- Our Grid Control Environment
- Our Challenge
- Grid Control Solution
- User Defined Policies – Use Case
Our EM Grid Control Environment

MONITORED TARGETS: ~ 1500
192 INSTANCES (53 RAC DBS)
223 HOSTS

Agent versions:
10.2.0.2, 10.2.0.3
10.2.0.4, 10.2.0.5
Solaris and Linux (32&64 bit)
Secure agent upload
Hardware load balancer

OMS version 10.2.0.5
Linux RHEL 4 (64 bits)
8CPU (2.33GHz) - 16Gb RAM

2-Node RAC (load balanced)
RDBMS 10.2.0.4
RedHat Linux 4 (64-bit)
NetApp NAS storage

Maximum Availability Architecture

Agent
Hardware Load Balancing
Users (https)
Management Server
Management Server
EMREP service
Repository Database
RAC node
RAC node
Our Challenge

- Minimize cost of monitoring growing architecture
- Provide timely, standardized access to meaningful information
- Enable pro-active management & problem avoidance
- Identify and remove configuration exceptions
Grid Control Solution

- Service Catalogue
- Discovery
- Databases/Hosts etc.
- Repository views
- Templates
- Metrics/Policies
- Targets - Databases - Hosts - Listeners
- Grid Control Web Interface
- Out of the box & Custom Reports
- Violation Reports
- Security policy
- DBAs/SysAdmins
- Management

ORACLE Enterprise Manager 10g
Grid Control
User Defined Metric Objective: Monitor the last RMAN backup timestamp for all databases

User Defined Policy Objective: Check that the metric has been successfully applied
How To (1) – Using User Defined Policies

View Monitoring Template: Age of RMAN backups

<table>
<thead>
<tr>
<th>Metric</th>
<th>Comparison Operator</th>
<th>Warning Threshold</th>
<th>Critical Threshold</th>
<th>Corrective Actions</th>
<th>Collection Schedule</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of datafile backup</td>
<td>&gt;</td>
<td>96</td>
<td>96</td>
<td>None</td>
<td>Every 12 Hours</td>
<td></td>
</tr>
<tr>
<td>Age of redolog backup</td>
<td>&gt;</td>
<td>6</td>
<td>12</td>
<td>None</td>
<td>Every 1 Hour</td>
<td></td>
</tr>
</tbody>
</table>

Tip: Empty Thresholds will disable alerts for that metric.
### Policies: Library

The following table lists all the policies and where they are currently in-use:

<table>
<thead>
<tr>
<th>Select</th>
<th>Policy</th>
<th>Severity</th>
<th>Category</th>
<th>Type</th>
<th>Description</th>
<th>Owner</th>
<th>Used in Monitoring Templates</th>
<th>Used by Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>Default Permanent Tablespace Set to a System Tablespace</td>
<td>Warning</td>
<td>Storage</td>
<td>Database Instance</td>
<td>Checks if the DEFAULT_PERMANENT_TABLESPACE database property is set to a system tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>☐</td>
<td>Default Permanent Tablespace Set to a System Tablespace</td>
<td>Warning</td>
<td>Storage</td>
<td>Cluster Database</td>
<td>Checks if the DEFAULT_PERMANENT_TABLESPACE database property is set to a system tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>1</td>
<td>71</td>
</tr>
<tr>
<td>☐</td>
<td>RMAN datafile backup metric exists</td>
<td>Warning</td>
<td>Security</td>
<td>Database Instance</td>
<td>Checks if the RMAN datafile backup metric exists</td>
<td>SYSMAN</td>
<td>2</td>
<td>97</td>
</tr>
<tr>
<td>☐</td>
<td>Users with Permanent Tablespace as Temporary Tablespace</td>
<td>Informational</td>
<td>Storage</td>
<td>Cluster Database</td>
<td>Checks if users using a permanent tablespace as the temporary tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>1</td>
<td>71</td>
</tr>
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<td>☐</td>
<td>Weblogic Performance Pack Enabled</td>
<td>Critical</td>
<td>Configuration</td>
<td>Oracle WebLogic Managed Server</td>
<td>This Policy verifies whether BEA WebLogic Server Performance Pack is enabled or not</td>
<td>&lt;SYSTEM&gt;</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Tip:** Policies provided by Oracle are owned by `<SYSTEM>`. They cannot be exported or deleted.

### Related Link

- Setup Monitoring Templates

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*Oracle Enterprise Manager 10g Grid Control*
## How To (3) – Using User Defined Policies

### Policies: Library

<table>
<thead>
<tr>
<th>Policy Name</th>
<th>Category</th>
<th>Severity</th>
<th>Type</th>
<th>Description</th>
<th>Owner</th>
<th>Used in Monitoring Template</th>
<th>Used by Targets</th>
<th>Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Permanent Tablespace Set to a System Tablespace</td>
<td>Storage</td>
<td>Warning</td>
<td>Database Instance</td>
<td>Checks if the DEFAULT_PERMANENT_TABLESPACE database property is set to a system tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>0</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Default Permanent Tablespace Set to a System Tablespace</td>
<td>Storage</td>
<td>Warning</td>
<td>Cluster Database</td>
<td>Checks if the DEFAULT_PERMANENT_TABLESPACE database property is set to a system tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMAN datafile backup metric exists</td>
<td>Storage</td>
<td>Warning</td>
<td>Database Instance</td>
<td></td>
<td>SYSMAN</td>
<td>2</td>
<td>97</td>
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### Related Link

- Setup Monitoring Templates
How To (5) – Using User Defined Policies

**SQL Query**

Select target_guid as TARGET_GUID, 1 "VALUE" from mgmt$target_metric_settings where collection_name='Age of datafiles backup' and target_type=oracle_database

One of the select columns must be target_guid. Do not end the statement with a semi-colon (;)
Validate SQL

**Non-Compliant Message**

Policy RMAN datafile backup metric exists is non-compliant.

**Compliant Message**

Policy RMAN datafile backup metric exists is compliant.
How To (6) – Using User Defined Policies

```sql
select target_guid as TARGET_GUID, 1 "VALUE"
from mgmt$target_metric_settings
where collection_name='Age of datafile backup'
and target_type='oracle_database'
union
select target_guid as TARGET_GUID, 0 "VALUE"
from mgmt$target
where target_type='oracle_database'
and target_guid not in (select target_guid
from mgmt$target_metric_settings
where collection_name='Age of datafile backup'
and target_type='oracle_database')
```
How To (7) – Using User Defined Policies

Edit Policy: Violation Condition
Enter the violation test to be evaluated.

SQL Query
```
select target_guid as TARGET_GUID, 1 "VALUE" from
mgmt$Target_metric_settings
where collection_name='Age of datfile backup'
and target_type='oracle_database'
```

Number of Key Columns 1

Condition
To check for violations, select a column name that was specified in the SQL statement above, and set the comparison operator and value to be tested. A violation is triggered if the condition returns true. If a more complex condition is needed, select SQL condition type and enter a SQL WHERE expression. If default parameters are used in the SQL expression, they can be customized during target association.

Condition Type  Calculate Threshold  SQL

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Data Type</th>
<th>Comparison Operator</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALUE</td>
<td>Number</td>
<td>=</td>
<td>0</td>
</tr>
</tbody>
</table>
How To (8) – Using User Defined Policies

Edit Policy: Test

Run a test evaluation against a single test target. Test results will be rendered below.

(Optional) Click Next to skip test.

* Target RMAN_T_new

Results

General

Severity Warning
Compliance Score (%) 76
Importance Normal
Category Security
Description Policy checks for the existence of the RMAN datafile backup metric

Violations

VALUE | Date Tested
0 07-Aug-2009 12:30:30 MEST
### Policies: Library

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<thead>
<tr>
<th>Select</th>
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<th>Category</th>
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<td>37</td>
</tr>
<tr>
<td></td>
<td>Default Permanent Tablespace Set to a System Tablespace</td>
<td>Warning</td>
<td>Storage</td>
<td>Cluster Database</td>
<td>Checks if the DEFAULT_PERMANENT_TABLESPACE database property is set to a system tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>1</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>RMAN datafile backup metric exists</td>
<td>Warning</td>
<td>Security</td>
<td>Database instance</td>
<td>Checks if the RMAN datafile backup metric exists</td>
<td>SYSMAN</td>
<td>2</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Users with Permanent Tablespace as Temporary Tablespace</td>
<td>Informational</td>
<td>Storage</td>
<td>Cluster Database</td>
<td>Checks for users using a permanent tablespace as the temporary tablespace</td>
<td>&lt;SYSTEM&gt;</td>
<td>1</td>
<td>74</td>
</tr>
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<td></td>
<td>Users with Permanent Tablespace as Temporary Tablespace</td>
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**Related Link**
- Setup Monitoring Templates

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Other names may be trademarks of their respective owners.

About Oracle Enterprise Manager
<table>
<thead>
<tr>
<th>Select</th>
<th>Target</th>
<th>Type</th>
<th>Policy</th>
<th>Severity</th>
<th>Last Evaluation</th>
<th>Category</th>
<th>Description</th>
<th>Disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Database Instance</td>
<td>RMAN datafile backup metric exists</td>
<td></td>
<td></td>
<td>06-Aug-2009 15:47:38 CEST</td>
<td>Security</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Database Instance</td>
<td>RMAN datafile backup metric exists</td>
<td></td>
<td></td>
<td>06-Aug-2009 16:37:34 CEST</td>
<td>Security</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Database Instance</td>
<td>RMAN datafile backup metric exists</td>
<td></td>
<td></td>
<td>06-Aug-2009 16:37:34 MEST</td>
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<td></td>
<td>06-Aug-2009 16:37:34 MEST</td>
<td>Security</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Other Examples – Using User Defined Policies

- Monitor if DB auditing is enabled
- Monitor if the audit data management procedure has been applied or if the login auditing trigger is enabled
- Monitor if the truncate audit procedure exists
Conclusion (I): Cost benefits

- Example:

- Without Grid Control:

<table>
<thead>
<tr>
<th>Monitoring task (EM policy)</th>
<th>Time consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time spent in a task per database per month</td>
<td>1 task x 5 mins x 1 month x 1 db</td>
</tr>
<tr>
<td></td>
<td>= 5 mins/month</td>
</tr>
<tr>
<td>Time spent in checking a task for all the databases</td>
<td>1 task x 5 mins x 1 month x 100 db</td>
</tr>
<tr>
<td></td>
<td>= 8 hours/month</td>
</tr>
<tr>
<td>Time spent in checking all tasks for all the database</td>
<td>8 hours x 20 tasks</td>
</tr>
<tr>
<td></td>
<td>= 166 hours/month</td>
</tr>
</tbody>
</table>

Conclusion => 1 post (FTE) just to check policies!!!!!!!
Example:

With Grid Control:

<table>
<thead>
<tr>
<th>Monitoring task (EM policy)</th>
<th>Time consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time spent in the initial effort in setting up:</td>
<td>It takes a few hours each. No overhead in re-running the policy.</td>
</tr>
<tr>
<td>✓ The User Defined Metric</td>
<td></td>
</tr>
<tr>
<td>✓ The User Defined Policy</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion => The post (FTE) can invest the time in taking new projects without increasing costs
Conclusion (III): Increased productivity

- Furthermore… Grid control reduces manpower needs by:
  - Providing centralized access to meaningful information
  - Enforcing compliance with our standards
  - Decreasing time consumed by daily operations
  - Reducing downtime by pro-active monitoring
  - Assisting DBAs in their tuning and performance improvement tasks
  - …and all with little additional effort even for a constantly expanding IT infrastructure
Oracle OpenWorld 2009

- Carlos Garcia Fernandez
- Manuel Guijarro Plaza
- Nilo Segura Chinchilla
- OOW 2009: General Overview
- Attended sessions
- Personal meetings
40000+ attendees (too big)
5 days long
~2000 presentations (sessions+keynotes)
Very fruitful personal meetings (jrockit, VM..)
Many commercial and product managers
Attended Sessions

- OEM
- Virtualization
- WebLogic VE / Jrockit
- Exadata/RAC
- Performance
Session focused on OEM Configuration Management Pack with a couple of 15 min success stories (including CERN’s)

**Configuration Management Pack**

*Doing more with less*

- **Knowing What You Have**
  - Asset Discovery
  - Automated Inventory
  - HW/SW Configurations
    - Operating Systems
    - Hardware
    - Database
    - Packaged Apps
  - Configuration Search
  - Relationships

- **Standardizing Configurations**
  - Drift Analysis
    - Config Comparison
    - Across the stack
    - Across lifecycles
    - Baseline & Gold Std
    - 1-to-1, 1-to-Many
    - Drift Reconciliation

- **Configuration Compliance**
  - Proactive Checks
    - Policy Management
    - Out-of-the-Box Policies
    - User-Defined Policies
    - User-Defined Groups
    - Compliance Dashboard

- **Detecting Configuration Changes**
  - Real-time Monitoring
    - Real-time Detection
    - Who, What and When
    - Compliance Framework
    - SOX, PCI, CoBIT ...
    - Change Reconciliation
    - Authorized vs Unauthorized
Personal meetings

- WLS-VE
- OVM
JRockit VE: Removing the OS and Creating a More Efficient Software Stack

- Customized to run single Java process
- No shell access allowed
- Headless

• ~1GB -> ~2 MB
• Improved performance
• Simplified configuration
• Increased security
• WebLogic Server Virtual Edition
  – Virtual machine containing WLS and JRockit VE
  – Designed to run on Oracle VM, without an operating system
  – Users can create their own virtual machine images containing WLSVE and their domains and applications

• JRockit VE
  – JRockit VE is the JRockit JVM extended so it can run directly on virtual hardware, and optimized for running Java on OVM and x86 hardware

• JRVE Image Tool
  – Create and edit the virtual machine images
Personal meeting: WLS-VE

- License to OVM through WLS-VE Early bird program (expected 1 year long validity)
- Offered to collaborate with Credit Suisse
- Offered to participate in Jrockit Flight Recorder Early bird program
- Testing program already arranged
WLS-VE details

- 9-13 Nov. OVM installation and testing
  - 10th Nov. @ 16h00 OVM training
- 19-20 Nov. JRVE & WLS experts at CERN
- 10th Dec. Results sharing with the Product Manager and Credit Suisse
Oracle VM

- Roadmap: Releases 2.2 & 3
- Oracle VM Templates
  - State University of New York (7 OVM hosts with 50+ VMs iSCSI storage)
- Virtualize with Oracle VM
- RACs on Oracle VM (interesting live demonstration based in templates)
- OVM @ Mercado Libre
  - 37.8 millions users / 320 servers
  - Reduction: 4:1 power 50:1 storage 4:1 cooling
Personal Meeting: OVM

- Explained CERN’s Fabric Management Infrastructure
- Creation of templates with Oracle VM Template Builder
- Provisioning using OEM
Many thanks

- Monica Marinucci
- Andrew Bulloch
- Andy Oppenheim
- Tuva Palm
- Madhup Gulati

-Presentation as well as all feedback provided to Oracle, has been perceived as a very useful exercise and CERN has been thanked for that.

-Currently CERN’s participation in 11.2 DB and Fusion Middleware is being studied.

-More in next meeting at UKOUG.
OOW 2009 – Questions?