Managing the Manager: Tips and Tricks for Maintaining Oracle Enterprise Manager 12

Subtitle

Aaron Rimel

*Production Owner Systems Architect*
Agenda

- About Enterprise Manager at Cerner
- Our Enterprise Manager Team
- Monitoring Enterprise Manager
- Planned Maintenance Activities
About Enterprise Manager at Cerner
About Me

- DBA with over 10 years with Oracle Database, 9i-11g
- Extensive usage of Enterprise Manager for the last what feels like 150 years, but is more like 7.
- Worked with Oracle Strategic Customer Programs, EM 12c Early Adopter and participate in Customer Advisory Board
- Past presentations at OpenWorld and recent IOUG Webcast
Cerner at a Glance

Largest Strategic Global Health Care IT Company
- Founded in 1979, headquartered in Kansas City, MO
- Supports:
  - 10,000+ Facilities Worldwide
  - 2,600+ Hospitals
  - 3,500+ Physician Practices (30,000+ Physicians)
  - 500+ Ambulatory Facilities
  - 800+ Home-Health Facilities
  - 1,600+ Retail Pharmacies

R&D Commitment and Clinical Culture
- Comprehensive Suite of Health Care Solutions & Services
- Over 1,000 Clinicians
- Over $2.5B of Cumulative R&D
- Contemporary, Scalable Solution Architecture

10,000+ Associates Worldwide
- 3,000+ Employed in Professional & Managed Services
- 2,000+ Employed in Intellectual Property (IP) Organization
The Business Case -> Beyond our Core Offering

We want to change the way Our clients think about IT in their healthcare environment.

- Reduce costs and maintenance
- Increase stability and capability
- Refocus on their core . . .
  Healthcare

Managed Services already has:
  - Size and Scale
  - Security
  - Technology Expertise
  - Proven Quality Delivery
  - Healthcare Focus

It makes sense to go beyond...
Foundation for new opportunity: OEM as a Service

- Integrated central repository for enriched database management:
  - Automated toolkit
  - Custom compliance policies
  - Self-healing actions capabilities

- Improved Stability & Performance
  - 50% decrease in database incidents as a result of preventative actions
  - 17% of problems are now identified without DBA intervention

- Reduced Capital Expense
  - Reduced hardware capital by $9.5M

- Increased DBA Efficiency
  - 12% client base growth with no additional staff
Our Baby...

- > 22,000 Targets, 950 Agents
- Cerner hosted targets as well as OEM as a Service
- 100+ Custom Metric Extensions
- 50+ Custom Compliance Standards
Host Metric Examples...

- Diff check:
  - CPU
  - # of Filesystems online
  - Memory
  - ASM Luns

- Hugepages Check

- Host uptime

- Compliance Standards
  - Patch
  - Init Settings
Database Metric Examples...

- AWR Standards
- AWR Monitoring: Buffer gets, Gets per exec, Disk Reads, Top 5
- Failed RMAN Backups
- Block Change Tracking Status
- Stat’s Collection Status
- SQL Tuning Advisor Results is compounded and viewed Globally
- Auto adding datafile and datafile auditing
Enterprise Manager 12c Architecture

Hospital’s Data Centers

Cerner Data Centers

OEM Application Servers

Oracle DB Servers

Bluecoat Proxy Server

Internal Agents

Active Directory

External Browser Traffic

Internet

HTTPS

143

VPN

https://internal-slb.com:1159

https://12c-external-url.com
Enterprise Manager Version History

- **10.2.0.3** • 2006
- **10.2.0.5** • 2009
- **11.1.0.1** • 2011
- **12.1.0.1** • April 2012
- **12.1.0.3** • August 2013
Our Enterprise Manager Team
If you really want to use Enterprise Manager to its full potential, this is not a 1-man (OR WOMAN) job.
Cerner’s Enterprise Manager Staffing Model

- No longer just a DBA tool
- Our team now consists of 6 individuals who share responsibility and knowledge
  - Solution Support is Owned by the CernerWorks Emerging Technology Services group, a remote hosting division of Cerner
  - I am the Client Owner and Production Owner
    - Drive development and manage day to day activities
  - Combined knowledge of Oracle Database, WebLogic Server, Oracle Patching Process, OS Experience
  - Nobody’s full-time job
EM Staffing Roles and Responsibilities

- **Architecture**
  - System Architecture and Integration
  - Future direction and Testing
  - Installation
  - OMS Patching
  - Advanced Troubleshooting and Availability

- **System Engineers**
  - Basic Agent and OMS troubleshooting
  - OMS Patching
  - Plug-in maintenance
  - Self-Updates (patches, plug-ins, etc.)

- **Discovery Engineer**
  - Typically India associates
  - Perform target discoveries and end user management

- **Metric / Compliance Standards Development**
  - Two individuals script, DBA group validates
  - Includes custom metrics, reporting, and monitoring best practices
EM Virtual Roles and Responsibilities

- Remedy knowledge for ticket integration
- Network, firewall, VPN, Bluecoat administrators
- Software load balancer configurations
- EM Security for Groups, Roles, Administrator segregation to control access for non-Cerner users
- Active Directory administrators
- Sales associates for external customers
- DBA & Middleware teams
- System Admins
- Alarm Management Group for SMNP Trap Configuration
Target Owner Responsibilities

- **Non-EM Associates**
  - Assigned specific “clients” for which they are responsible for the availability, monitoring and configuration.
  - Non-EM associates are responsible for the installation and configuration of the agent and related targets.

- **EM Associates**
  - Initial discovery, upgrade, and patching of agents.
  - Our India EM engineers are responsible for the creation and maintenance of users. We leverage Active Directory for internal users, our external users are not yet integrated.
Monitoring Enterprise Manager
What I’ve Learned About Managing EM...

- The more you rely on EM and the more you use it... The louder people scream when it’s down or not performing!
- Following are my suggestions to keep you informed and aware
Notifications About EM Itself

- Create an Incident Ruleset to monitor the EM components (OMS and Repository target)
  - Your EM Support Team should get these
  - Thresholds may need to be adjusted based on your site size and activity
  - We integrate with SNMP traps and email notifications

Target name=Management Services and Repository
Target type=OMS and Repository
Host=
Event reported time=Aug 29, 2013 7:13:03 PM GMT
Message=DBMS Job Processing Time (% of Last Hour) for Repository Metrics 7 crossed the critical threshold (95). Current value: 138.22
Metric=DBMS Job Processing Time (% of Last Hour)
Metric value=138.22
DBMS Job Name=
Severity=Critical
Associated Incident Acknowledged By Owner=No

MOS Note 1553342.1 - Oracle Enterprise Manager 12c Configuration Best Practices
Out-of-Bound Notifications

- If Enterprise Manager goes down, do you know before your DBAs call you?
- Out-of-Bound Notifications via an email, script, and/or trap when fatal conditions occur
  - Single OMS environment, if the OMS is down, but the Agent is up
  - Multi-OMS environment, if all OMS’s are down, but the Agent is up
  - If Repository database is unavailable (down, archive hung, listener down, etc)

MOS Note 1472854.1 - How To Setup Out Of Bound Email Notification In 12c
Manage Cloud Control Pages

- **Health Overview**
  - Status and Console Activity
  - Job System
  - Notification Backlog
  - Upload Performance/Backlog
  - Backoff Requests

- **Repository**
  - Repository details, session breakdown
  - Scheduler Status, Job queue
  - Repository Collection backlog
  - Repository Job Status
  - Management AQ Status
### Manage Cloud Control Pages

#### Agents
- Agent status (pending, blocked, up)
- Agent version, count
- Agent control and configuration
  - Start/stop agents
  - Edit agent configuration properties

#### Management Services
- Dashboard of incidents
- Loader Throughput
- CPU/Heap Usage
Database Performance

- Top Activity (database application waits/cluster waits)
- CPU/Memory utilization
- ADDM/AWR
- SQL Monitoring
- Statistics
Pre-defined reports can be scheduled and checked daily/weekly to look for increasing trends

<table>
<thead>
<tr>
<th>Enterprise Manager Health</th>
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<tbody>
<tr>
<td>Agents Clock Synchronization Offset</td>
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<tr>
<td>Displays the list of agents whose system clock is not synchronized with system clock on the repository host machine</td>
</tr>
<tr>
<td>Agents In Questionable State</td>
</tr>
<tr>
<td>Displays the list of agents which are in questionable state</td>
</tr>
<tr>
<td>Agents Restarted</td>
</tr>
<tr>
<td>Displays the list of agents restarted in past 24 hours</td>
</tr>
<tr>
<td>Broken Targets</td>
</tr>
<tr>
<td>Displays the list of targets which are broken</td>
</tr>
<tr>
<td>EM Services Dashboard</td>
</tr>
<tr>
<td>Displays the list of EM Services which are useful for monitoring the overall health of EM</td>
</tr>
<tr>
<td>Loader Statistics</td>
</tr>
<tr>
<td>Displays Loader Statistics</td>
</tr>
<tr>
<td>Targets Not Uploading Data</td>
</tr>
<tr>
<td>Displays the list targets which are not uploading data to the repository for the past 24 hours</td>
</tr>
</tbody>
</table>
Know Your Data

- OMS and Repository / Monitoring / All Metrics
  - Metrics about EM collected and stored for your enjoyment!
  - The more you know what your average values are, the better you can adjust thresholds and know when there’s a problem.
EMDIAG – Lazy Man’s Dream

Repository (repvfy)
- Verification and reports of critical components
- Schedule a weekly repvfy – details report and review for areas that need attention
- Use repvfy dump modules to diagnose components (job_health, notif_health, loader_health, agent_health)

OMS (omsvfy) and Agent (agtvfy)
- verify, show, status, snapshot, lsof, etc...
- zip
  - finds and zips your OMS log files!

MOS Note 421053.1 - EMDIAG Troubleshooting Kits Master Index
Planned Maintenance Activities
Patching Enterprise Manager – Necessary Evil

- Unfortunately will require downtime for most, some are rolling patches
  - OMS Patching via OPatch tool
    - See the Administrator’s Guide
  - Agent & Plug-in Patching via EM

- Recommended patch list on My Oracle Support
  - Patches & Updates / Recommended Patch Advisor
Patching Best Practices

- Use the recommended patch list on My Oracle Support / Patches & Updates / Recommended Patch Advisor.

- Agent & Plug-in Patching via the patching feature in EM
  - Instructions can be found in Administrator’s Guide for Agents and Plug-ins.

- OMS Patching via OPatch tool
  - Some patches require all OMSes to be shutdown during patching, some are rolling or online patches. For further details on OMS patching see the Administrator’s Guide.
Cerner’s Patch Process

- Frequency is determined by bugs hit, strive for BP’s.
  - Since most patches require full OMS downtime, and this solution monitors and manages 1/3 of the nation’s healthcare beds, uptime is very important
  - Agent patching is minimal, as no current work around for changing the agent’s software owner and nearly 1000 hosts with differing passwords
  - Repository database patching is aligned with CPU releases
  - Plug-ins are as needed for functionality

- Test then Deploy!
  - All patches are tested in our multi-oms certification environment
  - Released into production with a 21-day notice for all planned downtimes due to the multi-tenant nature of our system
Oracle Enterprise Manager 12c

Complete Cloud Lifecycle Management

Integrated Cloud Stack Management

Business-Driven Application Management

Self-Service IT  |  Simple and Automated  |  Business Driven
Safe Harbor

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle’s products remains at the sole discretion of Oracle.
Program Agenda

- Internal Subsystems

MOS 1553342.1 - Oracle Enterprise Manager 12c Configuration Best Practices
Whitepaper: Operational Considerations and Troubleshooting Oracle Enterprise
Manager 12c
EM Internals

- DBMS Scheduler
- Database Advanced Queuing
- Loader Subsystem
- Notification Subsystem
- Task Subsystem
- EM Job System
DBMS Scheduler

Setup -> Manage Cloud Control -> Repository

- Database Feature used to execute SQL and PL/SQL procedures in the repository (repeatedly if needed)
  - Examples: Composite availability calculations, Compliance scores, RCA analysis, ...
- Repository jobs running behind schedule or down can cause significant performance problems.
- `DBMS_SCHEDULER` must be enabled and the init parameter `JOB_QUEUE_PROCESSES` set to a non-zero value.

Setup -> Manage Cloud Control -> Repository

- Status
- Processing Time (%) (Last Hour)
- Next/Last Scheduled Run
Database Advanced Queuing

Setup -> Manage Cloud Control -> Repository

- Both OMS and Repository rely heavily on Advanced Queues.

- If performance is declining, it is possible that the AQ have become fragmented.

See My Oracle Support note:
1029626.1 Performance Tuning Advanced Queuing Databases and Applications
Loader Subsystem

- Controls loading all data collected by Agents into the repository. The efficiency of this process can greatly impact the performance and health of the overall EM system.
  - % of hour runs
  - Rows / second / thread

- Loader Statistics Report (Reports / Information Publisher)
  - Configured loader resource allocation
  - Loader performance
  - Agent count broken down by agent priority level (values are None, Mission Critical, Production, Staging, Test, Development)

- EMDIAG report to dump the health of the loader subsystem
  - $ repvfy dump loader_health
Loader Subsystem – Loader Backlog

Setup -> Manage Cloud Control -> Health Overview

- Loader backlogs can cause delays in receiving critical information and notifications.
- Can also cause poor console performance and OMS restarts.
- Key Metrics to trend:
  - Overall Back-off Requests in the Last 10 Mins
  - Overall Rows Processed by Loader in the Last Hour
  - Overall Upload Backlog (files)
  - Overall Upload Backlog (MB)
  - Overall Upload Rate (MB/sec)

Check for anomalies and spikes over time
Notification Subsystem

Setup -> Manage Cloud Control -> Health Overview

- Controls all e-mail, helpdesk connectors traffic and custom notifications.
- Backlog in notifications can cause a delay in alerts being sent or even a missing alert.
Notification Subsystem

Management Services and Repository target -> Monitoring -> All Metrics

- Validate Notification Status
- Four performance metrics for notification delivery:
  - Average Notification Time (seconds)
  - Notification Processing Time (% of last hour)
  - Notifications Processed (Last Hour)
  - Pending Notifications Count
- EMDIAG report on Notifications
  - $ repvfy dump notif_health

[Image of a screenshot from the Management Services and Repository tool displaying monitoring metrics and a notification status report.]
Task Subsystem

- Repository jobs are divided between two types: *Short Running* and *Long Running* tasks.
  - Job names are “Repository Metrics xx” (where xx is a number)
  - The lower numbers are the short running task workers and the higher numbers are the long running task workers.

You can identify which number corresponds to which task class with this command:

```bash
$ repvfy show worker_tasks
```
Task Subsystem

Setup -> Manage Cloud Control -> Repository

- EMDIAG provides a command to dump the health of the Task subsystem.
  $ repvfy dump task_health

- Identify any large spikes in processing time or throughput which could indicate an issue that is generating more work for the repository.

- If throughput for these Repository Metric jobs is consistently high and the backlog is growing, consider adding another task worker. Keep the number of short and long task workers the same.
  - To set the number of workers to 2 for both short and long:
    $ repvfy send set_workers
  - Do not increase the number higher than 4 without contacting Oracle Support for further diagnostics.

- If suspecting a performance problem with the tasks the workers are executing, execute this command:
  $ repvfy verify repository -test 6013 (short running tasks)
  $ repvfy verify repository -test 6014 (long running tasks)

- Further debugging of a questionable task can be done via these commands:
  $ repvfy send run_task -id <task id>
  $ repvfy dump trace
EM Job system

1. **Job Scheduler** (aka “Step Scheduler”)
   - DBMS_SCHEDULER program that runs in the repository
   - Prioritizes and marks unit of work as ‘ready to be executed’

2. **Job Dispatcher**
   - JAVA Thread on the OMS (1 per OMS)
   - Picks up ‘ready’ work and determines who is involved, and who is going to execute the work (long vs short / agent vs internal)

3. **Job Workers**
   - JAVA Thread on the OMS (Pool of worker threads)
   - Executes the unit of work (or tells the Agent the command to execute), and stores the output
EM Job System – Job Step Scheduler

Setup / Manage Cloud Control / Repository

- This is a global component so there is only one per EM environment.
- It is scheduled to run by the DBMS Scheduler.
- Purpose is to look for jobs that need to be executed.
- Look for the status of the *Job Step Scheduler* in the Repository Scheduler Jobs Status section.

![Repository Scheduler Jobs Status](image)
EM Job System – Job Dispatcher

- Runs locally on each OMS (1 dispatcher per OMS).
- Purpose is to dispatch the jobs found by the Job Step Scheduler to the job workers.
- A backlog is created when dispatchers cannot keep up with the work in the queue. If this is temporary then it is not a problem. If the backlog continues to grow, then either the dispatcher is not able to keep up or there is a problem with the job workers.
EM Job System – Job Workers

Setup / Manage Cloud Control / Management Services

- Job Workers take work from the Job Dispatcher and send it to the appropriate agent. They also receive information from the agents.

- If Job Workers are always busy, then capacity needs to be added either via another OMS or by increasing the number of job workers and potentially increasing the number of db connections.

- If the amount of work the dispatcher is able to give to the job workers approaches zero, then the workers are not keeping up.
## Oracle Enterprise Manager Sessions - Monday

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<td>Managing Oracle WebLogic Server and Oracle Coherence with Oracle Enterprise Manager 12c</td>
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<td>Managing the Manager: Tips and Tricks for Maintaining Oracle Enterprise Manager 12c</td>
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## Oracle Enterprise Manager Sessions - Wednesday

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## Oracle Enterprise Manager Sessions - Thursday

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<td>CON3103</td>
<td>Real Oracle Real Application Testing: What to Expect and Prepare For Migrating Oracle Enterprise Manager to a New Data Center with Near-Zero Downtime</td>
<td>Thursday</td>
<td>12:30 PM</td>
<td>Moscone South - 104</td>
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<tr>
<td>CON6129</td>
<td>Keyword-Driven Testing with Oracle Application Testing Suite: Application Testing Reinvented</td>
<td>Thursday</td>
<td>12:30 PM</td>
<td>Moscone South - 308</td>
</tr>
<tr>
<td>CON9575</td>
<td>Bank of America and Oracle Enterprise Manager 12c: Delivering Productivity and Efficiency</td>
<td>Thursday</td>
<td>12:30 PM</td>
<td>Moscone West - 3018</td>
</tr>
<tr>
<td>CON5677</td>
<td>JVM Diagnostics: Java Profiling in Production Environments</td>
<td>Thursday</td>
<td>2:00 PM</td>
<td>Moscone South - 308</td>
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<tr>
<td>CON9571</td>
<td>Manage Beyond Limits: Oracle Enterprise Manager CLI and Other Extensibility Features</td>
<td>Thursday</td>
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<td>Moscone South - 130</td>
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<tr>
<td>CON9587</td>
<td></td>
<td>Thursday</td>
<td>3:30 PM</td>
<td>Moscone South - 308</td>
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</table>
## Oracle Enterprise Manager DEMOgrounds

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

**Marriott Marquis - Salon 14/15**

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

- **Oracle.com:** [http://www.oracle.com/enterprisemanager](http://www.oracle.com/enterprisemanager)
  - Enterprise Manager Customer References
- **OTN:** [http://www.oracle.com/technetwork/oem](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
Backup Slides
Availability & Health
EM Infrastructure Availability

Setup -> Manage Cloud Control -> Health Overview

- Drill-down capabilities to all infrastructure components
- To get the list: OMS and Repository -> Members -> Show All
- Each component represents a target in EM.
  - Use information provided on the target’s home page (i.e. errors/alerts) to assist in diagnosing and resolving the availability issue

Note, if the system is configured with Level 4 High Availability, the standby OMS servers will show down. For additional information on High Availability configurations, see the Oracle Enterprise Manager Cloud Control Administrator’s Guide.
Checking OMS Availability

Setup -> Manage Cloud Control -> Management Services

- Verify the status of all EM key components and resolve any critical errors
Repository Availability

Setup -> Manage Cloud Control -> Repository -> name of database

- DB Performance and Waits
- Availability checks
- Tablespace Freespace
- Archive
- Statistics
Repository Maximum Availability

Repository Target -> Availability -> High Availability Console

- Check the repository and standby repository database (if applicable)
# Infrastructure Troubleshooting

## Repository checks

<table>
<thead>
<tr>
<th>Check</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBMS_SCHEDULER</td>
<td>Is the database scheduling engine working?</td>
</tr>
<tr>
<td></td>
<td><em>Setup -&gt; Manage Cloud Control -&gt; Repository</em></td>
</tr>
<tr>
<td>AQ</td>
<td>Are the Advanced Queue's working in the repository?</td>
</tr>
<tr>
<td></td>
<td><em>Setup -&gt; Manage Cloud Control -&gt; Repository</em></td>
</tr>
<tr>
<td>Repository Jobs</td>
<td>Are the EM repository jobs running?</td>
</tr>
<tr>
<td></td>
<td><em>Setup -&gt; Manage Cloud Control -&gt; Repository</em></td>
</tr>
<tr>
<td>Repository Collections</td>
<td>Processing of the internal tasks OK?</td>
</tr>
<tr>
<td></td>
<td><em>Setup -&gt; Manage Cloud Control -&gt; Repository</em></td>
</tr>
<tr>
<td>Check Logs</td>
<td>Alertlog of the database</td>
</tr>
<tr>
<td></td>
<td>Database Incidents</td>
</tr>
</tbody>
</table>
## Infrastructure Troubleshooting

### OMS checks

<table>
<thead>
<tr>
<th>Check</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loader Backlog</td>
<td>Is all the Agent information loaded in a timely fashion? &lt;br&gt;Setup -&gt; Manage Cloud Control -&gt; Health Overview</td>
</tr>
<tr>
<td>Notification Backlog</td>
<td>Are all notifications delivered in a timely fashion? &lt;br&gt;Setup -&gt; Manage Cloud Control -&gt; Health Overview</td>
</tr>
<tr>
<td>Check logs</td>
<td>OMS incidents (Uploaded to the Incident Manager in EM) &lt;br&gt;emoms.log and emoms_pbs.log from &lt;MW_HOME&gt;/em/EMGC_OMSn/sysman/log</td>
</tr>
</tbody>
</table>
Agent Health

Setup -> Manage Cloud Control -> Agents

- Look for agents that are blacked out, unreachable, pending or blocked.
- A significant percentage indicates an unhealthy environment. Troubleshoot these agents.
  - Reports / Information Publisher
  - EMDIAG report of Agent Health
    $ repvfy dump agent_health
- Spot check the agent health daily looking for a significant increase in problem agents.
# Agent Troubleshooting

<table>
<thead>
<tr>
<th>Check</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Up</td>
<td>Check to verify if the host is up. If not, is the host still valid? Many times hosts are decommissioned but not removed from monitoring.</td>
</tr>
<tr>
<td>Agent Up</td>
<td>Check to verify if the agent is up. Start agent if necessary. $ emctl status agent</td>
</tr>
<tr>
<td>Agent Uploading</td>
<td>In the emctl status agent, check for messages about heartbeat/upload. Attempt an upload: $ emctl upload</td>
</tr>
<tr>
<td>OMS Reachable</td>
<td>Ping the OMS from the agent, and agent from the OMS, ensure ports are not blocked by firewalls. $ emctl pingOMS</td>
</tr>
<tr>
<td>Check Logs</td>
<td>&lt;EMSTATE&gt;/agent_inst/sysman/log/ (ex: /u01/app/oracle/em/agent_inst/sysman/log)</td>
</tr>
<tr>
<td>Agent Dump</td>
<td>If the agent is still not uploading or reachable, run a target (or agent) report and am availability dump on the agent target from REPVFY: $ repvfy dump agent -name <a href="">agent:port</a> $ repvfy dump target -name <a href="">agent:port</a> $ repvfy dump availability -name <a href="">agent:port</a></td>
</tr>
</tbody>
</table>
Events and Incidents

- Review Critical or Warning errors as these could indicate an underlying issue that could lead to an outage.
- Large amounts of alerts cause a performance impact on the EM system.
- Metric errors indicate that data is not being collected or monitored properly so these need to be resolved to show the accurate target status.
- For detailed look at using Incident Manager see the Oracle Enterprise Manager 12c Cloud Control Administrator’s Guide.
Events and Incidents

UI locations for EM related incidents and errors

- Setup / Manage Cloud Control / Health Overview
  From the target menu, select
  OMS and Repository -> Monitoring -> Incident Manager

- Incident Console
  Enterprise -> Monitoring -> Incident Manager

- System Errors - This page details the errors found on the repository and/or the management services. The URL to this page is http://your_em_link/em/console/health/healthSystemError
  It is used for advanced fault research and should only need to be reviewed to help resolve a problem that has not been resolved through any of the other event and incident management tools. It is best to work with Oracle Support for help in resolving these issues.
## Maintaining Enterprise Manager

### Log & Trace Files

<table>
<thead>
<tr>
<th>EM Component</th>
<th>Log and trace files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Management Agent</td>
<td><code>&lt;EMSTATE&gt;/sysman/log</code> (&quot;emctl getemhome&quot; will return the location for <code>&lt;EMSTATE&gt;</code>)</td>
</tr>
<tr>
<td>Oracle Management Service</td>
<td><code>&lt;MWARE&gt;/gc_inst/em/&lt;OMSNAME&gt;/sysman/log</code> (where <code>&lt;MWARE&gt;</code> is the middleware home and <code>&lt;OMSNAME&gt;</code> is the name of the OMS instance ex: EMGC_OMS1)</td>
</tr>
<tr>
<td>Oracle HTTP Server (OHS)</td>
<td><code>&lt;MWARE&gt;/gc_inst/&lt;WebTier name&gt;/diagnostics/logs/OHS/&lt;ohs_name&gt;</code> (where <code>&lt;MWARE&gt;</code> is the middleware home and <code>&lt;WebTier name&gt;</code> is the name of the WebTier ex: WebTierIH1 and <code>&lt;OHS name&gt;</code> is the name of the HTTP Server instance ex: ohs1)</td>
</tr>
<tr>
<td>OPMN</td>
<td><code>&lt;EM_INSTANCE_BASE&gt;/&lt;webtier_instance_name&gt;/diagnostics/logs/OPMN/&lt;opmn_name&gt;</code></td>
</tr>
<tr>
<td>Oracle WebLogic</td>
<td><code>&lt;EM_INSTANCE_BASE&gt;/user_projects/domains/&lt;domain_name&gt;/servers/&lt;SERVER_NAME&gt;/logs</code></td>
</tr>
</tbody>
</table>
Maintaining Enterprise Manager

OMS Incident Files

- Errors in these files indicate product defects (bugs). Open an SR with Oracle Support for these issues.

- Two locations for the Automatic Diagnostic Repository (ADR) incidents created on the OMS servers:
  - WebLogic Server incidents:
    <EM_INSTANCE_BASE>/user_projects/domains/<domain_name>/servers/<SERVER_NAME>/adr.diag/ofm/EMGC_DOMAIN/EMOMS/incident
  - OMS Incidents:
    <EM_INSTANCE_BASE>/user_projects/domains/<domain_name>/servers/<SERVER_NAME>/adr.diag/ofm/<domain_name>/<SERVER_NAME>/incident
Maintaining Enterprise Manager

Agent Incident Files

- The ADR incidents created for the Agent are found here:
  \(<EMSTATE>/diag/ofm/emagent/emagent/incident\)
  Ex:
  /u01/app/oracle/em/agent_inst/diag/ofm/emagent/emagent/incident

**NOTE:**

- To call ADRCI for the Agent, you can use this AGTVFY command:
  
  $ agtvfy call adrci

- For more details on gathering incident information, refer to this
  My Oracle Support note:
  1512905.1: How to Invoke ADR Command Interpreter (adrci) in OMS or Agent Home?
Appendix A
Online References

- **Websites**
  - Cloud Control (oracle.com):

- **Documentation**
  - Oracle Learning Library:
    http://www.oracle.com/goto/oll
    http://www.youtube.com/user/oracleLearning
  - 12cR3 documentation set:
    http://docs.oracle.com/cd/E24628_01/index.htm

- **Blogs**
  - Oracle Enterprise Manager:
    https://blogs.oracle.com/oem
  - Enterprise Manager Best Practices:
    https://blogs.oracle.com/EMMMAA
Hardware and Software
Engineered to Work Together