

Oracle® Enterprise Manager

Cloud Control Introduction

12c Release 1 (12.1.0.1)

E25353-04

May 2012

Oracle Enterprise Manager Cloud Control Introduction, 12c Release 1 (12.1.0.1)

E25353-04

Copyright © 2011, 2012, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Contents

Preface	v
Audience	v
Documentation Accessibility	v
Structure	v
Conventions	v
1 Overview of Oracle Enterprise Manager Cloud Control 12c	
1.1 About Enterprise Manager Cloud Control 12c	1-1
1.2 Enterprise Manager Cloud Control 12c Architecture	1-2
1.3 Enterprise Manager Management Focus Areas	1-5
1.3.1 Framework and Infrastructure	1-5
1.3.2 Enterprise Monitoring	1-5
1.3.3 Application Management	1-6
1.3.4 Database Management	1-6
1.3.5 Middleware Management	1-6
1.3.6 Hardware and Virtualization Management	1-7
1.3.7 Heterogeneous (Non-Oracle) Management	1-7
1.3.8 Cloud Management	1-7
1.3.9 Lifecycle Management	1-8
1.3.10 Application Performance Management	1-8
1.3.11 Application Quality Management	1-8
2 New Features In Oracle Enterprise Manager Cloud Control 12c	
2.1 Framework and Infrastructure	2-1
2.1.1 Robust and Extensible Architecture	2-1
2.1.2 User Interface	2-4
2.1.3 Group and System Enhancements	2-4
2.1.4 Reporting Enhancements	2-5
2.1.5 Security	2-5
2.2 Enterprise Monitoring and Incident Management Features	2-6
2.3 Application Management	2-8
2.3.1 Oracle Fusion Applications Plug-in 12.1.0.1 Features	2-8
2.3.2 Oracle Fusion Applications Plug-in 12.1.0.2 Features	2-8
2.3.3 Application Replay	2-9
2.4 Database Management	2-9

2.4.1	Database Plug-in 12.1.0.1 Features	2-10
2.4.2	Database Plug-in 12.1.0.2 Features	2-14
2.5	Middleware Management	2-14
2.5.1	Fusion Middleware Plug-in 12.1.0.1 Features	2-14
2.5.2	Fusion Middleware Plug-in 12.1.0.2 Features	2-17
2.6	Heterogeneous (Non-Oracle) Management.....	2-18
2.7	Cloud Management	2-19
2.7.1	Cloud Management Plug-in 12.1.0.1 Features.....	2-20
2.7.2	Cloud Management Plug-in 12.1.0.2 Features.....	2-20
2.7.3	Chargeback and Consolidation Planner Plug-in 12.1.0.1 Features.....	2-21
2.7.4	Chargeback and Consolidation Planner Plug-in 12.1.0.2 Features.....	2-21
2.7.5	Virtualization Management Plug-in 12.1.0.1 Features	2-21
2.7.6	Virtualization Management Plug-in 12.1.0.2 Features	2-21
2.8	Lifecycle Management	2-22
2.8.1	Target Monitoring and Discovery Enhancements	2-22
2.8.2	Configuration Discovery and Collection Enhancements.....	2-23
2.8.3	Configuration Management Enhancements	2-23
2.8.4	Compliance Enhancements	2-24
2.8.5	Database Provisioning Enhancements	2-24
2.8.6	Patch Management Enhancements	2-25
2.8.7	Database Upgrade Enhancements	2-25
2.8.8	Database Change Management Enhancements	2-25
2.8.9	Data Comparison.....	2-26
2.8.10	Enhanced Provisioning of Java EE Applications	2-26
2.9	Application Performance Management.....	2-26
2.10	Oracle Enterprise Manager Cloud Control Mobile.....	2-29
2.11	My Oracle Support Integration.....	2-29

Index

Preface

This manual introduces Oracle Enterprise Manager. It provides a brief overview of the system architecture and describes the key features of the product. The manual also details new features in this release.

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

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Structure

The book consists of the following chapters:

Chapter 1, "Overview of Oracle Enterprise Manager Cloud Control 12c"

Presents the Enterprise Manager Cloud Control architecture and briefly describes the key features of the product.

Chapter 2, "New Features In Oracle Enterprise Manager Cloud Control 12c"

Highlights the new features available in Oracle Enterprise Manager Cloud Control 12c.

Conventions

The following text conventions are used in this document:

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

Overview of Oracle Enterprise Manager Cloud Control 12c

This chapter provides an overview of Enterprise Manager Cloud Control 12c and helps you understand its architecture and the various core components that are integrated within the product. It contains the following sections:

- [About Enterprise Manager Cloud Control 12c](#)
- [Enterprise Manager Cloud Control 12c Architecture](#)
- [Enterprise Manager Management Focus Areas](#)

1.1 About Enterprise Manager Cloud Control 12c

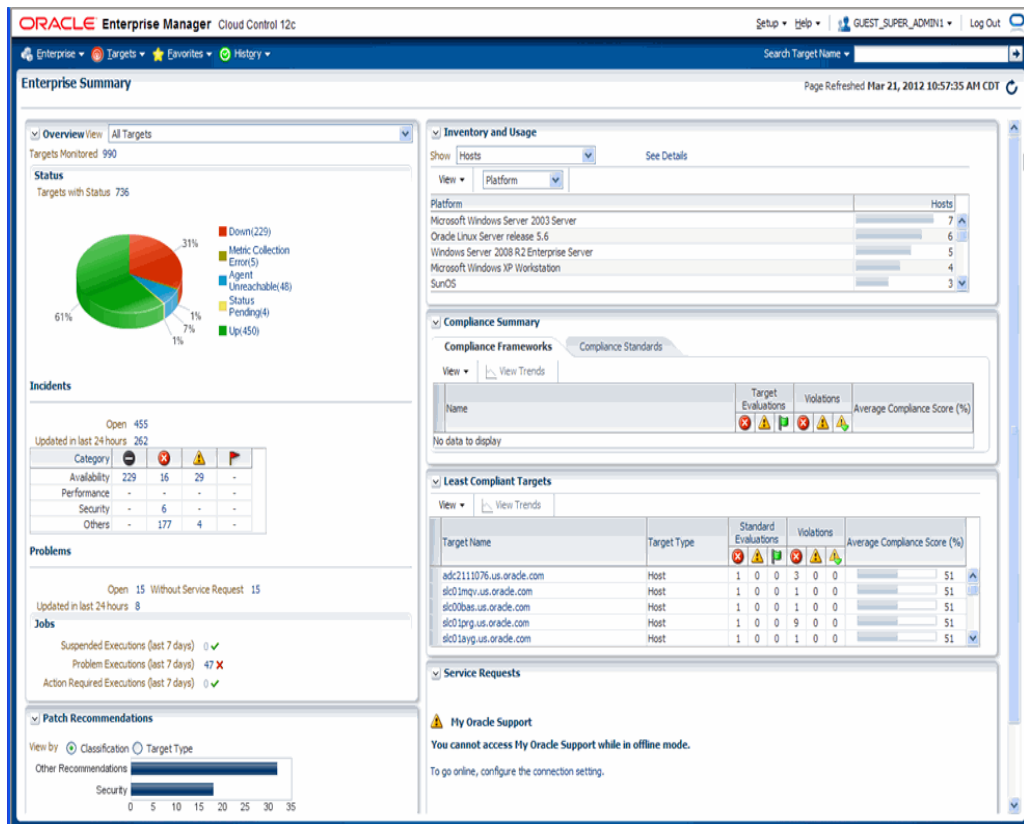
Oracle Enterprise Manager is Oracle's integrated enterprise information technology (IT) management product line, which provides the industry's only complete, integrated, and business-driven enterprise cloud management solution. Oracle Enterprise Manager creates business value from IT by leveraging the built-in management capabilities of the Oracle stack for traditional and cloud environments, enabling customers to achieve unprecedented efficiency gains while dramatically increasing service levels.

The key capabilities of Enterprise Manager include:

- A complete cloud lifecycle management solution enabling you to quickly set up, manage, and support enterprise clouds and traditional Oracle IT environments from applications to disk
- Maximum return on IT management investment through the best solutions for intelligent management of the Oracle stack and engineered systems with real-time integration of Oracle's knowledge base with each customer environment
- Best service levels for traditional and cloud applications through business-driven application management

[Figure 1-1](#) illustrates how Enterprise Manager Cloud Control offers a solution that enables you to monitor and manage the complete Oracle IT infrastructure from a single console.

Figure 1–1 Enterprise Manager Cloud Control



For more information about Enterprise Manager Cloud Control, access the following URL:

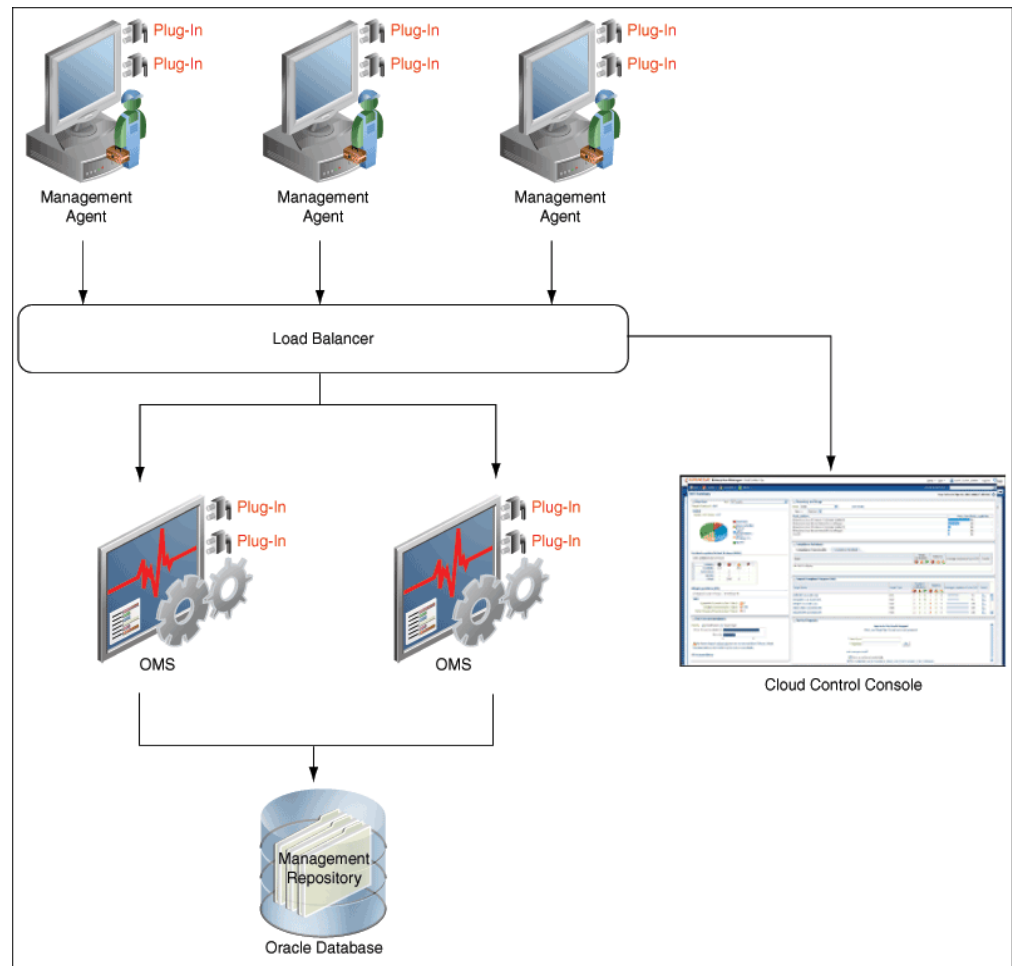
<http://www.oracle.com/us/products/enterprise-manager/index.html>

1.2 Enterprise Manager Cloud Control 12c Architecture

Although Enterprise Manager Cloud Control is viewed as a single entity, it is built with the following components:

- Oracle Management Agent
- Oracle Management Service
- Oracle Management Repository
- Oracle Management Plug-ins
- Enterprise Manager Cloud Control Console

Figure 1–2 shows a sample Enterprise Manager Cloud Control architecture and illustrates how these core components fit into the architecture.

Figure 1–2 Enterprise Manager Cloud Control Architecture

Note: In Figure 1–2, the load balancer and the multiple Oracle Management Services are depicted only to indicate how a sample Enterprise Manager Cloud Control architecture would look in a large organization. They are not a prerequisite or a requirement for an Enterprise Manager system installation. If you do not have a load balancer, then the Management Agents communicate directly with the Oracle Management Services.

The following sections describe the core components of Enterprise Manager Cloud Control.

Oracle Management Agent

Oracle Management Agent (Management Agent) is an integral software component that is deployed on each monitored host. It is responsible for monitoring all of the targets running on those hosts, communicating that information to the middle-tier Oracle Management Service, and managing and maintaining the hosts and its targets.

Oracle Management Service

Oracle Management Service is a Web-based application that orchestrates with the Management Agents and the Management Plug-ins to discover targets, monitor and

manage those targets, and store the collected information in a repository for future reference and analysis. Oracle Management Service also renders the user interface for Enterprise Manager Cloud Control. Oracle Management Services is deployed to the Oracle middleware home (middleware home), which is the parent directory that contains the Oracle WebLogic Server home, the Oracle Management Service home, the Management Agent home, the plug-in home, the Java Development Kit (JDK), the Oracle Management Service instance base directory, the Oracle Web tier directory, the Oracle common directory, and other relevant configuration files and directories. While deploying the Oracle Management Service, the Enterprise Manager Cloud Control Installation Wizard installs Oracle WebLogic Server if it does not already exist in your environment. As a result, an Oracle WebLogic Server administration console is also installed.

Oracle Management Repository

The Oracle Management Repository (Management Repository) is a storage location where all of the information collected by the Management Agent is stored. It consists of objects such as database jobs, packages, procedures, views, and tablespaces.

Technically, the Oracle Management Service uploads the monitoring data it receives from the Management Agents to the Management Repository. The Management Repository then organizes the data so that it can be retrieved by the Oracle Management Service and displayed in the Enterprise Manager Cloud Control console. Because data is stored in the Management Repository, it can be shared between any number of administrators accessing the Enterprise Manager Cloud Control.

At the time of installation, the Enterprise Manager Cloud Control Installation Wizard configures the Management Repository in your existing, certified database. The wizard, however, does not install a new database.

Oracle Management Plug-ins

The core Enterprise Manager Cloud Control features for managing and monitoring Oracle technologies, such as Oracle Database, Oracle Fusion Middleware, and Oracle Fusion Applications, are now provided through components known as *plug-ins* that can be downloaded and deployed using the new Self Update feature. This new “pluggable” framework enables Cloud Control to be updated with management support for the latest Oracle product releases, without having to wait for the next Cloud Control release to provide such functionality. For example, when a new version of Oracle Database is released, you can simply download and deploy the latest Oracle Database plug-in, which will include management support for the latest release.

Table 1–1 lists the default plug-ins that are installed on Oracle Management Service and the Management Agent by default with a new Enterprise Manager system. In addition to these default plug-ins, you can optionally install other plug-ins available in the software kit (DVD, downloaded software bundle, and so on). The installer offers a screen where you can select the optional plug-ins and install them.

Table 1–1 Mandatory Management Plug-ins

Name	Description
Oracle Database	Enables you to monitor and manage Oracle Database and related targets such as Oracle Real Application Clusters (Oracle RAC), Oracle Automatic Storage Management (Oracle ASM), and so on.
Oracle Fusion Middleware	Enables you to monitor and manage Oracle Fusion Middleware products such as Oracle WebLogic Domain, Oracle WebLogic Cluster, Oracle WebLogic Server, Oracle SOA Suite, Oracle Web Tier, and so on.

Table 1–1 (Cont.) Mandatory Management Plug-ins

Name	Description
My Oracle Support	Enables you to log in to My Oracle Support from within the Cloud Control console, search the knowledge library for notes and documents, raise service requests, and create patch plans and templates for patching monitored targets.
Oracle Exadata	Enables you to monitor and manage Oracle Exadata targets.

Enterprise Manager Cloud Control Console

The Enterprise Manager Cloud Control console is the user interface that you see after you install Enterprise Manager Cloud Control. With the help of the console, you can monitor and administer your entire computing environment from one location on the network. All the systems and services including enterprise application systems, databases, hosts, middleware application servers, listeners, and so on, are easily managed from one central location.

1.3 Enterprise Manager Management Focus Areas

This section provides brief descriptions of the following management focus areas:

- [Framework and Infrastructure](#)
- [Enterprise Monitoring](#)
- [Application Management](#)
- [Database Management](#)
- [Middleware Management](#)
- [Hardware and Virtualization Management](#)
- [Heterogeneous \(Non-Oracle\) Management](#)
- [Cloud Management](#)
- [Lifecycle Management](#)
- [Application Performance Management](#)
- [Application Quality Management](#)

1.3.1 Framework and Infrastructure

Oracle Enterprise Manager is a critical tool for data center management. It has a framework that is secure, scalable and highly available. With a next-generation user interface, it provides a rich, intuitive console that can be customized to suit different roles. Oracle Enterprise Manager framework also has advanced capabilities such as self-update where key components such as target plug-ins, compliance policies, and deployment procedures can be updated automatically as newer versions become available.

Oracle Enterprise Manager framework is enterprise-ready and is designed to manage and monitor critical business operations to ensure smooth running of enterprise data centers.

1.3.2 Enterprise Monitoring

World class enterprise monitoring is about monitoring the status of your infrastructure and applications, notifying the appropriate IT staff when incidents occur, and

reporting on status, history, and trends to interested parties throughout IT and the business. Oracle Enterprise Manager provides rich monitoring features as a foundation for monitoring all components of your IT infrastructure (Oracle and non-Oracle) as well as the applications and services that are running on them. These features enable IT to proactively monitor and resolve issues by business priority, implement operational best practices for monitoring, and provide consistent, high quality service in support of business goals.

1.3.3 Application Management

Oracle provides advanced, out-of-the-box application management solutions for Oracle E-Business Suite, Siebel, Peoplesoft, JD Edwards, and Fusion Applications. They provide end-to-end, integrated application monitoring and management capabilities, resulting in improved availability, predictability, and reliability. Oracle Enterprise Manager's management capabilities include user experience management, performance management, change and configuration management, patching, provisioning, testing, integrated diagnostics, and automatic tuning.

Enterprise Manager also offers advanced management capabilities for managing custom applications, integrations, and extensions. Capabilities such as Business Transaction Management (BTM), JVM Diagnostics (JVMD) and others are presented in further detail in [Section 1.3.10, "Application Performance Management"](#).

1.3.4 Database Management

Oracle revolutionized the field of enterprise database management systems with the release of Oracle Database 10g by introducing the industry's first self-management capabilities built right into the database kernel. Today, after several releases and continuous improvement of this intelligent management infrastructure, Oracle Database provides the most extensive self-management capabilities in the industry, ranging from zero-overhead instrumentation to integrated self-healing and business-driven management. Oracle's Database management capabilities make the lives of DBA's easier by providing a full-lifecycle solution encompassing the following:

- Change and configuration management
- Patching and Upgrades
- Provisioning
- Testing
- Masking/subsetting
- Performance management
- Automatic tuning

1.3.5 Middleware Management

Oracle Enterprise Manager provides a comprehensive management solution for Oracle WebLogic Server, Oracle Fusion Middleware, and non-Oracle middleware technology. Oracle's offering encompasses out-of-the-box availability and performance monitoring, robust diagnostics, configuration management, and lifecycle management across middleware software such as:

- WebLogic Server
- SOA Suite

- Coherence
- Identity Management
- WebCenter
- Web Tier
- Business Intelligence
- Exalogic Elastic Cloud
- Non-Oracle Middleware (for example, JBoss Application Server and IBM WebSphere Application Server)

1.3.6 Hardware and Virtualization Management

Oracle Enterprise Manager provides an integrated and cost-effective solution for complete physical and virtual server lifecycle management. By delivering comprehensive provisioning, patching, monitoring, administration, and configuration management capabilities through a web-based user interface, Enterprise Manager significantly reduces the complexity and cost associated with managing Oracle VM, Linux, UNIX, and Windows operating system environments. In addition, enterprises using Oracle Sun hardware can obtain deep insight into their server, storage, and network infrastructure layers and manage thousands of systems in a scalable manner. Oracle Enterprise Manager helps customers to accelerate the adoption of virtualization and cloud computing to optimize IT resources, improve hardware utilization, streamline IT processes, and reduce costs. Oracle Enterprise Manager is integrated with OVM 3.0 and Oracle Virtual Assembly Builder.

1.3.7 Heterogeneous (Non-Oracle) Management

Oracle Enterprise Manager, besides being the best suite of management products for Oracle technologies, also provides a comprehensive solution for the management of heterogeneous data centers through its rich collection of extensions known as plug-ins and connectors. The Self Update mechanism in Enterprise Manager 12c enables customers to download /import and deploy extensions built by Oracle, Oracle's numerous partners, and customers themselves. These extensions are built upon the same management framework that is used for Oracle products, and therefore provides the same level of stability and richness as the Oracle products.

1.3.8 Cloud Management

Enterprise Cloud presents new management challenges. The *2010 IOUG Survey on Cloud Computing* states that a top benefit expected from private cloud adoption is "cost savings through standardization for operational efficiency." The survey also states, "more than half of the 'advanced' deployers (with more than 10 services) say their greatest challenge is adequately provisioning server capacity to meet the new demands of the cloud..." These findings clearly demonstrate that, without proper management capabilities, expected economic benefits of cloud computing will not be realized.

Oracle Enterprise Manager is Oracle's complete cloud lifecycle management solution. It is the industry's first complete solution including self-service provisioning balanced against centralized, policy-based resource management, integrated chargeback, and capacity planning, and complete visibility of the physical and virtual environment from applications to disk.

1.3.9 Lifecycle Management

Lifecycle Management is a comprehensive solution that helps database, system, and application administrators automate the processes required to manage the lifecycle of Oracle technology. It eliminates manual and time-consuming tasks related to discovery, initial provisioning, patching, configuration management, and ongoing change management. In addition, the solution provides compliance frameworks for reporting and managing industry and regulatory compliance standards. Finally, all of the on-premise instrumentation can be connected in real-time to My Oracle Support for complete communication between Oracle and customers.

1.3.10 Application Performance Management

Enterprise Manager 12c provides a complete Application Performance Management (APM) solution for custom applications and Oracle applications (including E-Business Suite, Siebel, PeopleSoft, JD Edwards, and Fusion Applications). The APM solution is designed for both cloud and enterprise data center deployments and is supported on Oracle and non-Oracle platforms.

Oracle APM delivers Business Driven Application Management with end-to-end monitoring that includes:

- User Experience Management—real user monitoring and synthetic transaction monitoring with Real User Experience Insight (RUEI) and Service Level Management (SLM) beacons, respectively.

There are two ways to monitor Web site user experience: using real traffic from real customers or using synthetic traffic (traffic artificially created by software to mimic the load that the Web site would be expected to receive). RUEI supports monitor of both of these ways. SLM beacons are components within the monitored environment that send out synthetic traffic. Typically, they test the performance and availability of business-critical services in the infrastructure as part of SLM.
- Business Transaction Management—monitor and trace transactions and transaction instances. Monitor business metrics included in transaction content.
- Java and Database monitoring and Diagnostics—Zero-overhead, production Java and DB diagnostics for Oracle and non-Oracle platforms.
- Discovery and topology—multi-layer discovery of infrastructure and application topology.
- Application Performance Analytics—rich reporting and analytic capabilities on real user activities and transaction monitoring data.

1.3.11 Application Quality Management

Oracle's Application Quality Management products provide a complete testing solution for Oracle Database, Oracle Packaged Applications, and custom Web applications.

- Application Testing: Application Testing Suite's Test Management, Functional Testing, and Load Testing capabilities ensure the quality of web-based applications including Oracle e-Business Suite, Siebel, PeopleSoft and J.D. Edwards.
- Infrastructure Testing: Application Replay and Real Application Testing enable realistic, production-scale testing of the application and database infrastructure. They use real, production workloads to generate load against applications or databases under test and do not require any script development or maintenance.

With Application Replay or Real Application Testing you can reduce your testing time by more than 80%. They provide the most efficient, optimized and highest quality testing for validating application and database infrastructure changes.

- Test Data Management: Oracle Test Data Management and Data Masking provide efficient, automated, and secure test system creation capabilities for Oracle and non-Oracle databases, with out-of-the-box templates for Oracle packaged applications.

New Features In Oracle Enterprise Manager Cloud Control 12c

This chapter provides an overview of the new features available in Oracle Enterprise Manager Cloud Control 12c. The chapter covers new features in the Cloud Control 12.1.0.1 release, as well as the 12.1.0.1 and 12.1.0.2 plug-in releases.

Major feature areas include:

- [Framework and Infrastructure](#)
- [Enterprise Monitoring and Incident Management Features](#)
- [Application Management](#)
- [Database Management](#)
- [Middleware Management](#)
- [Heterogeneous \(Non-Oracle\) Management](#)
- [Cloud Management](#)
- [Lifecycle Management](#)
- [Application Performance Management](#)
- [Oracle Enterprise Manager Cloud Control Mobile](#)
- [My Oracle Support Integration](#)

2.1 Framework and Infrastructure

The Enterprise Manager Framework and Infrastructure component can be divided into the following groupings:

- [Robust and Extensible Architecture](#)
- [User Interface](#)
- [Group and System Enhancements](#)
- [Reporting Enhancements](#)
- [Security](#)

2.1.1 Robust and Extensible Architecture

The sections below describe features that make the architecture robust and extensible.

Management Features Now Provided through Plug-ins

The core Enterprise Manager Cloud Control features for managing and monitoring Oracle technologies, such as Oracle Database, Oracle Fusion Middleware, and Oracle Applications, are now provided through plug-ins that can be downloaded and deployed using the new Self Update feature. In addition to target management, other vertical capabilities such as self-service and chargeback are provided through plug-ins. This new "pluggable" framework enables Enterprise Manager features to be updated without having to wait for the next Enterprise Manager release to provide such functionality. For example, when a new version of Oracle Database is released, you can simply download and deploy the latest Oracle Database plug-in, which will include management support for the latest release.

Self Update

The Self Update feature enables you to expand Enterprise Manager's capabilities by updating Enterprise Manager components whenever new or updated features become available. Updated plug-ins are made available through the Enterprise Manager Store, an external site that is periodically checked by Enterprise Manager Cloud Control to obtain information about updates ready for download.

Cloud Control also provides support for plug-in and connector management. The ability to update plug-ins is particularly important because core Enterprise Manager features, such as Oracle Database management functionality, is now made available through plug-ins.

Specific updates authored by Oracle that are usually bundled with specific Cloud Control releases can be updated through Self Update. Some examples are Oracle authored Management Plug-ins and Deployment Procedures. In general, Oracle-supplied entities are read-only. You can create a copy and customize the copy according to your needs but you cannot modify the original Oracle-supplied entity.

Software Library

Software Library enhancements for Enterprise Manager 12c are as follows:

1. You can now associate multiple files with a single entity.
2. You can now move all the revisions of an entity from one folder to another.
3. You can now add notes (log information about the changes) and attachments (add/upload files) related to the entity.
4. You can now access all of the entities belonging to different functional areas such as bare metal provisioning (BMP), virtualization, and so on from the Software Library console, because the entity management of various functional areas has been integrated into the Software Library console.
5. You can now use any of the following storage options that have been newly introduced to store the entities:
 - **Referenced File Locations:** Referenced file locations enable you to leverage the organization's existing IT infrastructure (such as file servers, Web servers, or storage systems) for sourcing software binaries and scripts. These locations enable entities to refer to files without having to upload them explicitly to the Software Library storage. Referenced file locations support three storage options:
 - a. **HTTP:** An HTTP storage location represents a base URL which acts as the source of files that can be referenced.

- b. **NFS:** An NFS storage location represents an exported file system directory on a server. The server is not required to be an Enterprise Manager host target.
 - c. **Agent:** An Agent storage location is similar to the Oracle Management Services (Oracle Management Service) Agent File System option, but can be any host monitored by an Enterprise Manager Agent. The Agent can be configured to serve the files located on that host.
 - **Management Agent File System:** A Management Agent file system location should be accessible to the management agent running on the host machine where the Oracle Management Service is deployed, and is recommended for multiple Oracle Management Service setup on Windows.
6. You can now use the Migrate and Remove feature to migrate all of the entities from one storage location to another, and then delete (remove) the location that does not contain any entity files.
 7. You can now use the fine grained privileges to control user access to the different entities in the Software Library. Administrators by default do not have any Software Library privileges. It is the responsibility of the super administrator to grant access and privileges to an administrator. The following list describes the Software Library roles and their corresponding fine-grained privileges:
 - `EM_PROVISIONING_DESIGNER` (Designer): Create and view any Software Library entity
 - `EM_PROVISIONING_OPERATOR` (Operator): View any Software Library entity
 - `EM_PATCH_OPERATOR` (Operator): View any Software Library entity
 8. You can now use Grant and Revoke Privileges to grant users/roles certain privileges on the entities that you own.
 9. You can now edit, delete, and export entities that you own (user-owned entities). However, you can not edit, delete, or export the entities that are owned by Oracle (Oracle-owned entities)
 10. You can now use the Create Like option to create a clone of the Oracle-owned entity, and then edit the clone to suit your requirements.

Improved Loader and Redesigned Agent

The loader is the component of the Oracle Management Service that takes data from the agent and then uploads the data into the Enterprise Manager repository. The loader has been redesigned to work synchronously with the agent, eliminating the need to have a temporary file staging area for data uploads. Loader resources are automatically partitioned to enable the more important data (target availability for example) from the more important targets (based on Lifecycle Status) to be processed at higher priority.

The agent has been redesigned and rewritten to be more robust, self-tuning, lightweight and capable of scaling to manage thousands of targets.

Simplified Management of Enterprise Manager Components

Many control operations for the agent are now available in the console. These include start, restart, shut down, secure, resecure, and update of agent properties. These operations can be done on a per agent basis or across many agents at a time, therefore making it easy to manage agents across your data center from a single location. In addition, software problems related to the Oracle Management Service and management agents are automatically detected and raised as problems which can be

managed in Incident Manager. In the Incident Manager, you can access the Support Workbench to package the relevant diagnostic information about the problem and open a Support service request (SR) to obtain help from Oracle, thereby reducing time to resolve any Enterprise Manager related problems.

Target Prioritization

Each target now has a lifecycle status target property which can be set to one of the following values: mission critical, production, staging, test, or development. This target property is used to specify the priority by which data from the target should be handled. When Enterprise Manager is under a heavy load, targets where the value of the lifecycle property is mission critical or production are treated with higher priority than targets where the value of the lifecycle property is staging, test, or development. Setting the priorities of your most important targets ensures that even as your data center grows and the number of managed targets grows, your most important targets continue to be treated at high priority.

2.1.2 User Interface

The user interface has undergone major changes to enhance usability and tailor your Enterprise Manager experience to your job role. The first time you log in, you can select from a cross-section of pages to be your default home page. For example, if your main interest is incidents, you can select Incident Manager as your home page. The new interface includes global menus that are accessible from anywhere within Enterprise Manager. The Favorites menu offers the equivalent of browser bookmarks, providing immediate navigation to the pages you access most and the History menu provides quick access to the ten most recently accessed targets. A global search capability enables you to not only drill down to all target data, but also to comb through the knowledge base, the bug database, and user documentation.

With home page personalization you can customize the layout and data displayed in target home pages, such as the WebLogic Server home page, to suit your specific needs. The changes you make are persisted for either the target instance, or the user currently logged in, or both, enabling you to create customized consoles for monitoring various target types. Specifically, you can:

- Customize the layout of regions on a page
- Add a region to or remove a region from a page
- Specify the data displayed within each region
- Select the view that best meets your needs from a set of predefined home page layouts

2.1.3 Group and System Enhancements

The group home page continues to provide an overview of the status and health of members of the group and a central way to launch operations on the groups, such as submit jobs, start blackouts, and so forth. The group home page can be customized to match your job responsibility or areas of interest. Regions can be added, removed, or re-organized within the home page. In addition, target type filters on the group home page itself are provided to enable focused target management. For example, changing the target type filter to Database Instance changes all regions of the group home page to only show information related to the databases in the group. Additional database-specific regions are also provided, such as the database loadmap and the database high availability regions.

Systems are a set of infrastructure targets that work together to host an application. Enterprise Manager supports a richer set of associations between members of a system (Stored On Database, Cluster Contains, Authenticated By, and so forth) to more accurately depict the relationship and dependencies between members of a system. This enables better impact analysis of changes made or operations performed on members of a system. Enterprise Manager offers out-of-box systems for well-known Oracle systems including database systems. Generic Systems, which are user-defined systems, now support target availability based on user-specified criteria: you must specify that at least one key member must be running or all key members must be running for the system to be considered running. Doing this enables you to proactively monitor the availability of the system based on its key members.

2.1.4 Reporting Enhancements

Integration is provided with Oracle Business Intelligence (BI) Publisher, an enterprise reporting solution that lets you author, manage, and deliver your highly formatted documents, such as operational reports, electronic funds transfer documents, government PDF forms, shipping labels, checks, sales and marketing letters, and much more. Built on open standards, Oracle BI Publisher also permits the creation of custom reporting applications that can leverage an existing infrastructure. Reports can be designed using familiar desktop products and viewed online or scheduled for delivery to a wide range of destinations.

2.1.5 Security

The sections below describe new security features and enhancements in the release.

Authentication Enhancements

Support for LDAP authentication and Kerberos strong authentication for Enterprise Manager administrators is now supported. Integration with Oracle Access Manager is also supported. This enables data centers to comply with corporate security standards that they may have in place.

Nonpassword credentials are supported for host and database target authentication. Specifically, SSH key-based authentication is supported for host access and Kerberos tickets are supported for database authentication. Both enable you to take advantage of strong authentication mechanisms for target access.

Improved Credential Management

Credentials are used to control access to managed targets. The use and management of credentials has been improved and simplified. Credentials now have their own life cycle. Administrators can create, update, and delete credentials as separate entities apart from the features that use them. Credentials are also maintained in a centralized credential store. Features that use them refer to these credentials by reference; this means that any change in the credential will automatically be available to all features that use the credentials.

As an Enterprise Manager administrator, you can now create and share Named Credentials with other administrators without disclosing the sensitive content of the credentials. This enables more junior administrators who may not have access to the higher privileged credentials to use these credentials when managing targets. Named Credentials also significantly reduces the number of credentials that need to be created, reducing the time and effort needed to manage the credentials. Finally, the ability to create Named Credentials is protected by an Enterprise Manager privilege therefore enabling data centers to further control management of credentials.

Fine-grained Privileges and Out-of-Box Roles

Enterprise Manager includes more than 200 new granular privileges to control access to targets, objects and other resources, enabling administrators to better segregate their duties. There are also more than 20 new out-of-box roles containing the relevant privileges for different types of Enterprise Manager administrators. For example, consider the provisioning designer and provisioning operator job responsibilities. The former has greater responsibilities (creates components in the Software Library) than the latter (submits deployments). The out-of-box Provisioning Designer and Provisioning Operator roles are correspondingly defined with the appropriate privileges to support their different responsibilities.

Auditing Enhancements

Enterprise Manager continues to increase the set of audited actions. These include: creation and use of named credentials, user login/logout, privilege granting/revoking, monitoring template changes, database start/stop, and so forth. You can now view and search audit data in the Enterprise Manager console. Also, a built-in externalization service is available to purge audit data from the repository and export it to a file system, thereby enabling administrators to control the repository size without loss of audit data.

2.2 Enterprise Monitoring and Incident Management Features

The following sections describe new monitoring and incident management features and enhancements in the release.

Administration Groups and Template Collections

An Administration Group is a special type of group designed to automatically deploy management settings (monitoring templates, compliance standards, cloud policies) to targets when they join the group. Administration Groups are created by defining their membership criteria based on target properties. For example, the Administration Group containing all production targets in the Finance department must have the Lifecycle Status property set to Production and the Department property set to Finance. The management settings that should be applied to targets in an Administration Group are put together in a Template Collection which in turn is associated with the Administration Group. After that is done, when a new target must be setup for monitoring, administrators only have to set its target properties to match the membership criteria of the appropriate Administration Group. Enterprise Manager automatically adds the target to the Administration Group and auto-applies the applicable monitoring (and management) settings from the associated Template Collection. This automated monitoring setup provides data centers with a monitoring solution that can be easily scaled as their data center grows.

Metric Extensions

Metric Extensions are the next generation of User-Defined Metrics, which enable you to extend Enterprise Manager to monitor conditions specific to the enterprise's environment by creating new metrics for any target type. The migration of existing User-Defined Metrics to Metric Extensions is supported through the Enterprise Manager Command Line Interface (EM CLI).

Blackout Enhancements

Blackouts primarily support planned maintenance periods for managed targets. Consolidated blackout summary information is now available in the General region of the target home page.

Metrics Enhancements

The metrics user interface (All Metrics, Metric, and Collection Settings) has been enhanced to enable easier navigation and access to metric data. In All Metrics pages, you can search for a metric by name, view a summary of the currently open metric alerts and top five metrics with the most alerts within the last seven days. The metric charts have also been enhanced: you can hover your mouse over any part of the chart and receive tooltip information on the corresponding value of the metric. You can also toggle between the graphical view of the metric data and the tabular view to view more precise information on metric values at specific points in time. The new Threshold Suggestion feature is available to help you determine the appropriate thresholds for a metric based on the metric's historical data. The Threshold Suggestion feature is available in Metric and Collection Settings, All Metrics, and Monitoring Templates pages. Finally, configuration metrics are now included in the Metric and Collection Settings pages. This provides visibility into configuration metric collection information as well as the ability to change the collection schedule as needed.

Incident Management

Incident management features enable administrators to monitor and resolve service disruptions quickly and efficiently. Instead of managing numerous discrete events, administrators can manage a smaller set of more meaningful incidents by priority and across the lifecycle of the incident.

The Incident Manager user interface provides a central point of control for managing events, incidents, and problems across managed targets. Key features include:

- Out-of-box and user-defined views to show events, incidents, or problems of interest (for example, show all incidents assigned to me)
- In-context access to My Oracle Support for access to Knowledge base articles
- Support for incident lifecycle operations including assigning, acknowledging, prioritizing, tracking status, escalating, and suppressing incidents
- Support for incident lifecycle operations including assigning, acknowledging, prioritizing, tracking status, escalating and suppressing of incidents
- In-context access to diagnostic and resolution capabilities to resolve incidents

If integration with external ticketing systems has been setup through the help desk connector, then the ticket ID and status of the help desk ticket associated with an incident is also displayed in Incident Manager.

Incident Rules enable the automation of actions related to events, incidents, and problems. These actions include the creation of incidents based on an event, notifications actions including opening of help desk tickets, and incident workflow operations such as incident assignment and escalation. Out-of-box incident rules are also provided that auto-create incidents for important events. Incident Rules thereby enable data centers to automate operational processes related to the management of events, incidents, and problems.

As part of user preferences, administrators can identify e-mail addresses used to send regular e-mail versus those used to send page notifications. For example, when creating incident rules, you can configure the system to page you when critical incidents occur, but to just send e-mails for warning-level incidents. In case of heavy load, the handling of event severity data across many targets is prioritized based on a target's Lifecycle Status property.

2.3 Application Management

This section describes new features and enhancements for the following releases:

- [Oracle Fusion Applications Plug-in 12.1.0.1 Features](#)
- [Oracle Fusion Applications Plug-in 12.1.0.2 Features](#)

2.3.1 Oracle Fusion Applications Plug-in 12.1.0.1 Features

Oracle Fusion Applications Management Support

You can now manage and monitor all Oracle Fusion Applications targets across the enterprise from a single console, including Fusion instances, product families, and application instances. Unlike other management tools, Cloud Control enables you to manage multiple Fusion Applications components within a WebLogic Server domain. This release also supports scale out of clustered Fusion Products and Fusion Applications.

Support Workbench Enhancements for Oracle Fusion Applications

To enhance troubleshooting Fusion Applications issues, the Enterprise Manager Support Workbench framework now includes incident filtering based on application type and incident consolidation from multiple tiers.

Oracle Fusion Applications Installation Backup and Recovery

You can now perform a full or partial backup and recovery of a Fusion Applications installation. You can back up all components of the Fusion Applications environment, including database and all component file systems, in one procedure. Likewise, you can implement recovery of a full environment or of individual components. This feature replaces the manual Fusion Applications backup and recovery procedure with fully-automated backup and recovery workflows in Cloud Control, based on the System Backup and Recovery framework.

Enterprise Scheduler Service

You can now monitor the performance of Oracle Enterprise Scheduler (ESS) components and jobs. You can also view the status of job requests, including completed job requests by user, application, and work assignment.

2.3.2 Oracle Fusion Applications Plug-in 12.1.0.2 Features

Oracle Fusion Applications Management Support

Now, in addition to scaling out a WebLogic Domain, you can scale out (or scale up) the Oracle HTTP Server. You can perform these scale-out operations in tandem or independently.

Streamlining Whole Server Migration

Whole server migration is the process of migrating a server instance to a different physical machine upon failure. With this release, there is a wizard that enables you to configure a deployment procedure that can trigger whole server migration in the event of host machine failure. The wizard makes it extremely easy and straightforward to plan for and set up whole server migration.

2.3.3 Application Replay

Application Replay enables you to perform realistic production scale testing of your Web and packaged Oracle applications. It provides the most efficient and highest quality testing through zero overhead workload capture and without any need for script development and maintenance. The captured workload can then be replayed with production characteristics on a test system to validate application infrastructure changes from the middle tier to the disk.

2.4 Database Management

This section describes new features and enhancements for database management.

Database System Discovery Enhancements

Unlike previous releases, Enterprise Manager Cloud Control can detect databases in a data center even before the agent is deployed on the host. Enterprise Manager Cloud Control can detect the presence of the database by using an agentless (nmap) technology. This is then integrated with the database target promotion process to perform deep and automated agent-based discovery. The target promotion also includes the deployment of target-specific monitoring templates, such as the ones for test and production databases. The result of the discovery process is a database system that includes associated targets and applications.

Configuration Management Enhancements

Enterprise Manager Cloud Control provides a set of the features to manage database configurations and underlying infrastructure. This includes the ability to perform configuration searches, detect configuration drifts, and track configuration history. Configuration Search uses the underlying data and dependency mappings to find databases among thousands of databases. For example, it can find databases that are part of Exadata but missing a particular patch.

Configuration comparison functionality has been enhanced with new capabilities such as template support, system level comparison, comparison scheduling, and change notification. You can also ignore certain configuration differences. You can easily save output of a comparison and exported in plain text or CSV formats.

Configuration Compliance

Enterprise Manager Cloud Control can detect whether a database is compliant with Oracle's or the data center's own best practices. It includes a compliance framework which enables administrators to define rules and roll them up into compliance standards for better visibility. Rules can be created to detect changes from certain values or to detect real-time changes. The compliance standards can also be mapped to industry-standard compliance frameworks such as SOX, COBIT, or PCI.

Database System and Associations

A Database System is automatically created on discovery of an Oracle Database. The system is built on the new target and association model that can be used to monitor the database's storage, connectivity, and high availability. This also enables you to monitor and manage applications that are dependent on the database. Database System topology can be used to view relationship between various entities within the database system as well as external dependencies.

Database Patching and Upgrade

Enterprise Manager Cloud Control enables administrators to patch and upgrade multiple databases in mass scale. The patch management capability includes proactive patch advisories and patch plans for deploying many interim patches to multiple databases under one single downtime period. Enterprise Manager Cloud Control also supports out-of-place patching which enables administrators to create a copy of the patched version and move database instances when a downtime can be afforded.

Similarly, Enterprise Manager Cloud Control automates the application of major upgrades to the database environments. Integration with My Oracle Support enables administrators to ensure that current patch levels are being maintained in the new release, before the databases are upgraded.

Both patching and upgrade features leverage the already collected information to perform extensive pre-requisite checks (such as conflicts) so that the process is seamless and error-free.

Simplified EMCLI verbs for Deployment Procedures

This release simplifies existing EMCLI verbs and includes new verbs that enable system administrators to execute and track Deployment Procedures in a scripted manner.

2.4.1 Database Plug-in 12.1.0.1 Features

This section describes features and enhancements for Database Plug-in 12.0.1.

Oracle Real Applications Clusters Management Enhancements

Enterprise Manager Cloud Control can be used to monitor and manage Oracle Real Applications Clusters (RAC) One Node databases. RAC One Node has the same rich monitoring capabilities as a regular RAC databases. You can perform Online Database Relocation of RAC One Node using Enterprise Manager. Additionally, fail-over or relocation of RAC One Node database instances is now automatically handled by Enterprise Manager.

Enterprise Manager Cloud Control can be used to manage Quality of Service (QoS) Management functionality provided in Oracle Clusterware release 11.2.0.2 and above. You can create and edit policy sets, review or implement recommendations, and monitor QoS metrics.

Manage Automatic Storage Management Clusters as a Target

You can now monitor and manage clustered Automatic Storage Management (ASM) instances as a single clustered target. This includes discovery, monitoring, configuration, and administration operations at the cluster level. Also, shared storage resource monitoring will be performed from one master agent with a failover mechanism, resulting in higher performance and availability.

Backup and Restore Enhancements

The new Group backup feature in Enterprise Manager Cloud Control provides the ability to backup multiple databases, Oracle homes, and file systems in one operation. Centrally maintained backup configurations can be created, containing uniform database and file backup settings that are applied to all of the objects in a Group backup. A Group backup can include all or a subset of the databases that are members of the group. In addition, in environments where Oracle Secure Backup is used to backup file systems to tape, the respective Oracle homes of each included database can also be included in a Group backup, as well as any other files or directories on hosts

that are members of the group. Oracle homes that are backed-up as part of a Group backup can be independently restored to their original location or a new location.

Streams and XStreams Support

Streams and XStreams configurations can now be managed and monitored using Enterprise Manager Cloud Control. In addition to improvements in configuration management and performance monitoring, logical change record (LCR) tracking is available for high-level diagnosis of replication issues. Enterprise Manager Cloud Control also simplifies the management and monitoring of replicated environments.

Schema Change Management Enhancements

As part of the Oracle Change Management Pack, the new Change Plans function enables application developers and database administrators to encapsulate multiple required database schema changes into a change plan, which can be used to document, capture, and apply schema changes. Change plans are also integrated with developer and DBA tasks into SQL*Developer and Oracle Enterprise Manager task automation. This integration reduces the manual processes between the various stakeholders involved in the process of promoting planned changes across enterprise databases while ensuring the integrity of the process.

Active Session History Analytics

Active Session History (ASH) Analytics enables a performance specialist to explore the different performance attributes of a database session at any point in time. With the ability to create filters on various dimensions, the DBA can not only identify performance issues but also obtain a good understanding of various performance patterns, workload behavior, and system resource usage.

Emergency Monitoring

The Emergency Monitoring feature enables the database administrator to connect to an unresponsive database through a special proprietary mechanism and diagnose performance issues when normal mode connection is not possible. It has an in-built hang analysis capability that enables you to identify blocking sessions and kill these blockers with a click of a button.

Real-time Automatic Database Diagnostic Monitor

Real-Time Automatic Database Diagnostic Monitor (ADDM) is an innovative way to analyze problems in extremely slow or hung databases, which would have traditionally required a database restart. Real-Time ADDM can help resolve issues such as deadlocks, hangs, shared pool contentions, and many other exception situations without resorting to a restart of the database. Real-Time ADDM uses two types of connection modes to connect to the target instance. The normal JDBC connection is intended to perform extensive performance analysis when some connectivity is available. The diagnostic mode which makes a latch-less connection is useful for extreme hang situations when normal connection is not possible.

Compare Period ADDM

Compare Period ADDM enables the administrator to answer the age-old question 'why is performance slower today compared to yesterday'. The administrator can compare performance across any two periods of time and determine the root cause of why performance in one period was different than in the other. In addition to pinpointing the root cause for the difference in performance, Compare Period ADDM also indicates whether the two periods are comparable, for example do they have

similar SQL workloads running in the same period, by the use of the SQL Commonality index for the two periods.

New Active Reports

Three new Active Reports have been added in this release: ASH Analytics, Real-Time ADDM, and Compare Period ADDM. These are interactive reports that can be used for offline analysis. These reports offer the same level of interactivity as the actual Enterprise Manager screens, with drill-downs to detail views. These Active Reports can be emailed to anyone for offline analysis without giving the recipient direct access to Enterprise Manager.

Application Data Model

The Application Data Model (ADM) maintains the table definitions associated with an application, the referential relationships connecting those tables, sensitive data elements, and the associated columns contained in the application. An ADM can be defined for any application. Specific application drivers are provided for auto-discovery and creation of the ADM for Oracle Applications such as Fusion Application and E-Business Suite. After an ADM is defined, you can generate mask definitions dynamically to obfuscate sensitive data elements or subset the data to reduce the database size.

Data Subsetting

Data subsetting provides the ability to create a smaller sized copy of the original production data that can be given to developers for testing. While it is a data subset, the referential relationships are preserved so that the data set is complete. This enables enterprises to lower storage costs while making production data available to developers for testing, without having to incur the storage footprint of the entire production database.

Reversible Data Masking

You can use reversible masking, which relies on encryption and decryption algorithms, to enable user data encryption deterministically, as a regular expression in a format that you choose. Unmasking reverses the process and reverts back to the original data. This feature is useful in environments where sensitive data must be masked and sent to a third party for processing.

Real Application Testing and Data Masking Integration

Real Application Testing and Data Masking integration provides users with the ability to perform secure testing without compromising data security and compliance regulations. You can now use the SQL Performance Analyzer and Database Replay features against databases where sensitive information has been masked.

Application Templates for Data Masking and Data Subsetting

Enterprise applications are highly complex involving hundreds of tables and thousands of referential relationships. These tables also contain sensitive or private data that cannot be shared with developers or testers. Enterprise Manager now provides predefined data masking and data subsetting templates for different applications. Data masking templates contain the list of columns containing sensitive data and their associated masking formats. Data subsetting templates identify the tables involved in the subsetting process, their referential relationships and associated WHERE clause to extract the subset of the data. These templates enable you to automatically create test systems based on best practice recommendations from the Oracle Applications teams. These templates enable customers to easily create test

systems with a subset of the data that is relationally intact and with sensitive information de-identified.

Segregation of Duties

Enterprise Manager now supports the separation of roles specifically for provisioning into Designer and Operator. The Designer role corresponds to administrators who define provisioning standards. The Operator role typically corresponds to administrators who do actual software provisioning. Operators can be less experienced administrators.

Provisioning Profiles

A provisioning profile is a read-only snapshot of an existing database environment that can be used as a starting point to provision a new database. The snapshot can capture the Grid infrastructure (Clusterware and Automatic Storage Management), homes, database homes, and Database Configuration Assistant (DBCA) templates. This can all be stored in the Software Library for later use.

Input Lockdown

The locking down feature in Database Provisioning enables Designers to lock down the set of variables, such as host targets, credentials, Oracle homes to be provisioned, and others, in the deployment procedure wizard. This enforces standardized deployments and minimizes errors in configurations during mass deployment. The operator can then deploy the procedure that the designer configures and saves in the Procedure Library.

Provisioning Bundle Updates through the Self Update Feature

You can now access provisioning bundles directly through the Self Update feature, greatly simplifying the process of updating deployment procedures, Software Library entities, and other provisioning artifacts.

Default Variable Values in Deployment Procedures

Deployment Procedure interviews, the user-friendly wizards that guide you through the provisioning activity, now support saving of default variable values for use by other users.

Customizable User-Defined Deployment Procedures

User-Defined Deployment Procedures (UDDP) enable automation of custom, and often complex, processes (for example, third-party application provisioning, JRE upgrade, and so forth).

Software Library Entities

You can now assign privileges to Software Library entities, enabling the enterprise to implement segregation of duties and thus help in complying with corporate security policies. There is a single console for all Software Library entities. This reduces the time spent searching for entities while providing more meaningful ways to display information. This release also includes support for different storage types, such as agent file system, NFS, and HTTP.

Improved Troubleshooting for Deployment Procedures

Deployment Procedures are integrated with the Incident Framework, where incidents are automatically created for critical failures. An incident triggers dump scripts to collect debug information, which can then be packaged in an archive and sent to

Oracle Support for analysis. Deployment Procedures also support execution in debug mode, which can be used for additional logging information.

2.4.2 Database Plug-in 12.1.0.2 Features

This section describes features and enhancements for Database Plug-in 12.0.1.

Oracle Exadata Database Machine Management Enhancements

Enterprise Manager Cloud Control now provides support for full lifecycle management of Oracle Exadata Database Machine. Key features include:

- Automatic discovery of all Exadata hardware and software components
- Automatic creation of Enterprise Manager system for end-to-end monitoring of the entire Oracle Exadata Database Machine
- Extensive administration capabilities for databases, Exadata cells, and Infiniband switches
- Rich performance diagnostics with the help of in-depth performance charts covering all hardware and software Exadata components

Synchronizing the Software Library

You can now synchronize manually downloaded Cluster Verification Utility (CVU) binaries with the Software Library. Enterprise Manager, by default, provides a routine job that is scheduled daily to download binaries from My Oracle Support, if corresponding binaries in the Software Library need to be updated. If your Enterprise Manager deployment is behind a firewall or a DMZ such that the HTTP connection to My Oracle Support is disabled, the routine job will skip its execution. In this case, you can manually download the CVU binaries corresponding to your platform from OTN or My Oracle Support using patch 9288873 as the source. Subsequently, you can use the Cluster Verification Utility to ensure that the latest CVU binaries are present in the Software Library.

Automatic Storage Management Cluster File System Support

Enterprise Manager now supports Automatic Storage Management Cluster File System Support (ACFS) Security and Encryption features. ACFS encryption enables users to store data on disk in an encrypted format. Enterprise Manager users who are ACFS administrators are now able to use these features to implement and manage security on file system objects stored in ACFS.

2.5 Middleware Management

This section covers the following topics:

- [Fusion Middleware Plug-in 12.1.0.1 Features](#)
- [Fusion Middleware Plug-in 12.1.0.2 Features](#)

2.5.1 Fusion Middleware Plug-in 12.1.0.1 Features

Topology Views of the Fusion Middleware Environment

Oracle Enterprise Manager Cloud Control now enables you to visualize and monitor Oracle Fusion Middleware environments and components so that they might depend on. These topologies can be against a single SOA composite, WebLogic domain, or across multiple WebLogic domains. Such capabilities enable you to understand

relationships across your Java Platform, Enterprise Edition (Java EE) applications and the software supporting them, as well as to identify potential problems and their impact across tiers.

Oracle Exalogic Management Enhancements

This release supports full management capabilities with dedicated dashboards for Oracle Exalogic Elastic Cloud targets, enabling administrators to easily monitor and manage Exalogic hosts, Oracle WebLogic domains, application deployments, and Coherence clusters running on Oracle Exalogic Elastic Clouds.

Oracle Fusion Middleware Provisioning Enhancements

There are several new features related to middleware provisioning that will help to reduce the time-consuming, error prone, manual process associated with installing and configuring middleware software:

- The new Middleware Provisioning page provides centralized access to a variety of middleware-related provisioning operations, such as creating entities in the Software Library that can later be used as the source from which to clone, launching a variety of deployment procedures associated with provisioning middleware software, and tracking the status of submitted deployment procedures.
- Support for creating Software Library entities for Fusion Middleware software is now available. You can create a provisioning profile entity that includes WebLogic binaries and domain configuration, or a Middleware home entity that includes just WebLogic binaries.
- You can clone a WebLogic domain or Middleware home from entities already created in the Software Library. Doing this ensures that consistent, standardized middleware images are deployed across your IT organization.
- There is a new out-of-box deployment procedure for deploying, redeploying, and undeploying Java EE applications from the Cloud Control console, thereby reducing the need for multiple administration consoles.
- Provision-related operations are now accessible in the context of a specific WebLogic Domain. From the domain target menu, you can create an entity in the Software Library, clone the domain, scale up or scale out the domain, or deploy an application to the domain. This enables you to access such features quicker and with fewer clicks.
- You can clone and scale out/up WebLogic Domains without requiring that SOA Suite be installed to the source domain.

Oracle Directory Server Enterprise Edition Monitoring

This release includes performance monitoring for Oracle Directory Server Enterprise Edition (formerly Sun Java Directory Server Enterprise Edition). The system collects a wide range of out-of-box performance metrics for monitored Oracle Directory Server Enterprise Edition targets.

Platform-as-a-Service and Infrastructure-as-a-Service Environment Enhancements

These enhancements enable a Platform-as-a-Service (PaaS) user to request an environment with a WebLogic Server cluster and to enable the user to make additional requests to scale out the requested environment. This update also enables an Infrastructure-as-a-Service (IaaS) user to request an environment with two Linux

servers and storage and to enable additional requests for more storage to be submitted.

Monitoring and Diagnostics

With this release, you can customize performance views to:

- Select multiple metrics at a time for correlation
- Overlay metrics for comparison and better analysis
- Compare performance impact on a periodic basis
- Maintain historical views for trend analysis

A new system topology view provides a better overview of associations and dependencies, complete with drill-down capabilities for detailed analysis. Enhanced log file alerts improve your ability to discover log file patterns and to generate an alert on any matching pattern. Improved monitoring support includes monitoring for push replication, reap sessions, and transactional caches.

Cache Administration

A new interface for Cache Data Management provides query-based data operations and a central user interface for key cache operations. This new feature saves time in cache operations and simplifies administrator tasks. Queries can now be saved for future reference. Cache data can be exported and imported to a file. Additional cache operations include View, Purge, Add Index, Remove Index, and so forth. This feature gives administrators the ability to plan for downtime without losing the cached data and to better prepare caches in a new data center (such as in a high availability scenario).

Coherence Provisioning

This release provides support for node updating. You can automate the update process tasks (for example updating configuration files, application JARs, and so forth) on the nodes, which reduces risk and time. A central repository is now available for asset management. Provisioning enhancements include support for well-known address (WKA) based topologies, additional development and production options (such as Mode of Deployment), and improved flexibility in provisioning.

If the coherence node is started with the JVMD agent with the proper parameters, you can drill down in context from the coherence node to the associated JVM target in the JVMD. Do this to diagnose the real-time Java issues for the node for issues such as memory leak monitoring, locking analysis concerning coherence requests, and blocking issues for coherence calls.

Configuration Management

Improved configuration management enables you to set configuration parameters to make historical comparisons available. You can save your configuration into a repository as a *reference image* or *gold image* and then compare it against a current configuration. This feature enables you to quickly identify performance and availability issues related to configuration changes.

Performance Summary Baseline Support

With this release, you can create a performance summary baseline for a middleware-related target, save it, and compare baseline performance data to current performance data. This enables you to analyze and correlate performance data more efficiently.

Composite Application Dashboard

The new Composite Application dashboard enables you to build a comprehensive view representing a multi-tier composite application composed of multiple application deployments and Services Oriented Architecture (SOA) composites. You can easily include all additional components (such as databases, service buses, Coherence clusters, and other middleware and non-middleware targets). The Composite Application dashboard provides full visibility across the composite application with access to key monitoring and diagnostics regions, which can be easily customized and personalized. The overall result of this enhancement is a single dashboard view providing not only health information about the application, but also deeper visibility into component health and incidents at a glance.

Enterprise-Wide Web Service Policy Dashboard

If you use Oracle Web Services Manager for security, you can now monitor all of your policies across the enterprise in a single central dashboard. From there, you can drill down into the specifics of any violation on each server.

Middleware Diagnostic Advisor

This release includes a new tool to help administrators quickly resolve performance issues. The Middleware Diagnostic Advisor de-emphasizes administrator expertise in WebLogic internals and cross-tier functioning by taking advantage of WebLogic Server internal metrics. The Middleware Diagnostic Advisor significantly reduces problem resolution time by presenting "root cause" findings shown in context of the most relevant configuration parameters and by offering out-of-box suggestions for each finding. Trending and correlation metrics help administrators understand performance patterns and assist with diagnosing and resolving performance issues.

WebLogic and Fusion Middleware Log Viewer

This release enables you to centrally search logs generated by WebLogic and Oracle Fusion Middleware across all Oracle Fusion Middleware components. You can perform structured log searches based on log properties such as time, severity, or Execution Context ID (ECID). You can also download log files or export messages to a file. This feature provides ready access to log files no matter where they are stored on the file system.

Integration of BEA Guardian

The former BEA Guardian WebLogic health checks have been integrated into Enterprise Manager. In addition, custom health checks can also be created. Consequently, administrators are better able to verify that their WebLogic environment is in compliance with these standards.

2.5.2 Fusion Middleware Plug-in 12.1.0.2 Features

Enhanced Deploy/Undeploy Java EE Application Deployment Procedure

When using the Deploy/Undeploy Java EE Application deployment procedure to deploy or redeploy an application, you can now specify a single component—the Java EE Application component—from the Software Library. Previously, you had to specify multiple generic components to accommodate the archive file, the deployment plan, a predeployment script to create a data source, and a postdeployment script to roll back in the event of a problem. The ability to specify a single component not only saves time, but also presents a much cleaner interface.

Enhancements to Oracle Fusion Middleware WebLogic Domain Target Discovery

While adding Oracle Fusion Middleware WebLogic Domain targets to Enterprise Manager Cloud Control, you can now choose whether to add WebLogic Server targets that are discovered in a down state. This gives you more control in determining what to automatically add to Cloud Control for centralized management and monitoring. Further, when you refresh detected domain and target membership changes (managed servers that have been removed from a domain), you can choose to update the Management Repository in the context of the refresh operation (remove those managed servers from the Management Repository). Doing this saves you from having to manually remove targets following a domain refresh operation. If problems occur while adding Middleware-related targets or refreshing domain membership, you can enable additional debugging information to quickly diagnose and resolve the issue.

Request Instance Diagnostics

You can trace the path of a request in a WebLogic Domain and generate a report of all of the metrics associated with a particular instance of the request.

Support for Patching a WebLogic Domain

You can now use Enterprise Manager Cloud Control to apply one-off patches and critical patch updates across all managed servers within a WebLogic Domain. In addition to validation checking and rollback support, the new feature enables you to apply patches in a rolling fashion to avoid downtime.

Disaster Recovery Operations

With the Oracle Site Guard feature of Enterprise Manager Cloud Control, you can now automate disaster recovery operations such as switchover and failover. For example, if a primary site becomes unavailable due to a planned or unplanned outage, you can use EM CLI to automatically switch a standby site into production and track the operation's progress through Cloud Control. Consequently, you are able to minimize the downtime associated with the outage.

2.6 Heterogeneous (Non-Oracle) Management

The following sections describe new heterogeneous features and enhancements in this release.

Extensibility Developers Kit

This release provides the Extensibility Developers Kit (EDK) to support development of custom plug-ins for managing and monitoring target types with no out-of-box support. With the EDK, Oracle partners and integrators can extend Cloud Control support to virtually any type of target, without requiring direct support from Oracle development resources.

Plug-in and Connector Lifecycle Management

The Self Update feature provides a user-friendly mechanism for downloading and deploying Management Plug-ins and connectors. There also is a console for managing the lifecycle of plug-ins, enabling standardized management of different plug-in types and simplified deployment of plug-ins to Oracle Management Service and Management Agents.

Event and Help Desk Connectors

Event Connectors enable the sharing of Enterprise Manager events with third party event management systems. Event Connectors support all event types, thereby enabling sharing of not only monitoring-related events (target availability events, metric alerts, and so forth) but also other types of events such as job status events, compliance standard violations, and so forth. Multiple event connectors (either different event connectors or multiple instances of the same connector) can be configured with the same Enterprise Manager deployment. This is useful in deployments that may require integration with multiple event management systems. A new retry feature is available that retries the delivery of events if the third party event management system becomes unavailable.

Help Desk Connectors enable you to open help desk tickets in third party help desk systems for events detected in Enterprise Manager. Enhancements to help desk connectors include support for all event types, visibility of the ticket status within Enterprise Manager, and support for multiple connectors (either different connectors or multiple instances of the same connector). This feature enables the same Enterprise Manager deployment to work with different help desk systems which is useful in data centers that may be sharing the same Enterprise Manager deployment across different lines of business, each with their own separate help desk system.

Metric Extensions

Metric Extensions are the next generation of user-defined metrics, enabling you to extend Enterprise Manager to monitor conditions specific to the enterprise's environment by creating new metrics for any target type including non-Oracle target types.

Custom Configuration Collections

Custom configurations provide a way to identify files and other configuration data that Cloud Control does not already collect. These customized configurations can be collected on well-known target types or on a target type introduced as part of the custom configuration definition. You can also use custom configurations to extend existing configuration data collections.

There are two options available to extend configuration data collections using a custom configuration specification:

- Add additional collection items to an existing target type
- Add a custom target type with new collection items

User-defined Deployment Procedures

User-Defined Deployment Procedures (UDDP) enable automation of custom, and often complex, processes (for example, third-party application provisioning, JRE upgrade, and so forth).

2.7 Cloud Management

This section describes new features and enhancements for the following releases:

- [Cloud Management Plug-in 12.1.0.1 Features](#)
- [Cloud Management Plug-in 12.1.0.2 Features](#)
- [Chargeback and Consolidation Planner Plug-in 12.1.0.1 Features](#)
- [Chargeback and Consolidation Planner Plug-in 12.1.0.2 Features](#)

- [Virtualization Management Plug-in 12.1.0.1 Features](#)
- [Virtualization Management Plug-in 12.1.0.2 Features](#)

2.7.1 Cloud Management Plug-in 12.1.0.1 Features

Enterprise Manager offers capabilities necessary for deploying and managing clouds within the enterprise. This includes dynamic provisioning of applications and required infrastructure resources, tracking of resource usage trends and costs, and performance and availability monitoring of cloud infrastructure and applications running there. Enterprise Manager supports clouds built on both virtualized and physical infrastructure.

As part of the Cloud Management Plug-in, Enterprise Manager ships with an out-of-box self-service portal that enables developers, testers, DBAs, and other self service users to log on and request cloud resources as well as perform lifecycle operations such as start/stop, status, and health monitoring on them.

- For IaaS, you can deploy Oracle VM templates and Oracle Virtual Assemblies containing application software on an Oracle VM virtualized server infrastructure.
- For DaaS, the portal provides access to a service catalog which lists various published service templates for standardized single instance (SI) and RAC database configuration and versions.
- You can review your past and outstanding requests, resource quotas, current usage, as well as chargeback information for the resources that you own. The portal also enables you to automatically backup your databases on a daily basis or take on demand backups. You can restore the database to any of these backups. The Self Service Portal is your view into the cloud, so it is designed to be easy to use and yet useful.
- The portal is also backed by a command line interface (CLI) and application programming interface (API) that can be used to request and manage cloud resources instead of the user interface.

2.7.2 Cloud Management Plug-in 12.1.0.2 Features

Scaling Up and Scaling Down Tier Targets

You can scale up and scale down a tier within an assembly deployment. The scalability of a tier depends on how it is defined in the assembly. Scaling up enables you to create multiple servers; there are minimum and maximum limits. The scaling down feature also enables you to shut down servers in a tier.

Purging Deployment Requests

You can now purge deployment requests after a specified period of time by enabling the Request Archiving Policy.

Notification for Request Statuses

Self service users can now receive e-mail notification when their resource requests succeed or fail.

RESTful Web Services Support

This release includes RESTful Web Services-based API support for Database as a Service (DBaaS.) The previous release already provided API support for IaaS.

2.7.3 Chargeback and Consolidation Planner Plug-in 12.1.0.1 Features

The new Consolidation Planner helps you determine optimal server consolidation scenarios by leveraging data collected by Cloud Control against business and technical constraints. Using this capability, enterprises can reduce their capital expenditures as well their labor costs by consolidating separate databases and application servers into a smaller consolidated set of systems.

Chargeback functions enable you to track the use of business-critical resources or metrics by consuming entities (for example, cost centers) and enable businesses to report back the usage charges to the consuming entities. IT departments can accurately share or report costs with business users or business units commensurate with the usage of the resources.

2.7.4 Chargeback and Consolidation Planner Plug-in 12.1.0.2 Features

This release supports the following enhancements:

- You can now unassign cost centers and charge plans from targets. Targets that are disengaged in this way can be removed from Chargeback reports.
- You can now share a Real Application Cluster (RAC) not only by instance, but also by service. Services within a RAC can be assigned to different cost centers, but must all be assigned to the same charge plan.
- A new EM CLI verb (`emcli get_metering_data`) enables you to extract metering and charge data to a CSV file. This enables integration of Chargeback functions with external applications, for example, a billing engine or an analytics program.

2.7.5 Virtualization Management Plug-in 12.1.0.1 Features

Enterprise Manager Cloud Control provides comprehensive management for Oracle VM (x86) servers and Guest virtual machines. This includes bare metal provisioning for hypervisor, provisioning of Guests, performance and availability monitoring of virtualized resources and configuration and compliance management.

Other capabilities include:

- Managing zones and server pools for Oracle VM servers.
- Viewing and monitoring details of your virtual and physical infrastructure.
- Creating networks, storage servers, and storage repositories.
- Deploying virtual assemblies, Oracle VM templates, and database service templates.
- Viewing application to disk topology for virtualized environments. For example, you can drill down from the E-Business Suite middle tier to Oracle Database to the Guest VM to the Oracle VM server to storage details, viewing each tier in detail.
- Power management support to schedule Oracle VM servers to be powered off at certain times.
- Dynamic resource management to balance workloads within a server pool.

2.7.6 Virtualization Management Plug-in 12.1.0.2 Features

Patching the Oracle VM Server

Oracle provides a publicly available YUM repository that includes repositories for Oracle VM. These repositories include the full releases of Oracle VM and mirror those

releases on the Oracle VM DVDs/ISOs. The Oracle VM Server must be patched to ensure that the latest software updates and enhancements are applied. Patching the Oracle VM Server involves the following:

- Configuring the YUM repository
- Upgrading the Virtual Server

You perform both of these tasks in Cloud Control. From the Enterprise menu select **Infrastructure Cloud**, then select **Home**. See *The Cloud Administration Guide* for detailed instructions.

Acknowledging Oracle VM Events

All operations performed on a server, server pool, storage, or network generate Oracle VM events. The event can be informational, minor, or critical. A target in an error state generates a critical event. Targets with a Critical status cannot be used to perform any operations. The cloud administrator can now acknowledge Oracle VM events through a menu selection.

2.8 Lifecycle Management

This section covers the following topics:

- [Target Monitoring and Discovery Enhancements](#)
- [Configuration Discovery and Collection Enhancements](#)
- [Configuration Management Enhancements](#)
- [Compliance Enhancements](#)
- [Database Provisioning Enhancements](#)
- [Patch Management Enhancements](#)
- [Database Upgrade Enhancements](#)
- [Database Change Management Enhancements](#)
- [Enhanced Provisioning of Java EE Applications](#)
- [Data Comparison](#)

2.8.1 Target Monitoring and Discovery Enhancements

Automatic Target Discovery

Cloud Control can now automatically discover potential targets on the hosts that it manages. Targets that are discovered in this way can then be promoted to managed target status. The feature also supports mass deployment of Management Agents to selected targets to facilitate target promotion. After a management agent is deployed to a host, it searches the host for manageable targets and reports any potential targets to Enterprise Manager, which you can choose to promote as well.

Out-of-Box and User-Defined Systems Support

The out-of-box systems feature supports discovery of Oracle-provided systems as a single entity, including discovery of targets that make up the system as well as the relationships between them. The user-defined systems feature enables you to model and monitor your application system infrastructure in Enterprise Manager by creating systems targets. System target creation involves choosing the targets of the system and

defining how system availability should be computed. Both features provide richer support for monitoring the infrastructure systems of managed custom applications.

Metrics Enhancements

User interface enhancements to metrics support include improved usability, support for changing settings for all metrics, and a new threshold suggestions feature. Changing and viewing metric settings are common tasks for many types of users. The enhancements included in this release are designed to improve the user experience and fill in feature gaps based on customer usage.

2.8.2 Configuration Discovery and Collection Enhancements

Relationships Dependency Collection

Data collection includes not only configuration properties, but also target relationships and dependencies, which allows for Configuration Management Database (CMDB) type analysis such as root cause and impact.

Extensible Configuration Collection

With the integration of Application Configuration Console blueprint technology, you can extend the collection of out-of-box targets by adding files, command output, and SQL query results to the collection. The additional configuration data is available to all standard configuration management features, including comparisons, search, history, and so forth.

Inventory Reporting

Enterprise Manager's Inventory Reporting feature enables you to quickly learn your current and historic database deployments, operating systems, and so forth. You can manipulate the data using target properties such as lifecycle, location, cost center, and so forth, to obtain a targeted list of assets as well. The information can be exported to a spreadsheet such as Excel for additional manipulation or distributed through e-mail.

Configuration Topology View

The Topology Viewer enables you to see and traverse target relationships that are automatically detected as well as those added manually. The Topology Viewer enables you to perform impact and root cause analyses and provides access to a target's main menu to take action.

2.8.3 Configuration Management Enhancements

Comparison Templates

Comparison templates enable you to control the comparison by ignoring obvious differences and noise to find the "needle in the haystack." Oracle ships default comparison templates for most target types, including database and WebLogic Server, which you can customize to your needs.

System Comparisons

System comparisons enable you to compare an entire application stack comprised of any number of components, which enables you to manage drift among lifecycle environments such as Development, QA, Production, and so forth.

Graphical Configuration Search

This release provides a library of out-of-box searches. In addition, you can easily build custom search specifications using a new graphical interface that leverages the target collection model, enabling you to choose from the model instead of entering SQL statements.

Relationship History

Configuration history now includes changes to relationships as well as to configurations. You can also be notified on changes to specific configuration properties or relationships.

2.8.4 Compliance Enhancements

Compliance Framework

The compliance framework has been completely revamped. The four-layer hierarchy follows industry standard best practices, making it easier to use and reusable. Compliance scores are always current while maintaining historical trending information.

Out-of-Box Compliance Standards

Enterprise Manager ships with over 30 compliance standards consisting of over 1700 individual compliance validations covering the entire stack including host, Oracle Database, Fusion Middleware, Fusion Applications, and more.

Self-Updatable Compliance Standards

Oracle posts new and updated compliance standards as they are developed. You can download and deploy these posted standards without having to upgrade Enterprise Manager itself. This enables the support of new products as they are released as well as access to updates to existing standards.

Real-Time Change Detection

The Management Agent now supports real-time event detection on supported platforms. The detection records the exact time of the event as well as who performed the action. Real-time monitoring can be used to detect events involving files, processes, database objects, users, and directory objects. You can manually or automatically mark these events as authorized or unauthorized, which automatically affects the compliance standard score.

Integration of BEA Guardian

The former BEA Guardian WebLogic health checks have been integrated into Enterprise Manager. In addition, custom health checks can also be created. Consequently, administrators are better able to verify that their WebLogic environment is in compliance with these standards.

2.8.5 Database Provisioning Enhancements

Enterprise Manager Cloud Control can deploy an entire database environment including underlying Grid infrastructure in minutes. The environment can be cloned from Provisioning Profiles which are either Oracle certified bits provided through Enterprise Manager Self-Update or gold images derived from a reference environment. Cloning procedures have been enhanced to capture configuration properties as well as the software payload. This is particularly useful when migrating

databases from development to test to production environments or the reverse. Enterprise Manager Cloud Control also enables power-administrators (Designers) to lock down certain inputs so that other administrators (Operators) can provision with minimal user-interaction.

For more information about database provisioning features, see [Section 2.4, "Database Management"](#).

2.8.6 Patch Management Enhancements

This section describes patch management enhancements.

Out-of-Place Patching

The out-of-place patching capability minimizes down time for database patching. This approach clones the existing Oracle home of the database and patches the cloned Oracle home instead of the original Oracle home. Similarly, after applying the patch, moving the database to the new location involves minimal down time.

Patch Templates

Patch templates enable phased rollout of a set of tested patches across an organization. A patch template contains a predetermined set of patches and deployment options saved from the source patch plan for which you can select a completely new set of targets. This approach reduces the time and effort required to create new patch plans and enables patch designers to expose only approved plans to patch operators.

Target Patching Enhancements

The following target patching enhancements are now supported:

- Patching of Oracle Fusion Application targets.
- Patching of Oracle Grid infrastructure targets, which are part of Oracle Exadata Database Machine, using both in-place and out-of-place patching modes. In addition, if you patch in out-of-place patching mode, you can now switch back to the old Oracle home.
- Application of one-off patches and critical patch updates across all managed servers within a WebLogic Domain. In addition to validation checking and rollback support, the new feature enables you to apply patches in a rolling fashion to avoid downtime.

2.8.7 Database Upgrade Enhancements

Enterprise Manager now automates the upgrade of databases from 10.x, and 11.1.0.x to 11.2.0.x databases. With this feature, you can perform mass database upgrades with minimal downtime, less manual intervention, and faster upgrade.

2.8.8 Database Change Management Enhancements

Change Plans

A change plan is an Enterprise Manager object that contains a set of schema changes, which can be deployed to one or more targets at a time. A change plan can be generated from a schema comparison. The application developer can also generate a change plan in SQL Developer, while making changes to the schema as part of application changes. Change plans ensure consistent and repeatable deployment of

changes, without depending on application developers to supply SQL scripts for their changes.

Data Comparison

You can now compare data and report on differences. This ensures consistency of application configuration data across lifecycle environments, which in turn ensures proper testing.

Synchronization of `init.ora` Parameters

You can now compare and synchronize some or all initialization parameters between two or more databases automatically.

2.8.9 Data Comparison

In most application life cycle processes, enterprises maintain separate test, staging, and production systems. Over time, system changes may introduce differences in application data. To detect differences and to troubleshoot problems, administrators, application developers, and application managers can use data comparisons to easily detect and rectify application problems caused by missing or extraneous data, or by variances in data.

2.8.10 Enhanced Provisioning of Java EE Applications

You can now create a component of subtype Java EE Application in the Enterprise Manager Software Library. A Java EE Application component includes all necessary files related to an application to be deployed or redeployed:

- A standard Java EE archive (.ear, .war, .jar, and so forth)
- Deployment plan
- Predeployment and postdeployment scripts
- Target execution script
- Assorted other files, as required

Use the new component in conjunction with the Deploy/Undeploy Java EE Application deployment procedure to deploy and redeploy applications. The new component subtype is a great time saver. Previously, you had to create multiple components of subtype Generic Component, where each represents a file required for application deployment; that is, a generic component for the archive, another for the deployment plan, another for a predeployment script, another for a postdeployment script, and so forth.

2.9 Application Performance Management

Real User Experience Monitoring Enhancements

Oracle Real User Experience Insight (RUEI) provides you with powerful analysis of your network and business infrastructure. You can monitor the real-user experience, define key performance indicators (KPIs) and service level agreements (SLAs), and trigger alert notifications for incidents that violate them.

RUEI is a Web-based utility that reports on real-user traffic requested by, and generated from, your Web infrastructure. It measures the response times of pages and user transactions at the most critical points in your network infrastructure. An

insightful diagnostics facility enables application managers and IT technical staff to perform root-cause analysis.

Business Transaction Management Enhancements

Using Business Transaction Management, you can:

- Define and track transactions, and understand the business context of each transaction, including the transaction's consumers and business payload
- Define properties that enable you to facilitate searches and to surface important information without having to log messages.
- Define service-level agreements to set performance targets based on business criteria, and monitor performance relative to those targets.
- Generate alerts that warn you of unusual conditions. Such conditions might relate to faults, specific message content, or missing messages.
- Monitor a wide variety of distributed technologies including SOA, J2EE, OSB, RMI, JDBC, ASP.NET, and WCF.
- Enable network-level security for Business Transaction Management components. Doing this will provide message integrity and confidentiality for communication among distributed management components. You can also provide mutual authentication between management components.

Java Virtual Machine Monitoring and Diagnostics Enhancements

The latest Java Virtual Machine (JVM) monitoring and diagnostic enhancements include a broad range of capabilities related to ease of use, greater flexibility, and deeper visibility. Most significant, all JVMs are now considered Enterprise Manager targets. This means that you have more granular control over your settings, access, and flexibility with respect to the new personalization features for including JVM metrics in other dashboards such as the new Composite Application dashboard. The new JVM home page allows you to quickly enable deep JVM monitoring and drill into heap analysis, live threads, and overall JVM health metrics related to CPU utilization, garbage collection, thread state, and heap consumption. Filters can be deployed with a simple click enabling the JVM to be analyzed by method, request, thread state, database, database state, SQL calls, and even ECID monitoring to isolate transactions. You can now navigate bi-directionally between live JVM threads and database sessions with the correlation between JVM thread analysis and database diagnostics, enabling administrators and developers to collaborate in diagnosing cross-tier issues.

JVM Diagnostic Integration With ADDM

This feature provides seamless, bidirectional navigation between the JVM Diagnostics and ADDM to enable you to maintain context when dealing with JVM issues that correlate with database calls. By providing database administrators with true cross-tier navigation, they can now quickly resolve SQL issues that arise from Java applications by tracing issues directly from the JVM.

SLA Management Enhancements

Enhancements to the SLA management framework in Enterprise Manager ensure that it is flexible enough to represent any SLA in your environment. This feature provides a hierarchical SLA framework where Service Level Indicators (SLIs) represent key metrics and Service Level Objectives (SLOs) tie those SLIs together to define service level thresholds and requirements. SLAs use SLOs to define how the business requirements and associated notifications tie in to the overall monitoring service level framework. Using this arrangement, administrators and operations can now represent

any SLA required within their environment in a manner that represents both their business and technical requirements.

Simplified Middleware Diagnostics Deployment and Configuration

This release simplifies the process of enabling JVM Diagnostics and Application Dependency and Performance (ADP). In the past, these components were deployed through manual, time-consuming, error prone installation processes. Now, managers and agents for both JVM Diagnostics and Application Dependency and Performance can be deployed and configured from the Cloud Control console interface.

Application Data Model

ADM now maintains the tables associated with an application, the referential relationships connecting those tables and the sensitive data elements and the associated columns containing them in the application. These sensitive data elements are used to generate mask definitions dynamically. Instead of having to manually discover sensitive data, the application data model can programmatically identify and store the sensitive data elements through sensitive data scanning and import of data masking templates.

Diagnostic Snapshot Support

The new diagnostic snapshot feature captures both Oracle WebLogic Server and JVM data and packages it for later analysis. The feature displays a page of diagnostic snapshots that can be imported into and exported out of Enterprise Manager, enabling much more flexibility with respect to when and where you analyze the data. Should a similar situation arise, the diagnostic snapshot can be preserved to enable for later analysis and comparison. Also, diagnostic snapshots can be shared with Oracle Support to ensure that Oracle can better assist in critical issues where additional support is needed. If you combine this feature with the WebLogic Support Workbench that was introduced in the previous release, Enterprise Manager truly is integrated deeply into the My Oracle Support portal and Oracle Support in general to streamline support and the exchange of information necessary to resolve issues quickly.

Oracle Services Oriented Architecture Dehydration Store Diagnostics

This release enhances the Oracle Services Oriented Architecture (SOA) Suite by providing a dedicated view to analyze the behavior of the SOA dehydration database. In particular, you can monitor SQL performance metrics and table growth specifically in the context of the SOA Suite's use of the database. The view displays both throughput and wait bottleneck data, enabling you to monitor the general health of the target database instance. Using Active Session History, you can track usage data and display it as a table space chart, a growth rate chart, or an execution chart. Accurate CPU performance data is vital to properly administer your SOA applications.

Performance Diagnostics Enhancements

Oracle Enterprise Manager Cloud Control 12c includes ASH Analytics, a new tool to explore ASH data that enables the administrator to roll up, drill down, and slice or dice performance data across various performance dimensions. Using ASH Analytics the database administrator can explore the different performance attributes of a database session at any point in time. With the ability to create filters on various dimensions, the DBA can not only identify performance issues but also get a good understanding of various performance patterns and resource usage of the system.

Real-Time ADDM is an innovative way to analyze problems in extremely slow or hung databases, which would have traditionally required a database restart.

Real-Time ADDM can help resolve issues such as deadlocks, hangs, shared pool contentions, and many other exception situations without resorting to a restart of the database. Real-Time ADDM uses two different types of connection modes to connect to the target instance. The normal JDBC connection is intended to perform extensive performance analysis when some connectivity is available. The diagnostic mode which makes a latch-less connection is useful for extreme hang situations when normal connection is not possible.

2.10 Oracle Enterprise Manager Cloud Control Mobile

The Oracle Enterprise Manager Cloud Control 12c Mobile application enables you to track and manage incidents from your iPhone. You can view incident and problem details and acknowledge, assign, prioritize, escalate and annotate incidents. You can also seamlessly connect to My Oracle Support to drill down to service requests associated with a problem. The flexible setup screen enables you to connect to multiple Enterprise Manager 12c environments.

2.11 My Oracle Support Integration

View Service Requests

You can view details for current service requests filed with Oracle Support through Enterprise Manager Cloud Control. The My Oracle Support menu opens the Service Request page where you can monitor, update, and create service requests and associate them with the configurations found in Enterprise Manager.

View Patch Recommendations

Patch recommendations identify missing recommended patches issued by Oracle. Oracle compares the patches installed in your configuration with what Oracle recommends, and identifies any missing patches. You can view current patch recommendations for your environment through the Patch Recommendations region available from the Enterprise menu in Cloud Control.

Index

A

Active Session History Viewer, 2-28
Administration Groups, 2-6
agent. See Oracle Management Agent
Application Dependency and Performance, 2-28
Application Replay, 2-9
architecture
 Enterprise Manager Cloud Control, 1-2
authentication
 Kerberos, 2-5
 LDAP, 2-5
automatic target discovery, 2-22

B

backup and recovery, 2-8
BEA Guardian. See compliance standards
BI Publisher. See Oracle Business Intelligence
 Publisher
blackout information summary, 2-6

C

central search of log files, 2-17
centralized credential store, 2-5
Change Plans, 2-25
changing and viewing metric settings, 2-23
Cloud Control
 console, 1-1, 1-5
compliance
 standards, 2-17
Composite Application dashboard, 2-17, 2-27
configuration data, extending collections, 2-19
cross-tier navigation, 2-27
custom configuration collections, 2-19
customize performance views, 2-16
customize target home page, 2-4

D

data subsetting and data masking, 2-28
diagnosing and resolving performance issues, 2-17
diagnosis support, 2-4
diagnostic snapshots, 2-28

E

Enterprise Manager Cloud Control
 architecture, 1-2
 description, 1-1
Enterprise Scheduler Service, 2-8
Exalogic, 2-15

F

fine-grained privileges, 2-6
Fusion Middleware provisioning, 2-15

G

graphical topologies, 2-15

H

historical configuration comparisons, 2-16

I

IaaS (Infrastructure-as-a-Service), 2-15
Incident Manager
 automate business and operational processes, 2-7
 events and incidents notification, 2-7

J

Java EE application, 2-26
Java EE deployment, 2-15
Java Virtual Machine (JVM) targets, 2-27
JVM Diagnostics, 2-28

K

Kerberos authentication, 2-5

L

LDAP authentication, 2-5
load balancer, 1-3

M

managing

- Oracle Fusion Applications, 2-8
 - service requests, 2-29
- metric extensions, 2-19
- Middleware Diagnostic Advisor, 2-17
- Middleware diagnostics features, 2-28

N

- named credentials
 - auditing, 2-6
 - independent life cycle, 2-5
 - testing and verification, 2-6
- node updating, 2-16

O

- OMS. See Oracle Management Repository
- OMS. See Oracle Management Service
- Oracle Business Intelligence Publisher, 2-5
- Oracle Directory Server Enterprise Edition, 2-15
- Oracle HTTP Server, scale out, 2-8
- Oracle Management Agent, 1-3
- Oracle Management Repository, 1-4
- Oracle Management Service, 1-3

P

- PaaS (Platform-as-a-Service), 2-15
- performance
 - summary baseline, 2-16
 - troubleshooting, 2-28
- provisioning Fusion Middleware, 2-15

Q

- query-based data operations, 2-16

R

- request instance diagnostics, 2-18
- roles and privileges, 2-6

S

- scale out, 2-8
 - Fusion Applications, 2-8
 - Fusion Products, 2-8
- scaling tier targets, 2-20
- Self Update feature, 1-4, 2-2, 2-13
- Service Level Agreement (SLA)
 - framework, 2-27
- SOA applications, 2-28
- Software Library
 - entities, 2-13
- Sun Java Directory Server Enterprise Edition. See Oracle Directory Server Enterprise Edition
- Support Workbench, 2-4, 2-8

T

- target systems support, 2-23

- template collections, 2-6
- tier targets, scaling, 2-20
- topology views, 2-15

U

- usability and personalization, 2-4

V

- view patch recommendations, 2-29

W

- whole server migration, 2-8