

Oracle® Enterprise Manager

Cloud Control Introduction

12c Release 2 (12.1.0.2)

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Oracle Enterprise Manager Cloud Control Introduction, 12c Release 2 (12.1.0.2)

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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

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Access to Oracle Support

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

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<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.
monospace	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

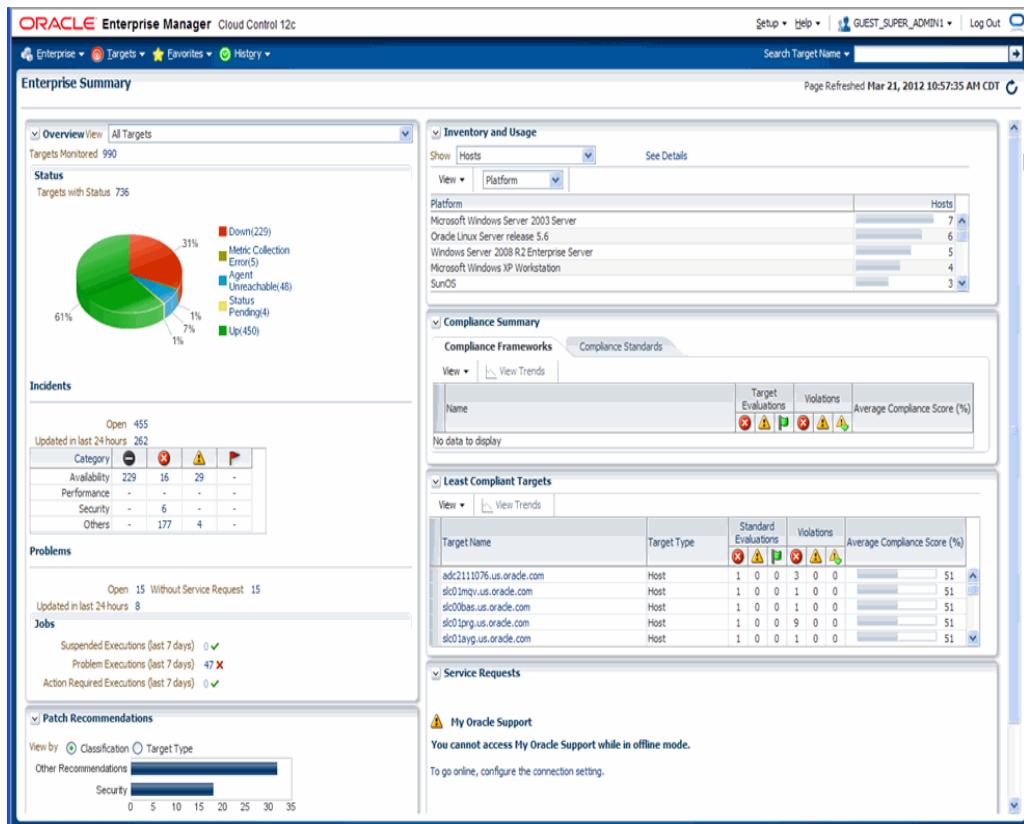
Oracle Enterprise Manager is Oracle's integrated enterprise information technology (IT) management product line, which provides the industry's only complete, integrated, and business-driven enterprise cloud management solution. Oracle Enterprise Manager creates business value from IT by leveraging the 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:

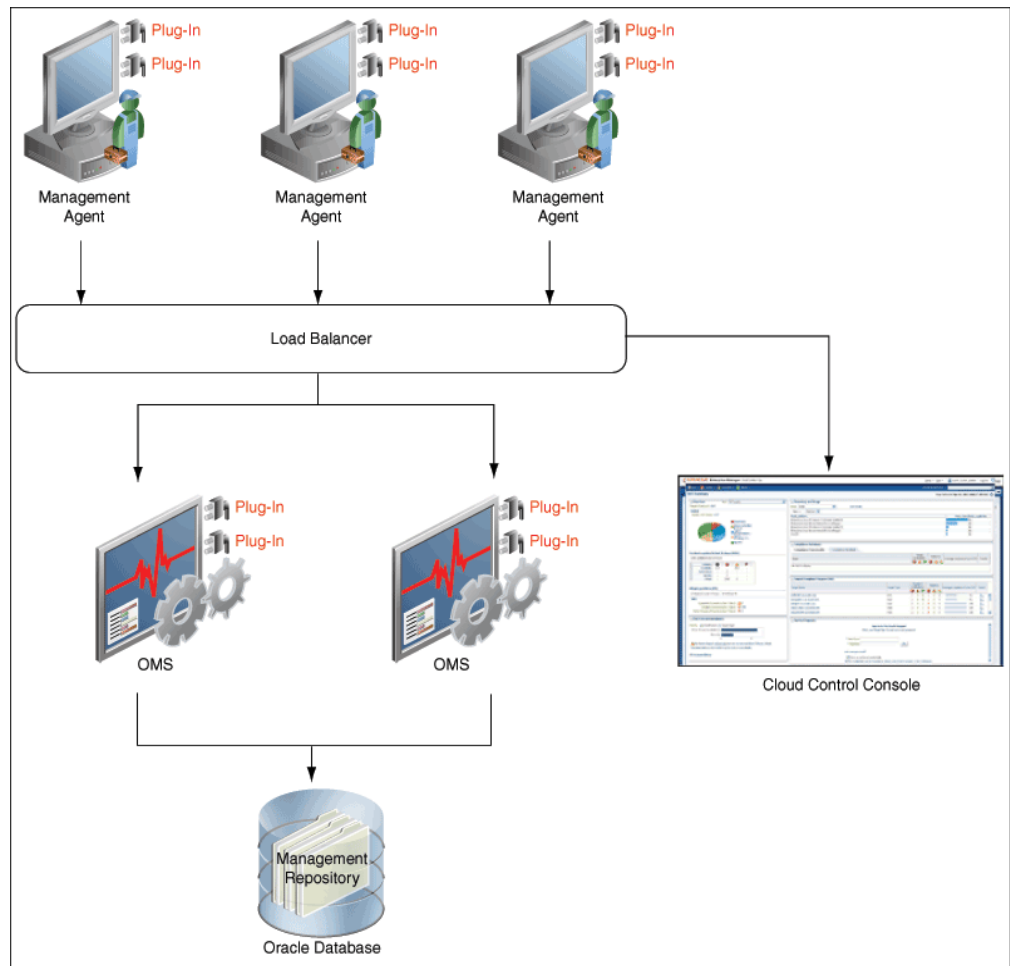
<http://www.oracle.com/us/products/enterprise-manager/index.html>

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 Management Plug-ins Installed by Default

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.) Management Plug-ins Installed by Default

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, non-Oracle middleware technology, and lifecycle management including configuration management, compliance management, provisioning, and patching. 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 (including Microsoft SQL Server and JBoss Application Server) 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 monitoring and diagnostics—Zero-overhead, production Java diagnostics for Oracle and non-Oracle platforms. Trace transactions from Java to Oracle Database and back.
- 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 Oracle Enterprise Manager Cloud Control 12.1.0.1 and 12.1.0.2 releases. Also highlighted are the latest Plug-in and Connector releases.

This document contains the following section:

- [What's New in Enterprise Manager Cloud Control 12c Release 2 \(12.1.0.2\)](#)
- [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 What's New in Enterprise Manager Cloud Control 12c Release 2 (12.1.0.2)

- [Framework and Infrastructure](#)
 - [EM CLI Verbs Available in the Software Library](#)
 - [Stage Operation](#)
 - [Enhanced Repository Page](#)
 - [New Oracle Management Service Page](#)
 - [Consolidated Agent Management Page](#)
 - [Dynamic Groups](#)
 - [Support for BI Publisher 11.1.1.6.0](#)

- Better Support for Changing WebLogic Server Demonstration Certificates
- EM CLI Tracking and Setup
- Support for Properties for Enterprise Manager Administrators
- Enterprise Monitoring and Incident Management Features
 - Search in Administration Group Hierarchy
 - Monitoring Templates and Template Collections Enhancements
 - Grant Edit or Full Privileges on Metric Extensions
 - Monitoring Templates and Template Collections Enhancements
 - Incident Manager Updates
- Fusion Middleware Plug-in 12.1.0.3 Features
- Application Management Features
 - Oracle Fusion Applications Plug-in 12.1.0.3 Features
 - Application Replay
- Database Management Features
 - Database Plug-in 12.1.0.3 Features
- Cloud Management Features
 - Cloud Management Plug-in 12.1.0.5 Features
 - Cloud Management Plug-in 12.1.0.4 Features
 - Virtualization Management Plug-in 12.1.0.4 Features
 - Virtualization Management Plug-in 12.1.0.3 Features
- Heterogeneous (Non-Oracle) Management
 - Metadata Plug-In Support

2.2 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
- EM CLI Tracking and Setup
- Support for Properties for Enterprise Manager Administrators

2.2.1 Robust and Extensible Architecture

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

2.2.1.1 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.

2.2.1.2 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.

2.2.1.3 Software Library

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

- You can now associate multiple files with a single entity.
- You can now move all the revisions of an entity from one folder to another.
- You can now add notes (log information about the changes) and attachments (add/upload files) related to the entity.
- 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.
- 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.
 - 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.
 - 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
 - You can now use Grant and Revoke Privileges to grant users/roles certain privileges on the entities that you own.
 - 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)
 - 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.
 - EM CLI Verbs Available in the Software Library

There are now EMCLI verbs for Software Library that enable you to integrate the creation of generic components with in-house build processes.

The files generated as part of the build process must be uploaded to the Software Library storage without using the GUI console. The EMCLI verbs supported enable the addition of a storage location, creation of new folders and generic components, upload or referencing of files, update existing generic component entities, and various listing functions.

Note: This feature is new in the 12.1.0.2 release.

- Stage Operation

There is now an option in the Software Library console to stage files associated with an entity, from Software Library storage to another host target.

Users can now quickly ascertain whether a newly created entity can be staged to a site, in the process validating the storage location configuration and its associated

credentials. Another use case is to extract large software files associated with an entity after it has been uploaded, possibly by other processes or subsystems.

Note: This feature is new in the 12.1.0.2 release.

2.2.1.4 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.

2.2.1.5 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.

2.2.1.5.1 Enhanced Repository Page

Note: This feature is new in the 12.1.0.2 release.

The Repository page has been enhanced to provide all pertinent repository information in a single location. The page now includes a breakdown of database sessions by Enterprise Manager subsystem. This feature assists Enterprise Manager administrators to isolate problem components within the appropriate Enterprise Manager subsystem. It reduces the time taken to diagnose the root cause of Enterprise Manager problems.

2.2.1.5.2 New Oracle Management Service Page

Note: This feature is new in the 12.1.0.2 release.

There is a new page to provide a list of all configured Oracle Management Services (OMSes) and global properties such as Admin Server OMS, SLB configuration, and throughput by configured OMS.

This page provides Enterprise Manager administrators with a view of the OMS tier from a single place to assist in diagnosing Enterprise Manager issues such as SLB configuration problems or issues with a subset of configured OMSes.

2.2.1.5.3 Consolidated Agent Management Page

Note: This feature is new in the 12.1.0.2 release.

The Consolidated Agent Management page now provides:

- Improved filtering and sorting of data
- More exposed columns to help administrators determine which agents and targets have problems
- The ability to drill down into agents that have metric collection problems and so on

2.2.1.6 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.

2.2.2 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

2.2.3 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.

2.2.3.1 Dynamic Groups

Note: This feature is new in the 12.1.0.2 release.

Dynamic Groups enable the creation of groups based on membership criteria. Membership criteria is based on target properties such as target type, lifecycle status, department, target version, and so on. Targets whose properties match the criteria of a dynamic group will automatically be added to the dynamic group.

Dynamic Groups facilitate easier management of groups. Administrators will only have to define the group membership criteria once and Enterprise Manager automatically adds or removes the targets to or from the appropriate dynamic group.

2.2.4 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.

2.2.4.1 Support for BI Publisher 11.1.1.6.0

Note: This feature is new in the 12.1.0.2 release.

Enterprise Manager now supports BI Publisher 11.1.1.6.0. As well as being the latest major release, BI Publisher 11.1.1.6.0 includes a number of performance and usability enhancements including Favorites and guided report development for users.

2.2.5 Security

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

2.2.5.1 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.

2.2.5.2 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.

2.2.5.3 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.

2.2.5.4 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.

2.2.5.5 Better Support for Changing WebLogic Server Demonstration Certificates

Note: This feature is new in the 12.1.0.2 release.

The WebLogic Servers that are installed as part of the Enterprise Manager infrastructure are configured, out-of-box, with a demonstration certificate. Oracle recommends that you replace these certificates with production quality certificates for non-development environments to enable more secure communications between components of the Enterprise Manager framework. You can now replace and configure a new certificate using `emctl secure wls`.

2.2.6 EM CLI Tracking and Setup

Note: This feature is new in the 12.1.0.2 release.

The deployment of EM CLI clients is now tracked by registering the EM CLI client as part of the EM CLI setup. Tracking the EM CLI installations will enable better management of the EM CLI clients. For example, tracking information can be used to identify EM CLI binaries that need to be patched, identify EM CLI installations that need to be updated when a user password changes, or ensure that all EM CLI clients have been synced with the latest verbs from the OMS.

No autologin is the default setup for EM CLI clients. This means that the user must logon to Enterprise Manager for each EM CLI session. The autologin option is available if required.

2.2.7 Support for Properties for Enterprise Manager Administrators

Note: This feature is new in the 12.1.0.2 release.

An Enterprise Manager administrator can now be assigned the following new attributes or properties:

- Cost Center
- Line of Business
- Department
- Contact
- Location

New targets created by the administrator will automatically be assigned the same cost center, line of business, department, contact, and location.

This feature enables more operational context to be associated with the administrator. In addition, this feature also facilitates the setting of these properties to targets because targets that are added by the administrator are automatically assigned the same set of values for Cost Center, Line of Business, Department, Contact, and Location.

2.3 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](#)
- [Metric Extensions](#)
- [Blackout Enhancements](#)
- [Metrics Enhancements](#)
- [Incident Management](#)

2.3.1 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.

2.3.1.1 Search in Administration Group Hierarchy

Note: This feature is new in the 12.1.0.2 release.

A new search mechanism is provided to locate a specific group in the administration group hierarchy. Administrators can search for administration groups by name. After the group is found, then administrators can associate template collections with a group, review the management settings associated with the group, and so on.

Support for searches makes it much easier for administrators to setup and review management settings for groups in the administration group hierarchy. This is especially useful in deployments that have large administration group hierarchies where it is difficult to visually locate a group in a hierarchy containing hundreds or thousands of groups.

2.3.1.2 Monitoring Templates and Template Collections Enhancements

Note: These enhancements are new in the 12.1.0.2 release.

You can create a monitoring template by pre-populating the monitoring template with metrics based on a user-selected target type. This is in addition to the option of creating a template based on the metric settings of an existing target. Also, when

adding a metric to a monitoring template, this process has been streamlined to enable the user to directly choose specific metrics or metric extensions that are applicable to the target type. These enhancements make it easier for an administrator to create or edit monitoring templates.

You can export and import monitoring templates to share monitoring settings between different Enterprise Manager deployments. The inclusion of Metric Extensions as part of the exported or imported monitoring template provides an easy way to share many Metric Extensions at a time between Enterprise Manager deployments.

Monitoring templates are now self-updatable entities. This means Oracle can provide new monitoring templates for managed targets through the Self-Update mechanism.

Monitoring templates containing Oracle's recommended monitoring settings for targets are now more easily available to customers.

Details of monitoring templates within a template collection can now be easily viewed directly within the Template Collection pages. Also, more information is provided on the management settings associated with an administration group that come as a result of multiple inherited template collections. This feature provides administrators with a more streamlined and easier way to verify and adjust their monitoring setup for the targets in the administration group hierarchy.

2.3.2 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).

2.3.2.1 Grant Edit or Full Privileges on Metric Extensions

Note: This feature is new in the 12.1.0.2 release.

The owner of a Metric Extension can now grant Edit or Full privileges on the metric extension to another Enterprise Manager administrator or role.

This feature enables the metric extension owner to manage the privileges associated with the metric extension instead of having it managed only by Enterprise Manager super administrators.

2.3.3 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.

2.3.4 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.

2.3.5 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.

2.3.5.1 Incident Manager Updates

Note: These features are new in the 12.1.0.2 release.

In Incident Manager, administrators can now perform bulk operations such as Clear and Acknowledge, against many applicable events and incidents at a time.

Incident Manager now displays additional properties about the target for which the incident or event has been raised. Such properties include Lifecycle Status, Cost Center, and so on. Search capabilities have also been expanded to include Lifecycle Status as search criteria. This feature helps provide more operational context about the targets on which the events or incidents were raised. Such operational context is useful in managing the lifecycle of the incident, for example setting the priority and owner of an incident can be based on the target's lifecycle status.

Incident Rules now support criteria based on the Lifecycle Status of a target. Administrators can now easily create rules for targets of specific Lifecycle Status values, for example rules for all Production targets and rules for all Development targets. This enhancement will help address the common customer requirement of creating rules for targets based on lifecycle status without requiring the intermediate step of creating a group that contains such targets.

2.4 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](#)
- [Oracle Fusion Applications Plug-in 12.1.0.3 Features](#)
- [Application Replay](#)

2.4.1 Oracle Fusion Applications Plug-in 12.1.0.1 Features

2.4.1.1 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.

2.4.1.2 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.

2.4.1.3 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.

2.4.1.4 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.

2.4.2 Oracle Fusion Applications Plug-in 12.1.0.2 Features

2.4.2.1 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.

2.4.2.2 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.

2.4.3 Oracle Fusion Applications Plug-in 12.1.0.3 Features

2.4.3.1 Fusion Applications Backup and Restore Enhancements

Administrators can quickly execute backup and restore operations for Fusion Applications directly from within Oracle Enterprise Manager reducing the overall manual maintenance efforts that can prove error prone and time consuming.

2.4.4 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.

2.5 Database Management

This section describes new features and enhancements for database management.

- [Database System Discovery Enhancements](#)
- [Configuration Management Enhancements](#)
- [Configuration Compliance](#)
- [Database System and Associations](#)
- [Database Patching and Upgrade](#)
- [Simplified EMCLI verbs for Deployment Procedures](#)
- [Database Plug-in 12.1.0.1 Features](#)

- [Database Plug-in 12.1.0.2 Features](#)
- [Database Plug-in 12.1.0.3 Features](#)

2.5.1 Database System Discovery Enhancements

Unlike previous releases, Enterprise Manager Cloud Control can detect databases in a data center even before the Management 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.

2.5.2 Configuration Management Enhancements

Enterprise Manager Cloud Control provides a set of 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.

2.5.3 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.

2.5.4 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.

2.5.5 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.

2.5.6 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.

2.5.7 Database Plug-in 12.1.0.1 Features

This section describes features and enhancements for Database Plug-in 12.1.0.1.

2.5.7.1 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.

2.5.7.2 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.

2.5.7.3 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.

2.5.7.4 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.

2.5.7.5 Schema Change Management Enhancements

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 database administrator (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.

2.5.7.6 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.

2.5.7.7 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.

2.5.7.8 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.

2.5.7.9 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.

2.5.7.10 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.

2.5.7.11 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.

2.5.7.12 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.

2.5.7.13 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.

2.5.7.14 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.

2.5.7.15 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, 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.

2.5.7.16 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.

2.5.7.17 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.

2.5.7.18 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.

2.5.7.19 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.

2.5.7.20 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.

2.5.7.21 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).

2.5.7.22 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.

2.5.7.23 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.

2.5.8 Database Plug-in 12.1.0.2 Features

This section describes features and enhancements for Database Plug-in 12.1.0.2.

2.5.8.1 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

2.5.8.2 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.

2.5.8.3 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.

2.5.9 Database Plug-in 12.1.0.3 Features

This section describes features and enhancements for Database Plug-in 12.1.0.3.

2.5.9.1 Support for Oracle ACFS New Features

Enterprise Manager support for Oracle Automatic Storage Management Cluster File System (Oracle ACFS) features includes Oracle ACFS enhancements for Grid homes, Oracle Flex ASM for Oracle ACFS and Oracle ADVN (ASM Dynamic Volume Manager), Oracle ACFS tagging, and Oracle ACFS snapshot enhancements. This support enables all Oracle ACFS file system functionality to be managed by an easy-to-use graphical management interface.

Enterprise Manager also now supports ACFS security and encryption. This new support provides security management solutions to customers who use Enterprise Manager to manage Oracle ACFS.

2.5.9.2 Support for Oracle ASM Features

Enterprise Manager now supports Oracle Flex ASM, disk resync improvements, Oracle ASM rebalance improvements, the ability to enable access control for Oracle ASM files on Windows, Oracle ASM corrupt media recovery (scrubbing), and Oracle ASM filter driver. Users benefit from the easy-to-use interface used to monitor and manage tasks such as job scheduling, metrics collection, and so on.

2.5.9.3 Data Masking Support

The following enhancements have been made to data masking and data subsetting functionality.

2.5.9.3.1 Mask During Subsetting or Mask as Source To mask confidential data for non-production use, enterprises were required to make a copy of the production database and then mask the data before sharing it with non-production users such as testers or developers. Masking at the source or masking while subsetting at the source database enables enterprises to provision a secure and reduced size test system directly from the production database without the need for a full production database copy. Enterprises may choose to execute the masking or subsetting operations or both to provision the test database in a single workflow.

Masking at the source or masking while subsetting at the source ensures that sensitive production data never leaves the source database when provisioning test systems and, therefore, complies with data privacy policies.

2.5.9.3.2 Self Update for Oracle Applications Masking and Subsetting Templates Enterprises can mask sensitive data using data masking templates for Oracle applications such as Oracle Fusion Applications and Oracle E-Business Suite. Given the complexity of enterprise applications such as Oracle Fusion Applications or Oracle E-Business Suite, the process of manually importing the data masking templates can be complex. Using self update for Oracle applications, enterprises can directly download masking and subsetting templates from Oracle and import them into their Oracle Enterprise Manager Cloud Control 12c environment with no manual intervention.

Enterprises can easily and seamlessly implement the best practices for protecting sensitive data and provisioning reduced sized databases in their Oracle applications non-production environments using the self update option for Oracle applications masking and subsetting templates.

2.5.9.3.3 Enhancements to Support Oracle E-Business Suite Masking Use Cases Securing Oracle E-Business Suite includes protection for the underlying E-Business data in production and non-production databases. While steps can be taken to provide a secure configuration to limit Oracle E-Business Suite access, an approach that will meet regulations and laws, such as Sarbanes-Oxley (SOX), Payment Card Industry Data Security Standard (PCI DSS), and the Health Insurance Portability Act (HIPAA), protecting non-production data is achieved by scrambling sensitive data in the non-production copy.

With Oracle Data Masking Pack today, enterprises can take advantage of anonymizing sensitive data in a cloned environment easily and quickly. Scrambling E-Business Suite data becomes somewhat challenging due to the complex meta-data architecture and knowing where the sensitive information resides in the architecture. To alleviate this challenge, Oracle has released the Oracle E-Business Suite Template for Data Masking Pack.

The template contains out-of-the-box, meta-data knowledge of the E-Business Suite architecture and the sensitive columns. Additionally, the template contains pre-defined

industry best-practice masking algorithms to ensure that the optimal technique is used to securely mask the data while maintaining the application integrity.

Oracle Data Masking and the E-Business Suite template enables organizations to enforce compliance with regulatory requirements that restrict the use of production data in non-production environments.

2.6 Middleware Management

This section includes the following topics:

- [Fusion Middleware Plug-in 12.1.0.1 Features](#)
- [Fusion Middleware Plug-in 12.1.0.2 Features](#)
- [Fusion Middleware Plug-in 12.1.0.3 Features](#)

2.6.1 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 JVMMD agent with the proper parameters, you can drill down in context from the coherence node to the associated JVM target in the JVMMD. 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.

2.6.2 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.

2.6.3 Fusion Middleware Plug-in 12.1.0.3 Features

2.6.3.1 Monitoring and Diagnostics Features

2.6.3.1.1 WebLogic Cluster Performance Summary Page A new customizable performance summary page is available for Oracle WebLogic Cluster target types. This new page provides a series of default performance metric charts displaying performance data over time. Administrators can customize the default view by modifying the performance metrics displayed, changing the timeline of data displayed, comparing current performance data with past performance data, and comparing multiple clusters' performance data on a single page.

2.6.3.1.2 Routing Topology Enhancements Administrators can now modify the default performance metrics that are displayed when metric annotations are enabled on the middleware Routing Topology page. While three performance metrics can be displayed on the diagrammatic view, additional metrics can be configured to appear on the tool tip which is accessible as the pointer hovers over a node on the topology page. In addition, historical performance data collected for the chosen metrics can be accessed from the same tool tip. Such customization of and easy access to performance data will help administrators in monitoring their middleware environment.

2.6.3.1.3 Log File Monitoring This release of Oracle Enterprise Manager Cloud Control introduces log file monitoring for the WebLogic Server as well as Application Deployment target types. Middleware administrators can configure the new log monitoring metric to send alert notifications to on-call administrators when specific patterns are found in the middleware-related log files.

By leveraging the log monitoring capability, administrators can receive alert notifications in context of the problematic middleware target; consequently, reducing troubleshooting time.

2.6.3.1.4 WebLogic and Fusion Middleware Log Viewer Enhancements

Beginning with this release, two significant enhancements have been made to the log viewing capabilities within Oracle Enterprise Manager Cloud Control. First, instead of being able to group log messages only by Message Type or Message ID, administrators now have the flexibility of grouping messages by several other possible fields - including Execution Context ID (ECID)/Relationship ID, Host, Host IP Address, Incident ID, Module, Target, Thread ID, or User. Second, the search criteria for log messages that an administrator defines can be saved for future usage and accessed through the Favorites menu. These enhancements to the log viewer feature of Oracle Enterprise Manager Cloud Control will save the administrator time when diagnosing performance problems across middleware software.

2.6.3.1.5 New Home Pages for Oracle Service Bus Target

New management pages for the Oracle Service Bus target replace the previous pages. The new pages improve the look-and-feel of the OSB monitoring pages and enable the

OSB targets to appear in the standard Fusion Middleware Farm/Domain navigation tree.

2.6.3.2 Business Application Management Features

2.6.3.2.1 Business Application Target The Business Application (BA) Target represents a monitored BA. BA brings together monitoring of business entities (through RUEI and BTM) and system monitoring (including JVMD and ADP). Users can define BA that represents a large application (for example, CRM, online store) or a BA that represents only subset of that application (for example, the book store within the online store, timecard functionality within an HR application). There is no limit to the number of BAs and no requirement that a component be part of only one BA.

The BA is associated with a system target, user experience data from RUEI, and Business Transactions.

The BA provides a consolidated dashboard that enables a BA owner to see and understand the health of their application. The target represents a holistic view of the monitored application, were the application is focused only on entities relevant to you. You can see in one place the current status of its business oriented activities (through business transactions and User Experience monitoring), and the status of the infrastructure that support these business activities (through the associated system target).

2.6.3.2.2 Business Application Dashboard This is the landing page for the BA target. The dashboard can show RUEI, BTM, and System regions containing data associated with the BA. In addition, a specialized status region shows the rollup status for RUEI KPIs, BTM transactions, and SLAs. The status region will also present the System status and the BA target status. The default configuration includes these regions:

- RUEI KPIs
- BTM Transaction list
- System status
- Incidents
- BA Status region

This dashboard lets you see all aspects of the BA health. It also provides problem triage capabilities, and a starting point to drill down to more detailed system related views (including JVMD, composite app, wls monitoring home page, and so on.).

2.6.3.2.3 Business Applications List Page This page provides a list of all BAs (that the user has at least read permission for) including significant status indicators. It can be used to navigate to a specific BA dashboard. This page enables the user to see in a glance which BAs require attention.

2.6.3.2.4 Drill-down from Request Instance Diagnostics to Real User Experience Insight Session Diagnostics With this feature it is possible to correlate the Request Instance trace that is reported in Request Instance Diagnostics, to a User Session reported in Oracle Real User Experience Insight (RUEI) Session Diagnostics and provide a contextual drill-down to review the request within the complete user session.

2.6.3.2.5 Business Transaction Management Transaction to Enterprise Manager Cloud Control Target Association The Business Transaction Management (BTM) region in the Business Application (BA) will expose transactions and have some transaction detail capability.

An association is created between a BTM transaction and one or more Enterprise Manager Cloud Control targets so that thresholds and conditions defined on the BTM side will trigger events on the associated targets. Enterprise Manager registers a BTM server with OMS to make its transactions accessible by the BA.

When creating a BTM region in the BA target, you must select which BTM transactions to expose in that region.

2.6.3.2.6 Business Application Creation Wizard The wizard leads you through the process of creating a BA target. You have the ability to select one or more RUEI applications, one or more business transactions, and one systems (mandatory). It also leads you through the component selection process, and ensures successful creation of the target. This is the only way you can create a BA target.

2.6.3.2.7 User Experience Monitoring in the Business Application Dashboard With the release of the BA dashboard, RUEI events are now exposed in the dashboard to provide end-to-end visibility in regards to user experience key performance indicators.

In addition, RUEI regions are now available directly within Oracle Enterprise Manager enabling administrators to analyze user experience data right along side critical transaction and middle-tier data providing end-to-end visibility.

2.6.3.3 Lifecycle Management Features

2.6.3.3.1 Synchronization of WebLogic Server Configuration Files If differences are detected between WebLogic Domains or WebLogic Servers during a configuration comparison operation, you can now synchronize WebLogic Server related configuration files (for example config.xml) from the Cloud Control console to make the configurations the same.

2.6.3.3.2 Oracle Fusion Middleware Provisioning Enhancement The Provision Middleware Deployment Procedure and Scale up/out Middleware Deployment Procedure now support the lock down feature. This feature enables administrators with designer privileges to launch the procedure, enter values for certain fields, and lock them so that the fields cannot be edited when accessed by other administrators. Creating these deployment procedure templates helps administrators to enforce standardization and consistency across the enterprise.

While cloning or scaling out a WebLogic Domain, you can now modify the default names for the administration server, managed servers, clusters, and systems for the destination domain.

While cloning a WebLogic domain, you can now specify the applications directory and Node Manager home directory locations.

2.6.3.3.3 New Features In Oracle

Control 12c Release 1 (12.1.0.3) This section provides an overview of the new features available in Oracle Site Guard 12c Release 1 (12.1.0.3) plug-in releases.

User Interface for Site Guard Configuration

In 12c Release 1 (12.1.0.3), you can use the Enterprise Manager Cloud Control Console user interface to perform the following task:

- Creating Oracle Site Guard Configuration
- Associating Credentials for Site

- Associating Pre-Scripts and Post-Scripts
- Associating Storage Scripts

For more information, see "Setting Up Oracle Site Guard" in the *Oracle Enterprise Manager Lifecycle Management Administrator's Guide*.

Preferred credentials Support

In this release, you can use preferred credentials to run an operation plan.

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

- **Default Credentials:** Default credentials can be set for a particular target type and will be available for all the targets of the target type. It will be overridden by target preferred credentials.
- **Target Credentials:** Target credentials are preferred credentials set for a particular target. They could be used by applications such as the job system, notifications, or patching. For example, if the user chooses to use preferred credentials while submitting a job, then the preferred credentials set for the target (target credentials) will be used. If the target credentials are not present, the default credentials (for the target type) will be used. If the default credentials are not present, the job will fail. If not specified, by default, preferred credentials refer to preferred target credentials"

For more information on setting up preferred credentials, see "Setting Preferred Credential Using EMCLI Commands" in the *Oracle Enterprise Manager Lifecycle Management Administrator's Guide*.

Re-order Execution Order

For more information, see "Changing Execution Orders" in the *Oracle Enterprise Manager Lifecycle Management Administrator's Guide*.

2.6.3.4 Identity Management Features

2.6.3.4.1 Configuration Collection for Oracle Access Manager and Oracle Identity Manager

Configuration collection for Oracle Access Manager and Oracle Identity Manager is now available, enabling users to view and keep track of configurations in oim-config.xml, entries in PTY table, and oam-config.xml. Users can perform key configuration management tasks such as keeping track of configuration changes for diagnostic and regulatory purposes, taking snapshots to store configurations, and comparing component configurations to ensure the consistency of configurations within the same environment or across different environments.

The feature provides automated configuration management to accelerate problem resolution and to find root causes of problems that could potentially slow performance or create outages.

2.6.3.4.2 Out-of-Box Compliance Rules and Change Detection for Oracle Identity Manager A set of 12 out-of-box compliance rules have been defined for Oracle Identity Manager based on best practices around plug-in and adapter reloading, caching configuration, and recommended database settings such as cursor sharing, block size, maximum

number of blocks read in one I/O operation, buffer pool, initial number of database writer processes, log buffer, maximum number of open cursors, query rewrite integrity, and session cursors to cache. Users can perform rules based analysis and change detection, and get access to a compliance scorecard for each of the monitored Oracle Identity Manager deployments.

This feature provides compliance monitoring and change detection that can help customers meet compliance and reporting requirements, and accelerate problem resolution.

2.6.3.4.3 Oracle Identity Manager Database Performance A new page is available to analyze the performance of the Oracle Identity Manager database in the context of the OIM-specific tables and user. Users can track key metrics such as the size of the double-space, top SQL statements, size of the segments, and growth rate, enabling users to identify root causes of database-specific problems that could potentially slow performance.

Users now have the ability to monitor database-specific metrics for Oracle Identity Manager to find root causes of problems that could potentially slow performance or create outages.

2.6.3.4.4 Out-of-Box Reports for Oracle Internet Directory, Oracle Access Manager, and Oracle Identity Manager Out-of-box BI Publisher reports are now available for Oracle Internet Directory, Oracle Access Manager, and Oracle Identity Manager. These reports summarize monthly LDAP Operations and Replication Jobs for OID, Provisioning, Self-Service and Role-Grant Requests for OIM, and Authentications & Authorizations Metrics for OAM - including Authentications/Authorizations Per Second and Failed Authentication/Authorization Ratio.

The out-of-box reports can be used to track the overall health of the monitored Identity Management environment enabling administrators to share these reports with the line-of-business or application owners to align IT and business demands.

2.6.3.5 Other Features

2.6.3.5.1 Oracle Traffic Director Target Correlation This feature correlates the new Oracle Traffic Director (OTD) target monitoring with the WebLogic and Oracle HTTP Server targets ensuring that administrators can easily understand relationships via the middleware topology and analyze problems across tiers.

OTD is available from the Exalogic dashboard as well.

2.6.3.5.2 Performance & Health Monitoring of Oracle BI 11g Instances & Essbase The discovery of BI 11g Instance is now included as part of the Oracle Fusion Middleware/WebLogic Domain discovery wizard, enabling you to quickly set up your monitoring environment. The discovery includes all key Oracle BI components as well as Essbase. The BI components discovered include Oracle BI Server, Oracle BI Presentation Server, Oracle BI Scheduler, Oracle BI Cluster Controller, and Oracle BI Java Host. After the BI Instances are discovered, you can proactively monitor your Oracle BI environment from both systems and end-user perspectives. A wide range of out-of-box performance metrics are collected for monitored Oracle BI targets enabling you to set up alerts based on warning and critical thresholds, view current and historical performance information using customizable charts in the Metric Palette and reports, and diagnose performance problems by identifying bottlenecks in any of the monitored Oracle BI targets.

By providing out-of-box monitoring for Oracle BI 11g, Enterprise Manager 12c now offers a centralized systems management solutions to efficiently manage multiple Oracle BI deployments including testing, staging, and production environments from a single console. You can now gain the ability to monitor a wide range of performance metrics for all critical BI components (both BI 10g and BI 11g) to find root causes of problems that could potentially slow performance or create outages. Thresholds may be defined against server and component statistics that cover responsiveness (including Request Processing Time and Average Query Time), load (including Active Sessions, BI Presentation Server Requests Per Second, and BI Server Queries Per Second), and reliability (including Failed BI Queries). BI Dashboard Usage Reports and metrics on Failed and Total Oracle BI Scheduler Jobs are also available.

For the Essbase Server, you can now monitor running applications, view any unaccessed applications as well as other useful metrics and information such as the number of connected users, configuration changes, and potential incidents.

2.6.3.5.3 Coherence Elastic Data and QL Support With the new capabilities of Coherence on engineered systems introducing the new Elastic Data and QL capabilities, Enterprise Manager now provides complete visibility into these key Coherence platform features to ensure these optimizations are fully used to their maximum potential.

2.6.3.5.4 Exalogic Topology View The new Exalogic Topology View ensures that administrators can immediately identify cross-tier relationships between components, middle-tier platforms, and the underlying hosts and hardware that make up an Exalogic Elastic Cloud system.

2.6.3.5.5 Registering RUEI Engine and BTM Engine in Enterprise Manager Cloud Control You can now register RUEI engine as a system in Enterprise Manager Cloud Control. Only one RUEI system can be created in Enterprise Manager Cloud Control. The registered system is used to provide data and events to Enterprise Manager Cloud Control. RUEI data is available to you from the EM console. In addition to supporting several UI regions, it also creates EM events for any RUEI KPI threshold violation (the events are associated with the BA target).

You can now register BTM engine as a system in Enterprise Manager Cloud Control. BTM data is available to you from the EM console. In addition to supporting several UI regions, it also creates EM events for any BTM SLA violation (the events are associated with the BA target).

Note: Only one BTM system can be created in Enterprise Manager Cloud Control. The registered system is used to provide data and events to Enterprise Manager Cloud Control.

2.6.3.6 Middleware as a Service Features

2.6.3.6.1 Resource Pool Support is provided for guided flow to create middleware resource pools on a self-service zone. This feature enables SSA administrators to carve out resources for a middleware cloud.

2.6.3.6.2 MWaaS Quotas Support is provided for the creation of middleware cloud quotas by an SSA administrator. This feature enables administrators to allocate resources between different users and ensure that no one user can usurp all resources.

2.6.3.6.3 MWaaS Request Settings Support is provided for the creation of middleware request quotas by SSA administrators. This feature offers SSA users the ability to schedule resources requests in advance.

2.6.3.6.4 Service Templates SSA administrators can create Service Templates and map them to resource pools and Zones. This feature enables SSA administrators to build a self-service catalog tailored to enterprise needs.

2.6.3.6.5 Provision and De-provision Service Instance A guided flow is available that enables SSA users to request a new service instance from a given set of service templates, resulting in creation of a new service instance and its appropriate placement in the resource pool. You can later delete a service instance as well, thereby returning resources to the underlying pool.

This feature enables SSA users to self-service provision and manage resources on the cloud.

2.6.3.6.6 Manage Application Lifecycle SSA users can deploy, redeploy, and delete a Java application from the self-service portal, enabling SSA users to manage the application lifecycle.

2.6.3.6.7 Service Instance Scaling SSA users can scale up or scale down a service instance from the self-service portal, enabling SSA users to manage scalability of a service instance.

2.6.3.6.8 Manage Data Sources SSA users can create data sources, add data sources to, or delete data sources from the service instance as required by an application. This feature enables SSA users to add data sources required by an application to the service instance.

2.6.3.7 Oracle Exalogic Management Enhancements

This release provides the following Exalogic dashboard enhancements:

- Integrated hardware and software schematics
- Hardware-software topology views
- Hardware targets monitoring (Compute, ZFA appliance, Infiniband Fabric, ILOM)
- OTD monitoring
- Support for virtual and non-virtual configurations
- Monitoring of Exalogic vServer guest virtual machines (VMs)
- Health checks
- Trusted partition/vCPU licensing report

2.7 Heterogeneous (Non-Oracle) Management

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

- [Extensibility Developers Kit](#)
- [Plug-in and Connector Lifecycle Management](#)
- [Event and Help Desk Connectors](#)
- [Metric Extensions](#)

- [Custom Configuration Collections](#)
- [User-defined Deployment Procedures](#)
- [Metadata Plug-In Support](#)

2.7.1 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.

2.7.2 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.

2.7.3 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.

2.7.4 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.

2.7.5 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

2.7.6 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).

2.7.7 Metadata Plug-In Support

Note: This feature is new in the 12.1.0.2 release.

This section describes new features that support Metadata Plug-in (MP) features.

2.7.7.1 System Support

With this feature, partner SDK enables Metadata Plug-ins to define composite target types or systems which contain multiple member target types that are related to each other. This relationship between target types can be defined through associations which are displayed as part of the system topology.

2.7.7.2 Custom Discovery Support

This feature enables guided discovery of systems and composite targets that include multiple members which enables discovery and promotion of members in bulk instead of manual discovery of each member.

2.7.7.3 Localization Support

This feature will enable Metadata Plug-ins to include resource bundle properties files to support translated strings that can be used across different features in Enterprise Manager exposed through the partner SDK. This will allow partners and customers to create Metadata Plug-ins that are linguistically and culturally appropriate for a target country or region.

2.8 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](#)
- [Cloud Management Plug-in 12.1.0.4 Features](#)
- [Cloud Management Plug-in 12.1.0.5 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](#)
- [Virtualization Management Plug-in 12.1.0.3 Features](#)
- [Virtualization Management Plug-in 12.1.0.4 Features](#)

2.8.1 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.

2.8.2 Cloud Management Plug-in 12.1.0.2 Features

2.8.2.1 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.

2.8.2.2 Purging Deployment Requests

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

2.8.2.3 Notification for Request Statuses

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

2.8.2.4 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.

2.8.3 Cloud Management Plug-in 12.1.0.4 Features

To support use cases where DRS/DPM is used in conjunction with schedule-based policies, the OVM pool as a target type is now available in the cloud policy authoring page. For example, an administrator may want to turn on DRS on a pool from Monday to Friday for load-balancing between hypervisors and turn on DPM on Saturday and Sunday to shut down under utilized hypervisors.

2.8.4 Cloud Management Plug-in 12.1.0.5 Features

2.8.4.1 Schema as a Service

This new capability provides the highest level of consolidation by hosting multiple schemas in a single database. Using Enterprise Manager 12c, Cloud users can request for one or more schemas, with seed data, from the out-of-the-box self service portal. Metering and chargeback capabilities provide visibility into resource consumption and expense incurred.

2.8.4.2 Database Cloning Using Snap Clone

Snap Clone is a new capability in Oracle Enterprise Manager 12c that provides instant database cloning. It enables administrators to provision copies of production systems very quickly into test environments. This is done using the built-in copy-on-write (CoW) capabilities of the underlying storage layer. Cloud users can request these databases and have them provisioned within minutes instead of hours all while keeping the storage needs to a minimum. The self-service provisioning capabilities save operational costs while helping DBAs to become more productive by removing the burdens of manual cloning tasks.

2.8.4.3 Database Cloning using RMAN Backup

RMAN has been the tool of choice for backing up and restoring databases for many years. Oracle Enterprise Manager 12c provides ability to clone databases using RMAN backups through the self service portal. This enables Cloud users who have not invested in storage cloning technologies to create full clones of databases within a few clicks.

2.8.4.4 Testing Cloud Self Service Portal

The Testing Cloud Self Service Portal, also known as Testing as a Service (TaaS), is a cloud-based platform for delivering automated application testing services. It is a self-service solution designed for private clouds. TaaS orchestrates the testing process end-to-end by automating the provisioning of test labs. This includes application under test and test tools, executing load and functional test scripts against the application, and providing rich application monitoring and diagnostics data for analysis. In addition, TaaS has a sophisticated charge back facility for metering and charging the usage of the testing cloud by end-users.

TaaS provides:

- A secure test library with access control for any assets consumed, for example Test Assets or Environment

- Automation and orchestration around provisioning of Test Drivers (test tools used together with TaaS)
- Test Drivers
- Rich monitoring and diagnostics
- Reporting capabilities
- Charge back and metering of resource usage during testing

2.8.5 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.

2.8.6 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.
- A new EM CLI verb (`test_named_credential`) is available to test the validity of specified named credentials. This is useful in scripts that can first verify if credentials are correct before using the credentials in jobs or other features that require credentials. The configuration of Privilege Delegation settings for a host can now be done by an Enterprise Manager administrator with Full privileges on the host. Administrators with at least View privileges on the host can view the host's privilege delegation settings.

Note: This feature is new in the 12.1.0.2 release.

2.8.7 Virtualization Management Plug-in 12.1.0.1 Features

Enterprise Manager Cloud Control provides comprehensive management for Oracle VM (x86) servers and Guest VMs. 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.

2.8.8 Virtualization Management Plug-in 12.1.0.2 Features

2.8.8.1 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.

2.8.8.2 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.

2.8.9 Virtualization Management Plug-in 12.1.0.3 Features

2.8.9.1 Support for Oracle VM 3.1.1 Management

The virtualization management functionality in Oracle Enterprise Manager 12c is now enhanced to include features from the latest Oracle VM 3.1.1 release. The key enhancements include:

- Automatic refresh of the (Oracle Cluster File System 2 (OCFS2) repository size
- Automatic resize of OCFS2 as part of a LUN (repository/server pool) resize
- Backup/restore of OCFS2 repositories
- Cold migration of VMs
- Multipath boot support for Oracle SAN (Storage Area Network)

- Support for hot vCPUs
- Ability to add and remove OCFS2 repository from a cluster

2.8.10 Virtualization Management Plug-in 12.1.0.4 Features

2.8.10.1 Support for Oracle VM 3.2.1 Management

The Virtualization Management Plug-in 12.1.0.4 provides support for managing Oracle VM 3.2.1 environments.

2.8.10.2 Virtual Server Roles

The I/O operations performed by virtual servers are resource intensive and can reduce application performance. To avoid this, you can now edit the virtual server and designate some servers to perform utility functions by assigning the following roles:

- Utility Role: Servers with this role are used for non-VM operations such as clone, import template, create repository, and delete assembly.
- Virtual Machine Role: Servers with this role are required to run VMs and perform start and stop operations.

2.8.10.3 Virtual Server Pool Enhancements

2.8.10.3.1 VM Start Policy While creating a virtual server pool, you can now specify the policy to be used to start the VMs. The VM Start Policy can be:

- Start on Best Server: The best server in the server pool is used to start the VM.
- Start on Current Server: The VM will be started on the same server on which it was created.

2.8.10.3.2 Agent Password You can now change the password for the OVM Agent running on the master server. The modified password is applied to the OVM Agents running on all virtual servers in the server pool.

2.8.10.4 Managing Multiple Virtual Servers

You can now upgrade, start, and stop multiple servers by selecting them on the Virtual Server Pool Members page.

2.8.10.5 Storage Repository

You can now periodically refresh and update the file system size of all storage repositories.

2.8.10.6 Cluster Timeout Period

During virtual server pool creation, if you enable clustering of Oracle VM servers in a virtual server pool, you can specify the cluster timeout period.

If Activate Cluster is enabled, you can set the cluster timeout period in seconds. The disk heartbeat and network heartbeat are derived from the cluster timeout value.

2.8.10.7 VM Administration

You can specify one or more tags for the VM. These tags are used to logically group the VMs and can be used to search for one or more VMs that meet a certain criteria.

2.8.10.8 Virtual Machine Tagging

Virtual machine tagging is now available. These tags are used to group the virtual machines logically and can be used to search for one or more virtual machines that meet a certain criteria. To apply virtual machine tagging, specify one or more comma separated tags.

2.9 Lifecycle Management

This section includes 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](#)
- [Data Comparison](#)
- [Bare Metal Provisioning](#)
- [File Update \(Make-It-So\) Support for ECM/CCS Configuration Data](#)
- [Enhanced Provisioning of Java EE Applications](#)
- [New Procedure Activity page](#)

2.9.1 Target Monitoring and Discovery Enhancements

2.9.1.1 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.

2.9.1.2 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.

2.9.1.3 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.

2.9.2 Configuration Discovery and Collection Enhancements

2.9.2.1 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.

2.9.2.2 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.

2.9.2.3 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.

2.9.2.4 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.

2.9.3 Configuration Management Enhancements

2.9.3.1 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.

2.9.3.2 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.

2.9.3.3 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.

2.9.3.4 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.

2.9.4 Compliance Enhancements

2.9.4.1 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.

2.9.4.2 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.

2.9.4.3 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.

2.9.4.4 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.

2.9.4.5 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.

2.9.5 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 2.5, "Database Management"](#).

2.9.6 Patch Management Enhancements

This section describes patch management enhancements.

2.9.6.1 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.

2.9.6.2 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.

2.9.6.3 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.

2.9.7 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.

2.9.8 Database Change Management Enhancements

2.9.8.1 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.

2.9.8.2 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.

2.9.8.3 Synchronization of `init.ora` Parameters

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

2.9.9 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.

2.9.10 Bare Metal Provisioning

Note: This feature is new in the 12.1.0.2 release.

You can save the configuration parameters for the BMP workflow as a deployment plan and reuse the plan for subsequent deployments.

2.9.11 File Update (Make-It-So) Support for ECM/CCS Configuration Data

Note: This feature is new in the 12.1.0.2 release.

EM 12c supports the collection of entire configuration files which are parsed and stored in the Enterprise Manager repository. When targets containing configuration files are compared, you can choose to synchronize unwanted differences from source to destination. With the use of comparison templates, you can ignore known or desired differences to maintain uniqueness.

By comparing a target to its baseline, you can see changes from a past state. You can essentially rollback changes by synchronizing differences from the baseline to the current configuration.

2.9.12 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.

2.9.13 New Procedure Activity page

Note: This feature is new in the 12.1.0.2 release.

The new Procedure Activity page offers the following benefits:

- Optimal screen design which enables you to access all of the steps and targets from the same page without having to drill down
- Multiple selections are possible from a single page. For example, if you want to select only the failed steps you can do so using the new design.
- The target-centric design with the introduction of filters makes it easy to analyze all failed steps from the same page and perform the required action on the step.
- You can view or download detailed output for every step which captures the log information pertaining to the step selected, making it easy to view and debug the step in case of a failure.
- Incident Creation is a new feature that has been introduced at the procedure level. It enables you to create an incident for the execution which can later be used to debug the procedure in case of a failure.

2.10 Application Performance Management

This section includes the following topics:

- [Real User Experience Monitoring Enhancements](#)
- [Business Transaction Management Enhancements](#)
- [Java Virtual Machine Monitoring and Diagnostics Enhancements](#)
- [JVM Diagnostic Integration With ADDM](#)
- [SLA Management Enhancements](#)
- [Simplified Middleware Diagnostics Deployment and Configuration](#)

- [Application Data Model](#)
- [Diagnostic Snapshot Support](#)
- [Oracle Services Oriented Architecture Dehydration Store Diagnostics](#)
- [Performance Diagnostics Enhancements](#)
- [Service Target Dashboard](#)

2.10.1 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.

2.10.2 Business Transaction Management Enhancements

Using BTM 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 BTM components. Doing this will provide message integrity and confidentiality for communication among distributed management components. You can also provide mutual authentication between management components.

2.10.3 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.

2.10.4 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.

2.10.5 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.

2.10.6 Simplified Middleware Diagnostics Deployment and Configuration

This release simplifies the process of enabling JVMD 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.

2.10.7 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.

2.10.8 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.

2.10.9 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.

2.10.10 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.

2.10.11 Service Target Dashboard

Note: This feature is new in the 12.1.0.2 release.

With this new feature, administrators can quickly create "out of box" overviews of the health of related services. They can create templates that contain a group of services selected from the defined services in Enterprise Manager. Any Enterprise Manager user can use these defined dashboards to quickly correlate the health of services, the status of key metrics, incidents and related status of the service level agreements tied to the service.

2.11 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.

2.11.1 Manage and Monitor Targets and Incidents

With smartphones and tablets becoming ubiquitous, the Oracle Enterprise Manager Cloud Control Mobile App enables administrators to manage and monitor all targets. The app provides the ability to look at all open incidents, update with the latest status, and assign an incident to other Enterprise Manager administrators.

2.12 My Oracle Support Integration

This section includes the following topics:

- [View Service Requests](#)
- [View Patch Recommendations](#)

2.12.1 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.

2.12.2 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.

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