Oracle
Enterprise Manager : 10g Grid Control

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IT Challenges

Which of the below is a problem today?

- Under utilized hardware
- Resizing, replacing or adding new servers
- Many applications running on many databases
- System downtime
- System response time

Not a Problem | 1 | 2 | 3 | 4 | 5 Big Problem
IT Challenges

Which of the below is a problem today?

- Under utilized hardware
- Resizing, replacing or adding new servers
- Many applications running on many databases
- System downtime
- System response time

Not a Problem  1  2  3  4  5 Big Problem

- Under utilized hardware: 0 0 0 0 0 0
- Resizing, replacing or adding new servers: 0 0 0 0 0 0
- Many applications running on many databases: 0 0 0 0 0 0
- System downtime: 0 0 0 0 0 0
- System response time: 0 0 0 0 0 0
How does your company address growing IT infrastructure needs?
This way, with big irons?

Access Your Applications

Run Your Applications

Manage Your Data

Open Standards Devices

Thin Clients

Oracle Application Server

Oracle Database Server
Or, this way?
The Grid Vision

• Have **minimal** number of **LARGE** Databases
• Use Grid Computing
  – Clustering ++
  – Low Cost Components
  – Higher Quality of Service
• Have Business Intelligence (BI) next to Operational Data
  – Less number of moving parts
  – Faster processing
  – Faster Business Intelligence
• Use Web Applications
  – Browser based access
  – Management of the applications in the data center. No Client/server
Oracle 10g for Enterprise Grid Computing
Grid Computing

- Grid computing treats computing as a utility.
  - Consumers don’t care where computing occurs.
  - Producers ensure computational power is:
    - Available
    - Reliable
    - Reasonably priced
“IT infrastructure is massively underutilized” - IDC
“Companies can save 20% or more through consolidation” - Giga Research
“75% of costs come from staffing & maintenance.” - Business Week
Grid computing is the coordinated use of a large number of servers and storage acting as one computer.

Low utilization with high cost to scale

High utilization with low cost to scale
Enterprise Manager 10g: Grid Control Architecture

Manage from Anywhere

Oracle Management Server

Servers  Storage  Network  Software
Database  iAS  OCS  eBiz
Enterprise Cmty Mgmt  Application Perf Mgmt  Precision System Monitoring  Administration

Infrastructure (Jobs, Alerts, …)

Open Repository

HTML Console
Mobile Device
Portals

HTTP/S
Firewall
Automated Provisioning

Scale Out to More Systems and Minimal Incremental Cost

Oracle Inventory
Software Configurations
Hardware Configurations

Install/Clone
Configure
Patch
Secure

Enterprise Manager Grid Control

View/Search
Compare/Diff
Change Tracking
Reference Configurations

LiveLink

Over 20% of downtime attributable to human configuration errors

Discover
Provision
Analyze

Oracle.com
Product Updates
Patches
Product Configuration
Oracle Enterprise Manager 10g: Grid Control

- Oracle Enterprise Manager 10g Grid Control provides the framework for monitoring and administering the grid, including the following:
  - A comprehensive overview of the grid’s status
  - A single point of monitoring for *all* associated targets
  - Alerts with drill-down capability to identify trouble spots
  - ASLM to enable holistic management of application performance
Grid Control Components

- Oracle8i Databases
- Oracle9i Databases
- Oracle10g Databases
- Oracle9i Application Servers
- Oracle10g Application Servers

Managed Targets → Oracle Management Agents → Oracle Management Services → Oracle Management Repository
Management Service (OMS)

- An Oracle Management Service (OMS) is:
  - A J2EE Web application
  - Deployed to Oracle Application Server 10g J2EE and Web Cache edition
- The OMS may be installed:
  - When the OMR is created
  - As a stand-alone service
Management Repository (OMR)

- An Oracle Management Repository (OMR) is:
  - A set of schema objects in an Oracle9i Database
  - Required prior to installing the Oracle Management Service
- The OMR may be installed:
  - In an existing database
  - In a new database
Management Agent (OMA)

- The Oracle Management Agent (OMA):
  - Must be installed on every managed server
  - Connects to one OMS
- The OMA may be installed:
  - When the OMR is created
  - When a stand-alone OMS is created
  - As a stand-alone service
Managed Targets

- Managed targets may include:
  - Oracle Databases
  - Oracle Database Listeners
  - Oracle Application Servers
  - Oracle Applications
  - Oracle Collaboration Suite
  - Most operating systems that are certified to run Oracle products
  - Third-party products and applications
Management Agent (OMA)

- Host server
- Oracle Management Agent
- Managed targets
  - OC4J
  - OC4J
  - OC4J
  - OC4J
  - OHS
  - Web Cache
- Application Servers
- Listeners
- Databases
- Oracle Management Service
- HTTP or HTTPS
- JDBC
- OMR
Accessing the Grid Control Console

• The Grid Control console may be accessed by any supported browser:
  – Netscape Navigator 4.78, 4.79, 7.01, 7.1.0
  – Mozilla 1.3.1
  – Microsoft Internet Explorer 5.5 (SP1) or 6.0 (SP2)
  – Microsoft Pocket Internet Explorer 2.0 (for HTTP) or 3.0 (for HTTPS)
    - http://<oms hostname>.<domain>:<port>/em
    - http://omsserver.mycompany.com:7777/em
Grid Control Console: Home
# Grid Control Console: Targets

![Grid Control Console](image)

<table>
<thead>
<tr>
<th>Select</th>
<th>Name</th>
<th>Type</th>
<th>Availability</th>
<th>Alerts</th>
<th>Policy Violations</th>
<th>Sessions: CPU</th>
<th>Sessions: I/O</th>
<th>Sessions: Other</th>
<th>Sessions: Other</th>
<th>Instance CPU (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dnl5p4</td>
<td>Database: Physical Standby</td>
<td>🌕</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>eddn5p1.us.oracle.com</td>
<td>Database</td>
<td>🌕</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>emep.us.oracle.com</td>
<td>Database</td>
<td>🌕</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iascb.us.oracle.com</td>
<td>Database</td>
<td>🌕</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>orcl.oracle.com</td>
<td>Database: Primary</td>
<td>🌕</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>orcl_EDDN5PO.oracle.com</td>
<td>Database</td>
<td>🌕</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>orcl_eedn5p7.us.oracle.com</td>
<td>Database</td>
<td>🌕</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>orcl5g2</td>
<td>Database: Logical Standby</td>
<td>🌕</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

**TIP** For an explanation of the icons and symbols used in this page, see the Icon Key.
Viewing a List of Hosts in Your Grid

- From the Hosts target page you can quickly check the status of all host servers in your grid.
Host Home Page

- The Host home page allows you to quickly determine the state of the host.
Viewing Performance Information

- The Host Performance page shows you how the host is using its available resources.
Comparing Metrics of Multiple Database Targets

- The Database Targets page makes it easy to compare resource usage of different databases.
Database Home Page

- The Database Home page presents an overview of database status and resource consumption.
Grid Control Console: Deployments

**Critical Patch Advisories**
- Patch Advisories: 0
- Affected Oracle Homes: 0

**Deployments Summary**

<table>
<thead>
<tr>
<th>Database Installations</th>
<th>Targets</th>
<th>Installations</th>
<th>Interim Patches Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle 10g 10.1.0.2.0</td>
<td>6</td>
<td>6</td>
<td>No</td>
</tr>
<tr>
<td>Oracle9i 9.0.1.5.0</td>
<td>2</td>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

**Overview**
Enterprise Manager maintains detailed information about hosts and their operating systems, as well as software installations. The Deployments Summary table provides a high level view of this information, as well as allowing you to explore the details by selecting individual components. This information is also available on the Configuration page for a host. Using the Deployments tools, you can:

- Perform searches on the detailed information.
- Compare the detailed information of hosts and databases.
- Search Oracle MetaLink for patches, and subsequently manage their deployment.
- Clone a database or Oracle home to an alternative location.
- Manage the configuration collection process.
**Grid Control Console: Alerts**

Your managed targets listed below have metric severities that are in Warning status.

<table>
<thead>
<tr>
<th>Target</th>
<th>Type</th>
<th>Open Since</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Mar 2, 2004 11:14:33 PM</td>
<td>81% of archive_area /u01/app/oracle/product/10.1.0/oradata/orcl/dg3/arc is used.</td>
</tr>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Mar 2, 2004 11:14:33 PM</td>
<td>81% of archive_area /u01/app/oracle/product/10.1.0/oradata/orcl/dg3/arc/dgarc is used.</td>
</tr>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Feb 28, 2004 9:36:47 AM</td>
<td>ORA-err stack (08660) [kspsg32'] logged in /u01/app/oracle/admin/orcl/dg3/dump/alert_orcl3...</td>
</tr>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Feb 28, 2004 9:17:48 AM</td>
<td>ORA-err stack (08660) [kspsg32'] logged in /u01/app/oracle/admin/orcl/dg3/dump/alert_orcl3...</td>
</tr>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Feb 28, 2004 8:56:16 AM</td>
<td>ORA-err stack (08660) [kspsg32'] logged in /u01/app/oracle/admin/orcl/dg3/dump/alert_orcl3...</td>
</tr>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Feb 28, 2004 8:54:12 AM</td>
<td>The database status is MOUNTED.</td>
</tr>
<tr>
<td>dn504</td>
<td>Database</td>
<td>Feb 28, 2004 8:47:16 AM</td>
<td>User SYS logged on from EDDNRP54.</td>
</tr>
<tr>
<td>addr5p0.us.oracle.com</td>
<td>Host</td>
<td>Feb 19, 2004 1:47:58 PM</td>
<td>Filesystem / has only 19% available space</td>
</tr>
<tr>
<td>addr5p1.us.oracle.com</td>
<td>Database</td>
<td>Feb 28, 2004 8:37:24 AM</td>
<td>Metrics &quot;Database Time Spent Waiting (%)&quot; is at 100 for event class &quot;Other&quot;</td>
</tr>
<tr>
<td>addr5p10.us.oracle.com</td>
<td>Host</td>
<td>Mar 3, 2004 10:35:52 AM</td>
<td>Swap Utilization is 85.19%.</td>
</tr>
</tbody>
</table>
Grid Control Console: Jobs

![Grid Control Console: Jobs](image)

### Search
- **Name**
- **Owner**: SYSMAN
- **Status**
- **Scheduled Start**
  - Last 7 days
  - Show jobs scheduled to start at the above time or afterwards

### Job Activity

#### Results

<table>
<thead>
<tr>
<th>Select</th>
<th>Name</th>
<th>Status (Executions)</th>
<th>Scheduled</th>
<th>Targets</th>
<th>Target Type</th>
<th>Owner</th>
<th>Job Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>🟪</td>
<td>REORGANIZE ORCL ORACLE.COM 25</td>
<td>Succeeded</td>
<td>Feb 27, 2004 6:50:03 AM GMT-07:00</td>
<td>orcl_oracle.com</td>
<td>Database</td>
<td>SYSMAN</td>
<td>Reorganize</td>
</tr>
<tr>
<td>🟪</td>
<td>BACKUP ORCL ORACLE.COM 000024</td>
<td>Succeeded</td>
<td>Feb 26, 2004 2:32:35 PM GMT-07:00</td>
<td>orcl_oracle.com</td>
<td>Database</td>
<td>SYSMAN</td>
<td>Backup</td>
</tr>
<tr>
<td>🟪</td>
<td>DATAGUARD CREATE STANDBY 21</td>
<td>Succeeded</td>
<td>Feb 26, 2004 8:28:46 AM GMT-07:00</td>
<td>2</td>
<td>Host</td>
<td>SYSMAN</td>
<td>Data Guard Create Standby</td>
</tr>
</tbody>
</table>
EM2Go

• Access Grid Control’s EM2Go with any wireless device using Microsoft Pocket Internet Explorer:
  – Requires no special configuration
  – Includes the most critical functionality of Grid Control
Monitoring Grid Control

- Grid Control must be functioning efficiently to effectively monitor targets. When monitoring the Grid Control framework, you should:
  - Examine management repository operations
  - Ensure that management services are functioning properly
  - Check management agent performance
Management System: Overview

- Select the Management System tab for an overview of the Grid Control framework.
Grid Control Console: Management System

Management Services and Repository

Overview | Repository Operations | Management Services | Errors

General

- Availability (%): 100%
- Last 24 hours
- Monitoring Agents: edmr5p10.us.oracle.com:1831
- Management Services: 2
- Agents: 13
- Targets: 75
- Administrators: 6
- Active Management Service Repository Sessions: 14

Loader Backlog (files)

Files

- 11:41
- 2
- 3
- 4
- 5

Mar 2, 2004

Notification Delivery Backlog

Backlog

- 1.0
- 0.8
- 0.6
- 0.4
- 0.2
- 0.0

Mar 2, 2004

Repository Details

- Host: edmr5p10.us.oracle.com
- Description: (ADDRESS_LIST=
  (ADDRESS= (PROTOCOL=TCP)
  (HOST=edmr5p10.us.oracle.com)
  (PORT=1521))) (CONNECT_DATA=
  (SERVICE_NAME=emrep.us.oracle.com))
- Databases: MGMT_ECM_DEPOT_TS
- MGMT_TABLESPACE
- Space Used: 301.00 MB of 1.000.00 MB
Grid Computing

- Highest quality of service
- Lowest Cost
- Easiest to Manage
Grid Computing

Application Server Grid
- Optimal resource utilization
- J2EE and Web Cache Clustering

Database Grid
- 10g RAC
- Self Management
- Optimal resource utilization
- Integrated Clusterware

Storage Grid
- ASM
- Transportable Tablespaces
- Data Pump
- Gateways
Grid Computing

Application Server Grid

Database Grid

Storage Grid
Automatic Storage Management (ASM)

- Eliminates need for conventional file system and volume manager
- Capacity on demand
  - Add/drop disks online
- Automatic I/O load balancing
  - Stripes data across disks to balance load
  - Best I/O throughput
- Automatic mirroring
- Easier to manage
Grid Computing

Database Grid Summary
- ASM
- Transportable Tablespaces
- Data Pump
- Gateways
Single Instance Database Architecture

- Database client may be connected thru a dedicated server, or thru a dispatcher to a shared server
- Buffer cache and DBWR only involved when not using direct writes
Real Application Clusters
A deployment scenario

Centralized Management Console

High Speed Switch or Interconnect

Clustered Database Instances

Hub or Switch Fabric

Mirrored Disk Subsystem

Application Servers/Network

Low Latency Interconnect VIA or Proprietary

Shared Cache

Storage Area Network

Drive and Exploit Industry Advances in Clustering

No Single Point Of Failure

Users
Self-Managing Database 10g

- Automated storage mgmt (ASM)
- Built-in intelligent infrastructure
  - Self-aware performance analysis
  - Proactive server alerts
  - Automatic tasks
- Automatic Database Diagnostic Monitor
- Expert engine in the database
- Automatic SQL tuning
  - Optimize packaged and custom applications
Database Grid Summary

• Mission Critical Quality of Service on Industry Standard, Low Cost Servers
• Lowers Cost
  – Optimal utilization IT assets
  – Integrated clusterware for RAC
  – Fault tolerant
  – Capacity on demand
Grid Computing

Application Grid

- Application Server Grid
- Database Grid
- Storage Grid

Database Grid
- 10g RAC
- Self Management
- Optimal resource utilization
- Integrated Clusterware

Storage Grid
- ASM
- Transportable Tablespaces
- Data Pump
- Gateways
Application Grid

*Oracle Application Server 10g: Complete & Integrated*

User Provisioning

Software Provisioning

Workload Management

Application Availability

Application Monitoring

Enterprise Grid

Virtualize – Ensure Quality of Service – Provision – Monitor
Application Service Level Management (ASLM)

- With Application Service Level Management (ASLM), you can:
  - Manage application availability
  - Monitor application performance
  - Diagnose application response-time issues
Manage Systems Holistically

- Administer the grid holistically with ASLM:
  - Monitor the end user’s view of an application
  - Correlate performance issues between all components of an application
  - Trace transactions and URLs through the entire stack rather than in only a single component

---

![Table and Diagram](diagram.png)
Beacons

- Monitor availability from your key user communities:
Define Availability

- Define application availability based on a key business transaction that is tested from critical end-user communities:

<table>
<thead>
<tr>
<th>Beacon</th>
<th>Total Transaction Response (ms)</th>
<th>Average Page Response (ms)</th>
<th>Slowest Page (ms)</th>
<th>Transaction Status</th>
<th>Collection Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>49786</td>
<td>4526</td>
<td>12990</td>
<td>↑</td>
<td>May 7, 2004 12:22:47 AM</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>59719</td>
<td>5429</td>
<td>12996</td>
<td>↑</td>
<td>May 7, 2004 12:19:27 AM</td>
</tr>
<tr>
<td>Australia</td>
<td>58336</td>
<td>5303</td>
<td>13994</td>
<td>↑</td>
<td>May 7, 2004 12:19:48 AM</td>
</tr>
</tbody>
</table>

Define Availability

<table>
<thead>
<tr>
<th>Use</th>
<th>Beacon</th>
<th>State</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>Western US</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td>In Sync</td>
<td></td>
</tr>
</tbody>
</table>

Availability Transaction

<table>
<thead>
<tr>
<th>Select Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petstore Shopping Transaction</td>
<td>Monitoring</td>
</tr>
<tr>
<td>homepage</td>
<td>Monitoring</td>
</tr>
</tbody>
</table>
Diagnose Performance Problems

• Interactive transaction trace:
  – Trace transactions on demand
  – Find transaction performance bottlenecks quickly

• Middle-tier performance drilldowns:
  – Evaluate historical J2EE activity breakouts
  – Click to drill down to EJB and SQL levels
  – Correlate performance
Interactive Transaction Trace

Manage Transactions

Select Name
- Browse Dogs
- Browse Products
- Credit Card Validation
- Login Account
- Online Purchase
- Search Pets

Server Time Details

<table>
<thead>
<tr>
<th>Step</th>
<th>URL</th>
<th>Server Time (ms)</th>
<th>Server/JSF Time (ms)</th>
<th>EJB Time (ms)</th>
<th>JDBC/SQL Time (ms)</th>
<th>Processing Time Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>/estore/control/commitorder</td>
<td>3407</td>
<td>37</td>
<td>3153</td>
<td>234</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>/estore/control/verifysignin</td>
<td>310</td>
<td>110</td>
<td>145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>/estore/control/product?product_id=FL-DLH-02</td>
<td>90</td>
<td>80</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>/estore/control/product?product_id=RP-SI-D01</td>
<td>100</td>
<td>10</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>/estore/control/product?product_id=DS-SW01</td>
<td>80</td>
<td>40</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>/estore/control/cart</td>
<td>17</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

JDBC Components

Transaction Online Purchase
URL: http://dsum1648.us.oracle.com:7779/estore/control/verifysignin

Connection Details

- Data Source: jdbc:oracle:thin:@dsum1648:1521:EM401db
- Schema: SCOTT
- New Connections: 0
- Total Connection Time (ms): 0

Component List

<table>
<thead>
<tr>
<th>SQL</th>
<th>Executions</th>
<th>Total Time (ms)</th>
<th>SQL Execution Time (ms)</th>
<th>Fetch Time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>select itemid, listprice, unitcost, attr1, attr2, a.productid, name, descn from item a, product b where a.productid = &quot;EST:1&quot; order by name</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>select itemid, listprice, unitcost, attr1, attr2, a.productid, name, descn from item a, product b where a.productid = &quot;EST:2&quot; order by name</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>select itemid, listprice, unitcost, attr1, attr2, a.productid, name, descn from item a, product b where a.productid = &quot;EST:3&quot; order by name</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
## Diagnose Middle-Tier Performance Issues

**Middle Tier Performance**

Middle Tier performance is a measure of the time taken to prepare web application content in the middle tier, including all end data sources.

**Slowest URLs by Average Time in OC4J**

<table>
<thead>
<tr>
<th>URL</th>
<th>Hits</th>
<th>Processing Time Per Hit (ms)</th>
<th>Processing Time Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>/estore/control/commitorder</td>
<td>965</td>
<td>853.0</td>
<td></td>
</tr>
<tr>
<td>/estore/control/verifysignin</td>
<td>1,360</td>
<td>433.4</td>
<td></td>
</tr>
<tr>
<td>/estore/control/product</td>
<td>10,366</td>
<td>265.6</td>
<td></td>
</tr>
<tr>
<td>/estore/control/search</td>
<td>414</td>
<td>248.8</td>
<td></td>
</tr>
<tr>
<td>/estore/control/productdetails</td>
<td>4,599</td>
<td>147.5</td>
<td></td>
</tr>
<tr>
<td>/estore/control/cart</td>
<td>9,368</td>
<td>142.9</td>
<td></td>
</tr>
<tr>
<td>/estore/control/main</td>
<td>414</td>
<td>116.7</td>
<td></td>
</tr>
<tr>
<td>/estore/control/category</td>
<td>12,643</td>
<td>105.1</td>
<td></td>
</tr>
</tbody>
</table>

**Processing Time and Load (Last 24 Hours)**

Each data point shown represents the average time per URL hit (in milliseconds) for that hour.

**Processing Time Breakdown (Last 24 Hours)**

Breakdown of URL processing time by OC4J subsystem. Values are the average per URL hit (in milliseconds):
Analyze the Processing Call Stack

### Processing Call Stack

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>% of Request</th>
<th>Exclusive to Call (ms)</th>
<th>In Callouts (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/petstore/control/product</td>
<td>URL</td>
<td>0.0</td>
<td>0.0</td>
<td>1,490.3</td>
</tr>
<tr>
<td>webTierEntryPoint</td>
<td>Servlet</td>
<td>0.1</td>
<td>0.8</td>
<td>1,484.3</td>
</tr>
<tr>
<td>template.jsp</td>
<td>JSP</td>
<td>0.2</td>
<td>3.6</td>
<td>1,490.7</td>
</tr>
<tr>
<td>index.jsp</td>
<td>JSP</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>banner.jsp</td>
<td>JSP</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>footer.jsp</td>
<td>JSP</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>product.jsp</td>
<td>JSP</td>
<td>5.5</td>
<td>81.4</td>
<td>1,398.9</td>
</tr>
</tbody>
</table>

### SQL Statements

- `select productid, name, descn from product where productid='...';`  
  - SQL Statement  
  - 2.4  
  - 35.4  
  - 0.0

- `SELECT VALUE FROM NLS_INSTANCE_PARAMETERS WHERE PARAMETER = '...';`  
  - SQL Statement  
  - 8.3  
  - 123.0  
  - 0.0

- `select COUNT(*) from item a, product b where a.productid = ...`  
  - SQL Statement  
  - 0.2  
  - 2.7  
  - 0.0

- `select itemid, listprice, unitcost, attr1, attr2, a.productid,...`  
  - SQL Statement  
  - 0.2  
  - 3.7  
  - 0.0

- `select COUNT(*) from item a, product b where a.productid = ...`  
  - SQL Statement  
  - 0.2  
  - 2.3  
  - 0.0

- `select productid, name, descn from product where productid='...';`  
  - SQL Statement  
  - 2.3  
  - 34.3  
  - 0.0
Oracle Grid Computing

Application Server Grid

Database Grid

Storage Grid

Grid Control
Additional Technical Information

• Oracle Database 10g

• Oracle Application Server 10g

• Oracle Enterprise Manager 10g Grid Control