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Oracle Enterprise Manager 12c Cloud Control: Architecture, Concepts and Best Practices

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**ORACLE
OPEN
WORLD**

**HARDWARE
AND SOFTWARE
ENGINEERED
TO WORK
TOGETHER**

Safe Harbor

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Program Agenda

- Architecture & Concepts
 - Core Enterprise Manager Components
 - Agent Collection and Upload
 - Extensible Architecture
 - High Availability & Disaster Recovery
- Implementation Best Practices
 - Implementation Strategy
 - Top Implementation Questions

Oracle Enterprise Manager 12c

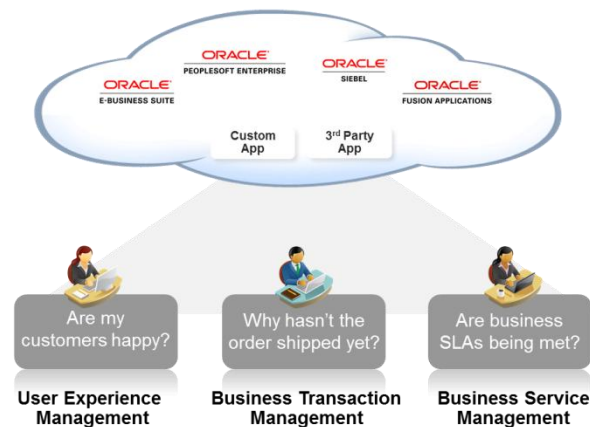
ORACLE®
ENTERPRISE MANAGER 12^c



**Complete Cloud
Lifecycle Management**



**Integrated Cloud
Stack Management**



**Business-Driven Application
Management**

Self-Service IT

| Simple and Automated

| Business Driven

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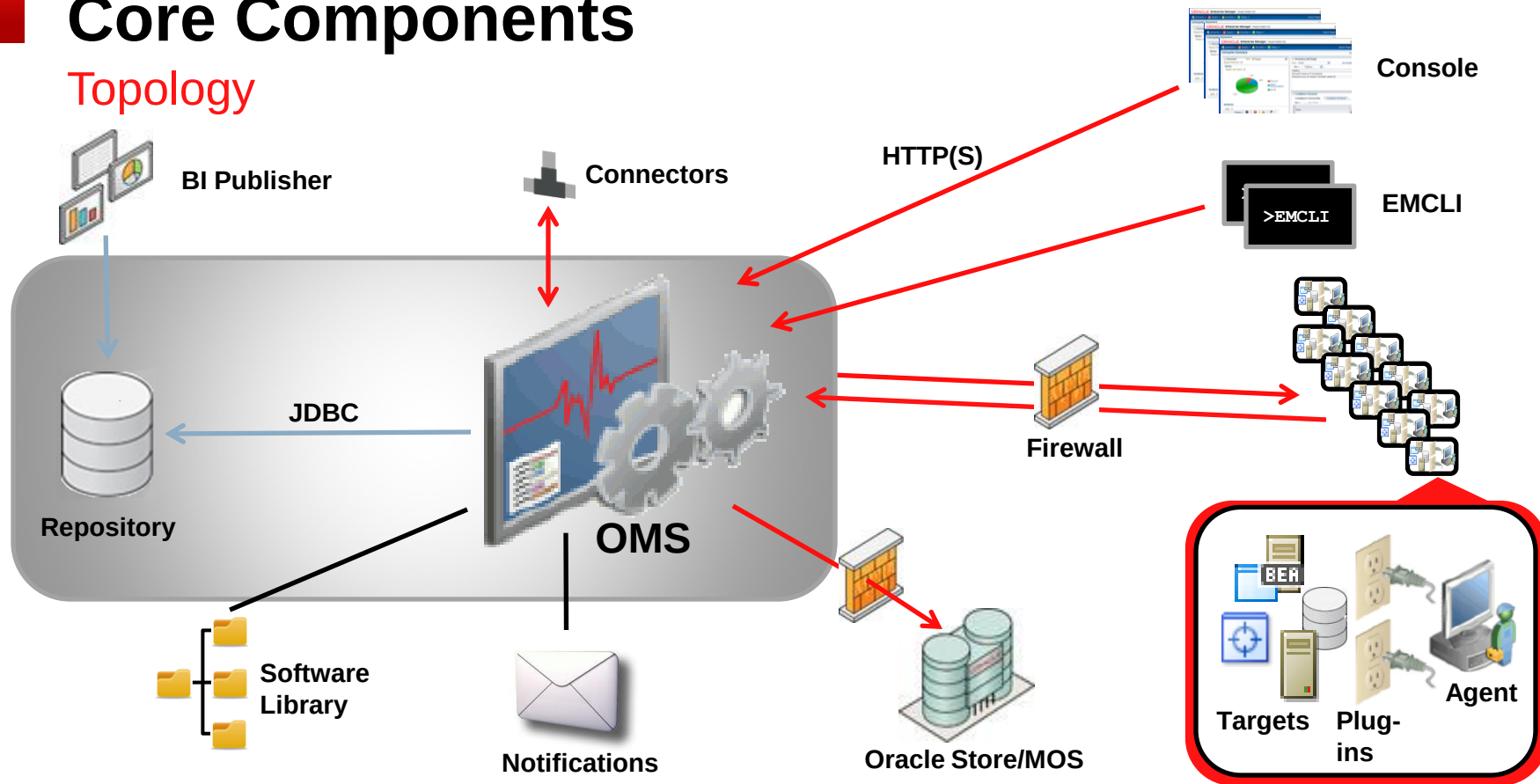
Architecture & Concepts



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Core Components

Topology



Core Components

Targets and Agents

- Components that are managed/monitored by Cloud Control
- Hundreds of out-of-box target types
- Extensibility Development Kit (EDK) can be used to add 3rd party and custom targets

Targets



- Collect monitoring and configuration data from the targets and send to OMS
- Execute tasks on behalf of Enterprise Manager users
- Typically one agent installation per OS deployment

Agents



Core Components

OMS and Repository

- Central Enterprise Manager Application
- Receives and processes data from Agents
- Used to schedule and coordinate user jobs
- Notifies users of events

OMS



- Persistent store for data collected from the Targets
- Used to store a variety of configuration information such as:
 - users and privileges
 - monitoring settings
 - job definitions

Repository



Core Components

Software Library and User Interfaces

- Filesystem repository used to store software entities such as:
 - Software patches
 - Reference gold images
 - Application software
 - Deployment procedures
- Critical component in Enterprise Manager 12c
 - Used by agent deployment and self-update

Software Library



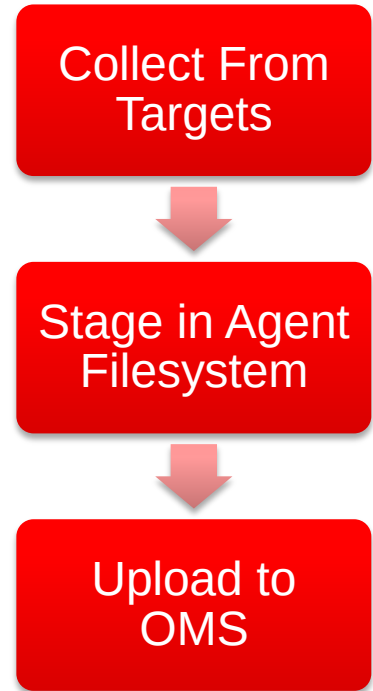
- Console – Rich, customisable application accessed through web browser. Primary interface for interactive management of targets
- EMCLI – Enterprise Manager command line interface. Used to manage targets from command line without a browser

User Interfaces



Agent Collection and Upload

- Data flows from agents to the OMS
 - Agents pull monitoring and configuration metrics from Targets
 - Data pushed to OMS
- Criticality of data varies widely
 - Alert data
 - Frequently and infrequently changing metrics
 - Configuration Data
 - Production/Test/Development Targets
- OMS and agents must work together for efficient upload and processing of all data from many agents/targets



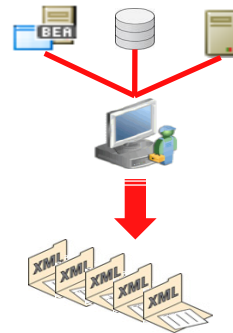
Agent Collections

- Collections operate independently on each agent
- Default collection frequency varies based on the criticality and volatility of the metric
 - Example collection intervals for Database metrics
 - Response – 15 seconds
 - Tablespaces Full – 30 minutes
 - Configuration collections default to once per day
- Target Metric and Collection Settings used to adjust collection intervals
 - Use Monitoring Templates to standardize

Metric	Operator	Current Value	Target Value	Severity	Collection Interval
Need to Instrument with OCM	=	1		None	
Operational Error					Every 5 Minutes
Archiver Hung	Matches		.*	None	
Data Block Corruption	Matches		.*	None	
Generic Operational Error	Matches		.*	None	
Media Failure	Matches		.*	None	
Response					Every 15 Seconds
State	Matches	MOUNTED	DOWN UNKN	None	
Status	=		Down	None	
SCN Growth Statistics					Every 1 Hour
SCN Health	<=	62	10	None	
Streams Processes Status					Every 30 Minutes
Streams Process Errors	>	0		None	
Streams Process Status	=	DISABLED	ABORTED	None	
Tablespaces Full					Every 30 Minutes
Tablespace Space Used (%)	>=	85	97	None	

Agent Upload Files

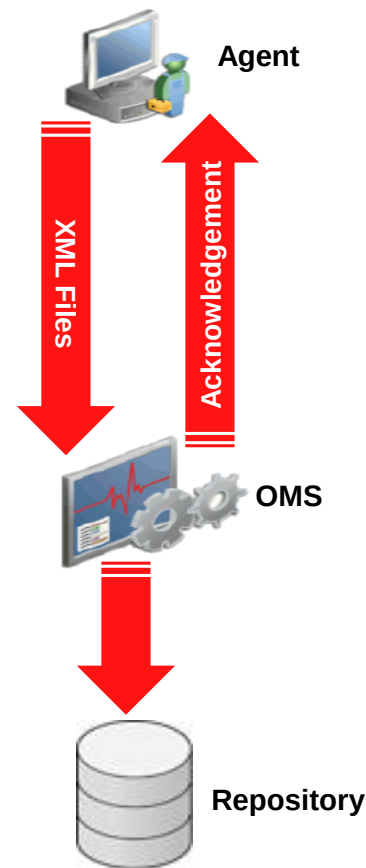
- Collected metrics are placed in XML upload files on agent filesystem
 - Files located in `$AGENT_HOME/agent_inst/sysman/emd/upload`
 - One file per collection
- Each target is statically mapped to an Upload Stream
 - Multiple streams allow more data to be sent to OMS in parallel
 - Preserves data ordering for each target



Agent to OMS Upload

OMS Functioning Normally

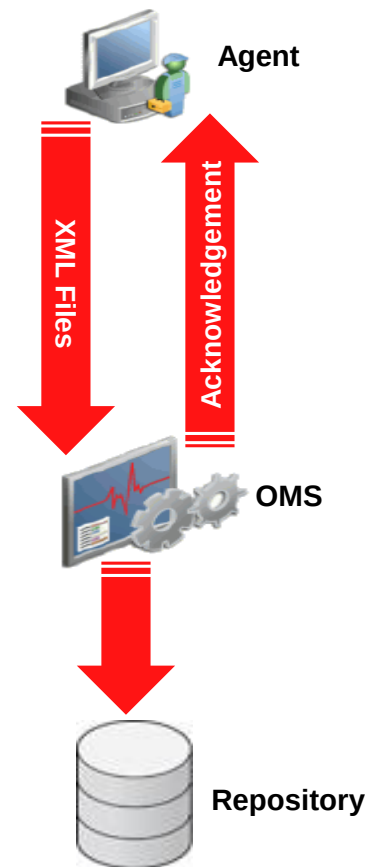
- Synchronous upload of XML files from agent to OMS
 - Upload interval is 15 minutes by default
 - Immediate upload for Response/Severity data
 - After file has been uploaded to the OMS it is purged from the agent filesystem
- Optimized data transfer from agent to OMS
 - Compression enabled by default
 - Configuration data not uploaded if no change



Agent to OMS Upload

OMS Unavailable or Overloaded

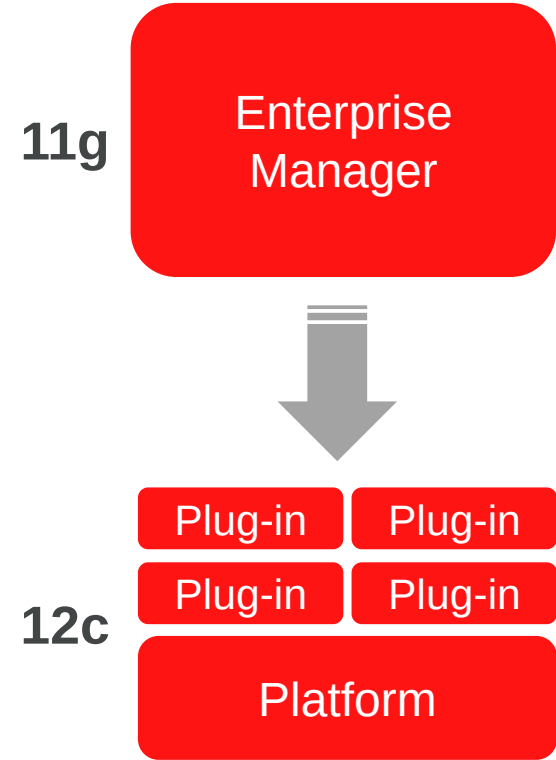
- Prioritized purging of data when OMS cannot receive data for an extended time
 - Data purged when agent files start to get backlogged
 - Oldest metric data purged to make space for new data
 - Alert and Compliance data never purged
- Flow control mechanism used when OMS is overloaded
 - Agent uploads backed off based on “Lifecycle Status” property
 - Ensures continued monitoring of high priority targets



Extensible Architecture

12c Platform and Plug-in Model

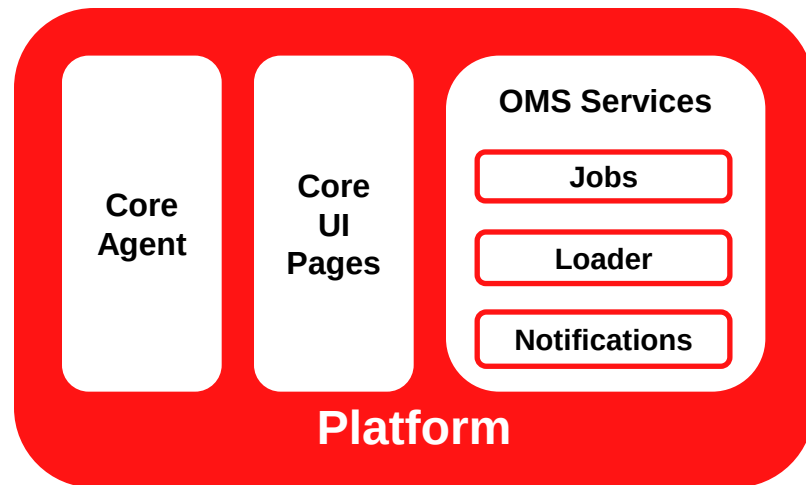
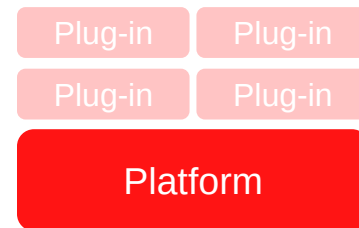
- Enterprise Manager 12c is built using a Platform/Plug-in model
 - Platform contains core EM services and Target agnostic UI pages
 - Each Plug-in contains Target specific management or other vertical functionality
 - Fundamental change from prior releases of Enterprise Manager
- Allows new features to be added outside of platform release cycle



Extensible Architecture

Platform

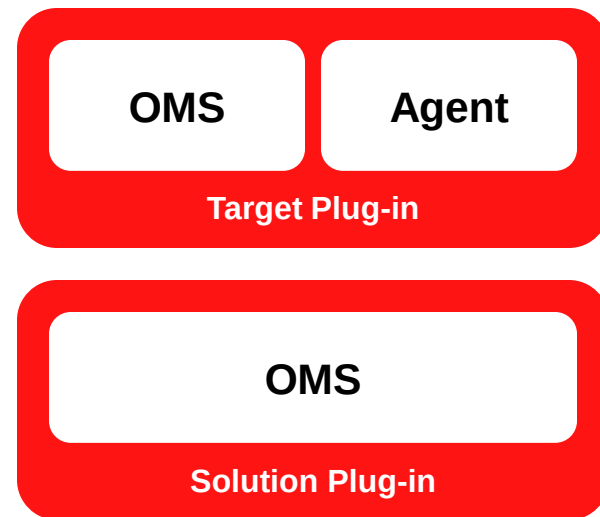
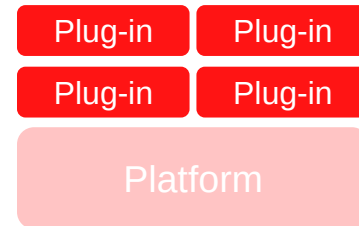
- Platform consists of:
 - OMS Services
 - Loader, Notification, Jobs
 - Target agnostic UI pages
 - All metrics, Jobs, Notifications, etc
 - Core Agent
- Platform versions
 - EM 12c Release 1 (12.1.0.1 Platform)
 - EM 12c Release 2 (12.1.0.2 Platform)
 - EM 12c Release 3 (12.1.0.3 Platform)



Extensible Architecture

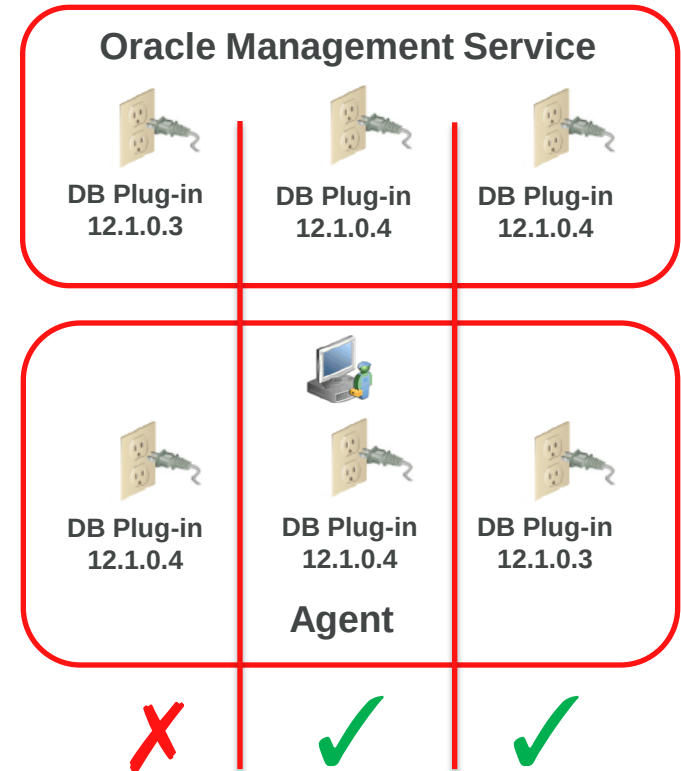
Plug-ins

- Target specific management is contained in Plug-ins
- Additional vertical Enterprise Manager functionality (e.g.: Cloud Application Plug-in) is also delivered using Plug-ins
- Plug-ins have their own lifecycle and version independent of the EM platform
- Plug-ins can be created by Oracle or 3rd party integrators using Extensibility Development Kit (EDK)



OMS and Agent Plug-in Compatibility

- Plug-ins are always updated on the **OMS first**
 - The Agent side Plug-in version cannot be higher than the OMS version
 - After Plug-in has been updated on the OMS the Plug-in can be updated on the Agents
- The version deployed on the **OMS must be $\geq$ the versions present on Agents**
 - Enables phased update of Agents



Extensible Architecture

Self Update

- Centrally manages the lifecycle of all updateable entities from the EM console
- Proactive notification for Oracle supplied updates if running in connected mode
- Supports online and offline modes
- Allows import of non-Oracle entities

ORACLE Enterprise Manager Cloud Control 12c

Setup Help MMCGILL Log Out

Enterprise Targets Favorites History

Search Target Name

Self Update

Page Refreshed Sep 25, 2012 3:06:41 AM PDT

Oracle periodically provides new functionality and updates for existing features in Enterprise Manager. The Self Update home allows administrators to receive notifications and view, download, and apply such updates. While these updates are retrieved automatically, a manual check can be made at any time.

Status

Connection Mode **Online** Last Download Time Sep 20, 2012 3:47:51 AM PDT
Most Recent Refresh Time Sep 24, 2012 11:26:03 PM PDT Last Download Type Plug-in Last Apply Time Sep 20, 2012 Last Apply Type Management

Informational Updates (5 New)

Actions Open Check Updates Agent Software

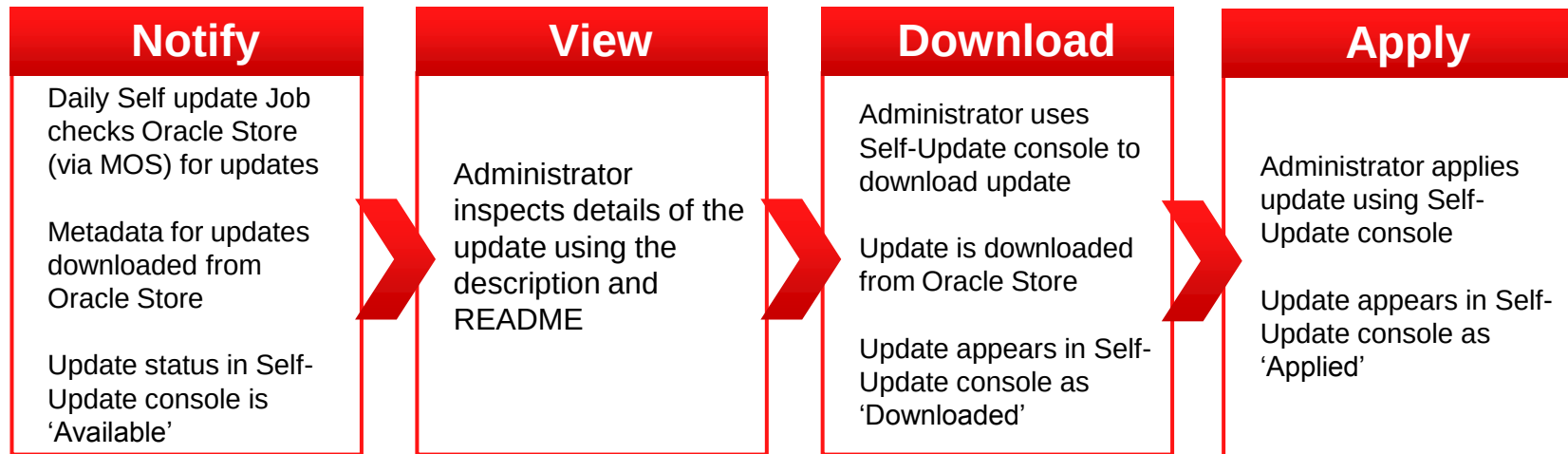
Type	Available Updates	Downloaded Updates	Applied Updates	Description
Agent Software	2	0	18	Agent software has to be installed on hosts for managing the host.
Compliance Content	0	0	0	Compliance Content contains Framework, Standard, Rules with support of add and delete on these entities.
Diagnostic Checks	0	0	0	Target side policy checks that identify conditions that may require the attention of target administrators.
EM Deployment Prerequisite Resources	0	0	0	EM Deployment Pre-requisite Checks are the metadata used for checking prerequisites for Install, Upgrade, Patching of EM Platform and Plugins.
Exadata Configuration Template	0	0	0	Configuration Templates for Oracle Exadata Database Machines
Extensibility Development Kit	0	0	1	Extensibility Development Kit (EDK) is a standalone tool designed to help development of Enterprise Manager extensions (For example: Plug-ins)
Management Connector	9	0	2	Management Connectors are components that integrate different enterprise frameworks into the Enterprise Manager Console.
Middleware Profiles and Gold Images	0	0	0	A collection of Software Components used for provisioning of Oracle Application Server homes.
Monitoring Templates	0	0	0	Monitoring Templates can be used to standardize monitoring across your enterprise by applying a subset of monitoring settings to targets.
Oracle Database Provisioning Profiles and	0	0	0	A collection of Software Components used for provisioning of Oracle Database, Clusterware and Grid Infrastructure homes.
Oracle Virtual Product Mapping	0	0	0	Pre-defined mappings for OVF Products and EM Targets
Oracle VM Templates and Oracle Virtual	15	0	1	Preinstalled and preconfigured software packages to deploy Oracle Guest VM
Plug-in	0	4	39	Plug-in extends Enterprise Manager to manage newer target type as well as to bring vertical functionality
Provisioning Bundle	0	0	1	Provisioning bundle is a collection of deployment procedures, software library entities, and other related artifacts that cater to the provisioning and patching of various Oracle and non-Oracle Products.

Past Activities: Agent Software

Actions	Status	OS Platform	Version	Administrator	Start Time	Elapsed Time(Sec)
Apply	Succeeded	Linux x86-64	12.1.0.1.0	SYSMAN		0.23

Extensible Architecture

Self Update: Process and Entities



- Agent Software
- Compliance Content
- Diagnostic Checks
- EM Deployment Prerequisite Checks
- Exadata Configuration Templates
- Extensibility Development Kit
- Informational Updates
- Management Connector
- Middleware Profiles & Gold Images
- Monitoring Templates
- Database Provisioning Profiles & Gold Images
- VM Templates & Assemblies
- Plug-ins
- Provisioning Bundles

High Availability and Disaster Recovery

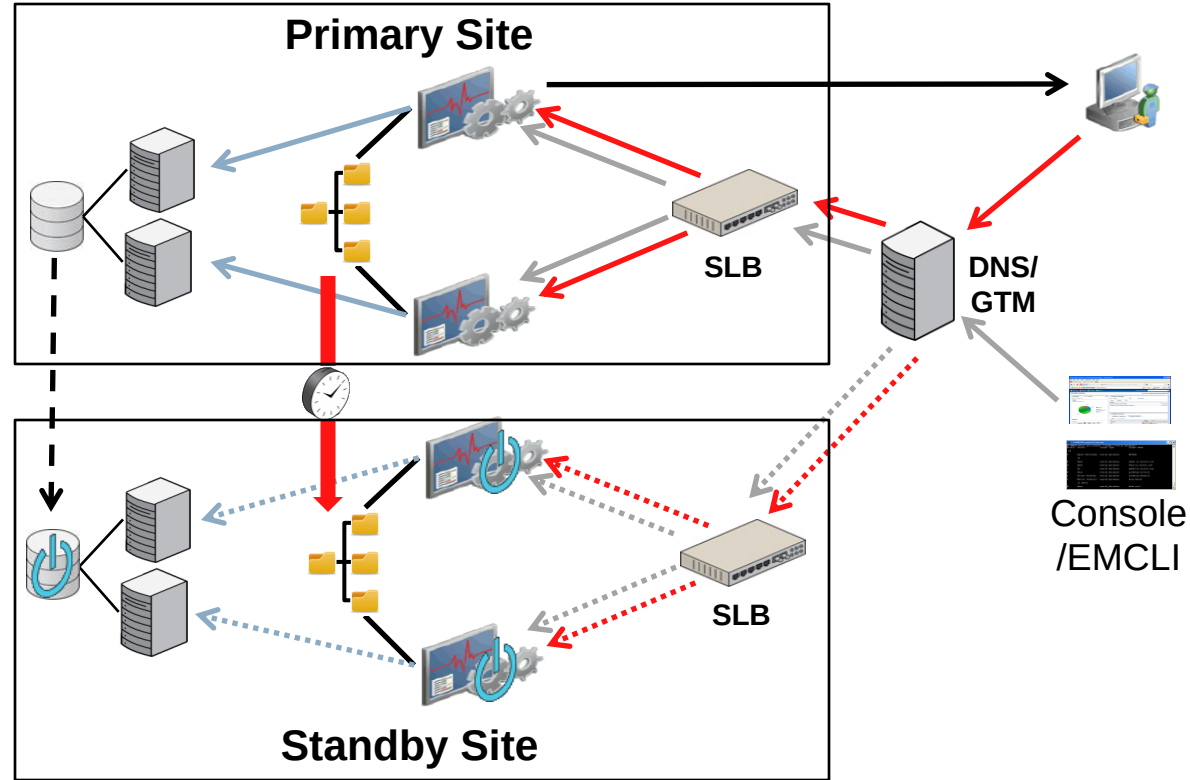
- Critical components in Enterprise Manager infrastructure are:
 - **Repository** - Persistent store for all Enterprise Manager data
 - **OMS** - Central application accessed by Agents and end-users
 - **Software Library** - Filesystem repository used to store software entities
- All of the above should be configured for High Availability if availability of Enterprise Manager is critical



High Availability and Disaster Recovery

HA/DR Topology

- HA using RAC and multi-OMS with Load Balancer
- DR using Data Guard and Standby OMSs
- Zero or minimal data loss depending on configuration



Implementation Best Practices



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Implementation Strategy

Best Practice

Planning & Architecture

- Targets & Goals
- Security Restrictions
- Resources
- Integrations
- Future Growth
- Scalability

Infrastructure Deployment & Essential Monitoring

- Install & Config
- High Availability
- Users & Groups
- Agent Deployments
- Promote Targets
- Incident Rules
- Test & Validate

Extending Use

- Lifecycle Management
- JVM, APD
- Cloud
- BI Publisher
- RUEI

Maintaining

- Monitoring
- Target Cleanup
- Patching
- Plug-ins
- Performance
- Capacity & Growth

A man and a woman are looking at a whiteboard. The whiteboard has a diagram with labels 'LUN', 'C:', 'Host D:', 'E:', and 'C:'. The diagram shows a central node connected to several other nodes, with some nodes labeled '10', '11', and '12'. The man is holding a pen and looking at the whiteboard. The woman is also looking at the whiteboard.

What Network Ports are Required?

- Communication between OMS, Agent, Targets (external)
- Additional ports required for add-on components (APD, JVMD, BIP)
- Secure web connection to Oracle for Online mode (https – 443)

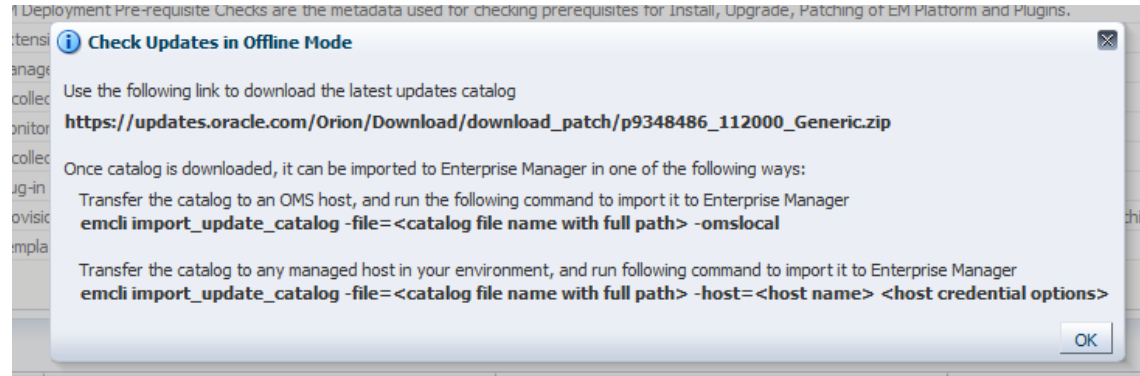
[Blog: Network Ports Used in Oracle Enterprise Manager 12c
https://blogs.oracle.com/oem/entry/planning_your_oracle_enterprise_manager](https://blogs.oracle.com/oem/entry/planning_your_oracle_enterprise_manager)

Default Port	Range	Component	Usage
4889	4889 – 4898	Enterprise Manager OHS Upload HTTP	Agent OM loc
1159	1159, 4899 –	Enterprise Manager OHS	Ag

Default Port	Range	Component	Usage
443		Secure web connection (https - 443) to updates.oracle.com support.oracle.com ccr.oracle.com login.oracle.com aru-akam.oracle.com	Outgoing from OMS used for online communication with Oracle for OCM, MOS, Patching, Self-Updates, ASR

What If I Can't Connect to Internet?

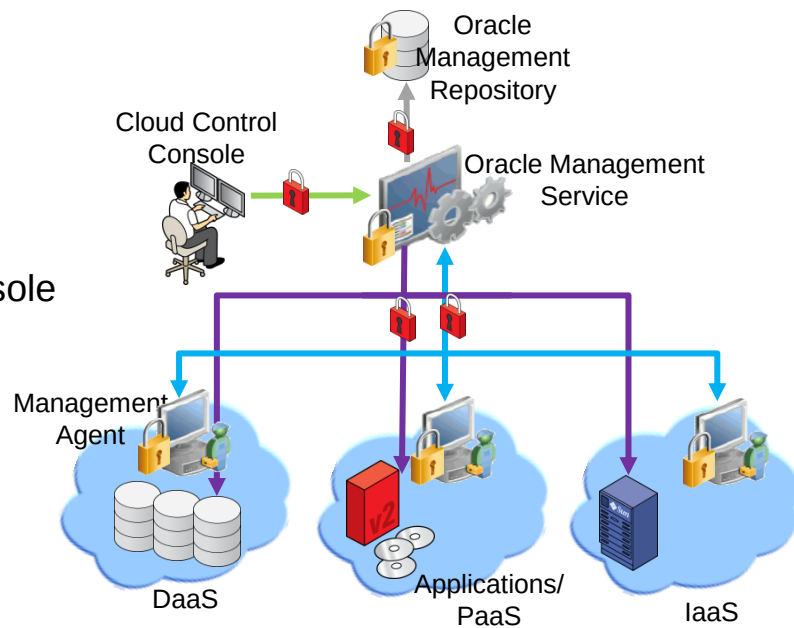
- Offline mode - download updates from an internet connected browser and import
 - No ability to upload files and submit draft SR via EM
 - No knowledge search capabilities in Incident Manager
 - No Oracle Configuration Management Harvester (OCM)
 - Limited Automated Patch Compliance Checking



[Doc: Using Self Update in Offline Mode](http://docs.oracle.com/cd/E24628_01/doc.121/e24473/self_update.htm#BEJICEBD)
http://docs.oracle.com/cd/E24628_01/doc.121/e24473/self_update.htm#BEJICEBD

How Can I Secure My EM Site?

- Secure Communications
 - Enabled by default
 - Can restrict non-secure ports
 - Integrate with corporate firewalls
 - Use custom certificates for Agent, OMS, WLS, Console
- Authentication & Authorization
 - Integrate with corporate LDAP/SSO
 - Roles & groups for privilege grants
 - Named credentials and privilege delegation (sudo, pbrun) for privileged accounts
- Auditing
 - Enable auditing and develop a plan
 - Review users and roles regularly



[Whitepaper: Oracle Enterprise Manager Cloud Control 12c Infrastructure and Operational Security Best Practices](http://www.oracle.com/technetwork/oem/framework-infra/wp-em12c-security-best-practicesv2-1493383.pdf)
<http://www.oracle.com/technetwork/oem/framework-infra/wp-em12c-security-best-practicesv2-1493383.pdf>

Top Implementation Questions - Deployment & Monitoring

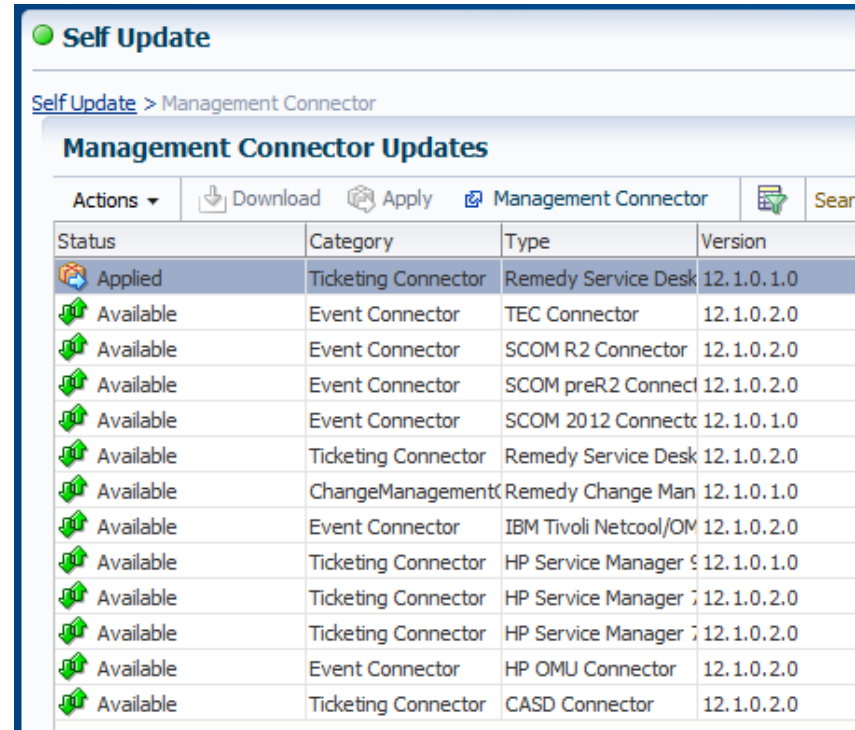


How Do I Get Notified of Alerts?

Incident Rules and Notification Methods

- SNMP traps
- E-mail/Paging notifications
- OS Scripts or PL/SQL
- Connectors for popular service desk tools
 - Microsoft SCOM
 - BMC Remedy
 - CA Service Desk
 - HP Service Manager, etc.
 - Develop your own [connector](http://docs.oracle.com/cd/E24628_01/em.121/e25163/toc.htm)

http://docs.oracle.com/cd/E24628_01/em.121/e25163/toc.htm

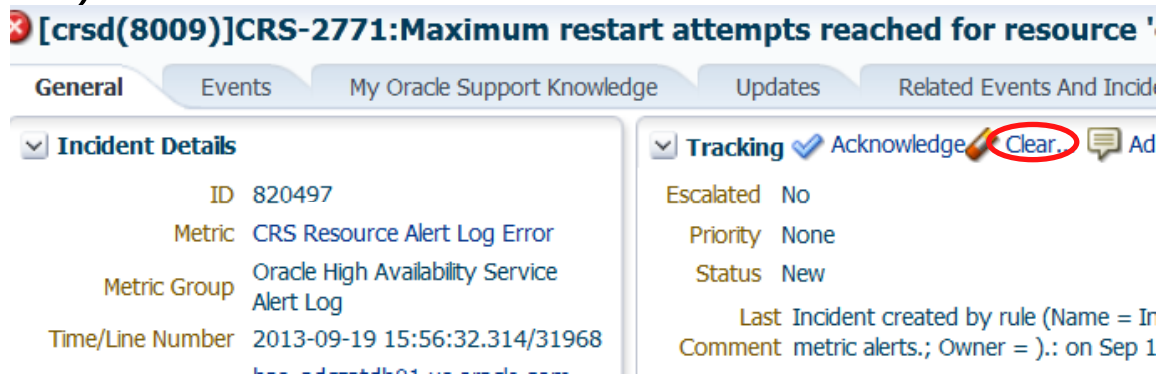


The screenshot displays the 'Self Update' section of the Oracle Enterprise Manager console. It shows a table of 'Management Connector Updates' with columns for Status, Category, Type, and Version. The first row is 'Applied' for the 'Ticketing Connector' (Remedy Service Desk) with version 12.1.0.1.0. Subsequent rows show 'Available' updates for various connectors like Event Connector, Ticketing Connector, and Change Management, with versions ranging from 12.1.0.1.0 to 12.1.0.2.0.

Status	Category	Type	Version
Applied	Ticketing Connector	Remedy Service Desk	12.1.0.1.0
Available	Event Connector	TEC Connector	12.1.0.2.0
Available	Event Connector	SCOM R2 Connector	12.1.0.2.0
Available	Event Connector	SCOM preR2 Connect	12.1.0.2.0
Available	Event Connector	SCOM 2012 Connect	12.1.0.1.0
Available	Ticketing Connector	Remedy Service Desk	12.1.0.2.0
Available	ChangeManagement	Remedy Change Man	12.1.0.1.0
Available	Event Connector	IBM Tivoli Netcool/OM	12.1.0.2.0
Available	Ticketing Connector	HP Service Manager	12.1.0.1.0
Available	Ticketing Connector	HP Service Manager	12.1.0.2.0
Available	Ticketing Connector	HP Service Manager	12.1.0.2.0
Available	Event Connector	HP OMU Connector	12.1.0.2.0
Available	Ticketing Connector	CASD Connector	12.1.0.2.0

How Do I Clear the Alerts?

- Cleared automatically based on metric evaluation (statefull)
 - Tablespace/Archive full, Target Up/Down, Agent Unreachable
- Cleared manually (stateless)
 - Log file monitoring
 - Create Incident Rule to clear automatically or use EM CLI



```
sh-4.1$ emcli clear_stateless_alerts -older_than=7 -target_type=oracle_database -target_name=Database -metric_internal_name=oracle_database:alertLog:genericErrStack ignore_notifications
```

How Do I Stop the Browser Warning?

- Create wallet with custom certificate
[MOS Note 1367988.1](#) and secure the console

Without Load Balancer

```
$ emctl secure console -wallet <wallet_loc>
```

With Load Balancer

```
$ emctl secure oms -host slb.example.com  
-secure_port 4900 -slb_port 4900  
-slb_console_port 443 -console  
-wallet <wallet_loc>
```

```
$ emctl stop oms -all
```

```
$ emctl start oms
```



This Connection is Untrusted

You have asked Firefox to connect securely to connection is secure.

it we can't confirm that your

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

Get me out of here!

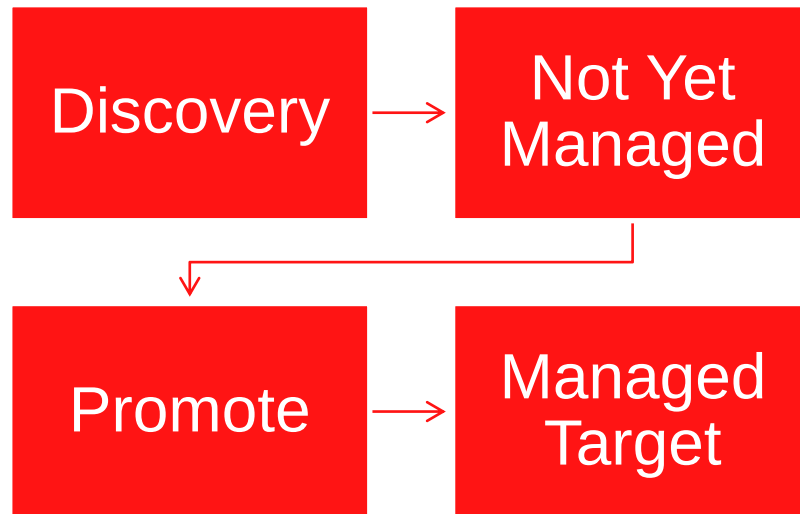
► Technical Details

► I Understand the Risks

Doc: Oracle Enterprise Manager Cloud Control Security Guide
http://docs.oracle.com/cd/E24628_01/doc.121/e36415/sec_features.htm#CJAIBFGC

Why Am I Not Seeing My Target After Agent Deployment?

- Host Discovery (Agent Deployment)
 - Network scan (NMAP) for hosts
 - Targeted host deployment
- Target Discovery
 - Auto-discovery scheduled process to discovery newly added targets
 - Manual/Guided discovery
 - Best Practice: Disable auto-discovery on static hosts after configuration
- Promote
 - Providing additional configuration (passwords) and target properties



How Do I Optimize Monitoring for Critical Targets?

- Make sure your monitoring setup is complete (all targets promoted, passwords set).
- For Mission Critical/Production consider HA monitoring (CRS, Data Guard, etc.)
- Utilize Administration Groups to monitor and notify on similar targets.
- Optimize the processing by setting lifecycle status target property to prioritize work when EM is under heavy load.
 - Set at target promotion or edit Target Properties (Console or EMCLI)

Mission Critical

Production

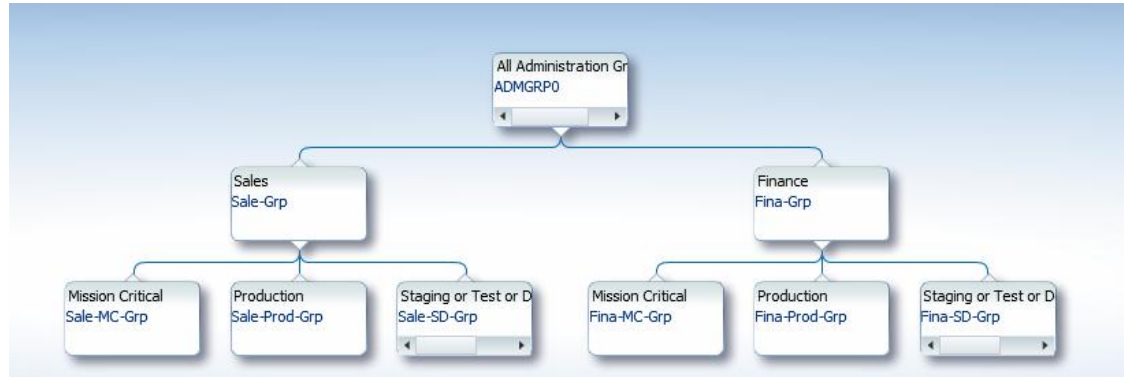
Stage (null)

Development

Test

What's the Best Admin Group Definition?

- Group targets that can be monitored/administered together.
 - 2 or 3 levels are common
 - More means LOTS of small islands
- Populate all target properties that are used in the Admin Group creation.
- Check Unassigned Targets Report frequently for non-adhering targets.



[Whitepaper: Strategies for Scalable, Smarter Monitoring using Oracle Enterprise Manager Cloud Control 12c](http://www.oracle.com/technetwork/oem/sys-mgmt/wp-em12c-monitoring-strategies-1564964.pdf)
<http://www.oracle.com/technetwork/oem/sys-mgmt/wp-em12c-monitoring-strategies-1564964.pdf>

Top Implementation Questions - Extending Use



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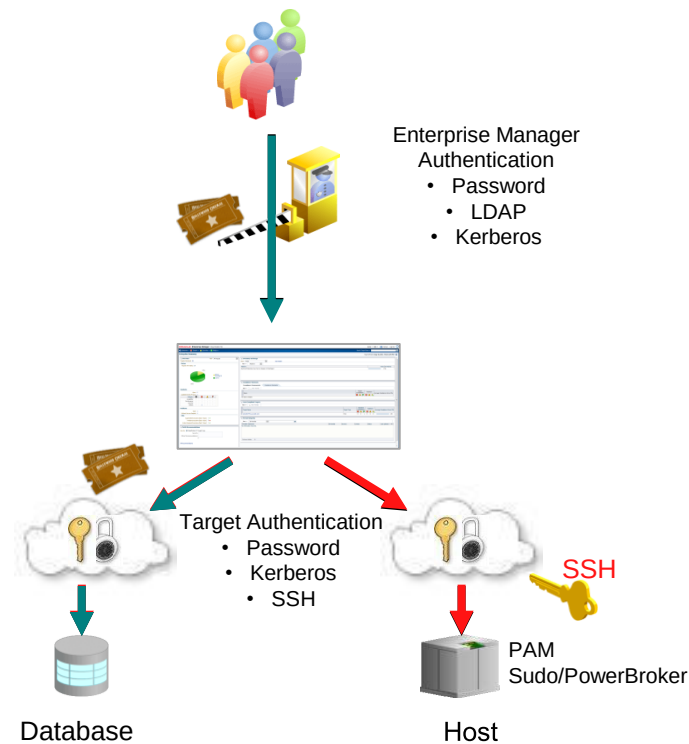
Do I Have to Patch Agents and Agent Plug-ins?

- Quarterly cycle recommended at a minimum
 - Agent and Plug-in Patches to be bundled – [MOS Note 1572022.1](#)
 - Create a deployment plan, check for conflicts and deploy to a few Agents
 - Create a template from deployment plan and use to mass deploy
- Maintain Consistent Patched Deployments
 - Create a gold agent that is patched and cloned upon deployment
 - Leverage the \$OMS_HOME/install/oneoffs directory for automatic patching at agent deployment
 - Create Custom Plug-in Update to include patches in deployment

[Blog: Simplified Agent and Plug-in Deployment](#)
https://blogs.oracle.com/oem/entry/simplified_agent_and_plug_in

Why Can't I See Performance Data if I'm Super Admin?

- Enterprise Manager Authentication
 - Grants access to EM application
 - Provides management access on targets
 - Resource access to functions (reporting, jobs, blackouts, etc.)
- Target Authentication
 - Same user permissions and privileges as before EM
 - For example, to shutdown a database via EM you must have a DB account with SYSDBA permissions



Top Implementation Questions - Packaging and Licensing



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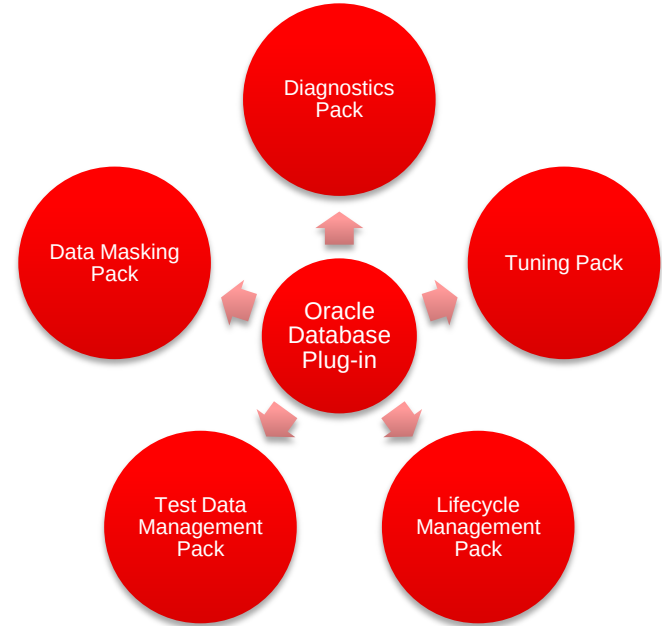
Do I need Licenses for the OMS & Repository?

- Single restricted-use license of the Oracle Database included for the Repository
 - Additional options may be separately licensed (e.g. RAC and DataGuard)
- Restricted-use WebLogic Server license limited to OMS functionality
 - WebLogic Clusters not supported for OMS
 - No licenses required for Additional OMS or Standby OMS
- Restricted-use of BI Publisher for use with EM functions only
- See [Licensing Guide](#) for further information

http://docs.oracle.com/cd/E24628_01/license.121/e24474/ch1_introduction.htm

Plug-ins vs. Packs...What's the Difference?

- Plug-ins are installable components that enable management of Enterprise Manager Target types or other vertical functionality
 - Examples: Oracle Fusion Middleware, Oracle Database, Oracle Siebel, IBM DB2, Oracle MOS, Oracle Consolidation Planning and Chargeback, Oracle Virtualization, Oracle Cloud Application
- Management Packs provide a license to use certain features in Enterprise Manager
 - E.g. AWR, ADDM, ASH features are in Database Diagnostics Pack
- No direct relationship between Management Packs and Plug-ins; however, typically a single plug-in enables multiple packs



How Do I Disable Unlicensed Features?

Setup | Management Packs

- License Information
- Management Pack Access
- Packs for this Page

ORACLE Enterprise Manager Cloud Control 12c

Setup Help SYSMAN Log Out

Enterprise Targets Favorites History Search Target Name

Management Packs

Management Pack Access
Enterprise Manager provides central management for your entire Oracle environment. Some premium functionality contained within this release of Enterprise Manager requires the use of a license. Use target based access to enable or disable access for each target or use pack based batch update to enable or disable selected packs for all targets of a specific type.

View Options
Choose from the below options to view management pack access information.

☒ Licensable Targets
☐ All Targets (Licensable targets and all dependent targets)

Top Activity
Drag the shaded box to change the time period for the detail section below.

CPU Cores

Management Packs for this Page
This Page requires either of the following pack(s):
• Database Diagnostics Pack
[License Information](#)

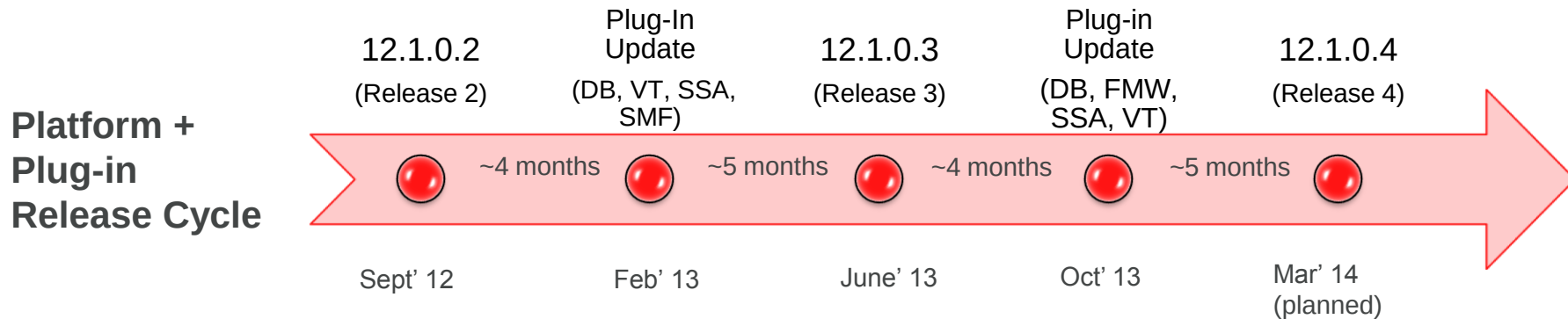
View Data
View Data
License Information
Management Pack Access
Packs for this Page
Enable Annotations

	Database Diagnostics Pack	Oracle Database Lifecycle Management Pack	Data Masking Pack	Test Data Management Pack	Database Tuning Pack	Pack Access Agreed
Oracle Cloud Management Pack for Oracle Database	☒	☒	☒	☒	☒	☒
Oracle Database Diagnostics Pack	☒	☒	☒	☒	☒	☒
Oracle Database Lifecycle Management Pack	☒	☒	☒	☒	☒	☒
Oracle Database Data Masking Pack	☒	☒	☒	☒	☒	☒
Oracle Database Test Data Management Pack	☒	☒	☒	☒	☒	☒
Oracle Database Tuning Pack	☒	☒	☒	☒	☒	☒

Revert Apply

Umeter 'control_management_pack_access' to disable or enable Database Diagnostic and Tuning Packs.
sey can be used within the product refer to the Oracle Database Licensing Information document, the Oracle
le Enterprise Manager Licensing Information document.

How Do I Plan for Enterprise Manager Updates?



- OMS Patches – Released as quarterly PSU (Patch Set Update) + one-offs
- Agent Patches + Plug-in Patches – Released as monthly “Bundle Patch” from 12c Release 3
 - Bundle Patches released on Tuesday closest to 17th of each month
 - One-off patches only for critical or platform specific issues

Oracle Enterprise Manager Sessions - Monday

Session	Session Title	Day	Time	Location
CON3267	Managing Oracle WebLogic Server and Oracle Coherence with Oracle Enterprise Manager 12c	Monday	10:45 AM	Moscone South - 130
CON6287	Managing the Manager: Tips and Tricks for Maintaining Oracle Enterprise Manager 12c	Monday	10:45 AM	Moscone South - 102
CON9572	Make the Most of Your Oracle Exalytics and BI Investments with Oracle Enterprise Manager 12c	Monday	10:45 AM	Moscone South - 131
CON9576	Six Essential Features for Effective Cloud-Based Testing	Monday	10:45 AM	Moscone South - 103
CON2131	DBA Best Practices for Performance Tuning in a Pluggable World	Monday	12:15 PM	Moscone South - 308
CON9582	Oracle Exadata Management Deep Dive with Oracle Enterprise Manager 12c	Monday	12:15 PM	Westin San Francisco - Metropolitan I
CON9573	Managing the Oracle Identity Management Platform with Oracle Enterprise Manager	Monday	1:45 PM	Moscone South - 130
CON9590	Oracle Enterprise Manager 12c: Architecture, Concepts, and Best Practices	Monday	1:45 PM	Moscone South - 104
CON9578	Automatic Workload Repository Soup to Nuts: Fundamentals of Database Performance Analysis	Monday	3:15 PM	Moscone South - 104
CON9591	Oracle Enterprise Manager 12c Deployment and Tuning Best Practices	Monday	4:45 PM	Moscone South - 308

Oracle Enterprise Manager Sessions - Tuesday

Session	Session Title	Day	Time	Location
CON8788	Maximizing Database Performance with Database Replay	Tuesday	10:30 AM	Moscone South - 308
CON9585	Zero to Cloud: Real Customers, Real-World Success Stories	Tuesday	10:30 AM	Moscone South - 305
GEN9592	General Session: Oracle Enterprise Manager 12c—Product Update and Customer Perspectives	Tuesday	12:00 PM	Moscone South - 103
CON9564	Optimize Oracle WebLogic Performance/Manageability: Oracle Enterprise Manager Cloud Control 12c	Tuesday	3:45 PM	Moscone South - 130
CON9580	Best Practices for Maximizing Oracle Enterprise Manager 12c Availability	Tuesday	3:45 PM	Moscone South - 308
CON9583	Harness the Power of Oracle Database 12c with Oracle Enterprise Manager Database as a Service	Tuesday	3:45 PM	Moscone South - 305
CON3991	Deploying Oracle Enterprise Manager 12c in a Complex Network Without Compromising Security	Tuesday	5:00 PM	Moscone South - 300
CON9586	DBA's New Favorite: Lifecycle Management with Oracle Enterprise Manager 12c	Tuesday	5:00 PM	Moscone South - 306
CON9574	Proactively Monitor Oracle WebLogic User Activity and Solve Issues Before End Users Complain	Tuesday	5:15 PM	Moscone South - 130

Oracle Enterprise Manager Sessions - Wednesday

Session	Session Title	Day	Time	Location
CON11255	Real-World Operating Excellence with Oracle Enterprise Manager 12c	Wednesday	10:15 AM	Westin San Francisco - Metropolitan I
CON9480	Simplify and Enhance Siebel Management Technologies with Oracle Enterprise Manager	Wednesday	10:15 AM	Moscone West - 3001
CON9566	Get Up and Running with Oracle Enterprise Manager for SOA and Oracle Fusion Middleware	Wednesday	10:15 AM	Moscone South - 130
CON9584	Deploying Applications in a Private Cloud with Oracle Enterprise Manager	Wednesday	10:15 AM	Moscone South - 308
GEN8792	General Session: Database Management Innovations—Oracle Database 12c Manageability Highlights	Wednesday	10:15 AM	Moscone South - 103
CON4101	Take Your Oracle WebLogic Applications to the Next Level with Oracle Enterprise Manager 12c	Wednesday	11:45 AM	Moscone South - 130
CON9581	Optimize Oracle Enterprise Manager Monitoring for Your Global Data Center	Wednesday	11:45 AM	Moscone South - 308
CON9579	Step-by-Step Cookbook for Identifying and Tuning SQL Problems	Wednesday	1:15 PM	Moscone South - 103
CON9589	Building a SPARC Cloud with Oracle Enterprise Manager Ops Center 12c	Wednesday	1:15 PM	Westin San Francisco - Metropolitan I
CON4666	Oracle Enterprise Manager 12c Database Lifecycle Management Automatic Provisioning and Patching	Wednesday	3:30 PM	Moscone South - 131
CON8768	DBA Best Practices for Protecting Data Privacy with Oracle's Data Masking	Wednesday	3:30 PM	Moscone West - 2024
CON9577	Active Session History Deep Dive: Advanced Performance Analysis Tips	Wednesday	3:30 PM	Moscone South - 104
CON3255	Being Sure: Confident Consolidations with Oracle Real Application Testing 12c	Wednesday	5:00 PM	Moscone South - 306
CON6217	Using Oracle Enterprise Manager 12c to Manage Engineered Systems and Oracle Fusion Middleware	Wednesday	5:00 PM	Moscone South - 130
CON9588	Get Proactive: Best Practices for Upgrading to Oracle Enterprise Manager 12c	Wednesday	5:00 PM	Moscone South - 308

Oracle Enterprise Manager Sessions - Thursday

Session	Session Title	Day	Time	Location
CON9605	Databases “On the Fly”: Unravel the Cloud Potential in Oracle Enterprise Manager 12c	Thursday	11:00 AM	Moscone South - 308
CON3103	Real Oracle Real Application Testing: What to Expect and Prepare For	Thursday	12:30 PM	Moscone South - 104
CON6129	Migrating Oracle Enterprise Manager to a New Data Center with Near-Zero Downtime	Thursday	12:30 PM	Moscone South - 308
CON9575	Keyword-Driven Testing with Oracle Application Testing Suite: Application Testing Reinvented	Thursday	12:30 PM	Moscone West - 3018
CON5677	Bank of America and Oracle Enterprise Manager 12c: Delivering Productivity and Efficiency	Thursday	2:00 PM	Moscone South - 308
CON9571	JVM Diagnostics: Java Profiling in Production Environments	Thursday	2:00 PM	Moscone South - 130
CON9587	Manage Beyond Limits: Oracle Enterprise Manager CLI and Other Extensibility Features	Thursday	3:30 PM	Moscone South - 308

Oracle Enterprise Manager DEMOgrounds

Session Title	Location
Application and Infrastructure Testing	Moscone West - W-098
Automatic Application and SQL Tuning	Moscone South, Left - SL-001
Automatic Fault Diagnostics	Moscone South, Left - SL-005
Automatic Performance Diagnostics	Moscone South, Left - SL-006
Complete Data Center Monitoring	Moscone South, Left - SL-018
Complete Database Lifecycle Management	Moscone South, Left - SL-014
Data Masking and Data Subsetting	Moscone South, Left - SL-015
Delivering and Managing Database as a Service	Moscone South, Left - SL-017
End-User Diagnostics	Moscone South, Right - SR-222
End-to-End Management of Oracle E-Business Suite	Moscone West - W-014
Identity Management Monitoring with Oracle Enterprise Manager	Moscone South, Right - SR-250
Infrastructure as a Service	Moscone South, Center - SC-175
Oracle Applications Management	Moscone West - W-062
Oracle Enterprise Manager Cloud Control 12c Overview	Moscone South, Left - SL-013
Oracle Real Application Testing	Moscone South, Left - SL-002
Oracle WebLogic Server, Oracle Coherence, and Middleware Cloud Management	Moscone South, Right - SR-206
SOA Management	Moscone South, Right - SR-224
Zero to Cloud: Infrastructure to Testing as a Service	Moscone South, Left - SL-016

Oracle Enterprise Manager Hands-on Labs

Marriott Marquis - Salon 14/15

HOL Session	Hands-on Lab Title	Day	Time
HOL10158	Database as a Service with Oracle Enterprise Manager and Oracle Database 12c	Monday	10:45 AM
HOL10209	Oracle Database 12c Lifecycle Management with Oracle Enterprise Manager	Monday	12:15 PM
HOL10160	Maximizing Oracle Database 12c Performance with Oracle Enterprise Manager	Monday	01:45 PM
HOL10202	Oracle WebLogic and Oracle Fusion Middleware Diagnostics with Oracle Enterprise Manager 12c	Monday	03:15 PM
HOL10303	Middleware as a Service with Oracle Enterprise Manager 12c	Monday	04:45 PM
HOL11733	Oracle WebLogic Plus Oracle Fusion Middleware Diagnostics with Oracle Enterprise Manager 12c	Tuesday	03:45 PM
HOL11305	Oracle Database 12c Lifecycle Management with Oracle Enterprise Manager	Wednesday	10:15 AM
HOL11304	Maximizing Oracle Database 12c Performance with Oracle Enterprise Manager	Wednesday	11:45 AM
HOL11284	Database as a Service with Oracle Enterprise Manager and Oracle Database 12c	Wednesday	01:15 PM
HOL11734	Middleware as a Service using Oracle Enterprise Manager 12c	Wednesday	03:30 PM

Enterprise Manager Resources

- Oracle.com: <http://www.oracle.com/enterprisemanager>
 - [Enterprise Manager Customer References](#)
- OTN: <http://www.oracle.com/technetwork/oem>
 - [Demos on Demand](#)
 - [Enterprise Manager Forums](#)
- Enterprise Manager Training from Oracle University
 - [Oracle Enterprise Manager 12c Learning Library](#)
 - [Oracle Enterprise Manager Cloud Control 12c: Install and Upgrade](#)
 - [Using Oracle Enterprise Manager Cloud Control 12c Ed 1](#)
 - [Oracle Enterprise Manager 12c: Overview Bundle Self-Study](#)
 - [Oracle Enterprise Manager 12c: Management Bundle Self-Study](#)
- Partners
 - [List of Enterprise Manager Specialized Partners](#)
 - [Oracle Enterprise Manager OPN Knowledge Zone](#)
 - [Oracle Enterprise Manager OPN Specialization](#)
 - [Oracle Enterprise Manager Application Quality Management OPN Specialization](#)
 - [IOUG Oracle Enterprise Manager Special Interest Group](#)
- Social Media
 - [Twitter](#), [Facebook](#), [YouTube](#), [Linkedin](#), [Blog](#)

The screenshot displays the Oracle Enterprise Manager 12c website. The top navigation bar includes links for Overview, Downloads, Documentation, Community, and Learn More. The main content area features the Oracle logo and the text "Oracle Enterprise Manager 12c". Below this, a paragraph describes the product's capabilities, stating it is a Total Cloud Control solution that reduces downtime by up to 90%, improves staff productivity by up to 75%, and reduces capital expenditures on servers by 20% or more. A list of key capabilities is provided, including a complete cloud lifecycle management solution, maximum return on IT management investment, and best service levels for traditional and cloud applications. On the right side, there is a video player showing three people in business attire. Below the video, the text "Oracle Enterprise Manager 12c" is displayed, followed by the tagline "Oracle is the Technology that Powers the Cloud". A "Watch the video" button is also present. At the bottom, the "Oracle Enterprise Manager Knowledge Zone" is highlighted, with a "Why Partner" section that includes a "Why Partner with Oracle" subsection. This subsection describes the Oracle PartnerNetwork and lists various roles such as ISV, OEM, OSI, Outsourcer, System Integrator, Hardware Partner, Value Added Distributor, Value Added Reseller, Cloud or Managed Service Provider. A final line of text states: "Increase your revenue or differentiate yourself beyond core product sales or services by including Manageability by".

Backup Slides

How Do I Monitor MySQL? SQL Server? IDM?

- Plug-ins allow for flexibility in target support.
- Most available from Self Update.
- Check [Extensibility Exchange](#) for additional available plug-ins from Partners.
- Develop your own using the [Extensibility Developer's](#) kit.

Contributor	Entity Type	Title	Management Area	Download
Blue Medora	Plug-in	Ping Probe	Network	Download
Blue Medora	Plug-in	Files and Directories	Storage	Download
Blue Medora	Plug-in	VMware vSphere	Virtualization	Download
Blue Medora	Plug-in	Time Drift	Network	Download
Blue Medora	Plug-in	SSL Certificates	Network	Download
Blue Medora	Plug-in	Oracle on VMware Licenses	Virtualization	Download
Dell	Plug-in	Dell Force10 Open Automation	Network	Download
EMC	Plug-in	EMC VMAX	Storage	Download
Entuity	Plug-in	Enterprise Network Manager	Network	Download
F5	Plug-in	F5 BIG-IP LTM	Network	Download
NetApp	Plug-in	NetApp Storage System	Storage	Download
Oracle	Plug-in	Pillar Axiom	Storage	Self Update
Oracle	Plug-in	Oracle Containers for Java (OC4J)	Middleware	Self Update
Oracle	Plug-in	Java Virtual Machine (JVM)	Middleware	Self Update
Oracle	Plug-in	Oracle Reports	Middleware	Self Update
Oracle	Plug-in	Sun Ray Software	Virtualization	Self Update
Oracle	Plug-in	Oracle Virtual Desktop Infrastructure	Virtualization	Self Update
Oracle	Plug-in	Oracle Directory Server	Middleware	Self Update
Oracle	Plug-in	Oracle HTTP Server	Middleware	Self Update

Why Does the Console Timeout?

Component	Default	Comments
OMS or Login Timeout	45 min	This is the oracle.sysman.eml.maxInactiveTime parameter that can be set per OMS. To prevent unauthorized access to Cloud Control, Enterprise Manager will automatically log you out of Cloud Control when there is no activity for a predefined period of time. If you have a load balancer, review Note 1478495.1 <pre>\$ emctl set property -name oracle.sysman.eml.maxInactiveTime -value 60 \$ emctl stop oms \$ emctl start oms</pre>
Apache Timeout	5 min	Number of seconds that an Apache session is kept active. If Apache timeout is set beyond the operating system TCP timeout, it will cause unpredictable results. The operating system timeout is set to 2 hours by default. <pre>\$ omsvfy show tcp Parameters Incoming Value tcp_keepalive_time 7200 tcp_keepalive_intvl 75 tcp_fin_timeout 60</pre>
ADF timeout	10 min	This is controlled by the variable oracle.adf.view.rich.poll.timeout. The variable applies to pages that have auto poll. ADF pages may be enabled with automatic poll. After a page does not receive any keyboard or mouse event for duration of oracle.adf.view.rich.poll.timeout variable, then the poll stops. From that point on, the page participates in the standard server-side session timeout.
SQLNET.EXPIRE_TIME	Default: 0 Minimum: 0 Recommended: 10	Use parameter SQLNET.EXPIRE_TIME to specify a time interval, in minutes, to send a probe to verify that client/server connections are active. Setting a value greater than 0 ensures that connections are not left open indefinitely, due to an abnormal client termination. If the probe finds a terminated connection, or a connection that is no longer in use, it returns an error, causing the server process to exit. This parameter is primarily intended for the database server, which typically handles multiple connections at any one time. If SQLNET.EXPIRE_TIME is set beyond the operating system timeout, it may cause SQL*Net errors such as ORA-12151 and ORA-12571.

Oops... I Forgot That Password

- Various passwords are needed at different phases, remember what you set during install!
 - sys and dbsnmp on the repository database
 - SYSMAN, weblogic (Admin Server), nodemanager, agent registration
- Agent Registration Password [MOS ID 1367946.1](#)
- SYSMAN Password (SYSMAN_MDS, BIP, SYSMAN_OPSS, SYSMAN_APM, SYSMAN_RO) [MOS ID 1365930.1](#)
- weblogic and nodemanager [MOS ID 1450798.1](#)
- Watch out for additional components such as JVMD, APD, BIP when changing passwords and when shutdown in general.

Can I Have Multiple Agents on the Same Host?

- Multiple agents pointing to the same EM?
 - This will not work, you'll get port conflicts as host can only be discovered once per hostname
 - Exception would be cold failover cluster where you use ORACLE_HOSTNAME to discover no a VIP
- Multiple agents loading to different EMs?
 - Need agents loading to a sandbox/test system to test patching, load
- For metrics thresholds that are maintained by the targets themselves (eg: database server side alerts), making changes to those from EM will cause the previous thresholds getting overwritten

How Do I Repoint an Agent to Another EM?

- OMS is the source of truth
 - Can't modify emd.properties and resecure anymore
 - Do not modify targets.xml
- Preferred method is to deinstall and reinstall Agent
- Alternate method to [redirect Agent](#)
 - Remove Agent and Targets from old OMS
 - Remove agent_inst directory
 - Rediscovered internal targets and adds to new OMS
 - Discover and promote targets

Implementation Strategy

Planning & Architecture

Targets & Goals

- What type of targets and how many are you going to monitor?
- What core functions of EM will you use?
- How many users?
- How many Data Centers and where are they located?
- Availability requirements?

Resources

- Who will own, manage and support EM?
- What hardware and architecture is available?

Security

- Firewalls and Network Ports?
- Access to Oracle/MOS?
- Users and Privileges
- Authentication

Integrations

- Ticketing or notification system?

Future Growth

- Data Center growth (increase in number of servers, databases, applications, data centers)
- Users (DBA, Middleware, Developers, Testing/QA, Cloud)

Implementation Strategy

Infrastructure Deployment & Essential Monitoring

Install & Config

- Configure hardware and create repository database
- Install 1st OMS
- Configure Security certificates
- Configure Load Balancer
- Configure MOS, Self-Update
- Configure backups
- Create users and roles
- Determine administration group criteria

High Availability

- Clone OMS for multi-OMS systems
- Create standby using storage replication
- Implement RAC for repository database
- Create Data Guard standby for repository database

Agent Deployment and Target Discovery

- Test agent deployment methods
- Create gold images for each platform with patches
- Document deployment and discovery procedures
- Mass deploy agents to hosts
- Discover and promote targets with target properties

Monitoring Targets

- Develop standard templates for monitoring thresholds
- Associate template collections with administration groups
- Create notification methods
- Create incident rules for notifications
- Test monitoring alerts and notifications

The background of the advertisement is a photograph of the Golden Gate Bridge in San Francisco. The bridge's iconic red-orange towers and suspension cables are prominent, framing the view of the city skyline. The Transamerica Pyramid is a notable building in the background. The sky is clear and blue. A solid red vertical bar is positioned on the right side of the image, containing the text 'ORACLE OPEN WORLD' and 'HARDWARE AND SOFTWARE ENGINEERED TO WORK TOGETHER'. A solid red horizontal bar is at the bottom of the image, containing the Oracle logo.

**ORACLE
OPEN
WORLD**

**HARDWARE
AND SOFTWARE
ENGINEERED
TO WORK
TOGETHER**

ORACLE

Hardware and Software

ORACLE®

Engineered to Work Together

ORACLE®