Oracle Enterprise Manager 13c

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Agenda

Journey from Oracle Enterprise Manager 12c to 13c
What’s New in EM 13c
Hybrid Cloud Management
Engineered Systems & Hardware Management
Database Management
Middleware Management
Q&A
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What’s New in EM 13c

Hybrid Cloud Management

Engineered Systems & Hardware Management

Database Management

Middleware Management

Q&A
Total Cloud Control

Superior Enterprise-Grade Management

Integrated Cloud Stack Management

Complete Cloud Lifecycle Management

Scalable, Secure  |  Optimized, Efficient  |  Agile, Automated
Enterprise Manager 12c Journey

Unique Improvements

- Hybrid Management
- Snap Clone
- Metering and Showback
- Middleware as a Service
- Database as a Service
- Infrastructure as a Service
- SQL Performance Analyzer
- Real-Time ADDM
- Patch Plans
- Compliance Framework
- Incident Manager
- Administrative Groups

- Introduced Cloud Management and extended to Hybrid Cloud
- Combined features from several acquisitions in Configuration and Performance Management
- 1500+ Enhancements across 4 patchsets
Enterprise Manager 12c: Unmatched customer adoption

- 10x agility
- 90% storage savings
- 50% less patching efforts
- 25% less testing efforts
Enterprise Manager 12c is the Nerve Center of Oracle Cloud

Management at an unprecedented scale

- 2.5 M assets monitored
- 25K service instances monitored per day
- 50+ Compliance Standards
- 2000 Groups
- 3.4 M events processed per day
- 11 M business flow tests per day
- 10 K compliance evaluations per day
- 2M job executions per day

*Statistics for largest site
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What’s New in EM 13c

Hybrid Cloud Management

Engineered Systems & Hardware Management

Database Management

Middleware Management

Q&A
Building on a Solid Foundation

Superior Enterprise-Grade Management

Integrated Cloud Stack Management

Complete Cloud Lifecycle Management

NEW: “Always On” Monitoring
NEW: Infrastructure Management
NEW: Improved Hybrid Cloud Management

Scalable, Secure | Optimized, Efficient | Agile, Automated
"The Communication Hub of Oracle"

- Single pane of glass for hardware and software management across cloud & on-premise
- Centralized communication & collaboration for diagnostics and troubleshooting
- Designed to share critical information while maintaining sandboxes
- Integrated named credentials & auditing
Key Infrastructure Capabilities

- Ease of cloud scale agent deployment via gold images

- **24x365** monitoring for Enterprise Manager targets
  - “Always on” regardless of planned or unplanned downtime of Enterprise Manager
  - Sends email for critical alerts

- Notification Blackout
  - Monitoring continues during planned maintenance of targets but no notifications are sent

- Intelligent Incident Compression
  - “Noise reduction” through automatic grouping of events
Drift, Consistency and Compliance Management

• Drift Management – INTER Target
  • Large scale and dynamic INTER target configuration difference tracking
  • Source can be live or saved baseline
  • Compliance and Drift Management across Clouds

• Consistency Management – INTRA Target
  • Auto comparison of member targets
  • System targets only (Exadata, Cluster DB, WebLogic Cluster, etc)

• Compliance Management Enhancements
  • Integration of Oracheck
  • STIG support for database 12c and Weblogic Server 12c
  • Automated corrective actions, e.g: lock accounts on multiple login attempt failures
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Enterprise Manager driven Hybrid Cloud Management

Single view of on-premises and Oracle Cloud

Clone or move workloads between Oracle Cloud and on-premises

Single Management Tool for On Premises and Public Cloud
Hybrid Cloud Managing Java – New OPC Service Provisioning

• Create template based on the existing services (service catalog)
• Provision JCS / SOA CS domain using Cloud APIs from on-premises EM using the created templates
• Monitoring and management from on-premises EM with the Single Pane of Glass view
Enterprise Manager JVMD on Hybrid Cloud (PaaS)

On Premises

EM

OMS

JVMD Engine

HTTPS

Hybrid Gateway Agent

JVMD Forwarder Handler

SSH

Oracle Cloud

Monitored Host

JVM

JVMD Agent WAR

HTTPS

Hybrid Gateway Proxy

JVMD Endpoint Handler

HTTPS

EM Agent

Application Database

On Premises

Oracle Cloud
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Q&A
Unification of hardware and software management

- Single pane of glass for hardware and software management
- Ease of diagnostics with drill down from application
- Unified
  - Agent and Management Service
  - Security Framework
  - Software Library
  - Incident Management
  - Job System
  - Extensibility
Engineered Systems Management

- **Provisioning**: VMs on Exadata and Exalogic
- **Monitoring**: Of entire stack
- **Compliance**: Proactive Exachecks
- **Patching**: End to end stack patching for Exa
- **Telemetry**: ASR integration
Engineered Systems Patching (Exadata)

- Exadata Bundle Patch Recommendation
- Pre-flight analysis
- Component level decomposition of patches
- Detailed drilled down logging
Infrastructure Management: Supercluster Management

Target Navigation Tree

Simplified Dashlet view

Hardware depicting faulty components (in red) and integrated with Incident Manager

Photorealistic and Schematic views
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Q&A
Next Generation DB Tuning Process

Effective, Accurate, Automated

• Built-in, self-diagnostics engine
• Automates complex and time consuming task of application tuning
• Validates tuning activities

* SPA is part of Real Application Testing
Find - Methodology and Toolset

• Gather Data: Performance and workload data capture
  – System statistics, wait information, SQL Statistics, etc.

• Data Analysis and Problem Identification
  – What types of operations are consuming most time?
  – Which resources is the bottleneck?
  – What is the root cause? / How can problem be remediated?

• If multiple problems identified, which is most critical?
• Which solution will give me most benefit?
• For SQL Related problems, ADDM recommends running SQL Tuning Advisor

AWR

ADDM
Fix - Automatic SQL Tuning

- **Automatic SQL Tuning**
  - Captures high-load SQL
  - Tunes SQL using SQL Profiles
  - Implements greatly improved SQL plans (optional)
- **Performance benefit of advice provided**
- **SQL Profiling tunes execution plan without changing SQL text**
- **Enables transparent tuning for packaged applications**
Validate - Real Application Testing Features

- Proactively identifies impact of routine DBA tasks on database performance
- SQL response time (unit) testing solution
  - Designed for identifying and tuning regressed SQLs
- Load and throughput testing solution
  - Designed for detecting and remediating throughout problems
- Consolidation testing and capacity planning solution
  - End-to-end consolidation solution
Database Management: Flexible DB Access Control

Fine-Grain Authorization for Database Management
Flexible privilege model and OOB roles that map to various personae, for e.g., Application Developer or DBA, View or Manage Performance, etc.

Authorized

- Performance
- SQL Monitor
- SQL Plan Control
- Top Activity
- Top Consumers
- SPA
- Read Only access to
  - Sessions
  - Database Schema
  - Optimizer Statistics

Not authorized

- Database Startup /Shutdown
- Run SQL
- SQL Worksheet
- Security Pages (Users, Roles, Profiles)
- View Table Data
- Tablespaces
- Init Parameters
- Any write access to database
28% have an annual database instance growth of more than 20%

Less than 50% have Consolidated

Source: IOUG, 2014
Database Consolidation Workbench

Comprehensive end-to-end solution for database consolidation

1. Plan: Advise
   - Gives consolidation advice by identifying candidate databases for the chosen platform using rich EM and AWR data
   - Provides advise for migration to Exadata and Oracle Cloud (DB Cloud Service), etc.

2. Migrate: Make it so!
   - Implements validated consolidation plan by migrating databases with minimal downtime using EM’s provisioning features
   - Supports online/offline modes, ADG, RMAN, Unplug/plug, Transportable Tablespace, Data pump, 10.2 and higher databases

3. Validate: Test
   - Validates consolidation plan with Real Application Testing (SPA) by running real workloads on destination databases
Data Lifecycle Management: What EM does for Private Clouds

Snap Clone

• Clone from Production to Test Master (Gold Copy)
  • Upgrade/Update/Reconfigure during cloning
  • Clone using RMAN or Active Dataguard
  • Masking, subsetting, running scripts pre-cloning

• Backup and Rewind to an earlier Snapshot
  • “Time Travel” across Snapshots

• Track association and lineage between Test Master and Clones

• Refresh from Production
  • Discrete refresh on demand
  • Continuous refresh using Dataguard
Data lifecycle Management: Agile Dev-Ops with continuous ‘Data Refresh’

Data is continuously refreshed with current data from production

NEW: Continuous Refresh
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Support for Oracle WebLogic Server 12.2.1

• New target types discovered when adding 12.2.1 domain:
  – Domain Partition
  – Partition Application Deployment
  – Coherence Partition Cache
• Oracle Traffic Director discovered as part of 12.2.1 domain discovery
• Target home pages provide summary of status & health
• Start/stop new target types
• View and correlate log messages in context of specific Domain Partition
• Routing topology viewer shows relationships across targets, components, resources
Monitoring Node Manager

• New target type ‘Oracle WebLogic Node Manager’ added via domain discovery
• Supports Java-based Node Manager versions 12.x and 10.3.6
• Monitor Node Manager status – receive notification if down
• In context of Node Manager, view associated domain(s)
• In context of domain and WLS, view associated Node Manager(s) and their status
• View and analyze collected configuration data on Node Manager – target properties like version, listen address, port
Administer Domains from Single Console

Eliminate need for multiple administration consoles

• Operations exposed in admin consoles integrated into Cloud Control console:
  – Change Center
  – Recording WLST Scripts
  – JDBC Data Source mgmt
  – Configure domain, cluster, server, machine

• Schedule and track process control operations and WLST script execution via predefined jobs

• Credential management
Audit WebLogic Specific Operations

Track who does what and when

- Operations performed from Cloud Control or EM Command Line Interface (EMCLI) will be audited
- Operations to be audited include the following:
  - WebLogic Domain Login
  - WebLogic Domain Logout
  - WebLogic Domain Update/Invoke
- Search audited data by date range, operation, administrator name, status, target name/type, client hostname, message, session, job name/type
- Accessible to super administrators only
- Not enabled out-of-box; enabled via EMCLI verb `update_audit_settings`
STIG Compliance Standard for Oracle WebLogic Server

Ensure compliance with security standards

- New, predefined compliance standard based directly on Department of Defense Security Technical Implementation Guide (STIG Version 1, Release 1) for WLS 12c
- Associate compliance standard to WLS targets and evaluations automatically occur on regular basis
- Receive notifications of violations
WebLogic & FMW Drift Management
Drivers and Solution

• Standardization, consolidation and compliance
  – Configuration variations increase risk and support costs
  – Consolidation important step towards cloud
  – Rapidly changing compliance auditing requires reference vs. discrete checks
  – Need for large-scale ongoing configuration/compliance drift management with automated policy violation notifications

• Combine dynamic and automated capability of compliance framework with accuracy and extensibility of configuration comparison.
Log Monitoring, Viewer, and Search

• Remove JRF dependency
  – Optimized to use JMX when JRF exists
  – Using ‘offline mode’ to access log files directly on non JRF domains
  – Offline mode is available regardless if WLS is up or down

• Download log files of all servers in a domain centrally

• Log Monitoring & Alerting based on regex matching

• Improved UI for Target selection and search by fields
Enhanced Target Management Best Practices

• Continues to recommend next steps post domain discovery and refresh
• Continues to be accessible outside of discovery and refresh
• Exposes wider range of management features for Fusion Middleware management
  – Basic setup (e.g. notifications, groups)
  – Configuration and Compliance Management
  – Provisioning and Patching
  – Monitoring and Diagnostics
  – Service Level Management
  – Administration

• Provides direct links to access features as well as links to view recorded demonstrations, documentation and online help
Enhanced Target Management Best Practices

Setup & Discovery

Add Fusion Middleware and WebLogic Domains
Targets > Middleware > Add > Middleware/Weblogic Domain
In order to add Fusion Middleware and WebLogic Domains - or promote those auto-discovered, unmanaged targets to managed targets status - you must provide details concerning the Administration Server of the domain (i.e. its hostname, listen port, credentials). A Management Agent then uses the JMX protocol to make a J2C/J2S connection to the Administration Server to obtain domain membership details.

Configure Automatic Discovery
Setup > Add Target > Configure Auto Discovery
In automatic discovery, you enable a Management Agent running on a host to run a job that scans for unmanaged hosts. You can convert these unmanaged hosts to managed hosts by deploying Management Agents on these hosts. Then you search for targets such as Fusion Middleware and WebLogic Domains on these managed hosts, and finally you promote these targets to managed target status.

Create Administration Group
Setup > Add Target > Administration Groups
Administration groups are a special type of group used to fully automate the application of management settings (e.g. monitoring settings, compliance standards) to targets upon joining the group.

Routine

Enable Automatic Refresh Job (target) > WebLogic Domain Home Page > General
Click on the WebLogic Domain Refreshed time link. By default, targets that are added or removed from an already discovered domain without using Cloud Control are not known to Cloud Control until the domain is refreshed. An automatic refresh operation is provided by a job that, by default, runs once a day. By default, this job is not enabled.

Perform Diagnostic Pre-checks
Diagnostic pre-checks are a series of tests that identify issues related to discovered, domain refresh, monitoring and other key features for managing Oracle Fusion Middleware software.
Java Workload Explorer (JWE)

- The primary interface to the JVMD data
- Refreshed UI
  - Dynamic and snapshot sets
  - Comparison between sets
    - Requests, Call stack, SQLs, Users, ECID, etc.
- New instrumentation
  - Track Time & Resource
  - Improved integration with RUEI
  - Enabled via Dynamic Instrumentation (no JVM command line change) and no restart of servers
- Profile by:
  - Requests, applications, sessions or user defined scopes
Improved Memory Diagnostics

• New multi tabs page for memory diagnostics
• Analysis of GC overhead
• Visibility into YC object tenuring
• Class loader stats
• Biggest allocators
• Sample and compare histograms
JVMD Self-Service Enhancements

• Full JVM functionality is now available via the Self Service pages
  – Request Instance Diagnostics
  – Thread Snapshots
  – Heap Snapshots
  – Class Histogram
  – JFR Snapshot
  – Memory Diagnostics
  – Java Workload Explorer & Report

• Capacity Planning for the Cloud Admin
  – Alerting Admin when JVMD Engines get close to capacity

• RESTful API to download JVMD agents
Coherence Management

- Heat Map view
  - Nodes, Caches, Services, and Hosts views by variety of relevant metrics
- New support for Managed Coherence
  - Discover Coherence as part of WLS domain
- FMWC for Coherence
  - Standalone and managed Clusters
- Support for MultiTenancy Clusters
- New and improved Topology viewer
- Coherence Log Viewer
  - Standalone and managed Clusters
- Remove Down Members
  - Streamline removal of obsolete targets
End User Monitoring

- Synthetic Monitoring - ASLM
  - Support for Selenium based tests

- RUEI in EM UI
  - New EUM Target
  - BizApp can contain multiple EUMs
  - New RUEI regions in EM UI (including map view)
  - Instance level drilldown to JVMD also for non-jfr domains
Dehydration Store Performance
Diagnostic Reports

Key health indicators across multiple SOA domains delivered to your inbox

System Backlog Report

- BPEL
  - Number of Pending Invoke Requests: 0
  - Number of Pending Callback Requests: 0
  - Number of Open Instances: 412
  - Number of instances waiting for callback: 0
  - Number of Faults: 0
  - Number of Recoverable Activities: 0

- Mediator
  - Number of Pending Mediator Deferred Messages: 0
  - Number of Faulted Mediator Deferred Messages: 0

- EDN
  - Number of Pending Messages in Event Queue: 0
  - Number of Pending Messages in OAOQ Queue: 0

- Human Workflow
  - Number of Unattended Tasks: 0
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