Application Testing on the Cloud: Smart Testing for Agile Enterprises

Joe Fernandes - Director of Product Management, Oracle
Frank Gemmer – VP, Head of Alliances, Cloud Program - Siemens
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 remain at the sole discretion of Oracle.
Agenda

- Introduction
- Cloud Overview
- Testing and Cloud
- Making it Work
- Siemens-Oracle Test & Development Cloud
- Summary
- Q&A
Business-Driven IT Management

Business Transactions
- Web Portal
- Product Catalog
- Order Entry
- Other Services

User Experience

Integrated Application-to-Disk and Cloud Management
- Applications
- Middleware
- Databases
- Servers
- Storage

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 Application Quality Management

High quality testing for all tiers of application stack

Testing Application Changes
- Application Testing Suite
  - Ensure quality and performance with end-to-end application testing

Testing Infrastructure Changes
- Real Application Testing
  - Designed and optimized for testing database tier infrastructure changes

Test Data Management
- Data Masking Pack
  - Achieve security & compliance objectives by obfuscating sensitive data in test environments
  - Enables secure, production-scale testing
Oracle Application Testing Suite
A powerful, integrated testing solution for ensuring application quality, performance and reliability

Oracle Functional Testing
Automated functional and regression testing

Oracle Test Manager
Test process management, requirements and defect tracking

Oracle Load Testing
Automated load and performance testing
Application Testing Suite – Key Features

• Integrated solution for automated functional testing, load testing and test process management
• Custom testing accelerators for Oracle Applications (E-Business Suite, Siebel, ADF and more)
• OpenScript integrated scripting platform for load testing and functional testing
  – Intuitive visual scripting interface
  – Java IDE for powerful extensibility
• Built-in server monitors and integration with EM Diagnostics to identify performance bottlenecks under load
• Scalable enterprise architecture built on Weblogic Server and Oracle Database, yet easy to deploy & manage
New in Application Testing Suite 9.2

- New Database Testing module
  - Load testing for Oracle Database
  - Integrated with Real Application Testing to generate test scripts
- Adobe Flex support for functional & load testing
  - Enhanced testing for Rich Internet Apps
- New & updated Test Starter Kits for E-Business Suite 11i and R12
  - Sample functional and load test scripts
- Integration with Enterprise Manager for Database Diagnostics
  - Analyze DB performance under load
- Additional load and functional testing enhancements
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Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

This cloud model promotes availability and is composed of:

<table>
<thead>
<tr>
<th>5 Essential Characteristics</th>
<th>3 Service Models</th>
<th>4 Deployment Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>• On-demand self-service</td>
<td>• SaaS</td>
<td>• Public Cloud</td>
</tr>
<tr>
<td>• Resource pooling</td>
<td>• PaaS</td>
<td>• Private Cloud</td>
</tr>
<tr>
<td>• Rapid elasticity</td>
<td>• IaaS</td>
<td>• Community Cloud</td>
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<tr>
<td>• Measured service</td>
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<td>• Hybrid Cloud</td>
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<tr>
<td>• Broad network access</td>
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</table>

Source: NIST Definition of Cloud Computing v15
44% of Large Enterprises Are Interested In Building A Private Cloud

“What is your company's highest level of awareness or interest in building and operating an internal “cloud” or pool of pay-per-use virtual servers?”

Enterprise (1,000+ employees)
- Already implemented: 4%
- Implementing in the next 12 months: 44%
- Interested and planning budget for it: 13%
- Interested but no budget for it: 23%
- Not aware (includes “don't know”): 33%
- Not interested: 23%

Mid-market (100-999 employees)
- Already implemented: 1%
- Implementing in the next 12 months: 4%
- Interested and planning budget for it: 12%
- Interested but no budget for it: 21%
- Not aware (includes “don't know”): 38%
- Not interested: 25%

VSB (2-99 employees)
- Already implemented: 1%
- Implementing in the next 12 months: 6%
- Interested and planning budget for it: 12%
- Interested but no budget for it: 41%
- Not aware (includes “don't know”): 39%
- Not interested: 1%

Base: North American and European hardware decision-makers at enterprises, mid-market, and very small businesses

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In the typical application development process, Testing is an isolated stage at the very end of the cycle.
In reality, the Test process is more complex and involves multiple stages of its own.
Test Process

From a practical standpoint, there are even more stages that Testers need to worry about:

- Define Requirements
- Design & Architect
- Develop Code
- Test
- Deploy to Production
- Sustain

Define Test Process → Run Unit Tests → Build App Staging Environment → Deploy Test Tools / Systems → Run Functional Tests → Run Load Tests → Apply Patches & Re-Test

And this can take up as much time as the testing itself …
Test / QA Challenges

• Test / QA teams face many challenges during testing
  – Lack of time
  – Limited resources
  – Poorly defined requirements and success criteria
  – Lack of testing expertise and knowledge of application under test

• However, some of the most significant challenges are encountered before testing can even begin!
  – Getting access to hardware
  – Getting access to different software configurations to test against (different OS’s, browsers, etc.)
  – Deploying an environment for the application under test
  – Deploying a test environment for load and functional test tools
Benefits of Cloud Computing for Test / QA

• Easier to access environments
  – Easier to get virtual environments vs. dedicated physical hardware
  – Easier to get different system types & software configurations

• Easier to deploy
  – Test Systems
  – Applications Under Test
  – Leverage preconfigured VM templates for both

• Easier to manage
  – Access systems when needed (e.g. during a test cycle)
  – Retire unneeded systems to free up resources

• Reduced Costs
Test Environments

• Test / QA teams have multiple options for deploying their test environments
  1. Physical Environment – traditional setup where all test systems and app under test run on physical hardware
  2. Virtualization – build and deploy VM’s to run your test systems and/or app under test
  3. Private Cloud – leverage private cloud managed by in-house IT to run your tests systems and/or app under test
  4. Public Cloud – leverage public cloud vendor infrastructure to run your test systems and/or app under test
Test System Layouts

• Traditional
• Test Systems – In Cloud
• Application Under Test – In Cloud
• Application & Test Systems – In Cloud
• Hybrid
Traditional Test System Layout

- Test Systems – Onsite
- Application Under Test – Onsite / In Data Center
- Use case: typical internal business application, test systems deployed internally
Test Systems – In Cloud

- Application – Onsite / In Data Center
- Test Systems – Cloud
- Use case: internal application, need for temporary test systems
Application – In Cloud

- Test Systems – Onsite
- Application – Cloud
- Use case: Internet application (e-commerce, etc.) with internal test resources
Application & Test Systems – In Cloud

• Test Systems – Cloud
• Application – Cloud
• Use case: Internet application, need for temporary test systems
Hybrid

- Test Systems – Onsite & Cloud (for extra capacity)
- Application – Either
- Use case: supplement onsite test systems with additional test resources in cloud
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Deploying Test Systems in the Cloud

• Identify desired layout for your test environment
  – On premise
  – Public/Private cloud
  – Hybrid

• Define systems / specifications required for application and test tools

• Identify security (port access) requirements
Application Testing Suite Architecture

Oracle Load Testing Server (OATS Application Service)

OLT (OTM) Controller

WebLogic Server

Oracle Load Testing Agents (OATS Agent Service)

Agent 1

Agent 2

Agent 3

Agent n

TCP 9001, 8088 (encrypted)

TCP 8088

DB Listener 1521

OLT (OTM) Database

Oracle DB

OpenScript Scripting Tool (IDE)
Application Testing Suite Architecture

Test Tools

- OATS Server (OATS Application Service)
- OLT (OTM) Controller
- WebLogic Server
- OLT (OTM) Database
- Oracle DB
- OpenScript Scripting Tool (IDE)

App Under Test

- Internet / Cloud
- Web Tier
- App Tier
- Database Tier

Virtual Users
Amazon EC2 Public Cloud Infrastructure

- Elastic Compute Cloud (EC2)
- SSH / Remote Desktop system access
- System-specific firewall rules within EC2
Cloud Setup Using Amazon EC2

- Use AWS Management Console or Amazon EC2 API Tools to:
  - Create AMI’s
  - Launch instances
  - Manipulate security groups and other settings

- Setup necessary environment variables to use EC2 API tools
  - JAVA_HOME – Java home directory
  - EC2_JVM_ARGS – Any necessary JVM arguments, such as proxy
    - -DproxySet=true
    - -DproxyHost=www-proxy.us.oracle.com
    - etc.
  - EC2_HOME – Location of EC2 API tools
  - PATH – To add tools into your path
  - EC2_PRIVATE_KEY – Private key location
  - EC2_CERT – Cert location
Amazon EC2 Cloud

• Network Connectivity
  – Lowest cost for data traffic within cloud region
  – Use internal addressing between systems deployed on EC2
    • `ec2-describe-instances`
Running ATS in the Cloud

- To start, launch two instances on Amazon EC2
  - Windows 2003 Server (Load Controller)
  - Linux Server or Windows 2003 Server (Load Agent System)
  - Configure firewall rules to allow access to running systems
    - Port 3389 (Remote Desktop Protocol – RDP) – Windows
    - Port 22 (SSH) – Linux
    - Port 8088 (Oracle Load Testing web interface)
Running ATS in the Cloud – (cont.)

- Firewall Rules
  - TCP 9001, 8088 (secure, encrypted traffic)
ATS Installation

• ATS Installation / Security
  – TCP port 3389 is needed for Remote Desktop access
  – Connect using Windows Remote Desktop

• Recommended: OLT controller – Windows 2003 Server

• Agent systems – use Linux agent for higher individual agent performance
  – TCP port 22 needed for SSH access
ATS Installation

- Install OLT Controller on Windows 2003 Server
- Disable Agent Service on OLT Controller
  - Will use separate Linux Agent to run Virtual Users (rather than run them on the OLT Controller)
  - Decrease resource usages on controller system

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<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Status</th>
<th>Startup Type</th>
<th>Log On As</th>
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<tr>
<td>Network Access Protection Agent</td>
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<td>Disabled</td>
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<td>Network DDE DEDM</td>
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<td>Portable Media Serial Number Service</td>
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<td>Manual</td>
<td>Local System</td>
</tr>
</tbody>
</table>
ATS Load Agent

- Install Load Agent on Linux Server
- JVM sizing performed automatically by Load Agent
- Collect Load Agent local system name
- Add Load Agent into Load Controller’s VU Agent Systems list using local hostname
Test Execution

- Access Oracle Load Testing through Web browser interface
  - Test execution and reporting proceeds normally over the web UI
- Load Agent systems can be terminated when no longer needed
- Database can be preserved for future test run usage
Private Cloud Deployment of ATS (Roadmap)
Complete Test Lifecycle Automation

- Self Service Lab Management
- Automatic Provisioning of Test Hardware, Software and Data
- Integrated Performance Diagnostic

Faster Testing
Reduced Manual Effort
Quick Defect Discovery and Resolution
Test Metering and Chargeback
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Summary

• Cloud computing provides many benefits for IT users
• Test/QA teams can also greatly benefit from leveraging cloud-based infrastructures to deploy
  – Test Software/Systems
  – Applications Under Test
• Understanding how cloud-based systems work is important in order to leverage them effectively
• Oracle ATS can be leveraged in a private or public cloud to simplify your test processes
Oracle Enterprise Manager 11g
Resource Center
Access Videos, Webcasts, White Papers, and More
Oracle.com/enterprisemanager11g
# Oracle Enterprise Manager Hands On Labs

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Monday September 20, 2010</td>
<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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<td>5:00 p.m. - 6:00 p.m.</td>
<td>Provisioning, Patch Automation, and Configuration Management Pack</td>
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<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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<td>Tuesday September 21, 2010</td>
<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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<td>12:30 p.m.-1:30 p.m.</td>
<td>Database and Application Testing</td>
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<td>2:00 p.m. - 3:00 p.m.</td>
<td>Oracle Fusion Middleware Management</td>
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<td>3:30 p.m. - 4:30 p.m.</td>
<td>Provisioning, Patch Automation, and Configuration Management Pack</td>
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<td>Wednesday September 22, 2010</td>
<td>4:45 p.m. - 5:45 p.m.</td>
<td>Database and Application Testing</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>
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<td>Thursday September 23, 2010</td>
<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>
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## 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>
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<tr>
<td>• 11:30 a.m. - Maximizing Database Performance: Performance Tuning with DB Time</td>
<td>• Moscone S Rm 104</td>
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<tr>
<td>• 11:30 a.m. - Make Upgrades Uneventful Using Oracle Enterprise Manager and My Oracle Support</td>
<td>• Moscone S Rm 310</td>
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<tr>
<td>• 12:30pm – Extracting Real Value from Your Data with Apache Hadoop</td>
<td>• Hilton Hotel, Plaza B</td>
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<tr>
<td>• 1:00 p.m. - Reducing the Risk of SOA Transactions</td>
<td>• Marriott Marquis, Salon 6</td>
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<tr>
<td>• 1:00 p.m. - SQL Tuning Roundtable with Oracle Gurus</td>
<td>• Moscone S Rm102</td>
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<tr>
<td>• 4:45 p.m. - Strategies for Monitoring Large Datacenters with Oracle Enterprise Manager</td>
<td>• Moscone S Rm102</td>
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<tr>
<td>• 4:45 p.m. - Oracle SOA Management Best Practices, Tips, and Techniques</td>
<td>• Moscone W L3, Rm 3018</td>
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<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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</table>
### 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>
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<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>
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<tr>
<td>• 10:30 a.m. - Best Practices for Managing Your PeopleSoft Applications</td>
<td>• Marriott Hotel, Golden Gate A</td>
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<td>• 10:30 a.m. - Oracle Enterprise Manager Grid Control Deployment Best Practices</td>
<td>• Moscone S. Room 102</td>
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<tr>
<td>• 10:30 a.m. - Managing Sun SPARC Servers with Oracle Enterprise Manager Ops Center</td>
<td>• Moscone S. Room 252</td>
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<td>• 10:30 a.m. - Heterogeneous Data Masking: Oracle, SQL Server, and DB2 Database Best Practices</td>
<td>• Moscone S. Room 306</td>
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<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>
</tr>
<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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<tr>
<td>Thursday, Sept. 23</td>
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<tr>
<td>• 1:30 p.m. - Patching Enterswide Databases: Automation Techniques and Real-World Insights</td>
<td>Moscone S. Room 310</td>
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<tr>
<td>• 1:30 p.m. - Managing User Experience: Lessons from eBay</td>
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<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>
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<tr>
<td>• 3:00 p.m - The X-Files: Managing the Oracle Exadata and Highly Available Oracle Databases</td>
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<tr>
<td>• 3:00 p.m. - Monitoring and Diagnosing Oracle RAC Performance with Oracle Enterprise Manager</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>
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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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<td>Real User Monitoring with Oracle Enterprise Manager</td>
<td>Moscone South - S021</td>
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<td>Siebel CRM Application Management</td>
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<td>Real User Monitoring with Oracle Enterprise Manager</td>
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<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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<td>Oracle Enterprise Manager Ops Center</td>
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<tr>
<td>Managing the Enterprise Private Cloud</td>
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<td>System Management, My Oracle Support, and Oracle Enterprise Manager</td>
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<tr>
<td>Self Managing Database: Change Management for DBAs</td>
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<td>Oracle Enterprise Manager: Complete Datacenter Management</td>
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<td>Self-Managing Database: Data Masking for DBAs</td>
<td>Moscone West</td>
</tr>
</tbody>
</table>
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