes some key concepts used in provisioning:

Concept	Description
Hardware Server	Applies to computers or workstations that have been installed into a rack in a data center or server farm.
	Hardware servers can also be any computer or workstation made available to automatic remote provisioning, such as performance tuning and benchmarking labs, cyber-cafes, training centers, or even desktop machines hosting office productivity tools within an enterprise.
Staging and Boot Servers	The staging server is an important part of the provisioning application. During the provisioning process, files associated with the image being provisioned are copied to a directory structure on the staging server in preparation for the network installation.
	The boot server allows network booting of the target machine that needs to be provisioned. After the hardware server reboots, the boot server instructs the machine to install the operating system and other software components that are laid out on the staging server. The Management Agent runs on the boot server.

Table 6–6 Key Concepts for Provisioning

Concept	Description				
Software Components	Refers to the Linux operating system software, Oracle software, and other third-party software applications with specific product release versions, patch versions, or software bundles that are packaged or released by a vendor. Software components are the fundamental building blocks of an image.				
	Components may refer to other components, and they can be reused in multiple images. In provisioning, you can classify a component according to its type/property. You can also define your own component and customize it according to the requirements by classifying it as a Generic Component type.				
	Such software components are individually maintained within the Oracle software library.				
Images	Refers to specific sets of software components, including the Linux operating system, when bundled together with other supporting elements (such as directives) for the purpose of installation.				
	The provisioning application helps you group, configure, and version such images within the software library. It also provides a basic set of software packages. The software components included in these packages have been determined by Oracle as the basic set of components required to create a default image.				
Default Image	The Default Image consists of a minimum set of software components required to provision any Linux machine; for example, ssh, rpm, sudo, kernel, Management Agent, and so on.				
	When a new hardware server (bare-metal machine) is connected to the enterprise network, and is booted for the first time via network boot protocol (PXE), this machine is automatically provisioned with the default image. When this hardware server comes up with the default image, you can use the Provisioning application to re-provision this machine with an image that meets your requirements.				
Directives	The set of executable instructions that run from a supported shell (for example, Bourne, Perl), or a programming language (for example, Java). Directives are contained within a file that may be stored in the Oracle Software Library and referenced from the software components that employ them. Directive files are typed according to the technology able to execute them.				
	The Provisioning application uses these directives associated with the software components to perform the actual work required during provisioning.				
Software Library	Stores various versions of the software binaries, and acts as a repository for the software components that may be provisioned to the hardware servers in your enterprise.				
	The Software Library is an infrastructure for storing and retrieving files and packages. The Oracle Software Library stores various versions of the software binaries and acts as a common repository for software components, scripts, and other files that can be used by provisioning, cloning, and future applications. The software library allows you to store, retrieve, update, and otherwise maintain all the software components that you create.				

Table 6–6 (Cont.) Key Concepts for Provisioning

Concept	Description
Assignments	Hold the necessary information to provision images to the target hardware servers. Assignments contain information about the image, network profile, stage server, boot server, and list of targets to be provisioned.
	Once an assignment is created, you can provision it by clicking Provision on the Assignments tab. Provision assignments immediately or schedule them for later.

 Table 6–6 (Cont.) Key Concepts for Provisioning

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 email) over a period of time.

The reporting framework allows you to create and publish customized reports: Intuitive HTML-based reports can be published via 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 out-of-box without additional setup and configuration.

This chapter covers the following topics:

- About Information Publisher
- Out-of-Box Report Definitions
- Custom Reports
- Scheduling Reports
- Sharing Reports

About Information Publisher

Information Publisher provides powerful reporting and publishing capability. Information Publisher reports present an intuitive interface to critical decision-making information stored in the Management Repository while ensuring the security of this information by taking advantage of Enterprise Manager's security and access control.

Information Publisher's intuitive user-interface allows you to create and publish reports with little effort. The key benefits of using Information Publisher are:

- Provides a framework for creating content-rich, well-formatted HTML reports based on Management Repository data.
- Out-of-box reports let you start generating reports immediately without any system configuration or setup.
- Ability to schedule automatic generation of reports and store scheduled copies and/or e-mail them to intended audiences.

 Ability for Enterprise Manager administrators to share reports with the entire business community: executives, customers, and other Enterprise Manager administrators.

Information Publisher provides you with a feature-rich framework that is your central information source for your enterprise.

Out-of-Box Report Definitions

The focal point of Information Publisher is the report definition. 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. Figure 7–1 shows an example of the Availability History (Group) report, displaying availability information for all members of a group.



Figure 7–1 Availability History (Group) Report

Generating this HTML report involved three simple steps:

Step 1: Click Availability History (Group) in the report definition list.

Step 2: Select the group for which you want to run the report.

Step 3: Click Continue to generate the fully-formed report.

Supplied report definitions are organized by functional category with each category covering key areas. The following table lists the major functional categories and areas covered by out-of-box reports.

Functional Category	Areas Covered						
Deployment and Configuration	Client Configurations Hardware Operating System Linux Operating System Patching Application Server Configuration Oracle Application Server Software Oracle Database Configuration Oracle Database Software Oracle Home Patch Advisories Oracle Home Patch History						
Enterprise Manager Setup	Management Pack Access						
Monitoring	Alerts and Policy Violations Availability History Dashboards Disabled Policies Service Alerts Service Performance and Usage Service Tests Web Application Page Performance Web Application Request Performance						
Security	Web Application Transaction Performance Oracle Database Audit Oracle Database Privileges Security Policy Overview						
Storage	Oracle Database Space Issues Oracle Database Space Usage						

 Table 7–1
 Predefined Report Definitions

Custom Reports

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 Information Publisher's Create Like function to create a new report definition based on one of the existing reports definitions.

Creating Custom Reports

To create custom reports:

- 1. Choose whether to modify an existing report definition or start from scratch. If an existing report definition closely matches your needs, it is easy to customize it by using Create Like function.
- **2.** Specify name, category, and sub-category. Grid Control provides default categories and sub-categories that are used for out-of-box reports. However, you can categorize custom reports in any way you like.
- **3.** Specify any time-period and/or target parameters. The report viewer will be prompted for these parameters while viewing the report.
- **4.** Add reporting elements. Reporting elements are pre-defined 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.
- **5.** Customize the report layout. Once you have assembled the reporting elements, you can customize the layout of the report.

Report Parameters

By declaring report parameters, you allow the user to control what data is shown in the report. There are two types of parameters: target and time-period.

Example: If you are defining a report that will be used to diagnose a problem (such as a memory consumption report), the viewer will be able to see information for their target of interest.

By specifying the time-period parameter, the viewer will be able to analyze historical data for their period of interest.

Analyzing Historical Data

Information Publisher allows you to view reports for a variety of time-periods:

- Last 24 Hours/ 7 Days/ 31 Days
- Previous X Days/ Weeks/ Months/ Years (calendar units)
- This Week/ This Month/ This Year (this week so far)
- Any custom date range.

Report Elements

Report elements are the building blocks of a report definition. In general, report elements take parameters to generate viewable information. For example, the Chart from SQL element takes a SQL query to extract data from the Management Repository and a parameter specifying whether to display the data in the form of a pie, bar, or line chart. Report elements let you "assemble" a custom report definition using the Information Publisher user interface.

Information Publisher provides a variety of reporting elements. Generic reporting elements allow you to display any desired information, in the form of charts, tables or images. For example, you can include your corporate Logo, with a link to your corporate website. Monitoring elements show monitoring information, such as availability and alerts for managed targets. Service Level Reporting elements show availability, performance, usage and achieved service levels, allowing you to track compliance with Service Level Agreements, as well as share information about achieved service levels with your customers and business executives.

The following table lists the report elements that are supplied with Information Publisher.

Report Element	Description						
Generic Report Elements	Element Descriptions						
Chart from SQL	Renders a line, pie or bar chart given a SQL or PL/SQL query.						
Image Display	Displays a supplied image.						
Separator	Displays a horizontal separator.						
Styled Text	Displays text using a chosen style.						
Table from SQL	Displays results of a SQL or PL/SQL query as a table.						
Service Level Reporting Elements	Element Descriptions						
Service Level Details	Displays Actual Service Level achieved over a time-period and violations that affected it.						

Table 7–2 Report Elements

	Liements						
Report Element	Description						
Service Level Violation	Displays details on Service Level violations for a set of services over a given time-range.						
Service Level Summary	Displays information on Service Levels over different time-ranges.						
Services Monitoring Dashboard	Displays the Services Monitoring Dashboard showing status, performance, usage and Service-Level information for a set of Services.						
Service Status Summary	Displays information on Services' Current status, Performance, Usage and Component Statuses.						
Enterprise Manager Setup Element	Element Descriptions						
Management Pack Access	Displays licensable targets with management pack access.						
Monitoring Elements	Element Descriptions						
Application Server Clusters	Displays monitoring and configuration information for Application Server Clusters.						
Application Server Targets	Displays monitoring and configuration information for Application Server Targets.						
Availability Timeline (Group)	Displays availability of targets over a period of time. Groups, Systems, Redundancy Groups and Clusters are supported.						
Metric Details	Displays a graph of a given metric for a set of targets of the same time, over a given time-period.						
Open Alerts	Displays details for outstanding alerts for a user-customizable set of targets and severities.						
Oracle HTTP Traffic	Displays Oracle HTTP/HTTPS Traffic information.						
Service Metric Details	Displays graphs of Performance and Usage metrics for a given service.						
System Monitoring Dashboard	Displays status and alert information for a Group or System.						
Web Application Page Performance	Renders page performance information for a given Web Application.						
Web Application Page Performance By Category	Web Application Page Performance By CategoryRenders page performance information by domain/region/visitor/web server.						
Web Application Request Performance	Displays details about request performance of a web application.						
Web Application Transaction Performance Details	Displays transaction performance details for a given transaction.						
Web Application Transaction Performance Summary	Displays summary information about transaction performance.						
Web Application URL Performance	Displays time series chart showing the performance for a given URL.						

Table 7–2 (Cont.) Report Elements

Scheduling Reports

Enterprise manager allows you to view reports interactively and/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.

Flexible Schedules

Grid Control provides the following scheduling options:

- One-time report generation either immediately or at any point in the future
- Periodic report generation
 - Frequency: Any number of Minutes/ Hours/ Days/ Weeks/ Months/ Years
 - You can generate copies indefinitely or until a specific date in the future.

Storing and Purging Report Copies

Enterprise manager allows you to store any number of scheduled copies for future reference.

You can delete each stored copy manually or you can set up automated purging based on either the number of stored copies or based on retention time. For example, you can have Enterprise Manager purge all reports that are more than 90 days old.

E-mailing Reports

You can choose for scheduled reports to be e-mailed to any number of recipients. You can specify reply-to address and subject of the e-mail.

Sharing Reports

Information Publisher facilitates easy report sharing with the entire user community. Enterprise Manager administrators can share reports with other administrators and roles. However, there may be cases when you need to share reports with non-Enterprise Manager administrators, such as customers and/or business executives. To facilitate information sharing with these users, Enterprise Manager renders a separate reporting website that does not require user authentication.

Note: To ensure that no sensitive information is compromised, only Enterprise Manager administrators with a special system privilege are allowed to publish reports to the Enterprise Manager reports website.

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 have an option of allowing report viewers to see the report with the owner's privileges. For example, as a system administrator you might want to share a host's performance information with a DBA using your server, but you do not want to grant the DBA any privileges on your host target. In this case, you could create a host performance report, and allow the DBA to view it with your privileges. This way, they only see the information you want them to see, without having access to the host homepage.

Managing Compliance

This chapter explains how Enterprise Manager Grid Control verifies that applications in your enterprise comply with preestablished standards. This chapter contains the following sections:

- Compliance Overview
- Compliance Management
- Setting Up Compliance Evaluations
- Policy Groups

Compliance Overview

To have your enterprise run efficiently, it must adhere to standards that promote the best practices for security, configuration, and storage. Once these standards are developed, you can apply and test for these standards throughout your organization; that is, test for compliance. Compliance is the conformance to standards, or requirements, or both.

Using Enterprise Manager Grid Control, you can test the conformance of your targets for security standards, and configuration and storage requirements.

By continually testing your systems, services, and targets, you are ensuring the best possible protection and performance your system can have.

Compliance is two-fold: evaluating the compliance of your targets, and the policy group lifecycle management. The following sections describe these two concepts.

Note: To view the compliance features:

- 1. Navigate to the Grid Control Home page.
- **2.** Click the **Compliance** tab to access information regarding the policies, policy groups, and security statistics for your enterprise.

Compliance Management

Oracle provides two types of compliance management: policies and policy groups. Policies and policy groups define the optimal configurations of systems.

Policies and policy groups are similar in purpose, that is, they both provide rules against which managed entities are evaluated. However, there are differences:

 Rules within a policy group are managed as a set. They are viewed, maintained, evaluated, and reported, in the context of a policy group. Policy rules are not evaluated as a set. Policy rules are viewed, maintained, and evaluated as standalone entities.

Whether you use the out-of-box policies and policy groups defined by Oracle or customize 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.

This section contains the following subsections:

- Accessing Compliance Management Pages in Grid Control
- Investigating Compliance Violations
- Assessing Security
- Compliance Violations Reports

Accessing Compliance Management Pages in Grid Control

To access compliance management pages in Grid Control:

- Click the **Compliance** tab to view violations associated with policies and policy groups.
 - Click the **Policies** tab for a roll-up view of all policy violations across all targets. From this tab, you can also access policy associations, the policy library, and errors.
 - Click the Policy Groups tab to view the list of policy groups against which there are violations. From this tab, you can also access the library of policy groups and policy group evaluation errors.
 - Click the **Security At a Glance** tab for a roll-up view of security statistics across the enterprise.
- Navigate to the Home page for a particular target. The links in the Policy Violations section display the number of policy violations according to severity level. Click the links to drill down to critical, warning, and informational policy violations for that target.

Investigating Compliance Violations

Here are a few suggestions for investigating compliance violations. Attend to the most critical violations or those that have the biggest impact on your enterprise.

- Study the statistics on the Enterprise Manager Grid Control Home page. In particular, look at the statistics in the All Targets Policy Violations section. The policy violations with "Critical" severity should be dealt with first.
- Study the security-related violations reported in the Security Policy Violations section. Non-compliance with these policy rules can greatly impact the security of your enterprise.
- Address targets that have the lowest compliance scores.
- For the policy violations of a particular target, examine the home page for that target. The Policy Violations section provides overview information, but it also gives you access to the Policy Trend Overview for that target.
- To deal with policies regardless of the target, navigate to the **Compliance** tab and then click **Policies.** Using this tab, you have access to all the policy violations for

the enterprise, the policy associations, the policy rule library which lists all the policies, and policy evaluation errors.

- Navigate to the Policy Violations page and enter an appropriate value in the "Most Recent Violation within *n* days" filter.
 - Suppress violations if you want to handle the violations at a later time.
- To deal with policy groups regardless of the target, click Policy Groups. Using this tab, you have access to all the evaluation results for the enterprise, the policy group library, and policy group evaluation errors.
 - Navigate to the Evaluation Results page for a particular policy group. In the navigation tree, click the name of the policy group and a summary page lists all the targets along with the number of violations.
 - Navigate to the Trend Overview page to see charts relating to the number of targets evaluated, the average violation count per target, number of targets by compliance score, and the average compliance score.

See Also: "About Policies" and "About Policy Groups" in the Grid Control online help for an overview of policies and policy groups and pointers to more information about viewing and managing policies and policy groups.

Assessing Security

Security policies are available for many targets, including Host, Database Instance, Cluster Database, Listener, OC4J, Oracle HTTP Server, and Web Cache.

Security policy groups are available for Database Instance, Cluster Database, and Listener.

Because security is crucial to the stability of your enterprise, security statistics are displayed prominently in Grid Control. On the Enterprise Manager Grid Control Home page, and many target home pages, there is a separate section displaying the security statistics for the target. This allows you to pay close attention to the security health of the enterprise.

In addition, the Security At a Glance feature provides an overview of the security health of the enterprise for all the targets or specific groups. This helps you to quickly focus on security issues by showing statistics about security policy violations and noting the critical security patches that have not been applied.

Viewing Compliance Evaluation Results

To view the results of an evaluation, use any or all of the following:

- Use the Evaluation Results page accessed through the Policy Groups tab
- Study the statistics in the Policy Violations section of the target's home page
- Use the Policy Trend Overview page and the Trend Overview page available from the Evaluation Results page
- Access the Security At a Glance page

Compliance Violations Reports

The Policy Violations reports and Policy Groups reports are available through the Reports feature. These reports deal with non-suppressed violations for all targets, groups, and a single target. The reports also deal with compliance summary for a

group and target. In addition, suppressed violations are reported according to all targets, groups, and a single target.

See Also: Chapter 7, "Information Publisher"

Setting Up Compliance Evaluations

Compliance evaluation is the process of testing the policy and policy group rules against a target and recording any violations in the Oracle Management Repository.

Scheduling an Evaluation

For the evaluation to take place, you must enable the evaluation in one of two ways:

- For a policy, use the Metric Thresholds option on the Metric and Policy Settings page
- For a policy group, use the Policy Group Library page

Out-of-Box Policies and Policy Groups

Oracle provides a number of out-of-box policies (also known as policy rules) and policy groups for various targets.

When you add a target to Enterprise Manager, that target automatically uses predefined policy rules for that type of target. For example, Oracle provides security, configuration, and storage policy rules for the database instances and cluster databases. Security and configuration policy rules are provided for hosts.

Note: Policy Groups are *not* automatically associated with targets.

Customizing Policies

You can customize policies by editing 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 a policy's evaluation (when possible).

See Also: Online help for compliance scores

Defining Corrective Actions

One of the features of customizing policies is the ability to define corrective actions. Corrective Actions is a special type of job that executes automatically in response to a policy violation.

Corrective Actions utilize the Enterprise Manager Grid Control Job System and, like regular jobs, can consist of multiple steps, can be run with arbitrary host and target credentials, and reports its success or failure and its output to the Management Repository.

See Also: Chapter 9, "Job System"

Using Templates for Monitoring

A monitoring template defines all Enterprise Manager parameters you would normally set to monitor a target. Monitoring templates simplify the task of setting up monitoring for large numbers of targets by allowing you to specify the monitoring and policy settings once and applying them as often as needed. You can save, edit, and apply these templates across one or more targets or groups.

See Also: "Monitoring Templates" in Chapter 4, "System Monitoring"

Policy Groups

Policy groups serve as standards by which targets are measured. Policy groups report deviations and enable closed loop remediation by optionally taking action to bring systems back into compliance. Oracle provides the following policy groups:

- Secure Configuration for Oracle Database
- Secure Configuration for Oracle Real Application Cluster
- Secure Configuration for Oracle Listener

These standards represent best practices and allow you to maintain consistency across enterprise systems and configurations. The trend analysis feature allows fine grained tracking of compliance progress over time.

The following sections provide the highlights of each policy group.

Secure Configuration for Oracle Database

This policy group adheres to the security standards available for the Oracle Database. The categories deemed the most important for this policy group are:

Post Installation

These rules ensure that a database is not compromised by having a default database server account left open that uses its default password.

Oracle Directory and File Permissions

These rules ensure that access should be restricted, making it more difficult for an operating system user to attack the database.

Oracle Parameters Settings

These rules ensure database initialization parameter settings are secure.

Database Password Profile Settings

These rules ensure database profile settings are correctly defined. Oracle password management is controlled through the use of user profiles which are then assigned to database users, enabling greater control over database security.

Database Access Settings

These rules ensure that access to and use of the database at the object level is restricted such that users are only given those privileges that are actually required to efficiently perform their jobs.

Secure Configuration for Oracle Real Application Cluster

This policy group adheres to the security standards available for the Oracle Cluster Database. The categories deemed the most important for this policy group are:

Post Installation

These rules ensure that a database is not compromised by having a default database server account left open that uses its default password.

Oracle Directory and File Permissions

These rules ensure that access should be restricted, making it more difficult for an operating system user to attack the database.

Database Password Profile Settings

These rules ensure database profile settings are correctly defined. Oracle password management is controlled through the use of user profiles which are then assigned to database users, enabling greater control over database security.

Database Access Settings

These rules ensure that access to and use of the database at the object level is restricted such that users are only given those privileges that are actually required to efficiently perform their jobs.

Secure Configuration for Oracle Listener

This policy group adheres to the security standards available for the Oracle Listener. The categories deemed the most important for this policy group are:

Oracle Directory and File Permissions

These rules ensure that access should be restricted, making it more difficult for an operating system user to attack the database.

Network Configuration Settings

These rules ensure that network configuration parameter settings are secure.

9

Job System

Because 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.

This chapter describes the Job System in the following sections:

- What Is a Job?
- Using and Defining Jobs
- Analyzing Job Activity
- Jobs and Groups
- Sharing Job Responsibilities
- Job Library
- Job Notifications
- Multitask Jobs

What Is a Job?

The Enterprise Manager Job System serves a dual purpose:

- Provides for the automation of many administrative tasks, for example, backup, cloning, and patching
- Allows users to create their own jobs using their own custom OS and SQL scripts

A job is a unit of work that you define to automate commonly-run tasks. One of the advantages of jobs 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.

The Job Activity page (Figure 9–1) is the hub of the Job System. From this page you can:

Search for existing job runs and job executions

You can restrict the search by name, owner, status, scheduled start, job type, target type, and target name.

Create a job

- View, edit, create like, suspend, resume, stop, and delete a run
- View, edit, create like, suspend, resume, retry, stop, and delete an execution

Figure 9–1 Job Activity Page

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Job functionality is not restricted to only the Jobs tab. You can access job functionality while you are working on deployments and databases. On the Deployments page you can create a job to clone a database and another job to clone an Oracle home. While you are working with your databases, you can clone a database by clicking **Deployments** in the Related Links section.

See Also: Chapter 6, "Managing Deployments"

What Are Job Executions and Job Runs?

Job executions are usually associated with one target, for example, a backup job on a particular database. When a job is run against multiple targets, each execution may execute on one target.

Job executions are not always a one-to-one mapping to a target. 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. For example, say that you run a backup job against 100 databases. Typical questions would be: Were all the backups successful? If not, which backups failed? If this backup job runs every week, you would want to know each week which backups were successful and those that failed.

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. Using the backup example, if you have a backup job against 100 databases on November 5th, then you will have a November 5 job run. The job table that shows the job run will provide a roll-up of the status of those executions.
Differences Between Job Executions and Job Runs

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. This alleviates the need to create a new job for that failed execution. When you use the Retry operation in the Job System, Enterprise Manager provides links from the failed execution to the retried execution and vice versa, should it become useful to retroactively examine the causes of the failed executions.

See Also: For more information on job executions and runs, refer to Enterprise Manager Grid Control online help.

Using and Defining Jobs

Enterprise Manager provides predefined job tasks for database targets and deployments. A job task is used to contain predefined, unchangeable logic—for example, patch an application, back up a database, and so on.

The predefined database jobs include backup, export, and import. The predefined jobs associated with deployments include patching, cloning Oracle homes, and cloning databases.

In addition to predefined job tasks, you can define your own job tasks by writing code to be included in OS and SQL scripts. The advantages of using these scripts include:

- When defining these jobs, you can use target properties.
- You can submit the jobs against many targets or a group. The job automatically keeps up with the group membership.
- For host command jobs, you can submit to a cluster.
- For SQL jobs you can submit to a Real Application Cluster.

Using the Job System, you can create jobs using the following job types:

- CloneHome: Copies the known state of an Oracle home. For example, after you
 have an Oracle home in a known state (you have chosen particular install options
 for it, applied required patches to it, and tested it), you may want to clone this
 Oracle home to one or more hosts.
- Host Command: Use to execute a user-defined OS script.
- **Patch**: Finds and applies a patch or patch set.
- Refresh from MetaLink: Use to be notified of critical patch advisories.
- SQL script: Use to execute a user-defined SQL script.

See Also: Chapter 6, "Managing Deployments" for information about deployment jobs

Chapter 13, "Database Management" for information about the Database Scheduler

"About Jobs," "About Scheduler," "About Cloning," and "About Patching" in the Enterprise Manager Grid Control online help.

Analyzing Job Activity

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. Figure 9–2 shows the All Targets Jobs information on the Grid Control Console Home page.



Figure 9–2 Summary of Target Jobs on the Grid Control Console Home Page

This information is particularly important when you are examining jobs that execute against hundreds or thousands of systems. You can determine the job executions that have failed. By clicking the number associated with a particular execution, you can drill down to study the details of the failed job.

Jobs and Groups

In addition to submitting jobs to individual targets, you can submit jobs against a group of targets. Any job that you submit to a group is automatically extended to all its member targets and takes into account the membership of the group as it changes.

For example, if a Human Resources job is submitted to the Payroll group, then if a new host is added to this group, the host automatically becomes part of the Human Resources job. In addition, if the Payroll group is composed of diverse targets, for example, databases, hosts, and application servers, then the job only runs against applicable targets in the group.

By accessing the Group Home page, you can analyze the job activity for that group.

See Also: Chapter 5, "Group Management"

Sharing Job Responsibilities

To allow you to share job responsibilities, the Job System provides job privileges. These job privileges allow you to share the job with other administrators. Using privileges, you can:

- View access to the administrators who need to see the results of the job
- Give full access to the administrators who may need to edit the job definition

These privileges can be granted on an as-needed basis.

See Also: "Roles" in Chapter 2, "Setting Up Enterprise Manager"

Job Library

Once you have defined jobs, you can save these jobs to the Job Library. Use the Library as a repository for frequently used jobs. Analogous to active jobs, you can grant View or Full access to specific administrators.

In addition, you can use the Job Library to store:

- Basic definitions of jobs, then add targets and other custom settings before submitting the job
- Jobs for your own reuse or to share with others. You can share jobs using views or giving full access to the jobs.

Job Notifications

The Grid Control Notification system allows you to define a notification rule to send e-mail to the job owner when a job enters a chosen state (Scheduled, Running, Suspended, Completed, or Problems). New functionality has been added to the Notification system (rule creation) that allows you to easily associate specific jobs with a notification rule.

See Also: "Notifications" in Chapter 4, "System Monitoring"

Multitask Jobs

Multitask 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 ad hoc operations on one or more targets of the same or different type.

You can create a multitask job consisting of two tasks, each a different job type, each operating on two separate (and different) target types. For example,

- Task 1 (OS Command job type) performs an operation on Host 1.
- If Task 1 is successful, run Task2 (SQL Script job type) against Database 1 and Database 2.

The Job System's multitask functionality makes it easy to create extremely complex operations.

Extending Enterprise Manager

Enterprise environments consist of a wide variety of components: OS platforms, hardware, software, network, and storage devices. All of these components work in concert to deliver critical information and functionality required to keep enterprise operations performing optimally and providing information to make important business decisions. While Oracle Enterprise Manager Grid Control allows you to monitor and manage a variety of components out-of-box, you may want to monitor third party components or custom applications specific to your environment. For example, with this release, you can seamlessly monitor WebLogic and WebSphere application servers (refer to "Third-Party Target Management" in Chapter 17, "Host and Third-Party Target Management" for more information). Additional plug-ins are being developed and will be announced as they become available.

In addition, you can use the same mechanism used by Oracle and partners to extend Enterprise Manager to monitor custom components via modular Management Plug-ins. Once a plug-in is defined, you use the Enterprise Manager Grid Control console to deploy the new plug-in throughout your enterprise environment.

This chapter discusses the following topics:

- Benefits of Extending Enterprise Manager
- Developing Management Plug-ins
- Management Plug-in User Interface

Benefits of Extending Enterprise Manager

Extending Enterprise Manager for monitoring additional components provides the following benefits:

- Centralize management information in a single console: When deployed, components defined by the Management Plug-in automatically appear in the Grid Control console. Being able to monitor all targets in your environment provides a consolidated view of your entire enterprise, thus allowing you to monitor and manage all components from a central point.
- Extend Enterprise Manager's monitoring and management features to non-Oracle components: Newly added components automatically inherit Enterprise Manager's powerful monitoring and management features, such as: alerts, policies, blackouts, monitoring templates, groups/systems, configuration management, and enterprise reporting.
- Comprehensive Service-Level Management: By managing all of your enterprise components with Enterprise Manager Grid Control, you can more fully utilize the Service-Level Management features offered in Enterprise Manager Grid Control.

See Also: Chapter 12, "Service Management"

Developing Management Plug-ins

Management Plug-ins allow you to seamlessly monitor and manage non-Oracle components from the Grid Control console by providing an easy way to specify new classes of components for Enterprise Manager to monitor. Once you have created the new Management Plug-in, you then deploy it to Management Agents within your enterprise.

The complete lifecycle of extending Enterprise Manager consists of five stages:

- 1. Design your Management Plug-in.
- **2.** Develop the plug-in.
- **3.** Validate the plug-in.
- 4. Package the plug-in into a portable archive file.
- **5.** Deploy the Management Plug-in throughout your Enterprise Manager environment.

About the Oracle Management Agent

In order to understand what it takes to develop a Management Plug-in, it is important to study the architecture of the Oracle Management Agent. Oracle Management Agents are deployed on each host, and are responsible for monitoring all components on that host. Out-of-box, the Management Agent knows how to monitor default target types, such as the Oracle Database. In order to monitor a particular target type, the agent uses two XML files:

- Target Type Metadata File: specifies the metrics that should be monitored for this target type, and methods to retrieve those metrics.
- Target Type Default Collections File: specifies the default collection intervals and alert thresholds for each of the target metrics.

For each metric, the Management Agent retrieves the appropriate data using fetchlets, which are parameterized data access mechanisms that take arguments for input and return formatted data. The following table lists available fetchlets.

Fetchlet	Description
OS Command	Obtains metric data by executing OS commands (either individually or from scripts) that return a standard out data stream.
SQL	Executes a given SQL statement on an Oracle Database as a given user.
JDBC	Executes SQL against any JDBC-enabled database.
SNMP (v.1)	Polls an SNMP agent on a given host for corresponding instances given a list of object identifiers (OIDs). An object identifier (OID) corresponds to either a MIB variable instance or a MIB variable with multiple instances.
HTTP Data	Contacts a Web Server at a URL, and parses returned data.
URLXML	Obtains the XML content of a given URL, and extracts information based on a given pattern.

Table 10–1 Fetchlets

Fetchlet	Description
WBEM	Accesses a CIMOM and retrieves requested information using the specified CIM class.
JMX	Fetches data from a JMX-enabled server
Java Wrapper	Executes Java code to return data.
SQL Timing	Times a SQL operation.
URL Timing	Gets the contents of a given URL, timing not only the base page source but any frames or images in the page as well.

Table 10–1 (Cont.) Fetchlets

The Agent uses the information in the Target Type Default Collections file to determine, for each target, the metrics that need to be collected and the corresponding collection frequency. It then uses information in the Target Type Metadata Files to determine how to collect the data. Based on this information, the Agent uses the appropriate fetchlet to retrieve data from the monitored targets.

Designing your Management Plug-in

The design stage of the management plug-in creation process involves defining the monitoring parameters required to accurately monitor and manage your new component. This involves:

- Identifying performance and configuration metrics that should be collected.
- Determining how often each metric should be collected. Oracle recommends that the collection frequency for any metric should not be less than once every five minutes.
- Based on customer-specific operational practices, specifying default warning and/or critical thresholds on these metrics. Whenever a threshold is crossed, Enterprise Manager generates an alert, informing administrators of potential problems.

Developing Your Management Plug-in

Developing a plug-in based on the requirements identified in the design phase involves:

- **1.** For each metric, determining the appropriate component-level API that exposes the metric.
- **2.** Mapping a method used to retrieve a particular metric to a 'Fetchlet' provided with the Agent, writing appropriate scripts to retrieve metrics, and determining input parameters for fetchlets. For example, the OS fetchlet will require an OS script, and a URL Timing fetchlet will require a URL parameter.
- **3.** Defining two XML files (Target Type definition file and Default Collections file) that the agent will use to monitor the new target type. This involves declaring appropriate metrics, metric collection methods, collection frequencies, and metric thresholds in the specified XML format.

The example below is an excerpt from a target-type Metadata file showing a sample metric declaration for collecting CPU Utilization. The OS Command fetchlet is used to retrieve the metric value by running an existing Perl script.

Example 10–1 Target Type Metadata File Excerpt

```
<Metric NAME="Load" TYPE="TABLE">
    <TableDescriptor>
        <ColumnDescriptor NAME="CPU Utilization" TYPE="NUMBER"/>
     </TableDescriptor>
     <QueryDescriptor FETCHLET_ID="OS">
<Property NAME="scriptsDir" SCOPE="SYSTEMGLOBAL"> scriptsDir </Property>
<Property NAME="script" SCOPE="GLOBAL"> %scriptsDir </Property>
</QueryDescriptor>
</Metric></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion></Propertion>
```

Once a metric has been defined in the Target Type Metadata file, the next step is to define metric collection frequency and appropriate metric thresholds. The following example includes a sample collections file for the *MyDatabase* target type, where CPU Utilization is collected every 10 minutes, and a critical alert should be generated when the metric value is greater than ("GT") ninety percent.

Example 10–2 Target Type Default Collections File

```
<TargetCollection TYPE="MyDatabase">
  <CollectionItem NAME="Load">
    <Schedule>
    <IntervalSchedule INTERVAL="10"/>
    </Schedule>
    <Condition column_name ="CPU Utilization" critical="90" operator="GT"/>
  </CollectionItem>
</TargetCollection>
```

Validating the Plug-in

Successful integration of new target types with the Enterprise Manager framework relies on accurate XML. It is essential that the Target Type Metadata file and Default Collections file are syntactically and structurally correct. It is also critical to simulate a runtime data collection for a new target type to ensure that proper data is collected, as well as ensuring that there are no adverse performance effects. To facilitate the validation process, Enterprise Manager provides a tool call ILINT.

Packaging the Plug-in

You package all of the files associated with a Management Plug-in (metadata files, monitoring scripts, report files) into a Management Plug-in Archive (MPA) via EM CLI. The MPA is a ".jar" file that contains one or more Management Plug-ins, thus facilitating easy import/export of plug-ins.

To run the EMCLI, open a terminal window on any machine where the EMCLI client is installed and execute the add_mp_to_mpa verb. The following example demonstrates verb usage:

Example 10–3 Using the EMCLI to create a Management Plug-in Archive

After you have added one or more Management Plug-ins to the archive file, you are ready to deploy your plug-in to Management Agents in your enterprise.

Deploying the Management Plug-in

After a Management Plug-in Archive file is created, Enterprise Manager makes it simple to deploy the new Management Plug-in. The deploy operation is performed directly from the Grid Control console and consists of three steps:

1. Import the Management Plug-ins into the Grid Control console.

Figure 10–1 Management Plug-in Import Page

Grid Control	Home Targets Deployments Alerts Policies Jobs Reports
Enterprise Manager Configuration Management Services and Repository Ager	ls
Management Plug-ins >	
Import Management Plug-ins	
Specify the Management Plug-in archive file that contains one or more Management Plug that you want to import. Please note that you are only able to select Management Plug-ir	ins, then click List Archive, then select the Management Plug-in (Cancel) (OK) s which are compatible with the current OMS version.
Select Management Plug-in Archive	
Management Plug-in Archive C:\DatabaseMPA_1.jar Browse]
© TIP Only Management Plug-ins delivered from Oracle via a secure mechanism sho Management Plug-ins for Archive: MyDatabaseMPA_1.jar	Id be imported.
Select All Select None	
Select Name Version Minimum OMS Version Description	n Deployment Requirements
MyDatabase_NN 2.8 none Sample DE	Monitoring Plug-in Requires access to a target Oracle DB V7+
<u>Home Targets Deployments Alerts Policies Jo</u> Copyright © 1996, 2005, Oracle. All rights reserved. Oracle, JD Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/or its aff/ <u>About Oracle Enterprise Manager</u>	Cancel) OK) <u>IS Reports</u> Setup Preferences Help Logout ates. Other names may be trademarks of their respective owners.

Once imported, the plug-ins appear on the Management Plug-ins page, and can be deployed to any number of Management Agents simultaneously.

Figure 10–2 Management Plug-ins Page

	e Manager 10g Setup Proferences Heb Looput
Enterprise Manager	Configuration Management Services and Repository Agents
Overview of Setup	Management Plug-ins
Roles	A Management Plug-in is a target type provided by the user or a third party to extend
Administrators	Enterprise Manager's set of predefined target types. This page is used to define new Page Refreshed Aug 16, 2005 12:41:02 PM ****
Notification Methods	Plug-ins to a Management Plug-in Archive, or to deploy a Management Plug-in into your
Patching Setup	system.
Blackouts	Search Management Plug-ins
Registration	Name Version
Passwords	Go
Management Pack Access	(Delete) (Export) (Import)
Monitoring	Select All Select None
Templates	Select Name 🖉 Version Deployed Agents Description Deployment Requirements Deploy Undeploy
Corrective Action	MyDatabase NN 2.8 0 Sample DB Monitoring Plug-in Requires access to a target Oracle DB V7+ 🥃 📑
Library	Related Links
Management Plug.ins	Deployment Status
Client Duritory	
Analyzer in Grid	
Control	
	Home Targets Deployments Alerts Policies Jobs Reports Setup Preferences Help Logout
Copyright @ 1996, 2005, Ora	cie. All rights reserved.
About Oracle Enterprise	Annaor de la construction de

2. Deploy the Management Plug-in(s) to the appropriate Agents.

Management Plug-ins can be deployed simultaneously to any number of Agents without causing any downtime to production environments. Enterprise Manager

automatically copies appropriate metadata files and monitoring scripts to the selected Agents.

Home Targets Deployments Alerts Policies Jobs Reports ORACLE Enterprise Manager 10g Enterprise Manager Configuration | Mana ment Services and Repository | Agents 0 -0 R Select Targets Deploym ent Verification Deploy Management Plug-in: Select Targets Name MyDatabase_NN Cancel Step 1 of 3 Next Version 2.8 Management Plug-ins are composed of a set of files that implement a new target type. For an agent to use a Management Plug-in, some of the Management Plug-in files must be deployed to that agent node. In this step, agents (or groups containing agents) are selected for the deploy Add Agents Deplo ents Delete stado39.us.oracle.com:5125 Î TIP The Deployment Verification step is skipped if there are no deployment errors detected (Cancel) Step 1 of 3 Next Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout Copyright © 1996, 2005, Oracle. All rights reserved. Oracle, DI Edwards, ReopleSoft, and Retex are registered trademarks of Oracle Corporation and/or its atfiliates. Other names may be trademarks of their respective owners. Oracle, JD Edwards, PeopleSoft, and Ret About Oracle Enterprise Manager

Figure 10–3 Deploy Management Plug-in Page

Once the Management Plug-in is deployed, Management Agents can monitor targets of the new type.

3. Discover the Management Plug-ins at the Agent.

Once a Management Plug-in is deployed, the Agent knows how to monitor the new target type. At this point, all that remains is to instruct the Agent to start monitoring one or more instances of the new target type. This involves discovering targets from the Agent home page by specifying a small set of target properties, such as SID and Username for a database.

Management Plug-in User Interface

Each Enterprise Manager managed target has a default home page that provides a consolidated, at-a-glance view of its health and performance status. The home pages also provide direct access to configuration information and management/monitoring features such as Blackouts, Monitoring Configuration, and Alert History. This rich user interface is available to Management Plug-Ins out-of-box, *without any custom code*.

SQLServer: smp-mpi1 MS SQ	LServer			
			P	age Refreshed Aug 15, 2005 7:13:37 PM PDT Refr
Home				
General				
Availability (%) Up Black Out (Last 24 Hours) Host Smp-mpi1.us.org	cle.com	5		
Alerts				
Metric		Severity	Alert Triggered	Last Value Last Checked
Load percentage for CPU0		×	Aug 5, 2005 6:19:10 PM	66 Aug 15, 2005 7:12:48 PM
Cache Hit Ratio for SMP-MPI1/MSSQLI	OCAL1	1	Aug 5, 2005 6:21:25 PM	71.96 Aug 15, 2005 7:06:07 PM
Host Alerts				
Host Alerts Metric Collection Errors 100 1				
Host Alerts Metric Collection Errors 🚯 <u>1</u> Metric	Severity	Alert Triggered		Last Value Last Checked
Host Alerts Metric Collection Errors 🚯 <u>1</u> Metric No Alerts found.	Severity	Alert Triggered		Last Value Last Checked
Host Alerts Metric Collection Errors 1 1 Metric No Alerts found. Configuration	Severity	Alert Triggered		Last Value Last Checked
Host Alerts Metric Collection Errors To 1 Metric No Alerts found. Configuration View Configuration	Severity Save	Alert Triggered		Last Value Last Checked
Host Alerts Metric Collection Errors 1 Metric No Alerts found. Configuration View Configuration Configuration Configuration	Severity Sana: Comp	Alert Triggered		Last Value Last Checked
Host Alerts Metric Collection Errors 1 Metric No Alerts found. Configuration Cientfguration Configuration Related Links	Severity Sans Com	Alert Triggered		Lost Value Last Checked
Host Alerts Metric Callection Errors D 1 Metric No Alerts found. Configuration Zonfiguration Configuration Alexandro Alexandro Related Links All Metrics	Severity Sace Comp	Alert Triggered	ings	Last Value Last Checked
Host Alerts Metric Collection Errors 1 Metric No Alerts found. Configuration Configuration Configuration Configuration Extended Links All Metrics Blackouts	Severity Save Com	Alert Triggered d Configurations pare Configuration ric and Policy Sett intoring Configuration	ings 10	Last Value Last Checked
Host Alerts Metric Callection Errors log 1 Metric No Alerts found. Configuration Configuration Configuration History Related Links All Metrics Slackouts Access	Severity Save Comp Matt Matt	Alert Triggered d.Configurations pare Configuration ric and Policy Setti intering Configuration get Properties	ings D	Lost Value Last Checked

Figure 10–4 Default Target Home Page

Enhancing Default Target Home Pages with Real-Time Reports

Enterprise Manager provides a powerful reporting framework called Information Publisher, which allows you to:

- Create custom reports against the Management Repository via the Grid Control console or by using the Information Publisher PL/SQL API.
- Generate reports on a schedule and share them with the entire user community.
- Create out-of-box monitoring, configuration, and service-level reports.

When developing a Management Plug-in, you can enhance information available from a default target home page by developing a management report definition using the Information Publisher PL/SQL API. These report definitions can be packaged with the plug-in, and are available from the Reports tab on the default target home page.

See Also: Chapter 7, "Information Publisher"



Figure 10–5 Default Target Home Page with Real-Time Report

Managing from Anywhere Using EM2GO

Businesses today place increasing demands on their IT systems and staff. Part of this demand is on administrators to be available at any time to meet unforeseen crises. Enterprise Manager helps to meet this demand by providing EM2Go, an Internet-enabled architecture that allows you to manage from anywhere and at any time.

This chapter contains the following sections:

- Introduction to EM2Go
- Highlights of EM2Go

Introduction to EM2Go

EM2Go is the mobile management application designed for the Oracle Environment. Not only can you monitor Enterprise Manager from your desktop, you can monitor while you are on the go. Because EM2Go is installed as part of Enterprise Manager, no additional configuration is necessary. You simply direct your personal digital assistant (PDA) that supports Microsoft Pocket PC IE to the Enterprise Manager UI and you access the EM2Go interface.

Mobile Security

EM2Go offers a highly secure solution as it leverages the Enterprise Manager security features. EM2Go utilizes HTTPS communications and the security model of administrator privileges and roles. When you connect your browser to the EM2Go URL, a login prompt is issued for you to enter your Enterprise Manager preferred credentials (Figure 11–1). You will then only see the targets to which you have been granted privileges.

A lost or stolen device is no longer a security risk because no enterprise data is stored on the device itself.

Note: If you are using EM2Go in a firewall environment, refer to "Configuring Enterprise Manager for Firewalls" in *Oracle Enterprise Manager Advanced Configuration* for information about accessing Oracle Enterprise Manager 10g Grid Control through a firewall.

http://dsur	nrap27.us.ora	cle.com:48	- 2
ORACLE	E		
Login to	Oracle Enter	prise Man	ager
EM2Go is the Manager.	mobile version of	Örade Enterp	rise
User Name			
Password			
	Login		
View Tools	💠 🔁 🚰 🤅	> 1 2	-

Figure 11–1 EM2Go Logon Page

Intuitive Interface

EM2Go provides an intuitive interface, similar to the Grid Control console. Because the layout is easy to use, you can quickly assess the availability and health of the Oracle Environment. Figure 11–2 displays a consolidated and personal Grid Control Console Home page.

Figure 11–2 EM2Go Home Page

Internet Explorer	
http://dsunrap27.us.oracle.com:48	_ @
ORACLE 🖌	<u>R</u> ? 🔺
Search Name Alerts and Availability Critical X Down Errors 10 Unknown 2 Targets Hosts Databases Application Servers Web Applications Groups All Target	=
Related Links	۳ L
Jobs	-
View Tools (A A A C A	and a second

The EM2Go Home page provides high-level data to isolate and repair availability and performance problems.

On the EM2Go home page:

- From the Alert and Availability section, you can drill down to investigate the problem that generated the alert.
- From the Targets section, you can click the type of target in which you are interested. The associated target home page displays only the most important metrics, thus helping you to quickly isolate and diagnose the root cause of the problem.
- In addition to monitoring targets, EM2Go supports the administration of Host and Oracle Database targets.

Highlights of EM2Go

The EM2Go subset of Enterprise Manager functionality is specific to the needs of the mobile administrator. EM2Go enables the following services available in Enterprise Manager.

Notifications

You can schedule notifications to be sent by way of email to your PDA.

If a target becomes unavailable or experiences performance problems, an alert is generated to both the Grid Control console and EM2Go.

For example, you receive an email notification that the Tablespace Full metric has triggered. You log into EM2Go to view the alert details. To help solve the problem, you can use the host information to check the file system space available. You can then use EM2Go to increase the size of the tablespace by enabling automatic extension of one of the tablespace datafiles, manually resizing one of the datafiles, or adding another datafile.

Ad Hoc SQL and OS Queries

EM2Go provides a tool that allows you to enter and execute SQL/OS commands dynamically. For example, you receive an alert from the CPU Utilization for Top Processes % metric through mobile email. Use the Execute OS Commands tool to check the load on the system using the following UNIX commands: uptime, top, or ps -ef.

Performance Monitoring

Using EM2Go, you can monitor the performance of your environment by:

- Displaying all metric warnings and alerts together with a metric history graph.
- Accessing the database home page, which provides information about the status
 of the database and the administration and configuration of the database
 environment.
- Studying key performance metrics to quickly assess the health of the host.
- Viewing storage information about tablespaces and datafiles.
- Observing transaction alerts, beacons, and availability of your Web applications.
- Studying availability and performance metrics of your Oracle Application Server.

Part II

Managed Targets

This part contains chapters that describe the different targets that Enterprise Manager can monitor, administer, maintain, and manage.

Refer to the chapters in Part I for descriptions of the general Grid Control features that apply across all targets.

Part II contains the following chapters:

- Chapter 12, "Service Management"
- Chapter 13, "Database Management"
- Chapter 14, "Application Server Management"
- Chapter 15, "Oracle Collabsuite Management"
- Chapter 17, "Host and Third-Party Target Management"
- Chapter 18, "E-Business Suite Management"

Service Management

This chapter introduces the concepts of services and service management in the following sections.

- Introduction to Services
- Modeling Services
- Managing Systems
- Monitoring Services
- Diagnosing Service Problems

Introduction to Services

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. Problems faced in an enterprise include service failures and performance degradation. Since these services form an important type of business delivery, monitoring these services and quickly correcting problems before they can impact business operations is crucial in any enterprise.

Service-level agreements 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 service-level agreements.

Enterprise Manager Grid Control provides a comprehensive monitoring solution that helps you to effectively manage services from the overview level to the individual component level. When a service fails or performs poorly, Grid Control provides diagnostics tools that help to resolve problems quickly and efficiently, significantly reducing administrative costs spent on problem identification and resolution. Finally, customized reports offer a valuable mechanism to analyze the behavior of the applications over time.

Grid Control monitors not only individual components in the IT infrastructure, but also the applications hosted by those components, allowing you to model and monitor business functions using a top-down approach, or from an end-user perspective. If modeled correctly, services can provide an accurate measure of the availability, performance, and usage of the function or application they are modeling.

Defining Services in Enterprise Manager

A "service" is defined as an entity that provides a useful function to its users. 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.

Grid Control allows you to define one or more services that represent the business functions or applications that run in your enterprise. You can define these services 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.

You can define the following service types: Generic Service, Web Application, Forms Application, and Aggregate Service. Web applications, a special type of service, are used to monitor Web transactions. Forms applications are used to model and monitor Forms transactions.

The following elements are important to understanding Grid Control's Service Level Management feature:

- Service: Models a business process or application.
- Availability: A condition that determines whether the service is considered accessible by the users or not.
- Service Test: The functional test defined by the Enterprise Manager administrator against the service to determine whether or not the service is available and performing.
- System: A group of underlying components, such as hosts, databases, and application servers, on which the service runs. For more information on systems, refer to the "Managing Systems" section in this chapter.
- Beacons: A functionality built into Management Agents used to pre-record transactions or service tests.
- **Performance and Usage:** Performance indicates the response time as experienced by the end users. Usage refers to the user demand or load on the system.
- Service Level: Operational or contractual objective for service availability and performance.
- Root Cause Analysis: Diagnostic tool to help determine the possible cause of service failure

Modeling Services

You can create a new target, called a service, to model and monitor your business applications from within Grid Control. While creating a service, you can define the availability, performance and usage parameters, and service-level rules.

Availability

"Availability" of a service is a measure of the end users' ability to access the service at a given point in time. However, the rules of what constitutes availability may differ from one application to another. For example, for a Customer Relationship Management (CRM) application, availability may mean that a user can successfully log on to the application and access a sales report. For an online store, availability may be monitored based on whether the user can successfully log in, browse the store, and make an online purchase.

Grid Control allows you to define the availability of your service based on service tests or systems.

- Service Test-Based Availability: Choose this option if the availability of your service is determined by the availability of a critical functionality to your end users. Examples of critical functions include accessing e-mail, generating a sales report, performing online banking transactions, and so on. While defining a service test, choose the protocol that most closely matches the critical functionality of your user communities. You can define one or more service tests using standard protocols and designate one or more service tests as "Key Tests." These key tests can be executed by one or more "Key Beacons" in different user communities. A service is considered available if one or all key tests can be executed successfully by at least one beacon, depending on your availability definition.
- System-Based Availability: Your service's availability can alternatively be based on the underlying system that hosts the service. Select the components that are critical to running your service and designate one or more components as "Key Components," which are used to determine the availability of the service. The service is considered available as long as at least one or all key components are up and running, depending on your availability definition. For more information on systems, refer to the "Managing Systems" section in this chapter.

Performance and Usage

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. You can calculate the minimum, maximum, and average response data collected by two or more beacons. For example, you can monitor the time required to retrieve e-mails from your e-mail service in San Francisco, Tokyo, and London, then compare results. You can also collect performance metrics for system components, then calculate the minimum, maximum, and average values across all components. For example, you can monitor average CPU utilization, memory utilization, and disk I/O utilization across several hosts.

Usage metrics are collected based on the usage of the system components on which the service is hosted. For example, if you are defining an e-mail service that depends on an IMAP server, you can use the Total Client Connections metric of the IMAP server to represent the usage of this e-mail service. 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 the above metrics and receive notifications and alerts. For more information on setting thresholds, see the "Monitoring Services" section of this chapter.

Business Metrics

You can define metrics to measure the performance of business in an organization. Business metrics are collected for system based services. Non system based metrics can be defined by using the Data Exchange feature. For more details on the Data Exchange feature, refer to *Oracle Enterprise Manager Integration Guide*.

.You can define the business metric to be based on the performance of one specific system component or aggregate it across multiple components. You can also set thresholds on these metrics and receive notifications and alerts.

Setting Service-Level Rules

Service-level parameters are used to measure the quality of the service. These parameters are usually based on actual service-level agreements or on operational objectives.

Grid Control's Service Level Management feature allows you to proactively monitor your enterprise against your service-level agreements to verify that you are meeting the availability, performance, and business needs within the service's business hours. For service-level agreements, 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.

Monitoring Templates for Services

Administrators are often faced with the task of defining similar monitoring attributes or rules for many applications. The same set of rules are often applicable to different applications. This can be achieved through the Monitoring Templates feature in Grid Control. A monitoring template for a service contains definitions for one or more service tests, as well as a list of monitoring beacons. You can create a monitoring template from a standard service target, then copy this template to create service tests for any number of service targets and specify a list of monitoring beacons. This helps reduce the required configuration time where a large number of applications need to be monitored.

See Also: "Monitoring Templates" in Chapter 4, "System Monitoring"

Managing Systems

A "system" is a logical grouping of targets that collectively hosts one or more services. It is a set of infrastructure targets (hosts, databases, application servers, and so on) that function together to host one or more applications or services.

In Enterprise Manager Grid Control, systems constitute a new 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.

Note: An Enterprise Manager "System" is used specifically to monitor the components on which a service runs. Many of the functions and capabilities for groups and systems are similar. See Chapter 5, "Group Management" for a detailed explanation of groups and how they are used.

Creating Systems

Use the Create System pages to perform the following configuration tasks:

- Select target components for a new system.
- Define the associations between the components of the system using the Topology Viewer.

- Add charts that will appear in the System Charts page. The charts represent the overall performance for the system or components of the system. Based on the target type of the components you select in the Components page, some charts are predefined.
- Select a set of columns you want to appear in the System Components page and in the system's Oracle Grid Control Dashboard.
- Customize the refresh frequency and specify the format for viewing component status, alerts, and policy violations in the system's Oracle Grid Control Dashboard.

See Also: "System Dashboard" in Chapter 5, "Group Management"

Enterprise Manager provides a Topology Viewer for several applications. The Topology Viewer allows you to view the relationships between components, nodes, or objects within different Oracle applications. You can zoom, pan, see selection details and summary information, and evaluate aggregate components. Individually distinct icons are used for each object type, and standardized visual indicators are used across all applications.

You may want to create system topologies for a number of reasons:

- Graphically model relationships
- Identify the source of a failure
- Perform visual analysis for high-level problem detection

When creating a system topology, you specify associations between the components in the system to logically represent the connections or interactions between them. For example, you can define an association between the database and the listener to indicate the relationship between them. Components are represented as icons, and associations are depicted as arrow links between components. After you have customized the topology to suit your needs, you can then view the overall status of the components in your system by accessing the System Topology page.

See Also: "Create System Topology Page" in the Enterprise Manager online help

Monitoring Systems

Use the System pages to perform the following monitoring and administration tasks:

- Quickly view key information about components of a system, such as outstanding alerts and policy violations.
- View metric data for several time periods.
- View summary information determined by the columns you configured when you created the system.
- Perform administrative tasks, such as creating jobs and blackouts.
- View the topology of system components, including the associations between them.

See Also: "System Topology" in this chapter

Grid Control	iterprise Manager 10g						Home	gets Deploy	ments Ale	rts Policies Jobs Reports
Hosts Datab	ases Application Servers	Web Applicatio	ns Services S	vstems (Groups All Ta	raets Collaboratio	n Suites	Sec. Copies	7.00	into Fondes Jobs Reports
Calendar Sys	tem: Calendar System	1								
	AL						Page Refres	ned Oct 22, 200	5 3:22:05 AM	PDT (Refresh) (Launch Dashboard)
Home	Charts Administration	<u>Components</u>	<u>Lobologă</u>							
Status						Alerts				
Status				(totus Histon	Alerts				Alort History
				9	(acus riistory)	Severity	Current	Last 2	4 hours	(Mert History)
						×	3	LUST	1	
						A	2		1	
						Total	5		2	
	33%	aum (2)					-		-	
		10Wh(3)				Policy Violation	ns			
	67%							Last 24 Hou	rs	
						Severity	Current	Cleared	New	Distinct Rules Violated
						×	8	2	2	3
			Ν			Δ	4	0	0	3
Services			43			i i	0	0	0	0
Services	1	1			D. 11	Total	12	2	2	<u>6</u>
Name	Type	Status	Performance Alerte Iles	ana Alarte	Violations	Policy Trend Oven	view			
Calendar	Type	Status								
Service 1	Calendar Service	•	0.0	0.0	000	Security Policy	Violations			
Calendar Use	Colondar Llear Accase Sanie	•	0 0	0 0	0 0 0		_	Last 24 Hou	IS	
Access	Calendar Oser Access Dervic	° 🐠				Severity	Current	Cleared	New	Distinct Rules Violated
Service 1						×	<u>6</u>	U	0	2
Calendar Use	^I Calendar User Access Servic	e 🕠	0 0	0 0	0 0 0	4	3	U	U	2
Access Service 2						Tatal	U	U	U	U
Calendar Wel	national in the		0.0	0.0	0.0.0	Focurity At a Clar	2	U	U	4
Application 1	VVeb Application	•	0.0	0.0	000	Security At a Giar	ice			
Calendar Wel	² Web Application	•	0 0	0 0	0 0 0	Critical Patch A	dvisories for	Oracle Homes		
rappileution 2										
Configurati	on Changes									
Configuration	changes detected for the last 7	days								
Ť	Ŭ.									
Category		Change	5							
All Target	Types	258								
Calenda	ir Server									
Host		256	1							
Oracle I	HTP Server	L								
🕨 Web Ca	icne	ļ	L							
Home	Charts Administration	Components	Topology							
Related Lir	nks									
Access			Edit Ca	endar Syst	em		F	Reports		
Target Proper	ties									

Figure 12–1 System Home Page

Monitoring Services

Monitoring a service helps you ensure that your operational and service-level goals are met. To monitor a service, define service tests that simulate activity or functionality that is commonly accessed by end users of the service. For example, you may want to measure a service based on a particular protocol, such as DNS, LDAP, and IMAP. To proactively monitor the availability and responsiveness of your service from different user locations, designate the geographical locations from which these service tests will be executed. Run service tests from specified locations using Enterprise Manager Beacons. You may also measure a service based on the usage of the service's system components.

Services Dashboard

In Grid Control, service levels are defined as the percentage of time during business hours that a service meets the specified availability, performance, and business criteria. Using the Services Dashboard, administrators can determine whether the service levels are compliant with business expectations and goals.

The Services Dashboard enables administrators to browse through all service-level-related information from a central location. The Services 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. The following details are displayed in the Services Dashboard:

- Availability: A measure of the end users' ability to access the service at a given point in time. Service level agreements typically require a service be available at least for a minimum percentage of time.
- Performance: Response time is a good measure of the performance experienced by the end users when they access the service. When the service performance is poor, the availability of the service may be affected.
- Usage: Indicates end-user usage, or level of user activity, of the service.
- Business: Business metrics measure the performance of business in an organization. Business metrics are displayed only if one or more key business indicators are associated with the service. The Service Level is impacted when a critical alert is generated for the specified business metric.

Figure 12–2 Consolidated Dashboard View of Multiple Services

Grid Control							Help
Services Dashboard			Page Refi	reshed On Oct 9, 20	105 2:56:22 AM PD	т	Refresh
Service	Status	Performance	Usage	Components	Service Level Last 24 Hours	Last 7 Days	Last 31 Days
sl_service1	♣	300148.00 Active Pages 86.64 CPU Idle Time (%) 1.00 Status	89.28 CPU Utilization (%) 5.00 CPU in I/O Wait (%) 1.80 Memory Usage (%)	1 down 9 up	100.00%	53.38%	53.38%
Internet Directory Service 1	Ŷ	5.32 LDAP Average B	No Data Active Data Ba No Data Directory Oper No Data Server Load	1 up	100.00%	100.00%	100.00%
PetStore Webapp	Ŷ	0.00 DNS Time (ms) 48.69 CPU Idle Time (%)	58.95 Memory Utilization (2 up	100.00%	100.00%	100.00%

System Topology

The System Topology page enables you to view the dependency relationships between components of the system. From the topology view, you can drill down to detail pages to get more information on the key components, alerts and policy violations, possible root causes and services impacted, and more.

Use the System Topology page, shown in Figure 12–3, to get a quick overview of the status of your system's components. The status indicators over each icon enable you to quickly assess which components are down or have open alerts. You can get more detailed information for any key component from this page.

Figure 12–3 System Topology Page

System: PetStore_System				
		Page Refre	eshed Oct 5, 2005 2:02:52 PM PDT	Refresh Launch Dashboard
Home Charts Administration	Components Topology			
			View Data [Real Time: Manual Refresh 🛛 👻
Overview				
+				
	1012.cluster1012_1.HTTP_	Server (Up)	Farm1012.cluster1012_1.oc4j	_2 (Up)
				S ((1
				LISTEN
	midtie		midtie	LIGTER
Selection Details		\rightarrow		
Nothing Selected				
	midtie		midtie	infraD
		and the second second		
Summary	stacz6			
Components <u>14</u> (① <u>14)</u> Alerts <u>1</u> <u>1</u>				
Policy Violations 26 18 2				



Service Topology

Use the Service Topology page, shown in Figure 12–4, to view the dependencies between the service, its system components, and other services that define its availability. Upon service failure, the potential causes of failure, as identified by Root Cause Analysis, are highlighted in the topology view. In the topology, you can view dependent relationships between services and systems.

Some data centers have systems dedicated to one application or service, while others have shared systems that host multiple services. In Grid Control, you can associate a single service or multiple services with a system, based on the setup of the data center.



Figure 12–4 Service Topology Page for a Collaboration Suite Service

Reports

Enterprise Manager provides out-of-box 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 via email 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.

See Also: "Chapter 7, "Information Publisher"

Notifications, Alerts, and Baselines

Using Grid Control, you can proactively monitor a service and address 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 are a standard set of notification rules that specify 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 alerts conditions are met. For example, thresholds can be defined so that alerts are generated when a system is down, if the end user cannot login to an application, or if the online transaction cannot be successfully completed.

You can set up baselines for a specified period and use these baselines to evaluate performance. Statistics are computed over the baseline period for specific target metrics. You can use these statistics to automatically set metric thresholds for alerting, as well as to normalize graphical displays of service performance.

See Also: Chapter 4, "System Monitoring"

Service Performance

Grid Control provides a graphical representation of the historic and current performance and usage trends in the Performance and Usage Charts. You can view metric data for the current day (24 hours), 7 days, or 31 days. The thresholds for any performance or usage alerts generated during the selected period are also displayed in the charts. This helps you to easily track the performance and usage of the service test or system over time and investigate causes of service failure. Users can choose the default chart for the Services Home page; all performance and usage charts are available on the Charts page.

Use the Test Performance page to view the historical and current performance of the service tests from each of the beacons. If a service test has been defined for this service, then the response time measurements as a result of executing that service test can be used as a basis for the service's performance metrics. It is possible to have multiple response time measurements if the service access involves multiple steps or the service provides multiple business functions. Alternatively, performance metrics from the underlying system components can also be used to measure performance of a service.

If performance of a service seems slow, it may be due to high usage of the service. Monitoring the service usage helps diagnose poor performance by indicating whether the service is affected by high usage of a system component.

Monitoring Web Application Services

Today's e-businesses depend heavily upon their Web applications to allow critical business processes to be performed online. As more emphasis is placed on accessing information quickly, remotely, and accurately, how can you ensure your online customers can successfully complete a transaction? Are you certain that your sales force is able to access the information they need to be effective in the field?

The Web application management features complement the traditional target monitoring capabilities of Enterprise Manager Grid Control. Full integration with the Enterprise Manager target monitoring capabilities allow you to monitor the performance and availability of components that make up the applications' technology environment, including the back-end database and the middle-tier application servers.

In Grid Control, you can define a Web application service to monitor Web transactions. This allows you to proactively monitor your e-business systems from the top down, and trace the experience of your end users as they enter and navigate the Web site. You can monitor the Web application service through the Services Dashboard, Topology Viewer, Charts, Reports, and more. For more information on these features, refer to the "Monitoring Services" section in this chapter.

Additionally, you can monitor the end-user performance response times, which enables you to effectively manage your e-business systems and understand the impact of application service-level problems.

Transactions

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. You can record the transaction using an intuitive playback recorder that automatically records a series of user actions and navigation paths.

End-User Performance Monitoring

The End-User Performance Monitoring feature enables you to measure the actual response time as experienced by the end users. When configured with Oracle Application Server Web Cache or Oracle HTTP Server/Apache HTTP Server, the End-User Performance Monitoring feature provides response time data generated by actual end users as they access and navigate your Web site.

You can track the response times for each user and all individual pages, allowing you to assess the end-user experience and address potential issues. You can also view the response times by individual visitor, domain, user-defined region, Web server, or a combination of these criteria. For example, tracking the response time of visitors ensures that critical customers, executives, and other important visitors are experiencing adequate response times.

You can set up Watch Lists of important URLs and view the response metrics of these critical pages at a glance. You can also use the Analyze feature to analyze the performance data stored in the Management Repository.

Monitoring Forms Applications

Oracle Forms provides a set of integrated builders that allow application developers to easily and quickly construct sophisticated database forms and business logic with minimal effort. The powerful, declarative features in Oracle Forms enable developers to create fully functional applications from database definitions with significantly reduced coding.

A Form is a collection of UI widgets that serves a specific purpose. It is usually built to perform one isolated task (such as accessing and displaying user data). A Forms application is a set of Forms that are related to each other. For example, Financials is a Forms application that contains Forms like, DISPLAY_SALARY, EDIT_ACCOUNT, and PRINT TAX ACCOUNT.

A Forms Application target in Enterprise Manager is used to model and monitor a specific Forms application. You can define, monitor, and playback a specific flow in the Forms application where each flow is recorded as a single Forms transaction. You can also measure the response time data as experienced by end-users while they are performing a Forms operation. You can measure the total response time, server time, and the database time for Forms operations such as Commit, Query, Runform, Callform, Newform, and Openform

Forms Transactions

A Forms transaction consists of a set of user actions within a single application when using Forms.You can record multiple Forms transactions by using the intuitive playback recorder that automatically records the Forms actions. You can monitor these transactions periodically and collect relevant metrics when these transactions are played back.

End-User Performance Monitoring

The End-User Performance Monitoring utility allows you to measure the response time of your applications by viewing information about how quickly the responses are When configured with Oracle Application Server Web Cache or Oracle HTTP Server/Apache HTTP Server, the End-User Performance Monitoring feature provides response time data generated by actual end users as they access a Forms application and perform a set of Forms actions. When you access a Forms application, the End-User Performance Monitoring utility measures the response time of Forms actions such as Commit, Query, Runform, Callform, Newform, and Openform. You can monitor the Forms actions and view reports based on the response times experienced by the user. You can also define a Watch List of the most important Forms actions to monitor and view the response metrics of these critical operations at a glance.

Diagnosing Service Problems

Grid Control offers you tools to help diagnose service problems, including Root Cause Analysis, Topology Viewer, and Web application diagnostics. If a service is unavailable or performing poorly, use these tools to determine the potential causes.

Root Cause Analysis

When a service fails, Root Cause Analysis returns a list of potential causes on the Service Home page. Potential root causes include failed subservices and failed key system components.

By default, Root Cause Analysis 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 Root Cause Analysis to consider. If a key component is unavailable, or if any of your component test's conditions are not met, then this component is considered a possible cause of the service failure.

You can also specify additional conditions, or component host tests, for the host on which this key component resides. If Root Cause Analysis identifies the key component as a cause of service failure, the component's host is then analyzed to see if it potentially caused the component, and therefore the service, to fail.

You can also access the Root Cause Analysis information from the Topology Viewer, which shows a graphical representation of the hierarchical levels displaying relationships between components. Red lines between the services and system components represent the associated failure. Follow these red lines to discover possible causes of failure.

Grid Control can also be integrated with the EMC SMARTS solution to detect network failures in Root Cause Analysis. When problems in the network are detected, you can use the SMARTS network adapter to query Root Cause Analysis information related to the hosts and IP addresses in the network.

Diagnosing Web Application Problems

When a Web application is unavailable, the Root Cause Analysis feature allows you to determine the causes of service failure. Apart from this feature, Grid Control provides tools to diagnose application performance degradation issues and pinpoint problem areas within the application stack. Comprehensive diagnostic tools enable you quickly drill down into the Oracle Application Server stack and monitor response times in various application server and database components.

Interactive Transaction Tracing

When the performance of a Web application 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. This in-depth drill-down diagnostics tool enables you to trace the transaction path and performance across the application tiers, and helps identify the cause of performance bottlenecks. Using these diagnostic tools, you can quickly resolve application problems, thus reducing the mean-time to repair.

All invocation paths of a transaction are traced and hierarchically broken down by servlet/JSP, EJB, and database times to help you locate and solve the problem quickly. Once a problem is resolved, you can also run Interactive Transaction Tracing to reassure you that the problem has been satisfactorily repaired. In addition, you can use the **SQL Statement Analysis** link to view details.

Request Performance Diagnostics

Grid Control 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.

Grid Control's Request Performance Diagnostics feature is instrumental to the application server and back-end problem diagnosis process. Slowest URL request processing times and the number of hits are provided so that you can easily recognize where problem resolution efforts should be prioritized. Application administrators need to know how their J2EE and database components are performing, including the top JSPs and servlets by processing time and request rates so that they can identify how these components are affecting overall response times.

URL request processing time and load graphs provide you with information on the impact of server activity on response times. Analyzing the J2EE and database at the subcomponent level helps you make accurate decisions to tune or repair the appropriate elements of a Web application.

Easy to read graphs of URL request processing times by theOC4J subsystem allows you to quickly assess where the most time is spent. Further drill-downs bring you directly to in-depth URL request processing call stack details. You can correlate URL request times (EJB time, database time, and so on) to the underlying system component metrics.

Database Management

This chapter introduces the concept of database management in the following sections:

- Introduction to Database Management
- Monitoring Databases
- Administering Databases
- Maintaining Databases
- Additional Maintenance Features
- Monitoring Oracle Real Application Clusters

Introduction to Database Management

Database management involves the monitoring, administration, and maintenance of the databases and database groups in your enterprise. Enterprise Manager is the premier tool for managing your database environment.

With Enterprise Manager, you receive:

- A complete set of integrated features for managing Oracle Databases
- Unparalleled scalability that lets you manage a single database or thousands of instances
- An intuitive management product that leads the industry in ease of deployment and use

Database Control Versus Grid Control

Enterprise Manager provides two separate consoles that you can use to monitor your database: Database Control and Grid Control.

- Database Control is the Enterprise Manager Web-based application for managing Oracle Database 10g Release 2 (10.2). Database Control is installed and available with every Oracle Database 10g installation. From Database Control, you can monitor and administer a single Oracle Database instance or a clustered database.
- Grid Control is the Enterprise Manager console you use to centrally manage your entire Oracle environment. Within Grid Control, you access the multiple database targets using the Targets tab, then Databases.

Database Home Page as the Management Hub

The Enterprise Manager Database Home page (Figure 13–1) shows important status and performance information about your database instance from a single source, including:

- A quick view of the status of the database and basic information about the database
- Relative CPU utilization of the Oracle host
- Amount of time the instance consumed using CPU and I/O, and the amount of time it consumed in bottlenecks
- Current response of the tracked set of SQL versus the reference collection response
- The number of Automatic Database Diagnostic Monitoring (ADDM) findings, the number of policy violations (Database Control only), and the Alert Log status
- Storage-related issues and recommendations for improved performance, and information about space violations and ADDM
- The most recent backup time and backup status
- Outstanding alerts and related alerts
- Rolled-up number of Oracle policy violations across all member targets in a system
- A quick view of database security
- Job executions that show the scheduled, running, suspended, and problem executions

Starting from the Database Home page, you can access additional details and management functions by drilling down through the user interface. In addition, the Database Home page provides a list of Related Links. From these links you can perform activities such as editing metric thresholds, analyzing job activity and metric collection errors, and accessing a number of advisors to help you improve the performance of your database.

See Also: "Oracle Database Home Page" in the Enterprise Manager online help

Home Performance Administratio	n Maintenance		
	Lates	t Data Collected From Target Oct 13, 2005 1	I:11:48 PM PDT Refresh View Data Manually
General	× Host CPU	Active Sessions	SQL Response Time
Shutdown Blac Status Up Up Since Oct 10, 2005 8:27:12 PM F Instance Name Finance Version 10.2.0.1.0 Host stadr/B.us.oracle.com Listener USTENER_stadr/B.us.orac	k Out 100% 75 75 rot 50 25 0	2.9 2.2 1.5 0.7 0.0	511.00 383.25 255.50 127.75 0.00
View All Properties	Load <u>3.42</u> Paging <u>0.00</u>	Maximum CPU 1	SQL Response Time (%) <u>64.59</u> Edit Reference Collection
Diagnostic Summary ADDM Findings 3 Period Start Time Oct 13, 2005 12:00:04 Opt 1 ag Oct 8, 2005 7:38:00 A	PM Problem	se Size (GB) <u>1.974</u> Tablespaces 1	High Availability Instance Recovery Time (sec) 39 Last Backup n/a
Alerts	™ Segment Aurisol Reco Spa Dump Ar	rmendations V ce Violations V rea Used (%) <u>54</u>	Usable Flash Recovery Area (%) <u>IQU</u> Flashback Logging <u>Disabled</u>
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Figure 13–1 Database Home Page

Monitoring Databases

Comprehensive database monitoring enables you to identify the problem areas in your database environment that are degrading performance. After you have identified the areas to improve, you can tune your databases' performance using the Enterprise Manager administration capabilities.

Enterprise Manager uses data from the Automatic Workload Repository (AWR) to display performance information and initiate database alerts. The user interface provides several real-time performance charts and drill-downs for the targets you manage. Both aggregate and instance-specific performance statistics are displayed using color-coded charts for easier viewing. To help you identify the source of a problem and resolve it, you can click a legend link next to a chart to display a detail page that provides comprehensive information.

The basic work flow in monitoring performance is to first go to the Database Performance page, which provides a high-level, comprehensive overview of important performance indicators.

Assessing Database Performance

Database tuning is much easier and more effective when all the information for an in-depth performance diagnosis is available on a single screen. On the Database Performance page (Figure 13–2), which is accessible from the Database Home page, you can quickly view performance data for the instance and its underlying host. Additionally, you can analyze trends for all critical performance metrics and compare the trends to those of other database instances.

The most direct method for investigating and diagnosing performance problems from this page consists of accessing the Automatic Database Diagnostic Monitor (ADDM). After you start your Oracle database, the Automatic Workload Repository (AWR) begins taking snapshots of database activity once every hour by default, and ADDM executes when the snapshots are collected. ADDM uses these snapshots to perform a top-down analysis of your database activity and then provide tuning recommendations.

Another method for investigating and diagnosing performance problems consists of observing which of the wait classes beside the Average Active Sessions chart appears to be consuming an excessive amount of time, shown as a spike above the Maximum CPU line, then drilling down for more information. This provides a way for you to visualize the data for which ADDM has made its recommendations.

Either method assists you in diagnosing and resolving problems. The first automated method produces textual findings, whereas the second interactive method produces graphical findings.



Figure 13–2 Database Performance Page

The charts on the Database Performance page display current and recent metric information on a common time axis that enables visual correlation of metrics. These charts provide context-sensitive drill-downs where you can find additional details for rapid problem diagnosis.
Chart	Description
Host	This chart shows potential problems outside the database. The load average is a moving average of the run queue length. The run queue length indicates the level of contention for CPU time.
Average Active Sessions	This chart is the centerpiece of Oracle performance monitoring, and shows potential problems inside the database. It displays a profile of the amount of time sessions are either working or waiting to work in the database instance.
	The Maximum CPU line on the chart helps determine how much of the CPU resource is being utilized. Session wait time accumulates above the CPU line, and the ratio of wait time to CPU time indicates how efficiently the system is working. Specific wait classes accumulating time indicate where you should focus your tuning efforts.
Instance Disk I/O	This chart shows the total requests that represent the rate at which the database instance is issuing read/write requests.
Instance Throughput	The charts show any contention that appears in the Average Active Sessions chart

 Table 13–1
 Performance Page Charts

The Additional Monitoring Links section enables you to access several related pages. Among those, the following pages have real-time diagnostic capabilities:

- Top Activity
- Top Consumers
- Instance Activity
- Historical SQL

See Also: "Performance Page" in the Enterprise Manager online help

Diagnosing Problems Interactively

You can manually diagnose problems using an interactive method by first investigating a wait class that you think may be problematic, then drilling down from there for either SQL details or session details. You can alternatively investigate all wait classes in one location and then drill down from there. The following sections explain these methods.

Investigating a Wait Class

Wait class drill-downs enable you to investigate a specific wait class where it appears that time is accumulating. You can then determine whether the problem is caused by one or several SQL statements that are accumulating an unusual amount of time, or whether the problem is caused by one or several sessions.

The wait class drill-downs are called Active Sessions Waiting pages. The pages are sourced from the Active Session History (ASH), which samples session activity every second. It continuously records what is happening, such as which sessions are using CPU and which sessions are waiting on I/O.

Select a wait class link beside the Average Active Sessions chart to obtain detailed information for the wait class. For instance, if you click **User I/O**, the Active Sessions Waiting: User I/O page appears, as shown in Figure 13–3.



Figure 13–3 Active Sessions Waiting Page

By default, the largest consumers of resources appear at the top of the detail tables. Look for skewed activity for either Top SQL or Top Sessions. If an excessive accumulation of activity appears to originate from an SQL source, you can click its associated SQL ID to go to the SQL Details page, which shows the SQL statement and activity. If excessive accumulation appears to originate from a session source, you can click its associated Session ID to go to the Session Details page, where you can kill the session if needed. You can also view the wait events associated with the session.

See Also: "Active Sessions Waiting Page" in the Enterprise Manager online help

Viewing SQL Details The SQL Details page, shown in Figure 13–4, displays the SQL statement you select in the Active Sessions Waiting page. You can also:

- Examine the activity of this SQL statement over time.
- View SQL-level statistics.
- Investigate the SQL plan.
- Access any prior Tuning Advisor run.
- Schedule a Tuning Advisor run.

Figure 13–4 SQL Details Page

Database Instance: database > Top Activity > SQL Details: b8b5jdj7khuaw			Logged in As SYSTEM
Switch to SQL ID Go	View Data	Real Time: Manual Refresh	Refresh Schedule SQL Tuning Advisor
Text			
<pre>SELECT event#, sql_id, sql_plan_hash_value,</pre>	sql_opcod	e, session_id, sessi	on_serial#, module, action,

client_id, DECODE(wait_time, 0, 'W', 'C'), 1, time_waited, service_hash, user_id, program, sample_time, p1, p2, p3, current_file#, current_obj#, current_block#, qc_session_id, qc_instance_id FROM v\$active_session_history WHERE sample_time > :1 AND sample_time <= :2</pre>

Details

Select the plan hash value to see the details below. Plan Hash Value 3106813959 💌



See Also: "SQL Details Page" in the Enterprise Manager online help

Viewing Session Details The Session Details page, shown in Figure 13–5, displays the wait events associated with the session you selected in the Active Sessions Waiting page. You can also:

- View the current values for metrics associated with the current session.
- View the list of currently open cursors in the selected session, including their hash value and SQL text.
- View sessions that are blocking other sessions.

Figure 13–5 Session Details Page



See Also: "Session Details Page" in the Enterprise Manager online help

Viewing Top Activity

The Top Activity page, shown in Figure 13–6, is essentially the sum of all wait class drill-downs. The interface format is the same as the Active Sessions Waiting page, but rather than showing the average active sessions for a particular wait class, the Top Activity page shows the average active sessions for all wait classes. The page also shows the Top SQL and Top Sessions consumers for all wait classes. As with the Active Sessions Waiting pages, look for skewed activity for either Top SQL or Top Sessions.





See Also: "Top Activity Page" in the Enterprise Manager online help

Diagnosing Problems Automatically

As mentioned in Assessing Database Performance, you can use the Automatic Database Diagnostic Monitor (ADDM) to automatically investigate and diagnose performance problems from either the Database Home page or the Database Performance page. Using regularly scheduled snapshots of the database activity, ADDM identifies the most resource-intensive components or operations, and determines whether or not these components or operations are acting as performance bottlenecks. If one or more problems have occurred, ADDM diagnoses these potential problems and provides advice, which may recommend that you run an advisor or change your database configuration.

You can view ADDM findings over a predetermined period of recent time or at the present time. You can view ADDM findings for the most recent time interval by clicking the **ADDM Findings** link in the Diagnostic Summary section of the Database Home page. You can also view ADDM findings for this interval by clicking the small ADDM icon below the Average Active Sessions chart in the Database Performance page. Either option displays the Automatic Database Diagnostic Monitor page, shown in Figure 13–7. To determine ADDM findings at the present time, you can click the **Run ADDM** button on the Database Performance page.

By default, the database takes snapshots at 60-minute intervals. You can use the Automatic Workload Repository to change the snapshot interval, ranging from 10 minutes to 2 hours.

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Figure 13–7 Automatic Database Diagnostic Monitor Page

See Also: "Performance Finding Details Page" in the Enterprise Manager online help

Using Additional Diagnostic Pages

Besides the primary diagnostic pages discussed above, there are other important secondary pages that can assist you in diagnosing and correcting performance problems. The following sections discuss these diagnostic pages:

- Top Consumers
- Instance Activity
- Historical SQL

Top Consumers

The Top Consumers link provides global summary information for the top database consumers of system resources. You can access detailed metrics data for a specific top consumer, such as sessions, services, modules, and clients. This enables you to pinpoint the most problematic areas on which to focus your database tuning efforts. Figure 13–8 shows the Top Modules page of Top Consumers, where you can perform tasks such as enabling and disabling aggregation and SQL traces for the consumer. You can use an SQL trace to trace statistics of SQL statements, such as CPU time, elapsed time, and the Explain Plan.

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Figure 13–8 Top Consumers Top Modules Page

See Also: "Top Consumers Page" in the Enterprise Manager online help

Instance Activity

The Instance Activity link displays database activity for specific data about groups of metrics, such as cursors, sessions, and transactions (Figure 13–9). For instance, the Cursors metric group displays information about opened and session cursors along with authentications and parse counts. The legend links below the chart in the graphic view, or the name links in the table view, enable you to access the Top Sessions page for more detailed information.



Figure 13–9 Instance Activity Page

See Also: "Instance Activity Page" in the Enterprise Manager online help

Historical SQL

The Historical SQL (AWR) link displays statements stored in the Automatic Workload Repository (AWR) for a 24-hour period. This link is available in the Additional Monitoring Links section when you select the Historical data view (Figure 13–10).

The table at the bottom of the page shows an analysis of all SQL statements for performance and resource consumption. You can select a statement link to see SQL details (statistics, activity, SQL plan, and tuning information) for the statement.You

can also run the SQL Tuning Advisor to receive recommendations for one or more statements.

Figure 13–10 Historical SQL Page



See Also: "Historical SQL (AWR) Page" in the Enterprise Manager online help

Using Other Performance Tools

Enterprise Manager offers several tools that provide additional assistance ranging from viewing the relationships between system components to collecting system statistics when database performance is degraded. The following sections discuss these tools:

- Topology Viewer
- Metric Baselines
- Memory Access Mode
- Hang Analysis

Topology Viewer

Enterprise Manager provides a Topology Viewer for several applications. The Topology Viewer allows you to view the relationships between components, nodes, or objects within different Oracle applications. You can zoom, pan, see selection details and summary information, and evaluate aggregate components. Individually distinct icons are used for each object type, and standardized visual indicators are used across all applications.

The Topology Viewer is available for the following database applications:

- Scheduler
- SQL Details
- SQL Explain Plans

- Oracle Real Application Clusters
- Cluster Databases

Figure 13–11 shows the Topology Viewer for the SQL Details Plan page. The Topology Viewer provides a graphical representation of your SQL steps as modeled in Enterprise Manager.

Figure 13–11 Topology for SQL Details Plan



Metric Baselines

From the Database Performance page, you can set a metric baseline—a time period associated with a target that you can use as a reference for evaluating target performance (Figure 13–12). Statistics are computed over the baseline period for specific target metrics. You can use these statistics to automatically set metric thresholds for alerts, as well as to normalize graphical displays of system performance.

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◯ Static metric baseline	×	Time Group	N/A
		Time Period	N/A
			Set Adaptive Thresholds (Revert) (Apply)

Figure 13–12 Metric Baselines Page

See Also: "Metric Baselines Page" in the Enterprise Manager online help

Memory Access Mode

When the database server experiences performance issues, diagnostic queries could further impact the system. A new feature, called Memory Access Mode, assists you in diagnosing performance-related problems by collecting system statistics even when the database is either slow or hung.

Instead of relying on the normal SQL engine, the data is retrieved by accessing tables directly from the Shared Global Area (SGA). The data collection is quick and does not further impact a system that is already slow. Potentially, this allows for sub-second sampling of performance metrics without causing any additional load on a system.

You can disable the standard SQL Access Mode and switch to Memory Access Mode by clicking the **Monitor in Memory Access Mode** link in the Related Links section.

See Also: "Database Performance Page" in the Enterprise Manager online help

Hang Analysis

A new feature, called Hang Analysis, enables you to diagnose locking issues that might either slow down a system or cause hanging. Normally, if a system is slow or in a hung state, the diagnostic queries are also either extremely slow or never return a result. This utility bypasses the typical query engine instead, and leverages the Oraclebug API to return results quickly even on systems that might be seemingly in a hung state.

The Hang Analysis page shows a visual map of the sessions that are either blocking or are blocked. A tree view of the sessions is displayed, and the problem session that is blocking other sessions is located at the root of the tree. Each session is shown color-coded, signifying how long the session has been blocked. Clicking on the session box brings up another page that shows session details. Using information from this page, you can cancel the problem session and return the system to its normal state.

You can access the Hang Analysis page by clicking the Hang Analysis link in the Additional Monitoring Links section.

See Also: "Hang Analysis Page" in the Enterprise Manager online help

Administering Databases

Oracle Enterprise Manager effectively keeps your Oracle Databases available and running efficiently. Enterprise Manager can help database administrators perform everyday tasks. Specifically, it provides a graphical user interface for managing database storage structures and schemas. As with database monitoring, administration of the Oracle Database begins with the Oracle Database Home page. From this page, you can display an overview of your database properties and performance. However, you can also use the Administration section of the page to perform common administration tasks such as the following:

- Allocating system storage and planning future storage requirements for the database system
- Creating and managing primary database storage structures (tablespaces)
- Creating and managing primary objects (tables, views, indexes)
- Enrolling users and maintaining system security by controlling and monitoring user access to the database
- Backing up and restoring the database

Just as Enterprise Manager monitoring identifies problem areas in your database and database groups, you can administer your database using the Enterprise Manager administration tools. The administration tools allow you to manage database objects and initiate database operations inside an Oracle Database. The following sections provide an overview of the database administrative features available to you in Enterprise Manager.

Managing Storage Objects

As an administrator, you can use the administration tools in Oracle Enterprise Manager to optimize database performance. Using these tools, you can manage storage structures such as control files, tablespaces, datafiles, and archive logs. In addition to viewing, editing, and deleting these structures, you can also perform other functions such as making tablespaces locally managed, displaying the dependencies of a datafile, or backing up a control file to a trace.

Using Database Configuration Features

Oracle Enterprise Manager incorporates many features that help you to manage your database configuration. For example, you can use Enterprise Manager to manage the memory size of the system global area and program global area of your system. You can also use the Undo Management feature to provide a means of explicitly specifying the amount of undo information to retain and ensure that undo information is not overwritten.

You can create or edit initialization parameters for the current database, setting these parameters to specific values to initialize many of the memory and process settings of an Oracle Database instance. You can also display a list of database features, showing how often the features are used in the operation of the database. Usage information can be utilized by support groups and other organizations to gain knowledge about how the system is being used, and to help apportion resources as necessary.

Using Automatic Storage Management

Enterprise Manager uses Automatic Storage Management (ASM) to automate and simplify the layout of datafiles, control files, and log files. Database files are

automatically distributed across all available disks, and database storage is rebalanced whenever the storage configuration changes. You can manage your entire Automated Storage Management environment through Enterprise Manger. Additionally, you can easily migrate an existing database to Automatic Storage Management on the same host by using the migration tool in Enterprise Manager. The process defines the migration request and submits a job to complete the migration process.

Converting Single Instances to Oracle Real Application Clusters

Oracle Real Application Clusters (RAC) provides a high-availability database environment spanning multiple hosts. Each cluster can be comprised of multiple cluster databases, each of which consists of multiple cluster database instances. A cluster database is available as long as one of its instances is available. You can use Enterprise Manager to asynchronously convert a single-instance database to an Oracle RAC database.

Converting to a Locally-Managed Tablespace

An added feature allows you to convert a dictionary-managed tablespace to a locally-managed tablespace, thereby simplifying space allocation, improving performance, and reducing reliance on the data dictionary.

Controlling Resources with Resource Manager

The Database Resource Manager controls the distribution of resources among various sessions by controlling the execution schedule inside the database. By controlling which sessions run and for how long, the Database Resource Manager can ensure that resource distribution matches the plan directive and hence, the business objectives. You can use the Database Resource Manager to automatically assign sessions to specific consumer groups by setting up mappings between session attributes and consumer groups. You can also map consumer groups in specified categories to users, client programs, modules, or services.

Resource consumer groups let you group user sessions together by resource requirements. Resource consumer groups are different from user roles; one database user can have different sessions assigned to different resource consumer groups. You can then use a resource plan to specify how the resources are to be distributed among various resource consumer groups.

Resource plans specify the resource consumer groups belonging to the plan and contain directives for how resources are to be allocated among these groups. Plan information is stored in tables in the data dictionary. Several views are available for viewing plan data. In addition to containing resource consumer groups, a plan can contain subplans. Use Enterprise Manager to manage all aspects of the resource plan.

Tracking Statistics to Improve Database Performance

The Workload Repository provides you with a mechanism for gathering database statistics for specific time intervals. You can use the Optimizer Statistics feature of Enterprise Manager to simplify the management of Optimizer Statistics operations such as gathering, restoring, deleting, locking, and unlocking statistics. Use these statistics to improve the performance of your SQL statements.

Using Oracle Scheduler

Oracle Enterprise Manager uses the Scheduler to enable database administrators and application developers to control when and where various tasks occur in the database environment. Using the Scheduler helps to improve the management and planning of these tasks. By separating a task into its component parts such as time, location, and database object, the Scheduler provides an easier way to manage your database environment. Database administrators can schedule and monitor recurring database maintenance jobs, such as backups or nightly data warehousing loads and extracts, and they can schedule job execution based on time or events.

With Enterprise Manager, you can enable and disable Scheduler jobs, alter the settings for existing jobs, start or stop current jobs, and view Scheduler information.

Working With Database Schemas

A schema is a collection of database objects comprised of logical structures that directly refer to the data in the database. Schema objects include structures such as tables, views, and indexes. These schema objects can be created and managed using the tools available in Oracle Enterprise Manager.

Managing Database Objects

Oracle Enterprise Manager provides a comprehensive set of tools that allows you to manage all aspects of database directory objects such as tables, indexes, and views. You can use the tools available in Enterprise Manager for fundamental tasks such as creating, editing, and viewing object properties, but you can also use Enterprise Manager for more comprehensive tasks such as running the Segment Advisor to evaluate a table for block and space usage and to determine whether space can be saved by shrinking highly fragmented segments. The space gained by the implementation of these recommendations is returned to the table.

Indexes are optional structures associated with tables that can be created to increase the performance of data retrieval. When you manage indexes in Enterprise Manager, you can perform functions such as shrinking segments to compact segments and free the recovered space to the current tablespace. Alternatively, you can also eliminate space problems by reorganizing space usage while changing the storage settings and location of the index.

Views are customized presentations of data in one or more tables or other views. In addition to creating, deleting, and managing views, you can also view the objects that are dependencies of the view. The Dependencies table shows you the Object Name and the Object Type that is dependent on the current view. Conversely, Enterprise Manager can also show you the objects on which the current view is dependent.

In general, use the Action menu on the Search page or Property page of any database object to see a list of the available functions you can perform on that object.

Enterprise Manager allows you to manage program structures, such as packages, package bodies, functions, and triggers in the same way. In addition to creating and viewing these elements, you can compile Java Sources, for example, or generate the data definition language (DDL) code for a specified object such as package. For more information about the various functions available for a specific object, you can refer to the online Help.

XML Database Features in Oracle Enterprise Manager

XML, eXtensible Markup Language, is the standard way to identify and describe data on the Web. Oracle XML DB treats XML as a native datatype in the database. Oracle XML DB offers a number of easy ways to create XML documents from relational tables. The result of any SQL query can be automatically converted into an XML document. Oracle also includes a set of utilities, available in Java and C++, to simplify the task of creating XML documents.

Managing Users and Privileges

Oracle includes security features that control how a database is accessed and used. Privileges and roles control user access to data and the types of SQL statements that can be executed. There are three types of privileges and roles: system privileges, object privileges, and roles. The system privilege is an Oracle-defined privilege usually granted only to and by administrators. It allows users to perform specific database operations. An object privilege is an Oracle-defined privilege that controls access to a specific object. A role can be created by users, usually administrators, and is used to group together privileges and other roles. This facilitates the granting of multiple privileges and roles to users.

Privileges and roles can be granted to other users by users who possess the power to do so. Oracle Enterprise Manager allows you to create and manage users, roles and profiles. You can also expire passwords and lock or unlock users by applying those actions against one or more users. When managing roles, you can display all users and roles assigned to the specified role by using the Show Grantees function.

Auditing is the monitoring and recording of selected user database actions. It can be based on individual actions, such as the type of SQL statement run, or on combinations of factors that can include name, application, time, and so on. Security policies can cause auditing when specified elements in an Oracle Database are accessed or altered, including content. You can set up and adjust audit settings easily within the Enterprise Manager interface. With Enterprise Manager, you can view the database audit configuration and manage audited objects, privileges, and statements. You can also view the content of the audit trail. Out-of-box, Enterprise Manager also provides audit reports to help you monitor successful and failed login attempts, as well as SYSUSER operations.

Managing Materialized Views

Materialized views are schema objects that can be used to summarize, compute, replicate, and distribute data. They are suitable in various computing environments such as data warehousing, decision support, and distributed or mobile computing. Enterprise Manager lets you create and manage materialized views and provides a set of additional tools that allows you to perform specific actions against the view. The Explain Materialized View feature helps you to determine what is possible with a materialized view by indicating whether a materialized view is fast-refreshable, what types of query rewrites you can perform with this materialized view, and whether PCT refresh is possible.

Oracle maintains the data in materialized views by refreshing them after changes are made to their master tables. The refresh method can be incremental (fast refresh) or complete. For materialized views that use the fast refresh method, a materialized view log keeps a record of changes to the master tables. You can use Enterprise Manager to advise you when a query can be rewritten. You can then take the appropriate action required to make a query rewrite. Query rewrite transforms a SQL statement

expressed in terms of tables or views into a statement accessing one or more materialized views that are defined on the detail tables.

Materialized views can be refreshed either on demand or at regular time intervals. You can use the Action menu in Enterprise Manager to manually refresh a materialized view.

About Change Management

A dictionary baseline is an object containing a set of database definitions captured at a certain time. Baselines are stored internally in the Enterprise Manager repository, and are in a form that other Change Management applications can use. You can use Enterprise Manager to capture the database object definitions at a particular point in time and create reusable baseline scope specifications. By capturing a dictionary baseline, you can compare different database objects at different points in time and track changes applied to the database objects.

A dictionary comparison identifies differences in database object definitions between two databases, a database and a baseline, or two schemas within a single database/baseline. With Enterprise Manager, you can compare, view, and track differences between two sets of database object definitions at different points in time. The comparison result displays identical objects, objects/attributes that are different, and objects present either in the left or right source.

Using Advisors in Oracle Enterprise Manager

Advisors are procedures that you can invoke, or Enterprise Manager can invoke internally, that designate a specific object for analysis. An advisor can report on a variety of aspects of the object, and describe a recommended action for each condition worthy of user intervention. The advisor might report that the condition can be corrected by an automated task that it provides.

Some advisors also provide what-if analysis for specific situations. For example, the Undo Advisor provides an analysis of the impact of changing the retention period for undo records on the size of the undo tablespace. Additionally, the Memory Advisor graphically displays the impact on performance of changing the size of a component of the SGA.

You can invoke an advisor from the Advisor Central Home page that is displayed when you click the Advisor Central link under the Related Links heading on the Database Home page, or on other pages where it is listed. You can also invoke advisors in the context of recommendations from alerts. Advisors are powerful tools for tuning your database. In general, advisors produce more comprehensive recommendations than alerts, since alert generation is intended to be low cost and have minimal impact on performance. On the other hand, because Advisors are often user-invoked, they can consume more resources and perform more detailed analysis. Their automated analysis can provide more results than you might normally be able to produce manually in the time afforded you as part of regular operations. This analysis, along with the what-if capability of some advisors, provides vital information for tuning that cannot be procured from any other source.

Maintaining Databases

You can use Oracle Enterprise Manager to control the flow of data between or outside Oracle Databases. The following sections provide an overview of the functions available to you that can help you maintain your Oracle Database.

Using Backup

Backup of an Oracle Database generally refers to physical backup; protecting the files that make up your database. The files protected by the backup and recovery facilities built into Oracle Enterprise Manager include datafiles, control files, and archived redo log files. The backup mechanisms that work at the physical level protect against damage at the file level, such as the accidental deletion of a datafile or the failure of a disk drive. The focus in Oracle backup and recovery is generally on the physical backup of database files, which permit the full reconstruction of your database.

Enterprise Manager's physical backup and recovery features are built on Oracle's Recovery Manager (RMAN) command-line client. Enterprise Manager carries out its backup tasks by composing RMAN commands and sending them to the RMAN client. Enterprise Manager makes available much of the functionality of RMAN, as well as wizards and automatic strategies to simplify and further automate implementing RMAN-based backup and recovery.

Managing backups consists of two things: managing the backups themselves as they exist on disk or tape, and managing the record of backups kept in the RMAN repository.

Datafiles or archived redo logs copied at the operating system level can be cataloged and added to the RMAN repository, after which they can be used in data restore and recovery operations just as if they had been created with RMAN. Backup maintenance provided in Enterprise Manager includes the following:

- Viewing lists of backups (backup sets and image copies) recorded in the RMAN repository
- Cross-checking your repository, which marks as expired any backups that are in the repository but not accessible at the time of the crosscheck
- Deleting expired backups from your RMAN repository
- Deleting obsolete backups from the repository and from disk. Note that if you use a recovery area for your backup storage, many maintenance activities are reduced or eliminated because of the flash recovery area's automatic management of disk space.

Recovery

Media recovery using Enterprise Manager can be either complete recovery or point-in-time recovery. In complete recovery, all changes from the logs are applied and the database returns to its state at the time of failure. You can then reopen the database with no loss of data.

In point-in-time recovery, you can choose any System Change Number (SCN) between the time of the datafile backup and the last change in the redo logs, and apply only changes up through that SCN. You can thus return your database to any SCN (and thus any point-in-time) between the time of your backup and the most recent SCN in the redo logs. This technique can be used to recover from situations such as user errors that cause logical corruption in the database. Point-in-time recovery is sometimes referred to as incomplete recovery, since not all changes are applied.

Media recovery requires a control file, datafiles, and all online and archived redo logs from the time the datafiles were backed up. It is typically used only in the case of database failure.

Crash recovery is used to recover from a failure either when a single-instance database crashes, or all instances of an Oracle RAC database crash. Instance recovery refers to the case where a surviving instance recovers a failed instance in an Oracle RAC

database. Datafile media recovery is used to recover from a lost or damaged current datafile or control file. Block media recovery is a technique for restoring and recovering individual data blocks while all database files remain online and available.

Flashback Recovery

Enterprise Manager's flashback features provide a range of physical and logical data recovery tools as efficient, easy-to-use alternatives to physical and logical backups. Flashback table allows you to revert a table to its contents at a time in the recent past; and flashback drop allows you to rescue dropped database tables. Neither requires advance preparation such as creating logical-level exports to allow for retrieval of your lost data, and both can be used while your database is available.

Flashback database lets you quickly recover an Oracle Database to a previous time to correct problems caused by logical data corruptions or user errors. If a flash recovery area is configured, then you can return the database to a prior time. Flashback table lets you recover tables to a specified point in time. You can restore table data along with all its associated attributes, such as indexes, triggers, and so on. This is done while the database is online by rolling back only the changes to the given tables. You can revert the table and its contents to a specific time or user-specified SCN. Use flashback table with flashback query and row versions to find a time to which the table should be restored.

The larger the flash recovery area, the more useful it becomes. Ideally, the flash recovery area should be large enough to hold two complete backup copies of your datafiles, plus any incremental backups and archive logs required to restore your database to any point in time during your recovery window.

Backup and Recovery Settings

You can use Enterprise Manager to configure a number of settings and policies that determine how backups are stored, which data is backed up, how backups perform, and how long backups are retained before being purged from the recovery area. You can also configure settings to improve backup performance. For disks, you can configure the default format for storing backups, the location on disk where backups are stored, and whether backup tasks are run in parallel for improved performance. Oracle backups to disk can be saved as image copies or backup sets. Backups to tape and similar media management devices must be stored as backup sets.

Managing Restore Points

You can use Enterprise Manager to create a restore point as a designated point in time to which you can restore your database. A restore point is a name associated with a past point-in-time of the database. You can flash back the database to a restore point if the required flashback logs and archived logs exist. A Guaranteed Restore Point is a restore point to which you can always flash back the database. Each restore point has a name and creation time. The restore points are sorted by creation time beginning with the most recent.

Overview of Data Guard

Oracle Data Guard ensures high availability, data protection, and disaster recovery for enterprise data. Data Guard provides a comprehensive set of services that create, maintain, manage, and monitor one or more standby databases to enable production Oracle Databases to survive disasters and data corruptions. Data Guard maintains these standby databases as transactionally consistent copies of the production database. Then, if the production database becomes unavailable because of a planned or an unplanned outage, Data Guard can switch any standby database to the production role, thus minimizing the downtime associated with the outage.

Data Guard can be used with traditional backup, restoration, and cluster techniques to provide a high level of data protection and data availability. With Data Guard, administrators can optionally improve production database performance by offloading resource-intensive backup and reporting operations to standby systems.

A Data Guard configuration consists of one production database and one or more standby databases. You can manage primary and standby databases using Enterprise Manager. You can use Enterprise Manager to monitor the status of a configuration as well as the online redo log file activity of the primary and standby databases. At the most basic level, the Data Guard Overview page for the configuration not only displays information about the configuration, but it also includes summary information about its databases.

Additional Maintenance Features

Enterprise Manager allows you to easily move data from files or databases into an existing database. You can export and import data, and you can clone databases using the tools available in Enterprise Manager. The following sections describe the features available in the Maintenance area of the Database Home page.

Exporting and Importing Features

The Export to Files feature enables you to move existing data in Oracle format to and from Oracle Databases. For example, export files can archive database data or move data among different Oracle Databases that run on the same or different operating systems. Using Export to Files, you can back up logical database objects while the database is open and available for use. It writes a read-consistent view of the database's objects to an operating system file.

Conversely, you can use Enterprise Manager to import the contents of a database, objects, and tables. You can also import the contents of a database by using the Import from Database feature. You can import an entire database, schemas within a database and the objects in the schemas, or one or more tables from within a schema. Use the Load Data from File feature to load data from a non-Oracle database into an Oracle Database.

Use the Monitor Export and Import Job feature to view the status of an import and export operation such as a full database export or a tablespace export. You can change the state of a job by suspending it, canceling it, or resuming it if it had previously been suspended. You can also increase the number of threads dedicated to the job and thus increase its resources.

Cloning Databases or Transporting Tablespaces

You can use the Enterprise Manager Clone Database tool to clone an Oracle Database instance to an existing Oracle home. After you have an Oracle Database instance in a known state, you may want to clone that database to another existing Oracle home.

Use the Transport Tablespaces feature to transport tablespaces between different machine architectures and operating systems. Transportable tablespaces entirely bypass the unload and reload steps. Using transportable tablespaces, Oracle datafiles (containing table data, indexes, and almost every other Oracle Database object) can be directly transported from one database to another. You can use the transportable

tablespaces feature to move a subset of an Oracle Database and plug it in to another Oracle Database, essentially moving tablespaces between the databases.

Overview of Oracle Streams

Oracle Streams enables the propagation and management of data, transactions, and events in a data stream either within a database, or from one database to another. The stream routes published information to subscribed destinations. As users' needs change, they can simply implement a new capability of Oracle Streams, without sacrificing existing capabilities. Oracle Streams can stream data between databases, nodes, or blade farms in a grid and can keep two or more copies in sync as updates are applied. It also provides a unified framework for information sharing, combining message queuing, replication, events, data warehouse loading, notifications, and publish/subscribe into a single technology.

Oracle Streams provides a set of elements that lets users control what information is put into a stream, how the stream flows or is routed from node to node, what happens to events in the stream as they flow into each node, and how the stream terminates. By specifying the configuration of the elements acting on the stream, you can address specific requirements, such as message queuing or data replication.

Use the tools in Oracle Enterprise Manager to set up and manage your Oracle Streams environment.

Working with Software Configurations

The Oracle Management Agent on a host collects host configuration information for the host and database configuration information for the Oracle Databases on the host and client configuration information and communicates that information over HTTPS to the Oracle Management Service, which stores it in the Oracle Management Repository. Enterprise Manager lets you compare these configurations to determine differences between two or more hosts, clients or databases. The Generic Compare feature allows you to compare various types of current/saved configurations with one or more current/saved configurations.

Using this feature, you can compare the current configuration of a selected target type with one or more current configurations of other targets of the same type, or compare saved configurations with one or more saved configurations of the same or other targets. You can also compare saved configurations with one or more current configurations of the same or other targets, or compare a specific configuration with another configuration and list the differences immediately. Lastly, you can compare a specific configuration with another configuration and schedule the comparison as a job.

Using Database Software Patching

Use Enterprise Manager to simplify the patching of Oracle software on any host where an Oracle Management Agent is running, and to provide critical patch advisories. Enterprise Manager simplifies the process of patching Oracle software. Oracle Patch Advisories describe critical software patches for Oracle products. To help ensure a secure and reliable configuration, all relevant and current critical Oracle patches should be applied. To promote critical patch application, Enterprise Manager performs an assessment of vulnerabilities by examining the host configurations collected for your enterprise to determine the Oracle homes that require one or more critical patches to be installed. All the Critical Patch Advisories are listed with their corresponding Impact areas, a brief description of each advisory, the number of Affected Hosts, and Oracle homes for each advisory. You can connect to Oracle*MetaLink* via Enterprise Manager, perform a search, download the required patches/patch sets, and apply the patches. You can perform all the patching activities from the Patch Cache. That is, even when the OMS is not connected to Oracle*MetaLink* via the Internet, you can perform a search, download, and apply a patch/patch set.

Monitoring Oracle Real Application Clusters

Oracle Real Application Clusters (RAC) provides a high-availability database environment spanning multiple hosts. Each cluster can be comprised of multiple cluster databases, each of which consists of multiple cluster database instances. A cluster database is available as long as one of its instances is available.

Enterprise Manager provides performance pages to monitor all levels of a cluster environment, including the cluster, the cluster database, and the cluster database instances. Managing Oracle Real Application Clusters databases and instances is similar to managing single-instance databases. Using Enterprise Manager, you can perform various tasks, such as:

- Managing clusters, cluster databases, and cluster database instances
- Monitoring key performance statistics
- Performing administration and maintenance tasks
- Managing Oracle Real Application Clusters features, such as Cluster Managed Database Services

Oracle RAC enables each computer (or host) that is a member of the cluster to share access to the database. If one cluster host fails or is taken offline, the other hosts of the cluster continue operating, and the entire Oracle RAC database remains available for applications. This means that two or more computers with typical performance appear to applications as if they were a much more powerful computer.

To increase performance, availability, and reliability of a two-host Oracle RAC database, you can add cluster hosts. Because data is not partitioned between hosts, adding hosts to the cluster does not create instability; instead, applications can run faster or support more users. The more hosts your Oracle RAC database has, the less the loss of any individual node affects the database.

Cluster Cache Coherency

Concurrent read and write activity on shared data in a cluster occurs frequently. Depending on the service requirements, this activity does not normally cause performance problems. However, when global cache requests cause a performance problem as indicated on the Cluster Database page, a successful strategy for performance tuning is to optimize SQL plans and the schema to achieve effective local cache hit efficiency and minimize I/O. To assist you in resolving the problem, the Cluster Cache Coherency page enables you to view cache coherency metrics for the entire cluster database, identify processing trends, and optimize performance for your Oracle Real Application Clusters environment (Figure 13–13).

See Also: "Cluster Cache Coherency Page" in the Enterprise Manager online help





The charts have the following purposes:

- Global Cache Block Access Latency represents the end-to-end elapsed time or latency for a block request.
- Global Cache Block Transfer Rate shows the total aggregated number of data blocks received by all instances in the cluster through an interconnect.
- Global Cache Block Transfers and Physical Reads shows the percentage of logical reads that read data from the buffer cache of other instances through Direct Memory Access and from disk.

Cluster Interconnects

The Cluster Interconnects page enables you to view the current state of interfaces on hosts (Figure 13–14). You can use this page to monitor the interconnect interfaces, determine configuration issues, and identify transfer rate-related issues, such as excess traffic. This page helps determine the load added by individual instances and databases on the interconnect. Sometimes, you can immediately identify interconnect delays due to applications outside the Oracle Database.

See Also: "Cluster Interconnects Page" in the Enterprise Manager online help

Figure 13–14 Cluster Interconnects Page

ORACLE Enterprise Manage Database Control	r 10g 📃							<u>Setup Preferences Help Loquut</u> Database
Cluster: crs								
						Lati	est Data Collected From	n Target Jun 7 2005 7:48:09 PM Refrech
Home Performance Targets Int	oraann	oate				Late	est Data Collected I for	Traiger out 7, 2003 7.40.03 T M (Kenesil)
The interconnect configuration and i and network interfaces currently in u transfers.	The interconnect configuration and internode communication will influence the performance of cluster databases. The tables below show network interfaces on all hosts and network interfaces currently in use by cluster databases. It is important that cluster databases are configured to use a private interconnect for message and block transfers.							
Interfaces by Hosts		into intoi	00111100		Tra	nsfer rate on th	e private network in the las	5 minutes.
Expand All Collapse All		-						
Name	Туре	Subnet	t I	nterface Type	Total	I/O Rate (MI	B/Sec) (Last 5 Minute:	s) Total Error Rate (%) (Last 5 Minutes)
Vers	Cluster							
v staju i i .us.oracie.com	HUSI Intorface	nla		Inknown			nle	
eth2	Interface	10.87.0	4 0 0	Drivoto			3.19	
eth0	Interface	140.87	24.0 F	Public			<u> </u>	
staiu12 us oracle com	Host	140.07.	24.0 r	UDIIC			1.0-	<u> </u>
oth0	Interface	10.87.2	4.0 6	Private			3.03	3
eth2	Interface	n/a		Inknown	<u></u>		<u>0.20</u> n/s	n/a
eth1	Interface	140.87	24 N F	Public			1.27	
Interfaces in Use by Clus	ster Da	tabase	s					
Expand All Collapse All								
	Interfac	e				Interface		Transfer Rate (MB/Sec) (Last 5
Name Target Type	Name		Host N	ame	IP Address	Туре	Source	Minutes)
▼ <u>testrac</u> Cluster Database								
testrac1 Instance	<u>eth0</u>		<u>staju11</u>	.us.oracle.com	10.87.25.147	<u>Private</u>	Oracle Cluster Repository	2.5
testrac2 Database Instance	<u>eth0</u>		<u>staju12</u>	<u>.us.oracle.com</u>	10.87.25.148	<u>Private</u>	Oracle Cluster Repository	<u>2.5</u>
IP The Transfer Rate is the e	estimateo	traffic c	ontribut	ed by the instar	nce assuming	uniform bloc	k size in the database.	
Home Performance Targets Int	erconn	ects						
Hosts	Hosts							
Name \triangle		Status		Alerts	Policy	Violations	CPU Util %	Mem Util % Total 10/sec
staju11.us.oracle.com		1		10		<u>23</u>	<u>19.14</u> 🗸	<u>99.61</u> <u>17.91</u>
staju12.us.oracle.com		٢		00		<u>18</u>	<u>13.24</u> 🗸	<u>43.19</u> 🗸 <u>11.35</u>
opyright © 1996, 2005, Oracle, All rights reserved. bout Oracle Enterprise Manager 10g Database Control								

Cluster-Managed Database Services

Services are groups or classifications of applications that comprise business components that extend and respond to application workloads. Examples of services are Accounts Payable, Customer Relationship Management, and so on. Services in Oracle RAC enable continuous, uninterrupted database operations to support multiple services on multiple instances.

Services enable Oracle RAC to integrate cluster database resources into a single system image to optimize cluster manageability. This simplifies system deployment, testing, disaster recovery, and administrative overhead. With services, users connect to a database without regard for which instance executes the SQL application service.

You assign services to run on one or more instances, and alternate instances can serve as backup instances in case the primary instance fails. If a primary instance fails, Oracle moves the service from the failed instance to a surviving alternate instance. Services enable you to model and deploy both planned and unplanned operations for all types of high availability or disaster recovery scenarios. During outages, Oracle RAC automatically restarts key components. Components that are eligible for automatic restart include instances, Oracle Net Services listeners, and the database as well as several database subcomponents.

You can create and edit services using the Create Services page in Enterprise Manager, which you can access from the Cluster Managed Database Services link in the Enterprise Manager Maintenance page (Figure 13–15).

See Also: "Create Service Page" in the Enterprise Manager online help

Figure 13–15 Create Service Page

Create Service		
Define a highly available service by specifying preferre	d and available instances. You can also specify	service properties to customize failover mechanisms, monitoring thresholds and resource management.
Service Name Accounts		
Start service after creation		
High Availability Configuration		
Instance Name	Service Policy	
racr21	Preferred 💌	
racr22	Preferred 💌	
𝞯 TIP Must select at least one preferred instance		
Service Properties		
Transparent Application Failover (TAF) Policy No	ne 💌	
Enable Distributed Transaction Brassessing		
Choose this option for all Distributed transactions including	XA JITA Services with exactly one preferred instance of	an enable this
Connection Load Balancing Goal Short (Load balance connections based on elapsed time (Short) or Notification Properties	D Long number of sessions (Long).	Sandra Thrashald Lavale
Enable Load Balancing Advisory		If thresholds are specified, alerts will be published when the service elapsed response time and/or
 Service Time O Throughput 		CPU time exceed the threshold.
Enable advisory for load balancing based on service q	uality.	Warning Critical
Enable Fast Application Notification (FAN	for OCI and ODP.NET Applications	Elapsed Time Threshold (milliseconds)
		CPU Time Threshold (milliseconds)
Resource Management Properties		
Associate this service with a predefined consu	mer group or job class.	
Consumer Group Mapping None 💌		
Job Scheduler Mapping 🛛 None 🔽		
		Cancel (OK

Oracle Clusterware and High Availability

When you combine Oracle Clusterware and Oracle RAC, you can achieve excellent scalability and high availability. To maintain high availability, the Oracle Clusterware components can respond to status changes to restart applications and processes according to high availability rules you can specify in the Create Service page (Figure 13–15). Oracle Clusterware achieves high availability with the components in Table 13–2.

 Table 13–2
 Oracle Clusterware High Availability Components

Component	Description
Voting Disk	The voting disk manages cluster membership by using a health check, and arbitrates cluster ownership among the instances in case of network failures. Oracle RAC uses the voting disk to determine which instances are members of a cluster.

Component	Description
Oracle Clusterware Registry	The OCR maintains database and cluster database configuration information as well as configuration information about any cluster database within the cluster. The OCR also manages information about processes that Oracle Clusterware controls.
Application Programming Interface	Oracle Clusterware provides a high availability application programming interface (API) that you can use to manage applications or processes that run on single-instance Oracle databases or Oracle RAC databases. This enables you to provide high availability for all of your applications.

Table 13–2 (Cont.) Oracle Clusterware High Availability Components

Application Server Management

This chapter describes how you can use Enterprise Manager Grid Control (Grid Control) to manage the crucial components of your middle-tier Oracle Application Servers, which provide you with a platform for deploying your e-business Web applications.

Specifically, this chapter describes how Grid Control can help you manage all aspects of your application server installations. The Oracle Application Server management capabilities of Enterprise Manager are described in the following sections:

- Introduction to Application Server Management
- Monitoring Application Servers
- Administering Application Servers
- Maintaining Application Servers

Introduction to Application Server Management

Oracle Application Servers can be managed using a standalone Application Server Control that comes with every Oracle Application Server or by using a centralized monitoring tool, that is Enterprise Manager Grid Control. This section introduces you to Application Server Control and Enterprise Manager Grid Control, and explains under what circumstances they come into use.

Out-of-Box Management Using Oracle Application Server Control

Every Oracle Application Server 10*g* instance is installed with an Application Server Control to help you manage that particular application server instance. Application Server Control provides Web-based management features designed to monitor and administer application server instances, farms, and clusters. You can also deploy applications, monitor real-time performance, manage security, and configure the application server components.

Application Server Control relies heavily on various underlying technologies to discover, monitor, and administer the application servers in an environment. It consists of the Application Server Control console and its underlying technologies:

- Oracle Dynamic Monitoring Service (DMS)
- Oracle Process Management Notification (OPMN)
- Distributed Configuration Management (DCM)
- A local version of the Oracle Management Agent specifically designed to gather monitoring data

However, you can manage only one application server at a time using Application Server Control. Typically, you have multiple application servers in your enterprise configuration, and managing all these instances using individual Application Server Controls becomes very difficult.

For centralized management and additional management functionality (for example, application service level management, deployments, historical data collections for performance trending alerts, and so on), you can use Grid Control.

Centralized Management Using Enterprise Manager Grid Control

While Application Server Control provides standalone management for a single application server instance and its components, Grid Control provides centralized management of multiple application servers in your environment.

For example, if you have ten application servers installed on ten different hosts, then you can manage all these ten application servers and hosts through a single window using Grid Control. With the help of Management Agents deployed on each host, Grid Control automatically discovers the application servers on these hosts and begins monitoring them using default monitoring levels, notification rules, and other default settings.

Both Application Server Control and Grid Control have their own application server home pages that provide easy access to key information required by the administrators. The Application Server Home page on Grid Control (Figure 14–1) provides:

- Application server status, responsiveness, and performance data
- Resource usage for the application server and its components
- List of core components that were installed and configured for the application server, and links to their home pages
- Functionality to start, stop, and restart any of those core components
- Alerts and diagnostic drill-downs so you can identify and resolve problems quickly
- Links to Application Server Control for administration operations such as starting and stopping components, modifying configurations, and deploying applications
- Links to other pages in Grid Control that might be helpful in accomplishing your given task

ORACLE Grid Control	Enterprise Manager 10 g			Home Ta	rgets D	eployments	Alerts	Setup Pret Policies	erences Help Logout Jobs Reports
Hosts Data	abases Application Serv	/ers Web Applicati	ons Services :	Systems Group	os All Tar	rgets			
Oracle Appl	ication Server: Enterr	viseManager0 st	tach11 us orac	le com					
	ication berver. Enter	insemanagere.s		10.0011	P	age Refrest	ed Oct 26.	2005 11:42:4	7 PM PDT Refresh
Home	Top J2EE Applications	Web Applications	Performance	Administration	Topology				
General				Applicatio	n URL Re	sponse (s	econds)		
	Status Up (<u>Black Ou</u> vilability (%) 100	t_)		0.06					
	(Last 24 Hours)			0.05					
Appl	ication URL <u>http://stacb11.</u>	<u>us.oracle.com:7778</u>		0.04					
Insta	Illation Type J2EE and Wel	b Cache		0.03					
0	racle Home <u>/scratch/Oracle</u>	eHomes/oms10g		0.02					
	TIUSE <u>StacDTT.US.UTA</u>	<u>cie.com</u>		0.01					
				0.00					
				6.54 Oct 2	26, 2005	Э	1	0 11	
Compone	nts								
Start S	Stop) (Restart)								
Select All	Select None								
Select Nan	ne $ riangle$	Туре		Curr	ent Status				
D hom	e	OC4J			Û				
	P_Server	Oracle HTTP Serve	ər		Û				
<u> </u>	IJ_EM	OC4J			Û				
<u>0C4</u>	IJ_EMPROV	OC4J			Û				
C Web	<u>o Cache</u>	Web Cache			Û				
Alerts									
Alerto									
Metric		Severity	Alert Triggered			L	ast Value	Last Checke	1
No Alerts to	und.								
Host Alert	s								
Madela		Courseller	Alext Television				ant Value	Last Charles	
No Alerts fo	und	Severity	Alen Inggered			L	ast value	Last Checker	1
Related L	inks								
Patch		<u>Char</u>	nge Application UR	L		<u>Admini</u>	ster	a:	
Alert History	<u>zontiguration</u>	All N Blac	<u>netrics</u> kouts			Metric Report:	and Policy 3	Settings	
Access	-	Targ	et Properties				-		
Home	Top J2EE Applications	Web Applications	Performance	Administration	<u>Topology</u>				

Figure 14–1 Application Server Home Page

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

Monitoring Application Servers

Grid Control provides a comprehensive set of features for monitoring application servers in your environment. You can view a summary of the most critical information pertaining to Oracle Application Servers and their core components. You can monitor their performance, view the alerts and policy violations that were generated, track the configuration changes that were made over a period of time, and perform other administrative tasks on them.

What Gets Monitored?

Grid Control helps you monitor the following application server components/types:

Monitored Target	Services Offered by Grid Control	Related Links			
Oracle	Automatically discovers Oracle	Monitoring Performance			
Application Server	Application Servers in your environment and monitors their status, responsiveness.	Viewing Topology			
	 and performance. Helps you view the I2EE and Web 	Creating Services from J2EE or Web Applications			
	applications deployed on the application servers.	Diagnosing Performance Issues with Top Reports			
	 Helps you perform administrative tasks like patching or cloning Oracle homes, backing up or recovering application servers, and viewing, comparing, or searching configuration information 	Managing Backup and Recovery of the Application Server Environment			
	 Also helps you view the topology. 	Cloning and Patching the Application Server Environment			
Oracle HTTP Server	 Automatically discovers and monitors Oracle HTTP Servers running within the 	Diagnosing Performance Issues with Top Reports			
	application servers.	Monitoring Performance			
	 Provides a host of metrics to gauge the server performance and virtual host performance. 	Managing Configurations			
	 Helps you view the top URLs being accessed. 				
	 Also helps you perform enterprise configuration management tasks like viewing, comparing, and searching configuration information. 				
OC4J	 Automatically discovers and monitors OC4J instances running within the application servers. 	Diagnosing Performance Issues with Top Reports			
	 Helps you view the active applications running on them. 	Managing Configurations			
	 Also helps you perform enterprise configuration management tasks like viewing, comparing, and searching configuration information. 				
OracleAS Web Cache	 Automatically discovers and monitors OracleAS Web Cache instances running within the application servers. 	Monitoring Performance Managing Configurations			
	 Helps you view the metrics associated with this target to analyze their performance. 				
	 Also help you perform enterprise configuration management tasks like viewing, comparing, and searching configuration information. 				

Table 14–1 Application Servers and Their Components That Get Monitored

Monitored Target	Services Offered by Grid Control	Related Links
Oracle BPEL Process Managers	 Automatically discovers and monitors Oracle BPEL Process Managers deployed on the application corrupt 	Creating Infrastructure and Aggregate Services
	 Helps you view a list of domains and processes for a BPEL target, and the partner links associated with a particular BPEL process. 	Adding SOAP Tests for Partner Links
	 Also helps you create infrastructure services for BPEL targets, aggregate services for their processes, and SOAP Tests for the partner links. 	
	Business Process Execution Language (BPEL) is an XML-based language for enabling task sharing across multiple enterprises using a combination of Web services. Oracle BPEL Process Manager provides a framework for easily designing, deploying, monitoring, and administering processes based on BPEL standards.	
Oracle	Helps you manually discovery Oracle	Viewing Members
Application Server Farm	Application Server Farms and monitor their overall health.	Viewing Topology
	 Helps you view the member DCM clusters and application servers within a farm. 	Monitoring Dashboard
	 Also helps you view the topology and perform administrative tasks like creating jobs and blackouts, and searching for deployments and configuration information. 	
	An OracleAS Farm is a collection of OracleAS DCM Managed Clusters and Oracle Application Server instances that share the	

same Farm Repository.

Table 14–1 (Cont.) Application Servers and Their Components That Get Monitored

Monitored Target	Services Offered by Grid Control	Related Links
Oracle	Helps you manually discovery Oracle	Viewing Members
Application Server DCM	Application Server DCM Managed Clusters and Oracle Application Server	Viewing Topology
Managed Cluster	Clusters, and monitor their overall health.	Monitoring Dashboard
and Oracle Application Server Clusters	 Helps you study the High Availability grouping done for the members of an DCM Managed Cluster. A High Availability Group is a group composed of similar individual components of application server instances clustered together in a DCM managed cluster. For example, an OC4J High Availability Group has a group of OC4J instances in an OracleAS Cluster. 	
	 Also helps you view the topology and access the Oracle System Monitoring Dashboard that provides a quick overview of the health of the target. 	
	Note: An OracleAS DCM Managed Cluster is a collection of release 9.0.4 to release 10.1.2 Oracle Application Server instances with identical configuration and application deployment characteristics. An OracleAS Cluster is a collection of release 10.1.3 or higher versions of Oracle Application Server instances.	
Third-Party Application Server	Helps you manually discover the following third-party application servers, and monitor their status:	Chapter 15: Host and Third-Party Target Management
	 BEA WebLogic Server Domain 	-
	 BEA WebLogic Server Cluster 	
	 BEA WebLogic Managed Server 	
	 IBM WebSphere Application Server Cell 	
	 IBM WebSphere Application Server Cluster 	
	 IBM WebSphere Application Server 	
	 JBoss Application Server 	
	Also helps you view the applications deployed on these third-party application servers, and perform enterprise configuration management tasks like viewing, comparing, and searching configuration information. Helps you view the members within a domain, cluster, or cell.	
Third-Party Plug-In	Helps you manually discover the following third-party plug-ins and monitor their health:	Chapter 15: Host and Third-Party Target
	IBM WebSphere MQ Cluster	Management
	 IBM WebSphere MQ Queue Manager (along with the associated Queues and Channels) 	

 Table 14–1 (Cont.) Application Servers and Their Components That Get Monitored

Note: For more information about monitoring third-party targets, see **Chapter 15: Host and Third-Party Target Management**.

Important: Enterprise Manager Grid Control 10.2 release supported only release 9.0.4 to release 10.1.2 application server targets, and for that release, OracleAS DCM Managed Cluster was actually called "OracleAS Cluster". However, now that Enterprise Manager Grid Control 10.2.0.2 release has additional support for 10.1.3 application server targets, for the purpose of clarity, the terminologies have been amended to distinguish the ones managed by DCM and the ones that relate to release 10.1.3 application server targets.

Viewing Critical Information

This section describes how you can use Grid Control to view critical information pertaining to application server targets.

General Information

Grid Control provides general information about the targets including their status and availability. This helps you understand how the target is performing, where it is deployed, what is its version, where is its home directory, and so on. If the target is a logical target that groups its inherent members, then details about the membership are also provided.

Figure 14–2 General Section



Alerts and Host Alerts

Grid Control shows the number of critical, warning, and error alerts generated for the past 24 hours. These alerts indicate that a particular metric condition has been encountered. For example, an alert is triggered when a metric threshold is reached. Using these details, you can drill down to investigate the target and the problem that triggered the alert. For more information about alerts, see Automated Monitoring and Alerts in this chapter.

Figure 14–3 Alerts and Host Alerts Sections

Alerts				
Metric	Severity	Alert Triggered	Last Value	Last Checked
Error Rate (%)	×	Nov 8, 2006 7:25:08 PM	3.26	Nov 8, 2006 7:25
Host Alerts				
Metric			Sever	ity Alert Trigger
Filesystem Space Available	<u>(%) for /</u>		×	Oct 4, 2006 12:58:06 AM
Log File Pattern Matched Lin for /private/oracle/orahomes/a	<u>ie Count</u> agent10g/sysmar	/log/emagent.log/ERROR/Sun Oct 22 16:37:15 2006 GM	<u>1-07:00</u>	Oct 22, 2006 4:37:14 PM

Policy Violations

Grid Control also shows the number of informational, warning, and critical policy rules violated for the application server target. You can see the roll-up of individual policy compliance scores for that target. Compliance scores provide a quick way to determine the health of your target. You can also see the policy trend overview for the last 24 hours, for the last week, for the last month, or for a user-defined time period, and determine your course of action in solving the policy violations.

Grid Control also shows the time when security policy rules were last evaluated, and shows the roll up of individual policy compliance scores for that target.

Figure 14–4 Policy Violations and Security Sections

Policy Violations				
Current 100	Distinct Rules Violated 100	💷 Compliance Score (%) 🏾 17		Policy Trend Overview
Security				
Last Security Evaluation	🐚 Nov 8, 2006 7:35:23 PM PST	Compliance Score (%)	17	Enterprise Se

Viewing Information About Applications Deployed

Grid Control provides details about the J2EE applications deployed on the application server instances. You can quickly assess which applications are most active and which are using the most system resources.

00	04J: h	ome					
		Page Refres	hed Nov 10, 2006 2:17:27 AM P	ST Refres	h) View Data La:	st 24 hours	-
	Hom	Applications	Performance Administration	1			
	Active	Applications					
	Crea	te Service			🛇 Previ	ous 1-25 of	27 🔽 <u>Next 2</u> 😒
	Select	Name		Active Requests	Request Processing Time (seconds)	Active EJB Methods	Method Execution Time (seconds)
	۰	rules_default_SOAOr	derBooking_1_0_DecisionService	0.00	<u>0.45</u>	<u>0.00</u>	0.00
	0	<u>gateway</u>		<u>0.00</u>	0.00	<u>0.00</u>	<u>0.00</u>
	0	<u>rulehelp</u>		0.00	0.00	<u>0.00</u>	0.00
	0	SOADEMO-RAPIDSE	RVICE-RapidService-WS	<u>0.00</u>	<u>0.01</u>	<u>0.00</u>	0.00
	0	<u>orainfra</u>		0.00	0.00	0.00	0.00

Figure 14–5 Viewing Details about the Applications Deployed

Grid Control gives you the flexibility to update the information about applications based on current, real-time application performance, or based on historical data from the Management Repository. For example, you can see which applications were the most active over the past 24 hours, over the past week, or over the past month.

Viewing Members

For logical, composite targets like OracleAS Farms and Clusters, Grid Control provides rolled-up information on the member targets that make up the group. It provides a "Members" tab that helps you view the members associated with that particular composite target; check their status; and start, stop, or restart each of them.

Oracl	Application Server Farm: Far	m101202	
		Page Refreshed Nov 10, 2006 2:32	53 AM PST
H	ome <u>Metrics</u> Administration	Members Topology	
Searc	h All		
Stari Expan	Stop Restart		
Select	Name	Statu Type Status Detail	s s Aler
۲	▼ <u>Farm101202</u>	Oracle Application Server Farm n/a 4 (습	4) <u>o</u>
0	V Farm101202.Cluster101202	Oracle Application Server DCM Managed Cluster n/a 4 (습	4) <u>o</u>
0	midtier101202_1.stacb08.us.or	acle.com Oracle Application Server 🕥 4 (介	4) <u>o</u>

Figure 14–6 Viewing Details about Member Targets

Grid Control also helps you study the High Availability (HA) grouping done for the members of an OracleAS DCM Managed Cluster. A High Availability Group is a group composed of similar individual components of application server instances clustered together in a DCM managed cluster. For example, an OC4J High Availability Group has a group of OC4J instances in an OracleAS Cluster

Monitoring Performance

This section describes the features offered by Grid Control that help you monitor the performance of application server targets.

Using Performance Metrics

Grid Control provides a set of predefined performance metrics for every application server target. By selecting a metric, you can determine whether the thresholds have been defined for a particular metric. Grid Control uses thresholds defined within metrics as a mechanism to generate alerts. These alerts in turn are used to notify you whether a target is up or down, a disk on the target is near full, and so on. Thus, you can monitor their overall performance.

The performance metrics provide details about the metric as a current real time value (30 seconds, 1 minute, or 5 minutes) or a previous value (past 24 hours, 7 days, or 31 days). The historical information is displayed as graphs and a table. By using graphs, you can easily watch for trends, and by using tables, you can examine details of past metric severity history.

Automated Monitoring and Alerts

Grid Control provides a comprehensive set of features that facilitates automated monitoring and generation of alerts. Oracle Management Agent on a host automatically discovers the Oracle Application Server targets on that host, and helps Grid Control perform unattended monitoring of their status, health, and performance.

Grid Control gathers and evaluates diagnostic information from these targets distributed across the enterprise, and an extensive array of application server performance metrics are automatically monitored against predefined thresholds.

For example, Grid Control can automatically monitor:

 The CPU or memory consumption of the application server, including detailed monitoring of individual Java Virtual Machines (JVMs) being run by the server's Oracle Application Server Containers for J2EE (OC4J) instances

- J2EE application responsiveness from the application down through individual servlets and Enterprise JavaBeans (EJBs)
- HTTP Server session volumes, connection duration, and error rates
- Oracle Application Server Web Cache hit rates and volumes
- Top servlets based on number of requests, maximum processing time, and highest average processing time

If an Oracle Application Server or any of its core components go down, or if a performance metric crosses a warning or critical threshold, then an alert is generated by Grid Control and a notification is sent to you. Grid Control supports notifications via e-mail (including e-mail-to-page systems), SNMP traps, and/or by running custom scripts.

When you receive an alert notification, Grid Control makes it easy for you to investigate the problem and take corrective actions wherever required. For example, notification of excessive CPU consumption by OC4J may lead to investigation of the applications running in that container. By using the Top J2EE Applications tab of the Application Server Home page (Figure 14–7) in Grid Control, you can quickly identify the highest volume or least responsive application. You can then drill down and diagnose application's servlets, Java Server Pages (JSPs), or EJBs to identify the bottleneck.

Figure 14–7 Monitoring the Performance of Your Deployed J2EE Applications

E	ome Top J2EE Applications Vel	o Applicatio	ons <u>Performance</u>	Administration	<u>i Topology</u>		
View T	op J2EE Applications by Total Processing	Time	•				
Crea	ate Service)						
		0C4J			Average Servlet/JSP Processing Time	Servlet/JSP Requests	T Servlet/ Process T
Select	Name	Instance	Total Processing Tir	ne (seconds) $ abla$	(seconds)	Processed	(secor
Select ©	Name system	Instance home	Total Processing Tir	<mark>ne (seconds)</mark> ⊽ 10.64	(seconds) 0.01	Processed	(seco) 1(
Select ©	Name system policymanager	Instance home home	Total Processing Tir	ne (seconds) ⊽ 10.64 7.93	(seconds) 0.01 0.03	Processed 1,102 264	(seco) 1(
Select O O	Name system policymanager default	Instance home home home	Total Processing Tir	ne (seconds) ▽ 10.64 7.93 1.03	(seconds) 0.01 0.03 0.002	Processed 1,102 264 477	(secon 1(
Select © O O	Name system policymanager default gateway	Instance home home home home	Total Processing Tir	ne (seconds) ▽ 10.64 7.93 1.03 0.00	(seconds) 0.01 0.03 0.002 0.00	Processed 1,102 264 477 0	(seco) 1(,
Select O O O O	Name system policymanager default gateway coreman	Instance home home home home home	Total Processing Tir	ne (seconds) ▽ 10.64 7.93 1.03 0.00 0.00	(seconds) 0.01 0.03 0.002 0.00 0.00	Processed 1,102 264 477 0 0	(secol 1(((

You can set up corrective actions to automatically resolve an alert condition. These corrective actions ensure that routine responses to alerts are automatically executed, thereby saving you time and ensuring that problems are dealt with before they noticeably impact the users.

You can also use monitoring templates to simplify the task of standardizing monitoring settings across your enterprise. You can specify the monitoring settings once and apply them to all Oracle Application Server targets. A Monitoring template defines all Grid Control parameters you would normally set to monitor an Oracle Application Server target, such as:

- Target type to which the template applies
- Metrics (including user-defined metrics), thresholds, metric collection schedules, and corrective actions

When a change is made to a template, you can reapply the template across affected Oracle Application Server targets in order to propagate the new changes. You can reapply monitoring templates as often as needed.

Viewing Topology

Besides the monitoring features provided for Oracle Application Servers, OracleAS Farms, and OracleAS DCM Managed Clusters, Grid Control also provides a topology view for these targets. You can view their topology to understand what application servers and components are running on which hosts, how these components are related to each other, and how requests are routed through different layers of the deployment. This kind of visualization of the data center enterprise topology helps administrators effectively monitor, manage, and validate the enterprise architecture.

Grid Control provides three different views of topology. Each view provides the overlay of some key metrics of components including current status, number of alerts and policy violations, and CPU/memory utilization performance metrics.

- Host View shows the physical view of deployment and visually shows the relationship between hosts and various components and instances hosted by them.
- Routing Overview shows the routing view of topology and provides an end-to-end view of wired component and application flow through them. The routing includes routing from OracleAS Web Cache to Oracle HTTP Server to OC4J to DB instances.
- Routing Details also shows the protocol and port used by various components to
 route requests to other components in the topology.



Figure 14–8 Topology View of an OracleAS Farm

These routing views enable you to fix various topology configuration problems immediately. For example, if an OC4J instance is not accepting any user requests, the

routing details view confirms if the front-ending Oracle HTTP Server instances are configured correctly to route user requests to that OC4J instance. OracleAS Web Caches, Oracle HTTP Server, or OC4J components are displayed in the same box, if they provide redundancy for each other.

For example, a set of OracleAS Web Caches are combined in the same box if all of them are routing to the same set of Oracle HTTP Server instances. Similarly, a set of OC4J instances are combined in the same box if they are routed by the same set of Oracle HTTP Server instances, and are also hosting the same set of J2EE applications. As the like-components are grouped together, the topology visual representation in routing overview or routing details view provides instant Root Cause Analysis for the service availability problems.

Monitoring Dashboard

Grid Control also provides access to Oracle System Monitoring Dashboard that helps you monitor the health of a target. However, this feature is provided only for OracleAS Farms, OracleAS DCM Managed Clusters, Oracle Application Servers, OC4J High Availability Groups, and HTTP Server High Availability Groups.

Oracle System Monitoring Dashboard presents information using intuitive icons and graphics that let you spot recent changes and quickly identify and respond to problems. You can customize the display attributes to match information requirements of managed targets, monitor status indicators for recent problems, and see new alerts that have been triggered since the dashboard was last viewed.

Oracle Applicatio	n Server Farm: sri11							F	^p age Refreshe	ed Oct 17,	2005 2:
arget	Туре		Status	Alerts	∇	Pc Violati	olicy ons	OC4J Instances - Active Sessions	Request Throughp (request per secon	: Requ ut Proces s Tim d) (secor	est sing C e Us ids) (
ri11.abc1	Oracle Application S	Server Cluster	5 🏠	0	0	2	20	٥	٥	٥	
ri11.abc	Oracle Application S	Server Cluster	10 🥾	0	0	4	0 0				
012ph1core1.stadn39.u	is.oracle.com Oracle Application S	Server	4 🛧	0	0	3	0 0	٥	٠	•	
severity Target	0	Date 🗸			Me	ssage				Latest Co	nment
ieverity Target	odn39.us.oracle.com	Date ⊽ Oct 15, 20	005 3:49:	07 AM	Mes The	ssage applicat	ion s	erver instanc	e is down	Latest Co	nment
Target Image: Severity Target Image: Severity 9042core.sta Image: Severity 904core.stad	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server	Date ▽ Oct 15, 20 Oct 15, 20	005 3:49: 005 3:49:	07 AM .	Mes The The	ssage applicat Oracle I	ion s ITTP	erver instanc Server instar	e is down nce is down	Latest Co	nment
Target Image: Point of the second	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC43	Date ⊽ Oct 15, 20 Oct 15, 20 Oct 15, 20	005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM	Mes The The	ssage applicat Oracle I ADFBC	ion s ITTP	erver instanc Server instar e instance is c	e is down nce is down down	Latest Co	nment
Average Target Image: Construction of the second sec	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC43 dn39.us.oracle.com HTTP Server	Date Oct 15, 20	005 3:49: 005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM 11 AM	Mes The The The	ssage applicat Oracle I ADFBC Oracle I	ion s ITTP nome ITTP	erver instanc Server instar instance is c Server instar	e is down nce is down down nce is down	Latest Co	nment
everity Target 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC4J dn39.us.oracle.com HTTP Server dn39.us.oracle.com Web Cache	Date √ Oct 15, 20	005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM 11 AM 14 AM	Mes The The The The	applicat Oracle I ADFBC Oracle I Web Ca	ion s ITTP nome ITTP che i	erver instanc Server instar Einstance is co Server instar Instance is do	e is down nce is down down nce is down wn	Latest Co	nment
everity Target 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad 9042core.stad	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC4J dn39.us.oracle.com HTTP Server dn39.us.oracle.com Web Cache n39.us.oracle.com home	Date Oct 15, 20	005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM 11 AM 14 AM 32 AM	Mes The The The	ssage applicat Oracle I ADFBC Oracle I Web Ca OC4J in	ion s ITTP nome ITTP che i stan	erver instanc Server instar Instance is do Server instar nstance is do ce is down	e is down nce is down down nce is down wn	Latest Co	nment
everity Target 9042core.stad 9042core.stad	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC4J dn39.us.oracle.com HTTP Server dn39.us.oracle.com Web Cache n39.us.oracle.com home n39.us.oracle.com	Date Oct 15, 20	005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM 11 AM 14 AM 32 AM	Mes The The The The	ssage applicat Oracle I ADFBC Oracle I Web Ca OC4J in applicat	ion s HTTP home HTTP che i stani	erver instanc Server instar Einstance is o Server instar nstance is do ce is down erver instanc	e is down nce is down down nce is down wm e is down	Latest Co	nment
everity Target 9042core.stad 9042core.stad	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC4J dn39.us.oracle.com HTTP Server dn39.us.oracle.com Web Cache n39.us.oracle.com home n39.us.oracle.com Web Cache n39.us.oracle.com Web Cache	Date Oct 15, 20	005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM 11 AM 14 AM 32 AM 39 AM	Mes The The The The The	ssage applicat Oracle I ADFBC Oracle I Web Ca OC4J in applicat Web Ca	ion s HTTP home HTTP che i stand ion s che i	erver instanc Server instar Einstance is do Server instar nstance is do te is down erver instanc nstance is do	e is down nce is down down nce is down wn e is down wn	Latest Co	mment
ieverity Target 9042core.stad 9042core.stad	0 dn39.us.oracle.com n39.us.oracle.com HTTP Server n39.us.oracle.com BC4J dn39.us.oracle.com HTTP Server dn39.us.oracle.com Web Cache n39.us.oracle.com Meb Cache n39.us.oracle.com Web Cache dn39.us.oracle.com BC4J	Date ∨ Oct 15, 20 Oct 15, 20	005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49: 005 3:49:	07 AM 08 AM 10 AM 11 AM 14 AM 32 AM 39 AM 41 AM	Me: <u> The</u> <u> The</u> <u> The</u> <u> The</u> <u> The</u> <u> The</u> <u> The</u>	ssage applicat Oracle I ADFBC Oracle I Web Ca OC4J in applicat Web Ca ADFBC	ion s HTTP home HTTP che i stand ion s che i home	erver instanc Server instar e instance is do Server instar nstance is do erver instanc nstance is do e instance is do	e is down nce is down down nce is down wn e is down wn down	Latest Co	mment

Figure 14–9 Oracle System Monitoring Dashboard

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Administering Application Servers

Grid Control provides features for performing administrative tasks on application server targets. It provides Web-based interfaces for performing operations such as:
- Starting, stopping, or restarting any of the core components of the application server.
- Performing configuration management tasks, such as viewing and comparing configuration information. Refer to "Managing Configurations" in this chapter for more information.
- Accessing a list of predefined search queries to search and retrieve configuration information. Refer to "Managing Configurations" in this chapter for more information.
- Integrating application instrumentation in Enterprise Manager's event monitoring infrastructure. Refer to "Extensible Monitoring" in this chapter for more information.
- Staging or applying an interim patch or patch set, and/or cloning an application server's Oracle home to one or more hosts. Refer to "Cloning and Patching the Application Server Environment" in this chapter for more information.
- Performing scheduled backup and recovery. Refer to "Managing Backup and Recovery of the Application Server Environment" in this chapter for more information.
- Creating blackouts to perform scheduled maintenance.
- Viewing the number of scheduled, running, suspended, and problem (stopped/failed) executions for all Grid Control jobs submitted on the application server.
- Creating Application Server Farms and managing their components.

Managing and Creating Blackouts

Grid Control comes with a bundle of performance and health metrics that enable automated monitoring of application targets in your environment. When a metric reaches the predefined warning or critical threshold, Grid Control generates an alert and notifies the administrators.

However, there are occasions when you want to perform maintenance work on your application server targets, and not want any alerts to be generated while you are bringing them down. In this case, you can schedule a blackout and suspend monitoring of the application server targets.

Blackouts allow you to suspend any data collection activity on one or more monitored targets, thus allowing you to perform scheduled maintenance on targets. If you continue monitoring during these periods, the collected data will show trends and other monitoring information that are not the result of normal day-to-day operations. To get a more accurate, long-term picture of a target's performance, you can use blackouts to exclude these special-case situations from data analysis.

Grid Control allows you to define new blackouts; view the status of existing blackouts; and edit, stop, and delete blackouts that are not required. You will find the Black Out option in the General section on the home page of any application server target. For composite targets like OracleAS Farms, you will find this option in the Administration tab.

Managing and Creating Jobs

For OracleAS Farms, OracleAS DCM Managed Clusters, and OracleAS Clusters, Grid Control provides a job system that allows you to create jobs. You can also view details about the jobs that are scheduled, running, suspended, or the ones that have a problem. You can schedule a job directly from these composite targets to run an OS command on the members or start, stop, or restart any OPMN component.

Creating Services from J2EE or Web Applications

Grid Control allows you to create services directly from a J2EE or Web application to help you track their availability and performance. Understandably, the business applications running on an application server simply reflect the quality of service rendered by an organization. Considering their criticality and complexity, it becomes imperative for any organization to ensure that they are always available and capable of servicing the requests within an acceptable turnaround time.

By creating services from a J2EE or Web application, you can group your applications as an entity that provides a useful function to its users. This helps you monitor the overall performance of the service that represents a function offered to the users, and also monitor the infrastructure components upon which the service depends. You can also receive alerts when there is a problem, identify common issues within the system, diagnose causes of failures, and resolve them.

Figure 14–10 Creating Service from J2EE or Web Applications

H	ome	Top J2EE Applications	<u>Web</u>	Application	ons	Performance				
View To	View Top J2EE Applications by Total Processing Time 🗾									
Create Service										
Select	Name			OC4J Instance	Total	Processing Tir				
()	system			home	. o tui					
0	policyn	- nanager		home						
0	default			home						

Every time you create a service for J2EE or Web application, Grid Control creates a service dependency to identify the components on which the selected application depends. Here, the components refer to infrastructure components like hosts, databases, application servers, and so on that work together to host your J2EE or Web applications. After identifying the components required for that application, Grid Control creates a system with those components, and then creates a service and associates it with that application.

So, every time you create a service, Grid Control checks to see if a dependency mapping is already available for the selected application. If it is available, then a service is created using that existing system rather than creating another system with exactly the same members.

According to the availability of this dependency mapping for an application, you can either create a new service with a new system, create a new service with an existing system, or refresh a service.

Creating Infrastructure and Aggregate Services

Grid Control allows you to create infrastructure services for Oracle BPEL Process Managers.

An infrastructure service is a dependency service that is created to identify the infrastructure components on which the selected Oracle BPEL Process Manager

depends. Here, the infrastructure components refer to hosts, databases, application servers, and so on that work together to host the Oracle BPEL Process Manager.

You can either create an infrastructure service with a new system or an existing system, or simply refresh an existing infrastructure service, if there is already one existing. By creating infrastructure services and systems, you can better manage your BPEL targets and also the components on which the BPEL targets depend.

Figure 14–11 Creating Infrastructure Service for Oracle BPEL Process Manager

System And Service									
Refresh BPEL Infrastructure Service									
System	Status	Alerts	Policy Violations	Service					
SOA_Instance_system	Ŷ	6 0	5 2 0	SOA_Instance					

Once you create an infrastructure service for an Oracle BPEL Process Manager target, Grid Control allows you to create an aggregate service for every process within that Oracle BPEL target. An aggregate service is a logical grouping of services, in this case, infrastructure services and availability services. An availability service is a service that is created when a SOAP (Simple Object Access Protocol) test is added for the first time to the partner links associated with the selected Oracle BPEL processes. Aggregate Services give you a bird's-eye view of the services that have been created for the Oracle BPEL target and helps you monitor their availability, performance, and usage.

Figure 14–12 Creating Aggregate Service for Oracle BPEL Process

Services									
Provides details about the services that have been created for this Oracle BPEL Process.									
(Create Service)									
Expand All Collapse All									
Name	Service Type	Status	Usage Alert	Performance Alert	Policy Violations				
default_BatchOrderProcessing(v.1.0)	Aggregate Service	Ŷ	0 0	0 0	0 0 0				
SOA_Instance	Generic Service	₽	0 0	0 0	0 0 0				

Adding SOAP Tests for Partner Links

Grid Control allows you to add SOAP tests for partner links associated with a selected Oracle BPEL process in order to test their availability.

SOAP is an XML-based message protocol used by Web Services of these partner links. Each SOAP message consists of a single SOAP envelope. An envelope defines how to process the message, who should process the message, and whether processing is optional or mandatory.

Grid Control allows you to select a particular method specific to a port type exposed by the Web service, and provide values for the input parameters that it should use. The SOAP test invokes the selected method and checks if the Web service is up. This way, you can track the performance of the partner links and know when they are down.

Creating Log Rotation Jobs

Oracle Application Server components generate log files containing messages that record all types of events, including startup and shutdown information, errors, warning messages, access information on HTTP requests, and additional information.

However, the information recorded in log files is voluminous, thus making it difficult to track what update was made at what time. Also because of the huge quantity of information updated periodically, the log files grow in size and occupy more space on the system over a period of time. The only way to manage these log files is to manually archive the contents to another file and store them in a different location.

Considering these impediments, Grid Control has been enhanced with a log rotation feature that helps you manage the logs of Oracle Application Server components more effectively. In particular, you can use Grid Control to:

- Schedule a job that automatically rotates a log at the scheduled date and time
- Manage space on your system by storing the rotated log files in a different directory

Grid Control allows you to view the logs of a particular Oracle Application Server component type and select the ones that need to be rotated. Note that a log rotation job can also be part of a multi-task job.

When a log rotation job is executed, Grid Control automatically stops the component whose logs have to be rotated. After it is stopped, the content from its existing log file is moved to another file that is distinguished with the timestamp when it was actually rotated. The original log file is kept empty for new log details to be populated. Once this is done, Grid Control starts the component.

Managing Configurations

Grid Control provides a suite of configuration management functions that can be performed on Oracle Application Server and its components (OracleAS Web Cache, Oracle HTTP Server, and OC4J).

Oracle Management Agent collects configuration information about Oracle Application Server targets from their respective configuration files, and communicates this information over HTTP/HTTPS to Oracle Management Service, which stores it in the Management Repository. This information is periodically collected and updated while maintaining the audit of changes. Enterprise Manager's configuration management capabilities efficiently guide the users to desired configuration data in a particular component.

See Also: "Hardware and Software Configurations" in Chapter 6, "Managing Deployments"

In addition to collecting and tracking hardware and software installations (binaries version number/patch level) of Oracle Application Server targets, Grid Control also tracks configuration details of core components (OracleAS Web Cache, Oracle HTTP Server, and OC4J) of all Oracle Application Server instances. You can compare these configuration details and view the differences and similarities between the core components. You have the flexibility to compare two configurations in the Management Repository or two saved configuration files. You can also compare one configuration with multiple configurations or one configuration in the Management Repository with a saved configuration file.

Using Grid Control, you can search configurations across application servers and find configuration anomalies - whether they are a mismatch of an install/patch version of Oracle Application Server software, or they are a mismatch of software configuration data for the core components of Oracle Application Server. You can perform more intelligent searches to identify all the components hosting a particular application or other resources.

You can also perform some out-of-box searches. The Administration page in Grid Control provided for Oracle Application Server targets allows you to search one or more:

- Origin servers
- Application servers with particular installation settings
- Data sources used by the applications deployed across your enterprise configuration
- J2EE applications deployed in a particular OC4J instance, application server instance, or host
- Modules of J2EE applications deployed across your enterprise configuration
- Application server ports across your enterprise topology

Extensible Monitoring

Many administrators often require custom logic to be written to check for conditions specific to their application environments. Grid Control allows integration of application instrumentation in Grid Control's event monitoring infrastructure. If application developers expose application instrumentation using standards like JMX or Web Services operations, then you can build management plug-ins for the instrumentation using easy-to-use command line tools, and leverage Grid Control's event monitoring system to monitor it. You do not have to edit any XM files or write any integration code to integrate such instrumentation in Grid Control. Follow these procedures to integrate application-defined instrumentation in Grid Control:

- Use Command Line Interfaces that analyze MBean interfaces for JMX and WSDL for Web Services and create management plug-ins
- Import Management Plug-in Archive in Grid Control
- Deploy Management Plug-in to Management Agents
- Create Target-type instances for the target types defined in Management Plug-in Archive
- Leverage Grid Control's event monitoring system including monitoring templates, corrective actions, historical and real time metric views, alerts, customization of notification rules, and methods on events generated from application instrumentation metrics

Diagnosing Performance Issues with Top Reports

When you are troubleshooting performance problems, it can be helpful to know which servlets or JSPs are the most active. By using the Top Servlets or Top JSPs performance links of the Application Server Performance page (Figure 14–13 and Figure 14–14) in Grid Control, you can identify the top Java servlets or JSPs running on the application server instance. You can then sort them to identify the servlets and JSPs by number of requests, maximum processing time, or highest average processing time.

Top Services									
				Page Refreshed Aug 17, 2005 11:31:50 F	M PDT Refresh View [Data 🛛 Real Time: Manual Refresh 🛛 💌			
View Top Servlets by Requests Processed 💌									
Name	OC4J Instance	Application	Web Module	Average Processing Time (seconds)	Requests Processed \bigtriangledown	Total Processing Time (seconds)			
upload	OC4J EM	em	<u>em</u>	0.05	10,606	509.79			
Spy	OC4J EM	default	<u>dms</u>	0.002	9,130	21.92			
OHW	OC4J EM	em	<u>em</u>	0.29	699	202.60			
jsp	OC4J EM	em	<u>em</u>	0.22	534	117.27			
console	OC4J EM	em	<u>em</u>	0.75	488	364.86			
dynamicImage	OC4J EM	em	<u>em</u>	0.12	210	25.85			
logon	OC4J EM	em	<u>em</u>	0.18	61	11.06			
TopoServlet	OC4J EM	em	<u>em</u>	0.006	2	0.01			
SVGServlet	OC4J EM	<u>em</u>	em	22.83	1	22.83			
genwallet	OC4J EM	em	em	0.008	1	0.008			

Figure 14–13 Monitoring the Top Servlets for a J2EE Application

Figure 14–14 Monitoring the Top JSPs for a J2EE Application

100 3268									
		Pa	ige Refreshe	d Aug 17, 2005 11:52:59 PM PDT 🌔	Refresh View Data R	eal Time: Manual Refresh 🛛 💌			
View Top JSPs by Requests Processed 💽									
	OC4J		Web	Average Processing Time		Total Processing Time			
Name	Instance	Application	Module	(seconds)	Requests Processed \bigtriangledown	(seconds)			
ip/render/elem/tableRender.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.001	38	0.05			
ias/faintTabsInclude.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.0003	29	0.01			
ias/faintTabsIncludeBottom.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.0004	28	0.01			
home.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.41	24	9.86			
ip/render/justInTimeSelectTargets.jsp	OC4J EM	em	<u>em</u>	0.04	22	0.81			
ip/render/previewReport.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.36	19	6.92			
ip/render/elem/chartRender.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.003	19	0.05			
ip/render/elem/textRender.jsp	OC4J EM	<u>em</u>	<u>em</u>	0.0009	16	0.01			
target/sel/targetSelection.jsp	OC4J EM	em	em	0.06	15	0.97			
ip/reportDefinitionList.jsp	OC4J EM	em	em	0.004	14	0.06			

Analyzing Historical Performance

As with all Grid Control diagnostics, the application server diagnostic reports can be based on current or historical data. Application server metrics are collected and stored in the Management Repository, so you can analyze the data well after the situation has changed. For example, you can use historical data and diagnostic reports to research an application performance problem that occurred days or even weeks ago.

You can even provide a customized time period for which the data should be retrieved from the Management Repository. You can customize the time period for:

- Pre-defined range of the last 24 hours, last 7 days, or last 31 days
- Customized range of any number of days, weeks, months, or years
- Any start date and end date (such that the duration is not greater than 99 years)

Maintaining Application Servers

This section describes the features offered by Grid Control that help you maintain the application server targets.

Managing Backup and Recovery of the Application Server Environment

Backup and recovery refers to the various strategies and procedures involved in guarding against hardware failures and data loss, and reconstructing data should there be a loss. A comprehensive backup strategy should involve a coordinated approach to backing up your entire application server environment, including the middle tiers and the Application Server Infrastructure Oracle homes.

Grid Control helps you manage the backup and recovery of a single application server or a group of application servers.

Using Grid Control, you can:

- Schedule backups
- Restore application server backups for recovery
- Display the status of backup jobs
- Display the status of recovery jobs
- Configure the required settings for backup

For more information on the types of backups and recommended strategy for performing backup and recovery, see the *Oracle Application Server Administrator's Guide*.

Cloning and Patching the Application Server Environment

Using Grid Control's automated provisioning tools, you can ensure standardization in your data center and also significantly reduce the time spent on these tasks. To consistently maintain standardization in the topology, it is recommended that the new instances be added through "cloning" rather than "install and configure."

Cloning ensures that the new instance is installed and configured exactly like other instances in the enterprise topology. Cloning is the process of copying an existing installation to a different location while preserving its configuration and deployments. Grid Control's cloning wizard automates the duplication of application server installations; specifically, the directories where the Oracle homes reside. Its "multicasting" capability also helps you create multiple clones on multiple target hosts in a single operation.

Using a direct link to Oracle MetaLink, Grid Control proactively and regularly retrieves the list of critical patches that have to be applied on Oracle Application Server installations. Grid Control also analyzes the data center environment and notifies you of patches that are applicable to their application server instances. All other patches can also be manually found in the context of a specific target. You can also automate the application of patches using robust job system infrastructure. You can apply the patches instantly or schedule the application in the maintenance window while backing out Oracle Application Server instances in the maintenance window.

See Also: "Cloning" and "Patching" in Chapter 6, "Managing Deployments"

Oracle Collabsuite Management

Oracle Collaboration Suite provides capabilities—mail, calendar, web conferencing, and content services—that are critical to the productivity of an organization. Users access Collaboration Suite services every day to communicate with colleagues, host remote meetings, and share information; therefore, it is important that Collaboration Suite administrators have reliable, comprehensive tools to effectively manage the performance and availability of their Collaboration Suite deployments.

Oracle Enterprise Manager Grid Control provides the monitoring and administration capabilities administrators need to ensure that the performance and availability of Collaboration Suite services meet customer expectations and service level goals.

This chapter describes how you can use Grid Control to manage your Oracle Collaboration Suite instances and components.

This chapter contains the following sections:

- Visualizing Your Collaboration Suite Deployment
- Automated Collaboration Suite Monitoring and Alerts
- Oracle Collaboration Suite Root Cause Analysis
- Diagnosing Oracle Collaboration Suite Performance and Availability Problems
- Collecting and Using Collaboration Suite Client Configuration Data
- Oracle Collaboration Suite Reports
- Administration for Oracle Collaboration Suite Instances

Visualizing Your Collaboration Suite Deployment

Oracle Enterprise Manager Grid Control utilizes the following Enterprise Manager concepts to visualize your Collaboration Suite deployment:

- Collaboration Suite Services
- Collaboration Suite Systems

Collaboration Suite Services

Critical application functions are defined and monitored as services in Grid Control. Each Collaboration Suite component (such as Mail, Calendar, Content Services, and so on) is a service. In addition, each component is made up of a set of services.

For example, the Mail service includes services that represent IMAP, SMTP, and the Web Mail application. By breaking down the Mail service into individual sub-services, you can monitor specific Mail functionality separately. You can then, for example,

distinguish between all Mail services being unavailable versus just the Web Mail application being inaccessible to users.

Because Collaboration Suite provides critical end-user functionality, it is useful to treat these functions as services. Each service is monitored by Grid Control beacons, which run service tests that simulate real user access to the service. Service availability and performance are monitored automatically, and problems are immediately reported to the administrator. By monitoring availability and performance of Collaboration Suite services, you can identify and resolve user-visible problems more quickly and thus minimize the impact on users.

The hierarchy of services that represent Collaboration Suite is used to visualize a Collaboration Suite deployment in Grid Control. The Collaboration Suite target subtab shows Collaboration Suite services in a hierarchical listing along with critical performance, usage, and availability data for each. You can also see an overview of Collaboration Suite performance, usage, and availability in the Services Dashboard. The dashboard also shows service-level compliance data. Finally, the service topology is a graphical tree view of your Collaboration Suite deployment.

Oracle Enterprise Manager Grid Control also provides the following features to help you visualize, monitor, and manage your Collaboration Suite instances and components:

Collaboration Suites Tab

After you add the Collaboration Suites tab in Grid Control, you can configure a Collaboration Suite service for each of your Collaboration Suite instances, and manage all the instances from the Collaboration Suites tab.

See Also: "Adding the Collaboration Suites Tab" in the Grid Control online help

Configuring Collaboration Suite Services

A Collaboration Suite service is a logical target configured by Grid Control that models the hierarchy of a Collaboration Suite instance and its components. You use Grid Control to step you through the process of configuring a Collaboration Suite service for each of your Collaboration Suite instances. After you configure a Collaboration Suite service, that service is displayed on the Collaboration Suite Services page.

When you configure a Collaboration Suite service for a Collaboration Suite instance, Grid Control also configures services for the Collaboration Suite components.

Collaboration Suite Services Page

The Collaboration Suite Services page provides you with a graphical, tree view of Collaboration Suite services. On this page, you can see the relationship between the various services that make up your Collaboration Suite deployment. This page also provides summary information about the availability, performance, and usage of each of the Collaboration Suite instances for which you have configured a Collaboration Suite service. From the Collaboration Suite Services page, you can drill down to more detailed information about your Collaboration Suite instances and components.

Collaboration Suite Services Dashboard

The Services Dashboard provides a high-level view of the status, performance, and usage of each Collaboration Suite component. Service-level compliance for various time periods are also included for each service on the dashboard. You can

launch the dashboard directly from the Collaboration Suite home page. You can also publish the Services Dashboard so that it can be viewed by non-Enterprise Manager users. This allows you to provide a self-service status web page to your end users.

Figure 15–1	Collaboration	Suite Service	Home Page

ORACLE Enterprise	Manager 10g	adek dauliestiene I O			T	Home	2 Targets	Deployments	Setup Prefer Alerts Policies	ences H obs	Help Li Repor	oqout ts
Hosts Databases .	Application Servers	web Applications S	ervices System	is Groups All	Targets	I Collaboration Sultes						
Voicemail and Fax S	Service : Voicema	il and Fax Service	e 3									
								Page Ri	efreshed Oct 23, 2005 12:	58:28 A	M PD	٢B
Home <u>Charts</u>	<u>Topology</u>											
General												
Aw Actual Servi	Status Up Bla Up Since Oct 21, 2 ailability (%) 100 (Last 24 Ho Performance ✓ Usage ✓ ce Level (%) 100,0000	<u>ck Out</u>) 005 3:15:43 PM nurs)										
Expected Servi	(Last 24 Ho co. Loval. (%), 85,0000	ours)		A								
Expected Servi	Ce Lever (%) 05.0000			.0								
Subservices												
									System	Kove	·	nonto
Name			Туре		Status	Performance Alerts	Usage Alerts	Policy Violations N	lame	St	tatus	Alerts
🔻 Voicemail and Fax	Service 3		Voicemail and F	ax Service	1	00	00	0000	VF Group1	û 0	☆ 3	0 0
Voicemail and F	ax Fax Service 3		Voicemail and F	ax Fax Service	(1)	00	00	0000	VF Group1	₽ 0	<u>∱</u> 2	0 0
Voicemail and Group1_pbx_(I Fax Fax Service 30√ 06_09_v2	E	Voicemail and F	ax Fax Service	٢	00	QQ		<u>)VF</u> Group1_pbx_06_09_v2	\$1	∂ 2	1 0
Voicemail and	I Fax Fax Service 30∨	F Group1_pbx_16_v2	Voicemail and F	ax Fax Service	٢	00	<u>0</u> 0	0000	VF Group1_pbx_16_v2	₽1	☆ 1	1 0
Voicemail and F	ax Recording Service 3		Voicemail and F Service	ax Recording	٢	00	00	0000	VF Group1	û 0	û 2	0 0
Voicemail and F	ax Retrieval Service 3		Voicemail and F	ax Retrieval Service	٢	00	QQ	0000	VF Group1	û 0	û 2	0 0
Alerts												
View All Alerts												
Target Name		Target Type		Severity		Alert Triggered		Mes	sage			
No alerts found												
Home Charts	Topology											
Related Links												
<u>Access</u> Edit Service Reports			<u>All Metrics</u> <u>Edit Service L</u> Root Cause A	<u>evel Rule</u> Analysis Configurati	<u>on</u>		<u>Blacko</u> Metric Target	outs and Policy Settin Properties	<u>gs</u>			
		Home Targets	Deployments I A	Nerts I Policies I	Jobs I	Reports Setup Pre	ferences I H	leip I Logout				

Service Monitoring

Grid Control enables you to monitor all of your Collaboration Suite services and their component services. Each service is monitored for performance, usage, and availability.

Each service has its own home page. The Service Home pages in Grid Control provide:

- Status, responsiveness, and performance data
- Resource usage data for the service
- Summary information such as status, performance alerts, usage alerts, and policy violations for the service's subcomponents, including other services and associated systems
- Links to home pages for the service's subcomponents
- Alerts and diagnostic drill-downs so that you can identify and resolve problems quickly
- The service's Topology Viewer
- Access to the Services Dashboard
- Related Links to do the following:

- View metrics for the service
- View client configurations
- Manage reports
- Edit the service
- View the service target's properties
- Manage blackouts
- View and manage metric thresholds and policies

See Also: Chapter 12, "Service Management"

Figure 15–2 Collaboration Suite Service Topology Page



Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

Collaboration Suite Systems

Collaboration Suite services run on a Collaboration Suite system defined in Grid Control. The system includes the software infrastructure components that the Collaboration Suite services rely on. The system includes components such as databases, HTTP servers, OC4Js, and other servers (such as IMAP or Calendar servers) used by Collaboration Suite.

The system is a collection of server targets that are grouped together in Grid Control to give you a view of the "data-center" components that comprise your Collaboration Suite. Grid Control also monitors the performance and availability of these components and provides a System Dashboard to view the health of the Collaboration Suite system in a single window.

Automated Collaboration Suite Monitoring and Alerts

Enterprise Manager automatically gathers and evaluates diagnostic information from Collaboration Suite targets distributed across the enterprise. As with all targets managed by Enterprise Manager, an extensive number of Collaboration Suite performance metrics are automatically monitored against predefined thresholds. Alerts are generated in Grid Control when metrics exceed these thresholds.

See Also: "Monitoring Basics" in Chapter 4, "System Monitoring"

Oracle Collaboration Suite Root Cause Analysis

Individual services in Collaboration Suite are associated with the critical service and system components they rely on. This allows Enterprise Manager to perform Root Cause Analysis down to the system level whenever a service outage is detected. When you are configuring a Collaboration Suite service or component service in Grid Control, some of the UI pages give you the option of providing information about beacons, databases, and application servers that are critical for the component. If you do specify this information, Grid Control will be able to take these beacons, databases, and application servers into account when performing a Root Cause Analysis for the service.

See Also: "Diagnosing Service Problems" in Chapter 12, "Service Management"

Diagnosing Oracle Collaboration Suite Performance and Availability Problems

You can use Grid Control to diagnose performance and availability problems with your Oracle Collaboration Suite services. For example, if a service outage occurs, Root Cause Analysis will determine if the primary cause is an outage of a critical service or system component. If a service performance issue is found, an administrator can examine detailed metrics over time related to that service and any of the service or system components used by that service. When you suspect there is a problem with one or more server components in the Collaboration Suite system, the system home pages provide metrics and charts for diagnosing the issue.

See Also: "Monitoring Services" and "Diagnosing Service Problems" in Chapter 12, "Service Management"

Collecting and Using Collaboration Suite Client Configuration Data

The Oracle Collaboration Suite extensions to the basic Client System Analyzer (CSA) application enable Collaboration Suite-specific information to be collected from Windows client machines. After CSA for Collaboration Suite collects the information, it uploads it to the Grid Control Management Repository.

See Also: "Client Configurations" in Chapter 6, "Managing Deployments"

Collaboration Suite administrators and help desk personnel assisting Collaboration Suite users can use the collected information to identify clients that are not properly configured to use Oracle Collaboration Suite.

After installing and configuring the Collaboration Suite enhancements to CSA, the Collaboration Suite administrator can provide users with the URL for the CSA for the

Collaboration Suite application. When users access the URL, they can give permission for the CSA applet to be downloaded to their Windows client machine. After it is downloaded, the applet collects Collaboration Suite-specific information on the Windows client machine, including:

- Operating system user privileges. Only a user with administrator privilege can
 install Collaboration Suite Connector for Microsoft Office. CSA will check whether
 a user is an administrator.
- Type, version, and installation location of the mail client. CSA can identify Microsoft Office, Netscape, Mozilla, and Outlook Express mail clients on the client machine. If there are multiple mail clients installed, information on all of them will be collected.
- IMAP server and SMTP server settings.
- Execution mode for Outlook Express 98 or 2000 mail clients. Oracle Connector for Microsoft Outlook Express only works if Outlook Express is configured in Workgroup mode. In Outlook Express 2002 and later, the execution mode is always set to Workgroup.
- Type of Oracle Calendar client installed. If the Oracle Calendar thick client is installed, information about the version and install location of Oracle Calendar is collected.
- Browser versions and minimum recommended versions for optimally using various Collaboration Suite components, such as Web Access Client and Web Conferencing.
- Latency between the client machine and mail servers (IMAP, NNTP, POP, and SMTP).

Users who use CSA will see the summary report the applet displays after it collects the Collaboration Suite-specific data. The report identifies the areas in which the client does not meet Oracle Collaboration Suite requirements.

Administrators can use Grid Control to view the Oracle Collaboration Suite-specific client configuration information collected by CSA by navigating to the Collaboration Suite Service page, then clicking the **Client Configurations** link in the Related Topics section.

See Also: "Viewing Collaboration Suite Client Configuration Information" in the Grid Control online help

Oracle Collaboration Suite Reports

You can define reports for Oracle Collaboration Suite services and systems, and also for Collaboration Suite component services, systems, and redundancy groups. For this release, you can view the following new reports for mail systems:

- Mail Queue Information Report
- Mail User Information Report
- Mail Message Information Report
- Mail Application-Tier Host Information Report
- Mail Detail Process Information Report
- Search Mail Message Report
- Unprocessed Mail Messages Report

Mail Quota Usage Report

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See Also: "Out-of-Box Report Definitions" in Chapter 7, "Information Publisher"
```

Leveraging the Grid Control Management Framework

Grid Control includes many general features that are useful to a Collaboration Suite administrator, including:

- Job Automation: You can use the Grid Control job system to schedule tasks you
 want to automate.
- Patching: The configuration management capabilities in Grid Control allow you to manage and apply patches to your Collaboration Suite installations. You are also alerted automatically when critical patch updates are released.
- Policies: You can utilize the policy framework to ensure your Collaboration Suite infrastructure adheres to your site-specific standards.
- Database and Application Server Management: Using the single Grid Control console, you can also manage the specific databases and application servers in your Collaboration Suite deployment if needed.
- Extensions: Grid Control also includes monitoring of key network components that may be part of your Collaboration Suite deployment. You can also extend Grid Control to monitor other components that are not recognized out-of-box by Enterprise Manager.

Administration for Oracle Collaboration Suite Instances

When you install an Oracle Collaboration Suite instance, you automatically get Oracle Application Server Control for Collaboration Suite to manage that instance. Each installed Collaboration Suite instance has its own Application Server Control for Collaboration Suite.

Application Server Control Console for Collaboration Suite is the Enterprise Manager Web-based application for managing Oracle Collaboration Suite releases 9.0.4 and 10g Release 1 (10.1). Application Server Control for Collaboration Suite provides Web-based management tools designed specifically for Collaboration Suite.

You can use Application Server Control for Collaboration Suite to monitor and administer a single Collaboration Suite instance, a group of Collaboration Suite instances, or individual components for a Collaboration Suite instance. You can also deploy applications, monitor real-time performance, manage security, and configure the components of your Collaboration Suite instance.

Application Server Control for Collaboration Suite relies on various underlying technologies to discover, monitor, and administer the Collaboration Suite environment.

Application Server Control for Collaboration Suite consists of Application Server Control Console for Collaboration Suite and its underlying technologies:

- Oracle Dynamic Monitoring Service (DMS)
- Oracle Process Management Notification (OPMN)
- Distributed Configuration Management (DCM)

• A local version of the Oracle Management Agent specifically designed to gather monitoring data for the Application Server for Collaboration Suite Control.

For additional management functionality, for example, Service Level Management, deployments, historical data collections for performance trending alerts, and so on, you can use Enterprise Manager Grid Control.

See Also: Oracle Collaboration Suite 10gR1 Administrator's Guide

While Application Server Control for Collaboration Suite provides standalone management for a Collaboration Suite instance and its components, you can centrally manage all your Collaboration Suite instances through one tool (rather than through several Application Server Controls for Collaboration Suite) by using Grid Control. For example, suppose you have 10 Collaboration Suite instances deployed on 10 hosts. By deploying a Management Agent on each host, Enterprise Manager automatically discovers the key Collaboration Suite components on these hosts, and automatically begins monitoring them using default monitoring levels, notification rules, and so on.

Identity Management

This chapter describes how you can use Grid Control to manage your Identity Management targets.

This chapter contains the following sections:

- About Access and Identity Management
- Using Grid Control for Monitoring Identity Management Targets
- Identity Management Systems
- Automated Identity Management Monitoring and Alerts
- Identity Management Root Cause Analysis
- Diagnosing Identity Management Performance and Availability Problems
- Leveraging the Grid Control Management Framework

About Access and Identity Management

Access management is the means for controlling user access to enterprise resources. Access management products provide centralized, fine-grained access management for heterogeneous application environments, as well as out-of-the-box integration with Oracle products such as Oracle Portal, Oracle Collaboration Suite, and Oracle E-Business Suite.

Oracle Identity Management is a product set that allows enterprises to manage the end-to-end life cycle of user identities across all enterprise resources both within and beyond the firewall.

Automating user identity provisioning can reduce IT administration costs and improve security. Provisioning also plays an important role in regulatory compliance. Compliance initiatives focus on the enforcement of corporate policies as well as the demonstration of compliance with these standards. An enterprise identity management solution can provide a mechanism for implementing the user management aspects of a corporate policy, as well as a means to audit users and their access privileges.

Oracle Identity management products include the following:

- Access Manager
- Identity Manager
- Identity Federation

Access Manager

Oracle Access Manager, formerly known as Oracle COREid Access and Identity, provides Web-based identity administration and access control to Web applications and resources running in a heterogeneous environments. It provides the user and group management, delegated administration, password management and self-service functions necessary to manage large user populations in complex, directory-centric environments. Access Manager supports all popular authentication methods including browser forms, digital certificates, and smart cards, and integrates seamlessly with most application servers and portals, including OracleAS 10g, BEA WebLogic, IBM WebSphere, Vignette and others. User identities and credentials can be accessed from a number of repositories including Oracle Internet Directory, Microsoft Active Directory, and Sun Java System Directory. With Access Manager, user access policies can be defined and enforced with a high degree of granularity through centralized management.

Access Server

The Access Server enables you to protect resources such as URLs and legacy, non-HTTP applications. It provides authentication and authorization services to enterprise applications. It uses the information stored by the Identity Server to control which users, groups, and organizations can access a resource. It stores information about configuration settings and security policies that control access to resources in a directory server that uses Oracle Access Manager-specific object classes. You can use the same directory to store the Access Server configuration settings, access policy data, and user data, or you can store this data on separate directory servers.

Identity Server

The Identity Server is a set of applications that provide delegated administration, user self-service, and real-time change management. The Identity Server stores information about users, groups, and organizations. For example, you can create, manage, and delete groups in the directory server. You can define a subscription policy for a group, including self-service with no approval needed, subscription with approvals, rule-based subscription, and no subscription allowed.

Identity Manager

The Oracle Identity Manager platform automates user identity provisioning and deprovisioning and allows enterprises to manage the end-to-end lifecycle of user identities across all enterprise resources, both within and beyond the firewall. It provides an identity management platform that automates user provisioning, identity administration, and password management, wrapped in a comprehensive workflow engine.

Automating user identity provisioning can reduce IT administration costs and improve security. Provisioning also plays an important role in regulatory compliance. Key features of Oracle Identity Manager include password management, workflow and policy management, identity reconciliation, reporting and auditing, and extensibility through adapters.

Oracle Identity Manager also provides attestation support. Attestation is the process of having users or system managers confirm people's access rights on a periodic basis. Existing Sarbanes-Oxley requirements demand enterprises to perform attestation for all financially significant systems every three to six months. Identity Manager includes a highly flexible attestation solution to help enterprise customers meet these regulatory requirements in a cost-effective and timely manner. By setting up attestation processes in Identity Manager, enterprise customers can automate the

process of generation, delivery, review, sign-off, delegation, tracking, and archiving of user access rights reports for reviewers on a scheduled or ad-hoc basis.

Identity Federation

As more companies move their business processes to the Web, many organizations have a greater need to extend the boundaries of their enterprise to include partner applications. Federated identity management allows companies to operate independently and cooperate for business purposes by enabling cross-domain single sign-on and allowing companies to manage user identities and vouch for them as they access resources managed by another domain.

Oracle Identity Federation, formerly known as COREid Federation, provides a self-contained federation solution that combines the ease of use and portability of a standalone application with a scalable, standards-based proven interoperable architecture. It helps corporations securely link their business partners into a corporate portal or extranet while also increasing their compliance with privacy and security regulations. Identity Federation enables companies to manage multiple partners and choose from industry standard federated protocols. Identity Federation provides built-in integration with customer's identity management infrastructure (Oracle and non-Oracle) to deliver an end-to-end user experience, addressing scenarios like automatic registration, identity mapping, seamless access control navigation, and others.

Using Grid Control for Monitoring Identity Management Targets

Enterprise Manager Grid Control helps you monitor the availability and diagnose the health of Access, Identity, Identity Federation, and Identity Manager servers within your enterprise configuration. By deploying a Management Agent on each host, you can use Enterprise Manager to discover the Identity Management components on these hosts, and automatically begin monitoring them using default monitoring levels, notification rules, and so on.

Identity Component Server Home Page

All Identity Management targets, whether Access, Identity, Identity Federation, and Identity Manager have their own server home pages that provide easy access to key information required by the administrators. Each Identity Management Server home page provides the following information:

- Server status, responsiveness, and performance data
- Alerts and diagnostic drill-downs so you can identify and resolve problems quickly
- Resource usage for the server and its components
- Functionality to start, stop, and restart components in the case of locally-monitored Access and Identity servers
- Configuration parameters for Access and Identity servers

Figure 16–1 shows the Access Manager - Access Server home page.

DRACLE Enterprise Manager 10g			Home Targets	Deployments Y Alerts	Setup Preferences Compliance Jobs	Reports
Hosts Databases Application Serve	rs Web Application	ns Services S	iystems Groups Al	II largets		
ccess Manager - Access Server	r: stiasi49.idc.ora	cle.com:6021	_Access Server			
				Page Refreshed De	c 14, 2006 10:27:01 PM I	PST Refresh
Home Performance						
General			Authentication	n		
Status Up Availability (%) Un (Lest 2) Fort 6021 Start Time Jan 6, Audit File Rotation Time Audit Host stiasid	3lack Out) I Hours) 2007 00:32:39 AM file rotation status is 9.idc.oracle.com	s off	23.10 22.75 22.40 22.05 21.70 10:37 1314 Decemb	6 12 PM	6 I Authentication	
Configuration Information Service Threads Connection Watcher Threads Started Service Queues Listener Threads Transport Security Mode	50 5 1 1 0 9 9 9 9 9 9		Load Request(per Authenticatic 40 45 30 25 20 9:00 11 13 Decen	hour) is the sum total o on, Successful Authoriz 2 AM 4 8 14 mber 2006	f Successful Authenticatic ation and Failed Authoniza 12 PM 4 Requests (per hour)	n, Failed tion
Associated Directory Server Info	ormation					
Name	Type	Ho	st	Port	Alerts	Status
No Associated Directory Server found						
Alerts						
Alerto -						
Metric	Severity	Alert Triggered		Last V	alue Last Checked	
NO Alerts found.						
Host Alerts						
Metric Collection Errors 🗟 1						
Metric	Severity	Alert Triggered		Last V	alue Last Checked	
No Alerts found.						

Figure 16–1 Access Manager - Access Server Home Page

Identity Management Systems

Identity Management services run on Identity Management systems defined in Grid Control. The system includes the software infrastructure components that the Identity services rely on. The system includes components such as databases, HTTP servers, OC4Js, and other servers.

The system is a collection of server targets that are grouped together in Grid Control to give you a view of the "data-center" components that comprise your Identity Management deployment. Identity Management Systems are created when Identity suite components are discovered using Grid Control. Grid Control also monitors the performance and availability of these components and provides a System Dashboard to view the health of the Identity Management system in a single window.

See Also: Chapter 4, "System Monitoring"

Figure 16–2 shows an Access Manager-Identity System home page:

ORACLE Grid Control	Enterprise M	anager 10g	ro I 18/oh Applio	otiono I So	He He	me Targets	Deploy	ments	Alerts	<u>Setu</u> Complia	<u>ip Preferences</u> nce Jobs	Help Logout Reports
HUSIS Da	abases Ap	plication Server	rs i web Applic	ations Sei	rvices Syste	inis Groups	T All Target	5				
Access Ma	nager - Ider	ntity Systen	n: Identity Sy	stem		Page Re	freshed De	: 15, 2006	1:24:50 AI	A Refi	resh) (Launcl	Dashboard
Home	<u>Charts</u>	Administration	Component	<u>s Topolog</u>	¥Υ.							
Status				Sta	atus History)	ServiceTin Average	nePerReq	uest:Ac	cess Man	ager - I	Identity Ser	ver:Highest
(100%		<u>up(1)</u>			0.40 0.35 0.30 0.25 0.20 0.15 1:39 Dec 1 stiasi49	6 1: 6 1: 14, 2006 .idc.oracle.c	2 PM om:6022	6 1: Identity Set	2 AM 15 Ver		
Services			Parformanco	lleado	Dolicy	Load in the	a Last Col	lection l	nterval			
<mark>Name</mark> (No data found.)	Туре	Status	Alerts	Alerts	Violations	Successful C Cache Flu	Request Pr ache Flush Ish Request	ocessed Request Failures	180 0 0			
Configura	ation Chang	es				Email Total LDA	AP Session:	r allures s opened	9			
Configuratio	on changes de	tected for the I	ast 7 days			Alerts						
Category			Char	iges		Alerts					(Alert History)
All Targ	et Types og Managor II	Idontity Sowor		0		Severity	Current	t La	ist 24 hours	6		
ALLE	ss Manayer - I	identity Server		<u>u</u>		×	0		0			
						Total	0		0			
						Policy Viol	ations					
						r oney tren	actoris		Last 24 H	ours		
						Seve	rity	Current	Cleared	New	Distinct R	ules Violated
						(No violatio	ins found)					
						Security P	olicy Viola	tions				
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						Security At a	Glance					
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Home	Charts	Administration	Component	<u>s Topolog</u>	1¥							
Deleted	inte											
Access	INKS			Edit Svstem				Propert	ies			
Reports				Target Prope	rties							
Copyright © 1996 Oracle, JD Edwar <u>About Oracle F</u>	<u>Hor</u> , 2007, Oracle. A ds, PeopleSoft, a Enterprise Mar	me Targets Il rights reserved. Ind Retek are regi lager	<u>Deployments</u> stered trademarks o	<u>Alerts</u> <u> </u> f Oracle Corpo	Compliance ration and/or its a	Jobs <u>Report</u> affiliates. Other nam	<u>s Setup</u> mes may be tra	Preferer	nces <u>Help</u> f their respect) <u>Logo</u> ive owne	<u>out</u> rs.	

Figure 16–2 Identity System Home Page

Configuring Identity Management Services

An Identity Management service is a logical target configured by Grid Control. You use Grid Control to step you through the process of configuring a web application service for your Identity component instances. After you configure a service, that service is displayed on the Services page.

Critical application functions are defined and monitored as services in Grid Control. Each service is monitored by Grid Control beacons, which run service tests that simulate real user access to the service. Service availability and performance are monitored automatically, and problems are immediately reported to the administrator. By monitoring availability and performance of Identity Management services, you can identify and resolve user-visible problems more quickly and thus minimize the impact on users.

Creating an Access Service

Access service allows the Enterprise Manager administrator to perform service-level monitoring. If authentication or authorization services are not available, then the

administrator should be notified about the service failures. Administrators will then be able to diagnose the cause of the problem using Root Cause Analysis. For more information about Root Cause Analysis, see "Identity Management Root Cause Analysis".

- 1. Discover the Access Server target in Grid Control. For information about discovering this target, see the Grid Control online help. This will create the associated system.
- 2. In Grid Control, in the Services tab, select Add Generic Service and click Go.

The Create Generic Service wizard is displayed.

- **3.** In the Create Generic Service: General page, provide a name for the service and associate the Access system. Click **Next**.
- **4.** In the Create Generic Service: Availability page, select **Define availability based on Service Test**. This allows you to create a web transaction. Click **Next**.
- **5.** In the Create Generic Service: Service Test page, provide a name for the web transaction, select **Record a Transaction** and click **Go**.
- 6. In the Create Service Test page, in the Steps section, click **Record**.
- **7.** In the Record Web Transaction page, click **Start**. A new browser window is displayed.
- **8.** In the browser, enter the URL that is protected by the Access Server. In the Single Sign-On login page displayed, enter the username and password.
- **9.** In the Record Web Transaction page, click **Stop** and then click **Continue**. The Create Web Applications: Service Test page is displayed again. Click **Continue**.
- **10.** In the Create Generic Service: Beacons page, add a beacon to execute the web transaction you created. Click **Next**.
- **11.** In the Create Generic Service: Performance Metrics page, click **Next**.
- 12. In the Create Generic Service: Usage Metrics page, click Next.
- **13.** In the Create Generic Service: Review page, click **Finish** to create the Access service that will be monitored by the beacon test.

Creating an Identity Service

Identity service allows the administrator to perform service-level monitoring of Access Manager Identity. If user management or group management services are not available, then the administrator should be notified about the service failures. Administrators will then be able to diagnose the cause of the problem using Root Cause Analysis. For more information about Root Cause Analysis, see "Identity Management Root Cause Analysis".

- 1. Discover the Identity Server target in Grid Control. For information about discovering this target, see the Grid Control online help. This will create the associated system.
- 2. In Grid Control, in the Services tab, select Add Generic Service and click Go.

The Create Generic Service wizard is displayed.

- **3.** In the Create Generic Service: General page, provide a name for the service and associate the Identity system. Click **Next**.
- **4.** In the Create Generic Service: Availability page, select **Define availability based on Service Test**. This allows you to create a web transaction. Click **Next**.

- **5.** In the Create Generic Service: Service Test page, provide a name for the web transaction, select **Record a Transaction** and click **Go**.
- 6. In the Create Service Test page, in the Steps section, click Record.
- **7.** In the Record Web Transaction page, click **Start**. A new browser window is displayed.
- **8.** In the browser, enter the URL of the Identity system (<host:port/identity/oblix>) and then click the Identity System Console link. The login page is displayed.
- **9.** In the Record Web Transaction page, click **Stop** and then click **Continue**. The Create Web Applications: Service Test page is displayed again. Click **Continue**.
- **10.** In the Create Generic Service: Beacons page, add a beacon to execute the web transaction you created. Click **Next**.
- 11. In the Create Generic Service: Performance Metrics page, click Next.
- 12. In the Create Generic Service: Usage Metrics page, click Next.
- **13.** In the Create Generic Service: Review page, click **Finish** to create the Identity service that will be monitored by the beacon test.

Creating an Identity Manager Service

For information about creating a web application service for Identity Manager, see the "Creating Web Applications for Identity Manager" topic in online help.

Creating an Identity Federation Service

You can create an Identity Federation service for service-level monitoring of Identity Federation. The procedure to create an Identity Federation service is similar to the procedure to create an Access or Identity service.

Monitoring Services

Grid Control enables you to monitor all of your Identity Management services. Each service is monitored for performance, usage, and availability.

Each service has its own home page. The Service Home pages in Grid Control provide:

- Status, responsiveness, and performance data
- Resource usage data for the service
- Summary information such as status, performance alerts, usage alerts, and policy violations for the service's subcomponents, including other services and associated systems
- Links to home pages for the service's subcomponents
- Alerts and diagnostic drill-downs so that you can identify and resolve problems quickly
- Services Dashboard

The Services Dashboard provides a high-level view of the status, performance, and usage of each Identity Management target. Service-level compliance for various time periods are also included for each service on the dashboard. You can launch the dashboard directly from Identity system target home page. You can also publish the Services Dashboard so that it can be viewed by non-Enterprise Manager users. This allows you to provide a self-service status web page to your end users.

- Related Links to do the following:
 - View metrics for the service
 - View client configurations
 - Edit the service
 - View the service target's properties
 - Manage blackouts
 - View and manage metric thresholds and policies

See Also: Chapter 12, "Service Management"

Identity Management Root Cause Analysis

Individual services in Identity Management are associated with critical system components. This allows Enterprise Manager to perform Root Cause Analysis down to the system level whenever a service outage is detected. When you are configuring an Identity Management service in Grid Control, as mentioned in Configuring Identity Management Services, you also mention the critical system components of this service. When an Identity Management service goes down, Enterprise Manager automatically performs a root cause analysis to determine which critical system component is responsible for this.

See Also: "Diagnosing Service Problems" in Chapter 12, "Service Management"

Automated Identity Management Monitoring and Alerts

Enterprise Manager automatically gathers and evaluates diagnostic information from Identity Management targets distributed across the enterprise. As with all targets managed by Enterprise Manager, an extensive number of Identity Management performance metrics are automatically monitored against predefined thresholds. Alerts are generated in Grid Control when metrics exceed these thresholds.

See Also: "Monitoring Basics" in Chapter 4, "System Monitoring"

Diagnosing Identity Management Performance and Availability Problems

You can use Grid Control to diagnose performance and availability problems with your Identity Management services. For example, if a service outage occurs, Root Cause Analysis will determine if the primary cause is an outage of a critical service or system component. If a service performance issue is found, an administrator can examine detailed metrics over time related to that service and any of the service or system components used by that service. When you suspect there is a problem with one or more server components in the Identity Management system, the system home pages provide metrics and charts for diagnosing the issue.

See Also: "Monitoring Services" and "Diagnosing Service Problems" in Chapter 12, "Service Management"

Leveraging the Grid Control Management Framework

Grid Control includes many general features that are useful to an Identity Management administrator, including:

- **Job Automation:** You can use the Grid Control job system to schedule tasks you want to automate.
- **Policies:** You can utilize the policy framework to ensure your Identity Management infrastructure adheres to your site-specific standards.
- Database and Application Server Management: Using the single Grid Control console, you can also manage the specific databases and application servers in your Identity Management deployment if needed.
- Extensions: Grid Control also includes monitoring of key network components that may be part of your Identity Management deployment. You can also extend Grid Control to monitor other components that are not recognized out-of-box by Enterprise Manager.

Host and Third-Party Target Management

Today's IT infrastructure has evolved to include a variety of server platforms from different vendors such as Red Hat, SUSE, Sun, IBM, HP, and Windows. A typical enterprise also contains hardware components and applications from a number of vendors to run services, provide storage, perform load balancing, and control IP traffic.

Out-of-box, Enterprise Manager Grid Control allows you to centrally manage more than just your Oracle infrastructure:

- Monitor and maintain the operating system and hardware for the hosts running your Oracle software.
- Monitor IBM and BEA application servers and clusters, F5 Server Load Balancers, Network Appliance Filers.

This chapter contains the following major sections:

- Host Management
- Third-Party Target Management

Host Management

With the array of available server platforms, it becomes more and more difficult for system administrators to maintain the operating systems and hardware for the server, or host, on which Oracle software runs. With Grid Control, as soon as a Management Agent is deployed to the host, Grid Control automatically starts monitoring alert and configuration information for that machine. System administrators—and anyone who requires host information, such as DBAs managing databases on those hosts—benefit from Grid Control's host management feature.

Note: To access the host management pages in Grid Control, do the following:

- **1.** Click the **Targets** tab.
- **2.** Click the **Hosts** subtab.

This will display all the monitored hosts in your enterprise. Click the **Help** link on any page to access the Grid Control online help system.

Host management allows users to:

- Analyze performance trends for host hardware to predict future performance
- Measure service levels by monitoring host performance in real-time

• Validate software and hardware configuration across the enterprise

Monitoring Hosts

Like for other managed targets, Grid Control's full suite of monitoring features, including alerts, custom notifications, blackouts, corrective actions, monitoring templates, and more, are available for hosts.

See Also: Chapter 4, "System Monitoring" for a complete description of Grid Control's monitoring features

Host Home Page

The Host Home page provides an overview of the status and vital statistics for each host that is part of the Grid Control environment.

Grid Control consolidates the relevant host information into a convenient single-screen Host Home page. You can see the availability, key configuration information, and outstanding alerts, as well as other pertinent information about the host. Convenient links allow you to view all the metrics collected for the host, change the thresholds as appropriate, or directly log in to the host to perform administrative actions.

Using the Host Home page, you can do the following:

- Drill down to view detailed metrics
- View operating system, hardware, and other configuration information for the host
- View policy violations and alerts for the host
- Analyze the job activity
- Determine whether there are outstanding patch advisories
- Determine the last security evaluation of the host
- Navigate to other pages to help you investigate the health of the host

Figure 17–1 Host Home Page

Grid Control Grid Control Collaboration Suites Hosts Databases Application Servers	Ho Web Applications Services Systems Groups All Targe	i <mark>me) Tar</mark>	gets Deployments	Setup Preferences Help Logaut Alerts Policies Jobs Reports
Host: ilinrbn05.us.oracle.com				
Home Performance Targets Configuration		Latest E	ata Collected From Target	Oct 13, 2005 7:25:55 AM PDT (Refresh)
General Right Out	Configuration	od Hot Ent	amrica Linux AS release 3	(Taraan Lindata 4) 2.4.21.27 El ama (22
Up Time 9 days	Operating System bit	<u>t)</u>	erprise Linux AS release 5	(Taroon opdate 4) 2:4:21 27.EEship (32-
Logons <u>8 View Current Users</u>	Hardware Platform <u>166</u>	<u>86</u> 14 25 34 61		
(Last 24 Hours)	CPUs 2	++.23.34.01		
	Memory Size (MB) 58	397		
	Local File Systems (GB) <u>66</u>	<u>5.31</u>		
Alerts	~\			
Metric Name		Severit	y Alert Triggered 🛆	Value Last Checked
Filesystem Space Available (%) for /		×	Oct 7, 2005 6:26:15	3 Oct 13, 2005 6:07:21
Log File Pattern Matched Line Count for /scratch/sabburi/mm9_a 2005 GM -07:00	gent/agent10g/sysman/log/emagent.log;ERROR;Tue Oct 11 16:21:2	25 🚹	Oct 11, 2005 4:21:24 PM	4 Oct 11, 2005 4:21:24 PM
Policy Violations Current 9:30 Distinct Rules Violated 2:20 Security	Compliance Score (%) 51 Policy Trend Overview			
Last Security Evaluation 🛛 🍃 Oct 13, 2005 5:39:09 AM PDT	Compliance Score (%) 59 Enterprise	Security A	<u>At a Glance</u>	
Critical Patch Advisories for Oracle Homes				
Current 4				
Affected Oracle Homes 1				
Job Activity				
Jobs scheduled to start no more than 7 days ago Scheduled Executions 0 Running Executions 0	Suspended Executions Problem Executions	✓ 0 ✓ 0		
Related Links				
Access Alert History All Metrics Blackouts Deployments Execute Host Command Home Performance Targets Configuration	Log File Alerts Metric and Policy Settings Monitoring Configuration Net Services Administration Open Teinet Session Remote File Editor		<u>Reports</u> <u>Storage Details</u> <u>Target Properties</u> <u>User-Defined Metrics</u>	

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

Host Performance Page

The Host Performance page provides an overview of the utilization statistics (CPU, Memory, Disk I/O, and Program Resource Utilization) for an individual host. Choose one of these options from the **View** menu. With this information, system administrators can determine whether resources need to be added or redistributed. You can also view the top processes consuming the most CPU or Memory and take appropriate action.

The performance metrics that are collected out-of-box for the host span several different categories: CPU Usage (including idle, wait, and user times), Disk Activity (including Average Disk I/O rate), and Network Interface Activity, among others. You can also view real-time metrics such as buffer activity.

Using the Performance page, you can:

- View various utilization charts by selecting an option in the View menu. Related metrics are also displayed under the charts. Click a metric link to view the metric in more detail.
- View the processes that are using the most CPU or memory resources.
- View performance data in real-time, or historical data over defined periods.

Figure 17–2 Host Performance Page



Host Configuration Page

The Host Configuration page lists not only operating system and hardware configuration information, but all Oracle software and operating-system registered software on the host as well. You can also compare configurations for single or multiple hosts.

See Also: "Hardware and Software Configurations" in Chapter 6, "Managing Deployments"

Operating System Details

Enterprise Manager Grid Control surfaces key operating system-level information for hosts. You can obtain general information about the operating system, such as the distributor and the version. You can also drill-down for specific information such as system properties, file systems, and operating system-level packages. This information helps when troubleshooting performance problems that arise because of configuration issues.

Note: To access the Operating System Details page:

- 1. From the **Hosts** subtab, select a host target.
- **2.** From the Host Home page, click the **Operating System Details** link under Configuration.

ORACLE Enterprise Manager 10g		Home Targets Deployments Alerts Policies Job	s Reports
Collaboration Suites Hosts Databases Application Servers Web Ap	plications Services Systems Groups	All Targets	
Host: ilinrbn05.us.oracle.com >			
Operating System Details		Data Collected Oct 13, 2005	5:37:46 AM PD1
Host ilinrbn05.us.oracle.com			(History)
Operating System bith	1ate 4) 2.4.21 27.ELSMp (32-		
Vendor Red Hat			
General File Systems Packages			
Distributor Version Red Hat Linux 3.2.3-47 Maximum Swap Space (MB) 8047.31			
Operating System Properties			
	1. Contraction of the second s	C Previous 1.25 of 295	Next 25 😒
Nama	Sauraa	Value	<u>140/(25</u> 0
Name	Source	100 05 040 44	
nameserver i	/etc/resolv.conf	130.35.249.41	
nameseiver 2	/atc/resolv.conf	138.3.302	
Maximum Swan Shace (MB)	/ehin/evectl	8047 31	
ahi defhandler, coff	/sbin/sysci	117//0515	
abi.defnandler_elf	/sbin/syscil	0	
abi.defhandler_cal7	/sbin/sysci	68157441	
abi defhandler_iboso	/shin/sysctl	68157441	
ahi fake utsname	/shin/sysctl	0	
abi trace	/shin/sysctl	0	
debug kerneltype	/sbin/sysctl		
debug romarch	/sbin/svsctl		
dev.parport.default.spintime	/sbin/sysctl	500	
dev.parport.default.timeslice	/sbin/sysctl	200	
dev.raid.speed limit max	/sbin/sysctl	10000	
dev.raid.speed limit min	/sbin/sysctl	100	
dev.rtc.max-user-freq	/sbin/sysctl	64	
fs.aio-max-pinned	/sbin/sysctl	393216	
fs.aio-max-size	/sbin/sysctl	131072	
fs.dir-notify-enable	/sbin/sysctl	1	
fs.file-max	/sbin/sysctl	65536	
fs.lease-break-time	/sbin/sysctl	45	
fs.leases-enable	/sbin/sysctl	1	
fs.nfs.nfs3_acl_max_entries	/sbin/sysctl	1024	
fs.nfs.nlm_grace_period	/sbin/sysctl	0	
		C Previous 1-25 of 295	💌 <u>Next 25</u> 📎
Related Link Search Operating System Property Settings on Hosts			
General File Systems Packages			

Figure 17–3 Host Operating System Details Page

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

The File Systems page includes information about the various mount points for the host, type of mount point, time of the mount, and the directory where the file system is mounted.

The Packages page lists all of the operating system packages installed on the host.

Hardware Details

The Hardware Details page allows you to view the CPU, I/O, and Network Interfaces associated with the host. It also helps the user keep track of the hardware changes that occur over time. The type of operation (INSERT, UPDATE, or DELETE) and the category of the hardware that is updated are reflected on this page.

Note: To access the Hardware Details page:

- 1. From the Hosts subtab, select a host target.
- **2.** From the Host Home page, click the **Hardware Details** link under Configuration.

Fiaure 17–4	Host	Hardware	Details	Page
i iguio i i i	11001	i lui uli u	Dotano	, ugo

DRACLE Enterprise Manager 10	g				Home Targets	Deployments Ale	Setup Preferences Help Lo erts Policies Jobs Report
Collaboration Suites Hosts Dat:	abases Application	n Servers Web Applicat	ions Services	Systems Groups Al	Targets		
ost ilinrbn05.us.oracle.com >					-		
ardware Details						Data C	ollected Oct 13, 2005 5:37:46 AM
CPUs	System Machine Hard Memo	Hostname ilintbn05.us.oracle.com (ilintbn05) Local Disk Configuration i686 Clock Fr J Architecture GenuineIntel i686 N ware Provider Intel Based Hardware Number ary Size (MB) 5897 Numb			I Disk Capacity (GB) ock Frequency (MHz) Number of CPUs umber of CPU boards Number of IO devices	65.31 99 2 1 13	H
CPU speed (MH7)	Vendor	PROM Revisio	n .	ECACHE (MB)	CPU Impleme	ntation	Mask
2791	GenuineIntel	2		5	Intel(R) Xeon(T)	VI) CPU 2 80GHz	15
2791	GenuineIntel	2		5	Intel(R) Xeon(T)	VI) CPU 2 80GHz	15
IO Devices		1					
Name 🛆		Vendor			Bus Type	Frequency (MHZ)	PROM Revision
00:04.0 Class ff00		Dell Embedded Remote	Access or ERA/0)	PCI	66	
00:04.1 Class ff00		Dell Remote Access Ca	d III		PCI	66	
00:04.2 Class ff00		Dell Embedded Remote	Access		PCI	66	
00:0e.0 VGA compatible controller		Dell			PCI	66	27
00:0f.0 Host bridge		ServerWorks CSB5 Sout	h Bridge		PCI	66	93
00:0f.1 IDE interface	ServerWorks CSB5 IDE Controller				66	93	
00:0f.2 USB Controller	ServerWorks OSB4/CSB5 OHCI USB Controller				66	05	
00:0f.3 ISA bridge		ServerWorks			PCI	66	
02:06.0 Ethernet controller		Intel Corp. PRO/1000 XT	Server Adapter		PCI	66	02
03:06.0 Ethernet controller		Dell Broadcom BCM570	l 1000Base-T		PCI	66	15
03:08.0 Ethernet controller		Dell Broadcom BCM570	l 1000Base-T		PCI	66	15
05:06.0 SCSI storage controller		Dell			PCI	66	01
05:06.1 SCSI storage controller		Dell			PCI	66	01
Network Interfaces	m Transfer Unit	Dress doesn't Address	March .	Ela un		MAGAddam	Martine Allance
Mame INET Address Maximu	in Transfer Unit	broadcast Address	IMASK	Flags		MAC Address	Hostname Allases
ethU 144.25.34.61 1500		144.25.35.255	255.255.252.0	BRUADCAST, MULTICAS	T,RUNNING,UP	UU:U2:B3:CD:27:4A	llinrbnU5,ilinrbnU5.us.oracle.com
eth1 1500				BRUADCAST, MULTICAS	-	UU:U6:5B:FC:D7:9B	
eth2 1500				BRUADCAST, MULTICAS		UU:U6:5B:FC:D7:9C	
lo 127.0.0.1 16436			255.0.0.0	LOOPBACK,RUNNING,U			localhost.localdomain,localhost
IP Some Information may not b	e available dependin(g upon the Hardware platfo	rm.				

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

Log File Monitoring

Grid Control monitors the log files for the occurrence of operator-specified patterns. Use this facility to monitor abnormal conditions recorded in the log files present on the host.

Log files are periodically scanned for the occurrence of desired patterns and an alert is raised when the pattern occurs during a given scan. During a scan, new content created since the last scan is searched for the occurrence of the desired patterns. Use this page to view, clear, and purge open alerts generated during log file monitoring.

Note: To access the Log File Alerts page:

- 1. From the **Hosts** subtab, select a host target.
- **2.** From the Host Home page, click the **Log File Alerts** link under Related Links.

See Also: "Configuring Generic Log File Monitoring Criteria" in Grid Control online help

Program Resource Utilization Monitoring

Enterprise Manager allows you to track resource use for programs and users. For example, you can track CPU usage by user, by program, or a combination of the two.

The Program Resource Utilization page provides a quick glimpse of the programs being monitored on this host. With this information, you can see trends in resource usage for:

A specific program or set of programs

- A specific user or set of users
- A combination of programs and users

Note: To access the Program Resource Utilization page:

- 1. From the **Hosts** subtab, select a host target.
- 2. From the Host Home page, go to the **Performance** page.
- **3.** From the Host Performance page, select **Program Resource Utilization** from the View menu.

You can also access the page from the All Metrics page for that host.

See Also: "Configuring Program Resource Utilization Monitoring Criteria" in Grid Control online help

File and Directory Monitoring

Enterprise Manager monitors the files and directories for the operator-specified criteria on hosts running various versions of the UNIX operating system. The operator should configure the criteria for monitoring the desired files and directories.

Note: To access the File Directory Monitoring page:

- 1. From the Hosts subtab, select a host target.
- **2.** From the Host Home page, click the **All Metrics** link under Related Links.
- **3.** From the All Metrics page, select **File and Directory Monitoring** from the list of metrics.

See Also: "Configuring File and Directory Monitoring Criteria" in Grid Control online help

Hardware Monitoring for Dell PowerEdge Systems

Hardware-specific monitoring is available out-of-box for Dell PowerEdge Linux hosts with Enterprise Manager. The following hardware health statistics can be monitored as part of the Dell PowerEdge Linux host target:

- Processor Status
- Memory Status
- PCI Device Status
- Power Supply Status
- System BIOS Status
- Fan Status
- Remote Access Card Status
- Temperature Probe Status

Note: To access the Hardware Monitoring page for Dell PowerEdge Systems:

- 1. From the Hosts subtab, select a host target.
- **2.** From the Host Home page, click the **All Metrics** link under Related Links.
- **3.** From the All Metrics page, select the metric you want to monitor from the list of metrics.

See Also: "Enabling Hardware Monitoring for Dell PowerEdge Linux Hosts" in Grid Control online help

Storage Resource Tracking

Tracking the storage resource allocation and usage is essential to large IT departments. Unallocated and underutilized storage can be put to better use. Historical trends at a business entity-level enable you to plan for future growth.

Storage Details are relevant to Enterprise Manager targets that are associated with one or more hosts. In particular:

- Summary attributes presented are rolled up for one or multiple associated hosts.
- Storage Details helps in tracking storage resource allocation and usage for one host or a group of hosts, and tracks historical usage trends.
- A host is associated with a group either through explicit membership, or implicit membership inherited through a group member target.

Note: To access the Storage Details page:

- 1. From the Hosts subtab, select a host target.
- **2.** From the Host Home page, click the **Storage Details** link under Related Links.

The Storage Details page displays the following charts:

- Overall Utilization: Shows summary attributes that provide a system-level view of storage resource utilization.
- Provisioning Summary: Shows allocation-related summary attributes for File Systems, ASM, Volumes, and Disks for the associated hosts.
- Consumption Summary: Shows usage-related summary attributes for Databases and File Systems.

The Disks option on the Storage Details page shows the allocated and unallocated storage for all the disks and disk partitions on a host. All disks are listed, including virtual disks from external storage systems such as EMC Storage Array.

Collaboration Suites Hosts Databases Application Services Systems Groups All Targets Host illinthn05.us.oracle.com > Storage Details Storage Details Storage Details Storage Details Overall Utilization Provisioning Summary Consumption Summary Latest Data Collected From Target Oct 13, 2005 5:38:28 AM PDT Refresh 4% 10% Bisks Used (GB)(323) Disks Used (GB)(323)	ORACLE Enterprise Manager 10)g			н	Inme Targets De	niovments Alerts	Setup Preferences Hele Policies Jobs Ro	p Logout
Host Illination S us oracle com > Storage Details Overhead information is not available for Disks and Writeable NFS. There were some errors collecting data. Used (GB)(33B) Image: Storage Details Disks Disks View Data All Very Data All Resource Name Resource Type Verded Storage Details	Collaboration Suites Hosts Data	hases Annlication Servers	Web Applications L S	Senvices Systems	Groups All Targe	ats	provincino - Acro	Toncies Jobs Re	ports
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/dew/sda2 Disk Partition Block FUJITSU 2.00 2.00 0.00	/dev/sda2 Disk Pa	artition Block	FUJITSU		2.00	2.0	00	0.00	
/dev/sda1 Disk Partition Block FWITSU 66.35 66.35 0.00	/dev/sda1 Disk Pa	artition Block	FUJITSU		66.35	66.3	35	0.00	
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Figure 17–5 Host Storage Details Page

Host Administration

In addition to the general Grid Control features and tools described in Part I, "General Grid Control Features" you can administer your hosts using the Host Administration tab and Grid Control's tools designed for host management.

Linux Host Administration

Linux host administration features for RedHat (RHEL4) and SuSE Linux (sles9) provide you the ability to administer the most important host functions easily and quickly. Operators with the appropriate privileges can set up and administer the following OS features:

- System Services
 - Start and stop individual services Facilitates upgrading and troubleshooting applications and databases
 - Configure services to run at boot time Ensures that all your applications and dependent services are available after every reboot
 - Assign system services to run levels Assures appropriate behaviors to assist in maintenance and trouble-shooting
- Network Setup
 - NFS Client Configuration Allows you to configure access to storage resources
 - Network Card Configuration Enables you to rapidly establish connectivity to the network to get your application service running quickly
 - View and edit host name lookup tables (/etc/hosts) Allows you to set-up and edit host names to identify new services to the network

Note: To access the Host Administration page:

- 1. From the **Hosts** subtab, select a Linux host target.
- 2. From the Host Home page, click Administration.

Execute Host Command

With the appropriate privileges, you can execute non-interactive host commands remotely over the network, as well as view and edit text files. The Execute Host Command page enables you to type operating system commands against one or more hosts, or all the hosts in a group, enabling you to perform multiple administrative operations at the same time.

Note: To access the Execute Host Command page:

- 1. From the **Hosts** subtab, select a host target.
- **2.** From the Host Home page, click the **Execute Host Command** link under Related Links.

Job System

You can leverage the Job System to run operating system commands for your host. From the Execute Host Command page, use the "Load from Job Library" option to search the Job Library for existing jobs that you can reuse.

From the Load from Job Library page, click the icon in the **Load** column of any row to return to the Execute Host Command page, loading the complete context of the library job in that row. The complete context includes the host command, OS script, targets, and credentials.

See Also: Chapter 9, "Job System"

Note: To access the Load from Job Library page:

- 1. From the Execute Host Command page, click the **Switch to Multiple Target Mode** link.
- 2. Click the Load from Job Library button.

Remote File Editor

The Remote File Editor page enables you to view, edit, copy, and save text files present on the remote host target. For example, using this utility, you can update the contents of configuration files on the remote host.

Note: To access the Remote File Editor page:

- 1. From the Hosts subtab, select a host target.
- **2.** From the Host Home page, click the **Remote File Editor** link under Related Links.

Managing Host Deployments

Use Grid Control's deployment management tools to:

View and compare host configurations
- Perform automated patching for your hosts
- Deploy new hosts using the provisioning facility

See Also: "Linux Host Patching" and "Provisioning the Operating System" in Chapter 6, "Managing Deployments"

Third-Party Target Management

Grid Control enables you to manage hardware and software from certain third-party vendors out-of-box. Most tools, functions, and features available for monitoring and administering Oracle targets can be used to manage other targets in your data center.

See Also: Chapter 4, "System Monitoring"

Note: Use Grid Control to manage your complete data center by developing Management Plug-ins for your managed targets. Refer to "Developing Management Plug-ins" in Chapter 10, "Extending Enterprise Manager" for more information.

Support for Third-Party Application Servers

With tools and features similar to managing Oracle Application Server targets, Grid Control allows you to monitor the following third-party application server targets, as well as the applications deployed on the servers:

- BEA WebLogic Domains, Clusters, and Managed Servers
- IBM WebSphere Cells, Clusters, and Application Servers
- JBoss Partitions and JBoss Application Servers

BEA WebLogic Domains and IBM WebSphere Cells represent logically-related groups of application server resources. All the resources in a BEA WebLogic Domain are centrally managed by the WebLogic Administration Server, and the resources in an IBM WebSphere Cell are managed by the Deployment Manager. Grid Control monitors them as composite targets, containing rolled-up information on the member targets that make up the group. The member targets that make up a domain are clusters and managed servers, and the member targets that make up a cell are clusters and application servers.

The JMX fetchlets specific to each product environment communicate with the BEA WebLogic Administration Server or IBM WebSphere Deployment Manager to collect the metric information for the individual application servers that make up the Domain or Cell, respectively. There is no need to deploy Oracle Management Agents to each application server node; as long as a Management Agent is locally or remotely deployed to the host on which the Administration Server or Deployment Manager resides, Grid Control can manage those targets.

BEA WebLogic Cluster, IBM WebSphere Cluster, and JBoss Partition provide a high-availability application server environment. Grid Control monitors them as composite targets, containing rolled-up information on the member targets that make up the group. The member targets for each of these targets are the application servers grouped under them.

BEA WebLogic Managed Servers, IBM WebSphere Application Servers, and JBoss Application Servers are used to deploy applications and other resources. They are all monitored as individual targets, much like Oracle Application Servers. Grid Control also provides configuration management features for these third-party application servers. Using these features, you can view the configurations that were last collected, save configurations so that they can be referenced in the future for possible analysis or comparison, and compare configurations to examine specific configuration variations between two instances. You can also perform some out-of-box searches, for example, you can search one or more J2EE applications deployed in your third-party application server instances.

However, note that all these third-party application servers have to be manually added to Grid Control for monitoring purposes. Unlike Oracle Application Servers, these third-party application servers are not automatically discovered by Grid Control. You can use the Application Servers tab of the Grid Control console to add these targets.

Some of the features available for these third-party application server targets are:

- Robust monitoring. Automatic performance and availability monitoring with Oracle recommended settings, out-of-box notifications for critical alerts, J2EE application monitoring for clusters, J2EE services monitoring for JBoss application servers, historical collections, blackouts, monitoring of application-defined MBeans, and more.
- Service management. Transaction performance monitoring, end-user performance monitoring, system monitoring, dashboards, Root Cause Analysis, and more.
- Group management. Group-level roll-ups for monitoring and task automation, monitoring templates.
- **Reporting.** Out-of-box and user-defined reports for JBoss Application Server.
- Policy violations. Out-of-box and user-defined policies for BEA WebLogic Managed Server.
- Administration. Process control for starting, stopping, and restarting BEA WebLogic Managed Server and IBM WebSphere Application Server. Also, control for starting and stopping Channels of IBM WebSphere MQ targets.
- **Configuration Management.** Viewing, comparing, and searching configuration information related to these application servers.

See Also: "Managing BEA WebLogic Servers and "Managing IBM WebSphere Application Server", and "Managing JBoss Application Server helpsets in Grid Control online help

Support for Third-Party Plug-Ins

Much like the support offered for third-party application servers, Grid Control also supports third-party plug-ins like IBM WebSphere MQ Queue Manager and IBM WebSphere MQ Cluster.

IBM WebSphere MQ Cluster is a composite target that groups the IBM WebSphere MQ Queue Managers, and provides a high-availability environment. Grid Control monitors them as logical targets and provides rolled-up information about the queue managers that make up the cluster.

IBM WebSphere MQ Queue Manager is monitored like any other application server target. You can monitor their status, be notified for critical alerts, access out-of-box reports and policies, and view a list of metrics and gauge their performance.

The other logical objects of IBM WebSphere MQ Queue Manager for which Grid Control collects metrics are Queues and Channels. For each of these logical targets, Grid Control provides a home page to help you monitor their status and performance. **See Also:** "Managing IBM WebSphere MQ Queue Manager" and "Managing IBM WebSphere MQ Cluster" helpsets in Grid Control online help

Network Appliance Filer

When you use Oracle Enterprise Manager to manage your Oracle environment, you can monitor not only your databases and application servers, but also supporting hardware, such as IP traffic controllers and storage devices.

Network Appliance Filers configured to use the ONTAP operating software (release 6.0 or later) are one type of storage device that can be managed out of the box. Network storage devices can be an important part of your Oracle environment. Use them to store and access large amounts of database and application data.

Similar to other managed targets, Grid Control's full suite of monitoring features are available for Network Appliance Filers. Key aspects of Network Appliance Filer monitoring are displayed as part of the Network Appliance-specific target pages, and include the following:

- Availability
 - Filer Target
 - Cluster Filer's Partner Status
- Storage Space Allocation and Usage Monitoring
 - Traditional and Flexible Volumes
 - Aggregates, Qtrees, and Snapshots
 - System Level Storage Capacity Summaries
- Performance Monitoring
 - CPU Utilization and NFS Statistics
 - NFS/CIFS Calls
 - Disk, Network, and Network Interface I/O
- Health Monitoring
 - Power Supplies, Fans, and NVRAM Batteries
 - Temperature and NFS/CIFS Bad Calls
 - Cluster Partner/Interconnect Status
 - Network Interface Status/Errors/Discards
 - Disk Failures and Spare Disks

See Also: "Overview of Adding a Network Appliance Filer" in Grid Control online help

F5 Load Balancer Switches

In addition to monitoring the performance of your database, the effectiveness of your mid-tier applications, and the response time of your Web pages, Grid Control helps you monitor load balancer switches. Load balancer switches are an important part of any complex Web application environment, because they distribute user requests to the Web servers.

F5 BIG-IP Load Balancers from F5 Networks running OS version 4.2 PTF-06, or later, can be managed out of the box from Grid Control. The user interface allows you to navigate through the relationships that exist among the entities present in the switch.

As with other managed targets, Grid Control's full suite of monitoring features are available for F5 Load Balancer Switches. Key aspects of F5 Load Balancer Switch monitoring are displayed on the Load Balancer Switch-specific target pages, and include the following:

- Availability
 - Load Balancer Switch Target
 - Virtual and Real Server Status
- Performance Monitoring
 - Switch Level CPU and Memory Utilization
 - Switch, Virtual Server, Server Group and Real Server Level Bits In and Bits Out Rates, Connections Per Second
 - Physical Interface Level Bits In and Bits Out Rates

See Also: "Overview of Adding a Load Balancer Switch" in Grid Control online help

E-Business Suite Management

The Oracle Grid Control Plug-in for Oracle Applications extends Enterprise Manager 10g Grid Control to help you to more effectively monitor and manage your E-Business Suite targets. This plug-in integrates Oracle Applications Manager with Grid Control to provide a consolidated solution for end-to-end management of Oracle Applications. This chapter describes the features and use of this new extension for Grid Control.

Overview of the Grid Control Plug-in for Oracle Applications

The Oracle Grid Control Plug-in for Oracle Applications provides extensions for the Enterprise Manager 10g Grid Control Management Service, Management Repository, and Management Agent. This plug-in introduces new target types that can be monitored within Grid Control, including:

- Oracle Applications System
- HTTP Server for Oracle Applications 11*i*
- JServ for Oracle Applications 11*i*
- Forms Listener for Oracle Applications 11*i*
- Reports Server for Oracle Applications 11*i*
- Discoverer for Oracle Applications 11*i*

The plug-in helps to manage the technology stack specific to Oracle Applications, such as Concurrent Manager, workflow, and native services. Administrators spend a lot of time managing the native technology stack of E-Business Suite, since their business depends on these set of technologies. Grid Control offers trending and charting capabilities for this native technology stack, which are not offered by Oracle Applications Manager.

The plug-in also provides new pages within Grid Control, which help you to monitor the performance and availability of your Oracle Applications systems. Grid Control provides a complete view of your enterprise, allowing you manage all of your Oracle Applications systems from a single console. Not only can you take advantage of advanced Grid Control features, such as Service Level Management and monitoring tools, but you can also seamlessly drill down into Oracle Applications Manager to access the management features that are built directly into the Oracle Applications system. Grid Control and Oracle Applications Manager work together to provide a comprehensive Oracle Applications system management solution.

Once you have registered your Oracle Applications systems, you are ready to start using the new features of Grid Control to manage these systems. Grid Control allows you to monitor multiple Oracle Applications systems from a single console and drill down into Oracle Applications Manager where you can control, configure, troubleshoot, and maintain individual systems.

Note: The features offered within Grid Control for individual Oracle Applications systems are dependent on the patch levels of those systems:

- The Grid Control Plug-in for Oracle Applications provides advanced features for Oracle Applications 11*i* systems that meet the standard interoperability patch level. These advanced features include extended performance metrics and links from Grid Control to Oracle Applications Manager.
- For Oracle Applications 11*i* systems that do not meet the interoperability patch level, basic monitoring is provided.

To obtain full management functionality within Grid Control for a given Oracle Applications system, you may need to apply one or more patches to that system.

About Oracle Applications Manager

Oracle Applications Manager delivers a powerful system management solution for Oracle E-Business Suite. Oracle Applications Manager helps IT staff configure, monitor, control, maintain, and support the E-Business Suite. Oracle Applications Manager can help improve IT efficiency, system availability, and application performance. Oracle Applications Manager is part of the Oracle E-Business Suite, an integrated set of applications that are engineered to work together.

For more information on Oracle Applications Manager, including the Grid Control Plug-in for Oracle Applications, visit the following URL:

http://www.oracle.com/technology/products/applications/index.html

Oracle Applications in Grid Control

Access Oracle Applications in Grid Control by clicking **Oracle Applications** in the Targets tab. To view this page, you must first enable the Oracle Applications subtab.

Enabling the Oracle Applications Subtab

The Grid Control Plug-in for Oracle Applications provides a new Oracle Applications subtab under the Targets tab of Grid Control. You can enable or disable this subtab, depending on your preferences. By default, this new subtab is enabled only for the SYSMAN super administrator user.

To enable the subtab:

- 1. In Grid Control, click the **Preferences** link.
- 2. On the Preferences page, click Target Subtabs.
- **3.** Select **Oracle Applications** from Available Target Subtabs and move it to Selected Target Subtabs.

ORACLE Enterpri	se Manager 10g	1		Home Targ	ets Deploym	ents Alerts	Setup Preference Policies Job	<u>es Help Logout</u> s Reports		
Hosts Databases	Application Sei	rvers Web App	olications Serv	ices Systems	Groups All	Targets Oracl	e Applications			
Oracle Applications										
Page Refreshed 🛛 Oct 20, 2005 4:17:00 PM PDT 民										
Search Go Advanced Search										
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			Daliau	Compliance	Earma	Requests:	Requests:	Active Service	Investid DR	
Select Name △	Status	Alerts	Violations	Score (%)	Sessions	(Normal)	(Standby)	Processes	Objects	
ebs_tst_2	<u>0</u> 2		0 0 0		0 🗸	0 🗸	0 🗸	<u>16</u> 🗸	0 🗸	
C <u>test_12</u>	<u>6</u>		0 0 0		0 🗸	0 🗸	0 🗸	<u>16</u> 🗸	0 🗸	
Availability Legend: 🗘 Up 🔞 Partials Up 🤌 Down 🤹 Under Blackout 🧏 Agent Unreachable 🤹 Agent Down 🔅 Status Pending 🗟 Metric Collection Error										
Hame Targete Deployments Alerte Policies John Departe Satur Proferences Help Lagout										

Figure 18–1 The Oracle Applications Subtab in Grid Control

The Oracle Applications Page

This page provides an overview of the Oracle Applications systems that have been registered with Grid Control. Use this page to add or remove Oracle Applications systems from Grid Control and edit the monitoring configuration of a system. The Management Repository holds management data for multiple E-Business Suite instances, which administrators can use to compare two instances side-by-side.

Figure 18–2 The Oracle Applications Home Page in Grid Control

ORACLE Grid Control	Enterprise Manager 10 <i>g</i>						Home	Targets Deploy	ments Alerts	Setup Policies	Preferences H	lelp <u>Loqout</u> Reports
Hosts Dat	abases Application Sen	vers Web App	ications Services	Systems	Groups	All Targets Oracle A	pplications					
Oracle App	lications: ebs_tst_2											
Home	System Performance	<u>Components</u>	Web Application	Performance								
General	Status System Name Version Products Installed New Internal System Patches Applied Site Level Profile Options Context Files Edited Monitoring Host	Partially Up oamtap 11.5.10.1 11.1 2 0 0 2 ap606atg.us.or	p(6) Down(2) C	<u>vther(0)</u>	Activity : 20 15 10 5 4:32 0ct 1	Summary 8 12 AM 4 19, 2005 20 Web Users (14 Concurrent Ra Concurrent Ra Concurrent Ra	8 ast Hour) 15 equests Run Processes	12 PM 4	Page Refr	eshed Oct 2	20, 2005 4:20	:48 PM 🖹
Applicatio	ons System Status											
Host	Platform		Host Status		Admin	Database		Concurrent Proc	essing		Forms	Web
AP606ATG	/606ATG LINUX Intel		Û		Û	0	0		1		0	1
Alerts												
Seve	arity Metric Target Name Targe		Target Typ	e	Alert Triggered	Last V		•	Last Checked			
Related A	lerts											
Severity	Metric			Targ	et Name	Target Type △	Alert Tri	ggered	Last Value	Last Ch	ecked	
Tablespace Space Used (%) for APPS_TS_TX_IDX Or					RAP	Database Instance	Sep 7, 2005 12:37:09 PM		88.58	Oct 20, 2005 4:02:47 PM		PM
⚠	Owner's Invalid Object C	ount for APPS		<u>OAM</u>	RAP	Database Instance	Sep 7, 20	005 11:17:35 AM	207	Sep 7, 2	005 11:17:35	AM
End-User URL No rows for	Peformance: URL Wa Avg Response Time (und	tch List sec) Samples										
Home	System Performance	<u>Components</u>	Web Application	Performance								
Pelated	inke											
	atrics				Edit	Monitoring Configuration						
Edit Metric Lon monitoring Comparation Edit Metric Alerts History Link to OAM Link to OAM												
		Home	Targets Deploy	ments Ale	rts <u>Polici</u>	ies Jobs Reports S	Setup Pre	ferences <u>Help</u> Log	out			

The Oracle Applications page summarizes the status of each Oracle Applications system that has been registered with Grid Control. For each system, the page also provides a set of metrics that summarize aspects of system usage and performance. You can drill down on the Oracle Application system Name to access the home page for that system. You can also drill down on any summary metric to view the historical values of that metric.

You can configure the summary metrics that are displayed in the Oracle Applications page by clicking **Preferences** in Grid Control, then selecting **Metric Columns.** Next, select Oracle Applications System as the type, and use the shuttle control to select the summary metric columns that you would like to appear in the Oracle Applications page.

Glossary

adaptive alert thresholds

Computed statistical alert thresholds using either static (user-defined) or dynamic (self-adjusting) baselines.

See also **metric baselines**.

ADDM

See Automatic Database Diagnostic Monitor (ADDM).

administrator account

Enterprise Manager administrator account that provides permission to perform daily administration work and access administrative information.

agent

See Oracle Management Agent.

alert

Indicator signifying a particular metric condition has been encountered. An alert is triggered when one of the following conditions is true:

- A metric threshold is reached.
- The availability of a monitored service changes. For example, the availability of the host changes from up to down.
- A metric-specific condition occurs. For example, an alert is triggered whenever an error message is written to a database alert log file.

Application Server Control

Web-based management features designed to monitor and administer application server instances, farms, and clusters.

attestation

Process of having users or system managers confirm people's access rights on a periodic basis.

Automatic Database Diagnostic Monitor (ADDM)

Application that automatically takes regularly scheduled snapshots of the database activity. ADDM identifies the most resource-intensive components or operations and provides advice, which may recommend running an advisor or making configuration changes to your database.

Automatic Storage Management (ASM)

Application that automates and simplifies the layout of datafiles, control files, and log files. Database files are automatically distributed across all available disks, and database storage is rebalanced whenever the storage configuration changes.

automatic target discovery

Process by which targets are located and added to Enterprise Manager. Automatic discovery begins when the Oracle Management Agent starts up after installation. Targets located on the Agent are discovered and added to Enterprise Manager to be monitored and administered. How the targets are installed determines which targets are automatically added.

Automatic Workload Repository (AWR)

Automatic capture of statistics data for real-time and historical performance analysis. AWR includes snapshot data, active session history data, and workload reports.

availability

The percentage or amount of scheduled time that a computing system provides application service.

AWR

See Automatic Workload Repository (AWR).

Beacon

Application to monitor transactions from different user communities or geographical regions. You can enable the Beacon software to monitor the availability and performance of network components (a host computer or an IP traffic controller) from more than one location, or Web pages and Web applications from multiple network locations.

blackout

Maintenance tool for suspending any data collection activity on one or more monitored targets. This allows you to perform scheduled maintenance on targets while excluding these special-case situations from the data analysis to obtain a more accurate, long-term picture of a target's performance.

cluster cache coherency

For Oracle Real Application Clusters (RAC) environments, helps you identify processing trends and optimize performance. The Cluster Cache Coherency page enables you to view the global cache block access latency, global cache block transfer rate, and global cache block transfers and physical reads.

control

See Oracle Enterprise Manager 10g Grid Control, Oracle Enterprise Manager 10g Database Control, Oracle Enterprise Manager 10g Application Server Control, Oracle Enterprise Manager 10g Application Server Control for Collaboration Suite.

dashboard

Tool for proactively monitoring status and alerts as they occur by viewing the health of managed targets in real time. The dashboard presents information using intuitive icons and graphics that let you spot recent changes and quickly identify and respond to problems.

database configuration

The configuration information Enterprise Manager collects for an Oracle database, which includes:

- General database and instance information, such as the database name, instance name, and whether or not the database is running in restricted mode or archive log mode
- Initialization parameter values
- System Global Area values
- Tablespaces and their parameters
- Datafiles and their parameters
- Control files and their attributes
- Redo logs and their attributes
- Rollback segments and their parameters
- High availability information
- License information
- Database options information

database instance

Running Oracle Database consisting of memory structures (SGA) and background processes. An instance only exists while it is up and running. Essentially, a database resides on disk, while an instance resides in memory.

A database is normally managed by only one instance. However, when using Oracle Real Application Clusters, multiple instances can be started for a single database (on different hosts of a cluster).

See also Oracle Real Application Clusters (RAC).

enterprise configuration

Configuration information stored in the Management Repository for the set of hosts and targets that comprise your enterprise.

fast-start failover

Ability of Data Guard to rapidly and automatically fail over to a standby database without requiring manual intervention. This improves the degree of availability as well as the disaster resilience for the system infrastructure.

fetchlet

Parameterized data access mechanism that takes arguments for input and returns formatted data.

Grid Control console

See Oracle Enterprise Manager 10g Grid Control console.

group

Single logical unit that can include targets of the same type (for example, all your production databases) or include targets of different types (for example, all targets comprising your business's application). Groups enable you to enable you to collectively monitor and administer many targets.

home page

See target home page.

host configuration

Configuration information that Enterprise Manager collects for a host that is a managed target, including:

- Hardware for the host (including memory, CPU, I/O device, and network interface information)
- Operating system for the host (including information such as operating system properties, packages, and installed patches)
- Installed Oracle software, including (but not limited to) installed products and their components, patch sets, and interim patches on the host. Enterprise Manager uses the Oracle Universal Installer inventory or inventories on a host to obtain information about the Oracle products installed on the host.

instance

See database instance.

J2EE

Abbreviation for Java 2 Platform Enterprise Edition. J2EE is an environment for developing and deploying enterprise applications.

Management Agent

See Oracle Management Agent.

Management Plug-in

See Oracle Management Plug-in.

Management Repository

See Oracle Management Repository.

Management Services

See Oracle Management Service.

metric

Unit of measurement used to report the health of the system.

metric baselines

Named period of time associated with a target and used as a reference for evaluating target performance. Statistics are computed over the baseline period for specific target metrics. You can use these statistics to automatically set metric thresholds for alerting, as well as to normalize graphical displays of system performance.

See also adaptive alert thresholds.

metric snapshot

Named collection of a target's 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.

Notification Methods

Mechanism for defining different mechanisms for sending notifications. These include e-mail, SNMP traps, or running custom scripts—or all three. Once defined, these methods can then be used with Notification Rules for sending notifications to administrators as a result of alert occurrences.

Oracle ecosystem

Organization of software, hardware, and their environment so that they function as a unit. Typically, this consists of an Oracle platform and all third-party software, including storage systems, hosts, routers, and so on. The Grid Control Home page provides a unified view of your ecosystem.

Oracle Enterprise Manager 10g

Oracle Enterprise Manager is the Oracle integrated management solution for managing your computing environment.

Oracle Enterprise Manager 10g Application Server Control

Application Server Control relies on various underlying technologies to discover, monitor, and administer the Oracle Application Server environment. Application Server Control consists of the Application Server Control console and its underlying technologies:

- Oracle Dynamic Monitoring Service (DMS)
- Oracle Process Management Notification (OPMN)
- Distributed Configuration Management (DCM)
- A local version of the Oracle Management Agent specifically designed to gather monitoring data for Application Server Control.

Oracle Enterprise Manager 10g Application Server Control console

The Enterprise Manager Web-based user interface for managing Oracle Application Server 10*g*. The Application Server Control console is installed and available with every Application Server 10*g* installation.

From the Application Server Control console, you can monitor and administer a single Oracle Application Server instance, a farm of Oracle Application Server instances, or Oracle Application Server Clusters.

Oracle Enterprise Manager 10*g* Application Server Control for Collaboration Suite

Application Server Control for Collaboration Suite consists of a Web-based user interface and a set of underlying technologies. Oracle Enterprise Manager 10g Application Server Control for Collaboration Suite is installed and available with every Collaboration Suite installation.

Oracle Enterprise Manager 10*g* Application Server Control Console for Collaboration Suite

The Enterprise Manager Web-based user interface for managing Oracle Collaboration Suite. The Application Server Control for Collaboration Suite console is installed and available with every Oracle Collaboration Suite installation. From this console, you can monitor and administer a single Oracle Collaboration Suite instance.

Oracle Enterprise Manager 10g Database Control

Database Control relies on various underlying technologies to discover, monitor, and administer the Oracle Database environment.

Database Control consists of the Database Control console and its underlying technologies:

- A local version of the Oracle Management Service designed to work with the local database or clustered database
- A local Oracle Management Repository installed in the local database and designed to store management data for the Database Control console
- A local version of the Oracle Management Agent designed to provide monitoring data to the local Management Service

Oracle Enterprise Manager 10g Database Control console

The Enterprise Manager Web-based user interface for managing Oracle Database 10g. The Database Control console is installed and available with every Oracle Database 10g installation.

From the Database Control console, you can monitor and administer a single Oracle Database instance or a clustered database.

Oracle Enterprise Manager 10g Grid Control

Grid Control relies on various underlying technologies to discover, monitor, and administer your computing environment. Grid Control consists of the Grid Control console and these underlying technologies:

- One or more Oracle Management Services
- The Oracle Management Repository
- The central Management Agent
- Remote Oracle Management Agents, installed on each monitored host

Oracle Enterprise Manager 10g Grid Control console

Enterprise Manager Web-based user interface for centrally managing your entire computing environment.

From the Grid Control console, you can monitor and administer your entire computing environment from one location on the network. All the services within your enterprise, including hosts, databases, listeners, application servers, HTTP Servers, and Web applications, are easily managed as one cohesive unit.

Oracle Management Agent

A process deployed on each monitored host. The Oracle Management Agent is responsible for monitoring all targets on the host, for communicating that information to the middle-tier Management Service, and for managing and maintaining the host and its targets.

Oracle Management Plug-in

Target type provided by the user or a third party to extend Enterprise Manager's set of predefined target types.

Oracle Management Repository

Two tablespaces in an Oracle Database that contain information about administrators, targets, and applications that are managed within Enterprise Manager.

The Management Service uploads to the Management Repository the monitoring data it receives from the Management Agent. The Management Repository then organizes the data so it can be retrieved by the Management Service and displayed on Grid Control.

Oracle Management Service

A J2EE Web application that renders the user interface for the Grid Control console, works with all Management Agents in processing monitoring and job information, and uses the Management Repository as its data store.

Oracle*MetaLink*

Oracle Support Services site where customers can get information about released patches and outstanding bugs. You can use Enterprise Manager to download patches from Oracle*MetaLink*.

Oracle Streams

Propagation and management of data, transactions, and events in a data stream either within a database, or from one database to another. Controls what information is put into a stream, how the stream flows from database to database, what happens to messages in the stream, and how the stream terminates.

policy

Defines the desired behavior of systems and is associated with one or more targets or groups. Policies include different categories of policy rules, such as configuration, security, and storage rules. Enterprise Manager compares the targets for which policy rules exist with the policy rules for that target type, and identifies the policy violations for the target.

policy association

Relationship of a policy rule and its settings to a target or monitoring template.

policy compliance score

Number denoting the conformance of a target to a set of requirements (policy rules.) The score, ranging from 0% to 100%, is much like a test score. A score of 100% means that the target was fully compliant with the goals of the policy. The policy compliance score facilitates your assessment of the relative levels of attention needed for various targets given the violations on those targets.

policy evaluation

Process of testing a policy's condition and recording any violations in the repository.

policy groups

Standards that report deviations and enable closed loop remediation by optionally taking action to bring systems back into compliance.

policy rule

A conditional expression that tests values from a target against a condition; for example, verifying that database profile limits are set as expected.

policy rule library

Collection of policy rules.

policy settings

Conditions related to a policy. The policy settings include, but are not limited to, parameter values and excluded objects.

policy trend

The policy compliance trend of a policy in the domain of a particular target.

policy violation

Infringement of a policy rule. For example, one of the host security policy rules checks for open ports. The recommendation is that the insecure ports not be opened. Therefore, the violation is that there are open ports.

privileges

A right to perform management actions within Enterprise Manager, such as view any target and add any target in the enterprise, or a right to perform operations on a target such as maintaining and cloning the target. Types of privileges are defined by Oracle.

Oracle Real Application Clusters (RAC)

Option that allows multiple concurrent instances to share a single physical database. It provides a high-availability database environment spanning multiple hosts. Each cluster can be comprised of multiple cluster databases, each of which consists of multiple cluster database instances.

redundancy group

Group that contains members of the same type that function collectively as a unit.

repository

See Oracle Management Repository.

roles

Collection of predefined Enterprise Manager target or system privileges created by super administrators to facilitate granting multiple privileges or roles to users. Roles limit target access and access to specific management features.

Secure Socket Layer (SSL)

Software to secure the communications between the Management Service and the Management Agent. Encrypted communications between the Management Agent and Management Service over HTTPS ensures the privacy of data sent from one computer to another.

service

Entity that provides a useful function to its users, such as CRM applications, online banking, and email services. Some simpler forms of services are business functions that are supported by protocols such as DNS, LDAP, POP, or SMTP.

standby database

Read-only database on the standby node. The standby database, also referred to as the replicated database, is physically identical to the master database. In the event of catastrophic failures, data modification activities "fail over" to the standby database so that it becomes the new master database.

Super Administrator

Enterprise Manager administrator that can create, modify, and delete any Enterprise Manager administrator, create any role in the system, perform any action on any target in the system, and see all areas of the management system.

SYSMAN

By default during the installation of Oracle Enterprise Manager, one Super Administrator account is created with the user name of SYSMAN. The SYSMAN account should be used to perform infrequent system-wide, global configuration tasks such as setting up the environment. Other administrator accounts can be created for daily administration work. The SYSMAN account is:

- Owner of the Management Repository schema
- Default Enterprise Manager Super Administrator
- User name used to log in to Enterprise Manager the first time

system

Logical grouping of targets that collectively hosts one or more services. It is a set of infrastructure targets (hosts, databases, application servers, and so on) that function together to host one or more applications or services.

system privilege

Allows a user to perform system-wide operations. For example, the VIEW ANY TARGET system privilege allows the administrator to view any target on the system, including Oracle Management Agents and Oracle Management Services.

target

A single component that you can monitor or configure with Enterprise Manager. Examples of a target include:

- Single Oracle 10g database
- Group of databases that provide your worldwide customers with product information
- Oracle Application Server or an instance of Oracle HTTP Server
- Web application that your customers visit to investigate or buy your products
- Linux host computer, including its memory, disks, and CPU
- Server load balancer switch that controls the Internet traffic for a set of Web servers

Enterprise Manager can manage all these targets. A complete list of the target types you can manage is included in *Oracle Enterprise Manager Grid Control Installation and Basic Configuration*.

target compliance score

Average of the individual policy compliance scores for policies that have been associated with a target. Also, a target's security compliance score is the average of the compliance scores for security policies associated with that target.

You can use a compliance score to assess a target's overall compliance, and a group can use a score to determine the most troubled targets with respect to policy violations.

target home page

Page that contains general information about the selected target. From a target home page, you can drill down for more detailed performance information.

target privilege

Privilege that allows an administrator to perform operations on a target. For example, the View Target privilege allows an administrator to view properties, inventory, and monitor information about a target.

threshold

Boundary values against which monitored metric values are compared. The comparison determines whether an alert should be generated.

topology

Graphically shows the relationships between components, nodes, or objects within different Oracle applications.

wait classes

Grouping of wait events. Whenever an Oracle process waits for something, it records the wait using one of a set of predefined wait events. These wait events are grouped in wait classes, which show how much of the database is waiting for CPU time. The wait classes appear in the Database Performance page.

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