Oracle® Enterprise Manager

Cloud Control Introduction

13c Release 2
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Oracle Enterprise Manager Cloud Control Introduction, 13c Release 2

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Contents

Index

Preface

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

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

http://docs.oracle.com/en/enterprise-manager/

Audience

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

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc`.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info` or visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs` if you are hearing impaired.

Structure

The book consists of the following chapters:

Overview of Oracle Enterprise Manager Cloud Control 13*c*

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

New Features In Oracle Enterprise Manager Cloud Control 13*c*

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

Conventions

The following text conventions are used in this document:

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

1

Overview of Oracle Enterprise Manager Cloud Control 13*c*

This chapter provides an overview of Enterprise Manager Cloud Control 13*c* and helps you understand its architecture and the various core components that are integrated within the product. It contains the following sections:

1.1 About Enterprise Manager Cloud Control 13*c*

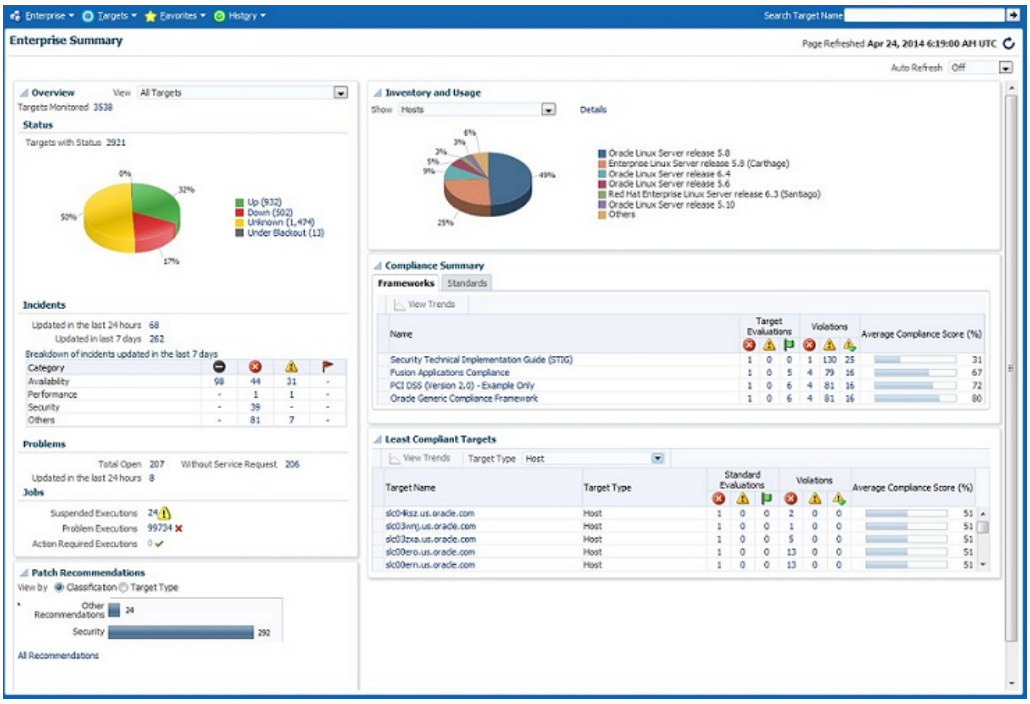
Oracle Enterprise Manager is Oracle's integrated enterprise information technology (IT) management product line, which provides the industry's only complete, integrated, and business-driven enterprise cloud management solution. Oracle Enterprise Manager creates business value for IT by leveraging the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



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 Architecture

This section introduces you to the architecture of Enterprise Manager Cloud Control and describes the core components of the product. It includes the following sections:

- Architecture of Enterprise Manager Cloud Control
- About Oracle Management Agent
- About Oracle Management Service (OMS)
- About Oracle Management Repository
- About Plug-ins
- About Oracle JVMD Engine
- About Oracle BI Publisher
- About Enterprise Manager Cloud Control Console
- About EMCTL
- About EM CLI

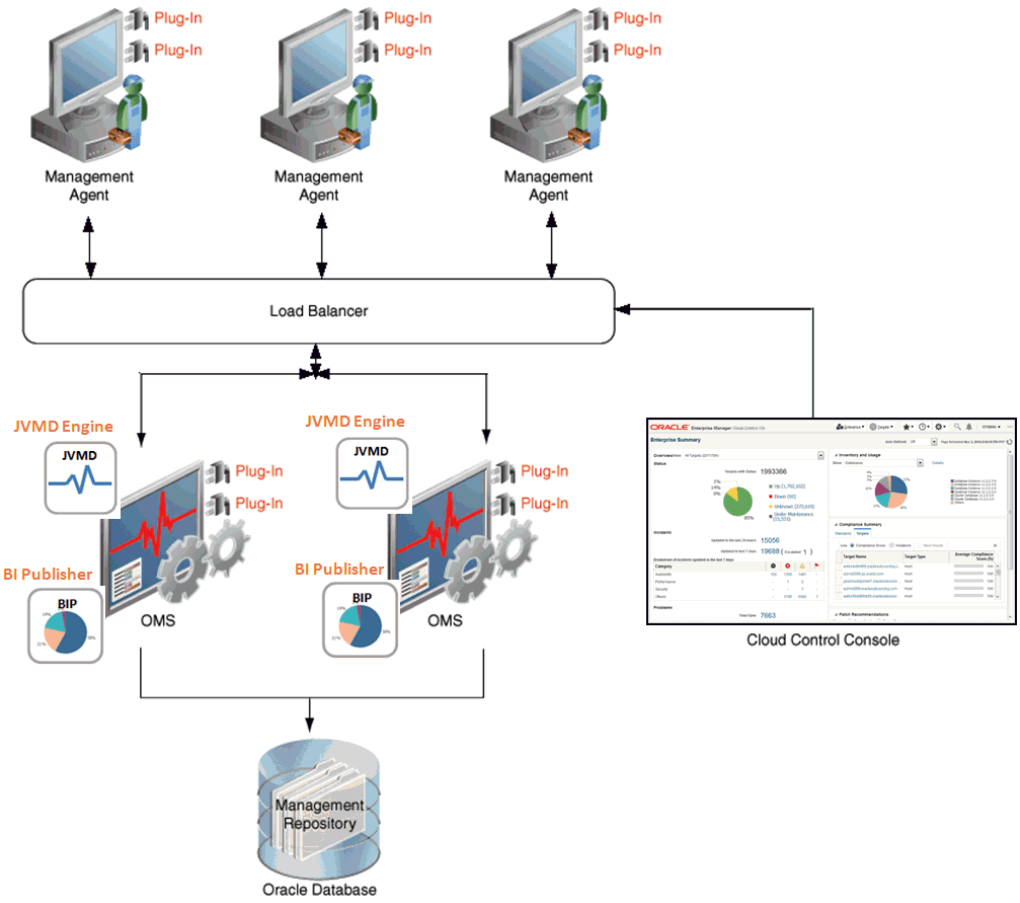
1.2.1 Architecture of Enterprise Manager Cloud Control

Enterprise Manager Cloud Control includes the following components:

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

Figure 1-2 shows a sample Enterprise Manager Cloud Control configuration 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 Service (OMS) instances 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 OMS instances.

1.2.2 About Oracle Management Agent

The Management Agent is an integral software component that enables you to convert an unmanaged host to a managed host in the Enterprise Manager system. The Management Agent works in conjunction with the plug-ins to monitor the targets running on that managed host.

With the first Oracle Management Service (OMS) you install, by default you receive a Management Agent called the *Central Agent.* The *Central Agent* is used for monitoring only the first OMS host, the first OMS, and the other targets running on the first OMS host. To monitor other hosts and the targets running on those hosts, you must install a separate *Standalone Management Agent* on each of those hosts.

1.2.3 About Oracle Management Service (OMS)

Oracle Management Service (OMS) is a Web-based application that orchestrates with the Management Agents and the plug-ins to discover targets, monitor and manage them, and store the collected information in a repository for future reference and analysis. The OMS also renders the user interface for Enterprise Manager Cloud Control.

The OMS is deployed to the middleware home, which is the parent directory that contains Oracle WebLogic Server, OMS, plug-ins, Java Development Kit (JDK), Oracle WT directory, Oracle Common, and other relevant configuration files and directories. While installing the OMS, the Enterprise Manager Cloud Control Installation Wizard automatically installs Oracle WebLogic Server and JDK, and therefore, a WebLogic Server admin console is available by default.

1.2.4 About Oracle Management Repository

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

The OMS 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 OMS and displayed in the Enterprise Manager Cloud Control console. Since 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.

1.2.5 About Plug-ins

Plug-ins are pluggable entities that offer special management capabilities customized to suit specific target types. Unlike the earlier releases of Enterprise Manager, in Enterprise Manager Cloud Control, the plug-ins work in conjunction with the OMS and the Management Agent to monitor every target in your environment. Therefore, they are deployed to the OMS as well as the Management Agent. In the earlier releases, plug-ins enabled you to monitor only third-party targets, but in Enterprise Manager Cloud Control, plug-ins enable you to monitor all types of targets in your environment.

Plug-ins have independent release cycles, so every time you have a new version of an Oracle product released, you will have a new version of the plug-in released to support monitoring of that new product version in Enterprise Manager Cloud Control. This simplifies things because you no longer have to wait to upgrade your Enterprise Manager system to support a new product version; instead you can upgrade your plug-ins to monitor the new product version.

Table 1-1 lists the default plug-ins that are installed with a new Enterprise Manager system. In addition to these 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 Default Plug-ins Installed with Enterprise Manager Cloud Control

Name	Description
Oracle Database	Enables you to discover, 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 discover, monitor, and manage Oracle Fusion Middleware products such as Oracle WebLogic Domain, Oracle WebLogic AdminServer, Oracle WebLogic Server, Oracle SOA Suite, Oracle Web Tier, and so on.
Oracle Exadata	Enables you to discover, monitor, and manage Oracle Exadata targets.
Oracle Cloud Framework	Enables you to access basic features that are common across cloud services such as Middleware as a Service (MWaaS), Database as a Service (DBaaS), Infrastructure as a Service (IaaS), and Testing as a Service (TaaS).
Oracle System Infrastructure	Enables you to discover, monitor, and manage Oracle hardware systems and Super Cluster engineered systems, including server hardware, chassis, racks, power distribution unit, network equipment, operating systems, virtualization software, and clustering software.

1.2.6 About Oracle JVMD Engine

Java Virtual Machine Diagnostics (JVMD) Engine enables you to diagnose performance problems in Java applications in the production environment. By eliminating the need to reproduce problems, it reduces the time required to resolve these problems, thus improving application availability and performance.

Starting with Oracle Enterprise Manager 13*c* , as part of the Oracle Fusion Middleware Plug-in deployment, one JVMD Engine is installed and configured by default on the OMS. For every additional OMS you deploy, you receive one JVMD Engine by default with that OMS.

While JVMD Engine is installed by default on the OMS host, you will still need JVMD Agents to be manually deployed on the targeted JVMs.

1.2.7 About Oracle BI Publisher

Oracle Business Intelligence (BI) Publisher is Oracle's primary reporting tool for authoring, managing, and delivering all your highly formatted documents. Oracle BI

Publisher makes your data stand out with pixel-perfect reports and dashboards, offers a variety of report and dashboard layouts, and enables you to create all types of highly formatted documents.

Starting with Oracle Enterprise Manager 13*c*, Oracle BI Publisher is installed and configured by default on the OMS. For every additional OMS you deploy, you receive one Oracle BI Publisher by default with that OMS.

1.2.8 About Enterprise Manager Cloud Control Console

The Enterprise Manager Cloud Control console is the user interface you see after you install Enterprise Manager Cloud Control. See Figure 1-1. 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.

1.2.9 About EMCTL

EMCTL is a command-line tool that enables you to execute certain tasks on the OMS and Management Agents. You can use it for tasks such as starting or stopping OMS instances, setting properties on OMS instances, or getting a list of targets being monitored by a specific Management Agent. EMCTL commands are executed on a specific OMS or Management Agent.

1.2.10 About EM CLI

The Enterprise Manager Command Line Interface (EM CLI) is a command-line tool that is accessible through classic programming language constructs, enabling tasks to be created and run either from the command-line or programatically. EM CLI enables you to access Enterprise Manager Cloud Control functionality from text-based consoles (shells and command-line windows) for a variety of operating systems.

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
- Hybrid Cloud Management
- Lifecycle Management
- Application Performance Management

- Application Quality Management

> **Note:**
>
> Some of the Enterprise Manager 13c DB Plug-in pages related to database management require Adobe Flashplayer Plugin for rendering.

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 also available.

1.3.4 Database Management

Oracle revolutionized the field of enterprise database management systems with the release of Oracle Database 10*g* 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 and Subsetting
- Performance Management
- Automatic Tuning

In addition, Oracle Enterprise Manager Cloud Control provides the following database management capabilities:

- Provides problem detection and guided resolution work flows
- Enables you to perform day to day tasks from Enterprise Manager Cloud Control
- Enables you to run repetitive jobs from Enterprise Manager Cloud Control

1.3.5 Middleware Management

Oracle Enterprise Manager Cloud Control 13*c* provides a comprehensive management solution for Oracle WebLogic Server, Oracle Fusion Middleware, and non-Oracle middleware technologies. Oracle's offering encompasses out-of-the-box availability and performance monitoring, robust diagnostics, administration, and lifecycle management that includes configuration and compliance management as well as provisioning and patching across middleware software such as:

- WebLogic Server
- SOA Suite
- Coherence
- Identity Management
- WebCenter
- Web Tier
- Business Intelligence
- Exalogic Elastic Cloud
- Oracle GlassFish
- 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 higher 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 13*c* 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.

For more information, see the Oracle Enterprise Manager 13*c* Extensibility Exchange page:

http://www.oracle.com/goto/emextensibility

1.3.8 Cloud Management

Enterprise cloud presents new management challenges. With a move to virtualization, a top benefit expected from private cloud adoption is cost savings through standardization for operational efficiency. However, without proper management capabilities, expected economic benefits of cloud computing will not be realized.

Oracle Enterprise Manager Cloud Control 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 Hybrid Cloud Management

With Hybrid Cloud Management, Enterprise Manager Cloud Control provides you with a "single pane of glass" for monitoring and managing on-premise as well as Oracle Cloud deployments, all from the same management console. By deploying Hybrid Cloud Agents onto the Oracle Cloud virtual hosts serving your Oracle Cloud services, you are able to manage Oracle Cloud targets just as you would any other. The communication between Management Agents and your on-premise Oracle

Management Service instances is secure from external interference. In addition to a hardened architecture of its own, Enterprise Manager supports the use of additional external HTTP proxies that support tunneling, which can be configured to connect to the Oracle Cloud.

1.3.10 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.

1.3.11 Application Performance Management

Enterprise Manager 13*c* 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.

1.3.12 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, Fusion, Siebel, PeopleSoft, Hyperion, 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.

2

New Features In Oracle Enterprise Manager Cloud Control 13*c*

This chapter provides an overview of the new features available in Oracle Enterprise Manager Cloud Control 13*c*. It lists new features specifically associated with the base Oracle Enterprise Manager platform which includes the Cloud Control console, Oracle Management Service, and Oracle Management Agents.
This document contains the following sections:

2.1 Virtualization

Oracle VM is a platform that provides a fully equipped environment for better leveraging the benefits of virtualization technology, and it enables you to deploy operating systems and application software within a supported virtualization environment.

The entire Oracle VM environment can be managed from within Oracle Enterprise Manager. Oracle Enterprise Manager offers extended functionality beyond that of Oracle VM. The Enterprise Manager for Oracle Virtualization (VT) Plug-in has been extended to work seamlessly with Oracle's latest server virtualization product, Oracle VM Release 3.4. Oracle VM Release 3.4 delivers many important features and enhancements to enable rapid enterprise application deployment.

2.2 Database Management

This section describes new features and enhancements for database management.

- Discovery and monitoring of database 12.2 including monitoring of database shards.
- Lifecycle management of database 12.2 including support for provisioning, patching, and upgrading from earlier versions.
- Database as a Service support for database 12.2 including support for relocation and clone refresh.

- Fleet patching is now supported for 12c pluggable databases. Enterprise Manager provides automated patching for a fleet of container databases then migrate the pluggable databases in phases. The feature is complemented with sophisticated reporting to track the overall progress.
- Simplified deployment of SaaS applications through multi-tenant application container database support. Discovery and administrative operations of application containers and associated PDBs is also supported.
- Accurate performance diagnostics with simplified database administration using per-PDB snapshots and reporting in a multi-tenant environment.
- Out-of-the box visualization of resource usage at the PDB level and ability to navigate and analyze large number PDBs in a scalable manner. Enterprise Manager provides intuitive visualization for PDB level resource usage distribution, identifying resource usage outliers, and analyzing resource usage trends over time.

2.2.1 Database Fleet Maintenance

Database Fleet Maintenance uses the software end-state to standardize the Oracle home content and provides a simple and reliable way to roll out patches and upgrades across the database estate.

It enables administrators to recognize configuration pollution in their database estate and provide recommendations to patch and upgrade their databases to the standardized configurations. Administrators can subscribe databases to these standardized configurations and perform automated bulk updates without any manual intervention and with minimum downtime.

2.3 Middleware Management

This section describes new features and enhancements for middleware management.

2.3.1 Weblogic Management Enhancements

The enhancements in this release are:

- **Provisioning and Patching Support for WebLogic Release 12.2.1.1 and 12.2.1.2 Domains**: Provisioning and patching of Oracle WebLogic Server Release 12.2.1.1 and 12.2.1.2 is now supported. In terms of provisioning, all use cases are now supported against releases 12.2.1.1 and 12.2.1.2 – including creation of profiles, cloning of profiles and scaling up/out of clusters.

- **Configuring Application Deployments**: Administrators can configure and tune application deployments directly from the Oracle Enterprise Manager Cloud Control console. Using the Cloud Control console as the single pane of glass for configuring, monitoring and fully managing all domains helps to guarantee the security of your WebLogic environments.
- **Support for Staggered Restart of WebLogic Cluster**: Administrators can stop and restart one server at a time, ensuring zero down time for applications deployed to the cluster.
- **Deploy/Undeploy/Redeploy Java EE Applications to Resource Groups or Resource Group Templates**: The Java EE Applications provisioning capabilities have been enhanced to support deployment into resource groups and resource group templates. This saves administrators time and effort by automating deployment tasks across multiple domains in a single operation rather than several on a domain by domain basis.
- **Custom WLST Commands Supported in WLST Script Job Type**: Administrators can now schedule, execute and track custom WLST commands. With this enhancement to the predefined WLST Script job type, administrators can specify the directory location from where WLST should be launched (the Oracle Common home or component home).
- **Improved User Experience for Scaling Up/Out WebLogic Cluster**: The deployment procedure to scale up or scale out an existing WebLogic Cluster has been simplified and enhanced.

2.3.2 JVM Diagnostics

The enhancements in this release are:

- The new agent deployment system provides faster, simpler, and more reliable installation of JVMD agents on WebLogic servers.
- Automatic deployment of JVMD agents as part of a WebLogic and SOA domain provisioning is now supported.
- Enhanced Java Workload Explorer user interface, allows for easy zoom-in and granular view of at 1 second intervals.

2.3.3 SOA Management

For FMW 12.2.1.2 and higher, SOA composites are not modeled as targets. This will reduce the load on Enterprise Manager while continuing to provide all existing functionality.

2.3.4 Oracle HTTP Server Management

The new features in this release are:

- **Track Compliance to the Oracle HTTP Server 12c Security Technical Implementation Guide (STIG)**: The Fusion Middleware Plug-in Release 13.2.2 provides an out-of-the-box compliance standard based directly on the Department of Defense's Security Technical Implementation Guide (STIG) for Oracle HTTP Server 12.1.3. Administrators can directly leverage this standard to confirm that their Oracle HTTP Servers – whether in a WebLogic Server domain or standalone domain - conform to the CAT I rules included in the STIG.

- **WebLogic Server Proxy Plug-in Metrics for Oracle HTTP Server**: New performance metrics specific for the Oracle WebLogic Server Proxy Plug-in (mod_wl_ohs) module are available. These new metrics are available with Oracle HTTP Server Release 12.2.1.x when collocated with a WebLogic Server domain.

2.3.5 Fusion Middleware Lifecycle Management

The enhancements in this release are:

- **Fusion Middleware Patching**: Opatch auto based patching for Fusion Middleware 12.2.1.x and higher is now supported.
- **Provisioning of Oracle Fusion Middleware Infrastructure Release 12.2 Installation Media**: Provisioning of JRF domain from installation media profile is now supported. Administrators can provision the profile to install WebLogic Server across multiple hosts and configure a domain with Oracle JRF or Oracle Restricted JRF templates.
- **Import domain as a partition (WebLogic 12.2.1.2 and higher)**: This capability facilitates domain consolidation and allows for quick domain upgrade. Administrators can export one or more existing 12.1.x or 10.3.6 domains and import them as partitions of a 12.2.1.x domain.

2.3.6 Coherence Management

Support of standalone Coherence clusters configured with dynamic management node (12.2.1.x and higher) is now available. With this functionality, if the management node fails, administrators can continue monitoring by quickly switching to a new management node.

2.3.7 Fusion Middleware Plug-in (13.2.1.0) Features

This section describes new features and enhancements included in the Fusion Middleware Plug-in (13.2.1.0):

- Middleware Routing Topology Viewer
- Process Control for Node Manager
- Expiry Time of SSL Certificates for Oracle HTTP Server
- Oracle Traffic Director Performance Metrics
- New Thread State (Other)
- SOA Management
- Weblogic Management Enhancements
- Support for Service Bus Patching
- Configure Multitenancy in Oracle WebLogic Server
- Export and Import Partitions in WebLogic Server Multitenant

2.3.7.1 Middleware Routing Topology Viewer

Beginning with Fusion Middleware Plug-in release 13.2.1.0, the Fusion Middleware Routing Topology Viewer's dependency on Adobe Flash has been removed.

The Routing Topology Viewer provided in previous Oracle Enterprise Manager Cloud Control releases required the use of Adobe Flash. Removal of the Adobe Flash dependency improves the users experience with the routing topology viewer as well as reduces the risk of security vulnerabilities.

2.3.7.2 Process Control for Node Manager

Administrators can now perform start or stop operations against Oracle WebLogic Node Manager targets directly from the Oracle Enterprise Manager Cloud Control console.

In addition to immediate execution of these process control operations, administrators can also choose to schedule such operations in the future. When administrators discover that a Node Manager process is unexpectedly down, they want to immediately bring the process back up. Being able to control Node Manager processes directly from Cloud Control helps the administration team to be more efficient and effective in managing their middleware environment.

2.3.7.3 Expiry Time of SSL Certificates for Oracle HTTP Server

This release introduces certificate monitoring for Oracle HTTP Server targets.

By enabling and configuring the out-of-box “No of days left for expiry of the certificate” metric for Oracle HTTP Server, administrators can be alerted about SSL certificates that are about to expire. This ability enables administrators to be more proactive in monitoring their middleware environment.

2.3.7.4 Oracle Traffic Director Performance Metrics

With Fusion Middleware Plug-in 13.2.1.0, Oracle Enterprise Manager Cloud Control introduces several new performance metrics for the Oracle Traffic Director instance target type.

These metrics span the three categories of Connection Queue metrics, Keep Alive metrics and Session metrics. By tracking data for these performance metrics, administrators are able to ensure optimal performance of the Oracle Traffic Director instance. In addition, administrators can set thresholds for the metrics so that if the thresholds are breached, alerts and notifications are sent to on-call staff.

2.3.7.5 New Thread State (Other)

The new thread state, Other, is introduced to display threads executing user requests, even if the thread is idle at the time of sampling.

In previous releases, threads that were not identified as using JVM or OS resources, were identified as idle and were ignored. As result, during the request execution, the user experienced long wait-times and JVMD did not show the state of the threads. However, with the new enhancement, JVMD marks such threads as being in “Other” state. This change enables users to see samples of request states during the entire execution period.

2.3.7.6 SOA Management Features

Enterprise Manager Cloud Control 13c Release 2 includes several new Services Oriented Architecture (SOA) management features.

- **Heat Map for SOA Composites**

  Using SOA heat maps, administrators have a clear view of the entire SOA estate. The Heat Map tab shows the health and performance of a composite. Administrators can change the configuration of the heat map, select metrics for the size and color, group by specific criteria (for example, by Partition) and limit the service count for scalability. Administrators will save time by viewing the entire SOA estate in a single page.

- **Integration of the IWS Report**

  The SOA Integrated Workload Statistics (IWS) report is a new diagnostic feature added as part of the SOA 12.2.1 release. IWS reports provide a variety of statistics such as system resource usage, message flows at key points in the system, backlogs at various components, and activity execution times which can diagnose performance/scaling issues. With this release, users can generate and download an IWS report from Enterprise Manager Cloud Control, enabling administrators to use Enterprise Manager Cloud Control as the single tool to manage their entire SOA estate.

- **Download/Export SOA Composite**

  This release of Enterprise Manager provides the ability to export and download SOA 11g and SOA 12c SAR files from Enterprise Manager Cloud Control. This feature is very useful for hybrid cloud scenarios where users can download a composite from one SOA instance and deploy it on another SOA instance from within Enterprise Manager Cloud Control.

- **SOA Cloud Service Certification**

  Enterprise Manager now certifies all monitoring and diagnostic features on SOA Cloud Service (CS). Using the hybrid cloud approach, users can now discover SOA instance running on SOA CS in Enterprise Manager Cloud Control and avail of all monitoring and diagnostic features. This is a very useful feature for hybrid cloud scenarios. With this feature users can add an SOA CS instance to Enterprise Manager and start monitoring and managing it from a single pane of glass.

2.3.7.7 Support for Service Bus Patching

Users can now patch Oracle Service Bus (OSB) targets or an OSB cluster target from Enterprise Manager using the Enterprise Manager patching framework.

Patch plans have been improved to contain heterogeneous patches so users can apply Weblogic and OSB patches in a single patch plan. Users can now run post patch SQL scripts through the patching wizard. This feature enables administrators to perform automated patching to patch OSB targets and clusters. With the ability to contain heterogeneous patches in a single patch plan and run post patch SQL scripts, administrators will save the effort required for manual execution.

2.3.7.8 Configure Multitenancy in Oracle WebLogic Server

Beginning with Oracle Enterprise Manager Cloud Control release 13.2 and the Fusion Middleware Plug-in release 13.2.1.0, administrators can configure settings related to multitenancy in Oracle WebLogic Server 12*c*.

Administrators can now create, edit, and delete resource groups, resource group templates, virtual targets, and partitions directly from the Cloud Control console to provide a sharable infrastructure for use by multiple organizations.

Having multitenancy configuration capabilities integrated into the Oracle Enterprise Manager Cloud Control console simplifies an administrator's job and increases productivity by offering a single interface for comprehensive management of the WebLogic environment.

2.3.7.9 Export and Import Partitions in WebLogic Server Multitenant

Beginning with Oracle Enterprise Manager Cloud Control 13*c* Release 2 and Fusion Middleware Plug-in Release 13.2.1.0, administrators can use Cloud Control to export a partition from one domain and then import that partition into another domain.
The source or destination domain can be installed on-premises or it can be running in the cloud.

Creating partitions with the export and import feature of the Oracle Enterprise Manager Cloud Control console offers maximum flexibility to administrators and simplifies their job by offering a single console from which to perform all of their day-to-day operations.

2.4 Infrastructure Management

The new features in 13.2.2.0 release are:

- **Discovery and Monitoring of New Hardware Targets**: Oracle MiniCluster S7-2, Oracle Server X6-2 and SPARC S7-2 Server can now be monitored.
- **SuperCluster Virtualization Provisioning**: Support for creating a RAC Cluster including VMs, Oracle Database, Grid Infrastructure and ASM is now available. Scale up and scale down of a RAC Cluster by adding or removing VMs including Oracle Database, Grid Infrastructure, and ASM is also supported.

The new features in 13.2.3.0 release are:

- **Discovery and Monitoring of New Hardware Targets**: Oracle SPARC M8-8 Server, Oracle SPARC T8-1, Oracle SPARC T8-2, Oracle SPARC T8-4, Oracle Server X7-2, Oracle Server X7-2L, Oracle Server X7-2C, Oracle Server X7-8, Oracle MiniCluster S7-2, ZFS Storage ZS5-2, ZFS Storage ZS5-4, Juniper EX switch, and Cisco Nexus switch can now be monitored.

2.5 Hybrid Cloud Management

The new features in this release are.

- **Automated Service Discovery and Target Promotion on the Discovered Services**: Discovery of cloud services specific to a particular tenant and the

discovery of targets belonging to these services is now supported. Discovery can also be driven at scale using command line and response files.

- **Data Management for Hybrid Cloud**: Data backup (full and incremental) from on-premise or Oracle Cloud to Oracle Cloud based on a periodic schedule is now supported. The data can then be used to instantiate a new DBCS service or refresh existing DBCS instances periodically for development and testing purposes. Additionally, the new workflow allows users to "time-travel" to a point in time and refresh the data. The database on Oracle Cloud can also be cloned using storage-efficient thin cloning technologies on Oracle Cloud.

2.6 Framework and Infrastructure

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

- Support for Transport Layer Security 1.2
- Support for Exadata X6–2
- Support for Exadata and Real Application Custers with IPv6
- Upgrade and Transition to Disaster Recovery Readiness Feature
- Federated Caching Monitoring
- Support for IPv6
- Software Only Install with Plug-ins

2.6.1 Support for Transport Layer Security 1.2

Enterprise Manager 13*c* now supports monitoring targets on Transport Layer Security (TLS) 1.2 secure communication protocol.

2.6.2 Support for Exadata X6–2

Enterprise Manager can now monitor and manage Exadata X6-2 systems.

2.6.3 Support for Exadata and Real Application Custers with IPv6

You can now use Enterprise Manager to monitor and manage IPv6 enabled Exadata systems and IPv6 configurations with Real Application Clusters (RAC) databases.

The IPv6 network provides several technical benefits including larger address spaces.

2.6.4 Upgrade and Transition to Disaster Recovery Readiness Feature

The Upgrade and Transition to Disaster Recovery (DR) Readiness feature provides seamless transitioning from two-domain disaster recovery installations to single-domain disaster recovery installations.

This feature enables users to transition Enterprise Manager 12*c* installations with existing disaster recovery implementations from the Standby OMS instances using Standby WebLogic Domain disaster recovery architecture (also known as a two-domain installation) to the Standby OMS instances using Storage Replication disaster

recovery architecture (also known as a single-domain installation) on Enterprise Manager 13*c*. It is available through the Upgrade option in the Enterprise Manager Installer.

After starting the installer with the UPGRADE_TRANSITION flag specified, the Upgrade and Transition to DR Readiness option appears and enables users to configure an alias host name and specify an installation location on replicated storage. This option can also be used to configure an Enterprise Manager 13*c* installation according to Maximum Availability Architecture (MAA) best practices to support a future disaster recovery implementation.

2.6.5 Federated Caching Monitoring

Federated caching provides support for active-active, active-passive, hub and spoke, and custom multi-datacenter topologies.

When a monitored cluster participates in data federation, Enterprise Manager Cloud Control identifies the remote cluster and presents metrics related to the data federation including performance and volume metrics at the cluster, node, and service levels. Federated caching provides improved scalability, durability, latency, and configurability of data replication. Data monitoring enables users to ensure the health, impact, and performance of the federation on the monitored cluster.

2.6.6 Support for IPv6

Enterprise Manager 13*c* can now be configured on pure IPv6 or dual IPv6/IPv4 stack.

2.6.7 Software Only Install with Plug-ins

This feature provides an efficient way of performing an upgrade with minimal downtime and is the recommended approach. It enables the user to deploy the software binaries along with plug-in binaries well ahead of the downtime and also deploy all the mandatory plug-ins. Additionally, it enables users to select and deploy other optional plug-ins of their choice.

2.7 Enterprise Monitoring and Incident Management Features

2.7.1 Always-On Monitoring Enhancements

Always-On Monitoring provides continuous monitoring of target down and other critical alerts when the regular Enterprise Manager monitoring and notification services are unavailable during Enterprise Manager planned downtime.

This release provides the following enhancements to Always-On Monitoring:

- **Always-On Monitoring Installed on a Different Host**

  Always-On Monitoring can now be installed on a different host than the Oracle Management Service. This allows Always-On Monitoring to provide continuous monitoring of targets when the Oracle Management Service host is not available.

- **New emsctl list_agents Verb**

The new emsctl list_agents verb provides information about Management Agents that are communicating with Always-On Monitoring. Prior to a planned Enterprise Manager downtime, it is necessary for the Enterprise Manager administrator to know if all agents are uploading their alerts to the Always-On Monitoring service. The emsctl list_agents verb provides a count of the agents that have communicated with the Always-On Monitoring Service within the past hour, as well as the URL for each agent. This gives the Enterprise Manager administrator assurance that the agents are uploading their alerts to the Always-On Monitoring service prior to a planned Enterprise Manager downtime.

2.8 Cloud Management

2.8.1 Virtual Infrastructure Plug-in (13.2.1.0)

The Virtual Infrastructure Plug-in (13.2.1.0) works seamlessly with Oracle's latest server virtualization product, Oracle VM Release 3.4.

Oracle VM is an enterprise-class server virtualization solution comprised of Oracle VM Server for x86, Oracle VM Server for SPARC, and Oracle VM Manager. Oracle engineered the Oracle VM server virtualization and management solution to address the market segments of private cloud infrastructure within a corporate data center, or at a hosting site (managed cloud services) as well as cloud service providers. Oracle VM enables virtual machines to be deployed, managed, and moved throughout Oracle’s public and private cloud infrastructure.

Oracle VM Release 3.4 delivers many important features and enhancements to enable rapid enterprise application deployment. The entire Oracle VM environment can be managed from within Oracle Enterprise Manager. In addition, Oracle Enterprise Manager offers extended functionality beyond that of Oracle VM.

2.8.2 Database Lifecycle Management on Compute Cloud

Administrators can now achieve complete automation on provisioning databases using locked down configurations along with binaries (Profile) on any Compute Service. Using out-of-box deployment procedures, they can also upgrade any existing databases running on Compute Cloud. Data cloning and refresh across clouds is available for secure (TDE enabled) databases via a context sensitive wizard based on library of backups (db_clone_managment emcli verb group) to Oracle Cloud, within Oracle Cloud, and from Oracle Cloud back to on-premise databases.

2.8.3 Extend DBaaS to Oracle Cloud

Cloud Administrators can design dedicated PaaS Infrastructure zones and database pools for provisioning databases through the Self Service Portal on Compute nodes. With Enterprise Manager version 13.2, creating pluggable databases on container database Cloud Service instances using published service templates is also supported.

Index

V

W

X