S316974 The X-Files – Managing the Oracle Exadata and Highly Available Oracle Databases

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Business Users and Customers

Business-Driven Application Management
- Understand business needs
- Manage from business perspective

Integrated Application-to-Disk & Cloud Management
- Eliminate management silos
- Create agile IT for dynamic business

Integrated Systems Management & Support
- Proactively identify and fix problems
- Maximize business productivity

Oracle Support

Integrated Application-to-Disk and Cloud Management

APPLICATIONS
- Middleware
- Databases
- Servers
- Storage

Services Cloud
Agenda

- Oracle’s Database High Availability portfolio
- Data Guard Management highlights
- Real Application Cluster Management highlights
- Exadata Database Machine Management
Oracle Data Guard
Low cost, high value protection

Primary Site

Standby Site

Data Guard Broker

Primary Database

Physical or Logical Standby Database

Data Guard SYNC / ASYNC
Real Application Clusters

- Oracle’s flagship data grid enablement technology
- Built-in HA to support mission critical workloads
- Scale workloads across multiple low cost servers
- Consolidate into fewer servers and databases
- Runs all Oracle database applications
Exadata Database Machine Overview

- Each Exadata Cell is a self-contained server which houses disk storage and runs the Exadata software
- Oracle Databases are deployed across multiple Exadata Cells
- Oracle Database enhanced to work in cooperation with Exadata Storage Server
Managing Data Guard
Monitoring and Management of Data Guard

- Lifecycle management features including creation of Data Guard environments from within the EM Console
- Key monitoring views on the health of your Data Guard environment
- View the status of all enterprise Data Guard environments from a single console
Support for Creation of Data Guard Environments

- Out of box functionality to create Data Guard environments
- Automates the process completely through a wizard based interview process
- Reduces the time and complexity in creating HA environments

Let’s take a quick walk through the process to illustrate it…
Initiate the Workflow to Create Data Guard Config

Choose the database to create a Standby from, then select Availability…
Select the Type of Standby Database You Want

At this point we choose whether we want a physical or logical standby database.
Specify Where to Lay-down the Remote Environment
Specify How to Manage the Files on the Standby
Wrapping Up Your Choices

Some final choices you need to make on naming the Standby, how it will be monitored and whether to use the DG Broker…
Confirm Your Selections….And We’re Good to Go

If you’re unhappy with any of the settings you can navigate back and make corrections or changes…
...and we’re off!

The execution length of this process will vary based on:-

- Available Bandwidth (on the network)
- Workload (on the primary database and standby host)
Some minutes later…
Summary on Data Guard creation in Grid Control

- Automated, guided workflow through Data Guard creation process through a GUI interface
- Takes a potentially complex process and simplifies and automates it
  - Saving time taken to create high availability configurations and increasing DBA productivity
  - Reducing potential for errors in creation
- Very useful in environments where production ‘spin-off’s are used for reporting, backups, warehousing, etc.
  - Frees up DBA resources to concentrate on value add to the business applications they support
Using Data Guard as a Means to Migrate

- Data Guard provides an excellent migration option to move your database applications onto the Exadata Database Machine
- This paper provides an overview of the process

Using Data Guard as a Migration Technique

- For an example of how this technique works in transitioning a Grid Control environment to an MAA compliant solution see session S316996
- Process is equally valid for your database applications you want to migrate to the Exadata Database Machine or RAC
Now We’re Up and Running...

- We need to validate that the Data Guard configuration is behaving as expected
- We need to monitor it’s readiness to be activated if it’s required in a failure scenario

This can all be done from within the Grid Control Console...
HA Console Provides ‘one-screen’ View of Data Guard Environment Status

(available since 10.2.0.5)
Validate that Enterprise is Prepared for Failures

From the Data Guard homepage we can trigger a verification process
Within seconds we get validation of the preparedness of the DG configuration

- Performs a number of checks including the capability to switchover/failover
- Failures are highlighted so action can be taken pro-actively
RAC Management
Why Are We Interested in RAC Management?

- RAC is a cornerstone technology in the Exadata Database Machine
- Management of RAC is essential and Enterprise Manager provides breadth and depth
- Let’s explore the capabilities in Enterprise Manager to manage the performance of your high availability environment
Capacity Monitoring on Clusters

- Understand overall cluster status at a glance
- Automated diagnostics on the cluster interconnect

Visually identify load skew and other cluster characteristics
Storage Management in RAC Environments

- Detailed storage statistics show breakdown of storage allocation and usage
- Allows for some trending of storage usage over time
- ASM management also available in Single Instance
Diagnosing RAC Performance Issues (RAC ADDM)

• New in EM 11.1, ADDM is now RAC aware
• Cluster wide view of performance issues helps focus on diagnosing and acting on greatest ‘global’ issues first
• Impact analysis can be very powerful when used in conjunction with applications that are well instrumented
Identifying Cluster Wide issues

Identifying issues that affect some or all cluster nodes
Impact analysis aids quick problem detection
Managing RAC Services in Enterprise Manager

- Mapping applications data services onto RAC Services allows resource segregation ‘ring fencing’
- RAC and an Exadata Database Machine are often used as a consolidation platform for database services
- Ability to manage and monitor RAC Services is key on large Exadata deployments where Services are used extensively
- Deployments often have a large number of ‘services’ provided by the Exadata Database Machine
Firstly, where can you find Services in Enterprise Manager?

- ‘Hidden’ under the Availability tab on Cluster Database targets
Clicking this brings up a list of defined services

- Let's add a new service

Enterprise Manager will take care of creating the services across all Cluster nodes
Service definitions complete

- Now that we’ve defined cluster services what benefits can you get?
The Service view on Performance

- Default views on Performance show waits
- Optionally also show performance by instance
See your application activity by service
To summarise

- Use Services functionality in Enterprise Manager to help you manage the resources RAC and the Exadata Database Machine
- Management and Monitoring functionality in Enterprise Manager is Service aware
- ADDM and RAC ADDM is also Service aware
- Great functionality to use on an Exadata Database Machine to show the performance of your environments
Exadata Database Machine Overview

Scaleable Grid of industry standard servers
- All monitored using Enterprise Manager
- Existing capabilities and Plug in Extensions

Database Grid
- 8 compute servers
- 64 Intel cores

Storage Grid
- 14 storage servers (2U)

InfiniBand Network
- Redundant 40Gb/s switches
- Unified server & storage net

Cisco Switch for Management Network
- Highly Available hardware
  - PDU
  - KVM
The Exadata Database Machine and Grid Control

Scaleable Grid of industry standard servers
• All monitored using Enterprise Manager
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Cisco Switch for Management Network
• Highly Available hardware
  • PDU
  • KVM
What were our design goals?

- Flexibility of architecture
- Detection of failures is essential to maintaining optimal system performance and availability
- Seeing the database machine as a whole (system target)
  - The ability to model the components of the Exadata Database Machine
The Benefits of Using Grid Control to Manage the Exadata Database Machine

• Database feature integration!
• Plug-ins developed using the Enterprise Manager Extensibility Framework
  – These plug-ins provide the essential information for each of the sub components of the Exadata Database Machine
  – Plug-ins can be tailored to meet data center monitoring standards
• Let’s take a more in-depth look at the characteristics of a plug-in...
The anatomy of a plug-in target

• Key availability information on the target home page
• Plug-in monitors the health of the target
• Notifications can be enabled as with any Grid Control target
Extensibility Framework data flow

Management Server

Grid Control Repository

Plug-in data

Management Agent

IB Plug-in
Cisco Plug-in
Storage Cell Plug-in
Extensibility / Plug-in install

• Plug-ins can be downloaded from OTN
• Install to existing GC 11.1 architectures
• Installation of plug-ins… easy!

Plug in Deployment

Search and Select: Agents

Management Plug-ins
A Management Plug-in is a target type or predefined target types. This page is used to export Management Plug-ins to a Menl system.

Plug-ins
Name
Version
Go

Select All | Select None
Select
Name
Version
Deploy

<table>
<thead>
<tr>
<th>Select</th>
<th>Name</th>
<th>Version</th>
<th>Deploy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cisco_switch</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cisco_switch</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>kvm</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>oracle.Cell</td>
<td>1.2.4.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>oracle.V2.a</td>
<td>0.9943</td>
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</tr>
<tr>
<td></td>
<td>oracle.V2.b</td>
<td>0.9957</td>
<td></td>
</tr>
<tr>
<td></td>
<td>oracle.V2.c</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

Oracle Exadata Storage Server monitoring including reports
Requires SSH setup from agent host to Oracle Exadata...
Configure Target availability

- High Availability for plugin targets
  - Automate the capability of relocate target
  - Preconfigure target to have a known default host and failover host
    - On agent or node fail, job submitted to move monitoring of target to surviving host
    - When agent comes back up, monitoring moved to ‘default host’
    - On agent startup, check for unmonitored targets and bring up if possible
    - Honors target blackout
So – what should be monitored? Why?

• What is important to monitor?
  – Documented in MOS note 1110675.1
  – Covers environment setup
  • Key metrics outlined
  • Complete details for each component

• Some items monitored automatically by Exadata
  – And should not be monitored any other way
  – Example - Storage cell software alerts

• Some require set up on the device
Exadata Storage Cell Plug-in

- Home page shows critical components
  - Monitors data from MS
  - Storage cell email alerts
  - Notifications can also be done outside GC
Alerts Through From The Storage Cell

Alert Details:
- Metric: Cell Alert
- Alert Type: Hardware
- Alert Object: n/a
- Alert Sequence: 99
- Severity: Critical
- Alert Triggered: May 18, 2010 11:38:58 AM
- Last Updated: May 18, 2010 11:38:58 AM
- Acknowledged: n/a
- Acknowledged By: n/a

Message:
Alert Severity: critical Message: A field replaceable unit at /SYS/DBP/HDD1 has been removed from the system. Action: If the FRU is not intentionally removed, contact Oracle Support.

Metric Data:
- Last Known Value: Not available
- Last Collection Timestamp: Not available

Metric Settings:
- Warning Threshold: INFO
- Critical Threshold: Critical
- Occurrences Before Alert: 1

Actions:
- Edit Thresholds

Updates:
- May 18, 2010 11:38:58 AM: Alert Severity: critical Message: A field replaceable unit at /SYS/DBP/HDD1 has been removed from the system. Action: If the FRU is not intentionally removed, contact Oracle Support.
Additional Configurations

- Most monitoring configuration shipped out of the box
  - Design goal – minimal setup!

- However, Some set up on cell is required
  - Alerts then forwarded to the plugin and displayed as an alert

- Set up additional checking for disk I/O errors:

  create threshold CD_IO_ERRS_MIN warning=1, comparison='>='; occurrences=1, observation=1;
Additional Configurations

• Checking for network errors, monitor for warnings:
  – Host MB Dropped Per Sec
  – Host RDMA MB Dropped Per Sec

• And… a double check
  list alerthistory where notificationState like '[023]' and severity like '[warning|critical]' and examinedBy = NULL;

Full set of additional setup instructions are contained in the MOS 1110675.1
Exadata Database Machine Networks

- Two network paths to reach an Exadata Database Machine
  - Client Network
    - Connection between the database nodes and the network
    - Application data channel
  - Management network
    - Connection to the ILOM, host OS
      - Database nodes and storage cells
    - Network managed through the provided Cisco switch

- Internally – Infiniband network is the backbone providing throughput
InfiniBand Switch Monitoring

- The InfiniBand Switch used in the Exadata Database Machine is a key component in delivering the incredible performance
- Detection of failures is essential to maintaining optimal system performance and availability
- Let’s take a more in-depth look at this plug-in….
Infiniband Switch Monitoring

- The framework enables powerful availability trending...
Infiniband Switch Monitoring

- Configure notification rules to monitor IB switches
- Apply notification rules with granular control or across all the switches monitored in Grid Control
Infiniband Switch Monitoring

- Tell Enterprise Manager how to notify you on regarding issues with IB Switches
Infiniband Switch Monitoring

- Uses standard Enterprise Manager framework processes
- Define rules on ‘what’ and ‘when’ to be notified of failures
Infiniband Switch Monitoring

- Integration with ILOM (Integrated Lights Out Manager) directly from the EM Console
Cisco Switch Plugin

- Provides monitoring coverage of the in-cabinet Cisco switch provided with the Oracle Database Machine

Cisco Switch: santaclaradc2175-swi-1.us.oracle.com

<table>
<thead>
<tr>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status: Up</td>
</tr>
<tr>
<td>Availability (%): 97% (Last 24 Hours)</td>
</tr>
<tr>
<td>Host: sclczdb01.us.oracle.com</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alerts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
</tr>
<tr>
<td>Interface Status for GigabitEthernet1/47/1000</td>
</tr>
</tbody>
</table>
Cisco Switch Plug-in

• Provides monitoring coverage of the in-cabinet Cisco switch provided with the Exadata Database Machine

• What’s important to monitor?
  – Field replaceable component failures
  – Switch up/down, power cycle
  – Access to the switch

• Configuring the Cisco plug-in
  – Additional SNMP commands required on the switch
  – Documented in MOS 1110675.1
Cisco Switch – Key components

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Thresholds</th>
<th>Collection Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>santaclaradc2175-swi-1.us.oracle.com</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU</td>
<td>Some</td>
<td>Every 5 Minutes</td>
</tr>
<tr>
<td>Fan</td>
<td>All</td>
<td>Server Generated</td>
</tr>
<tr>
<td>Fan State</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>All</td>
<td>Every 5 Minutes</td>
</tr>
<tr>
<td>Network Interfaces</td>
<td>Some</td>
<td>Every 5 Minutes</td>
</tr>
<tr>
<td>Power Supply</td>
<td>All</td>
<td>Server Generated</td>
</tr>
<tr>
<td>Power Supply State</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>All</td>
<td>Every 1 Minute</td>
</tr>
<tr>
<td>Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCP Ping, Milliseconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Information</td>
<td>Not Applicable</td>
<td>Real-time Only</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature, State</td>
<td>All</td>
<td>Every 5 Minutes</td>
</tr>
<tr>
<td>Temperature, Value (Celcius)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Exadata Compute Server Plug-in

- Exadata Compute Server nodes are monitored by the Plug-in
- Plug-in allows EM user to
  - Get response metric
  - Collect hardware faults/sensor events
  - Gather ILOM telemetry
  - Report configuration data
  - Punch out to ILOM console
## Sensor Events

### Sensor Alerts

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Sensor Status</td>
<td>OK</td>
</tr>
<tr>
<td>Fan Sensor Status Description</td>
<td>All sensors of this kind are OK</td>
</tr>
<tr>
<td>Power Supply Sensor Status</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>Power Supply Sensor Description</td>
<td>Power Supply sensor #0x78 indicates that it is at state: Asserted</td>
</tr>
<tr>
<td>Voltage Sensor Status</td>
<td>OK</td>
</tr>
<tr>
<td>Voltage Sensor Description</td>
<td>All sensors of this kind are OK</td>
</tr>
<tr>
<td>Current Sensor Status</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>Current Sensor Description</td>
<td>Current sensor #0x7d indicates that it is at state: Upper Non-recoverable</td>
</tr>
<tr>
<td>Temperature Sensor Status</td>
<td>OK</td>
</tr>
<tr>
<td>Temperature Sensor Description</td>
<td>All sensors of this kind are OK</td>
</tr>
</tbody>
</table>

### Alerts

<table>
<thead>
<tr>
<th>Metric</th>
<th>Severity</th>
<th>Message</th>
<th>Alert Triggered</th>
<th>Last Value</th>
<th>Last Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Sensor Status</td>
<td></td>
<td><img src="https://raw.githubusercontent.com/oracle-oracle-critical-event-icon/master/critical_icon.png" alt="Critical" /></td>
<td>Aug 24, 2010 9:00:01 PM</td>
<td>CRITICAL</td>
<td>Aug 24, 2010 11:45:01 PM</td>
</tr>
<tr>
<td>Power Supply Sensor Status</td>
<td><img src="https://raw.githubusercontent.com/oracle-oracle-critical-event-icon/master/critical_icon.png" alt="Critical" /></td>
<td>Power Supply sensor #0x78 indicates that it is at state: Asserted</td>
<td>Aug 24, 2010 9:00:01 PM</td>
<td>CRITICAL</td>
<td>Aug 24, 2010 11:45:01 PM</td>
</tr>
</tbody>
</table>
ILOM Telemetry

- Metric table per sensor class
  - Fan Speeds
  - Temperature
  - Voltage Sensors
- Sensor state column
- Sensor reading column
- Collected every 2 Minutes
In **Related Links** section of target home page
Keyboard Video Mouse (KVM) Plugin

- Keyboard Video Mouse (KVM)
- Redundant access to all components
Power Delivery Unit (PDU) Plugin

- Power Delivery Unit (PDU)
  - Now shipping with updated firmware
  - Threshold recommends set by hardware configuration
View the Exadata Database Machine as a Service in Enterprise Manager

- Systems and Services in Enterprise Manager allows the Exadata Database Machine to be viewed in a service model
- Provides a rolled-up view of service status, performance and usage
- Very powerful for determining from a high level whether your Database Machine is delivering on service levels to applications
- Can utilise power root cause analysis functionality of EM framework to quickly diagnose the cause of service failure and it’s impact
Create Systems

- Systems consist of collections of components
- For example, group all your listeners or instances together
Create Services based on these

- If desired, you can add key Performance and Usage charts to the Service
Define key service attributes

Define key system components

Choose components: orcl_orcl2, orcl_orcl1

Define Service Level criteria
Finally create an Exadata Service

- Create an Aggregate Service to consolidate all the Exadata sub-services you’ve defined
Exadata Aggregate Service

Automated Root Cause Analysis highlights why Exadata Service is impacted

Possible Causes of Service Failure
Grid Control has performed Root Cause Analysis for this service failure and has identified the following possible causes. Click Root Cause Analysis Details to view details related to this analysis.

Confidence High

<table>
<thead>
<tr>
<th>Timestamp (PST)</th>
<th>Target Name</th>
<th>Target Type</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Jul-2010 09:14:14</td>
<td>LISTENER_SCAN 1 v2</td>
<td>Listener</td>
<td>The listener is down: LSNRCTL for Linux: Version 11.2.0.1.0 - Production on 15-Jul-2010 08:14:15 Copyright (c) 1991, 2009, Oracle. All rights reserved. Welcome to LSNRCTL, type &quot;help&quot; for information. LSNRCTL&gt; Connecting to (DESCRIPTION=(ADDRESS=  (PROTOCOL=IPC)(KEY=LISTENER_SCAN))) TNS-12541: TNS:no listener TNS-12560: TNS:protocol adapter error TNS-00511: No listener Linux Error: 2: No such file or directory LSNRCTL&gt;</td>
</tr>
</tbody>
</table>

Aggregate Service Status and Subservice status reflected

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Status</th>
<th>Performance Alerts</th>
<th>Usage Alerts</th>
<th>Policy Violations Name</th>
<th>System</th>
<th>Key Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exadata Service</td>
<td>Aggregate Service</td>
<td>↓</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Ex ASM Service</td>
<td>Generic Service</td>
<td>↑</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Ex Host Service</td>
<td>Generic Service</td>
<td>↑</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Ex Instance Service</td>
<td>Generic Service</td>
<td>↑</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Ex Listener Service</td>
<td>Generic Service</td>
<td>↑</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Ex Storage Servers Service</td>
<td>Generic Service</td>
<td>↑</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Publish Exadata Service Dashboards

- Service information can be published for executives and business owners
• The SPA utility in Enterprise Manager Grid Control can help quantify and determine how much your application would benefit from running on the Exadata Database Machine
• Workflow driven approach to capture and analyze a workload
• Grid Control has knowledge of how workloads benefit from Exadata technology and can analyse real workloads and highlight potential benefits
First we need a workload

- Select an application you want to profile as a possible candidate for migration to the Exadata Database Machine
Capture the workload

- SQL Tuning Sets in Enterprise Manager let you capture a snapshot of a real workload
- From the performance page select “SQL Tuning Sets”
Create our SQL Tuning Set

- Create a SQL Tuning Set, based on
  - AWR Snapshots
  - Cursor Cache
  - etc
Run the simulation

• Simulates the effect of an Exadata Storage Server on a SQL Tuning Set
Automatic Service Request (ASR)

• Automatically opens service requests with Oracle for specific hardware faults
  • Service requests filed electronically and securely
  • Fast and accurate resolution of the hardware faults
  • Improved availability, less downtime

• Can be integrated with existing monitoring tools
  • ASR manager can send SR notifications via SNMP traps to existing monitoring tools
How Does ASR Work?

Fault occurs

Customer Datacenter

FRU replaced by Field Engineer

Oracle Field Engineer

Customer

SR creation email notification to customer

Product's auto-diagnosis facility sends SNMP trap to ASR Manager

ASR Manager

Fault telemetry securely transmitted to Oracle

ASR Service

Oracle Case Management System

Service Request (SR) created

Oracle Support Services

FRU dispatched by Support Engineer

Oracle Support Engineer

Service Request routed to Support Engineer

Oracle Support Services

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• Comprehensive suite of High Availability technologies
  – Covered by a complete monitoring solution
  – Grid Control, Plug-ins, ASR

• Flexible Configuration
  – Deploy what you need based on your standards
  – Solution configurable at install time or after the deployment

• Easy to use Dashboards & Tools
  – HA Console for Data Guard, RAC and Exadata Services
  – SPA Simulator can help evaluate Exadata’s potential benefits for your applications
Questions?
Oracle Enterprise Manager 11g Resource Center
Access Videos, Webcasts, White Papers, and More

Oracle.com/enterprisemanager11g
### Additional Oracle Enterprise Manager Sessions

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00am</td>
<td>Oracle@Oracle: How Oracle IT Achieves High Application Service Levels</td>
<td>Moscone W L2, Rm 2020</td>
</tr>
<tr>
<td>11:00am</td>
<td>End-to-End Application Management: Top Ten Tips and Techniques</td>
<td>Moscone S Room 305</td>
</tr>
<tr>
<td>11:00am -</td>
<td>End-to-End Application Management: Top Ten Tips and Techniques</td>
<td>Moscone S Room 305</td>
</tr>
<tr>
<td>12:30pm</td>
<td>Day in the Life of a DBA: End-to-End Management with Oracle Enterprise Manager</td>
<td>Moscone S Room 303</td>
</tr>
<tr>
<td>12:30pm -</td>
<td>Automate Oracle E-Business Suite Testing With Oracle Application Testing Suite</td>
<td>Moscone W L2, Rm 2020</td>
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<tr>
<td>2:00pm</td>
<td>How we built our Private Cloud with Oracle Enterprise Manager: The Verizon Story</td>
<td>Moscone S Room 102</td>
</tr>
<tr>
<td>2:00pm</td>
<td>Mission Critical Database Monitoring with Enterprise Manager-Real World Lessons</td>
<td>Moscone S Room 309</td>
</tr>
<tr>
<td>2:00pm -</td>
<td>How You Can Optimize Siebel Applications for Today and Prepare for the Future</td>
<td>Moscone W L2, Rm 2001</td>
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</table>
# Additional Oracle Enterprise Manager Sessions

<table>
<thead>
<tr>
<th>Monday, Sept. 20</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 3:30 pm - <em>General Session: Enterprise IT and Cloud Computing</em></td>
<td>• Moscone S Rm 102</td>
</tr>
<tr>
<td>• 3:30 p.m.- &quot;Lost in Transaction&quot;: Managing Business Transactions across Distributed Systems</td>
<td>• Moscone S Rm 310</td>
</tr>
<tr>
<td>• 3:30 p.m.- Accelerate/Streamline Your Unicode Migration: Oracle Unicode Migration Assistant</td>
<td>• Moscone S Rm 252</td>
</tr>
<tr>
<td>• 3:30 p.m. - Avoiding SQL Performance Regressions: New Techniques for Solving an Old Problem</td>
<td>• Moscone S Rm 303</td>
</tr>
<tr>
<td>• 3:30 p.m - Business-Driven Application Management and End-to-End Performance Diagnostics</td>
<td>• Moscone W L3, Rm 3024</td>
</tr>
<tr>
<td>• 5:00 p.m.- Application Change &amp; Configuration Management: Tales from the Trenches</td>
<td>• Moscone S Rm 102</td>
</tr>
<tr>
<td>• 5:00 p.m.- Mission Accomplished: Virtualization Powered by Oracle Enterprise Manager</td>
<td>• Moscone S Rm 305</td>
</tr>
<tr>
<td>• 5:00 p.m.- Managing Oracle WebLogic Server: New Features and Best Practices</td>
<td>• Moscone W L3, Rm 3024</td>
</tr>
</tbody>
</table>
## Additional Oracle Enterprise Manager Sessions

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 a.m.</td>
<td>General Session: Business-Driven IT with Oracle Enterprise Manager 11g</td>
<td>Moscone S Rm102</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>Managing the Oracle Ecosystem on a Cloud Platform: Oracle Enterprise Manager</td>
<td>Moscone S Rm 309</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Smart Database Administration: Cool New Features for Power DBAs</td>
<td>Moscone S Rm104</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Application Testing in the Cloud: Smart Testing for Agile Enterprises</td>
<td>Moscone W L2, Rm 2010</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Oracle Identity Management Administration Best Practices</td>
<td>Moscone S Rm 309</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Latest on Oracle Application Change Management Pack for Oracle E-Business Suite</td>
<td>Moscone W L2, Rm 2024</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Deploy New Database Features Risk-Free with Database Replay</td>
<td>Moscone S Rm 102</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>SQL Tuning for Smarties, Dummies, and Everyone in Between</td>
<td>Moscone S Rm 104</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>Oracle Enterprise Manager Ops Center for OS and Hardware Management</td>
<td>Moscone S 270</td>
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</table>
## Additional Oracle Enterprise Manager Sessions

<table>
<thead>
<tr>
<th>Wednesday, Sept. 22</th>
<th>Location</th>
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<tbody>
<tr>
<td>• 10:00 a.m. - Manage the Manager: Diagnosing and Tuning Oracle Enterprise Manager</td>
<td>• Moscone S Rm 102</td>
</tr>
<tr>
<td>• 11:30 a.m. - Maximizing Database Performance: Performance Tuning with DB Time</td>
<td>• Moscone S Rm 104</td>
</tr>
<tr>
<td>• 11:30 a.m. - Make Upgrades Uneventful Using Oracle Enterprise Manager and My Oracle Support</td>
<td>• Moscone S Rm 310</td>
</tr>
<tr>
<td>• 12:30pm – Extracting Real Value from Your Data with Apache Hadoop</td>
<td>• Hilton Hotel, Plaza B</td>
</tr>
<tr>
<td>• 1:00 p.m.- Reducing the Risk of SOA Transactions</td>
<td>• Marriott Marquis, Salon 6</td>
</tr>
<tr>
<td>• 1:00 p.m. - SQL Tuning Roundtable with Oracle Gurus</td>
<td>• Moscone S Rm102</td>
</tr>
<tr>
<td>• 4:45 p.m.- Strategies for Monitoring Large Datacenters with Oracle Enterprise Manager</td>
<td>• Moscone S Rm102</td>
</tr>
<tr>
<td>• 4:45 p.m.- Oracle SOA Management Best Practices, Tips, and Techniques</td>
<td>• Moscone W L3, Rm 3018</td>
</tr>
<tr>
<td>• 4:45 p.m.- Oracle E-Business Suite Technology: Vision, Release Overview, Product Roadmap</td>
<td>• Moscone W L3, Rm 3002 / 3004</td>
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# Additional Oracle Enterprise Manager Sessions

<table>
<thead>
<tr>
<th>Thursday, Sept. 23</th>
<th>Location</th>
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<tbody>
<tr>
<td>• 9:00 a.m. - Oracle WebLogic Server Management for Oracle DBAs</td>
<td>• Marriott Marquis, Salon 9</td>
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<tr>
<td>• 9:00 a.m. - Enabling Database as a Service Through Agile Self-Service Provisioning</td>
<td>• Moscone S. Room 102</td>
</tr>
<tr>
<td>• 9:00 a.m. - Reduce TCO with Oracle Application Management Pack for Oracle E-Business Suite</td>
<td>• Moscone W L2, Rm 2024</td>
</tr>
<tr>
<td>• 10:30 a.m. - Best Practices for Managing Your PeopleSoft Applications</td>
<td>• Marriott Hotel, Golden Gate A</td>
</tr>
<tr>
<td>• 10:30 a.m. - Oracle Enterprise Manager Grid Control Deployment Best Practices</td>
<td>• Moscone S. Room 102</td>
</tr>
<tr>
<td>• 10:30 a.m. - Managing Sun SPARC Servers with Oracle Enterprise Manager Ops Center</td>
<td>• Moscone S. Room 252</td>
</tr>
<tr>
<td>• 10:30 a.m. - Heterogeneous Data Masking: Oracle, SQL Server, and DB2 Database Best Practices</td>
<td>• Moscone S. Room 306</td>
</tr>
<tr>
<td>• 12:00 p.m. - Scalable Enterprise Data Processing for the Cloud with Oracle Grid Engine</td>
<td>• Moscone S. Room 310</td>
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<tr>
<td>• 12:00 p.m. - Spot Problems Before Your Users Call: User Experience Monitoring for Oracle Apps</td>
<td>• Marriott Hotel, Golden Gate A</td>
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<tr>
<td>• 12:00 p.m. - Reduce Problem Resolution Time with Oracle Database 11g Diagnostic Framework</td>
<td>• Moscone S. Room 102</td>
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## Additional Oracle Enterprise Manager Sessions

<table>
<thead>
<tr>
<th>Thursday, Sept. 23</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>• 1:30 p.m. - Patching Enterprisewide Databases: Automation Techniques and Real-World Insights</td>
<td>Moscone S. Room 310</td>
</tr>
<tr>
<td>• 1:30 p.m. - Managing User Experience: Lessons from eBay</td>
<td>Marriott Hotel, Golden Gate A</td>
</tr>
<tr>
<td>• 1:30 p.m. - Deep Java Diagnostics and Performance Tuning: Expert Tips and Techniques</td>
<td>Marriott Marquis, Salon 9</td>
</tr>
<tr>
<td>• 1:30 p.m. - Oracle Enterprise Manager Configuration Management Unleashed: Top 10 Expert Tips</td>
<td>Marriott Marquis, Salon 6</td>
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<tr>
<td>• 1:30 p.m. - Oracle Enterprise Manager Security Best Practices</td>
<td>Moscone S. Room 102</td>
</tr>
<tr>
<td>• 3:00 p.m - The X-Files: Managing the Oracle Exadata and Highly Available Oracle Databases</td>
<td>Moscone S. Room 102</td>
</tr>
<tr>
<td>• 3:00 p.m. - Monitoring and Diagnosing Oracle RAC Performance with Oracle Enterprise Manager</td>
<td>Moscone S. Room 310</td>
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### Oracle Enterprise Manager Hands On Labs

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Topic</th>
<th>Location</th>
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<tbody>
<tr>
<td><strong>Monday September 20, 2010</strong></td>
<td></td>
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<tr>
<td>3:30 p.m. - 4:30 p.m.</td>
<td>Database Performance Diagnostics and Tuning</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<tr>
<td>5:00 p.m. - 6:00 p.m.</td>
<td>Provisioning, Patch Automation, and Configuration Management Pack</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<tr>
<td>5:00 p.m. - 6:00 p.m.</td>
<td>Oracle Application Mgmt. Pack for Oracle E-Business Suite: Monitor/Clone</td>
<td>Marriott Marquis, Nob Hill</td>
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<tr>
<td><strong>Tuesday September 21, 2010</strong></td>
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<tr>
<td>11:00 a.m.-12:00 p.m.</td>
<td>Using Oracle Application Change Management Pack for Oracle E-Business Suite</td>
<td>Marriott Marquis, Nob Hill</td>
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<tr>
<td>12:30 p.m.-1:30 p.m.</td>
<td>Database and Application Testing</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<td>2:00 p.m. - 3:00 p.m.</td>
<td>Oracle Fusion Middleware Management</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<tr>
<td>3:30 p.m. - 4:30 p.m.</td>
<td>Provisioning, Patch Automation, and Configuration Management Pack</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<tr>
<td><strong>Wednesday September 22, 2010</strong></td>
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<tr>
<td>4:45 p.m. - 5:45 p.m.</td>
<td>Database and Application Testing</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<td>4:45 p.m. - 5:45 p.m.</td>
<td>Oracle Application Mgmt. Pack for Oracle E-Business Suite: Monitor/Clone</td>
<td>Marriott Marquis, Nob Hill</td>
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<tr>
<td><strong>Thursday September 23, 2010</strong></td>
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<tr>
<td>9:00 a.m. - 10:00 a.m.</td>
<td>Database Performance Diagnostics and Tuning</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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<td>10:30 a.m. - 11:30 a.m.</td>
<td>Oracle Fusion Middleware Management</td>
<td>Marriott Hotel, Salon 12/13, YB Level</td>
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# Oracle Enterprise Manager Demogrounds

<table>
<thead>
<tr>
<th>DEMO TITLE</th>
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<tbody>
<tr>
<td>Oracle Real Application Testing: Database Replay</td>
<td>Moscone West</td>
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<tr>
<td>Oracle Real Application Testing: SQL Performance Analyzer</td>
<td>Moscone West</td>
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<tr>
<td>Self-Managing Database: Automatic Performance Diagnostics</td>
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<tr>
<td>Self-Managing Database: Automatic Fault Diagnostics</td>
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<tr>
<td>Self-Managing Database: Automatic Application and SQL Tuning</td>
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<tr>
<td>Application Quality Management: Application Testing Suite</td>
<td>Moscone South - S022</td>
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<tr>
<td>Real User Monitoring with Oracle Enterprise Manager</td>
<td>Moscone South - S021</td>
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<tr>
<td>Siebel CRM Application Management</td>
<td>Moscone South - S024</td>
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<tr>
<td>Real User Monitoring with Oracle Enterprise Manager</td>
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<tr>
<td>Oracle WebLogic Server Management and Java Diagnostics</td>
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<td>SOA Management with Oracle Enterprise Manager</td>
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<td>Oracle Business Transaction Management</td>
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<td>Push Button Provisioning and Patch Automation</td>
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<td>Smart Configuration Management</td>
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<tr>
<td>Oracle Enterprise Manager Ops Center</td>
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<tr>
<td>Managing the Enterprise Private Cloud</td>
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<tr>
<td>System Management, My Oracle Support, and Oracle Enterprise Manager</td>
<td>Moscone West</td>
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<tr>
<td>Self Managing Database: Change Management for DBAs</td>
<td>Moscone West</td>
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<tr>
<td>Oracle Enterprise Manager: Complete Datacenter Management</td>
<td>Moscone West</td>
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<tr>
<td>Self-Managing Database: Data Masking for DBAs</td>
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