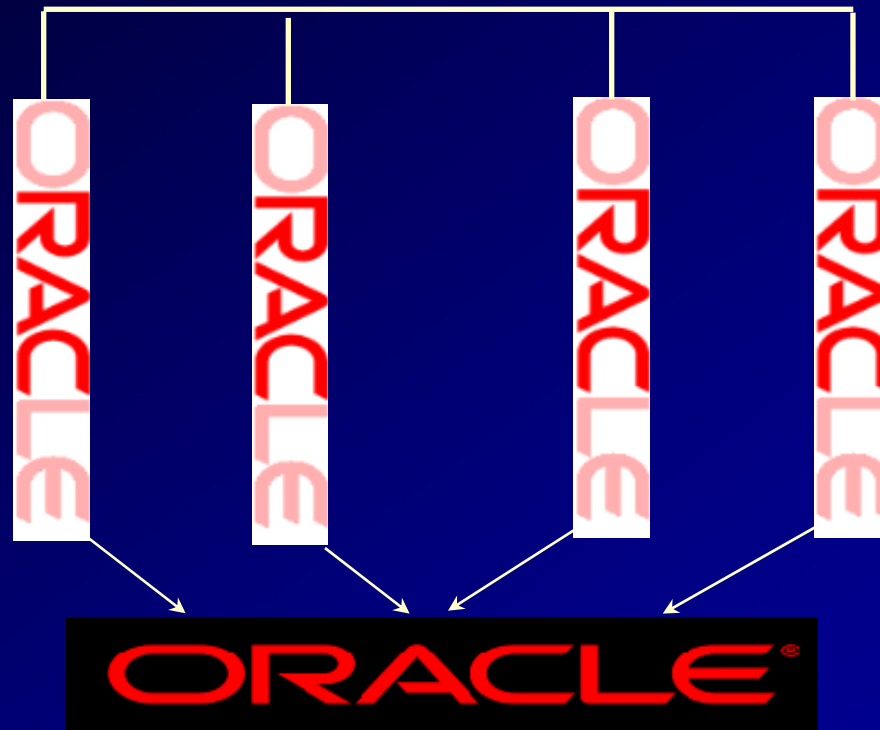
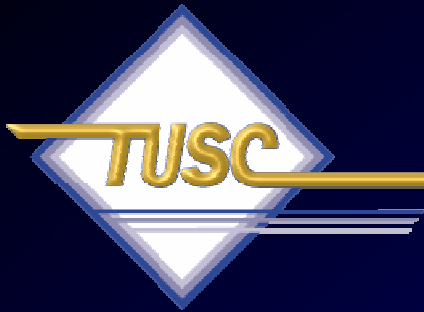


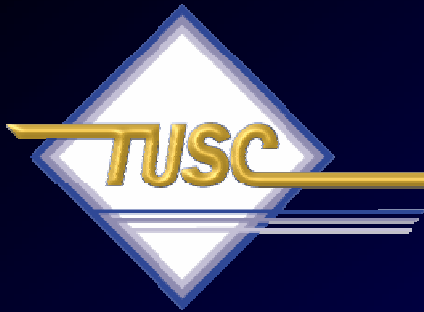
Tuning the Oracle Grid

SOUG - 2007



Rich Niemiec, TUSC
(Special Thanks: IOUG)

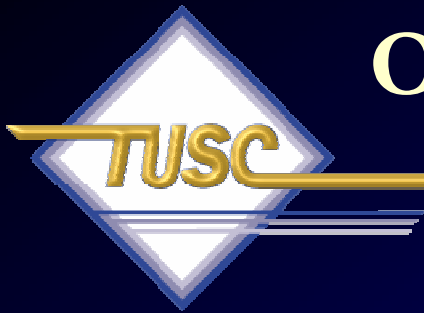
(Thanks: Prabhaker Gongloor, Anil Khilani, Jay Rossiter, John Kennedy, Julie Wong, Arsalan Farooq, Benoit Dageville, Jim Hawkins, Brad Brown & Joe Trezzo)



Audience Knowledge

- Oracle8i Experience ?
- Oracle9i Experience ?
- Oracle9i RAC Experience?
- Oracle10^g Experience?
- Oracle10^g Grid Control Experience?
- Goals
 - Overview of Tuning and Oracle 10^g Grid
 - Focus on a few nice grid features of Oracle 10^g
- Non-Goals
 - Learn ALL aspects of Tuning Oracle 10^g
 - Learn how to install/manage RAC/Grid

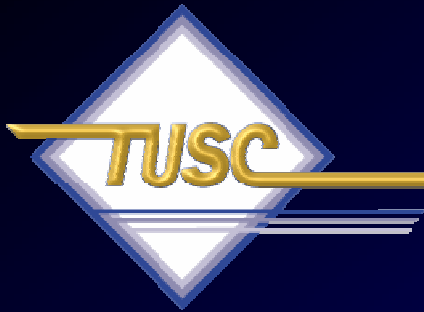




Overview



- The Basics, Oracle & Market Direction
- RAC, Grid Basics and Scaling it All
- Tuning the Interconnect & using Statspack/AWR
- Grid Control Basics, Multi-Node & Tuning
- Other quick Tips
- Availability thoughts
- Summary

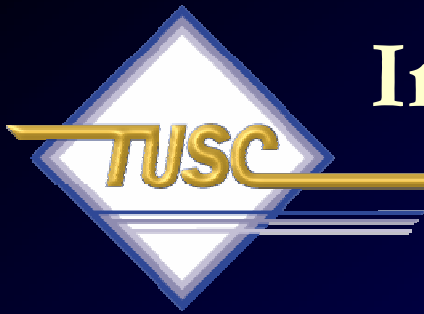


Tip #1

Know the Basics – OPS and early Clusters



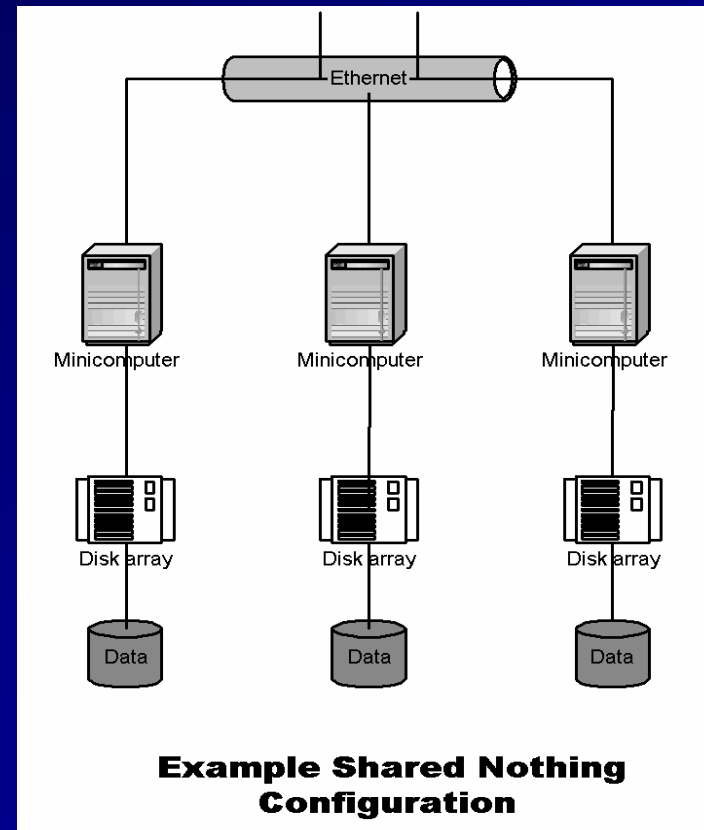
Retailers like Wal-Mart are benefiting from the economic growth caused by China's decision to allow foreign retail and wholesale companies to set up wholly foreign-owned businesses in the country.

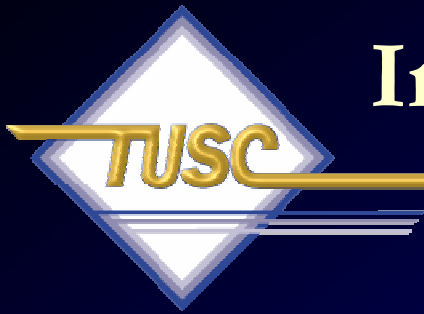


Introduction to RAC

- IBM drove the Shared Nothing Architecture in its cluster solution.
- Others that use this*:
 - Teradata
 - Netezza
 - Google

* *Wikipedia*





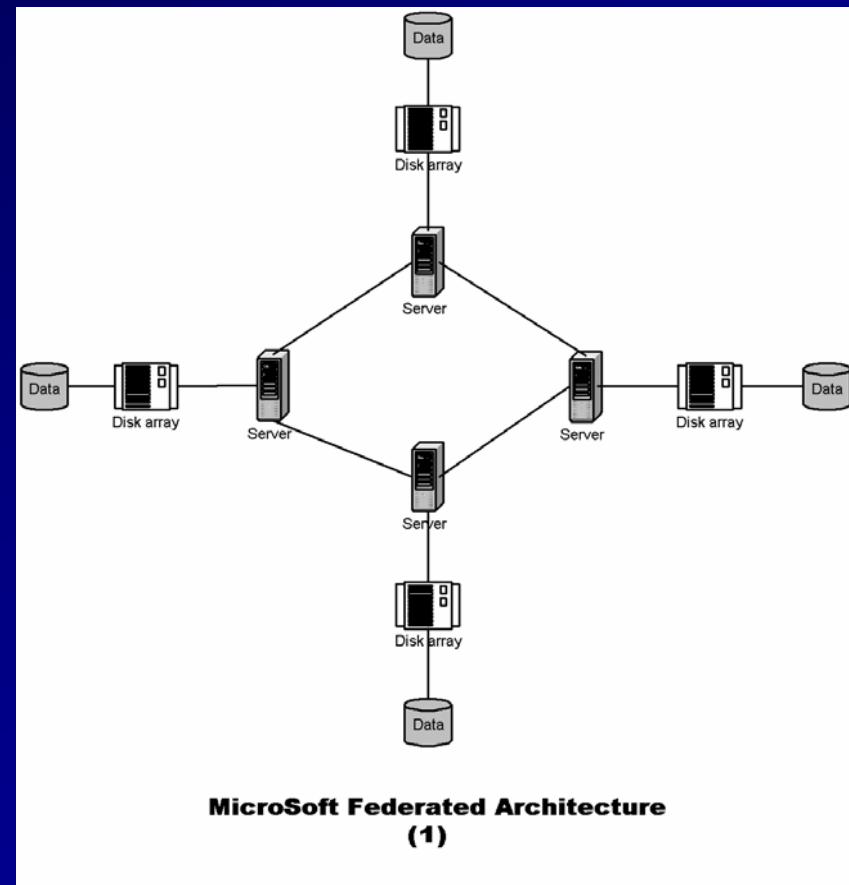
Introduction to RAC

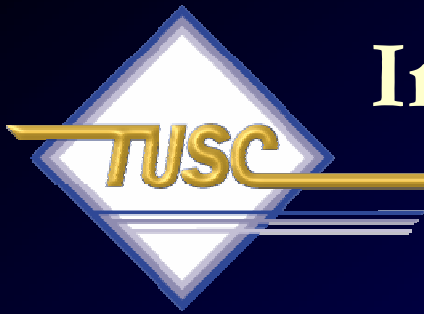
- Shared nothing architecture uses **data partitioning** where each server has independent memory and disk architectures
- The problems are:
 - Loss of a node loses that nodes data
 - Adding a node means the database must be re-organized
 - Backups are complex
 - Suffers from **convoy effect** (only as fast as the slowest member)
 - Requires complex two-phase commit architecture for referential integrity (similar to Oracle6)



Introduction to RAC

- Federated Databases (Microsoft based Architecture)
- Similar to shared-nothing



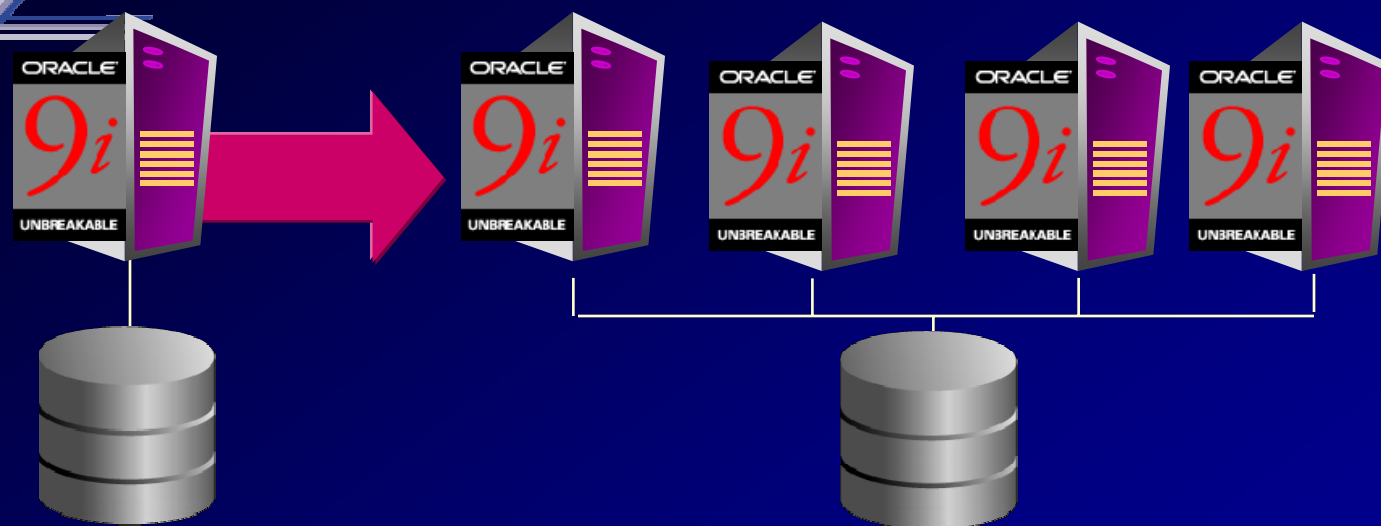


Introduction to RAC

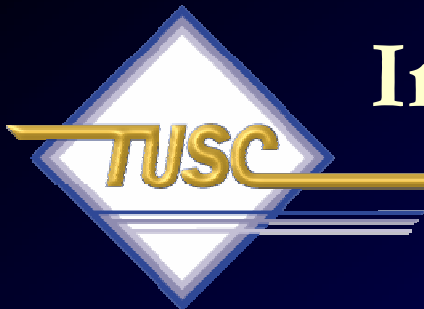
- Federated allows some limited failover capability
- Failover increases the load to the designated failover server
- Instead of data partitioning, *each node maintains a copy of the *entire* database (similar to Oracle7)*
- The databases are kept *synchronized with complex data N-way replication* architectures
- Has same limitations as shared-nothing for referential integrity
- Note: Microsoft also has a shared-nothing approach. 8



Introduction to RAC



- Start small, grow incrementally
- Scalable AND highly available
- NO downtime to add servers and disk
- OPS was the beginning in Oracle6 for Digital only. In Oracle8i it was expanded to other platforms. OPS was 95% rewritten to RAC in Oracle9i & expanded for Grid Computing in 10g.

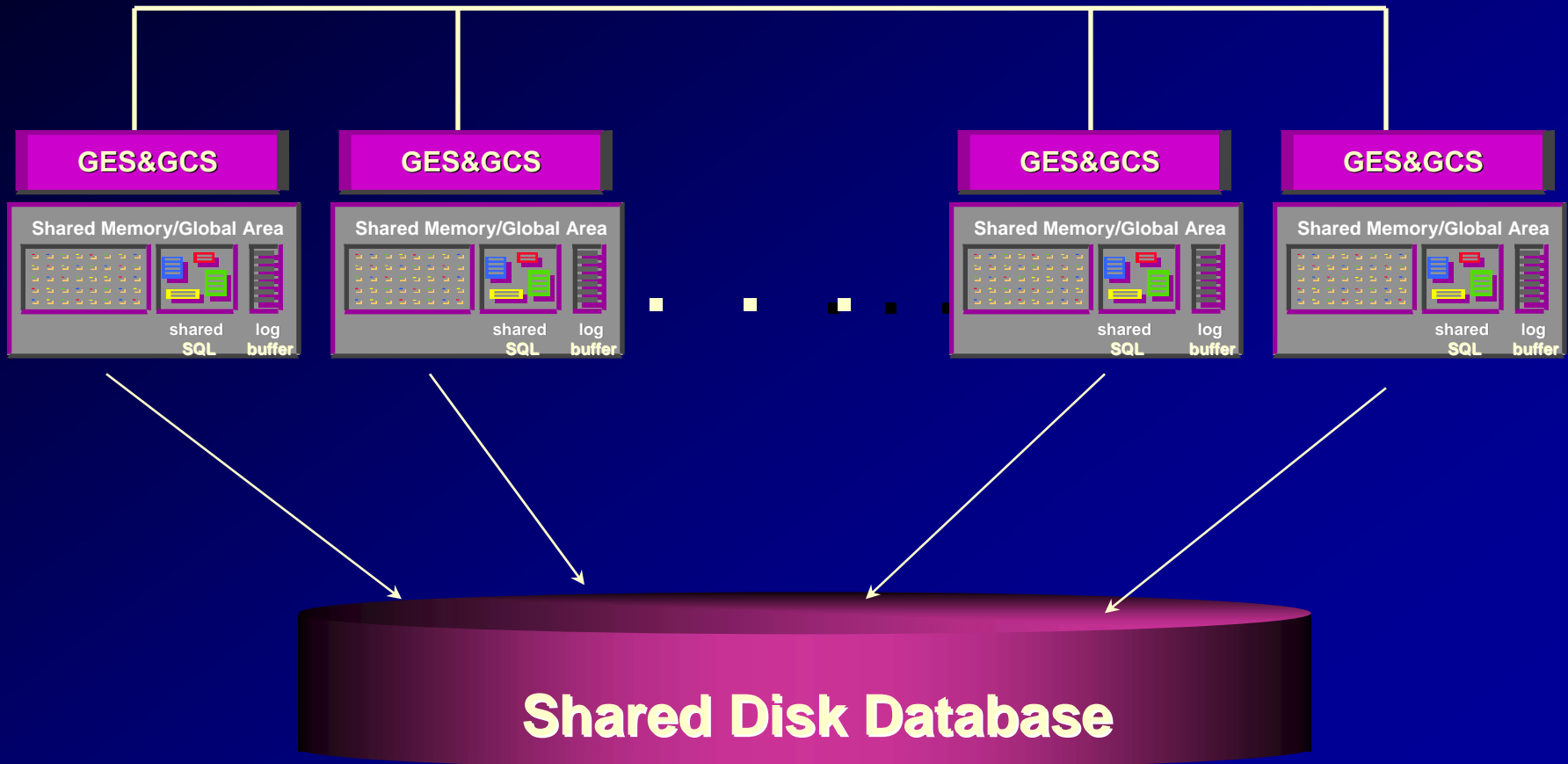


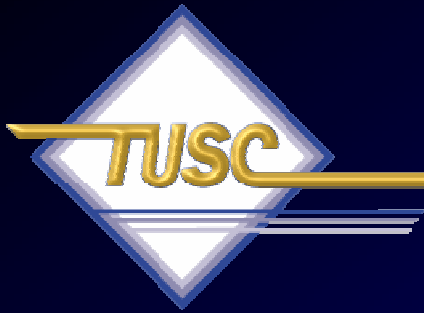
Introduction to RAC

- Cache fusion:
 - Implemented through the **high speed cluster interconnect** that runs between the servers.
 - Each instance in Oracle RAC is independent, it uses its own shared memory area, its own processes and redo logs etc.
 - **Cache fusion** unites these shared memory structures such that **block images are rapidly transferred from one shard memory area to another** through the high speed interconnect
 - The virtual shared area is the sum of the individual areas.



Introduction to RAC Shared Data Model





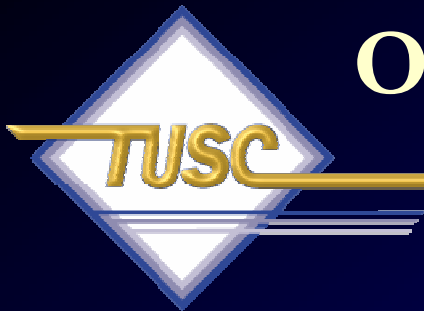
Tip #2

Know the Oracle

"I admire risk takers. I like leaders – people who do things before they become fashionable or popular. I find that kind of integrity inspirational."



LAWRENCE J. ELLISON | *Chairman & Chief Executive Officer, 2003*



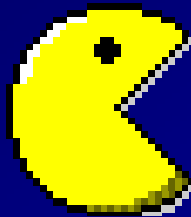
Oracle Firsts – *Innovation!*

- 1979 First commercial SQL relational database management system
- 1983 **First 32-bit** mode RDBMS
- 1984 First database with read consistency
- 1987 **First client-server** database
- 1988 First RDBMS with SMP support
- 1994 First commercial and multilevel secure database evaluations
- 1995 **First 64-bit** mode RDBMS
- 1996 First to break the 30,000 TPC-C barrier
- 1997 **First Web** database
- 1998 First Database - Native **Java** Support; Breaks 100,000 TPC-C
- 1998 First Commercial RDBMS ported to **Linux**
- 2000 First database with **XML**
- 2001 First middle-tier database cache
- 2001 First RDBMS with **Real Application Clusters**
- 2004 First **True Grid Database**
- 2005 First **FREE Oracle Database** (10g Express Edition)
- 2006 First **Oracle Unbreakable LINUX Support**



Tip #3

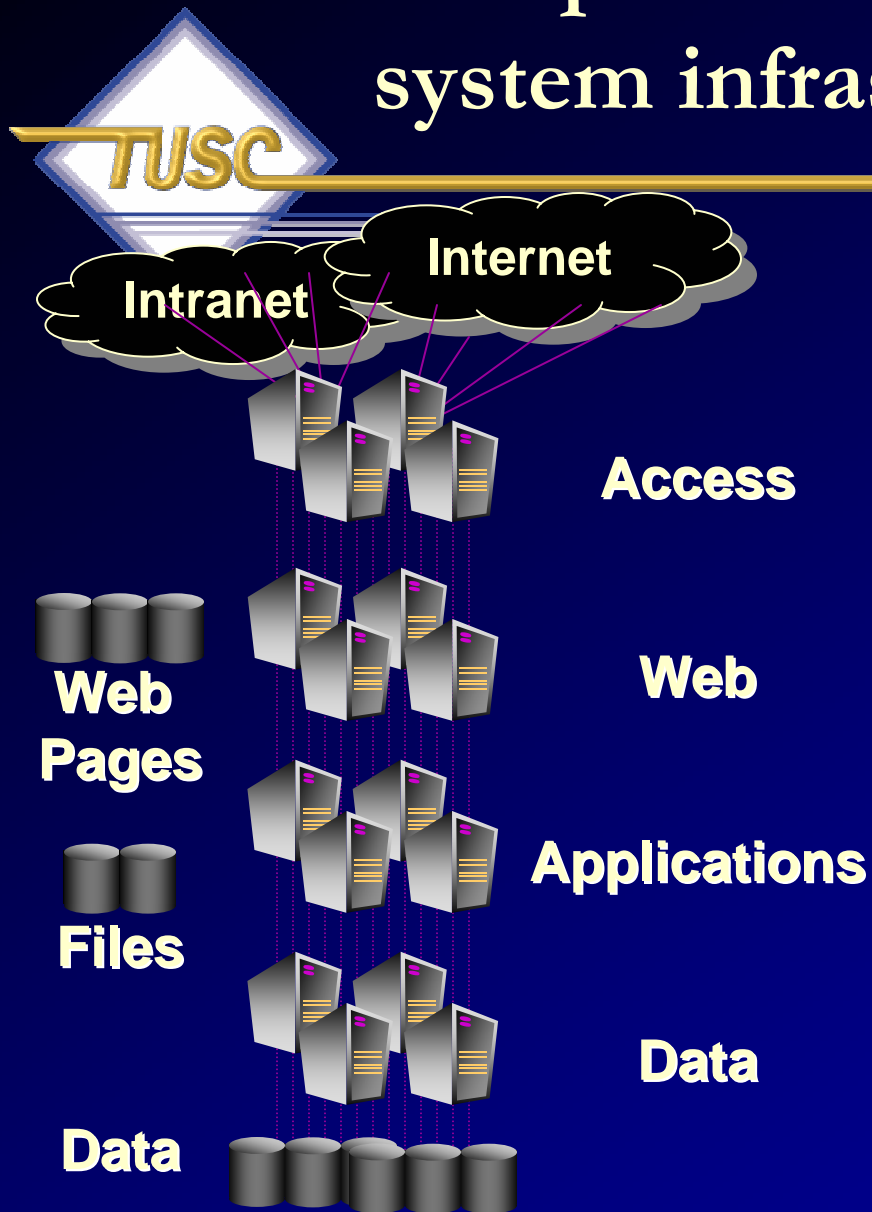
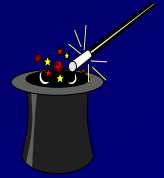
Know the Market Direction – Consolidation!



“I think there is a world market for maybe 5 computers.”

- Thomas Watson, IBM Chairman '43

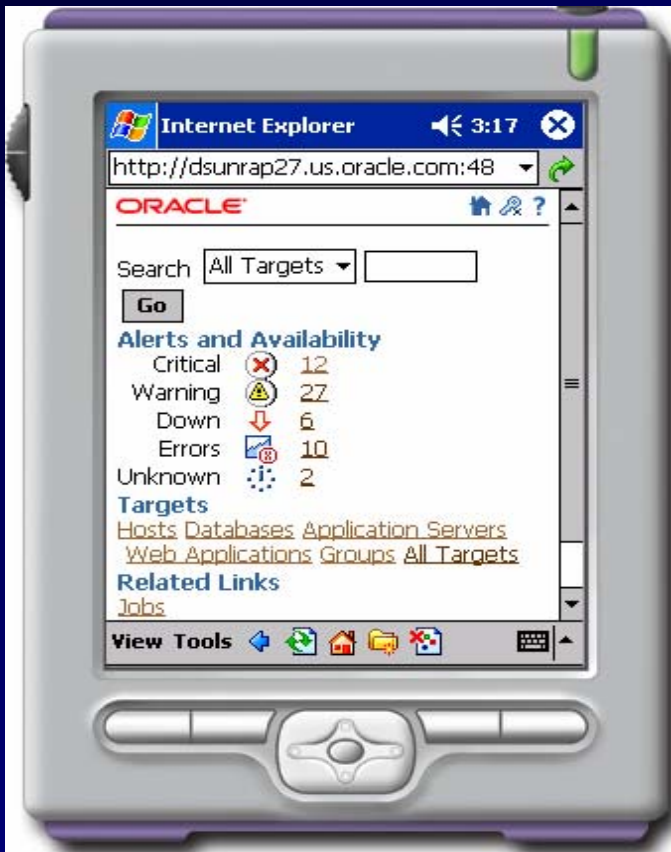
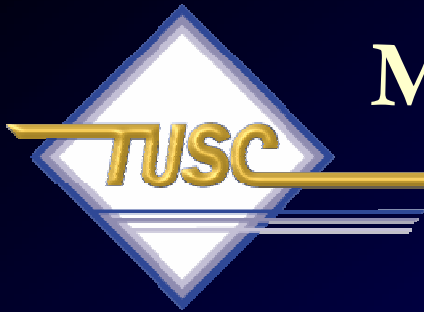
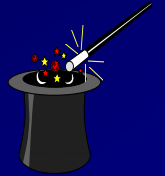
The problem with hardware and system infrastructure



- Islands of Data
- Low utilization of server CPU's
 - Dedicated to an application
 - Utilization often less than 20%
- Low utilization of storage
 - Tied to server
 - Utilization often less than 50%
- Too much labor
- Slow application provisioning

The Future

Manage end to end



Web Services

Service Framework

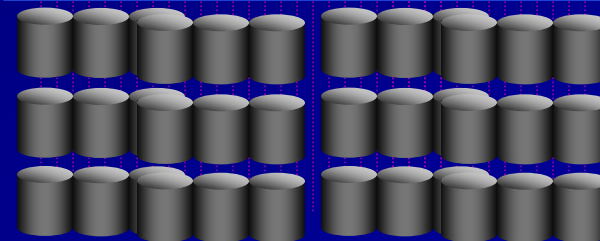
Processor Virtualization



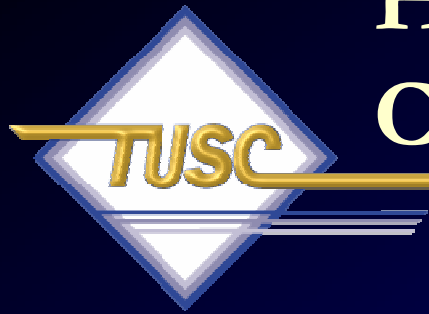
Server
Pool

Data Management

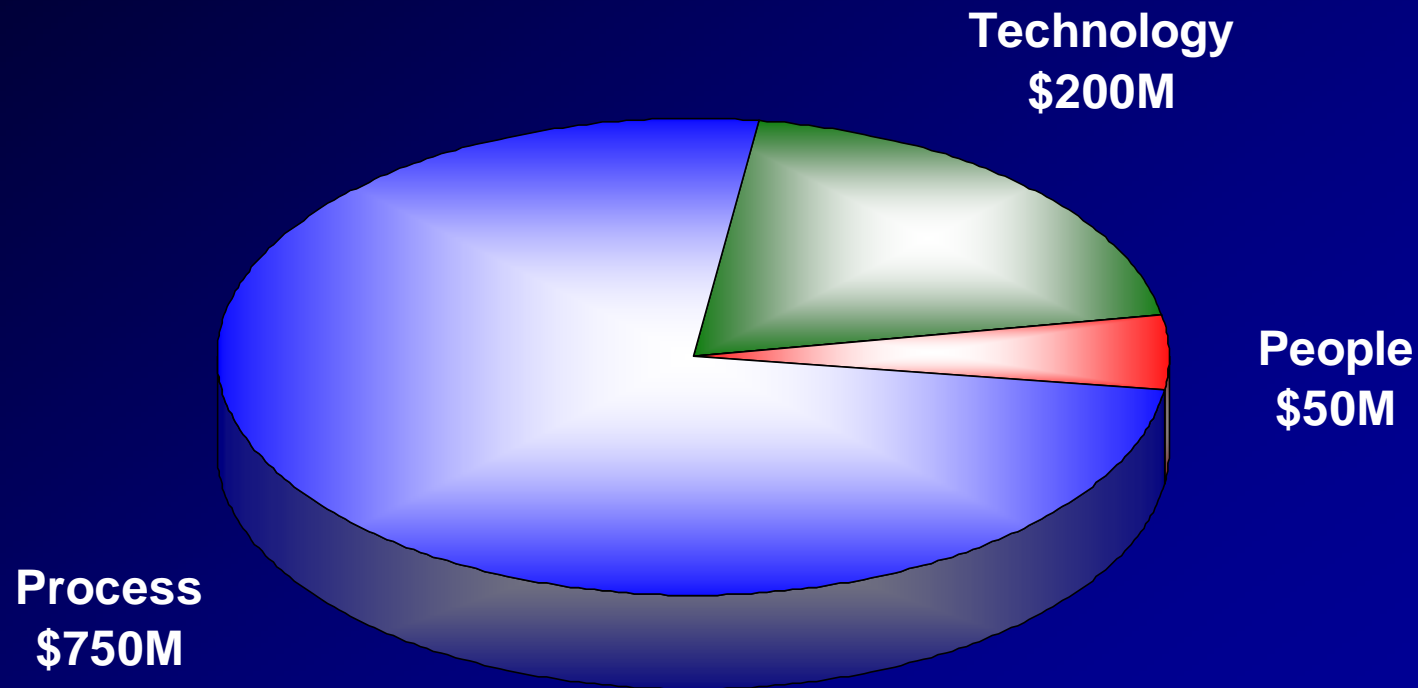
Storage Virtualization



Storage
Pool



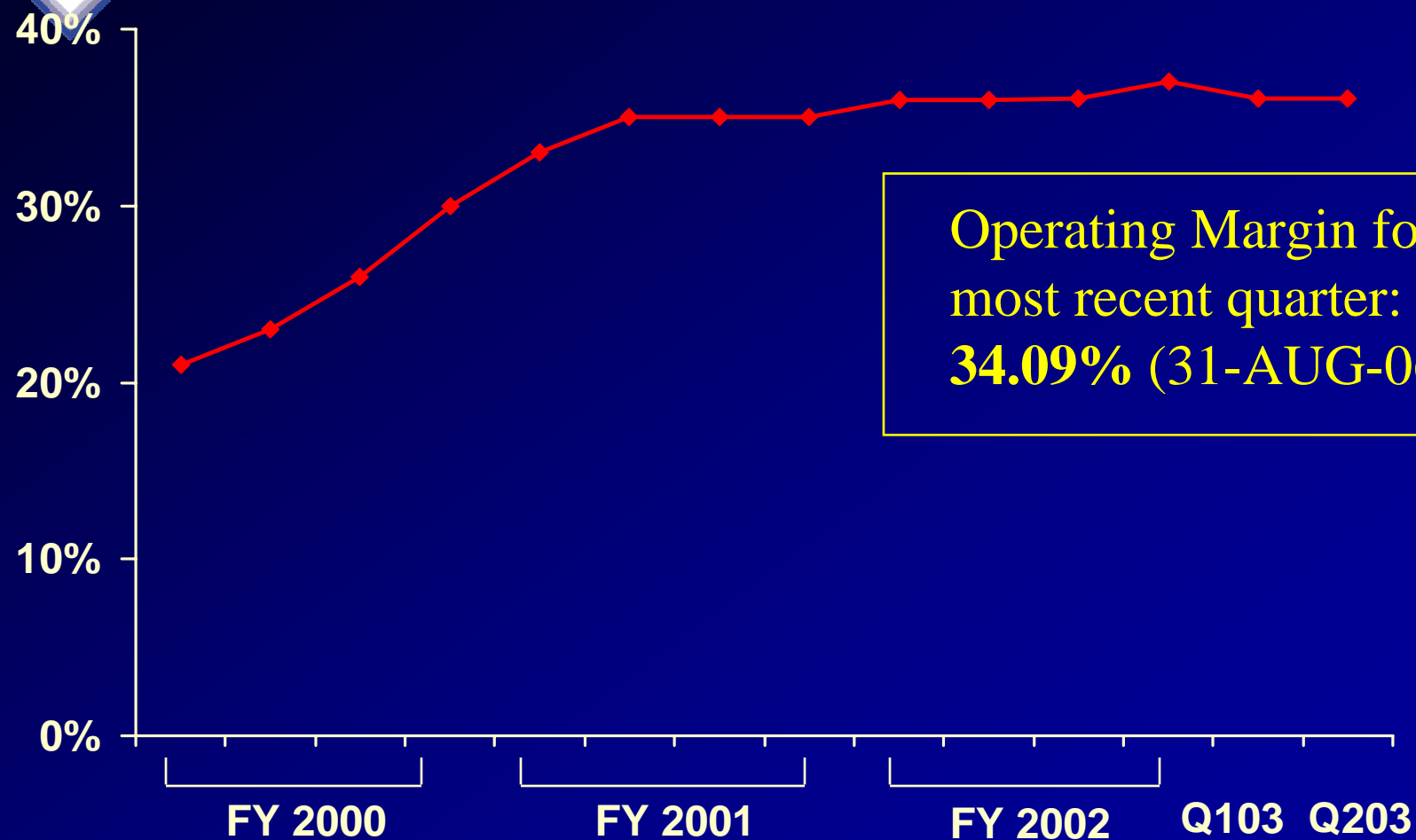
How Oracle saved \$1B: **CONSOLIDATION! & Process**





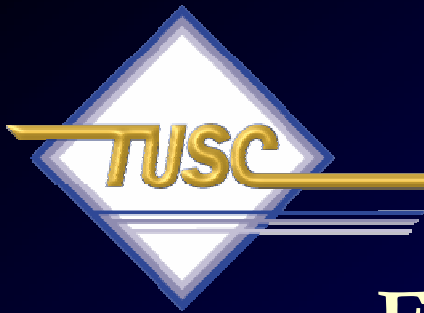
Operating Margin Improvement

Trailing 12 Month Operating Margin Trend



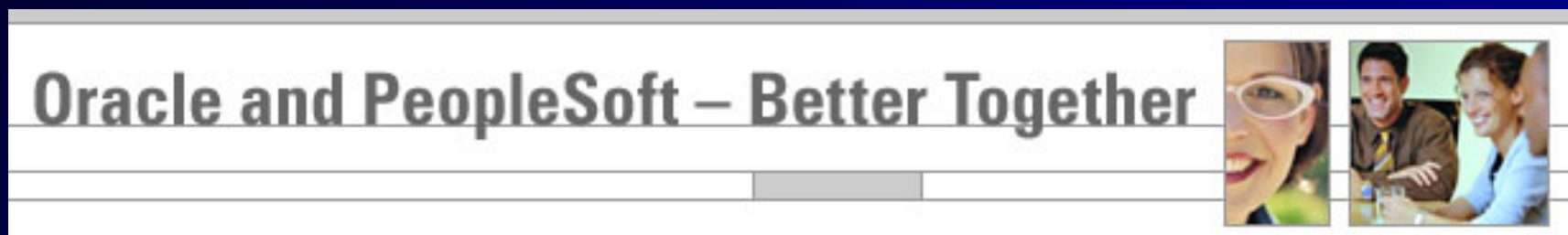
Operating Margin for
most recent quarter:
34.09% (31-AUG-06)

Note: Oracle Corporation - Ending November 2002



PROJECT FUSION
Protect, Extend, Evolve
Your Applications Investment

Future Goal is to do this for Others:



ORACLE

Oracle Agrees to Buy Siebel

- Vaults Oracle to #1 in Customer Relationship Management
- Together Oracle and Siebel will be our customers' most valued partner

* Rule 425 Disclosure



Not to be confused with...

Fusion Middleware Acquisitions:





Why Linux Helps RAC/Grid?

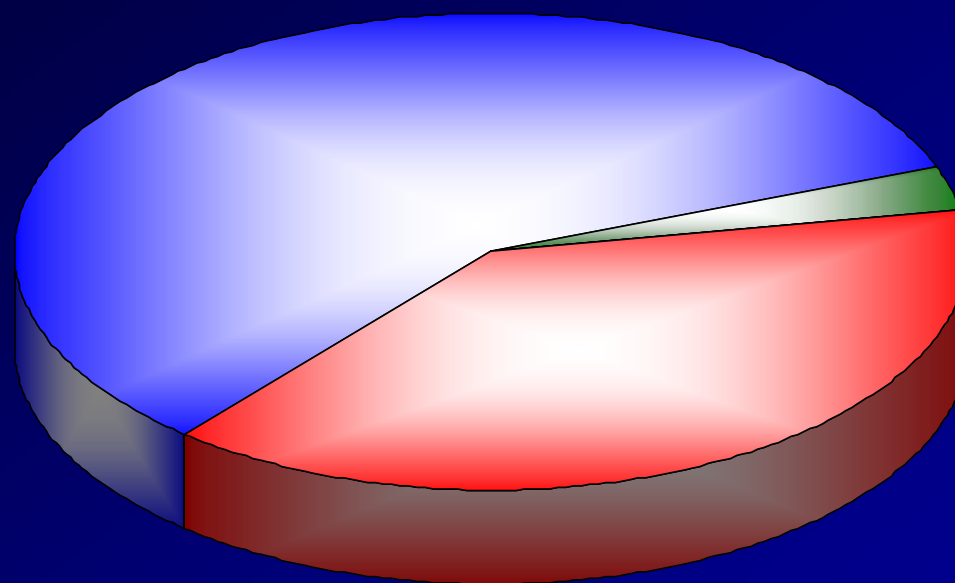
- Performance via Grid
- Availability via Grid
- Stability via Grid
- Security via Oracle
- Cost Savings via Smaller Servers (Grid)
- Larry says so:
 - Companies start building, supporting and creating once Larry charts a bend in the road.





Commercial Linux Database Market 2002

IBM (58%)



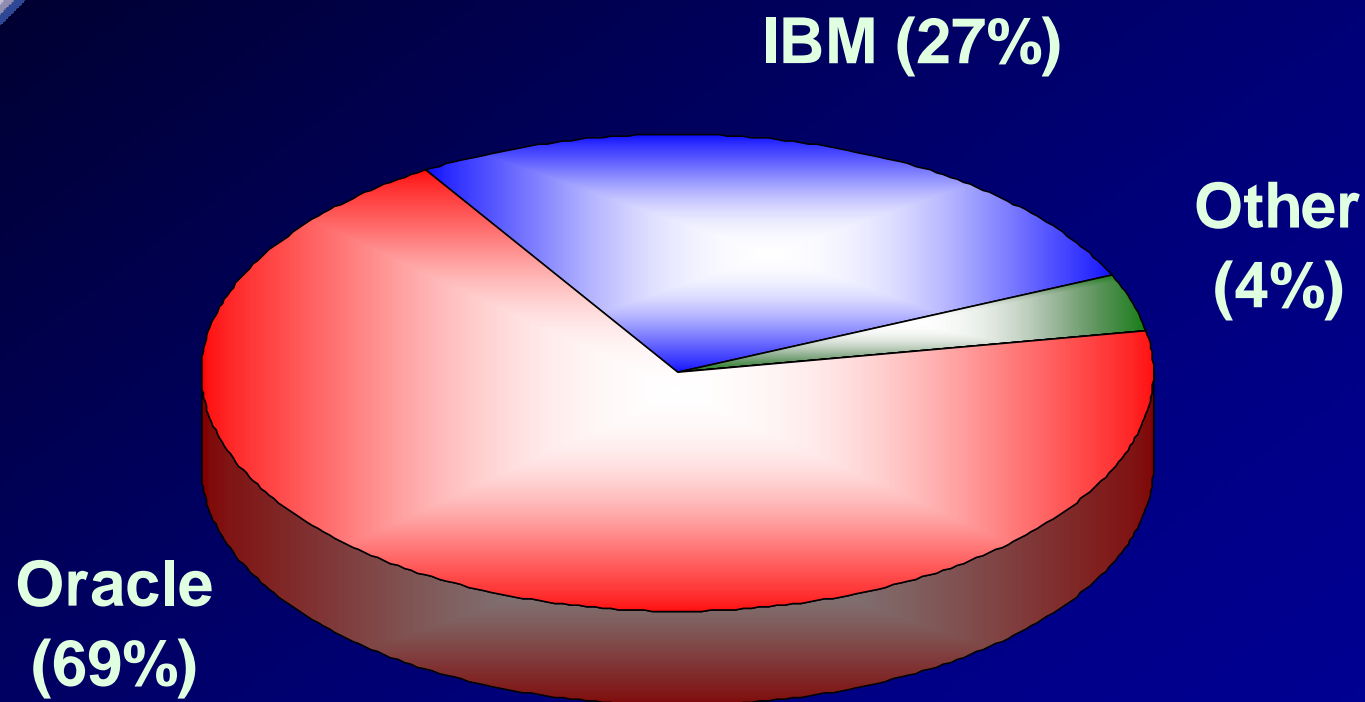
**Other
(3%)**

**Oracle
(39%)**

Source: Gartner, May 2005



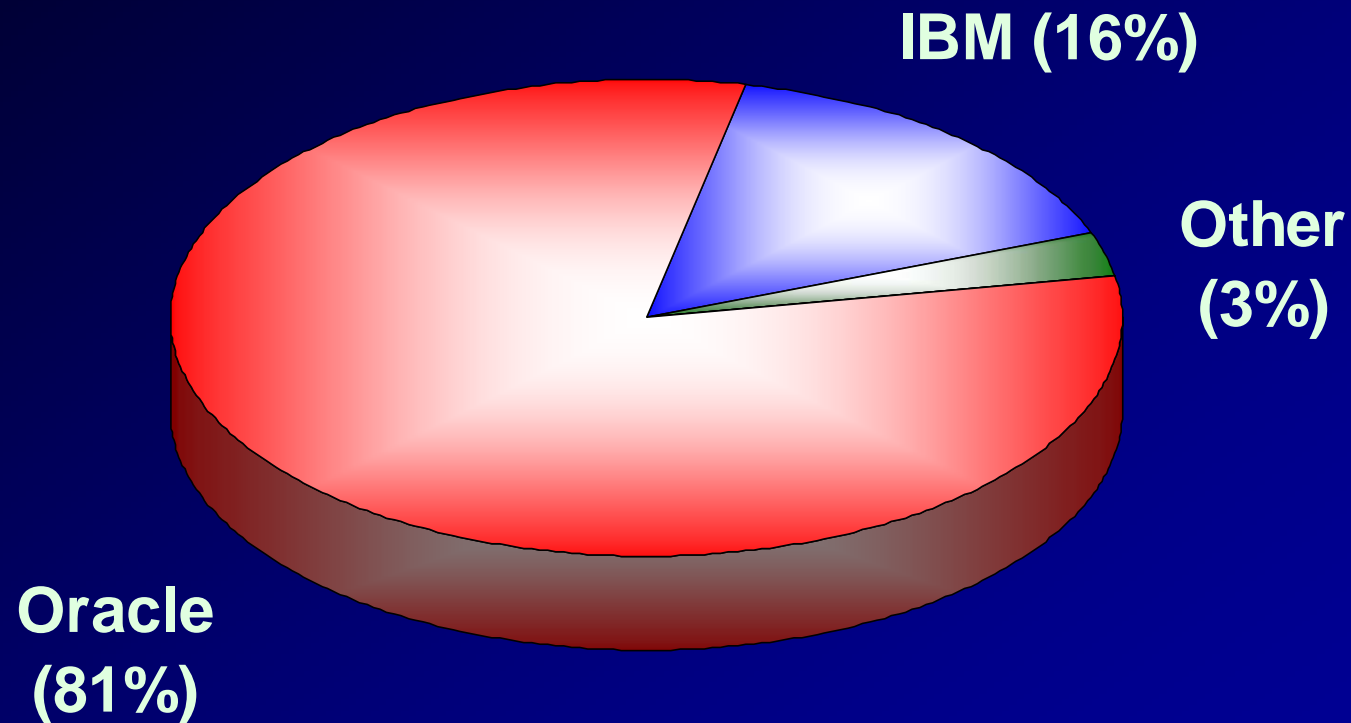
Commercial Linux Database Market 2003



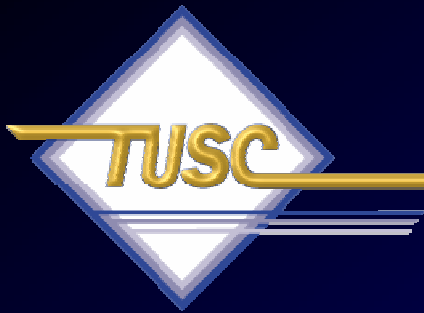
Source: Gartner, May 2005



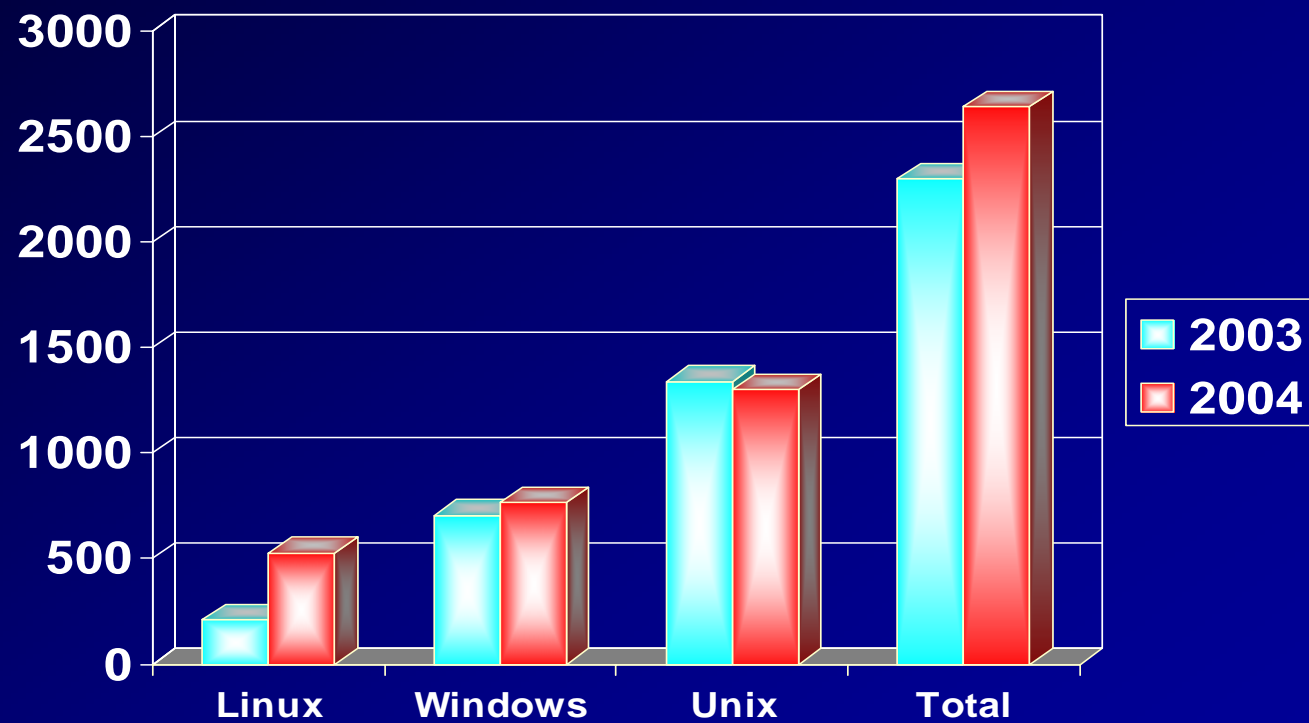
Commercial Linux Database Market 2004



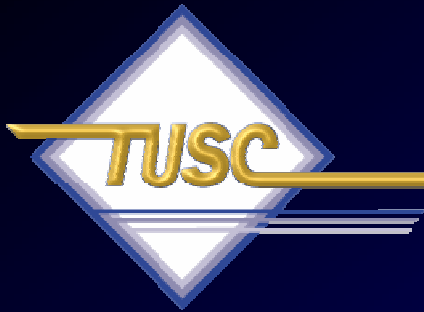
Source: Gartner, May 2005



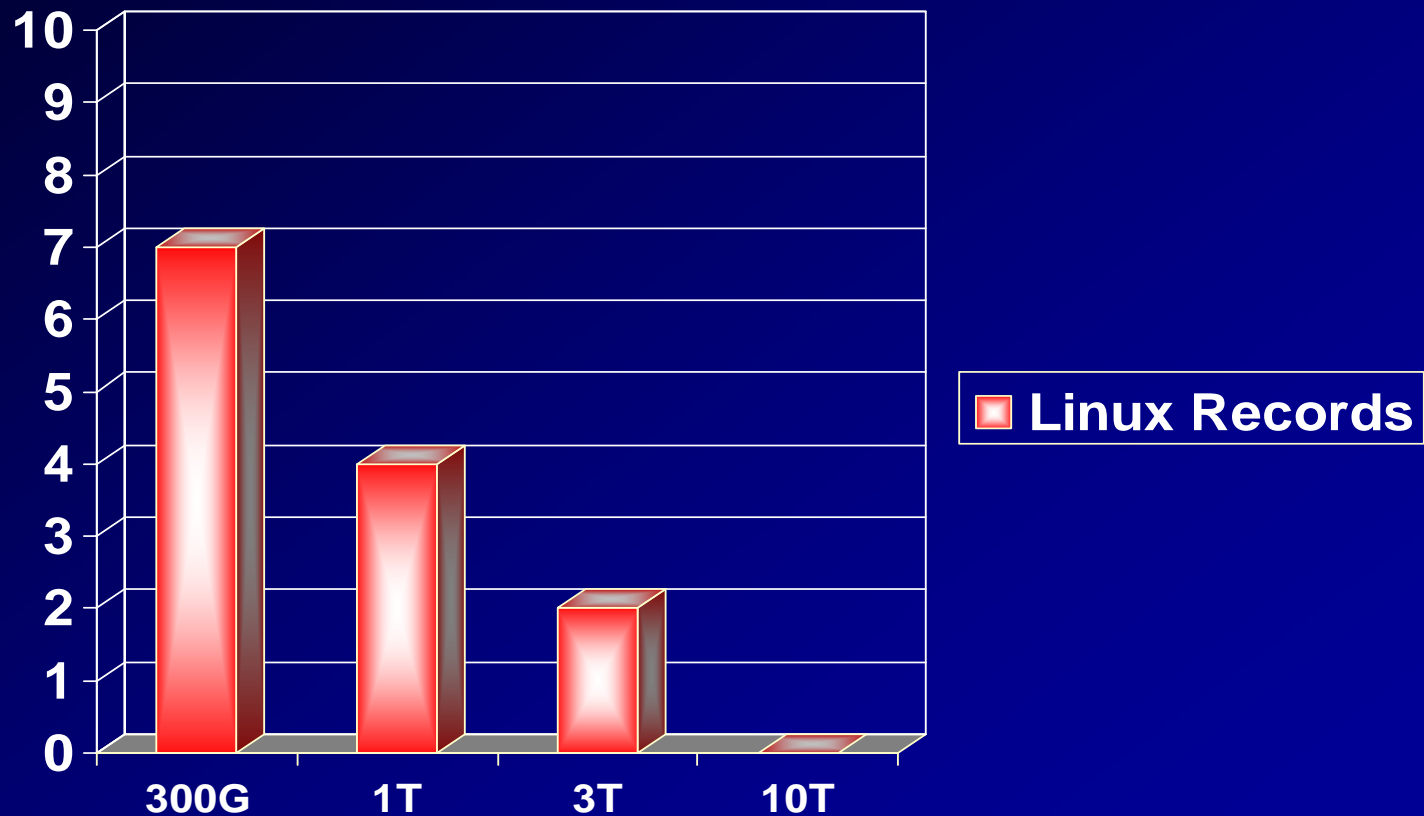
Oracle Sales Market 2003/2004



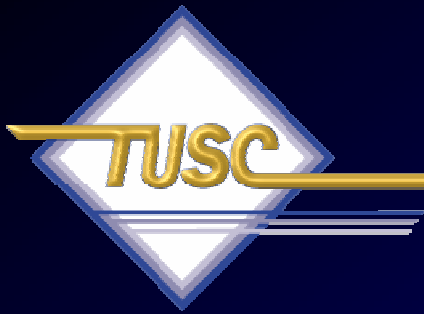
Source: Gartner, May 2005



Records in Top 10 – TPC-H



Source: www.tpc.org (As of November 1, 2006)



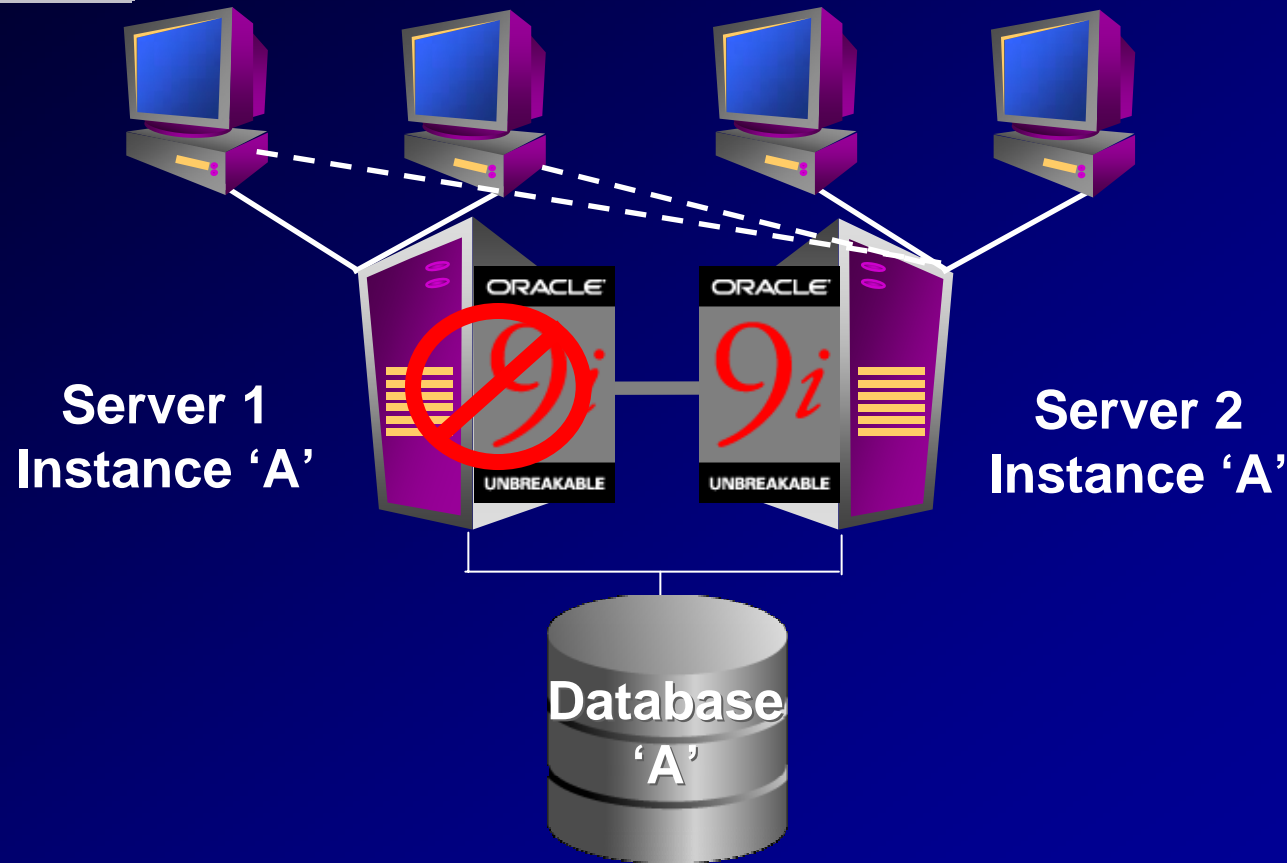
Tip #4: Grid Basics – Start with RAC

“Forrester estimates that there are more than 1,200 customers who are currently using RAC in production, and this is likely to double in the next 12-18 months...”

- Forrester, Oracle RAC Gains Momentum - 9/15/05



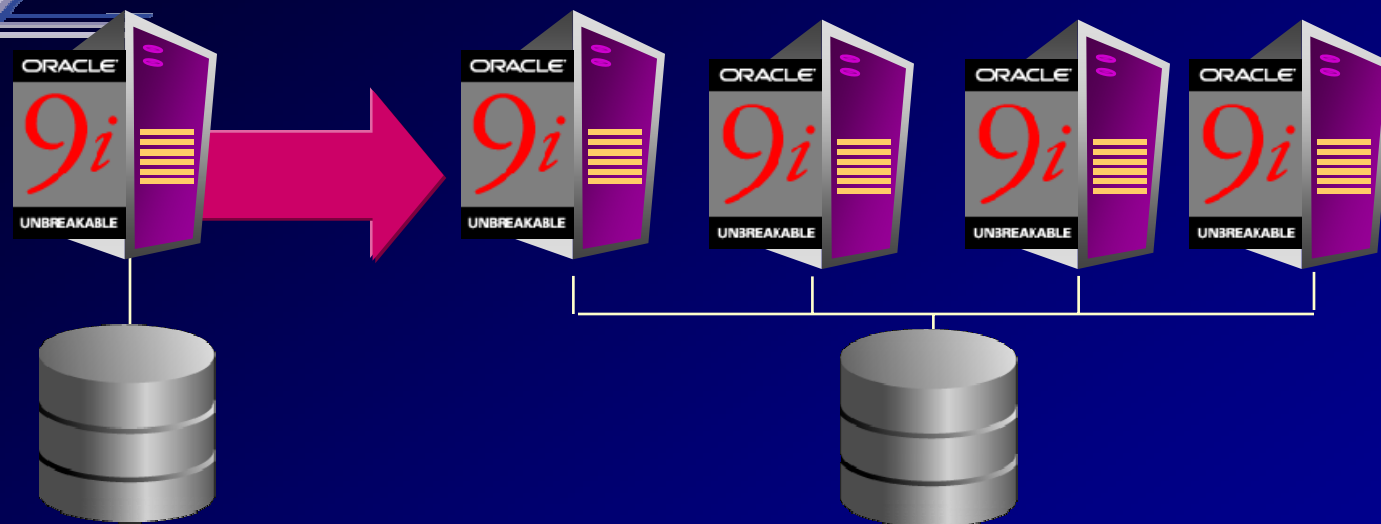
Real Application Clusters



~~SERVER failover from SERVER failover~~ available

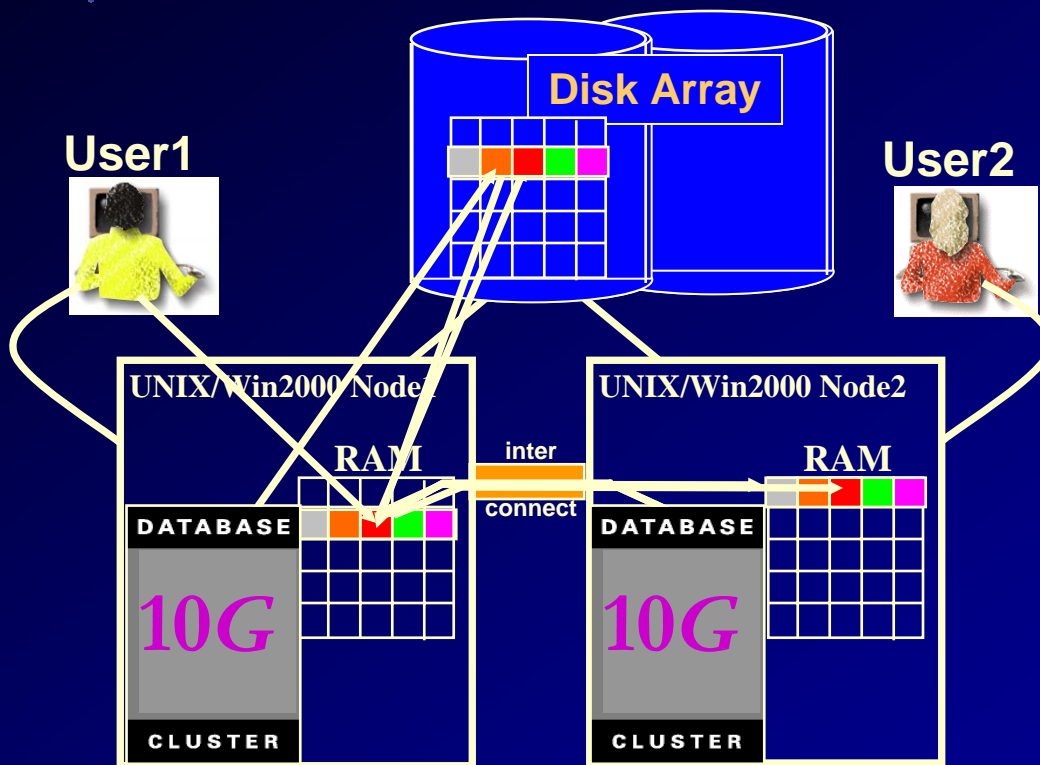


Oracle9i Database Clusters

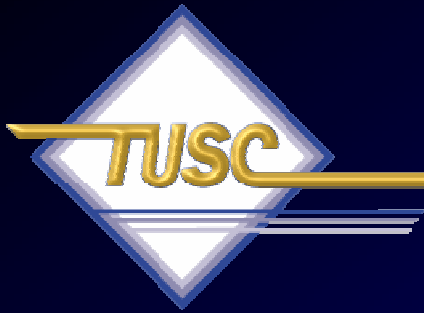


- Start small, grow incrementally
- Scalable AND highly available
- NO downtime to add servers and disk

Real Applications Clusters - Cache Fusion



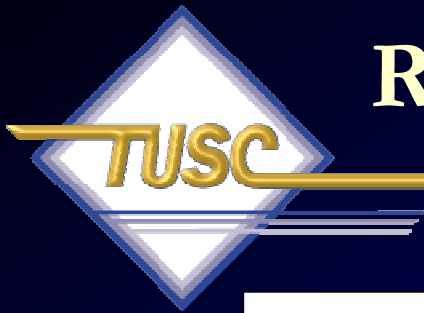
1. User1 queries data
2. User2 queries same data - via interconnect with no disc I/O
3. User1 updates a row of data and commits
4. User2 wants to update same block of data – 10g keeps data concurrency via interconnect



Tip #5: Grid Basics – Scaling it

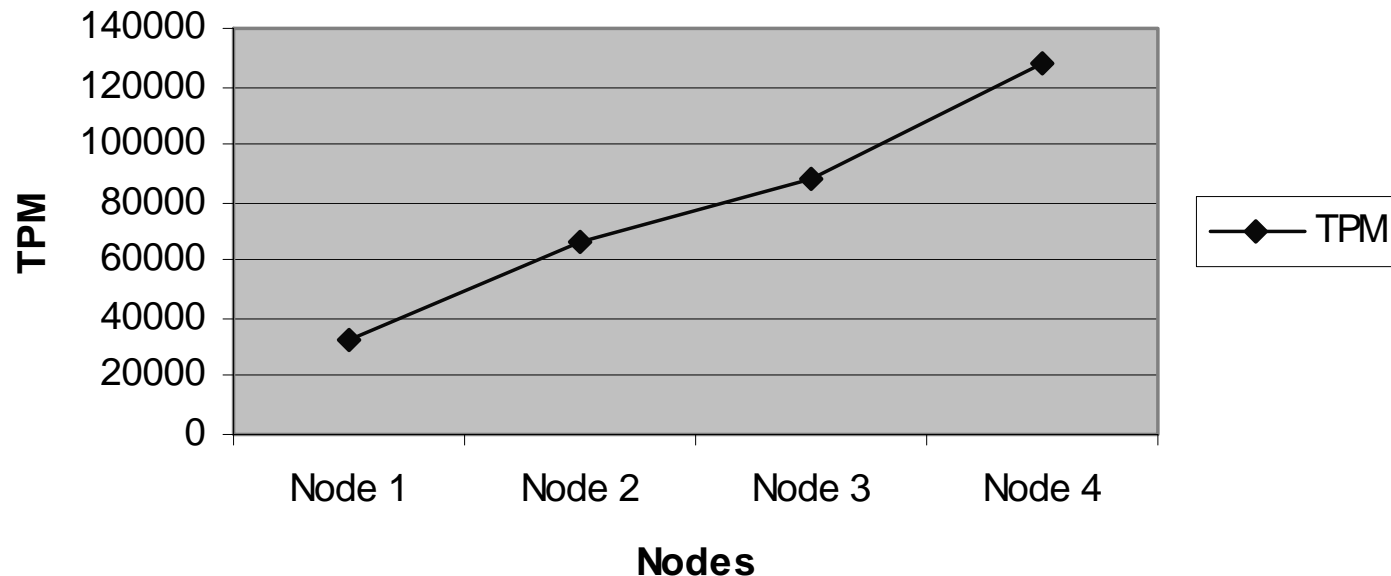
“The best thing about the Grid is that it is unstoppable.”

*The Economist
June 2001₃₀*



RAC Architecture

Oracle9i RAC Scalability

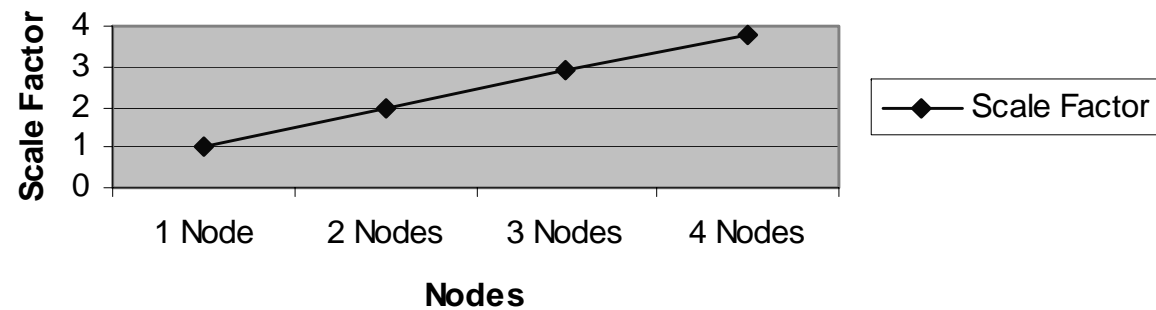


• (Data From: Deploying Oracle9i Real Application Clusters on Intel Architecture-based Servers, Rick Jacobson, Intel, 2002)

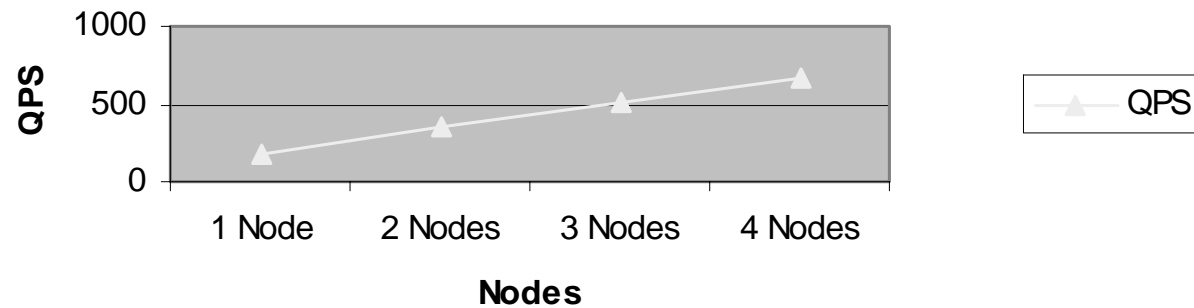


RAC Architecture

HPUX RAC Scale Factor



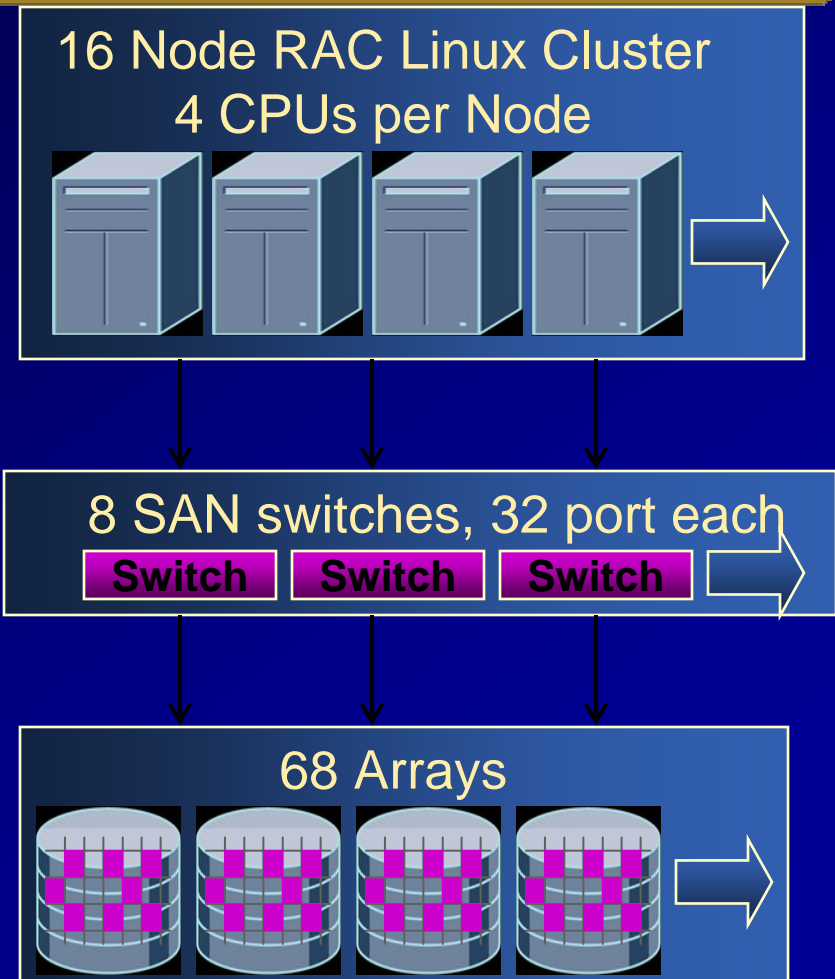
HPUX RAC Queries Per Second





Amazon.com Data Warehouse

- 25 TB database
 - 15 TB row data
- 9iR2 using one Oracle Cluster File System per storage array
- Services 50,000 complex queries per week
 - 2 to 3 gigabyte (byte, not bit) per second table scan throughput
- Listed in top ten (6th) largest Warehouses in 2005 Winter Survey and only RAC system.
 - In 2003, Amazon was #5 with 13T.
 - Yahoo was #1 in 2005 with 100T of data (triple the #1 of 2003) and they had 385 trillion rows on Oracle!
 - Teradata had 4 of the Top 10 databases in the 2003 survey, yet has zero in the 2005 survey





2005 TopTen Award Winners

Winter Corporation recognizes these organizations and their vendors for their achievements in the 2005 TopTen Program.

[List of all the winners](#)

[Frequently Asked Questions](#)

Pick a TopTen Award Category:

Metric:
 Platform:
 Usage:

Database Size, All Environments, DW *

Company/Organization	Database Size (GB)	DBMS	Platform	Architecture	DBMS Vendor	System Vendor	Storage Vendor
Yahoo!	100,386	Oracle	UNIX	Centralized/SMP	Oracle	Fujitsu Siemens	EMC
AT&T	93,876	Daytona	UNIX	Federated/SMP	AT&T	HP	HP
KT IT-Group	49,397	DB2	UNIX	Centralized/Cluster	IBM	IBM	Hitachi
AT&T	26,713	Daytona	UNIX	Federated/SMP	AT&T	Sun	Sun
LGR - Cingular Wireless	25,203	Oracle	UNIX	Centralized/SMP	Oracle	HP	HP
Amazon.com	24,773	Oracle RAC	Linux	Centralized/Cluster	Oracle	HP	HP
Anonymous	19,654	DB2	UNIX	Centralized/MPP	IBM	IBM	EMC
UPSS	19,467	SQL Server	Windows	Centralized/SMP	Microsoft	Unisys	EMC
Amazon.com	18,558	Oracle RAC	Linux	Centralized/Cluster	Oracle	HP	HP
Nielsen Media Research	17,685	Sybase IQ	UNIX	Centralized/SMP	Sybase	Sun	EMC



WINTER CORPORATION TOP TEN PROGRAM

2003 TopTen Award Winners

Winter Corporation recognizes these organizations and their vendors for their achievements in the 2003 TopTen Program.

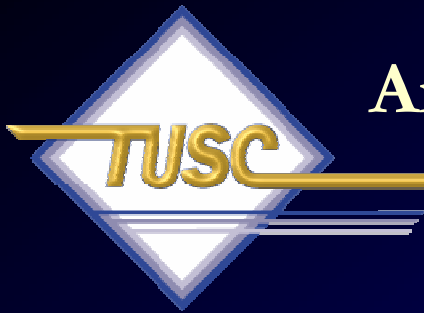
[Download a PDF with all the winners](#)

Pick an Award Category:

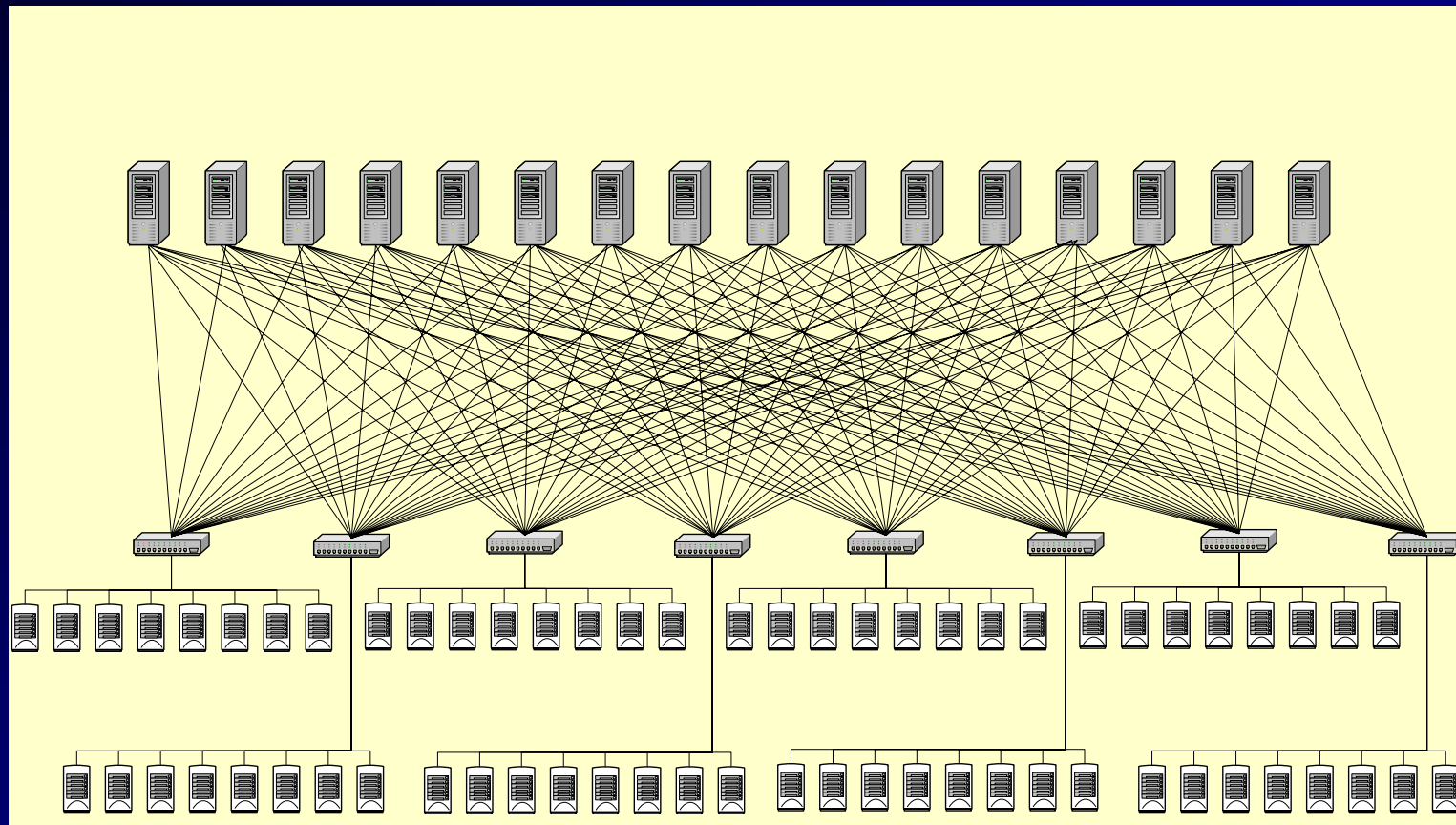
Category:	Platform:	Usage:
Database Size ▼	All ▼	DSS ▼
Display		

Database Size, All, DSS

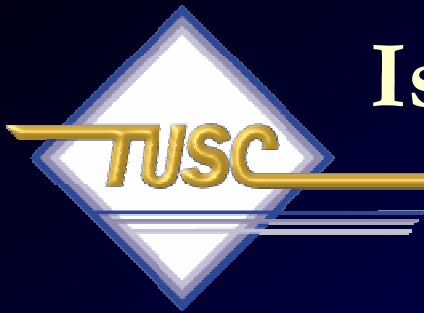
Company/Organization	Database Size (GB)	DBMS	System Arch.	DBMS Vendor	System Vendor	Storage Vendor
France Telecom	29,232	Oracle	SMP	Oracle	HP	HP
AT&T	26,269	Daytona	SMP	AT&T	Sun	Sun
SBC	24,805	Teradata	MPP	Teradata	NCR	LSI
Anonymous	16,191	DB2 for Unix	MPP/Cluster	IBM	IBM	IBM
Amazon.com	13,001	Oracle	SMP	Oracle	HP	HP
Kmart	12,592	Teradata	MPP	Teradata	NCR	LSI
Claria Corporation	12,100	Oracle	SMP	Oracle	Sun	Hitachi
Health Insurance Review Agency	11,942	Sybase IQ	Cluster	Sybase	HP	Hitachi
FedEx Services	9,981	Teradata	MPP	Teradata	NCR	EMC
Vodafone D2 GmbH	9,108	Teradata	MPP	Teradata	NCR	LSI



An attempt at 8+ Gbytes per second of I/O



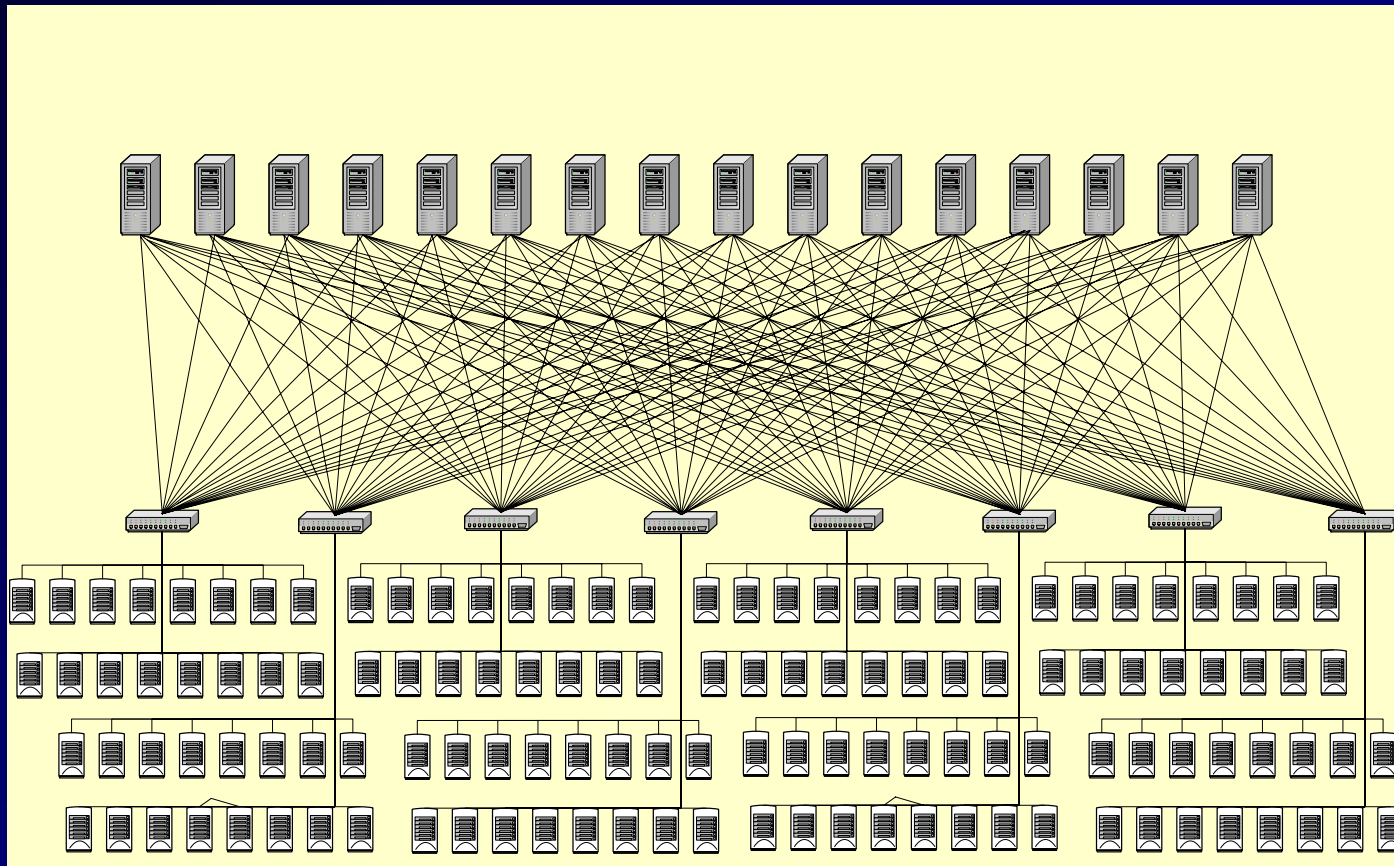
Note: These 5 slides from Oracle Open World presentation “**Using Oracle RAC and ASM to enable scaling on Linux with low cost storage**” by Amazon’s Grant McAlister 36

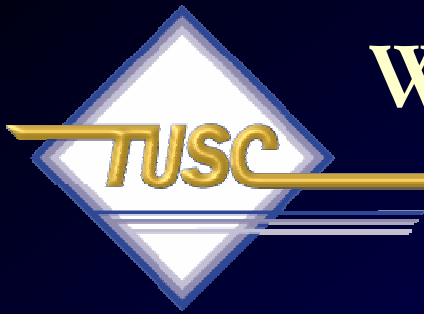


Issues

- Too many filesystems
 - 68 arrays (2 luns ea.) results in 136 filesystems.
 - To get an even I/O across arrays needed a datafile for every tablespace on each filesystem.
 - Takes over 30 minutes to mount all the filesystems on a host reboot
- Too many datafiles
 - This resulted in thousands of datafiles that caused major management and performance issues
- Not performing to design
 - At first they used no async IO on OCFS 1.0 limited the throughput of cluster to 3 Gbytes of IO per second. Once we got to OCFS 1.0.14 and async I/O the throughput almost doubled to 5 Gbytes per second

Scale it out to 16+ Gbytes per second of I/O Amazon moves to 10g on ASM





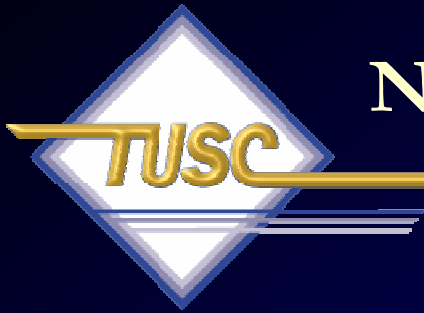
Write Caches = Redo Performance

- Write cache
 - A fast array with write caching can do 0.5 ms average writes vs 6 ms for a non cached write
 - Write speed causes issues when writing redo slowing commit.
- Some items that can affect your write times
 - Internal array mirroring
 - They used faster Controllers & mirrored them (doubled IOPS)
- ASM
 - ASM allowed them to use BIGFILE tablespaces which cut datafiles < 100
 - No slow reboots due to mounting



Tip #6

Tune the Interconnect



Normal database Tuning and Monitoring

- Prior to tuning RAC specific operations, each instance should be tuned separately.
 - APPLICATION Tuning (Fix the SQL fixes everything)
 - DATABASE Tuning (Bad setup = Bad performance)
 - OS Tuning (Bad setup = Bad performance)

THEN

■ You can begin tuning RAC



Tuning the RAC Cluster Interconnect

High GCS Time Per Request

- Problem Indicators:
 - High Transfer Time
 - One node showing excessive transfer time
- Use OS commands to verify cluster interconnects are functioning correctly.
- Contention for blocks: Modify the object to reduce the chances for application contention.
 - Reduce the number of rows per block
 - Adjust the block size to a smaller block size
 - Modify INITRANS and FREELISTS



Tip #7

Use Statspack & AWR to Tune RAC



Statspack/AWR – Check Regularly

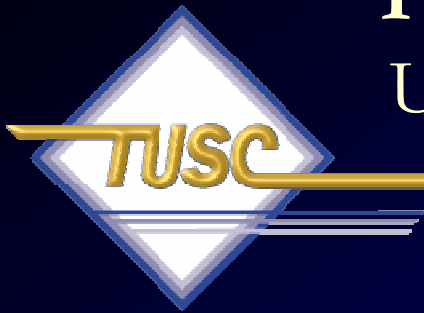
1. Top 5 wait events
2. Load Profile
3. Instance Efficiency Hit Ratios
4. Wait Events / **Wait Event Histograms**
5. Latch Waits
6. Top SQL
7. Instance Activity / **Time Model Stats / O/S Stats**
8. File I/O / **File Read Histogram / Undo Stats**
9. Memory Allocation
10. Undo



Tuning the RAC Cluster Interconnect

Using STATSPACK Reports

- The STATSPACK report show statistics ONLY for the node or instance on which it was run.
- Run `statspack.snap` procedure and `spreport.sql` script on each node you want to monitor to compare to other instances.
- In 10g you can still use statspack or you can also use the **new AWR Report**.



Tuning the RAC Cluster Interconnect Using STATSPACK Reports

- Top 5 Timed Events

Top 5 Timed Events

~~~~~

Event

Waits

Time (s)

% Total  
Elap Time

-----  
global cache cr request

820

154

72.50

CPU time

54

25.34

global cache null to x

478

1

.52

control file sequential read

600

1

.52

control file parallel write

141

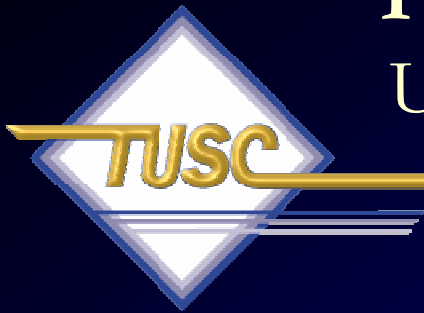
1

.28

- 
- Transfer times are excessive from other instances in this cluster to this instance.
  - Could be due to network problems or buffer cache sizing issues.

CPU time (processing time) should be the predominant event

Exceeds CPU time, therefore needs investigation.



# Tuning the RAC Cluster Interconnect

## Using STATSPACK Reports

- Network changes were made
- An index was added
- STATSPACK report now looks like this:

Top 5 Timed Events

~~~~~

Event

Waits

Time (s)

% Total

Ela Time

CPU time

global cache null to x

enqueue

global cache busy

DFS lock handle

1,655

46

104

38

99

28

8

7

2

64.87

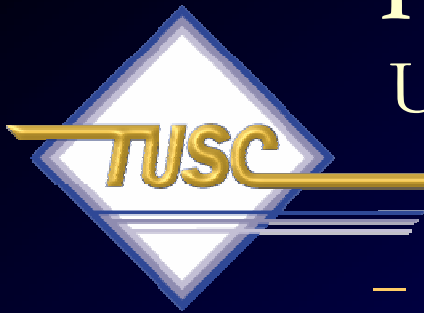
18.43

5.12

4.73

1.64

CPU time is now the predominant event



Tuning the RAC Cluster Interconnect Using STATPACK Reports

– Workload characteristics for this instance after changes:

Cluster Statistics for DB: DB2 Instance: INST1

Before network and
index changes.

Global Cache Service - Workload Characteristics

Ave global cache get time (ms):	8.2	3.1
Ave global cache convert time (ms):	16.0	3.2
Ave build time for CR block (ms):	1.5	0.2
Ave flush time for CR block (ms):	6.0	0.0
Ave send time for CR block (ms):	0.9	1.0
Ave time to process CR block request (ms):	8.5	1.3
Ave receive time for CR block (ms):	18.3	17.2
Ave pin time for current block (ms):	13.7	0.2
Ave flush time for current block (ms):	3.9	0.0
Ave send time for current block (ms):	0.8	0.9
Ave time to process current block request (ms):	18.4	1.1
Ave receive time for current block (ms):	17.4	3.1
Global cache hit ratio:	2.5	1.7
Ratio of current block defers:	0.2	0.0
% of messages sent for buffer gets:	2.2	1.4
% of remote buffer gets:	1.6	1.1
Ratio of I/O for coherence:	2.9	8.7
Ratio of local vs remote work:	0.5	0.6
Ratio of fusion vs physical writes:	0.0	1.0



Tuning the RAC Cluster Interconnect Using AWR Reports (FYI Only)

Global Cache Load Profile

	Per Second	Per Transaction
Global Cache blocks received:	0.38	0.05
Global Cache blocks served:	0.26	0.04
GCS/GES messages received:	766.83	106.40
GCS/GES messages sent:	1,278.25	177.36
DBWR Fusion writes:	0.01	0.00
Estd Interconnect traffic (KB)	404.57	

Global Cache Efficiency Percentages (Target local+remote 100%)

Buffer access - local cache %:	100.00
Buffer access - remote cache %:	0.00
Buffer access - disk %:	0.00

Global Cache and Enqueue Services - Workload Characteristics

Avg global enqueue get time (ms):	1.9
Avg global cache cr block receive time (ms):	1.8
Avg global cache current block receive time (ms):	1.9
Avg global cache cr block build time (ms):	0.0
Avg global cache cr block send time (ms):	0.2
Global cache log flushes for cr blocks served %:	0.0
Avg global cache cr block flush time (ms):	
Avg global cache current block pin time (ms):	0.1



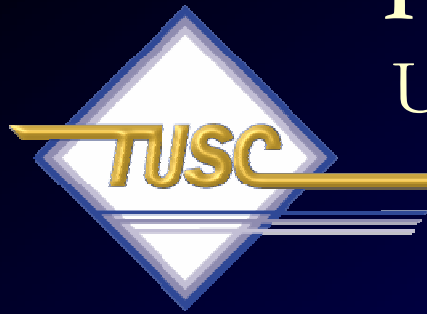
Tuning the RAC Cluster Interconnect Using AWR Reports (FYI Only)

SQL ordered by Cluster Wait Time

Cluster Wait Time (s)	CWT % of Elapsed Time	Elapsed Time(s)	CPU Time (s)	Executions	SQL Id	SQL Module	SQL Text
75.00	0.38	19,515.02	7,568.17	1,680			
0.85	3.63	23.36	7.56	1			
0.15	13.69	1.09	0.76	1			
0.09	31.73	0.27	0.08	46			
0.06	12.31	0.46	0.30	1			
0.03	0.20	14.19	6.18	1,688			
0.03	0.26	10.71	2.71	1,688			
0.03	83.42	0.03	0.00	1			
0.02	36.30	0.07	0.06	4			
0.02	43.85	0.06	0.01	1			
0.02	1.77	1.12	0.54	10			
0.02	10.23	0.15	0.13	1			
0.02	3.76	0.40	0.02	1			
0.01	12.17	0.11	0.09	1			
0.01	33.26	0.03	0.02	1			
0.01	8.39	0.09	0.09	177			
0.01	11.26	0.02	0.02	1			

Done

Internet



Tuning the RAC Cluster Interconnect

Using STATSPACK Reports

- Guidelines for interconnect statistics:
 - All times should be $< 15\text{ms}$
- High values could indicate possible network or memory problems
- Could also be caused by application locking issues
- May need to review the enqueue section of STATSPACK or AWR report for further analysis.



AWR – High Insert: ITL Issues



Segments by ITL Waits

- % of Capture shows % of ITL waits for each top segment compared
- with total ITL waits for all segments captured by the Snapshot

Owner	Tablespace Name	Object Name	Subobject Name	Obj. Type	ITL Waits	% of Capture
				INDEX PARTITION	126	32.06
				INDEX PARTITION	112	28.50
				INDEX PARTITION	66	16.79
				INDEX PARTITION	65	16.54
				INDEX PARTITION	12	3.05



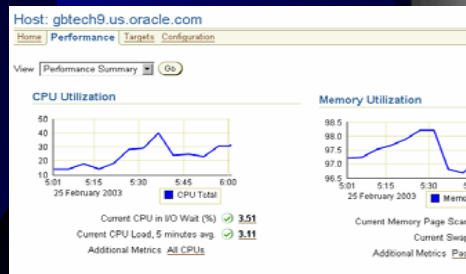
Tip #8

Use Grid Control

Enterprise Manager for the Grid Grid Control



Host and Hardware



Database

State

Active Sessions 19
SQL Response Time (%) 83.87
(compared to baseline)
Bad SQL 11
Top SQL Report 238
Duplicate SQL 738
Latest Alert Log Entry No ORA- errors

Oracle9iAS

Application Server: ias902.dlsun1641.us.oracle.com

Home | Applications | Websites | Performance

View | Top Applications by Average Servlet/JSP Processing Time

Name	ORA/J Instance	Total Processing Time (seconds)	Average Servlet/JSP Processing Time (seconds)	Servlet/JSP Requests Processed	Servlet Process Time (sec)
hrapp	home	167.20	12.09	11	1
defail	home	562.77	0.17	3 235	5

Network and Load Balancer

Alerts

Metric	Transaction	Severity
Packets Dropped (%)	mail.us.oracle.com	X
Status	mail.us.oracle.com	X

Administration Monitoring Provisioning Security

Enterprise
Manager

Applications

Storage

Qtrees (ordered by Used (%))

Status	Name	Volume	Total GB	Used GB	Used (%)
X	slot3	eb04	60.0	58.82	98.03
X	ndw_top	app04	250.0	231.48	92.59
X	local_backup	back04	250.0	219.68	87.87
X	qum_top	app04	350.0	298.05	85.18
X	slot1	eb04	60.0	49.51	82.68
X	slot2	eb04	60.0	47.92	79.87
X	slot4	eb04	60.0	47.66	79.43
X	andbackup	back04	100.0	82.67	82.67
X	app01sun	app04	50.0	26.3	52.61

Collaboration Suite: My Collab Suite

Home | Tools & Resources | Administration | Monitoring | Maintenance

Component Status

Single Application or Selected Component

Alerts

Related Links

Components



Grid Control 10gR2: Monitor All Targets

Monitor
Targets...
are they
up?

Target
Alerts

Oracle Enterprise Manager 10g
Grid Control

Page Refreshed Apr 13, 2006 2:23:09 PM CDT

View: All Targets

Overview
Total Monitored Targets **201**
All Targets Status

Legend: Down (6), Unknown (8), Up (189)

All Targets Alerts

- Critical **47**
- Warning **47**
- Errors **42**

All Targets Policy Violations

- Critical **209**
- Warning **80**
- Informational **10**

All Targets Jobs

- Problem Executions (last 7 days) **1**
- Suspended Executions (last 7 days) **0**

Target Search

Search: All

Security Policy Violations

- Critical **197**
- Warning **79**
- Informational **3**
- New in Last 24 Hours **5**

Critical Patch Advisories for Oracle Homes

Patch Advisories **1**

Affected Oracle Homes **7**

Job: [RefreshFromMetalink](#)

Deployments Summary

View: Database Installations

Database Installations	Targets	Installations	Interim Patches Applied
Oracle Database 10g 10.1.0.3.0	1	1	Yes
Oracle Database 10g 10.1.0.4.0	1	2	Yes
Oracle Database 10g 10.1.0.4.2	1	1	No
Oracle Database 10g 10.2.0.1.0	3	3	No
Oracle9i 9.2.0.8.0	0	1	No

Resource Center

- [Documentation](#)
- [Release Notes](#)
- [Support](#)
- [Oracle Technology Network](#)



Grid Control 10gR2: See the Specific Hosts

Click on
Targets
Tab...

See the
Specific
HOSTS

Oracle Enterprise Manager (GCDEW0) - Hosts - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

http://www.oracle.com/em/console/targets

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts Databases Application Servers Web Applications Services Systems Groups All Targets Collaboration Suites NetApp Filer

Page Refreshed Apr 13, 2006 2:27:15 PM CDT

Search (Go) Advanced Search

Remove Configure Add

Select Name	Status	Alerts	Policy Violations	Compliance Score (%)	CPU Util %	Mem Util %	CPU IO Wait %	Transfers/s	Swap Util %	CPU Load (5min)	Location
stdemo06.oracle.com	OK	0 1	44 2 0	60	100 ✓	82.58 ✓	79.08 ⚠		22.2 ✓	.48 ✓	
stdemo07.oracle.com	OK	1 1	33 2 0	60	100 ✓	54.55 ✓	84.91 ✗		38.45 ✓	.35 ✓	
stdsbeacon1dc.oracle.com	OK	0 2	13 3 0	70	11.42 ✓	79.32 ✓	0 ✓		.08 ✓	.07 ✓	
stdsbeacon1uk.oracle.com	OK	0 1	5 1 0	76	83.81 ✓	82.16 ✓	.04 ✓		0 ✓	.9 ✓	
tdscbea01.oracleads.com	OK	0 0	5 1 0	76	4.3 ✓	46.59 ✓	1.48 ✓		0 ✓	.03 ✓	
tdscgm01.oracleads.com	OK	0 0	6 1 0	57	10.01 ✓	74.55 ✓	1.95 ✓		0 ✓	.15 ✓	
tdscprep01.oracleads.com	OK	0 2	6 1 0	57	100 ✓	98.02 ✓	2.12 ✓		8.07 ✓	4.82 ✓	
tdscweb01.oracleads.com	OK	0 0	5 1 0	76	5.18 ✓	70.84 ✓	2.18 ✓		0 ✓	.35 ✓	
tdscwin02.oracleads.com	OK	0 0	5 1 0	80	5.33 ✓	62.7 ✓		0 ✓	1.48 ✓		
tdscs80.oracleads.com	OK	1 0	5 1 0	76	12.82 ✓	96.37 ✓	.47 ✓		1.69 ✓	1 ✓	
tdspel01.oracleads.com	OK	1 0	6 1 0	57	12.82 ✓	97.21 ✓	1.84 ✓		.6 ✓	.21 ✓	

Remove Configure Add

TIP For an explanation of the icons and symbols used in this page, see the [Icon Key](#).

Related Links

[Customize Table Columns](#) [Execute Host Command](#)

Home Targets Deployments Alerts Policies Jobs Reports Setup Preferences Help Logout

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[About Oracle Enterprise Manager](#)



Grid Control 10gR2: See the Specific Databases

Still on
Targets
Tab...

See a
Specific
Database

Cluster
Database

Oracle Enterprise Manager (GCD0M0) - Databases - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Print Mail Address Book

Address: http://tds001.oracleads.com/em/console/targets?dxType=Databases

ORACLE Enterprise Manager 10g
Grid Control

Home **Targets** Deployments Alerts Policies Jobs Reports

Hosts **Databases** Application Servers Web Applications Services Systems Groups All Targets Collaboration Suites NetApp Filers

Databases

Page Refreshed Apr 13, 2006 2:27:52 PM CDT

Targets Not Configured 1

Search Go Advanced Search

Remove Configure Add

Select Name	Type	Status	Alerts	Policy Violations	Compliance Score (%)	Sessions: CPU	Sessions: I/O	Sessions: Other	Instance CPU (%)	Library cache pin (%)	Data Dictionary Hit (%)	Free buffer waits (%)
emrep.oracleads.com	Database Instance		0	11 11 4	91							
ora10g.oracle.com	Database Instance		0 2	6 4 2	88	.01	0	0	.5		92	✓
ora10gR2.oracleads.com	Database Instance		0 3	11 17 2	91	0	0	0	.28		100	✓
prod	Cluster Database (1 of 2 up)		1 5	6 0 0	93	n/a	n/a	n/a	n/a	n/a	✓	n/a
tds0cs80.oracleads.com_DB	Database Instance		0 8	10 18 2	92	.05	0	.03	1.25		100	✓

TIP For an explanation of the icons and symbols used in this page, see the [Icon Key](#).

Related Links

[Customize Table Columns](#) [Dictionary Baselines](#) [Dictionary Comparisons](#)
[Execute SQL](#) [Recovery Catalogs](#)

Home **Targets** Deployments Alerts Policies Jobs Reports Setup Preferences Help Logout

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[About Oracle Enterprise Manager](#)



Grid Control 10gR2: View the Topology

One node
is
UP

One node
is
DOWN

Oracle Enterprise Manager (GCDEM0) - Cluster Database: prod - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address: http://t02grrm11.cra.cse.csi.cmu.edu/console/patcher/tenant/type=rac_database/target=prod/pageNum=5

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | **All Targets** | Collaboration Suites | NetApp Filers

Cluster: stdemo06_cluster...

Cluster Database: prod

Latest Data Collected From Target: Apr 13, 2006 2:28:44 PM CDT Refresh

Home Performance Administration Maintenance **Topology**

Cluster Database topology presents the host view of a cluster database. Database instances, ASM instances, listeners, and interfaces information is available. You can optionally view configuration information. These views can also be used to launch various administration and configuration functions.

☒ Show Only Hosts With Instances ☐ Show Configuration Details View Data: Manually

Overview:

Selection Details:

Name: prod_prod1
Type: Database Instance
Host: stdemo06.oracle.com
Critical Alerts: 0
Warning Alerts: 3
Status: Up

Summary:

Status: Up
Up Instances: 2 (31 1)

Legend:

Home Performance Administration Maintenance **Topology**

Instances

Name	Status	Alerts	Policy Violations	Compliance Score (%)	ADDM Findings	ASM	Sessions: CPU	Sessions: I/O	Sessions: Other	Instance CPU (%)	Library cache pin (%)	Data Dictionary Hit (%)	Free buffer waits (%)
prod_prod1	Up	3	0	100	0	+ASM1_stdemo06.oracle.com	0	0	0	05			



Grid Control 10gR2: Look at all Systems

Monitor
Systems
and their
members

Oracle Enterprise Manager (GCD140) - Systems - Microsoft Internet Explorer

Address: http://sdgcm01.credlabs.com/em/console/targetsback?type=Systems

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts Databases Application Servers Web Applications Services **Systems** Groups All Targets Collaboration Suites NetApp Filers

Systems

Page Refreshed Apr 13, 2006 2:31:07 PM CDT

Search [] Go Advanced Search

Remove Configure Add

Select Name	Type	Alerts	Policy Violations	Members
<input checked="" type="radio"/> Calendar System 1	Calendar System	0 0	2 2 0	Host Calendar Server Redundancy Group more
<input type="radio"/> Collaboration Suite Search System 1	Ultrasearch System	0 0	5 1 0	OC4J OCS Search Client Redundancy Group more
<input type="radio"/> Discussions System 1	Discussions System	0 0	8 2 0	Host OC4J more
<input type="radio"/> EM Website System	System	1 0	22 12 4	OC4J Host more
<input type="radio"/> Identity Management System 1	Identity Management System	0 0	7 1 0	OC4J Single Sign-On Redundancy Group more
<input type="radio"/> Mail System 1	Mail System	0 0	18 20 2	Host OC4J more
<input type="radio"/> MedRecServer System	System	0 0	2 0 0	BEA WebLogic Server Domain BEA WebLogic Managed Server
<input type="radio"/> Mobile Collaboration System 1	Mobile Collaboration System	0 0	9 2 0	OC4J Mobile Collaboration more
<input type="radio"/> OCS System 1	OCS System	0 0	20 20 2	OC4J Host more



Grid Control 10gR2: Click on a Specific System

Click on
the
PetStore
System

Check
all
changes
made
and
Alerts

Oracle Enterprise Manager (OC4EHO) - System: Petstore | System - Microsoft Internet Explorer

http://tdscom01.oracleads.com/em/console/target/groups/view/home?type=generic_system&target=Petstore%20%20System&ot.cType=Systems

ORACLE Enterprise Manager 10g
Grid Control

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports

Hosts | Databases | Application Servers | Web Applications | Services | **Systems** | Groups | All Targets | Collaboration Suites | NetApp Filers

System: Petstore | System

Page Refreshed Apr 13, 2006 2:31:36 PM CDT (Refresh) (Launch Dashboard)

Home | Charts | Administration | Components | Topology

Status

Status History

100% Up

Alerts

Alert History

Severity	Current	Last 24 hours
✖	5	0
⚠	0	0
ℹ	0	0
Total	5	0

Policy Violations

Severity	Current	Last 24 Hours		Distinct Rules Violated
		Cleared	New	
✖	10	0	0	5
⚠	1	0	0	1
ℹ	0	0	0	0
Total	11	0	0	7

Policy Trend Overview

Security Policy Violations

Severity	Current	Last 24 Hours		Distinct Rules Violated
		Cleared	New	
✖	2	0	0	5
⚠	1	0	0	1
ℹ	0	0	0	0
Total	10	0	0	6

Security At a Glance

Critical Patch Advisories for Oracle Homes

Services

Name	Type	Status	Performance Alerts	Usage Alerts	Policy Violations
Petstore	Web Application	Ⓢ	0 0	3 0	0 0 0

Configuration Changes

Configuration changes detected for the last 7 days

Category	Changes
▼ All Target Types	0
▶ Host	0
▶ OC4J	0
▶ Oracle Application Server	0
▶ Oracle HTTP Server	0
▶ Web Cache	0

Home | Charts | Administration | Components | Topology

Related Links

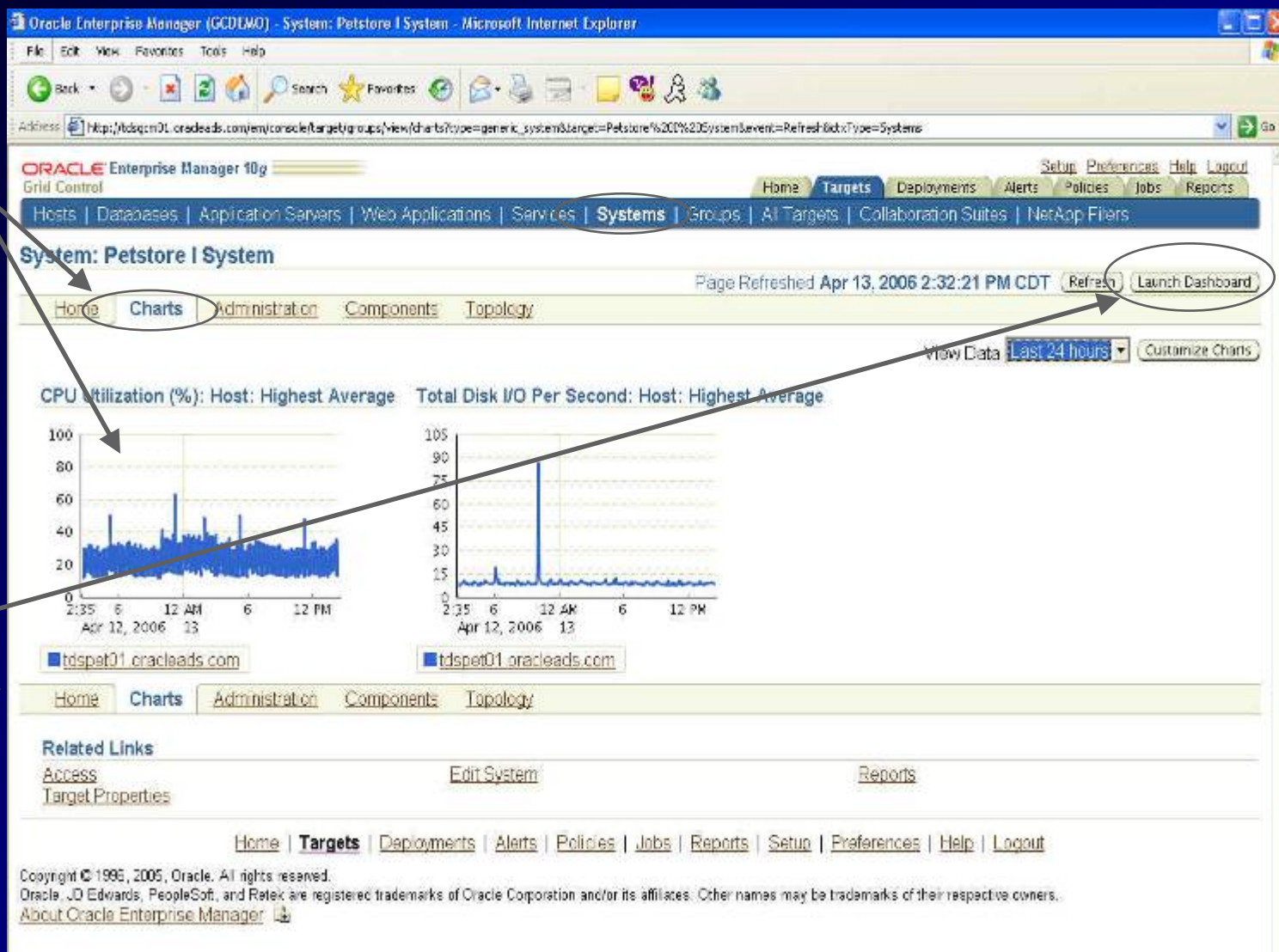
Access Edit System Reports



Grid Control 10gR2: Specific System – Chart Tab

Click on
Charts to
see
further
details

Launch
Dashboard
(See next
slide)





Grid Control 10gR2: Specific System – Dashboard

Dashboard
for the
PetStore
system &
Targets

X5 Petstore I System - System Monitoring Dashboard - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://tdsgcm01.oracleads.com/em/console/target/system/systemDashboard?type=generic_system&target=Petstore%20I%20System&ctxType=Systems

ORACLE Enterprise Manager 10g
Grid Control

System: Petstore I System Page Refreshed: Apr 13, 2006 2:33:10 PM CDT Refresh

Target	Type	Status	Alerts	Policy Violations	CPU Utilization (%)	Total Disk I/O Per Second	Total Disk I/O Per Second	Total Disk I/O Per Second	Memory Utilization (%)
las10g.tdspe01.oracleads.com	Oracle Application Server		1 0	1 0 0	-	-	-	-	-
las10g.tdspe01.oracleads.com HTTP...	Oracle HTTP Server		2 0	2 0 0	-	-	-	-	-
tdspet01.oracleads.com	Host		1 0	5 1 0					
las10g.tdspe01.oracleads.com Web ...	Web Cache		0 0	1 0 0	-	-	-	-	-
las10g.tdspe01.oracleads.com home	OC4J		0 0	1 0 0	-	-	-	-	-

Alerts 5 0

Severity	Target	Date	Message	Latest Comment
	las10g.tdspe01.oracleads.com	Jan 18, 2006 11:58:32 AM	Memory Utilization is 95.24%	
	las10g.tdspe01.oracleads.com	Mar 15, 2006 8:10:11 AM	Memory Utilization of HTTP Server is 103.11%	
	las10g.tdspe01.oracleads.com HTTP Server	Mar 15, 2006 8:12:04 AM	Memory Utilization is 100%	
	las10g.tdspe01.oracleads.com HTTP Server	Mar 27, 2006 4:51:43 AM	The number of active requests is 146	
	tdspet01.oracleads.com	Apr 12, 2006 9:32:48 AM	Filesystem /app has 4% available space. Fallen below warning (20) or critical (5) threshold.	

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Alerts



Grid Control 10gR2: Specific System – Topology

Click on
Topology
to see
further
details

Target
Alerts

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. The browser window title is "Oracle Enterprise Manager (GCDemo) - System: Petstore | System - Microsoft Internet Explorer". The address bar shows a URL starting with "http://d10g01.Oracle.com". The main navigation bar includes "Home", "Targets", "Deployments", "Alerts", "Policies", "Jobs", and "Reports". The "Systems" link is highlighted. The sub-navigation bar includes "Home", "Charts", "Administration", "Components", and "Topology", with "Topology" being the active view. The "Overview" section on the left shows a small topology diagram. The "Selection Details" section lists: Type: Host, Name: t1spet01.oracle.com, Status: Up, Critical Alerts: 1, Warning Alerts: 0, Policy Violations: 7. The "Summary" section shows: Components: 8 (96), Alerts: 5 (0), Policy: 10 (10). The "Topology" view displays a diagram with three main components: "spet..." (a server icon with a red X), "ias10g..." (a server icon with a gear), and another "ias10g..." (a server icon with a red X). The "Related Links" section at the bottom includes "Access", "Edit System", "Reports", and "Target Properties". The footer shows "Copyright © 1996-2005, Oracle. All rights reserved."



Grid Control 10gR2: Specific Groups

Now
move to
Groups

Many
more
Changes

Oracle Enterprise Manager (OCDEMO) - Group: Production Databases - Microsoft Internet Explorer

Address: http://192.168.1.1:1151/console/.../groups/production%20databases%20targets%20groups

ORACLE Enterprise Manager 10g
Grid Control

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | **Groups** | All Targets | Collaboration Suites | NetApp Filers

Group: Production Databases

Page Refreshed: Apr 13, 2006 2:35:08 PM CDT

Home | Charts | Administration | Members

Status

Status History

Alerts

Alert History

Configuration Changes

Configuration changes detected for the last 7 days:

Category	Changes
All Target Types	28
Cluster Database	6
Database Instance	20

Policy Violations

Severity	Current	Cleared	New	Distinct Rules Violated
×	23	0	0	16
!	21	0	0	9
i	4	0	0	1
Total	48	0	0	29

Security Policy Violations

Severity	Current	Cleared	New	Distinct Rules Violated
×	20	0	0	13
!	21	0	0	9
i	1	0	0	1
Total	42	0	0	23

Critical Patch Advisories for Oracle Homes

Current 1

! Patch Advisory information may be stale.
Oracle MetaLink refresh job has not run successfully in 72 hours.

Affected Oracle Homes 4

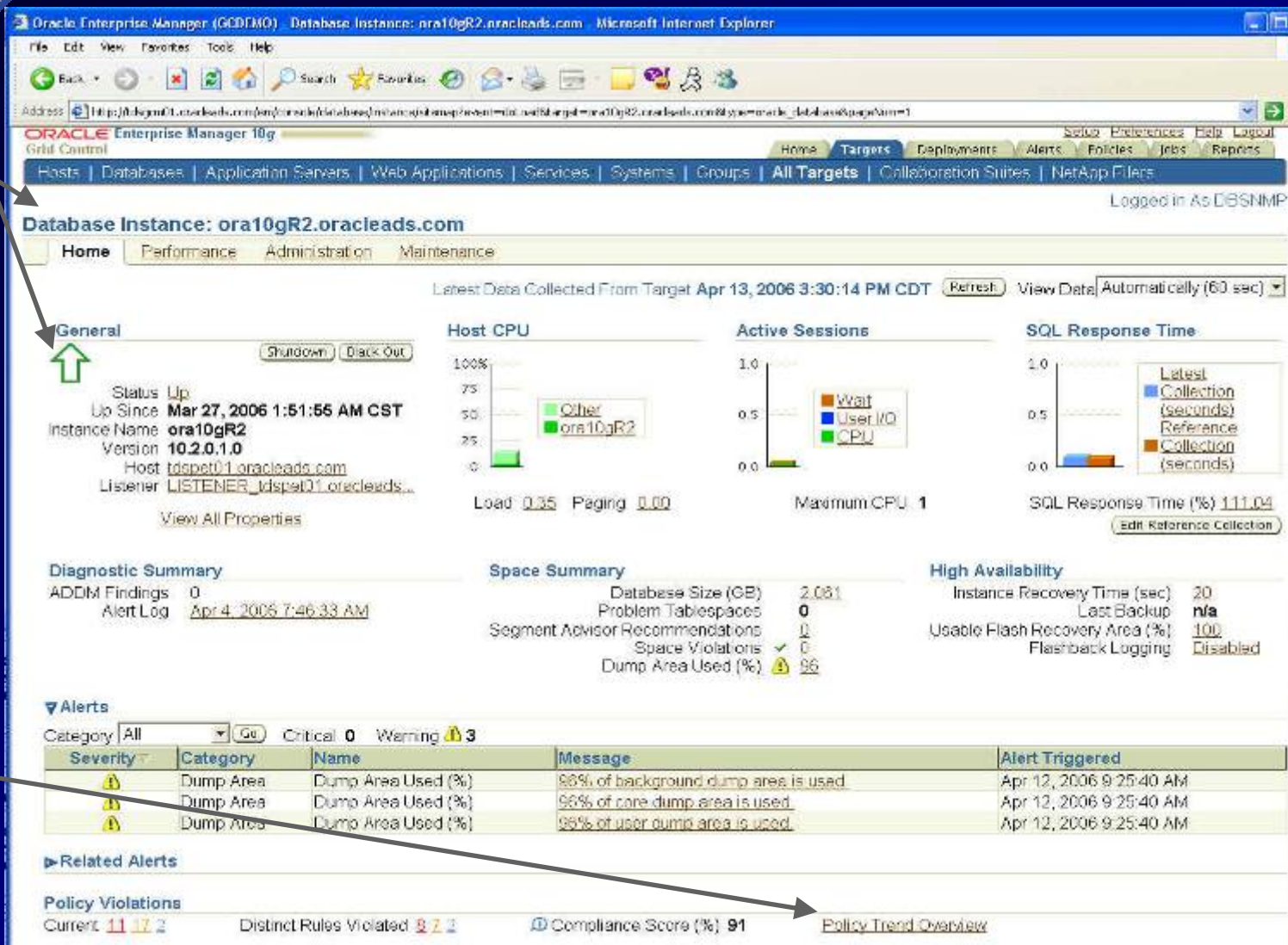
Job RefreshFromMetaLink



Grid Control 10gR2: All Targets – Specific DB

Monitor
DB and
all core
Info.

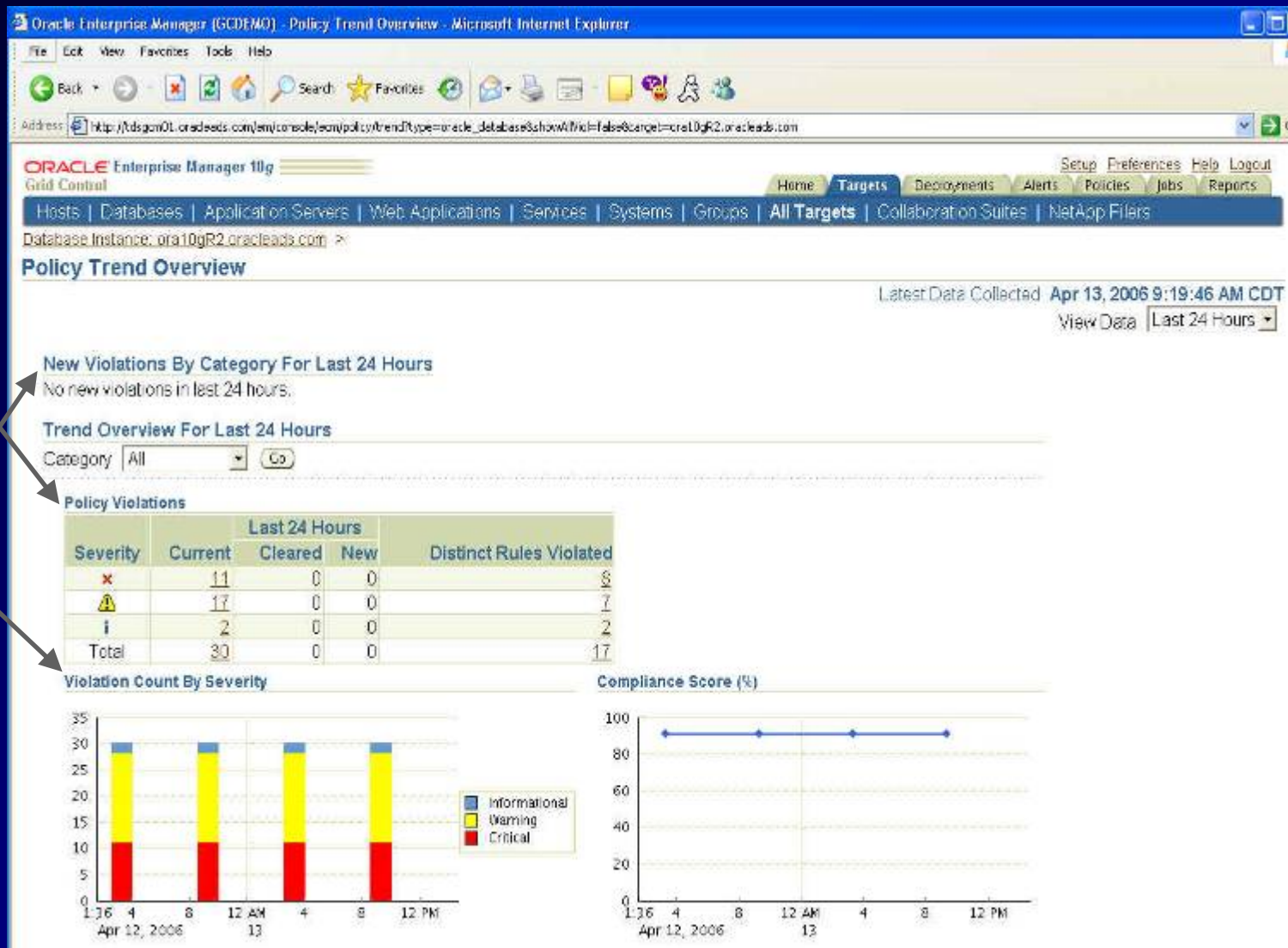
Click on
Policy
Trends
(See next
slide)





Grid Control 10gR2: Specific DB – Policy Trends

Policy
Trend
Overview
shows
Violations
and
Severity





Grid Control 10gR2: Policies – All Violations

Click on
Policies
Tab &
Search
Violations

Specific
Violation

Oracle Enterprise Manager (GCDHMO) - Policy Violations - Microsoft Internet Explorer

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports

Policy Violations

The following table displays a rollup of policy violations. For detail information click on the violation count link.

Page Refreshed Apr 13, 2006 2:38:43 PM CDT

Simple Search

Target Type: All | Most Recent Violation within: 7 Days | ☒ Ignore suppressed violations

Target Name:

Category: All | Severity: All | [Go](#) [Advanced Search](#)

Severity	Violation Count	Policy Rule	Target	Type	Most Recent Violation	Category	Compliance Score (%)	Non-Compliant Since
✖	1	Critical Patch Advisories for Oracle Homes	tdsgrep01.oracleleads.com	Host	Apr 13, 2006 6:31:16 AM CDT	Configuration		26 Apr 13, 2006 6:31:16 AM CDT
✖	1	Listener Logfile Permission	LISTENER_tdsgrep01.oracleleads.com	Listener	Apr 13, 2006 5:55:06 AM CDT	Security		26 Apr 13, 2006 5:55:06 AM CDT
✖	1	Listener Trace Directory Permission	LISTENER_tdsgrep01.oracleleads.com	Listener	Apr 13, 2006 5:55:06 AM CDT	Security		26 Apr 13, 2006 5:55:06 AM CDT
⚠	1	Listener Password	LISTENER_tdsgrep01.oracleleads.com	Listener	Apr 13, 2006 5:55:06 AM CDT	Security		26 Apr 13, 2006 5:55:06 AM CDT
⚠	1	Use of Hostname in Listener.ora	LISTENER_tdsgrep01.oracleleads.com	Listener	Apr 13, 2006 5:55:05 AM CDT	Security		26 Apr 13, 2006 5:55:05 AM CDT
⚠	1	Listener Default Name	LISTENER_tdsgrep01.oracleleads.com	Listener	Apr 13, 2006 5:55:05 AM CDT	Security		26 Apr 13, 2006 5:55:05 AM CDT
✖	2	Critical Patch Advisories for Oracle Homes	stdemo07.oracle.com	Host	Apr 10, 2006 12:09:58 PM PDT	Configuration		26 Apr 10, 2006 12:09:58 PM PDT
✖	2	Critical Patch Advisories for Oracle Homes	stdemo08.oracle.com	Host	Apr 10, 2006 6:29:54 AM PDT	Configuration		26 Apr 10, 2006 6:29:54 AM PDT
✖	42	Open Ports	stdemo08.oracle.com	Host	Apr 10, 2006 6:28:50 AM PDT	Security		26 Dec 7, 2005 12:43:05 AM PST

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout



Grid Control 10gR2: Deployments

Check
Deployments
and Patches

Check all
Installations
& Summary
of Patches

Oracle Enterprise Manager (GCDemo) - Deployments - Microsoft Internet Explorer

Address: https://tcdgcm01.oracle.com/em/console/functions

ORACLE Enterprise Manager 10g

Home Targets **Deployments** Alerts Policies Jobs Reports

General | Provisioning

Deployments

Critical Patch Advisories for Oracle Homes

Patch Advisories 1

! Patch Advisory information may be stale.
Oracle Metalink refresh job has not run successfully in 72 hours.

Affected Oracle Homes 7
[Job RefreshFromMetalink](#)

Deployments Summary

View Database Installations

Database Installations	Targets	Installations	Interim Patches Applied
Oracle Database 10g 10.1.0.3.0	1	1	Yes
Oracle Database 10g 10.1.0.4.0	1	2	Yes
Oracle Database 10g 10.1.0.4.2	1	1	No
Oracle Database 10g 10.2.0.1.0	3	3	No
Oracle9i 9.2.0.6.0	0	1	No

Configuration

[Search](#)
[Compare Configuration](#)
[Compare to Multiple Configurations\(Job\)](#)
[View Saved Configurations](#)

Patching

[Patch Oracle Software](#)
[View Patch Cache](#)
[Patch Linux Hosts](#)

Cloning

[Clone Database](#)

Import Configuration

[Host Configuration Collection Problems](#)
[Refresh Host Configuration](#)
[Configuration History](#)

Agent Installation

[Install Agent](#)
[Agent Installation Status](#)

[Clone Oracle Home](#)

Overview

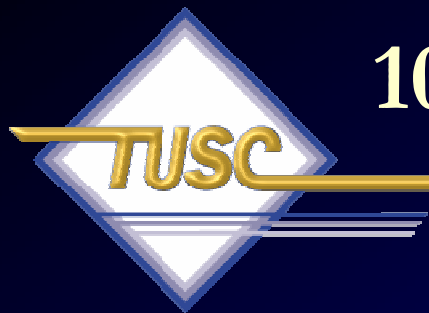
Enterprise Manager maintains detailed information about hosts and their operating systems, as well as software installations. The Deployments Summary table provides a high level view of this information, as well as allowing you to explore the details by selecting the individual components. This information 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.



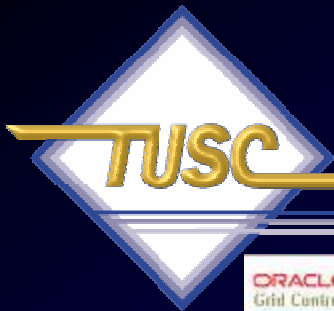
Tip #9

Use Grid Control for Multi-Node Systems



10g RAC Enhancements

- GRID Control
 - Allows for RAC instance startup, shutdown
 - Allows for RAC instance creation
 - Allows for resource reallocation based on SLAs
 - Allows for automatic provisioning when used with RAC, ASM and Linux



Monitor Clusters

Monitor
4-Node
IOUG
Cluster

Check
Alerts &
Policy
Issues

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Cluster: IOUG Latest Data Collected From Target Apr 13, 2006 2:08:03 PM EDT Refresh

Home Performance Targets Interconnects Topology

General

Status Up [Black Out](#)

Hosts 4 (↑4)

Availability (%) 100.0 (Last 24 hours)

Cluster Name IOUG

Oracle Clusterware Status Up (↑4)

Clusterware Version 10.2.0.2.0

Clusterware Home /u01/app/oracle/product/Crs

Configuration

View Hardware

Hardware	Hosts
x86_64 AuthenticAMD x86_64	1
x86_64 GenuineIntel x86_64	3

Diagnostic Summary

Interconnect Findings 0

Cluster Databases

Name	Status	Alerts	Policy Violations	Compliance Score (%)	Version
iooug	Ⓢ	0 14	23 40 9	90	10.2.0.2.0

Alerts

Category All Critical 0 Warnings 0

Severity	Target Name	Target Type	Category	Name	Message	Alert Triggered
(No Alerts!)						

Security

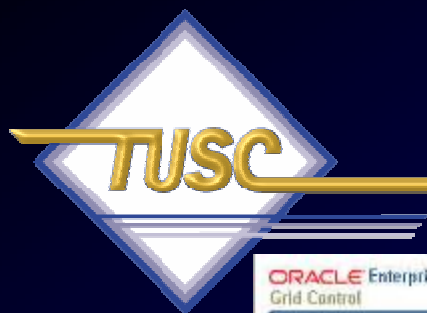
Last Security Evaluation Apr 13, 2006 12:32:30 PM EDT Compliance Score (%) 67 Enterprise Security At a Glance

Job Activity

Create Job OS Command Co

Job executions scheduled to start no more than 7 days ago

Status	Submitted to the Cluster	Submitted to any member
Scheduled	0	0
Running	0	0
Suspended	0	0
Problem	0	0



Monitor Clusters: Interconnect

Check the
Inter-
connects

All
Nodes
listed

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Cluster: IOUG

Latest Data Collected From Target Apr 13, 2006 2:16:38 PM EDT Refresh

Home Performance Targets **Interconnects** Topology

The interconnect configuration and internode communication will influence the performance of cluster databases. The tables below show network interfaces on all hosts and network interfaces currently in use by cluster databases. It is important that cluster databases are configured to use a private interconnect for message and block transfers.

View Data Manually

Private Interconnect Transfer Rate (MB/Sec) 0.0788 *
Transfer rate on the private network in the last 5 minutes.

Interfaces by Hosts

View Private

Expand All Collapse All

Name	Type	Subnet	Interface Type	Total I/O Rate (MB/Sec) (Last 5 Minutes)	Total Error Rate (%) (Last 5 Minutes)
IOUG	Cluster				
atlnodi1.us.oracle.com	Host				
eth1	Interface	192.168.1.0	Private	.051 *	0 *
atlnodi2.us.oracle.com	Host				
eth1	Interface	192.168.1.0	Private	.018 *	0 *
atlnodi3.us.oracle.com	Host				
eth1	Interface	192.168.1.0	Private	.026 *	0 *
atlnodi7.us.oracle.com	Host				
eth1	Interface	192.168.1.0	Private	.056 *	0 *

Interfaces in Use by Cluster Databases

Expand All Collapse All

Name	Target Type	Interface Name	Host Name	IP Address	Interface Type	Source	Transfer Rate (MB/Sec) (Last 5 Minutes)
IOUG	Cluster Database						
IOUG1	Database Instance	eth1	atlnodi1.us.oracle.com	192.168.1.1	Private	Oracle Cluster Repository	.012 *
IOUG2	Database Instance	eth1	atlnodi2.us.oracle.com	192.168.1.2	Private	Oracle Cluster Repository	.0035 *
IOUG3	Database Instance	eth1	atlnodi3.us.oracle.com	192.168.1.3	Private	Oracle Cluster Repository	.011 *
IOUG6	Database Instance	eth1	atlnodi7.us.oracle.com	192.168.1.7	Private	Oracle Cluster Repository	.025 *

TIP The Transfer Rate is the estimated traffic contributed by the instance assuming uniform block size in the database.

TIP * indicates the data that is more than 10 minutes old.



Monitor Clusters: Topology

View the
Cluster
Topology

Look at
the 4
Listeners

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Cluster: IOUG

Latest Data Collected From Target: Apr 13, 2006 2:16:38 PM EDT Refresh

Home Performance Targets Interconnects **Topology**

Overview topology presents a global view of all databases, ASM instances, listeners and interconnects on this cluster. By Hosts View shows these targets as associated to the cluster hosts. You can optionally view configuration information. You can also use these views to launch various administration and configuration functions.

View Overview ☐ Show Configuration Details View Data Manually

Overview

The diagram shows the cluster topology. At the top, there is a 'Cluster ASM' icon and an 'Interconne...' icon. Below them is the 'ioug' database icon. At the bottom, there are four 'LISTENER A...' icons. Arrows point from the 'Cluster ASM' icon to the 'ioug' database icon, and from the 'ioug' database icon to each of the four 'LISTENER A...' icons. There are also arrows pointing from the 'Overview' tab to the 'Cluster ASM' icon and from the 'Selection Details' tab to the 'ioug' database icon.

Selection Details

Name: ioug

Type: Cluster Database

Up Instances: 4/4

Critical Alerts: 0

Warning Alerts: 16

Status: Up

Summary

Status	Hosts	Oracle Clusterware
Up	4 (4/4)	Up

Legend

Home Performance Targets Interconnects **Topology**

Hosts

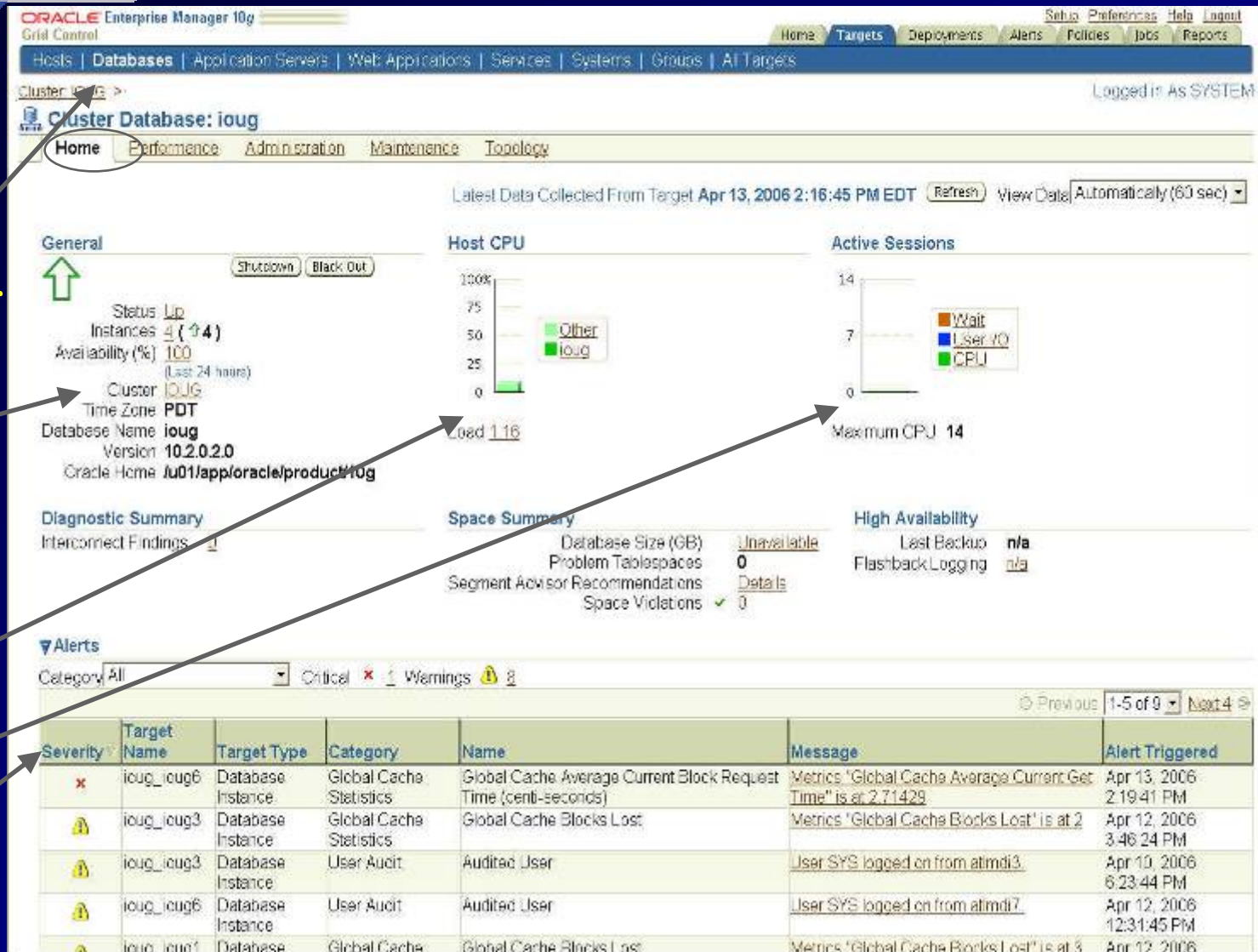
Name	Status	Oracle Clusterware Status	Alerts	Policy Violations	Compliance Score (%)	CPU Util %	Mem Util %	Total IO/sec
atimdr1.us.oracle.com	Up	Up	0/0	5/1/0	76			30.63
atimdr2.us.oracle.com	Up	Up	0/0	5/1/0	76			28.33
atimdr3.us.oracle.com	Up	Up	0/0	5/1/0	76			25.27
atimdr4.us.oracle.com	Up	Up	0/0	5/1/0	76			24.9

Monitor Clusters: Databases



Go to the
Database
Screen for
the
Cluster

Check
CPU,
Sessions
& Alerts

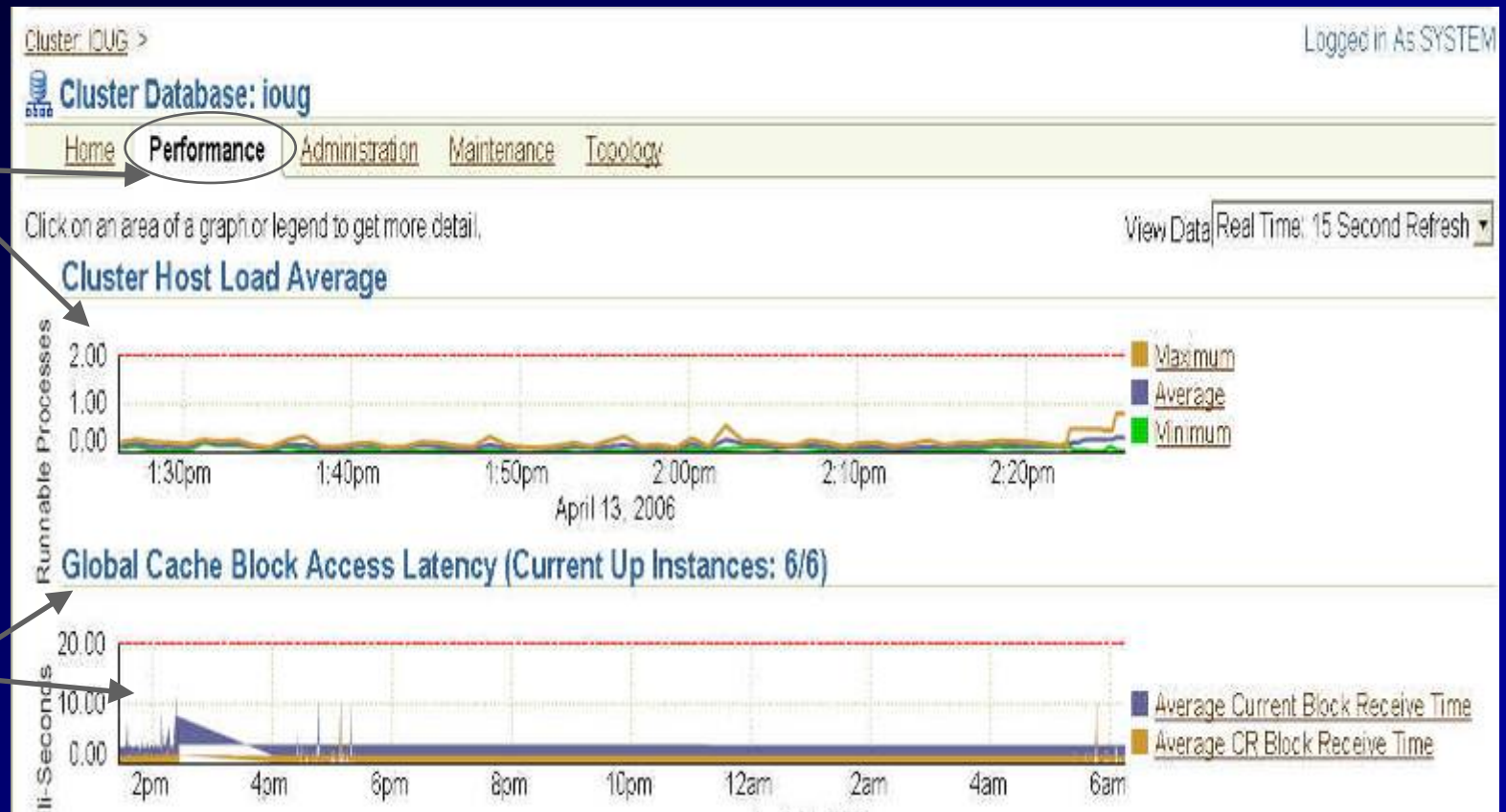


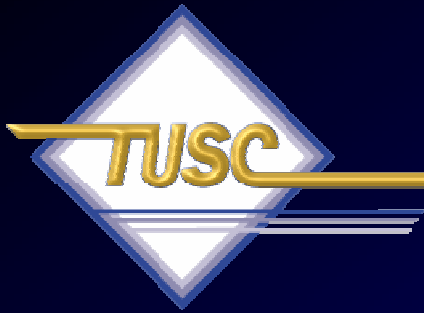


Monitor Clusters: Global Block Transfers

Check
Performance

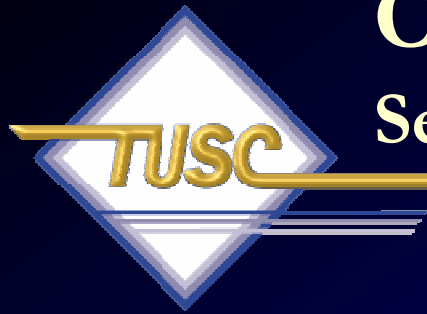
Check the
Transfer
of Blocks





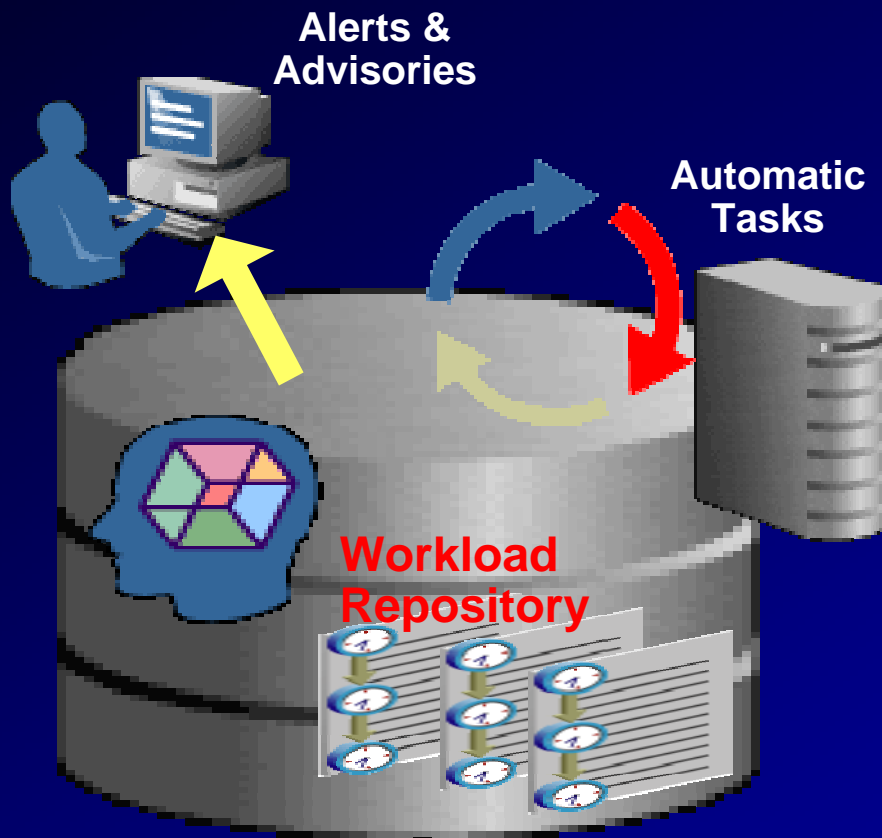
Tip #10

Use Grid Control for Tuning Systems

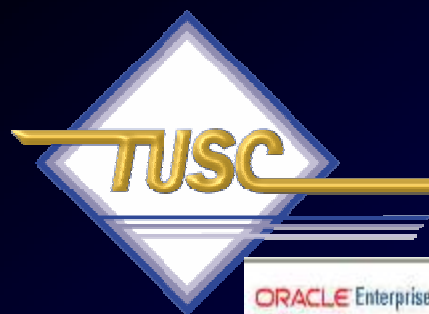


Oracle 10^g Database

Self-Managing Intelligent Infrastructure



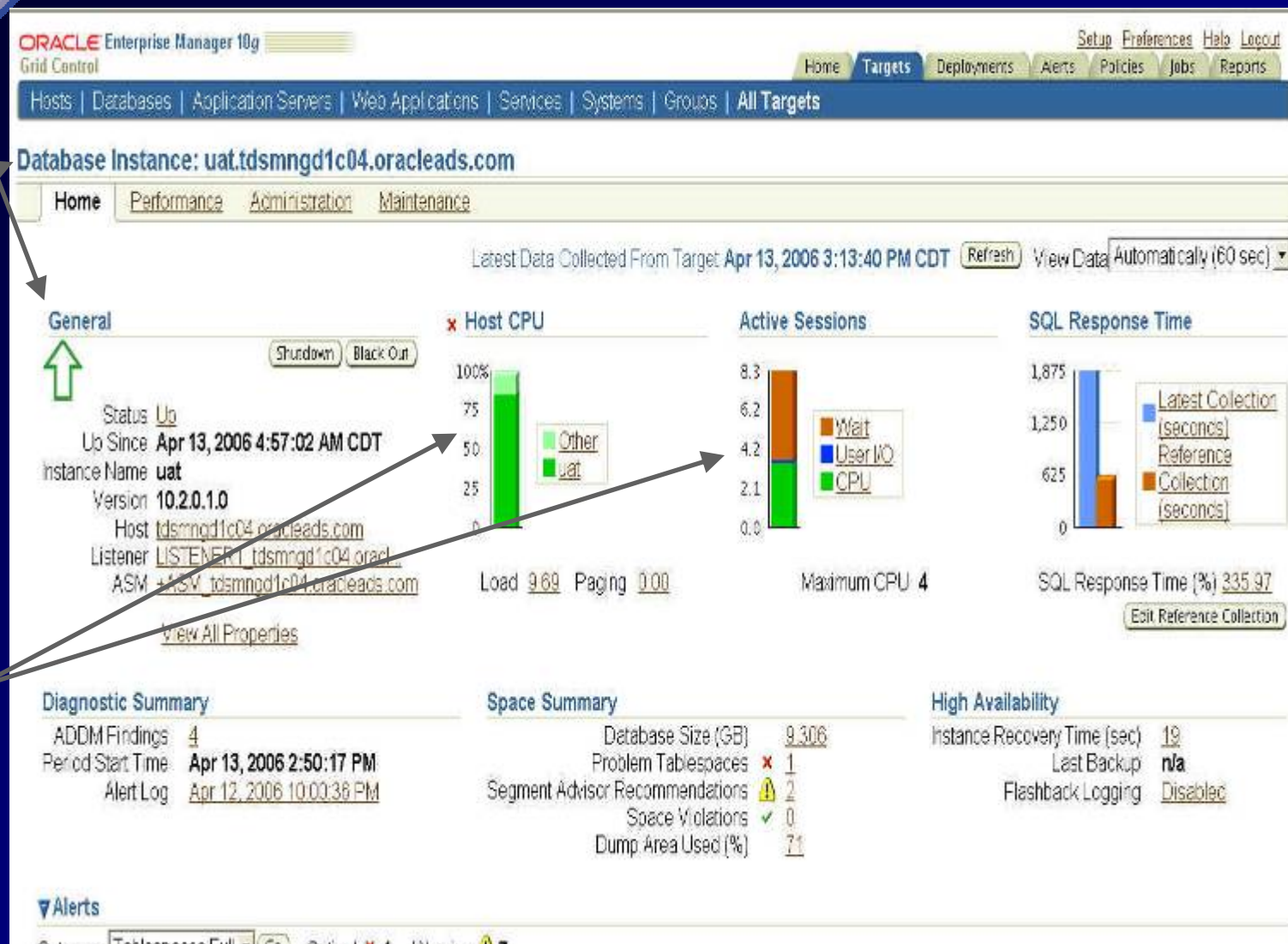
- Aware
 - Self-monitoring
- Proactive
 - Automatic tasks
 - Proactive alerts
- Intelligent
 - Self-diagnosing
 - Self-tuning



Tune Specific Database

Monitor
Specific
Database

CPU
Issues
and User
Waits!





Tune Specific Database (long page continued...)

Performance Analysis – CPU Issue

Alerts
Category: [Tablespaces Full](#) [Go](#) Critical ✖ 1 Warning ⚠ 7

Severity	Category	Name	Message	Alert Triggered
✖	Tablespaces Full	Tablespace Space Used (%)	Tablespace USERS3 is 96 percent full	Apr 13, 2006 5:04:28 AM

Related Alerts

Performance Analysis
Period Start Time: **Apr 13, 2006 2:50:17 PM** Period Duration (minutes): **10.02**

Impact (%)	Finding	Recommendations
100	Host CPU was a bottleneck and the instance was consuming 38% of the host CPU. All wait times will be inflated by wait for CPU.	1 Application Analysis 2 SQL Tuning 1 Host Configuration
74.8	SQL statements consuming significant database time were found.	3 SQL Tuning
21.8	SQL statements were not shared due to the usage of literals. This resulted in additional hard parses which were consuming significant database time.	1 Application Analysis
21.5	SQL statements were found waiting for row lock waits.	1 Application Analysis

Policy Violations
Current 11 10 4 Distinct Rules Violated 8 5 4 Compliance Score (%) **92** [Policy Trend Overview](#)

Security
Last Security Evaluation 📅 **Apr 13, 2006 4:59:42 AM CDT** Compliance Score (%) **90** [Enterprise Security At a Glance](#)

Job Activity
Jobs scheduled to start no more than 7 days ago

Scheduled Executions **0** Running Executions **0** Suspended Executions ✔ **0** Problem Executions ✔ **0**

Home [Performance](#) [Administration](#) [Maintenance](#)

Related Links

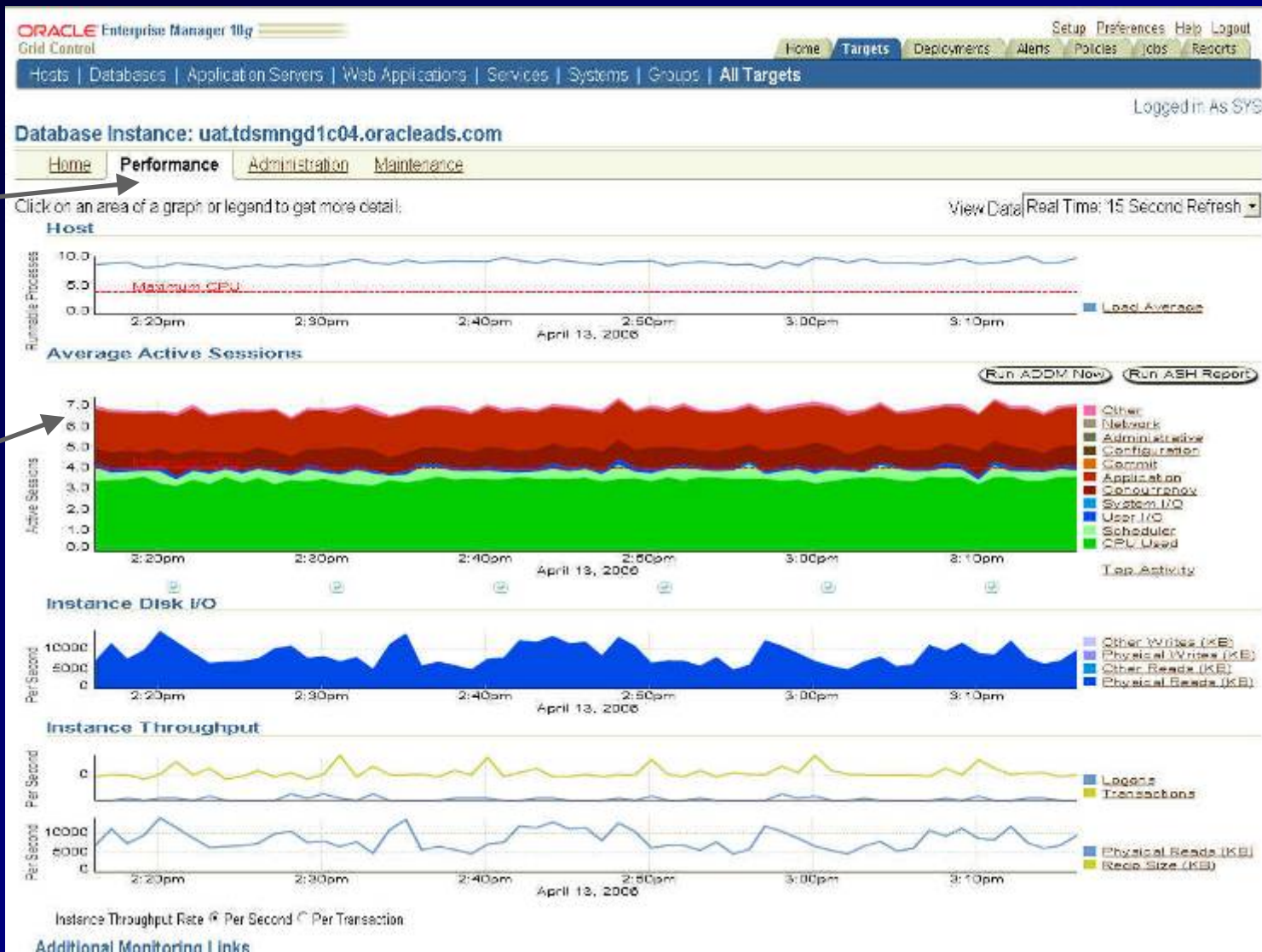
Access	Advisor Central	Alert History
Alert Log Content	All Metrics	Blackouts
Deployments	Execute SQL	iSQL*Plus
Jobs	Metric and Policy Settings	Metric Baselines
Metric Collection Errors	Monitoring Configuration	Monitor in Memory Access Mode
Reports	Rules Manager	SQL History
Trend Overview	User Based Metrics	



Tune Specific Database: Click on Performance

Click on
Perf. Tab

CPU &
Application
Issues

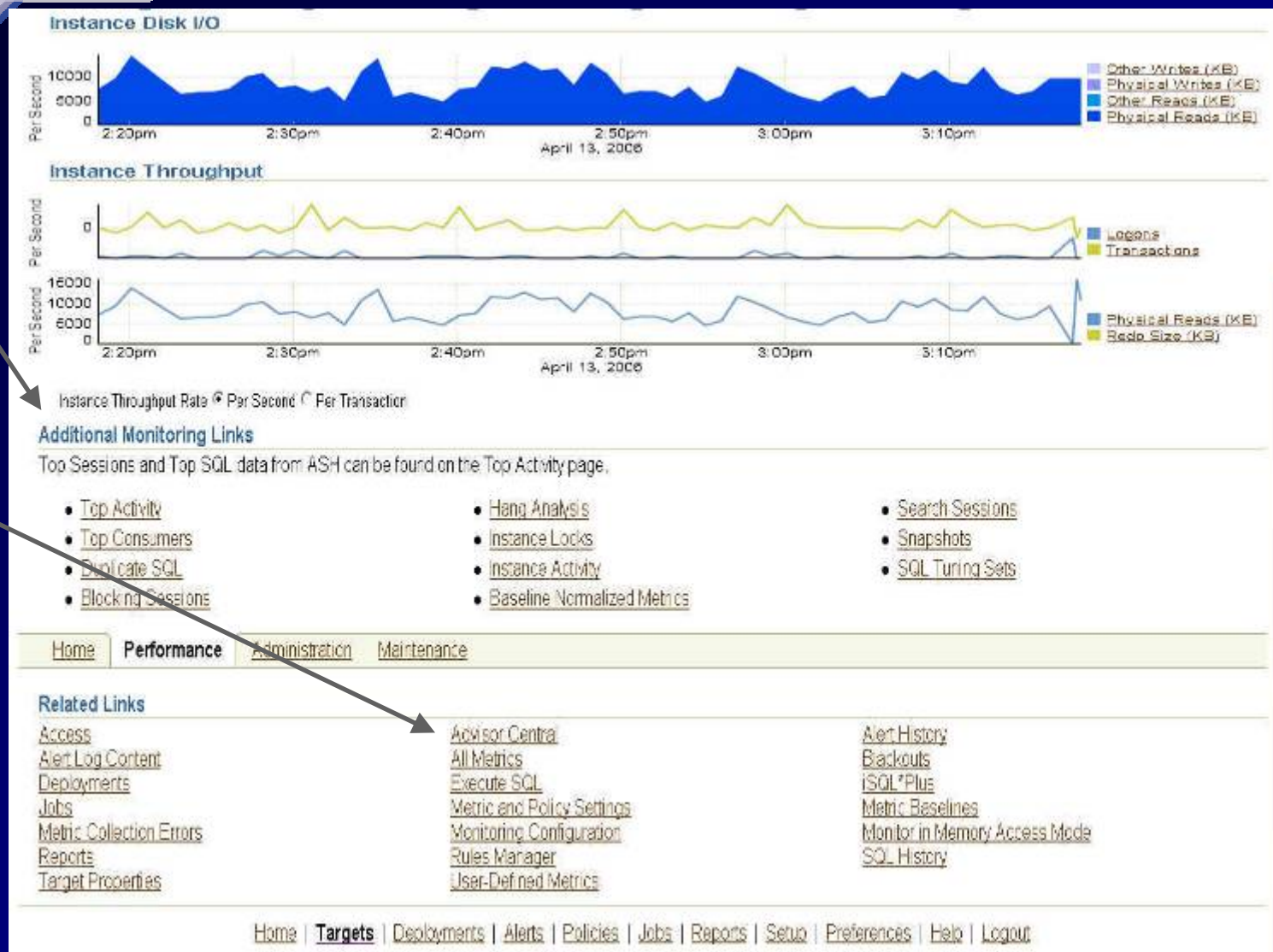




Tune Specific Database: Click on Performance (cont.)

Links to
Top SQL

Advisor
Central
& Other
Quick
Links

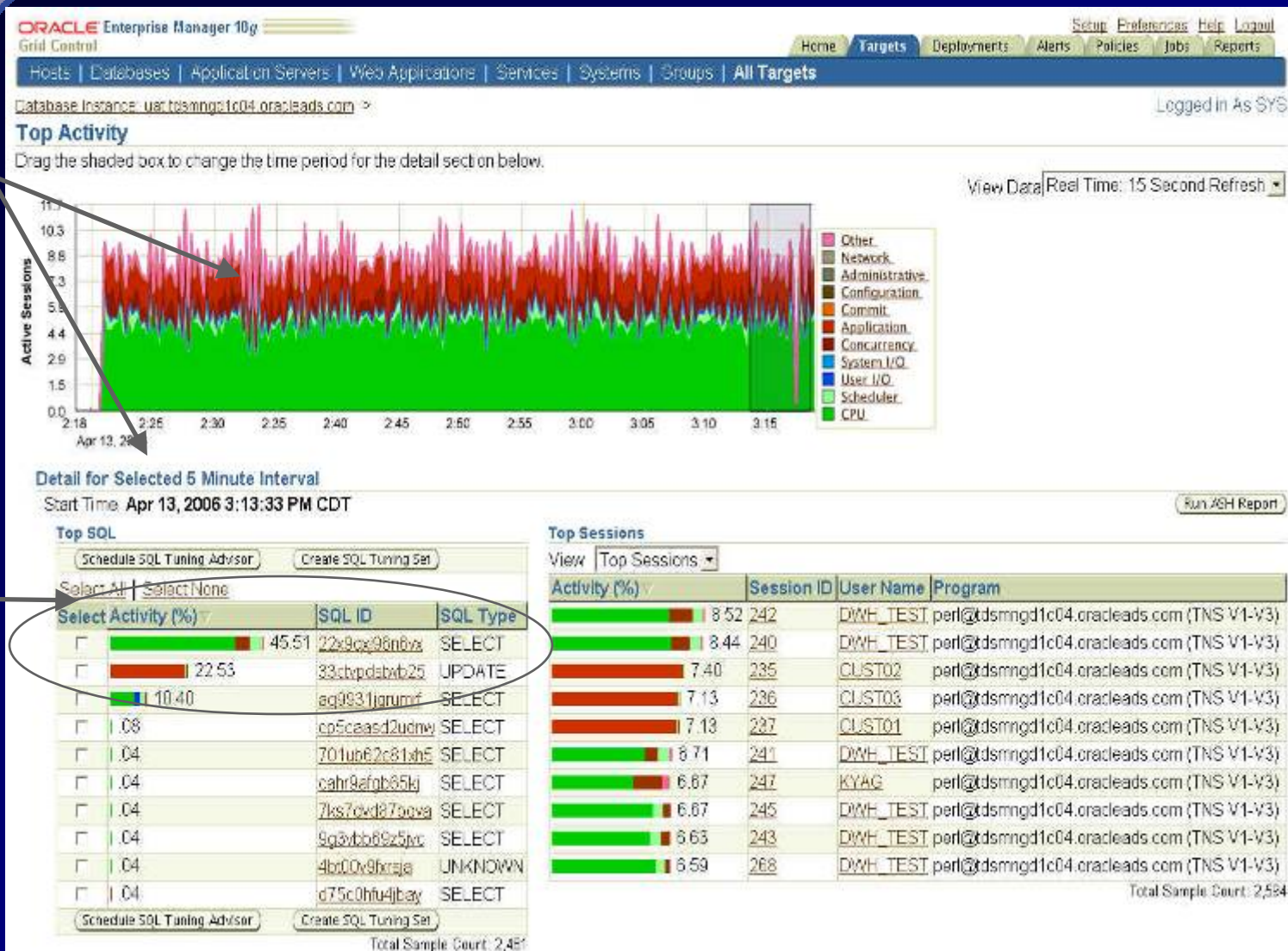




Tune Specific Database: Click on Top Activity

Drill into
the Top
Resource
Hogs.

Worst
SQL to
Tune!

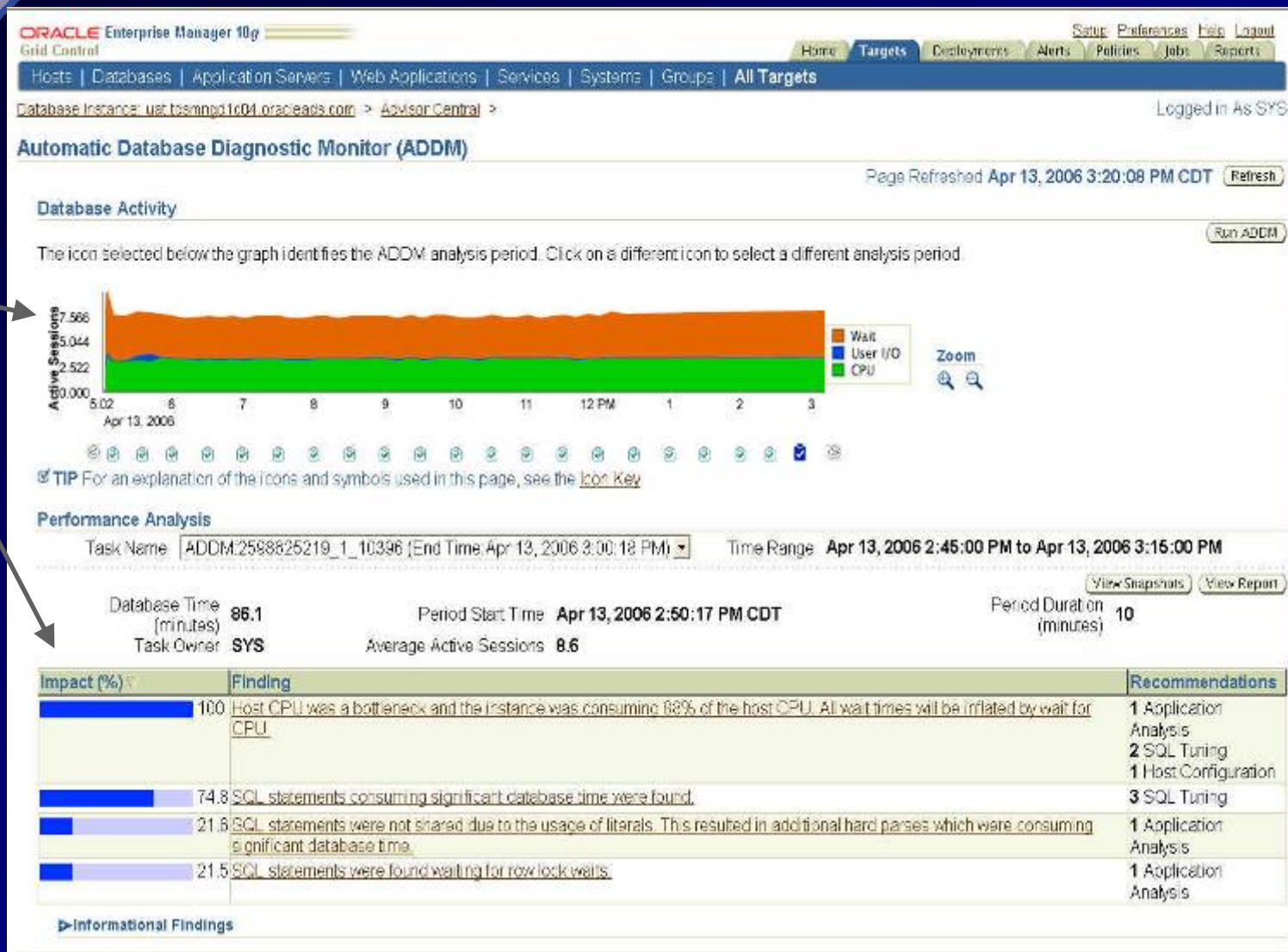




Tune Specific Database: Go To Advisor Central (ADDM)

Pick a
problem
time.

Analyze
Problem;
Click
Here
(next
slide)



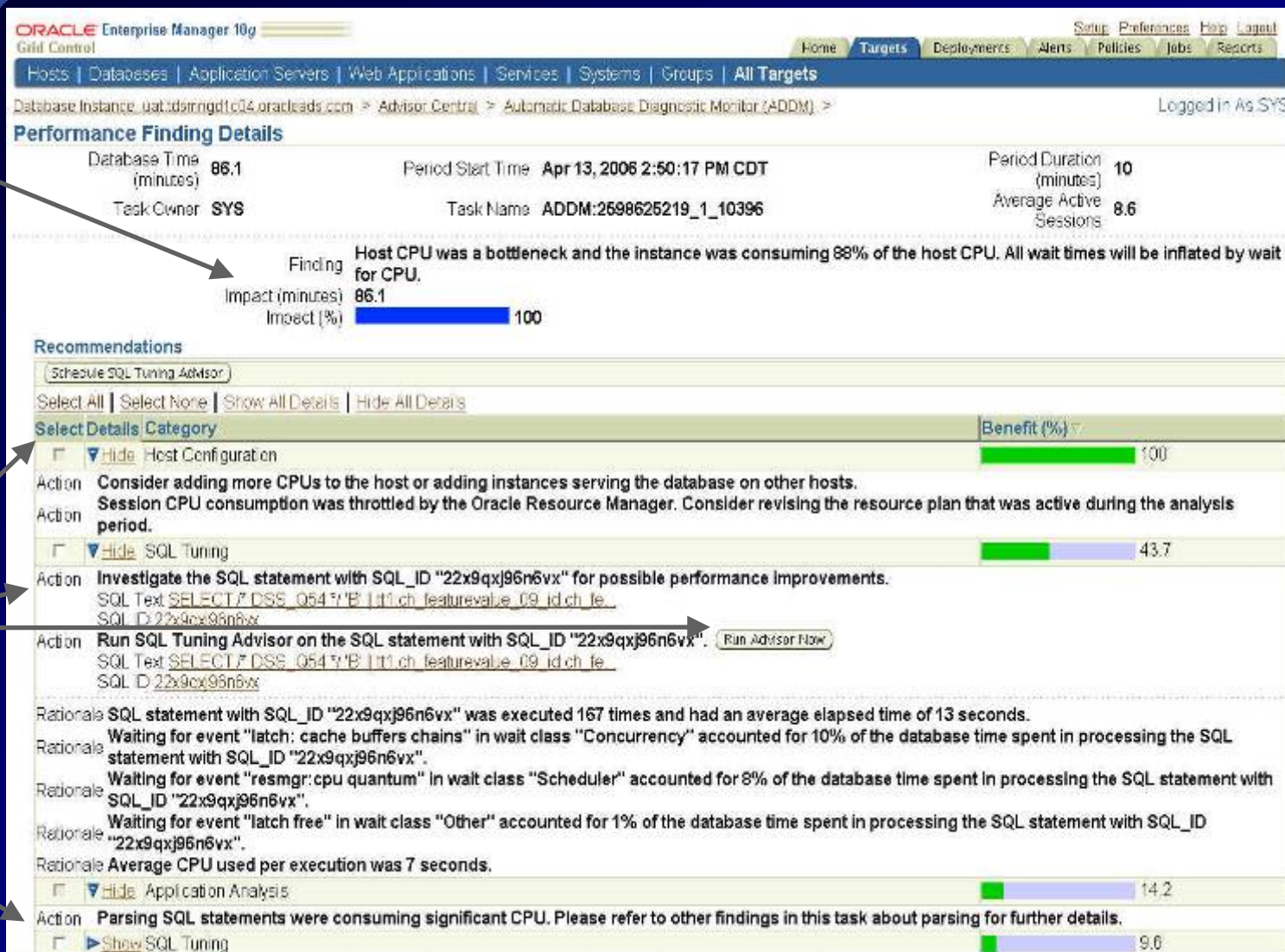


Tune Specific Database: Run ADDM

Main
Finding

Details
and Top
SQL

Parsing
Issue





Tune Specific Database: Advisor: SQL Tuning Set

Run SQL
Tuning
Set

Results
for worst
queries

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Database Instance: usatdismr041c04.oracleleads.com > Advisor Central > Logged in As SYS

SQL Tuning Results:SQL_TUNING_1144959719826

Page Refreshed Apr 13, 2006 3:23:52 PM [Refresh](#)

Status **COMPLETED**
Started **Apr 13, 2006 3:22:07 PM**
Completed **Apr 13, 2006 3:23:45 PM**

Tuning Set Owner **SYS**
Tuning Set Name **TUNING_SET_1144959719140**
Time Limit(seconds) **1800**
Running Time(seconds) **98**

Recommendations

[View Recommendations](#)

Select SQL Text	Parsing Schema	SQL ID	Statistics	SQL Profile	Index	Restructure SQL	Miscellaneous Error
SELECT /* DSS_Q64 */ B' t1.ch_featurevalue_09_id ch_featurevalue_09_id, ...	DWH_TEST	22x9cx96n6xx		✓			✓
SELECT /* Restructure Query */ distinct t1.project_type_id ...	DWH_TEST	ac9931jgrumrf	✓			✓	

Home | **Targets** | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout



Tune Specific Database: View Recommendations – Query1

Problem
Query

Use the
Profile:
to Help
99%!

Compare
Xplan

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Database instance: uat.tdsimgd1c04.oracleads.com > Advisor Central > SQL Tuning Results:SQL_TUNING_1144959719826 > Logged in As SYS

Recommendations for SQL ID:22x9qxj96n6vx

Return

Only one recommendation should be implemented.

SQL Text

SELECT * DSS_Q54 * 'B' || t1.ch_featurevalue_09_id ch_featurevalue_09_id, G' || t1.ch_featurevalue_02_elgr_id ch_featurevalue_02_id, ...

Select Recommendation

Original Explain Plan (Annotated)

Implement

Select Type	Findings	Recommendations	Rationale	Benefit New Explain (%) Plan	Compare Explain Plans
<input checked="" type="radio"/> SQL Profile	A potentially better execution plan was found for this statement.	Consider accepting the recommended SQL profile.		99.08	
<input type="radio"/> Miscellaneous	The optimizer could not merge the view at line ID 4 of the execution plan.				

Return

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout

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[About Oracle Enterprise Manager](#)



Tune Specific Database: Compare Explain Plans

New
Xplan

Old
Xplan

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Database Instance: uat.tbsmngd1c34.oracleads.com > Advisor Central > SQL Tuning Results: SQL_TUNING_1144959719826 >
Recommendations for SQL ID: 22x8gq96c6w >

Logged in As SYS

Compare Explain Plans

New Explain Plan With SQL Profile
[Expand All](#) | [Collapse All](#)

Operation	Line ID	Object
SELECT STATEMENT	0	
HASH GROUP BY	1	
VIEW	2	
HASH GROUP BY	3	
VIEW	4	
WINDOW NOSORT	5	
SORT GROUP BY	6	
HASH JOIN	7	
INLIST ITERATOR	8	
TABLE ACCESS BY INDEX ROWID	9	DWH_TEST.LU_ELEMENTGE
INDEX RANGE SCAN	10	DWH_TEST.LU_ELEMENTGE
HASH JOIN	11	
TABLE ACCESS BY INDEX ROWID	12	DWH_TEST.LU_ELEMENTGE
INDEX RANGE SCAN	13	DWH_TEST.LU_ELEMENTGE
HASH JOIN	14	
TABLE ACCESS BY INDEX ROWID	15	DWH_TEST.LU_ELEMENTGE
INDEX RANGE SCAN	16	DWH_TEST.LU_ELEMENTGE
HASH JOIN	17	
TABLE ACCESS FULL	18	DWH_TEST.LU_PERIOD_236
HASH JOIN	19	
TABLE ACCESS FULL	20	DWH_TEST.LU_OUTLET_236

Original Explain Plan (Annotated)
Indicates an adjustment from the original plan by the SQL Tuning Advisor. The following is the original explain plan for the SQL statement being tuned.
[Expand All](#) | [Collapse All](#)

Operation	Line ID	Object
SELECT STATEMENT	0	
HASH GROUP BY	1	
VIEW	2	
HASH GROUP BY	3	
VIEW	4	
WINDOW NOSORT	5	
SORT GROUP BY	6	
TABLE ACCESS BY INDEX ROWID	7	DWH_TEST.FACT_PD_C
NESTED LOOPS	8	
MERGE JOIN CARTESIAN	9	
HASH JOIN	10	
MERGE JOIN CARTESIAN	11	
TABLE ACCESS BY INDEX ROWID	12	DWH_TEST.LU_ELEMEI
NESTED LOOPS	13	
NESTED LOOPS	14	
TABLE ACCESS BY INDEX ROWID	15	DWH_TEST.LU_ELEMEI
INDEX RANGE SCAN	16	DWH_TEST.LU_ELEMEI



Tune Specific Database: View Recommendations – Query2

Second
worst
SQL to
Tune

Fix by
collecting
statistics
Or
Rewrite
SQL

ORACLE Enterprise Manager 10g
Grid Control

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Database Instance: uattdsmngd1c04.oracleads.com > Advisor Central > SQL Tuning Results:SQL_TUNING_1124959719826 > Logged in As SYS

Recommendations for SQL ID:aq9931jgrumrf

[Return](#)

Only one recommendation should be implemented.

SQL Text
SELECT /* Restructure Query */ distinct t1.project_type_id FROM lu_item_293 t2, f...

Select Recommendation
[Original Explain Plan \(Annotated\)](#)
[Implement](#)

Select Type	Findings	Recommendations	Rationale	New Benefit (%)	Explain Plan	Compare Explain Plans
<input checked="" type="radio"/> Statistics	Index "DWH_TEST"."PROJECT_TYPE_IDX_A" was not analyzed.	Consider collecting optimizer statistics for this index.	The optimizer requires up-to-date statistics for the index in order to select a good execution plan.			
<input type="radio"/> Restructure SQL	The predicate <code>TO_NUMBER("T1"."PROJECT_TYPE_ID")=1</code> used at line ID 9 of the execution plan contains an implicit data type conversion on indexed column "PROJECT_TYPE_ID". This implicit data type conversion prevents the optimizer from selecting indices on table "DWH_TEST"."FACT_PD_OUT_ITM_293_A".	Rewrite the predicate into an equivalent form to take advantage of indices.	The optimizer is unable to use an index if the predicate is an inequality condition or if there is an expression or an implicit data type conversion on the indexed column.			

[Return](#)

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports | Setup | Preferences | Help | Logout



Tune Specific Database: ADDM Finding/Fix - Parse Issue

Problem:
Not using
bind
variables

Fix for
entire
database
or SQL

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Database Instance: uat-bisprod1r04.oracleads.com > Advisor Central > Automatic Database Diagnostic Monitor (ADDM) > Logged in As SYS

Performance Finding Details

Database Time (minutes) 86.1 Period Start Time Apr 13, 2006 2:50:17 PM CDT Period Duration (minutes) 10
Task Owner SYS Task Name ADDM:2598625219_1_10396 Average Active Sessions 8.6

Finding SQL statements were not shared due to the usage of literals. This resulted in additional hard parses which were consuming significant database time.
Impact (minutes) 18.6
Impact (%) 21.6

Recommendations

Show All Details | Hide All Details

Details	Category	Benefit (%)
Hide	Application Analysis	21.6

Action Alternatively, you may set the parameter "cursor_sharing" to "force". [Implement](#)
Action Investigate application logic for possible use of bind variables instead of literals.

Rationale At least 1056 SQL statements with PLAN_HASH_VALUE 3191477378 were found to be using literals. Look in V\$SQL for examples of such SQL statements.

Findings Path

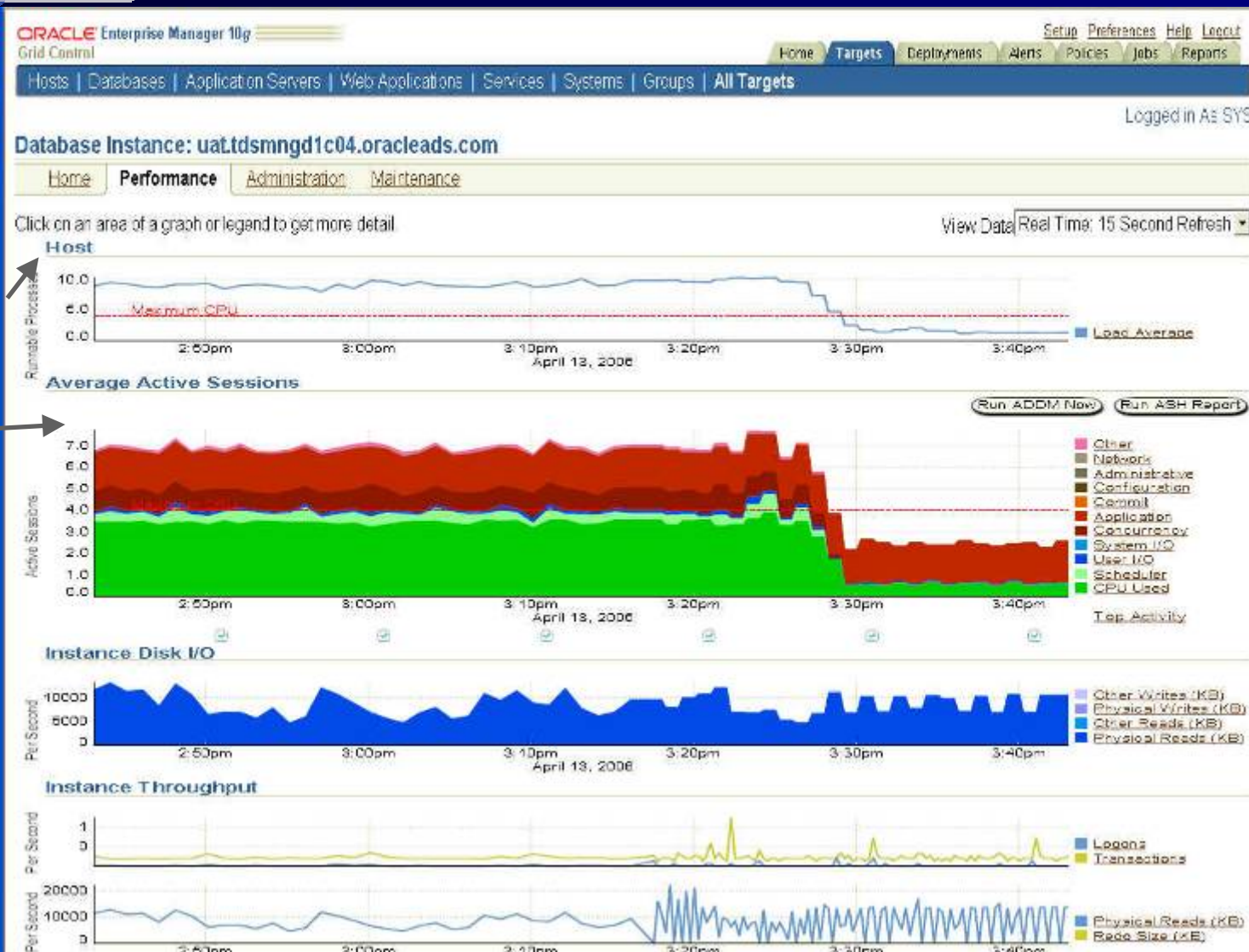
Expand All | Collapse All

Findings	Impact (%)	Additional Information
SQL statements were not shared due to the usage of literals. This resulted in additional hard parses which were consuming significant database time.	21.6	
Hard parsing of SQL statements was consuming significant database time.	21.6	
Contention for latches related to the shared pool was consuming significant database time.	6.2	Additional Information
Wait class "Concurrency" was consuming significant database time.	10.8	



Tune Specific Database: Problem Fixed - Nice Improvement

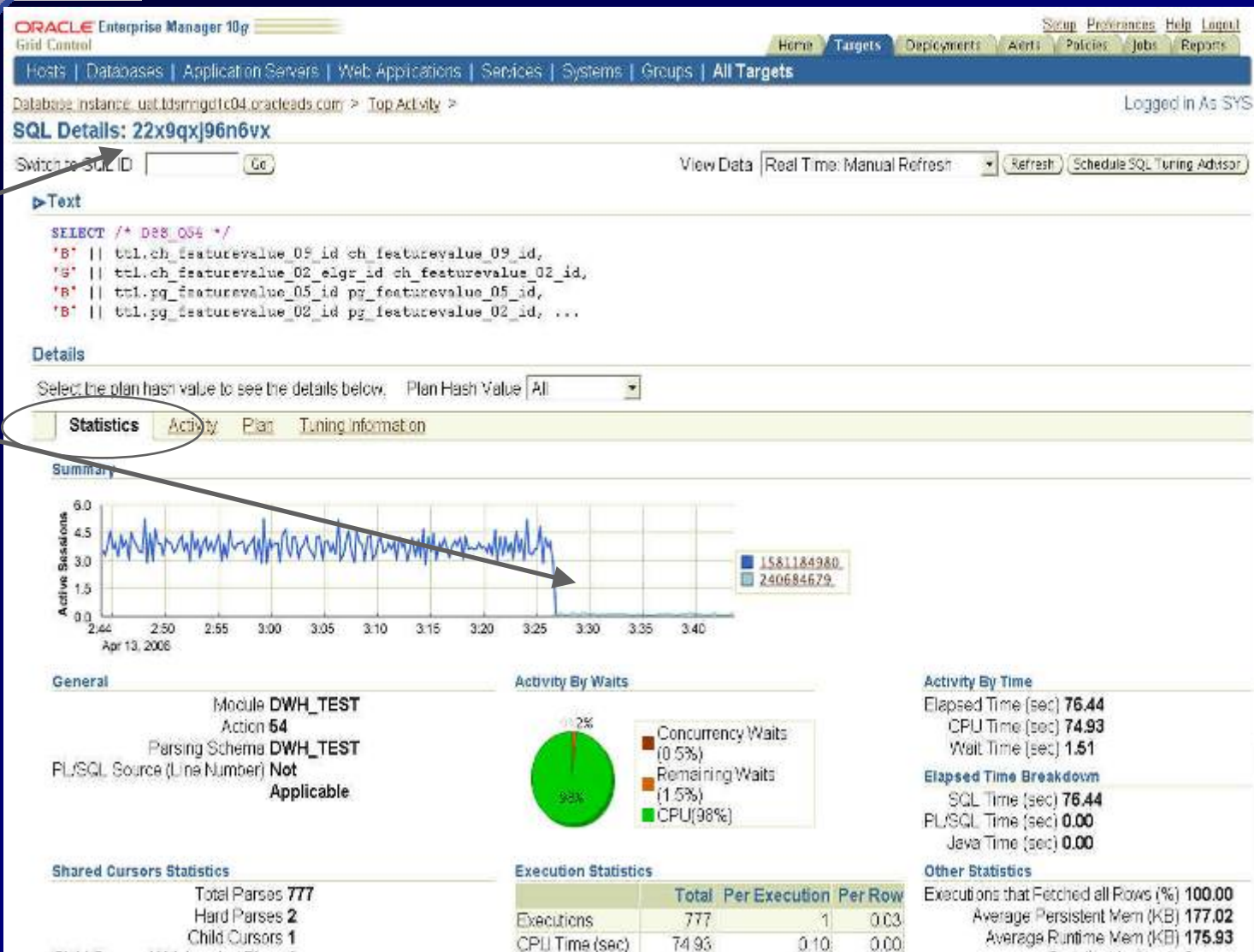
Quick
Impact on
Host CPU
and on
Users





Tune Specific Query: Problem Fixed - Query Improvement

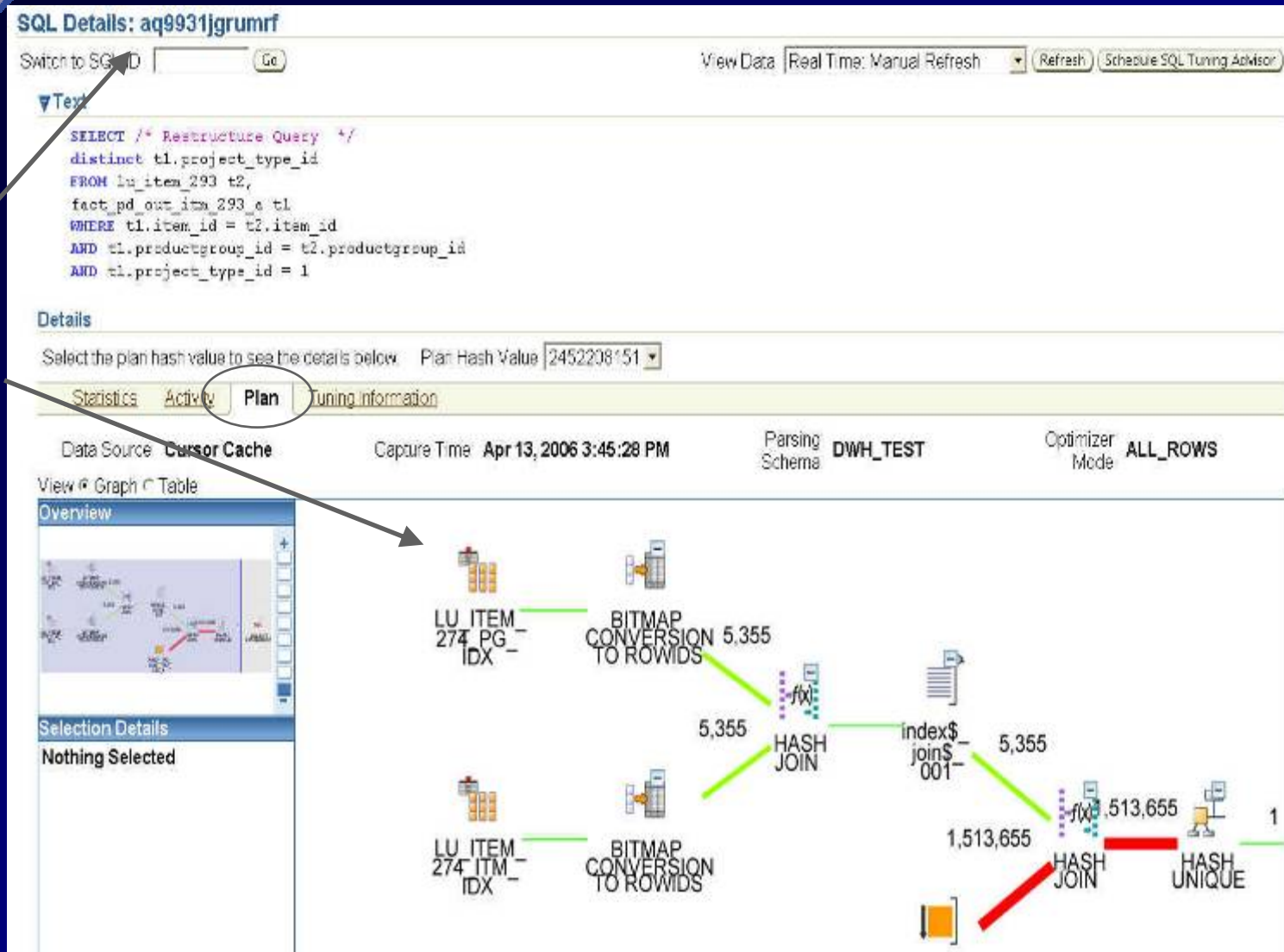
Worst
Query 1:
Shows
Huge
Benefit





Tune Specific Query: View Plan - Query Improvement

Worst
Query2:
Example
Plan Tree





Tune Specific Query: Problem Fixed – Query Advice Tracked

Query 1:
Check the
Tuning
Info.

ORACLE Enterprise Manager 10g
Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Database instance: uat01smngd1004.oracleads.com > Top Activity > Logged in As SYS

SQL Details: 22x9qxj96n6vx

Switch to SQL ID: Go View Data Real Time Manual Refresh Refresh Schedule SQL Tuning Advisor

►Text

```
SELECT /* 388_Q54 */  
'B' || ttl.ch_featurevalue_09_id ch_featurevalue_09_id,  
'S' || ttl.ch_featurevalue_02_elgr_id ch_featurevalue_02_id,  
'B' || ttl.pg_featurevalue_05_id pg_featurevalue_05_id,  
'B' || ttl.pg_featurevalue_02_id pg_featurevalue_02_id, ...
```

Details

Select the plan hash value to see the details below. Plan Hash Value

Statistics Activity Plan **Tuning Information**

SQL Profiles and Outlines
A SQL Profile contains additional statistics of this SQL statement for the query optimizer to generate a better execution plan. An outline contains hints for this SQL statement for the query optimizer to generate a better execution plan.
[Change Category](#) [Delete](#) [Disable/Enable](#)

Select Name	Type	Category	Status	Created
• SYS_SQLPROF_0142a53boeb44000	SQL Profile	DEFAULT	ENABLED	Apr 13, 2006 3:26:30 PM

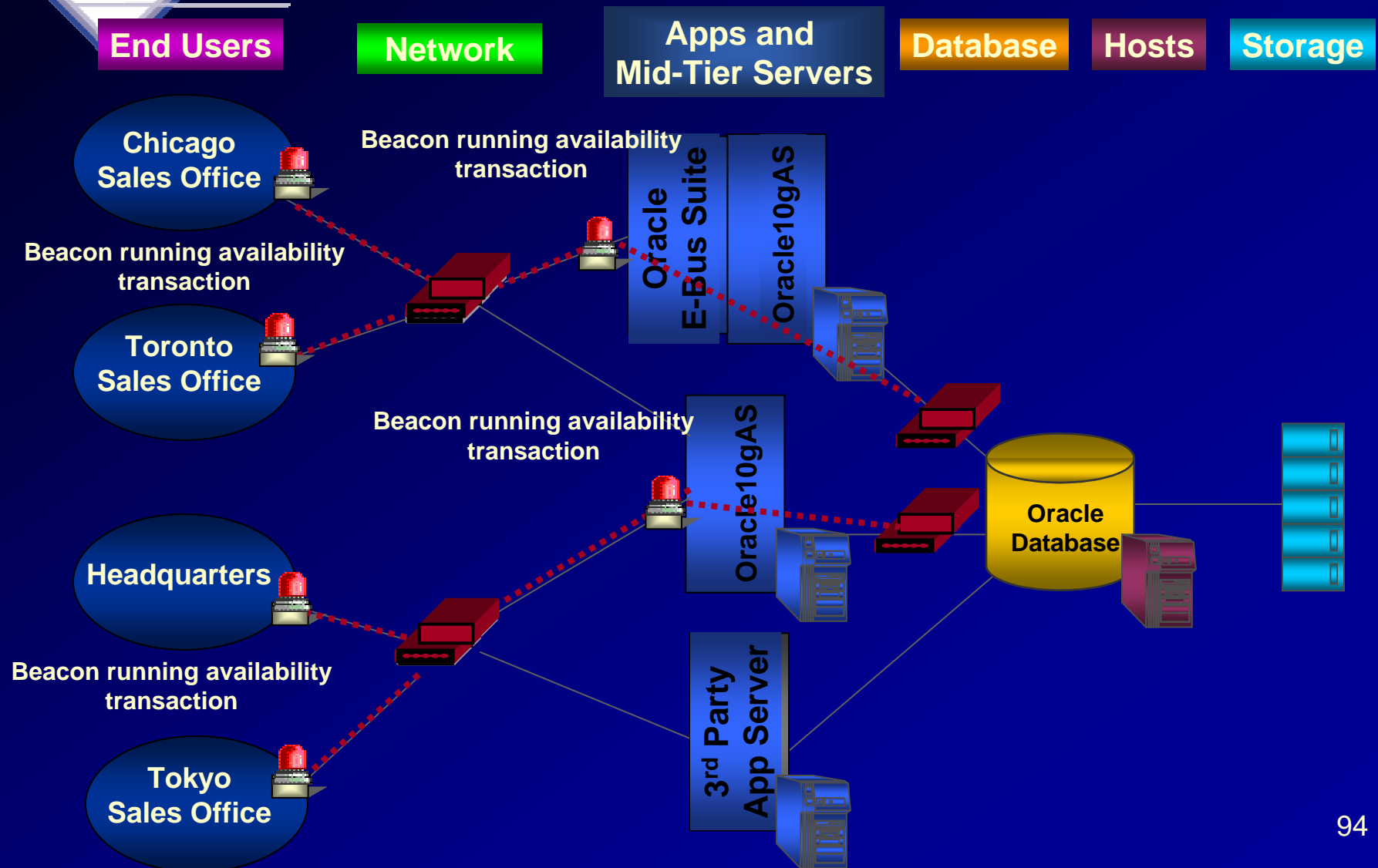
SQL Tuning History
The following SQL tuning tasks provide the recommendations to tune this SQL statement.

Advisor Task Name	Advisor Task Owner	Task Completion
SQL_TUNING_1144959718826	SYS	Apr 13, 2006 3:23:45 PM

Statistics Activity Plan **Tuning Information** [Schedule SQL Tuning Advisor](#)



Availability Monitoring Topology



3rd party – Tuning with Toad



Toad for Oracle Trial Version - [SYSTEM@CORPMIG1 SQL Editor (<No name>)]

SQL File Edit Grid SQL Editor Create Database Tools View DBA Debug Team Coding Window Help

SYSTEM@CORPMIG1 <default>

Set Schema SYSTEM <named SQL>

<No name>

```
1 select max(nvl(updated_date,created_date))
2 from sa_header a
3 where emp_id = 1316;
```

Explain Plan

Data Grid Script Output Explain Plan Auto Trace DBMS Output (disabled) Query Viewer

Operation	Object Name	Rows	Bytes	Cost	Object Node	In/Out
SELECT STATEMENT Optimizer Mode=ALL_ROWS		1		14		
SORT AGGREGATE		1	17			
TABLE ACCESS FULL	ICC_DATA.SA_HEADER	7	119	14		

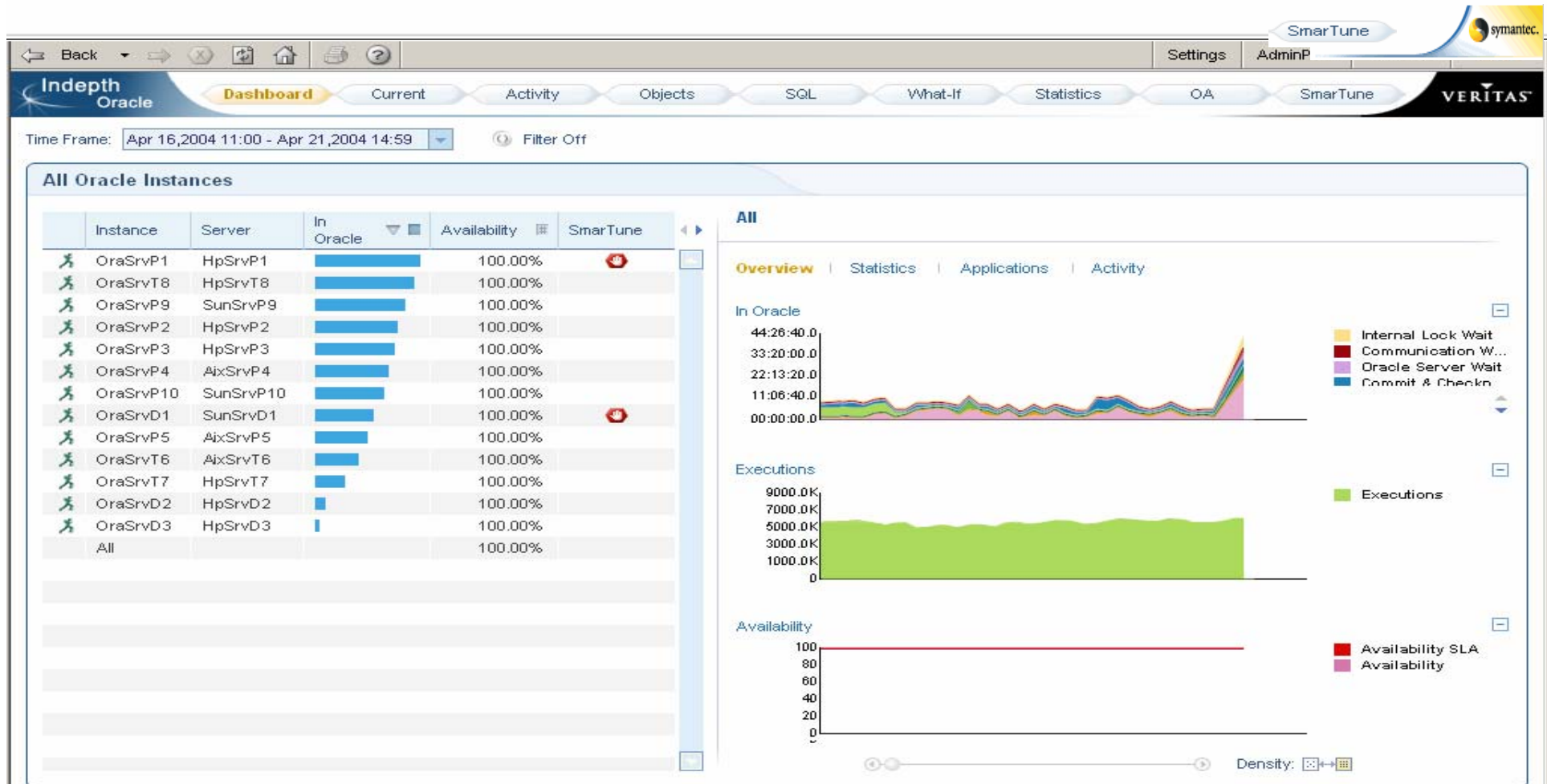
80 msec SYSTEM@CORPMIG1 Modified

Schema Browser SQL Editor Schema Browser Schema Browser Schema Browser

AutoCommit is OFF CAPS NUM INS



3rd party – Indepth Oracle





3rd party – Indepth Oracle

Back

Settings

AdminPoint

StartPoint

Indepth Oracle

Dashboard

Current

Activity

Objects

SQL

What-If

Statistics

SmarTune

symantec.

Time Frame: Jun 06,2004 12:00 - Jun 07,2004 12:59

Instance: OraSrvP1(HpSrvP1)

Findings

Changes | Instance

Finding	Rank	Potential Gain (%)	Occurrence
Shared pool too small or not configured	1	18.15%	307
SQL*Net overhead due to application e	2	9.08%	302
Insufficient shared server processes	3	7.43%	263
Too many small transactions	4	5.78%	413
Extent management contention for obje	5	5.45%	11
Block ITL contention or unique index ke	6	5.23%	12
Hot block	7	4.24%	1
Too many hard parsed statements	8	3.54%	413
Extent management contention during s	9	2.27%	415
Inefficient cursor caching	10	2.21%	2

Shared pool too small or not configured properly

Highlights | Advice | Shared pool waits and statistics | Background

To improve performance, choose the approach that best fits your needs. Following is a list of possible solutions:

- Increase your shared pool size by doing one of the following:
 - In Oracle 9i and higher, run the command `alter system set shared_pool_size=XXXXXX;`
 - Increase the shared_pool_size init parameter.
- Pin heavily used PL/SQL packages by running `dbms_shared_pool.keep('xxxxxx');`

Note: If you increase the total size of your SGA, make sure not to exceed the available physical memory of the Oracle server, to avoid paging.

Consider also one of the following actions:

- Make sure objects are not analyzed too frequently, unless there is a significant change in their content.
- Avoid using synonyms. Instead, do one of the following:
 - Use fully qualified names, such as APPS.TAB1, in your SQL statements.
 - Run the following command to make your application change from the current schema to the schema that owns all objects: `alter session set current_schema=APPS`

See Also

To examine the size of your shared pool, open the [Objects workspace](#).

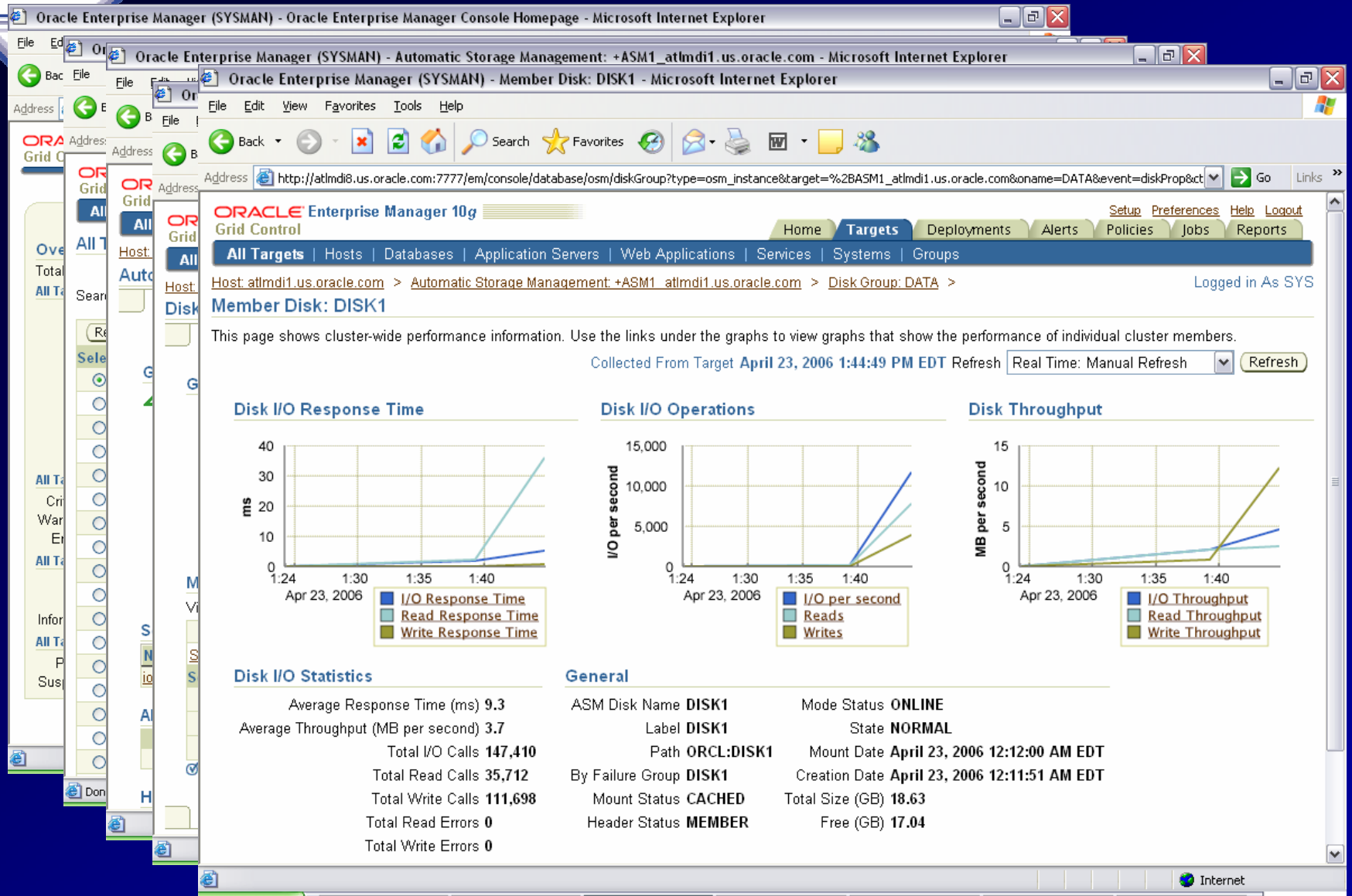
To examine how your application is waiting for shared pool resources and how this is related to parsing, click the [Parse Waits and Statistics tab](#).

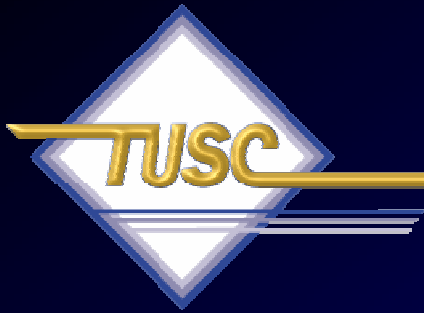


Tip #11

Where does ASM Fit?

Grid Control – 10gR2; A Look at ASM



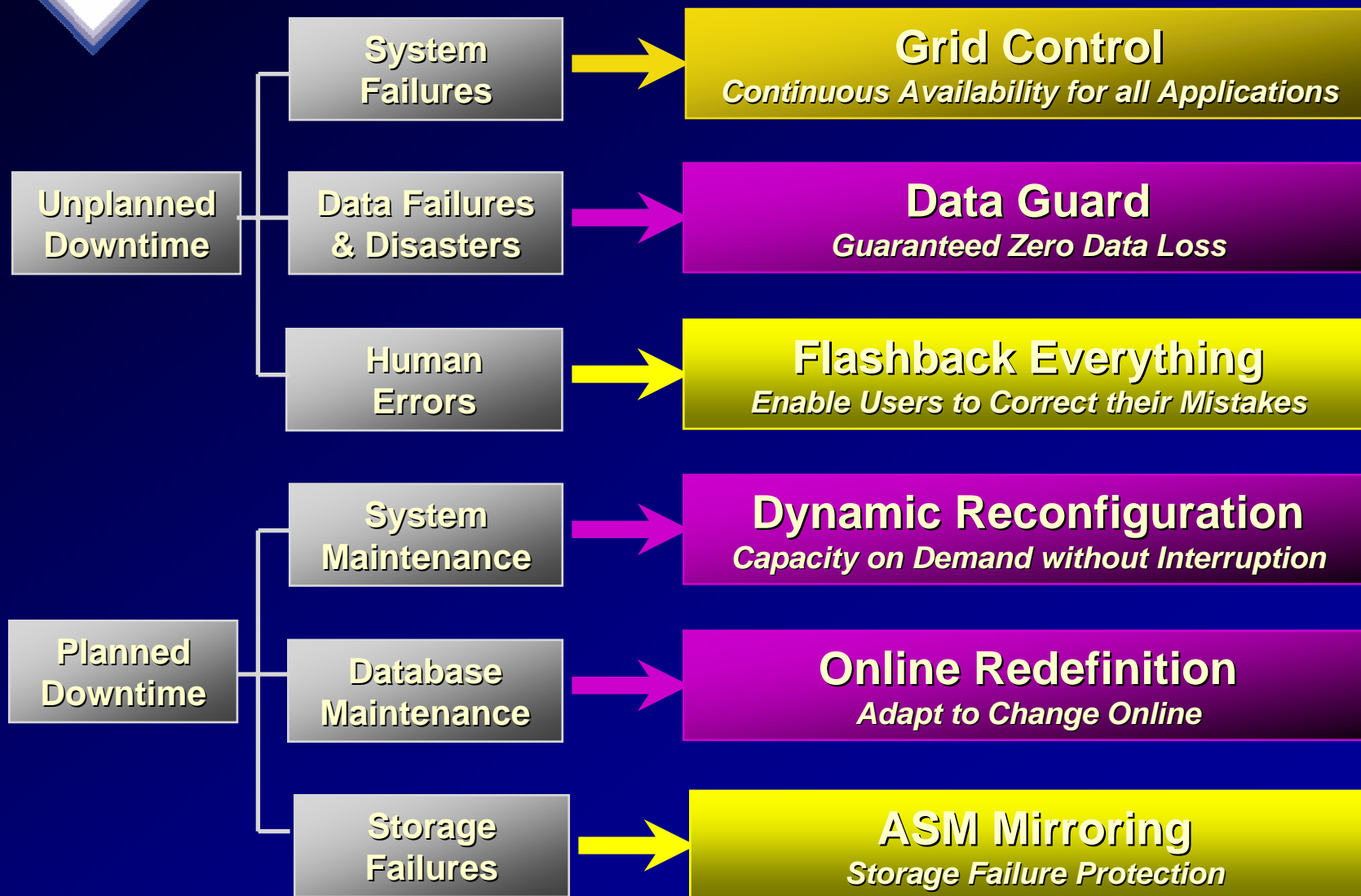


Tip #12

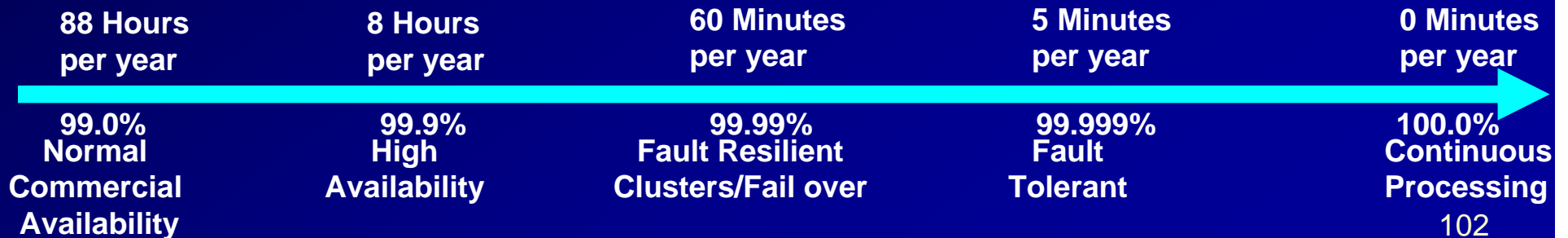
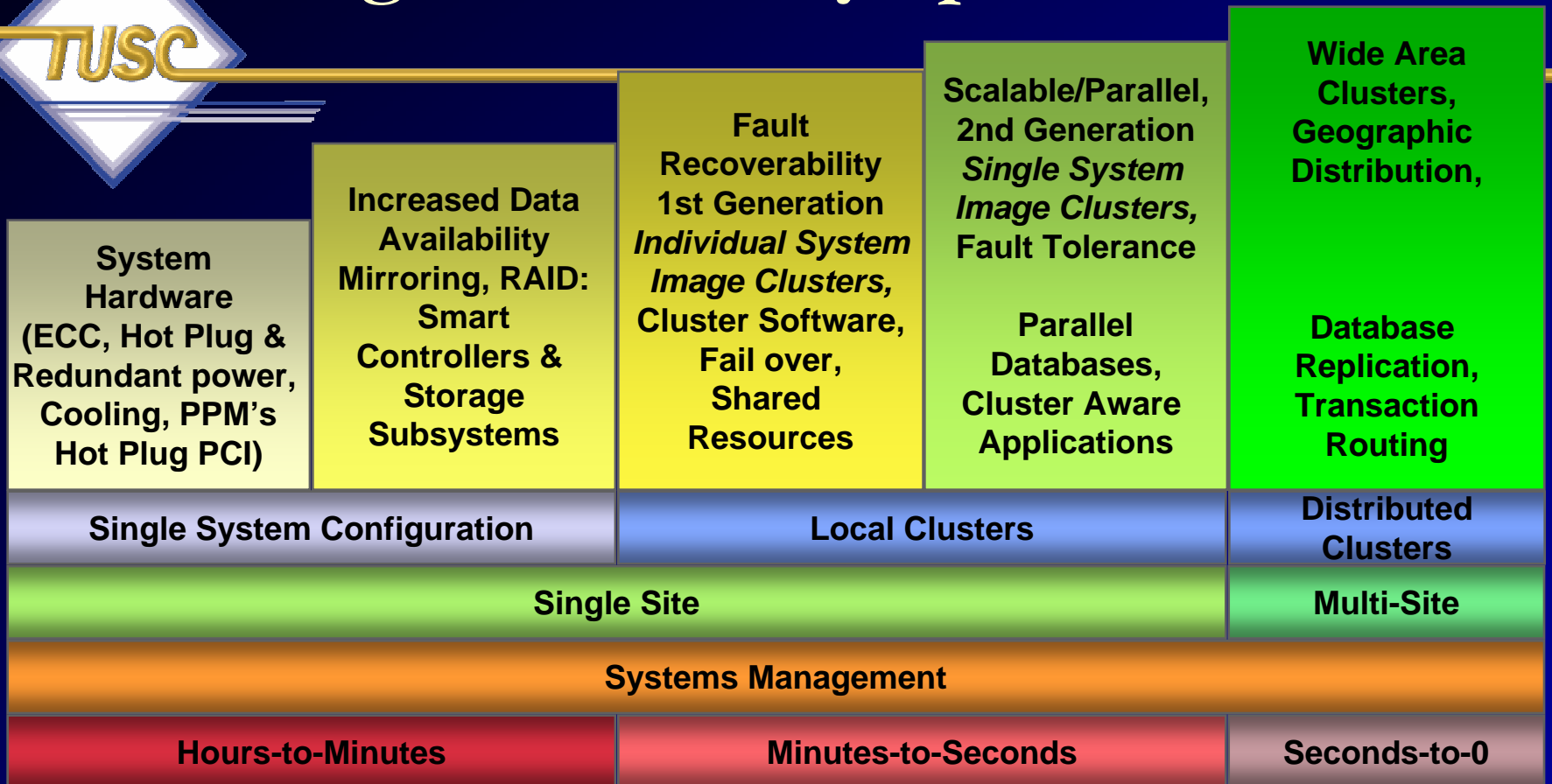
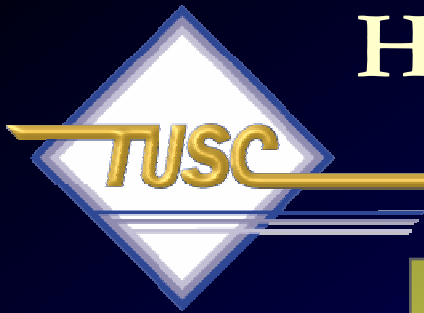
Use all parts of Oracle for High Availability Grids



Oracle10g Database - ensures business information is always available

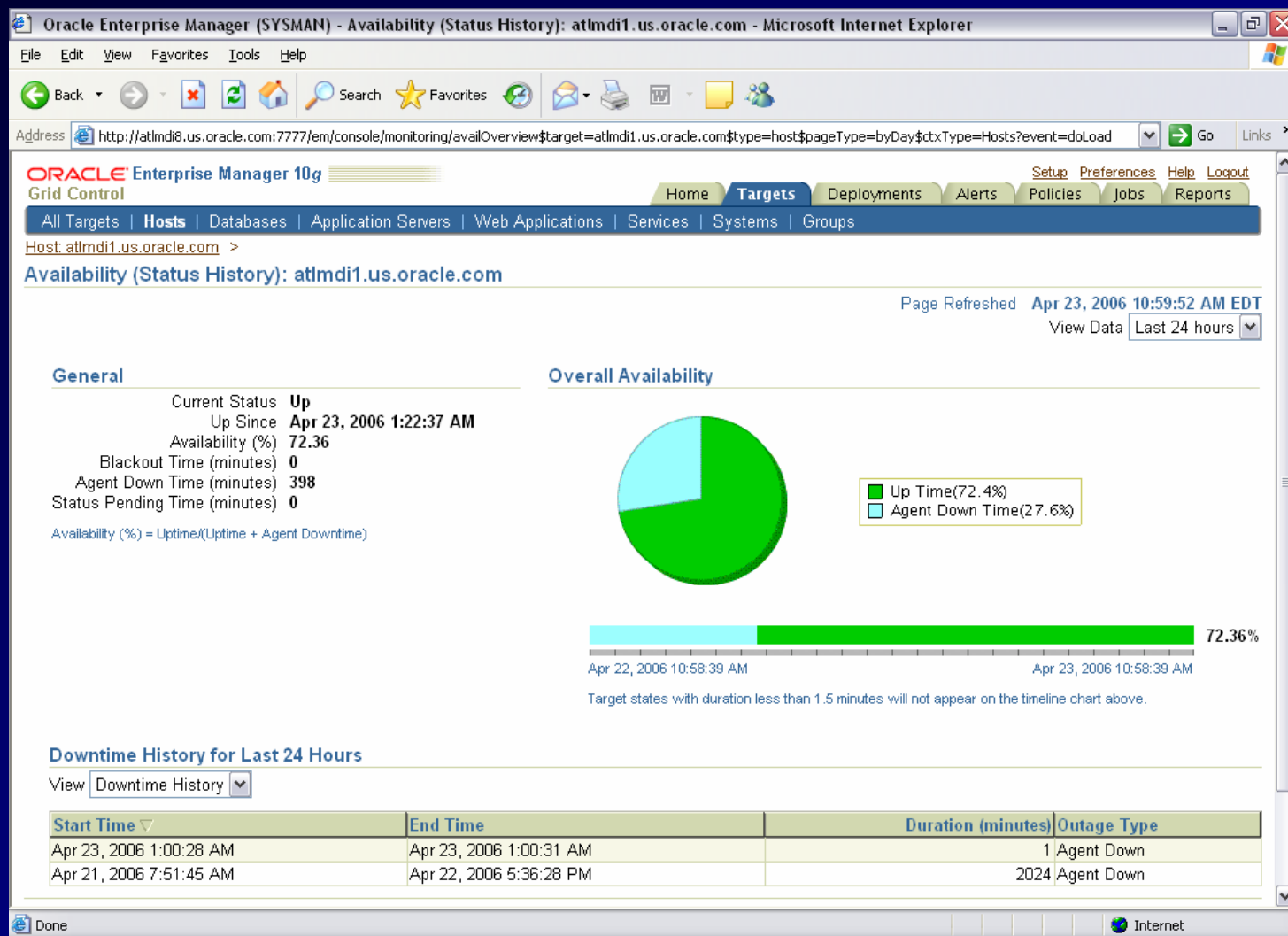


High Availability Spectrum





Grid Control – 10gR2; Host Availability & Quick Looks!



gR2;

!

Oracle Enterprise Manager (SYSMAN) - Oracle Enterprise Manager Console Homepage - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - All Targets - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - All Targets - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Databases - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Address: http://atlmidi8.us.oracle.com:7777/em/console/rac/racSiteMap?type=rac_database&target=ioug&pageNum=5

Cluster: IOUG >

Cluster Database: ioug

Latest Data Collected From Target Apr 23, 2006 11:19:22 AM EDT Refresh

Home Performance Administration Maintenance Topology

Cluster Database topology presents the host view of a cluster database. Database instances, ASM instances, listeners, and interfaces information is available. You can optionally view configuration information. These views can also be used to launch various administration and configuration functions.

☒ Show Only Hosts With Instances ☐ Show Configuration Details View Data Manually

Overview

Selection Details

Nothing Selected

Summary

Status Up

Up Instances 6 (↑6)

Cluster IOUG

Alerts 5 8

Name: ioug_ioug1

Type: Database Instance

Host: atlmidi1.us.oracle.com

Critical Alerts: 1

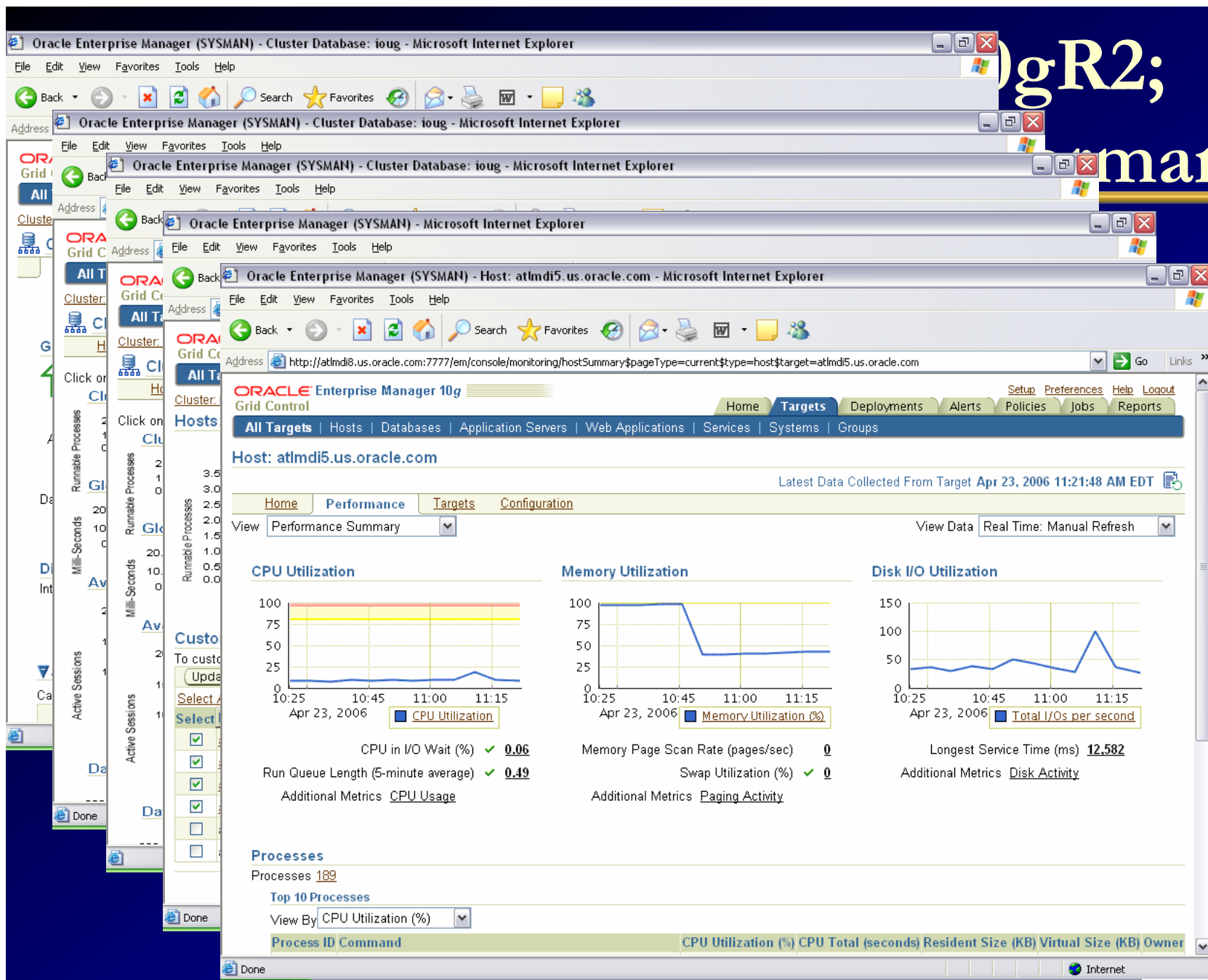
Warning Alerts: 1

Status: Up

ASM: +ASM1_atlmidi1.us.oracle.com

Internet

10gR2; Performance



Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Cache Coherency - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Cache Coherency - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster: IOUG - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Hardware Details - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Hardware Details - Microsoft Internet Explorer

Address: http://atlmidi8.us.oracle.com:7777/em/console/ecm/track/hc/view/hardware?type=host&target=atlmidi1.us.oracle.com

Name	Vendor	Bus Type	Frequency (MHZ)	PROM Revision
0000:00	Intel Corporation	PCI	66	0c
0000:00	Intel Corporation	PCI	66	0c
0000:00	Intel Corporation	PCI	66	0c
0000:00	Intel Corporation	PCI	66	02
0000:00	Intel Corporation	PCI	66	02
0000:00	Intel Corporation	PCI	66	02
0000:00	Intel Corporation	PCI	66	02
0000:00	Intel Corporation	PCI	66	02
0000:00	Intel Corporation	PCI	66	02
0000:01	Intel Corporation	PCI	66	09
0000:01	Intel Corporation	PCI	66	09
0000:02	QLogic Corp.	PCI	66	02
0000:03	Intel Corporation PRO/1000 MT Dual Port Network Connection	PCI	66	03
0000:03	Intel Corporation PRO/1000 MT Dual Port Network Connection	PCI	66	03
0000:04	Intel Corporation	PCI	66	27

Network Interfaces

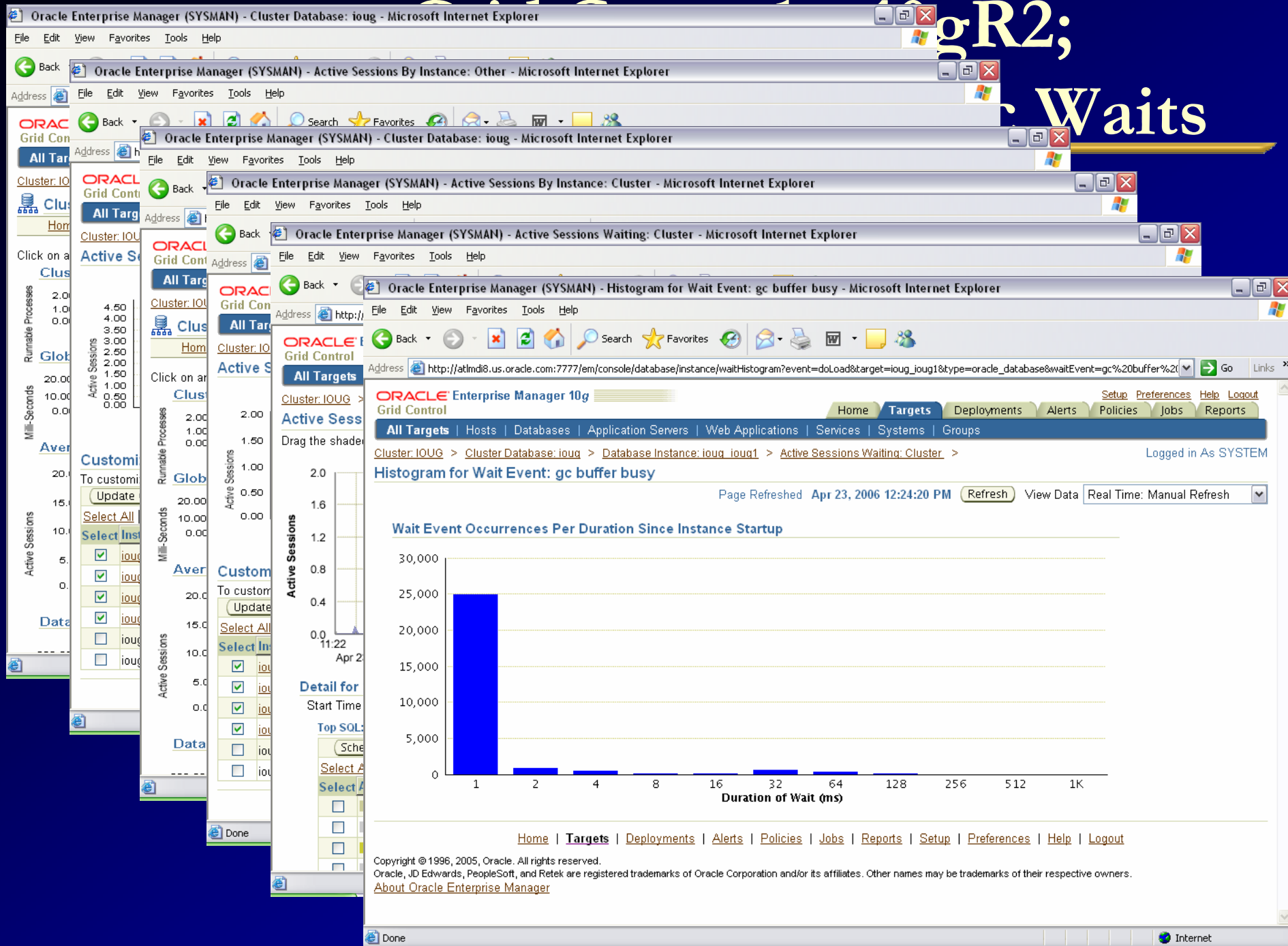
Name	INET Address	Maximum Transfer Unit	Broadcast Address	Mask	Flags	MAC Address	Hostname Aliases
lo	192.168.2.2	1500	192.168.2.255	255.255.255.0	BROADCAST,MULTICAST,RUNNING,UP	00:04:23:B1:41:C8	
eth0	192.168.2.2	1500	192.168.2.255	255.255.255.0	BROADCAST,MULTICAST,RUNNING,UP	00:04:23:B1:41:C8	
eth0:2	192.168.2.2	1500	192.168.2.255	255.255.255.0	BROADCAST,MULTICAST,RUNNING,UP	00:04:23:B1:41:C8	
eth1	192.168.2.2	1500	192.168.2.255	255.255.255.0	BROADCAST,MULTICAST,RUNNING,UP	00:04:23:B1:41:C8	

TIP Some Information may not be available depending upon the Hardware platform.

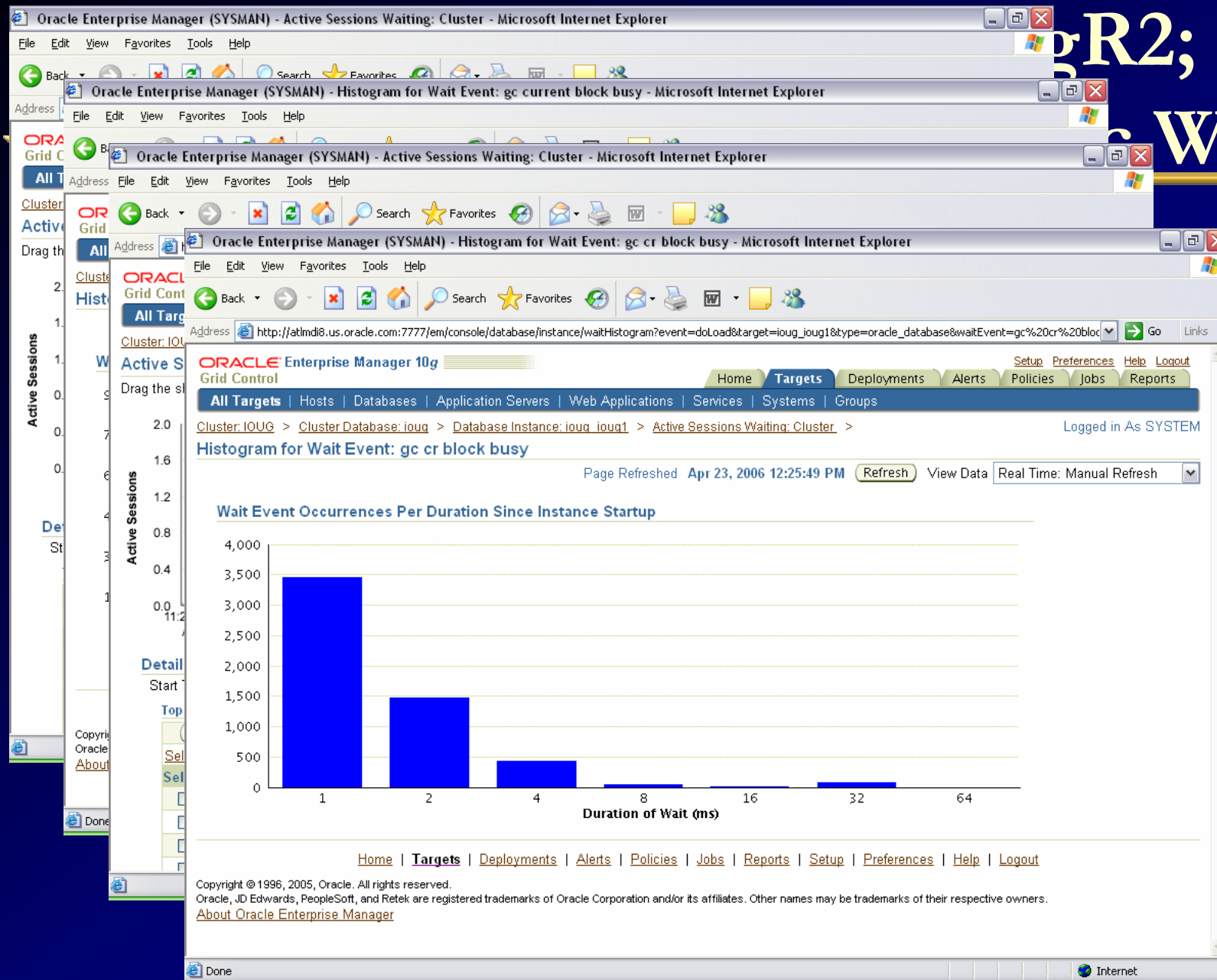
[Home](#) | [Targets](#) | [Deployments](#) | [Alerts](#) | [Policies](#) | [Jobs](#) | [Reports](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[About Oracle Enterprise Manager](#)

gR2; Waits



gR2; c Waits



Grid Control 10gP2

ery!

Oracle Enterprise Manager (SYSMAN) - Active Sessions Waiting: Cluster - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Active Sessions Waiting: Cluster - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - SQL Details: 75621g9y3xmvd - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - SQL Details: 0bzhqhjh9mpaa - Microsoft Internet Explorer

Address http://atlmidi8.us.oracle.com:7777/em/console/database/instance/sqlDetail?event=doLoad&target=ioug_ioug1&type=oracle_database&sql_id=0bzhqhjh9mpaa&planHashV

ORACLE Enterprise Manager 10g Grid Control

Home Targets Deployments Alerts Policies Jobs Reports

All Targets Hosts Databases Application Servers Web Applications Services Systems Groups

Cluster: IOUG > Cluster Database: ioug > Database Instance: ioug_ioug1 > Top Activity > Logged in As SYSTEM

SQL Details: 0bzhqhjh9mpaa

Switch to SQL ID View Data Real Time: Manual Refresh Refresh Schedule SQL Tuning Advisor

Text

```
INSERT INTO CUSTOMERS
(CUSTOMER_ID ,CUST_FIRST_NAME ,CUST_LAST_NAME ,NLS_LANGUAGE ,NLS_TERRITORY ,CREDIT_LIMIT ,CUST_EMAIL ,ACCC
VALUES (:B9 , :B4 , :B3 , :B8 , :B7 , FLOOR(DBMS_RANDOM.VALUE (:B6 , :B5 )), :B4 ||'.'||:B3 ||'@'||'oracle.
(DBMS_RANDOM.VALUE (:B2 , :B1 )))
```

Details

Select the plan hash value to see the details below. Plan Hash Value 1388734953

Statistics Activity Plan Tuning Information

Summary

Drag the shaded box to change the time period for the detail section below.

Active Sessions

11:27 11:35 11:40 11:45 11:50 11:55 12 PM 12:05 12:10 12:15 12:20 12:25

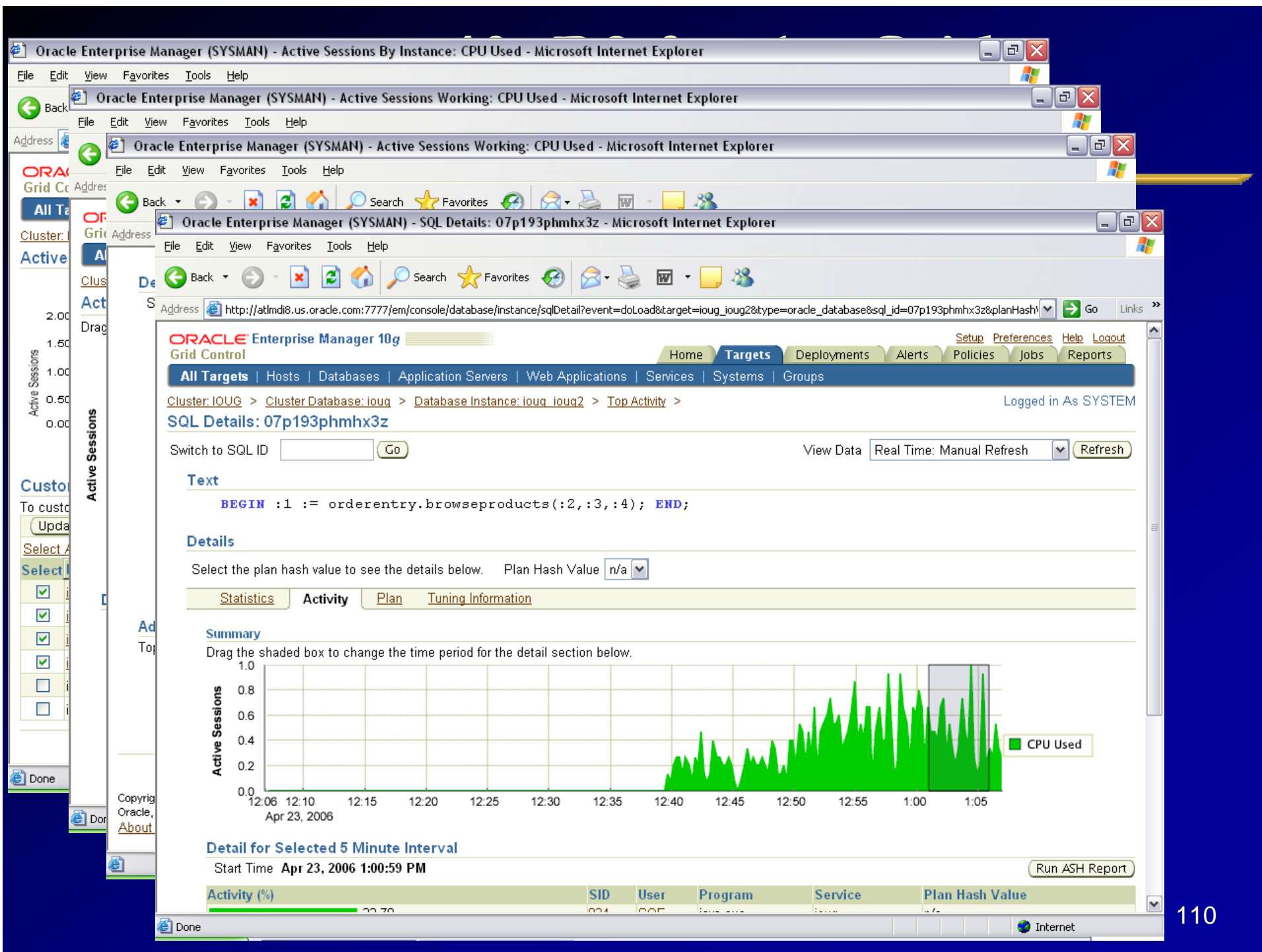
Apr 23, 2006

- gc current block 3-way
- gc current multi block request
- db file scattered read
- db file sequential read
- CPU Used

Copyright Oracle, Inc. About O

Done

Internet



R2;

Oracle Enterprise Manager (SYSMAN) - Databases - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Cluster Database: ioug - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Database Instance: ioug_ioug1 - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Database Instance: ioug_ioug1 - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Automatic Workload Repository - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Snapshots - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Snapshot Details - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Snapshot Details - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Snapshot Details - Microsoft Internet Explorer

Oracle Enterprise Manager (SYSMAN) - Snapshot Details - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Mail News RSS Feeds

Address http://atlmind8.us.oracle.com:7777/em/console/database/instance/swrfSnapshotDetails?target=ioug_ioug1&type=oracle_database&startID=25&endID=26&event=viewRe Go Links

ORACLE Enterprise Manager 10g

Grid Control Home Targets Deployments Alerts Policies Jobs Reports

All Targets | Hosts | Databases | Application Servers | Web Applications | Services | Systems | Groups

Cluster: IOUG > Cluster Database: ioug > Database Instance: ioug_ioug1 > Automatic Workload Repository > Snapshots > Logged in As SYSTEM

Snapshot Details View ADDM Run

Details Report

WORKLOAD REPOSITORY report for

DB Name	DB Id	Instance	Inst num	Release	RAC	Host
IOUG	325326670	ioug1	1	10.2.0.2.0	YES	atlmind1

	Snap Id	Snap Time	Sessions	Cursors/Session
Begin Snap:	25	23-Apr-06 11:30:34	61	3.6
End Snap:	26	23-Apr-06 11:40:34	77	3.7
Elapsed:		10.01 (mins)		
DB Time:		23.14 (mins)		

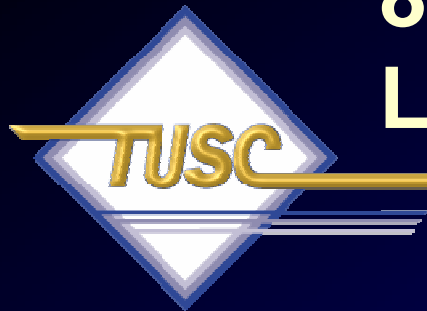
Report Summary

Cache Sizes

	Begin	End		
Buffer Cache:	848M	832M	Std Block Size:	8K
Shared Pool Size:	272M	268M	Log Buffer:	14,360K

Load Profile

Done Internet



8 Exabytes: Look what fits in one 10g Database!

- 1000 Internets (8P each)

or

- 400,000 Libraries of Congress
(20T each and 17-18 million books in each)

or

- 8 Billion Movies on CD (1 G each)

or

- 8 Billion Pickup Trucks of Documents (1G each)

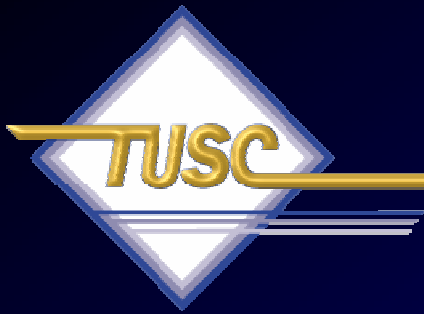
or

- 1 Mount Everest filled with Documents (approx.)

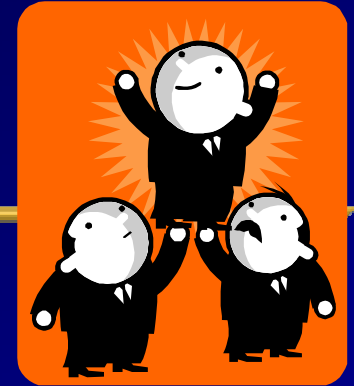
or

- Every piece of data produced each year (2E-5.6E)





Summary



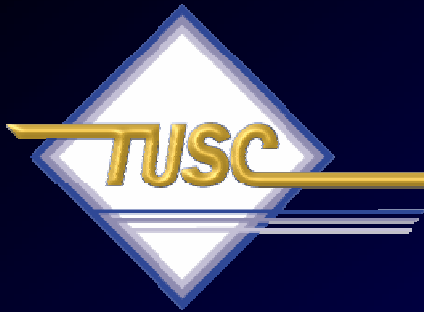
- The Basics, Oracle & Market Direction
- RAC, Grid Basics and Scaling it All
- Tuning the Interconnect & using Statspack/AWR
- Grid Control Basics, Multi-Node & Tuning
- Other quick Tips
- Availability thoughts
- Summary

Thanks for Coming!



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www.tusc.com



“Success usually comes to those that are too busy to be looking for it.”

- Henry David Thoreau

Oracle Corporation – 25th+ Anniversary

TUSC





Save the Date!



April 15 - 19, 2007

Mandalay Bay Resort and Casino
Las Vegas, Nevada



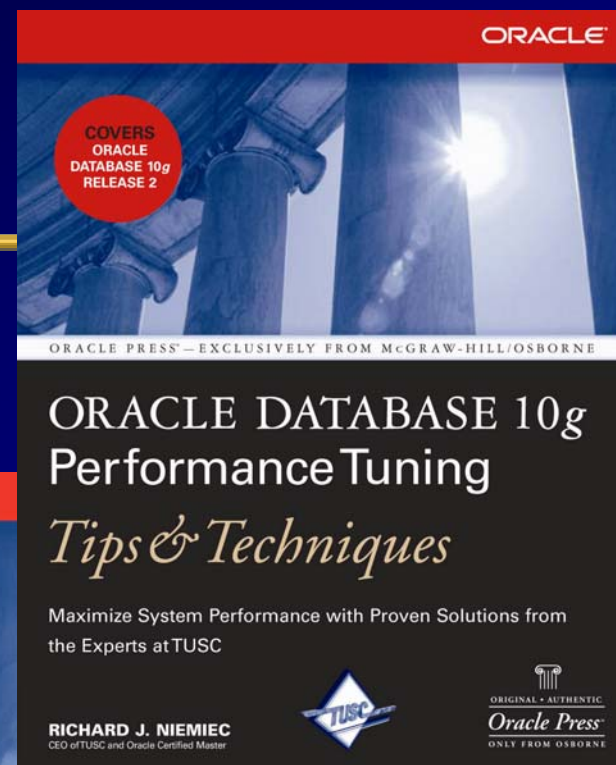
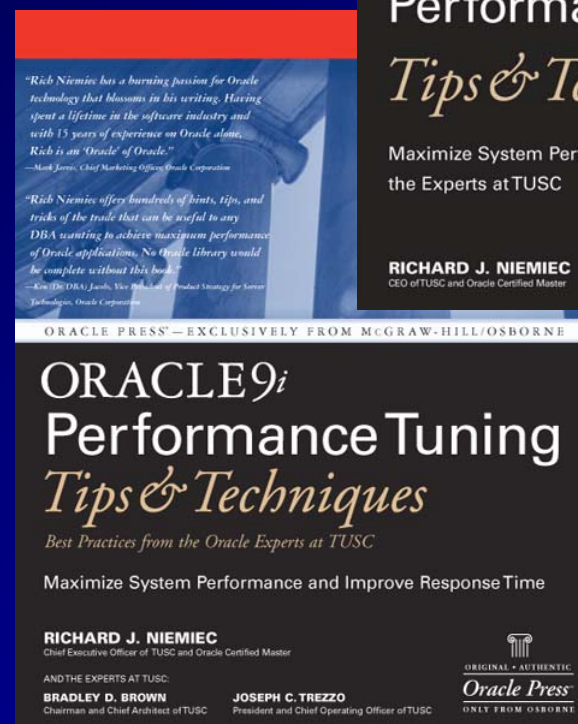
For the Complete Technology & Database Professional





For More Information

- www.tusc.com
- *Oracle9i Performance Tuning Tips & Techniques; Richard J. Niemiec; Oracle Press (May 2003)*
- *Oracle 10g Tuning (Early 2007)*



"If you are going through hell, keep going" - Churchill

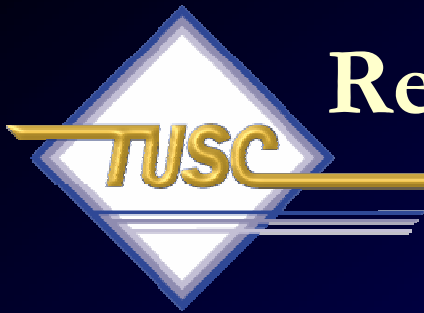


Get good Information:

Your Team extends to TUSC!

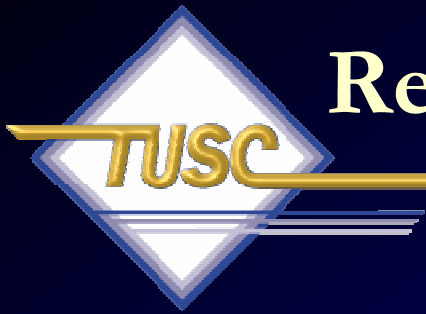
“The strength of the team is each individual member...the strength of each member is the team.”

--Phil Jackson



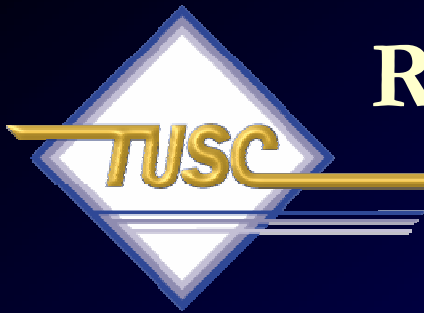
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- *Oracle PL/SQL Tips and Techniques*, Joseph P. Trezzo; Oracle Press
- *Oracle9i Web Development*, Bradley D. Brown; Oracle Press
- *Using Oracle RAC and ASM to enable scaling on Linux with low cost storage*, Grant McAlister, Amazon, 2005
- *Special thanks to Steve Adams, Mike Ault, Brad Brown, Don Burleson, Kevin Gilpin, Herve Lejeune, Kirk McGowan, Erik Peterson, Randy Swanson and Joe Trezzo.*



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- <http://geocities.com/pulliamrick/>
- *Tips for Tuning Oracle9i RAC on Linux*, Kurt Engeleiter, Van Okamura, Oracle
- *Leveraging Oracle9i RAC on Intel-based servers to build an "Adaptive Architecture"*, Stephen White, Cap Gemini Ernst & Young, Dr Don Mowbray, Oracle, Werner Schueler, Intel
- Oracle 10gR2 New Features & Strategies; Jim Hawkins
- Thanks to The Winter Group for the Great Top 10!!



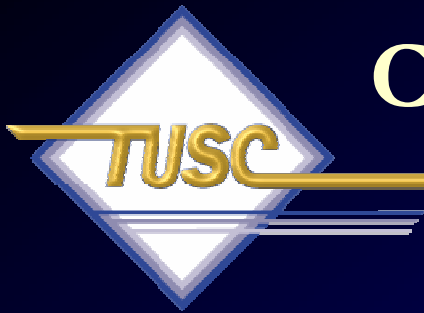
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- *Running YOUR Applications on Real Application Clusters (RAC); RAC Deployment Best Practices*, Kirk McGowan, Oracle Corporation
- *The Present, The Future but not Science Fiction; Real Application Clusters Development*, Angelo Pruscino, Oracle
- *Creating Business Prosperity in a Challenging Environment*, Jeff Henley
- Oracle Real Application Clusters, Murali Vallath.
- Oracle 10g Real Application Clusters Installation For Intel Linux x86, John Smiley, TUSC (Available on OTN)
- Build Your Own Oracle RAC 10g Cluster on Linux and FireWire, *by Jeffrey Hunter* (Available on OTN)
- **Oracle Database 10g - The World's First Self-Managing, Grid-Ready Database Arrives**, Kelli Wiseth, Oracle Technology Network, 2003, otn.oracle.com



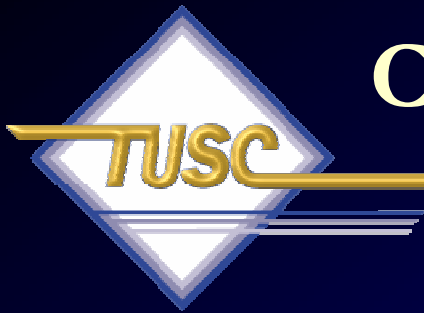
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- *Oracle RAC and Linux in the real enterprise*, Mark Clark, Director, Merrill Lynch Europe PLC, Global Database Technologies



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