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14648 – Oracle Exadata Management Fundamentals: New features for Monitoring, Tuning and More

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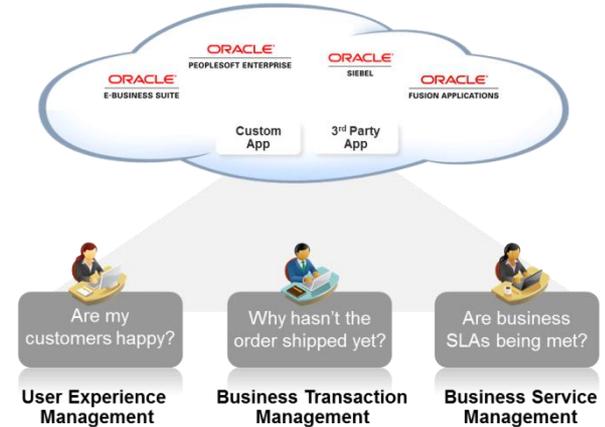
Total Cloud Control



Complete Lifecycle Management



Integrated Cloud Stack Management



Business-Driven Application Management

Self-Service IT

Simple and Automated

Business Driven

Management Challenges

Challenges

- Reduce deployment cost and errors—rapid time to value
- Migrate application while ensuring business continuity
- Proactively monitor all components
- Maximize availability
- Ensure quality of service

Oracle Enterprise Manager Release 12.1

- Manages all stages of Exadata lifecycle from deployment to maintenance
- Automates deployment reducing cost and effort
- Mitigates migration risk
- Maximizes performance, availability and service quality



Exadata Management



Setup & Monitor

- Discovering Exadata for monitoring
- Monitoring the Database machine



Test

- Consolidate on Exadata
- Validate Application Performance



Manage

- Performance Diagnostics
- Application SQL Tuning



Maintain

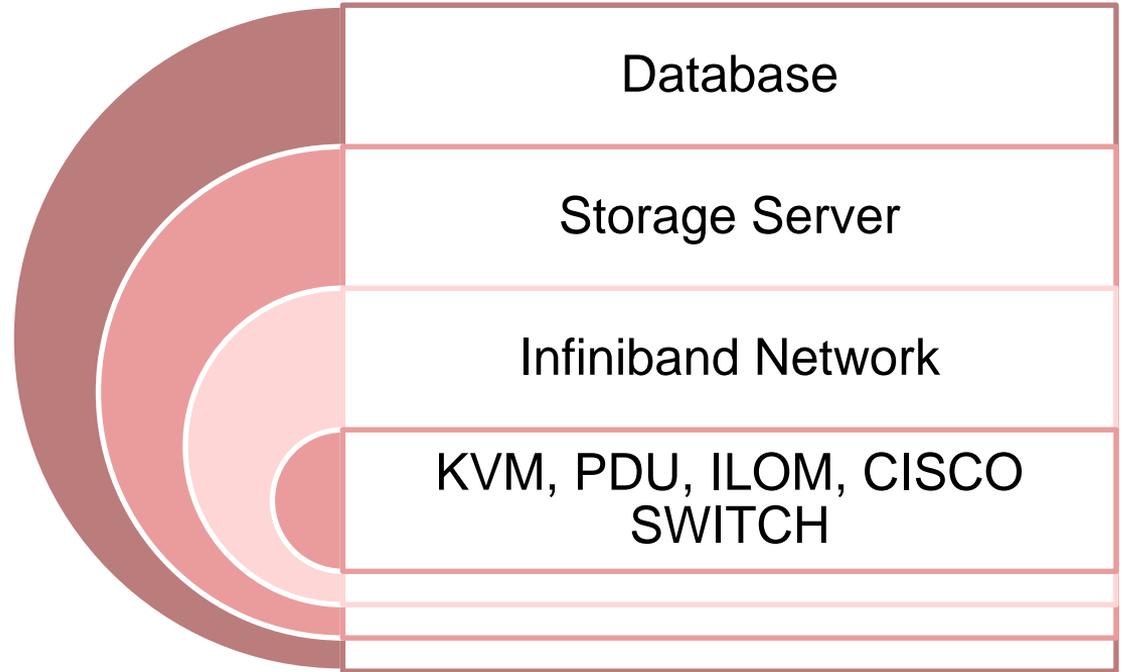
- Configuration Compliance
- Patch Automation

Discovering Exadata in Enterprise Manager 12.1



- Wizard driven guided discovery now significantly faster (10x) than 11g
- Exadata Cell and the Infiniband components discovered out-of-the box
- Exadata Plug-in bundled for all other targets (viz. KVM, PDU, Cisco Switch)
- Option to Discover New DB Machine or rediscover – Add DB Machine Members

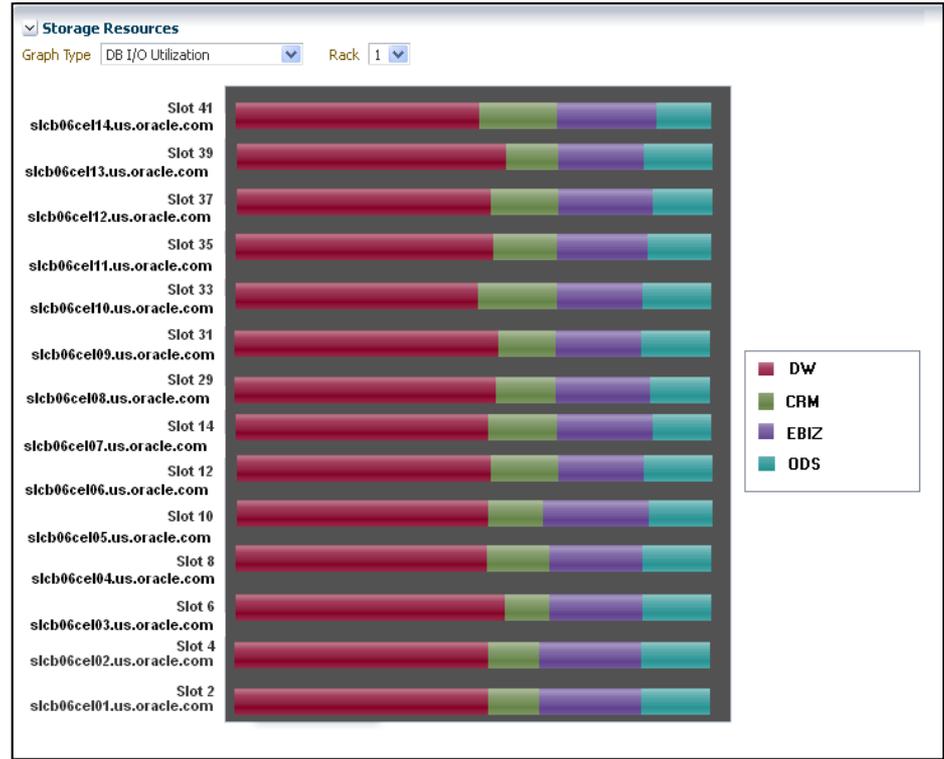
Exadata Monitoring



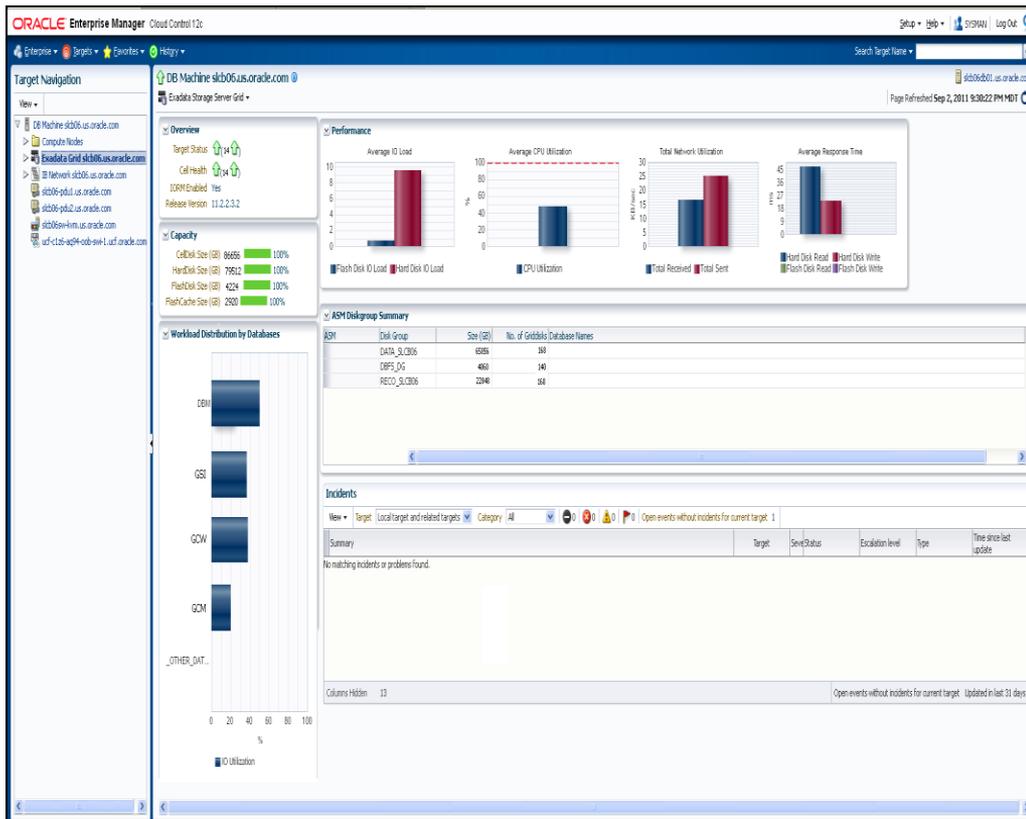
Exadata Management

Integrated View of Hardware and Software

- **Hardware view**
 - Schematic of cells, compute nodes and switches
 - Hardware components alerts
- **Software/system view**
 - Performance, availability, usage by databases, services, clusters
 - Software alerts db, cluster, ASM
 - Topology view of DB systems/clusters
- **Configuration view**
 - Version summary of all components along with patch recommendations



Storage Cell Management



- **Storage Cell monitoring and administration support**
 - Cell Home page and performance pages
 - Actions supported: Start/stop Cell, verify connectivity, setup SSH
- **Automatic discovery of Exadata cells**
- **Management by Cell Group**
 - All cells used by a database automatically placed in a group
 - Cell Group level administration operations

Storage Cell Management

Select Targets

Targets displayed below are part of Exadata Grid System. Select the targets on which Administration Operation need to be performed.

Search Targets:

Select	Exadata Target Name	Availability
<input type="checkbox"/>	slcb06cel03.us.oracle.com	
<input type="checkbox"/>	slcb06cel02.us.oracle.com	
<input type="checkbox"/>	slcb06cel01.us.oracle.com	

I/O Resource Manager (IORM) Settings:

I/O Resource Manager controls how databases utilize the disks and flash cache, based on the settings specified here.

Tip: Oracle recommends the same IORM settings for the group of cells used by the same set of databases. Click on Update All button to change the IORM settings for all cells in this Group.

Status: 2-Active,1-Inactive,0-Target Down
Select: Active Inactive

Disk Objective: Common objective is not set on all cells
Select:

Inter-Database Plan: Basic Plan

Database Name	Disk Utilization Limit	Disk I/O Allocations
testdb		20
other		80

- Perform Cell Administration tasks
 - Execute Cellcli commands on a set of cells or all cells
- Setup IORM for database targets

Infiniband Network Management

Switches																				
Name	Status	Type	Port Details																	
sclcbws-ib2.us.oracle.com	↑	Normal	20	22	24	26	28	30	35	33	31	14	16	18	11	9	7	5	3	1
			19	21	23	25	27	29	36	34	32	13	15	17	12	10	8	6	4	2
sclcbws-ib3.us.oracle.com	↑	Normal	20	22	24	26	28	30	35	33	31	14	16	18	11	9	7	5	3	1
			19	21	23	25	27	29	36	34	32	13	15	17	12	10	8	6	4	2
sclcbws-ib1.us.oracle.com	↑	Spine	20	22	24	26	28	30	35	33	31	14	16	18	11	9	7	5	3	1
			19	21	23	25	27	29	36	34	32	13	15	17	12	10	8	6	4	2

Legend: Normal Ports Degraded Ports Ports with Errors Available Ports

Nodes						
Name	Status	Type	HCA	IP Address	Port Details	
sclcbcel04.us.oracle.com	↑	Oracle Exadata Storage Server	HCA-1	192.168.10.111	1	2
sclcbcel13.us.oracle.com	↑	Oracle Exadata Storage Server	HCA-1	192.168.10.120	1	2
sclcbcel07.us.oracle.com	↑	Oracle Exadata Storage Server	HCA-1	192.168.10.114	1	2
sclcbdb08.us.oracle.com	↑	Host	HCA-1	192.168.10.107	1	2

- Infiniband network and switches as GC targets
 - Automatic discovery
- Network home page and performance page
 - Real time and historical
- Topology view of Network with switch and port level details
- Full monitoring
 - Alerts (switch generated and EM generated)
 - Performance metrics
 - Configuration metrics – detect and notify configuration changes/best practice violations

Infiniband Network Management

The screenshot displays the 'Infiniband Network Administration : Target & Command' page. At the top, there is a breadcrumb trail: 'Target & Command' (active), 'Credentials & Schedule', and 'Review'. Below this, the 'Target' section is expanded, showing 'Target Type' with radio buttons for 'Compute Node', 'IB Switch' (selected), and 'Exadata Cell'. The 'Target' field contains 'slcb06sw-ib2.us.oracle.com'. The 'Command' section is also expanded, showing an 'Operation' dropdown menu with options: 'Enable Port' (selected), 'Disable Port', 'Clear Performance Counters', 'Clear Error Counters', 'Switch LED On', and 'Switch LED Off'. The 'Port' field is set to '19'.

- Perform Infiniband Administration tasks
 - Enable Port
 - Disable Port
 - Clear Performance counters
 - Clear Error Counters

Monitoring: ILOM, Cisco Switch, KVM

Incidents and Problems

* Target: Local target and related targets | * Category: All | 0 | 3 | 0 | 0

Message	Target	Severity	Status	Escalated	Type	Time Since La...
Count of targets not			New	-	Incident	14 days 22 hours
Power supply sensor(New	-	Incident	6 days 22 hours
Current sensor(s) at l			New	-	Incident	6 days 22 hours

Job Activity

For jobs whose start date is within the last 7 days.

- Suspended Executions 0
- Problems Executions 1
- Action Required Executions 0
- Scheduled Executions 0
- Running Executions 0

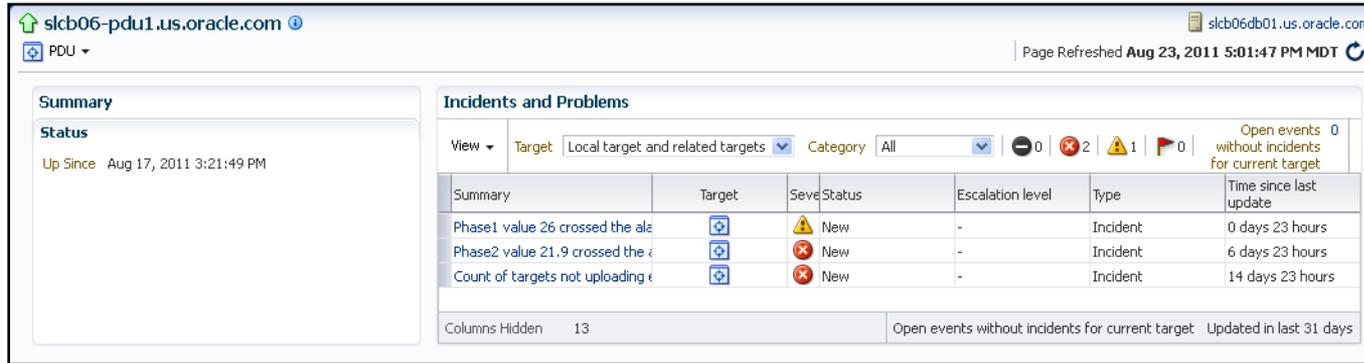
Common metrics monitored

- Power supply failure
- Fan failure
- Temperature out of range

Specific metrics monitored

- Cisco Switch
 - Configuration change tracking and reporting
 - Unauthorized SNMP access
- Keyboard, Video, Mouse (KVM)
 - Server connected to KVM added/removed, powered on/off

Monitoring: Power Distribution Unit (PDU)



slcb06-pdu1.us.oracle.com

PDU

Page Refreshed Aug 23, 2011 5:01:47 PM MDT

slcb06db01.us.oracle.com

Summary

Status
Up Since Aug 17, 2011 3:21:49 PM

Incidents and Problems

View Target: Local target and related targets Category: All 0 Critical 2 Warning 1 Error 0 Info

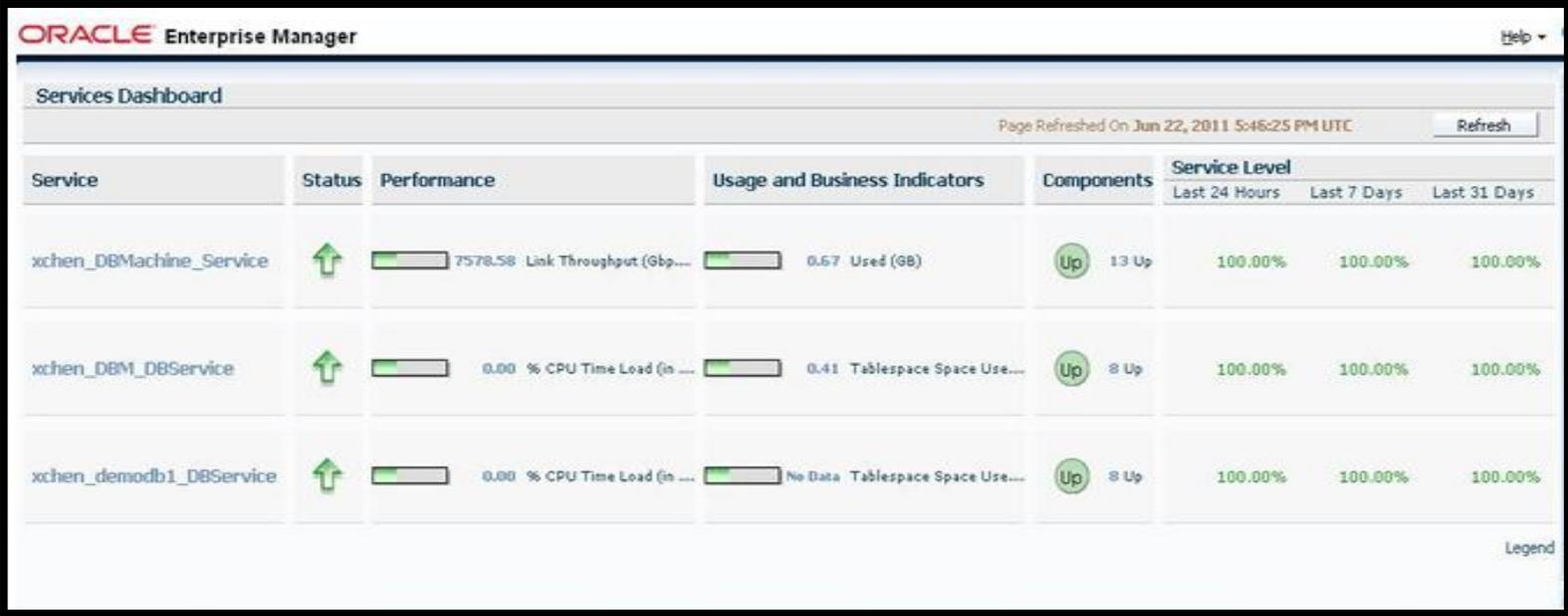
Summary	Target	Seve	Status	Escalation level	Type	Time since last update
Phase1 value 26 crossed the alert		Warning	New	-	Incident	0 days 23 hours
Phase2 value 21.9 crossed the alert		Warning	New	-	Incident	6 days 23 hours
Count of targets not uploading		Warning	New	-	Incident	14 days 23 hours

Columns Hidden 13

Open events without incidents for current target Updated in last 31 days

- Measures power consumption used by Exadata components and provides early warning of impending thresholds
- Monitors electric current being used by equipment connected in Exadata rack

Exadata Service Dashboards



ORACLE Enterprise Manager Help ▾

Services Dashboard Page Refreshed On Jun 22, 2011 5:46:25 PM UTC

Service	Status	Performance	Usage and Business Indicators	Components	Service Level		
					Last 24 Hours	Last 7 Days	Last 31 Days
xchen_DBMachine_Service		7578.58 Link Throughput (Gbps)	0.67 Used (GB)	13 Up	100.00%	100.00%	100.00%
xchen_DBM_DBService		0.00 % CPU Time Load (in ...)	0.41 Tablespace Space Use...	8 Up	100.00%	100.00%	100.00%
xchen_demodb1_DBService		0.00 % CPU Time Load (in ...)	No Data Tablespace Space Use...	8 Up	100.00%	100.00%	100.00%

Legend

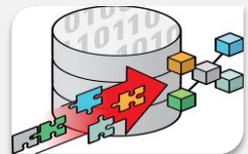
- Service dashboard for executives and business owners
- Many components reporting up to one Exadata Service

Exadata Management



Setup & Monitor

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- Monitoring the Database Machine



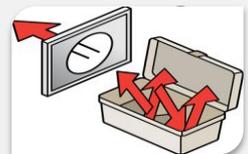
Test

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Manage

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- Application SQL Tuning



Maintain

- Configuration Compliance
- Patch Automation

Deploying Applications on Exadata

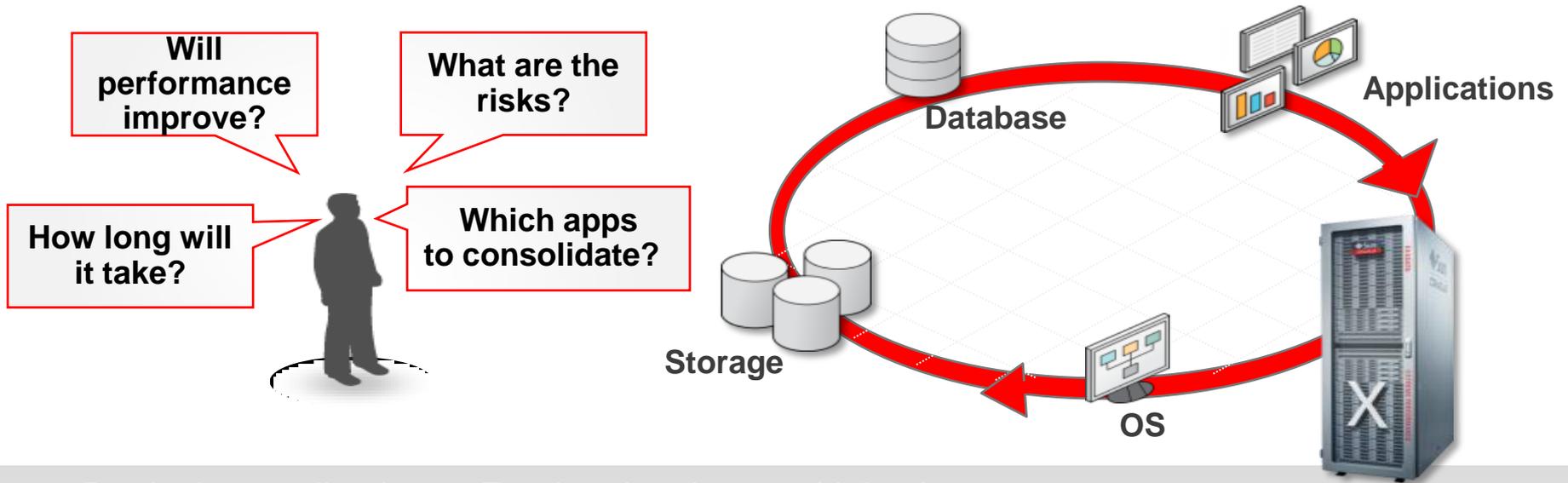
Identify
Applications

Create Test
Environments

Validate
Performance

- Migrating applications to Exadata can be a very time consuming
- Three step process
 - Identify which applications to be migrated to Exadata
 - Create test environment on Exadata
 - Validate application performance

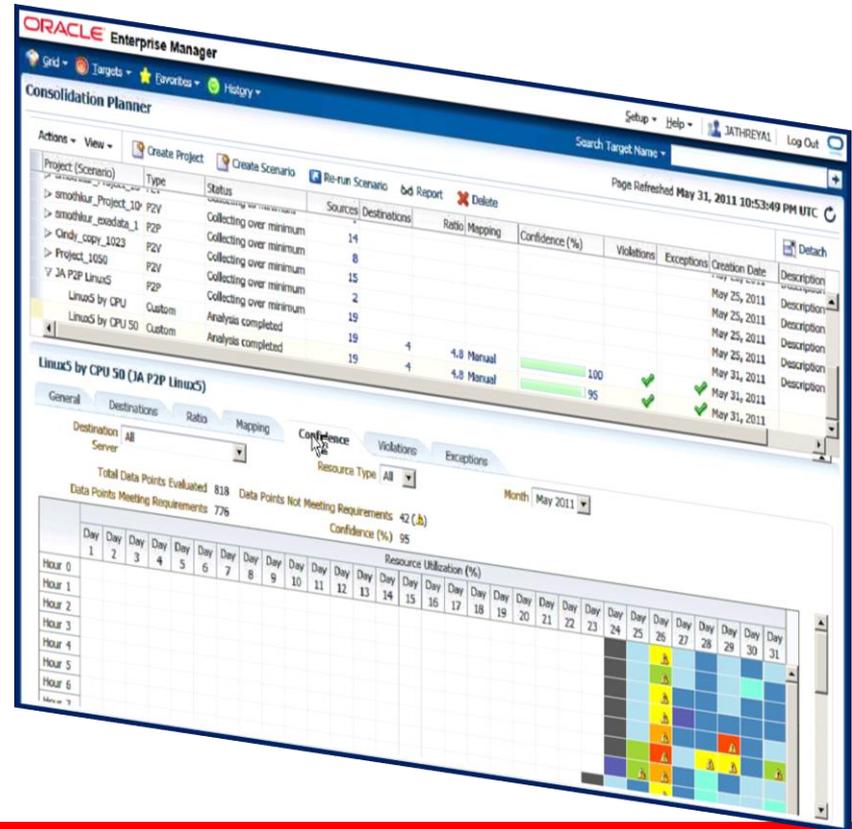
Deployment Challenges



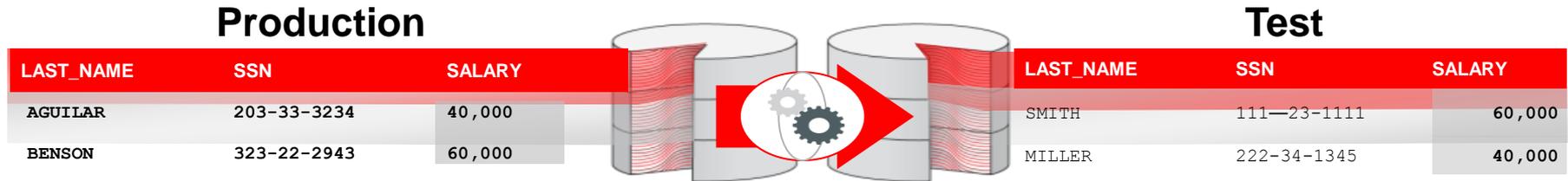
- Deploying application to Exadata involves multiple changes:
 - O/S migrations
 - Storage subsystem changes
 - Database upgrades
 - Single database instance to RAC
- Proper testing required for risk mitigation.

Consolidation Planner

- Target resource utilization and configuration data extracted from Enterprise Manager repository
 - CPU, memory, storage, network
- Administrator specifies servers and constraints for workload migration
 - Physical/virtual servers
 - Existing/planned servers
 - Business/technical constraints
- Reports detail how consolidated workloads would perform on target servers

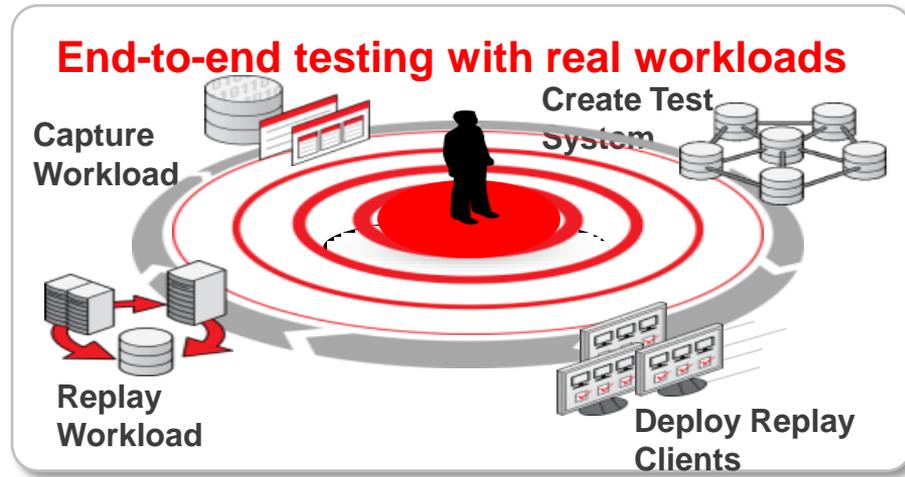


Secure Test System Deployment



- Deploy secure test system by masking sensitive data
- Sensitive data never leaves the database
- Extensible template library and policies for automation
- Sophisticated masking: Condition-based, compound, deterministic
- Integrated masking and cloning
- Leverage masking templates for common data types
- Masking of heterogeneous databases via database gateways
- Command line (EMCLI) support for data masking actions

Validate Application Performance



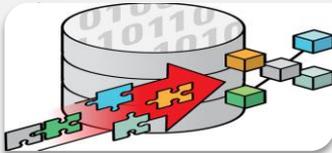
- SQL Performance Analyzer
 - SQL unit testing for response time
 - Identify and tune regressed SQL
 - Integrated into SQL Tuning Advisor and SQL Plan Baseline
- Database Replay
 - Load, performance testing for throughput
 - Remediate application concurrency problems
 - Integrated with Oracle Application Testing Suite for superior comprehensive testing solution
- Seamless integration with Data Masking to preserve data sensitivity compliance

Exadata Management



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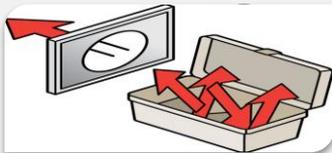
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Maintain

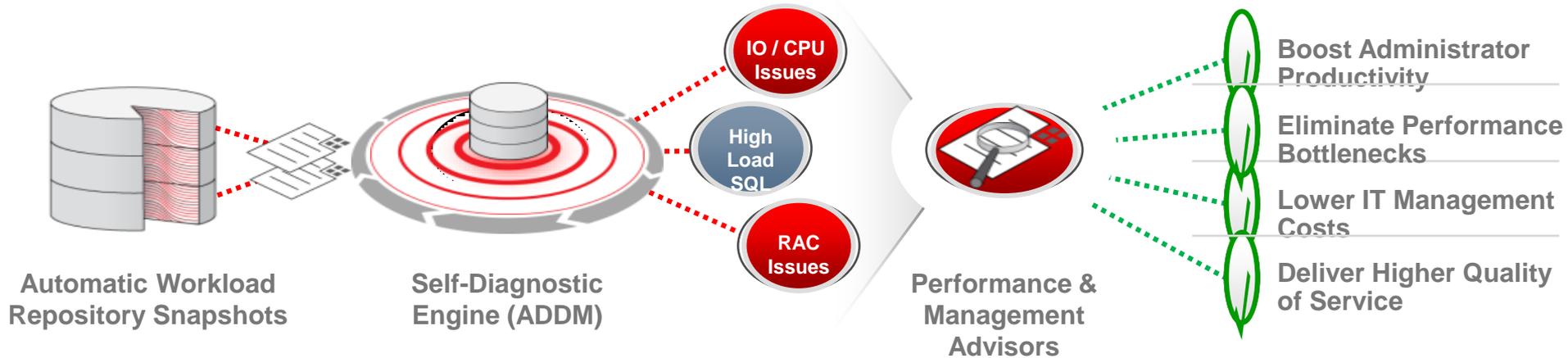
- Configuration Compliance
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Integration with the Database Performance Page



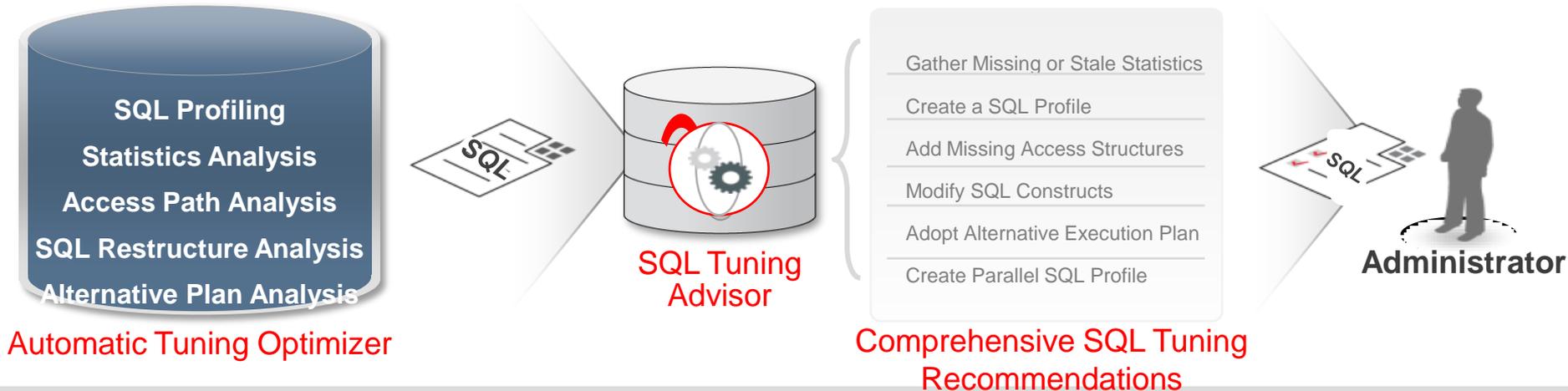
- Drill down from database Performance page
- Provides composite view of all health indicators of a cell or cell group
- Helps triage
 - Load imbalance
 - ASM related problems
 - Cell software or hardware failures
 - Cell configuration issues
 - Network related failures

Performance Diagnostics and Tuning



- Oracle Database 11g's Automatic Performance Diagnostics helps maximize Exadata performance
- Top-down performance analysis using Automatic Workload Repository
- Real-time performance analysis with Automatic Database Diagnostic Monitor
- Resolve performance issues faster with drill-down root-cause analysis
- Classification tree based on Oracle performance tuning expertise
- Fully automates database performance diagnostics

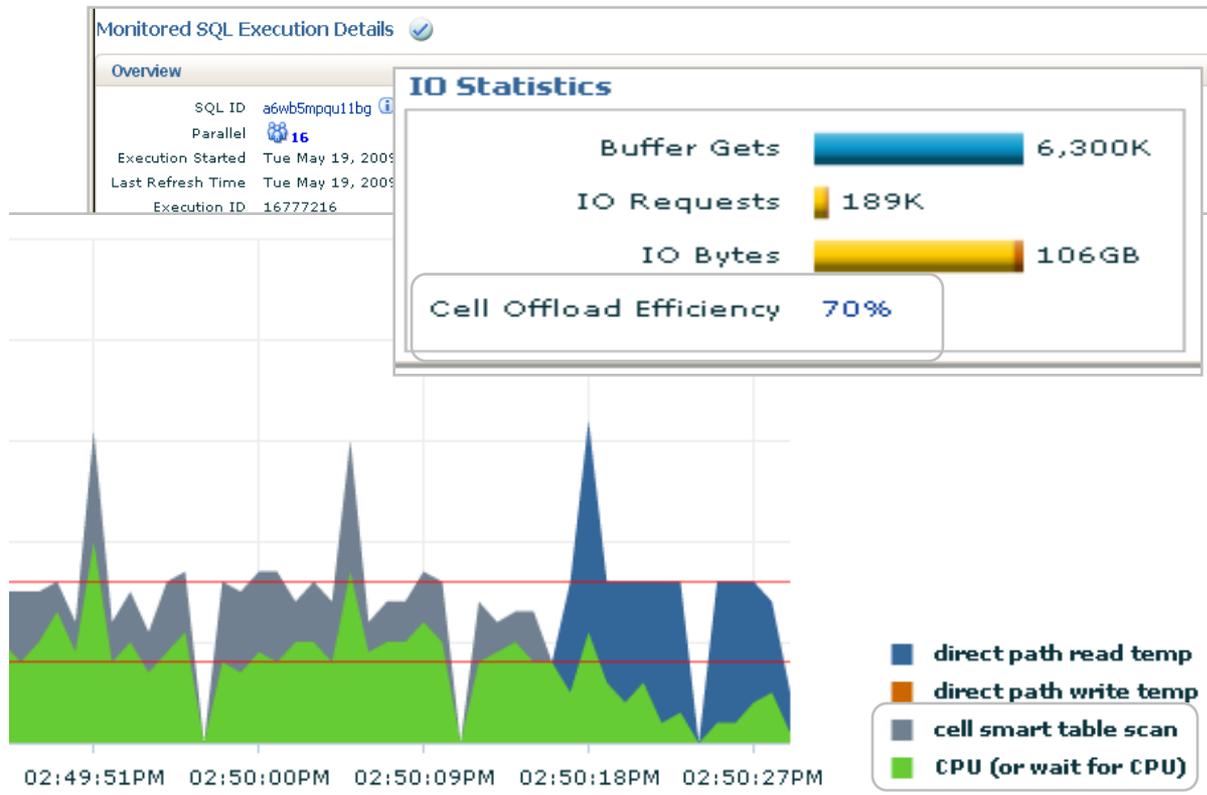
Performance Diagnostics and Tuning



- Automatic SQL Tuning
 - Analyze high-load SQL → tune using SQL Profiles → implement improved SQL plans (optional)
- Comprehensive SQL analyses across 6 dimensions: statistics, SQL profiling, index, alternate plan, parallelization and SQL structure
- SQL Profiles tunes execution plan without changing SQL text
- Enables transparent tuning for packaged applications

Exadata Aware SQL Monitoring

- Real time monitoring of application SQL
- I/O performance graphs with Exadata information
 - Cell offload efficiency
 - Cell smart scan
- Rich metric data
 - CPU
 - I/O requests
 - I/O throughput
 - PGA Usage
 - Temp Usage

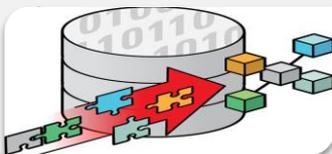


Exadata Management



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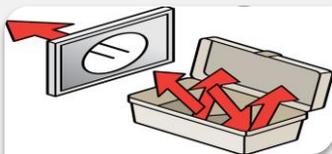
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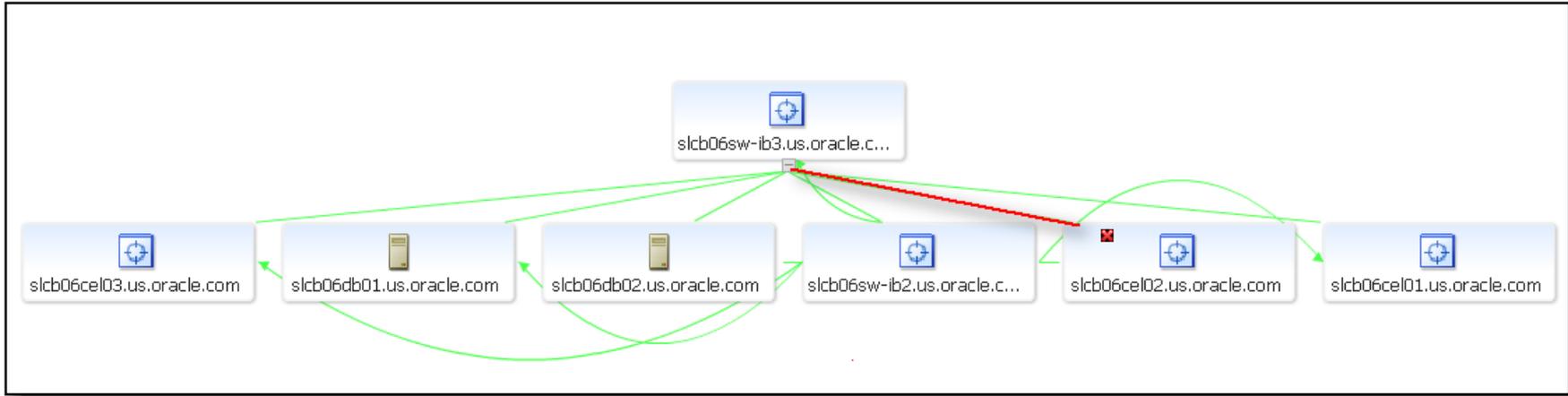
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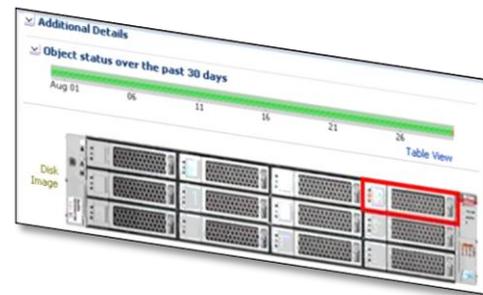
Root Cause Analysis of Hardware Problems



- Topology View of all Exadata components by
 - Uses
 - Used By
 - System Members
 - DB Machine Software
- Enables out of the box root cause analysis of issues.

Defect Diagnostics

- Support Workbench
 - Exadata integrated with Database defect diagnostic framework
 - Support Workbench provides viewing and packaging of incidents
 - Correlated packaging from DB through ASM to Exadata
- Incident Management
 - Software and hardware incidents tracked via Incident Console
 - Track, manage and resolve critical incidents
 - Hardware alerts (temperature, cell down, power supply, etc.)
 - Hardware failures come with picture indicating failed part location
 - Best practice violations automatically alerted



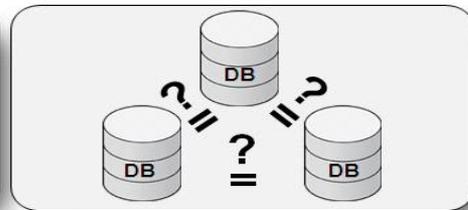
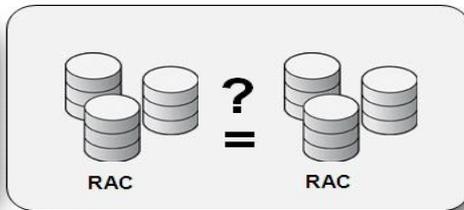
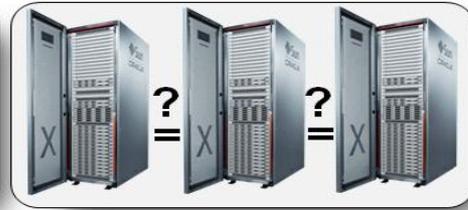
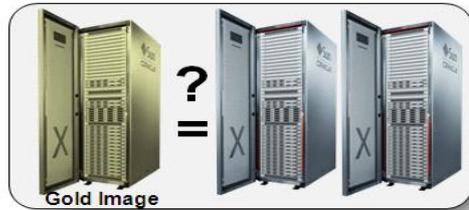
Configuration Management



Automated Configuration Management

- Enforcement of Exadata configurations using Policies
- Detection of configuration drifts and changes
 - From defined golden standards
 - Between storage servers and between database machines
- Detect database targets that do not have required patches

Configuration Management



Compare between Oracle Database Machines

- Gold Image Comparison
- Baseline vs. Current
- Multiple DB Machines

Configuration Management

Storage Cell to Storage Cell

The screenshot displays the Oracle Enterprise Manager Configuration Management interface. The main window shows a comparison of configurations for the job 'CONFIGURATION COMPARISON JOB MON JUN 13 10:42:01 PDT 2011'. The comparison details show two configurations: 'sclcgcel01.us.oracle.com (Oracle Exadata Storage Server)' and 'sclcgcel02.us.oracle.com (Oracle Exadata Storage Server)'. The job details section shows a tree view of configuration categories, with 'Infiniband HCA Port Configuration' selected. A table below the tree shows the results of the comparison for 'Port Number', with two rows: '1' and '2'. The 'Configuration Properties' table below shows the properties for the selected configuration, including 'Port Number', 'Connected to Switch Port Number', 'Enabled link width (Eg 1X or 4X)', 'Supported link speed (Gbps)', and 'Enabled link speed (Gbps)'. The table has columns for 'Result', 'Configuration Property Name', 'First', and 'Second'.

Result	Configuration Property Name	First	Second
⚙️	Port Number	1	1
⚙️	Connected to Switch Port Number	2	1
⚙️	Enabled link width (Eg 1X or 4X)	4	4
⚙️	Supported link speed (Gbps)	100	100
⚙️	Supported link width (Eg 1X or 4X)	4	4
⚙️	Enabled link speed (Gbps)	100	100

- Ability to compare current configuration vs. saved configurations
 - Within cells
 - Across multiple cells

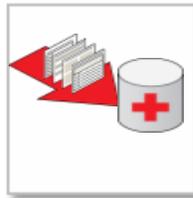
Automating Database Infrastructure Patching

Fully Integrated with My Oracle Support

ORACLE[®]
MY ORACLE SUPPORT



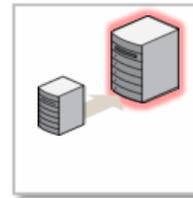
Analyze



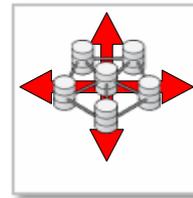
Patch



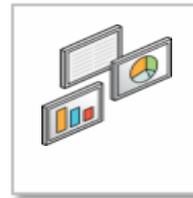
Test



Stage



Provision

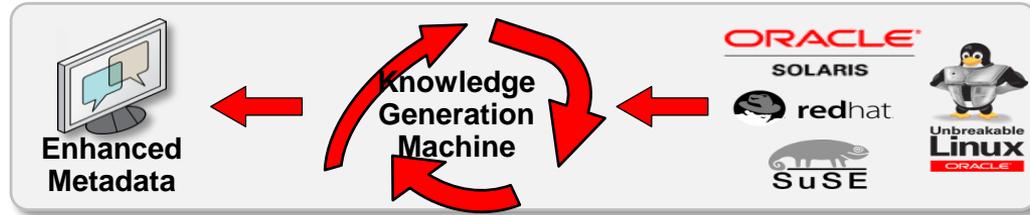


Report

- Proactive advisories, recommendations, and analysis
 - One-off patches, patch set updates, and critical patch updates
- Zero downtime for patching
- Integrated patch management & deployment automation
- Patch intelligence and community
- Streamlined conflicts and merge patch process
- “Patchmgr”, a command line tool, is used to patch the Storage Cells from the Compute Nodes .

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OPS Center: OS Patch Management



- Central Repository for iso images
- Unique knowledge base, analysis and how-to-install
- Uses plans, profiles and policy based patch management
- Track and audit change history
- Audit patch and configuration compliance
- Protect RPM by blacklisting
- Only for use on the Compute Nodes



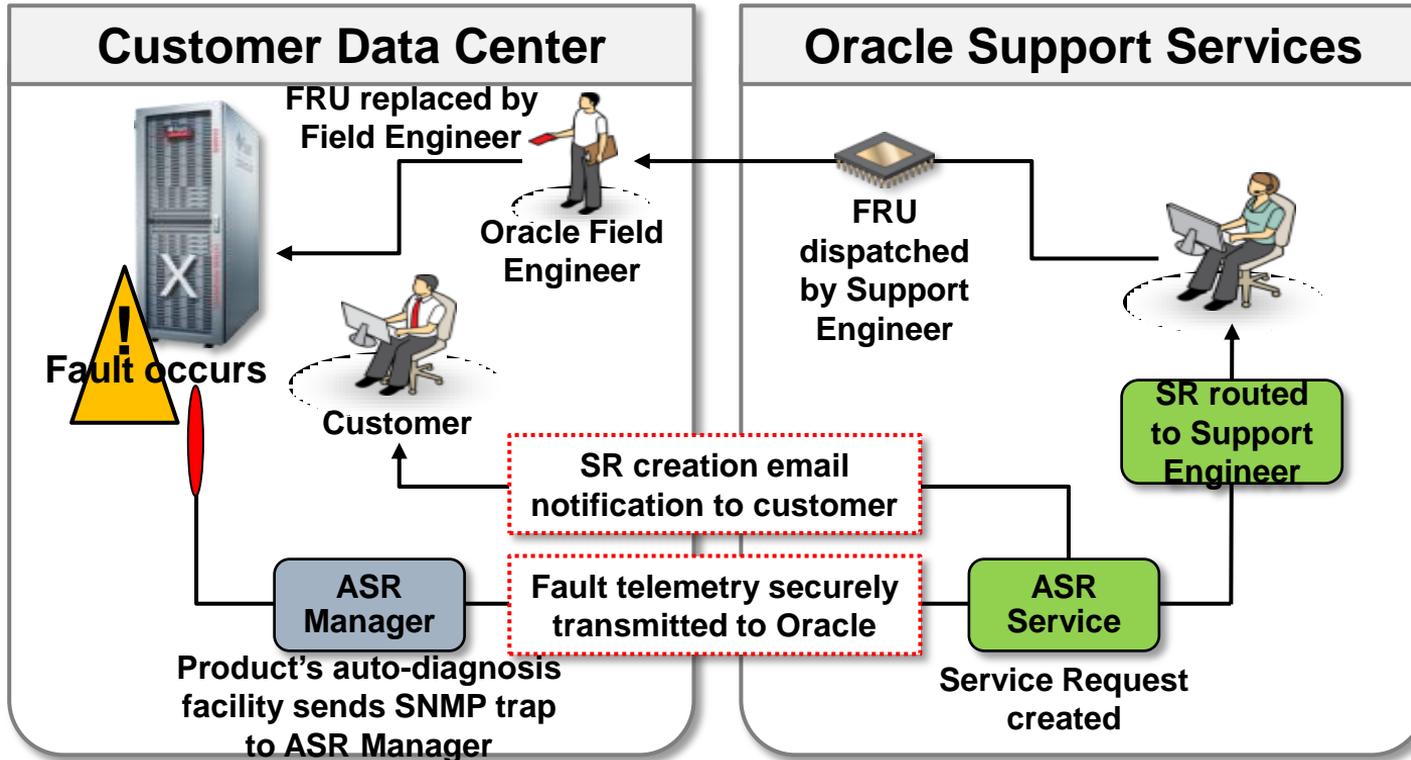
OPS Center: Firmware Management

- Automatically downloads required firmware from Oracle
- Run compliance reports to see if the environment is up to date
 - Take action only if it is the Compute Node
- Ops Center uses both Service Processor and OS level APIs to determine disk health
 - Leverages and installs the *hwmgmt* daemon
 - *hwmgmt* sends event information to Ops Center via the Service Processor



Maintain

Fault Diagnostics: ASR Flow



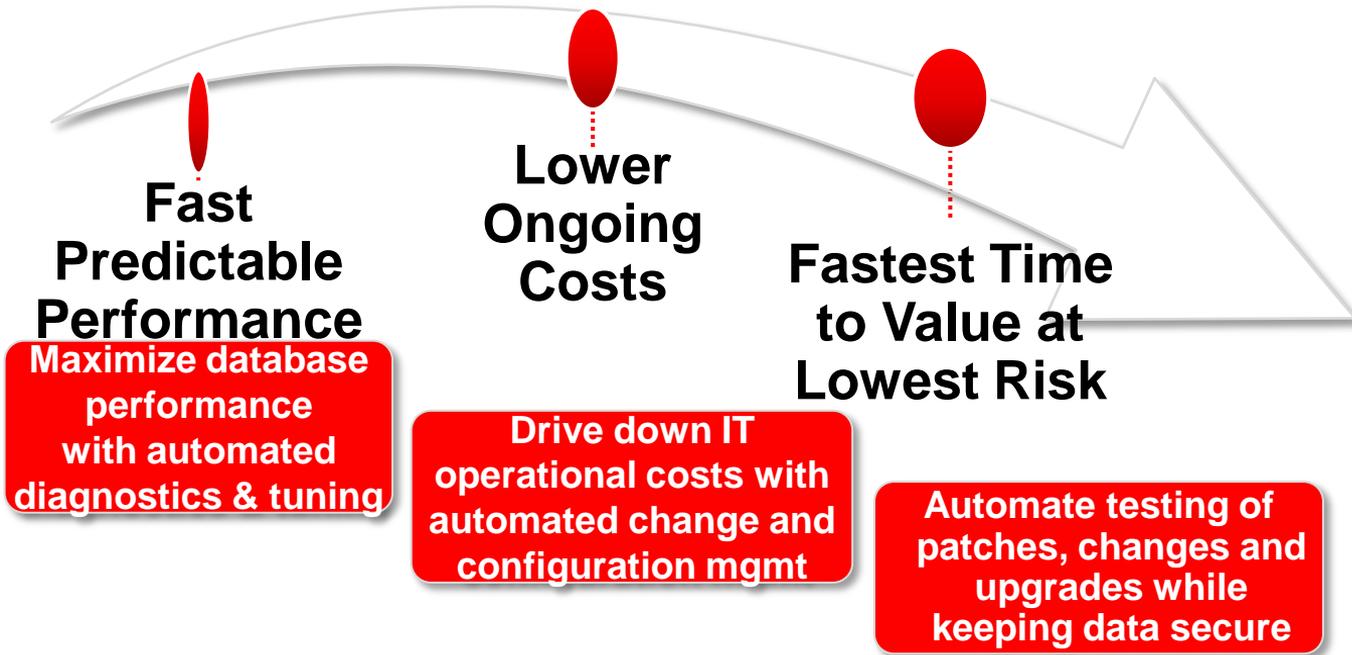
Comprehensive Fault Coverage

- CPU
- Disk controllers
- Disks
- Flash Cards
- Flash modules
- InfiniBand
- Cards
- Memory
- System Board
- Power supplies
- Fans

ORACLE

Oracle Exadata Database Machine

Extreme ROI Platform



Oracle Enterprise Manager

Proven Solution. Trusted by Customers.



Saves weeks on application testing time



Saves 80% time and effort for managing Databases



Ensures seamless user experience for 50,000,000 users



90% of IT issues addressed before they impact users



Drives asset utilization up by 70%



Cuts configuration management effort by 90%



Saves \$1.9 million with Oracle Enterprise Manager



Saves \$170,000 per year with Oracle Enterprise Manager



Replaces manual tools with automation; saves time by 50%



Reduces Database testing time by 90%



Reduces provisioning effort by 75%



Deploys SOA infrastructure 92% faster



Cuts application testing from weeks to hours



Reduces critical patching time by 80%



Delivers 24/7 uptime with Oracle Enterprise Manager

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Questions



Additional Oracle Enterprise Manager Sessions

Wednesday, October 5, 2011

TIME	TITLE	LOCATION
10:15 am – 11:15 am	Day in the Life of a DBA: Cloud-Ready Management Solutions for Any IT Shop	Moscone S, Rm 309
10:15 am – 11:15 am	Oracle Exadata Management Fundamentals: New Features for Monitoring, Tuning, and More	Moscone S, Rm 305
11:45 am – 12:45 am	An Inside Look at Oracle Enterprise Manager: New Framework and Architecture Overview	Moscone S, Rm 305
11:45 am – 12:45 am	Make Upgrades Uneventful with Oracle Enterprise Manager and My Oracle Support	Moscone S, Rm 309
11:45 am – 12:45 am	Roadmap to Enterprise Cloud Computing	Moscone S, Rm 310
11:45 am – 12:45 am	SQL Tuning Expert Roundtable	Moscone S, Rm 103
1:15 pm – 2:15 pm	Consolidation Planning and Chargeback: Cloud Implementation Essentials	Moscone S, Rm 309
1:15 pm – 2:15 pm	Scalable, Smarter Monitoring with Oracle Enterprise Manager: Expert Tips	Moscone S, Rm 305
5:00 pm – 6:00 pm	Oracle Enterprise Manager Deployment Best Practices	Moscone S, Rm 305
5:00 pm – 6:00 pm	Oracle Enterprise Manager Upgrade Best Practices	Moscone S, Rm 309
10:15 am – 11:15 am	Day in the Life of a DBA: Cloud-Ready Management Solutions for Any IT Shop	Moscone S, Rm 309

Oracle Enterprise Manager Demogrounds and Hands On Labs

- For further information, visit the Enterprise Manager Demo Grounds in Moscone West and South
 - See detailed demos of Enterprise Manager functionality
- For hands on practice with Enterprise Manager, visit the Hands On Labs at the Marriott Hotel, Marquis Salon 14 / 15
 - “Test Drive” (1 hour) and “Grand Tour” Labs featuring Oracle Enterprise Manager 12c running Tuesday – Thursday

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