

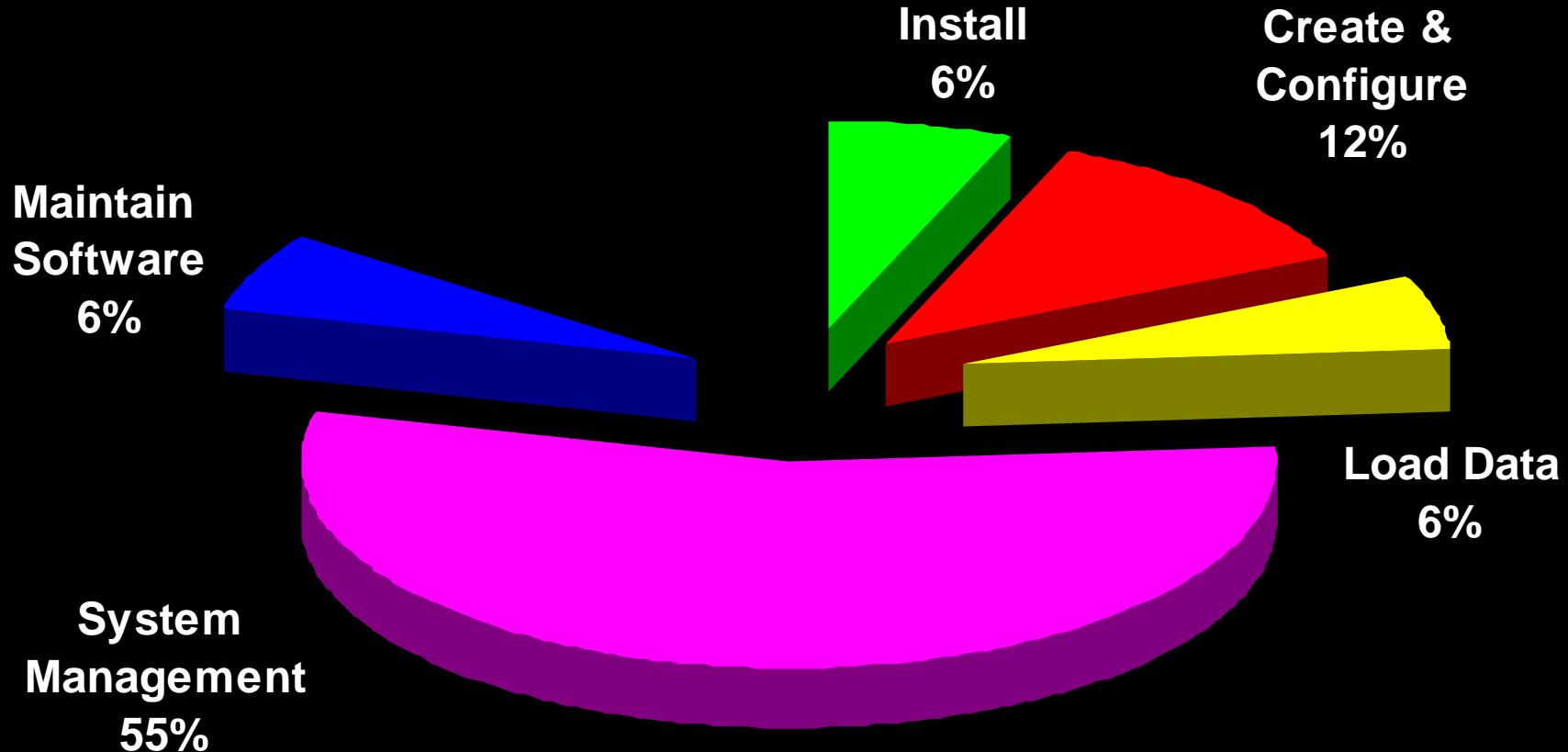
Oracle Database 10^g: Managing the Self- Managing Database

הדר פئيس

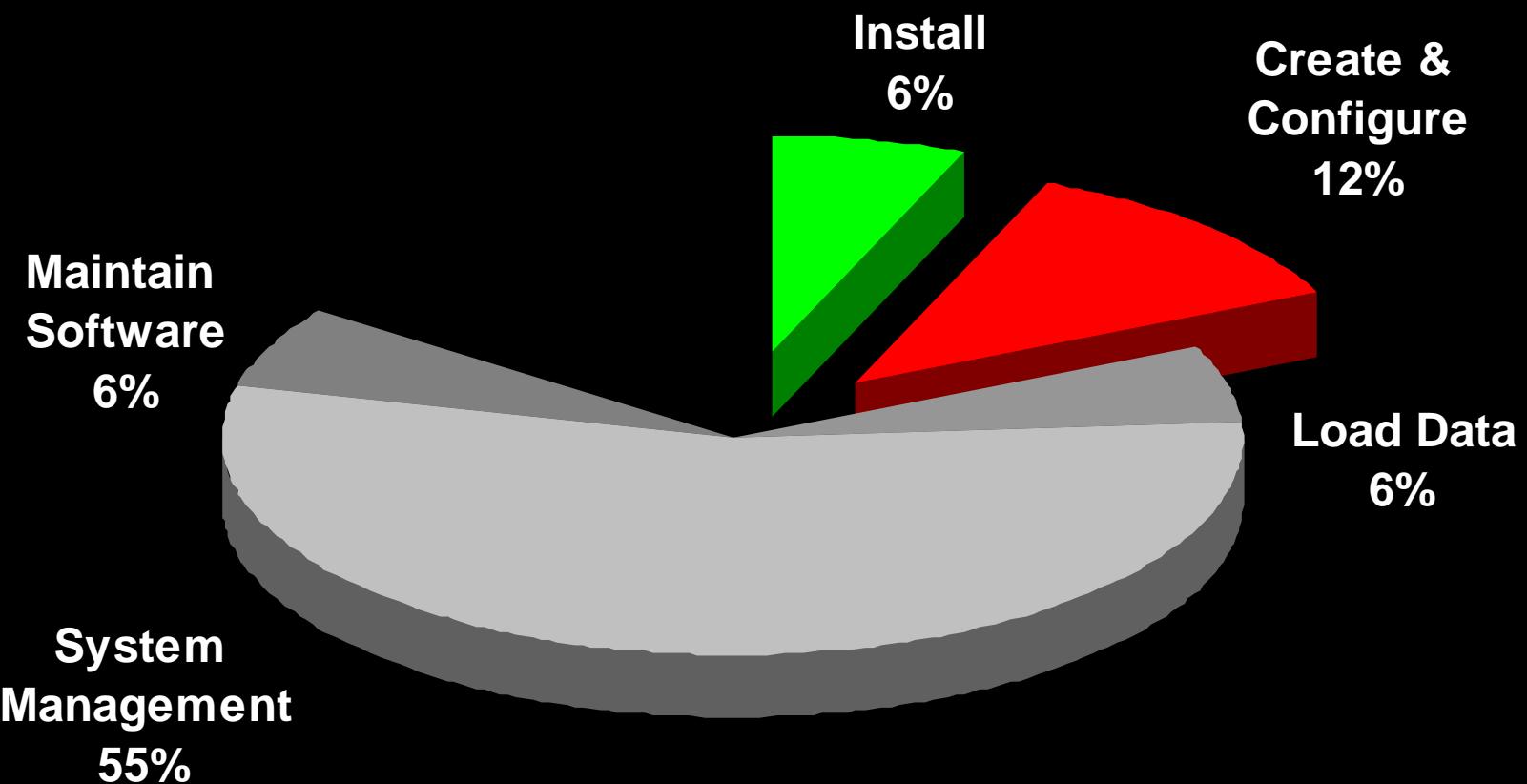
יונתן טולדנו

Certified Oracle 10^g Technician

How DBAs Spend Their Time?



How DBAs Spend Their Time?



Software Installation

- Fast lightweight install
 - Major redesign of installation process
 - Single CD, 20 Minutes
 - CPU, memory, disk space consumption greatly reduced
 - Extremely lightweight client install (3 files) using Oracle Instant Client
- Automation of All Pre and Post Install Steps
 - Validate OS Configuration, patches, resource availability etc.
 - Configure all components (listeners, database, agent, OMS, OID etc.) for automatic startup and shutdown
- Enhanced silent install

Simplified Creation & Configuration

- Greatly reduced database creation time using pre-configured, ready-to-use database
- 90% reduction of initialization parameters: < 30 Basic parameters
- Automatically setup common tasks, e.g. backups
- Automatically configures LDAP server
- Automatic Shared Server Set-up
- Easy Connect Naming

Basic Parameters

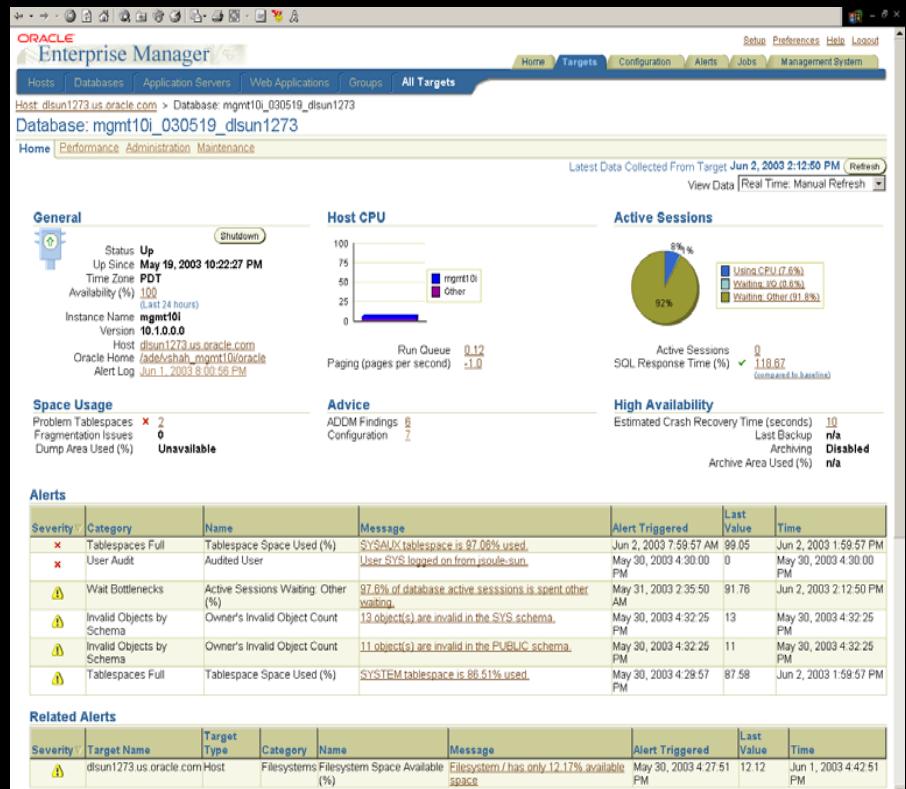
- compatible
- processes
- sessions
- pga_aggregate_target
- nls_language
- nls_territory
- db_domain
- shared_servers
- instance_number
- cluster_database
- db_block_size
- sga_target
- control_files
- db_name
- db_recovery_file_dest
- remote_listener
- db_recovery_file_dest_size
- db_create_online_log_dest_n
- db_create_file_dest
- log_archive_dest_n
- log_archive_dest_state_n
- remote_login_passwordfile
- db_unique_name

Simplified Upgrade

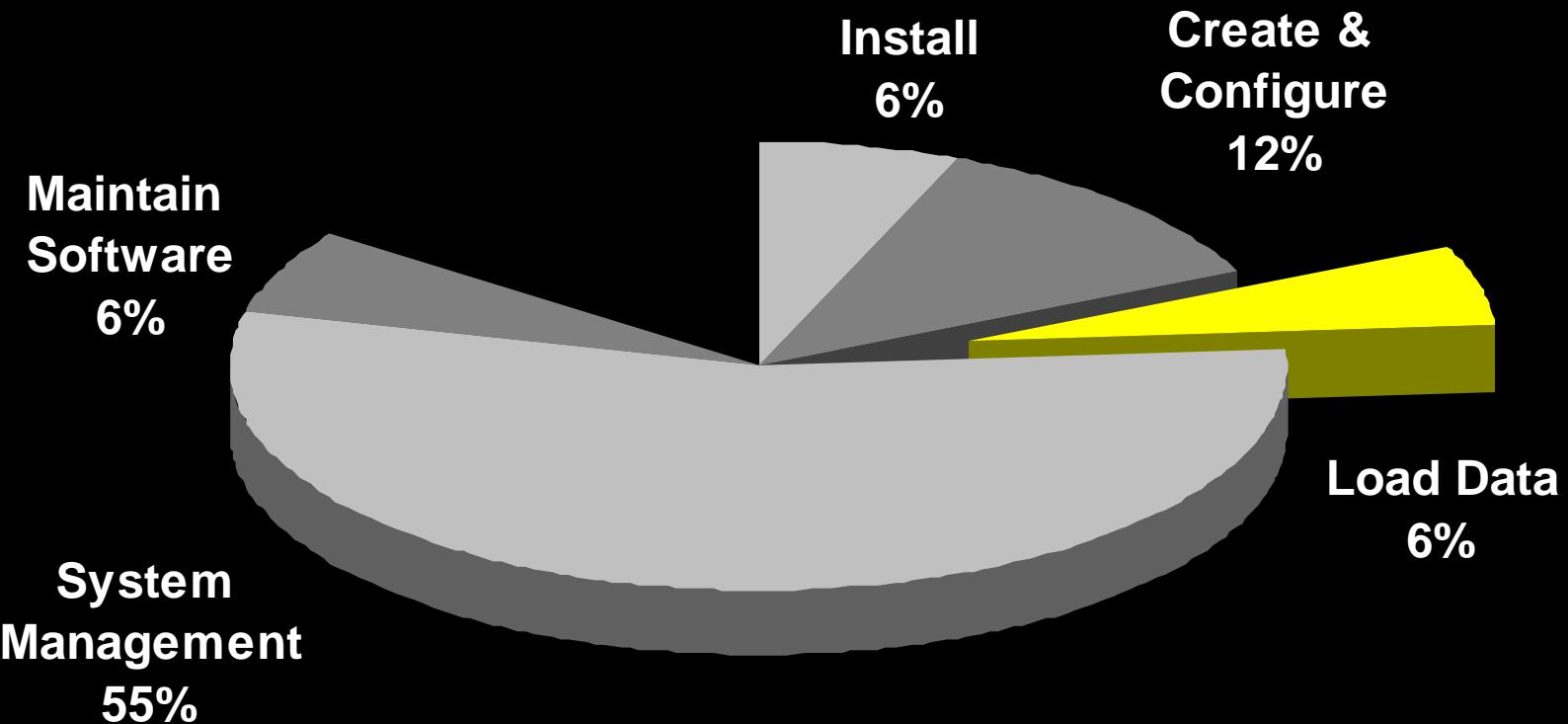
- Pre upgrade checks (e.g. parameter settings)
- Post upgrade status checks
- Time estimator
- Re-startable
- Guide administrators in using best practices

Out-of-the-Box Database Control

- No separate install
 - Fully functional administration and monitoring after database creation
 - Listener discovery, configuration & monitoring



How DBAs Spend Their Time?



Data Pump: What is it?

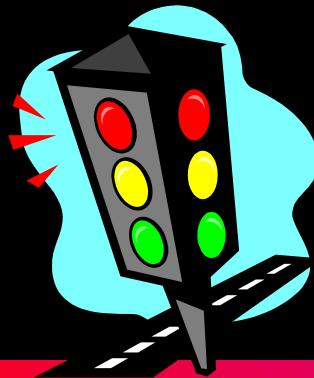
- Server-based facility for high performance loading and unloading of data and metadata
- Callable: DBMS_DATAPUMP. Internally uses DBMS_METADATA
- Data written in Direct Path stream format. Metadata written as XML
- New clients expdp and impdp: Supersets of original exp / imp.
- Foundation for Streams, Logical Standby, Grid, Transportable Tablespaces and Data Mining initial instantiation.

Features: Performance!!

- Automatic, two-level parallelism
 - Direct Path for inter-partition parallelism
 - External Tables for *intra*-partition parallelism
 - Simple: parallel=<number of active threads>
 - Dynamic: Workers can be added and removed from a running job in Enterprise Edition
 - Index builds automatically “parallelized” up to degree of job
- Simultaneous data and metadata unload
- Single thread of data unload: 1.5-2X exp
- Single thread of data load: 15X-40X imp
- With index builds: 4-10X imp

Features: Checkpoint / Restart

- Job progress recorded in a “Master Table”
- May be explicitly stopped and restarted later:
 - Stop after current item finishes or stop immediate
- Abnormally terminated job is also restartable
- Current objects can be skipped on restart if problematic



Features: Monitoring



- Flexible GET_STATUS call
- Per-worker status showing current object and percent done
- Initial job space estimate and overall percent done
- Job state and description
- Work-in-progress and errors

Features: Network Mode



- Network import: Load one database directly from another
- Network export: Unload a remote database to a local dumpfile set
 - Allows export of read-only databases
- Data Pump runs locally, Metadata API runs remotely.
- Uses DB links / listener service names, not pipes. Data is moved as ‘insert into <local table> select from <remote table>@service_name’
- Direct path engine is used on both ends
- It’s easy to swamp network bandwidth: Be careful!

Features: Fine-Grained Object Selection

- All object types are supported for *both* operations: export *and* import
- Exclude: Specified object types are excluded from the operation
- Include: Only the specified object types are included. E.g, just retrieve packages, functions and procedures
- More than one of each can be specified, but use of both is prohibited by new clients
- Both take an optional name filter for even finer granularity:
 - INCLUDE PACKAGE: “LIKE ‘PAYROLL%’”
 - EXCLUDE TABLE: “IN (‘FOO’,’BAR’, …)”

New Clients – expdp / impdp



- Similar (but not identical) look and feel to exp / imp
- All modes supported: full, schema, table, tablespace, transportable. Superset of exp / imp
- Flashback is supported
- Query supported by both expdp *and* impdp... *and* on a per-table basis!
- Detach from and attach to running jobs
- Multiple clients per job allowed; but a single client can attach to only one job at a time
- If privileged, attach to and control other users' jobs

New Clients – expdp / impdp



- Interactive mode entered via Ctl-C:
 - ADD_FILE: Add dump files and wildcard specs. to job
 - PARALLEL: Dynamically add or remove workers
 - STATUS: Get detailed per-worker status and change reporting interval
 - STOP_JOB{=IMMEDIATE}: Stop job, leaving it restartable. Immediate doesn't wait for workers to finish current work items... they'll be re-done at restart
 - START_JOB: Restart a previously stopped job
 - KILL_JOB: Stop job and delete all its resources (master table, dump files) leaving it unrestartable
 - CONTINUE: Leave interactive mode, continue logging
 - EXIT: Exit client, leave job running

Features: Other Cool Stuff...

- Can extract and load just data, just metadata or both
- SQLFILE operation generates executable DDL script
- If a table pre-exists at load time, you can: skip it (default), replace it, truncate then load or append to it.
- Space estimates based on allocated blocks (default) or statistics if available
- Enterprise Manager interface integrates 9*i* and 10*g*
- Callable!



Large Internet Company

2 Fact Tables: 16.2M rows, 2 Gb

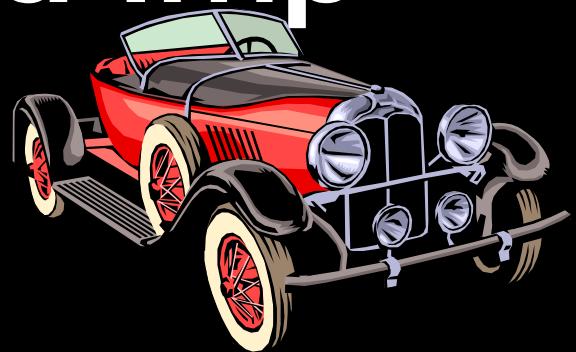
Program	Elapsed		
exp out of the box: direct=y	0 hr	10 min	40 sec
exp tuned: direct=y buffer=2M recordlength=64K	0 hr	04 min	08 sec
expdp out of the box: Parallel=1	0 hr	03 min	12 sec
imp out of the box	2 hr	26 min	10 sec
imp tuned: buffer=2M recordlength=64K	2 hr	18 min	37 sec
impdp out of the box: Parallel=1	0 hr	03 min	05 sec

Keep in Mind:



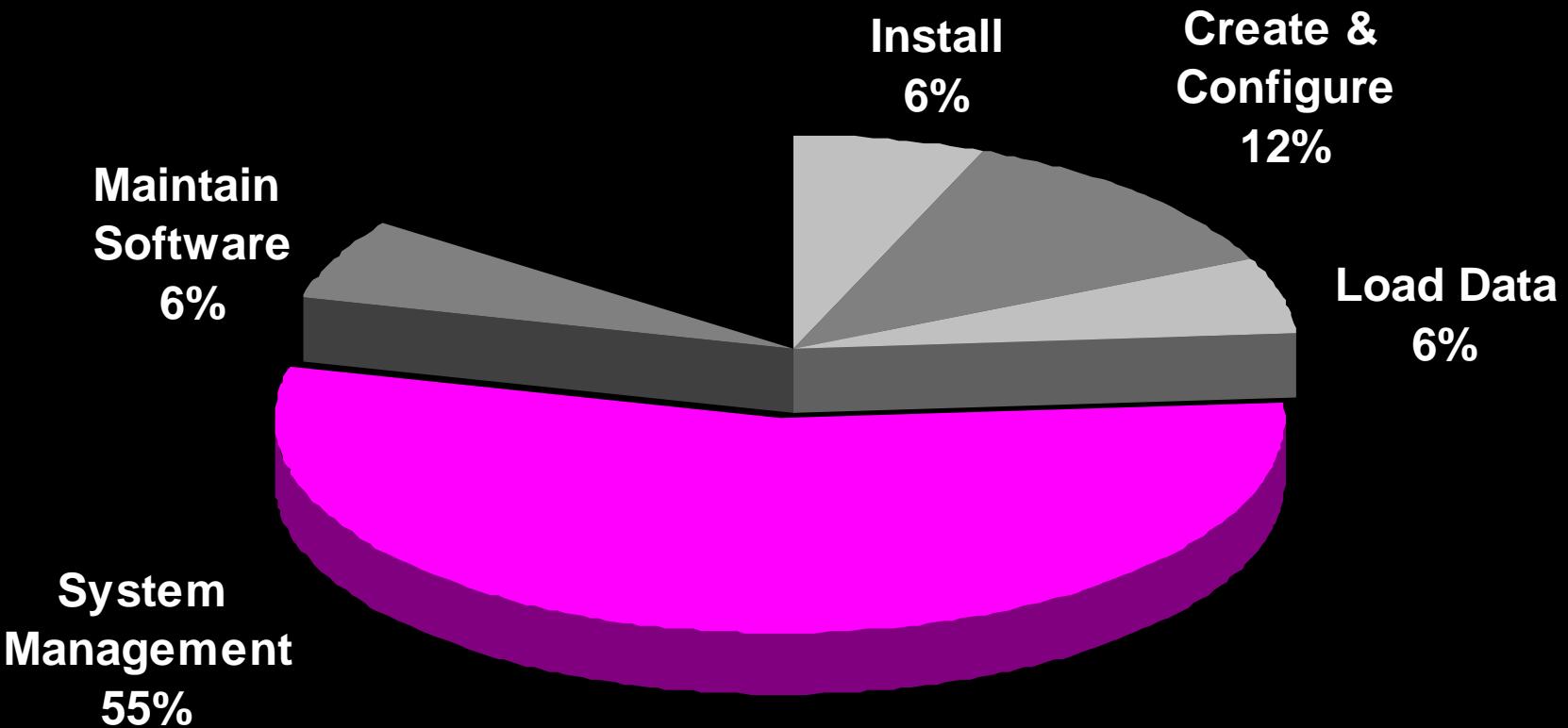
- Designed for ***big*** jobs with lots of data.
 - Metadata performance is about the same
 - More complex infrastructure, longer startup
- XML is bigger than DDL, but much more flexible
- Data format in dump files is ~15% more compact than exp
- Import subsetting is accomplished by pruning the Master Table

Original exp and imp

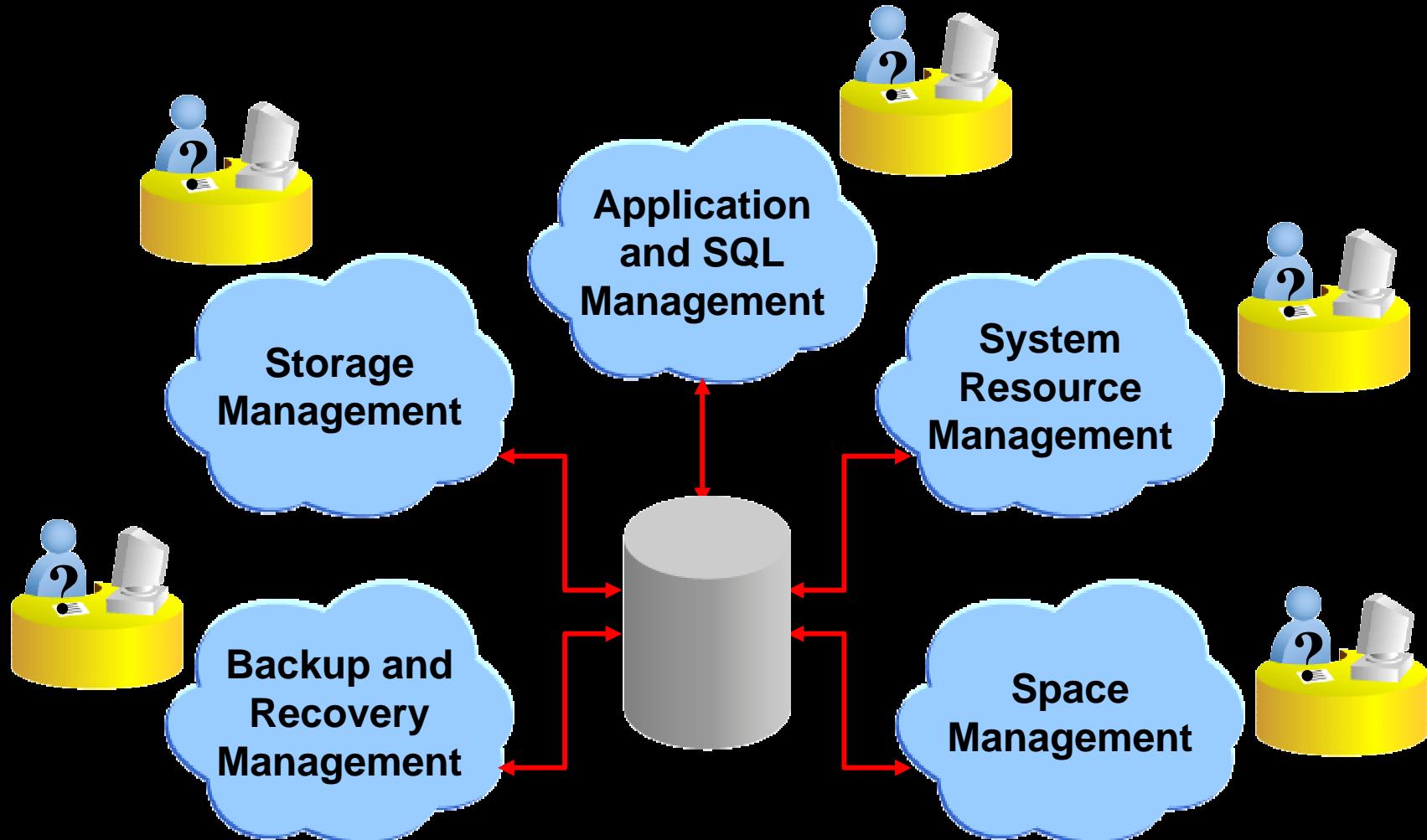


- Original imp will be supported forever to allow loading of V5 – V9*i* dump files
- Original exp will ship at least in 10*g*, but may not support all new functionality.
- 9*i* exp may be used for downgrades from 10*g*
- Original and Data Pump dump file formats are not compatible

How DBAs Spend Their Time?

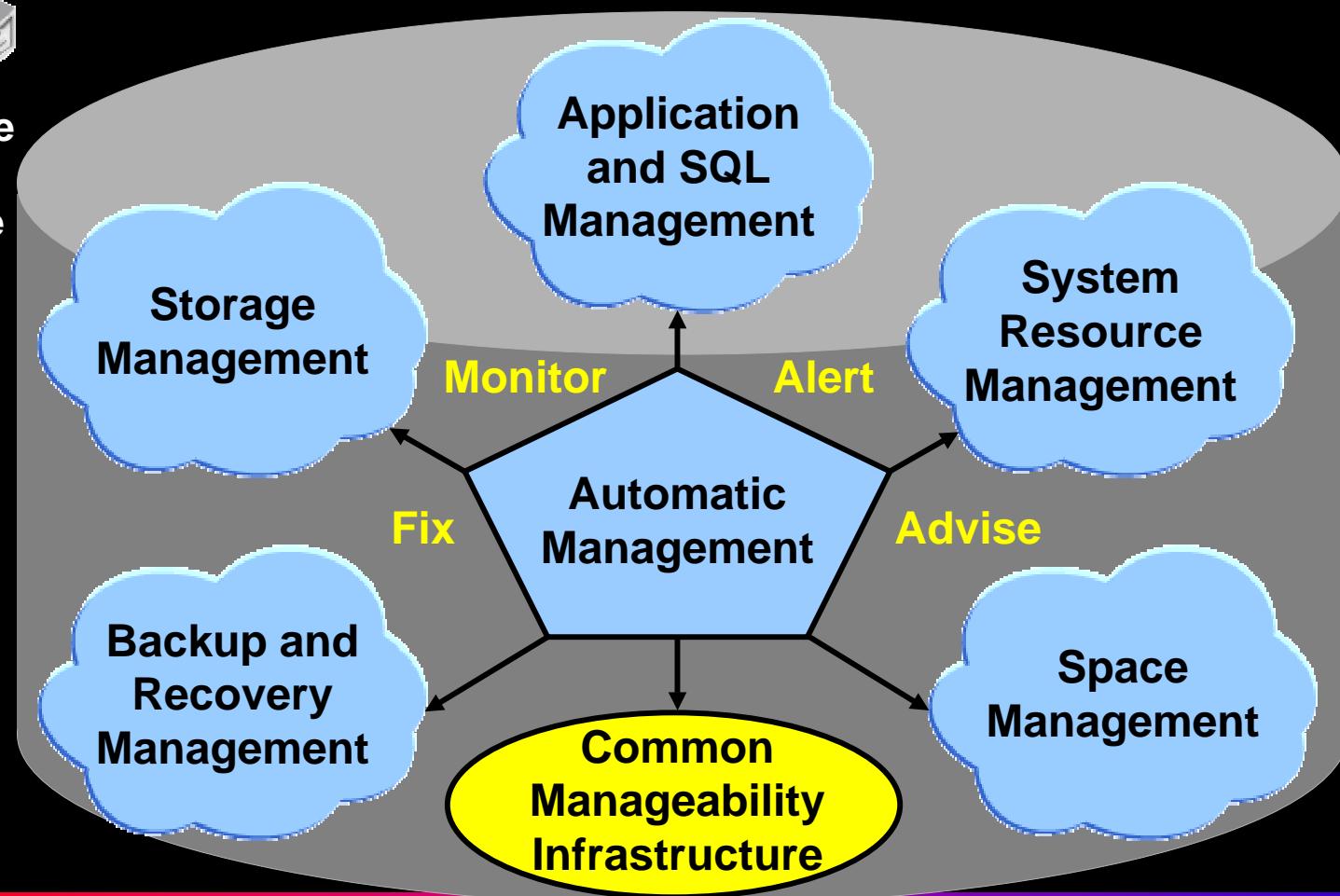


Database Management Challenges

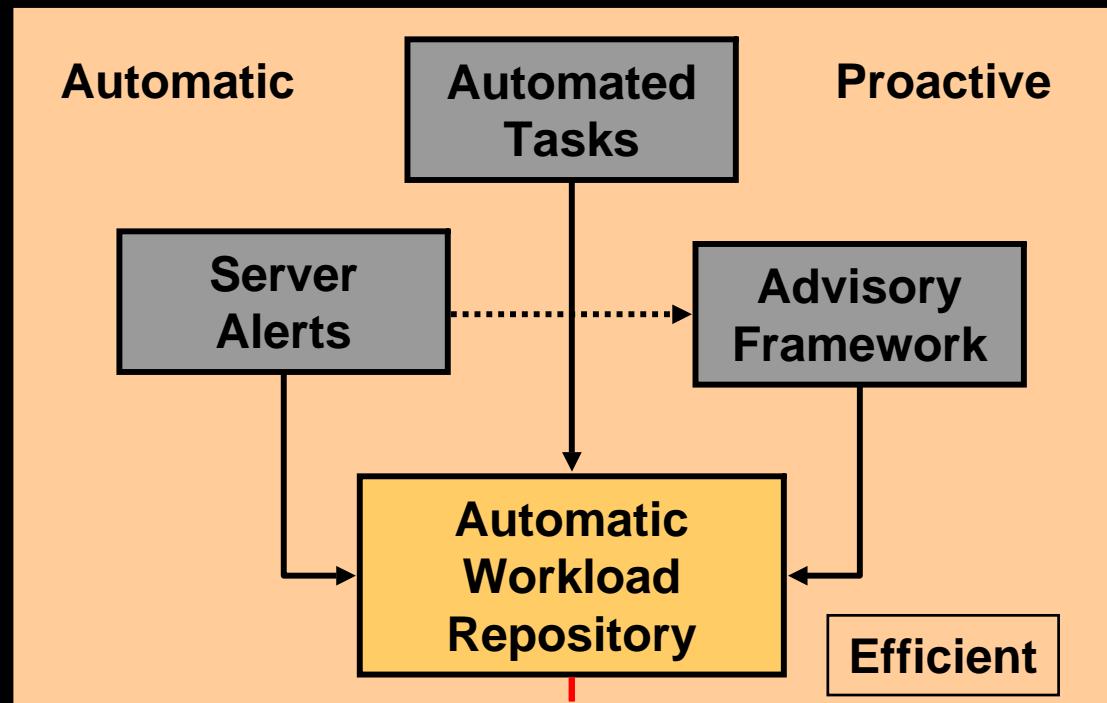




Solution: Self-Managing Database



Common Manageability Infrastructure: Automatic Workload Repository

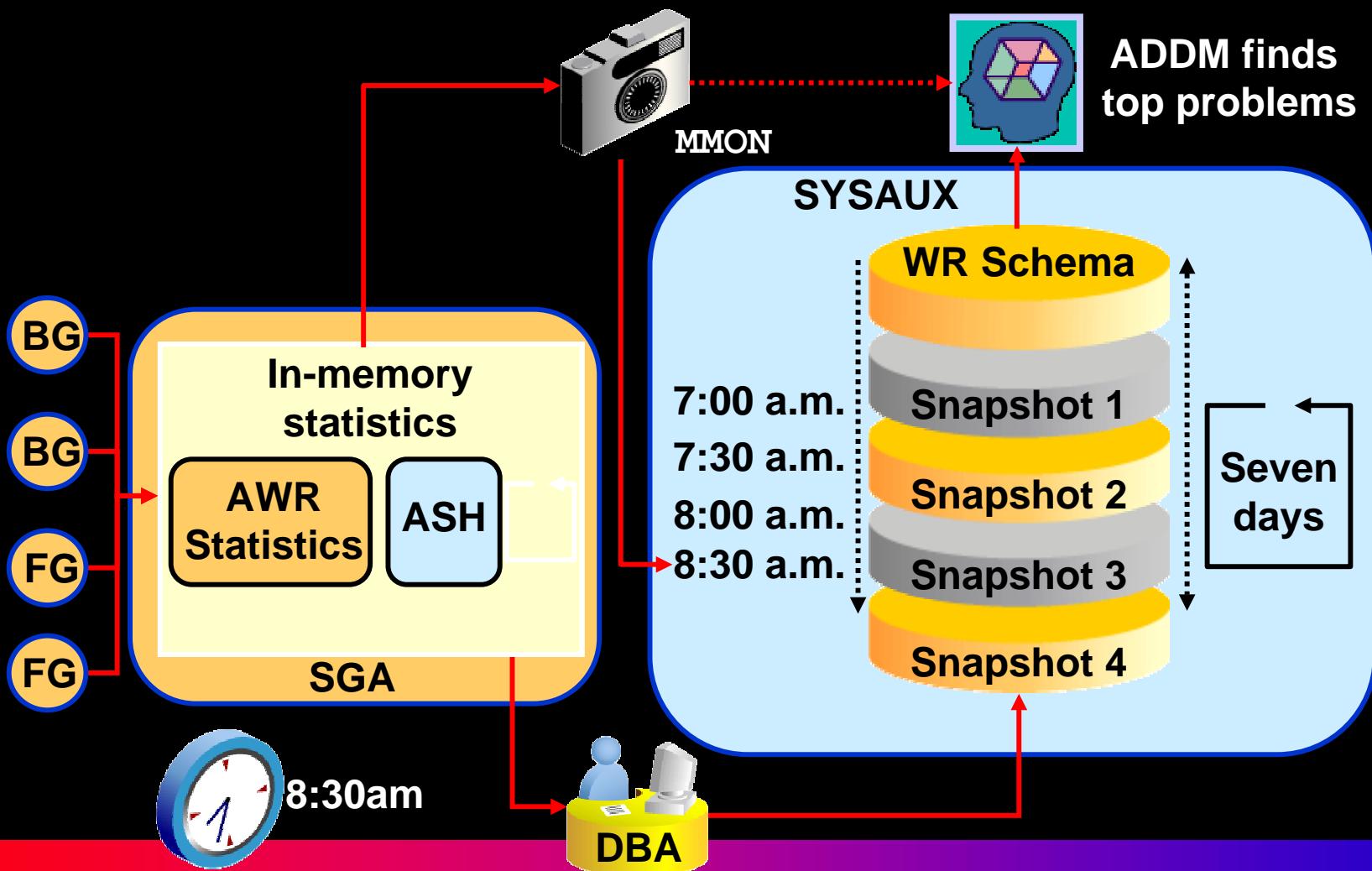


Data Warehouse
of the Database

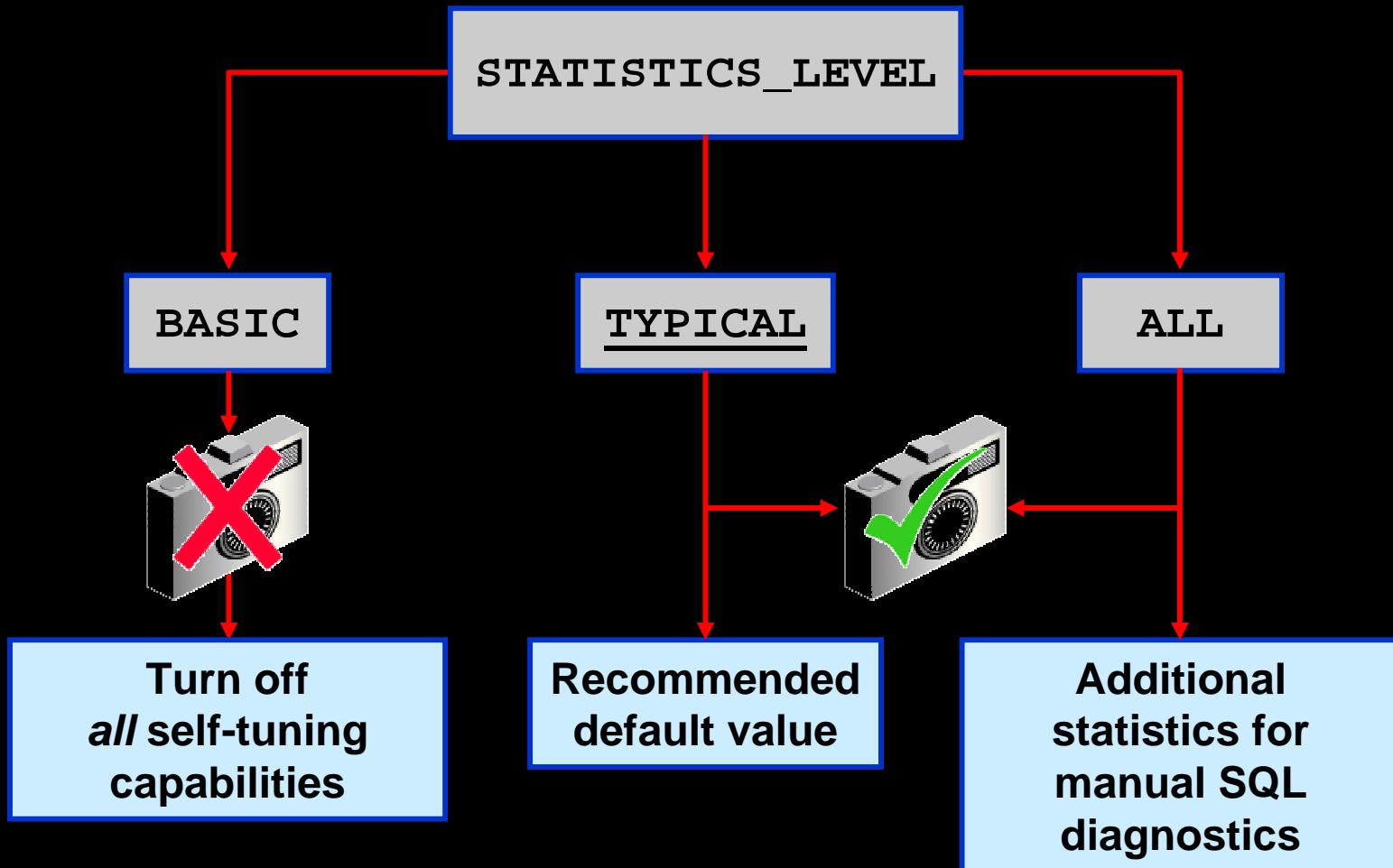
Automatic collection
of important statistics

Direct memory
access

Automatic Workload Repository



Statistics Level



Configuring The Workload Repository

The screenshot shows the Oracle Enterprise Manager interface for configuring the Workload Repository. The top navigation bar includes links for Setup, Preferences, Help, Home, Targets (which is the active tab), Configuration, Alerts, and Management System. Below the navigation is a breadcrumb trail: Host: dsunrdf03.us.oracle.com > Database: mqmt10i > Workload Repository. The main content area is titled "Workload Repository" and indicates it was "Collected From Target Apr 4, 2003 3:37:24 AM". The "General" section contains settings for Snapshot Retention (7 days), Snapshot Interval (30 minutes), Collection Level (TYPICAL), and Next Snapshot Capture Time (Apr 4, 2003 4:00:28 AM). An "Edit" button is highlighted with a red box. The "Snapshots" section displays statistics: Number of Snapshots (164), Number of Baselines (2), Latest Snapshot Time (Apr 4, 2003 3:30:28 AM), and Earliest Snapshot Time (Mar 31, 2003 5:58:31 PM).

Host: dsunrdf03.us.oracle.com > Database: mqmt10i > Workload Repository

Workload Repository

Collected From Target Apr 4, 2003 3:37:24 AM

General

Snapshot Retention (days) 7
Snapshot Interval (minutes) 30
Collection Level TYPICAL
Next Snapshot Capture Time Apr 4, 2003 4:00:28 AM

Edit

Snapshots

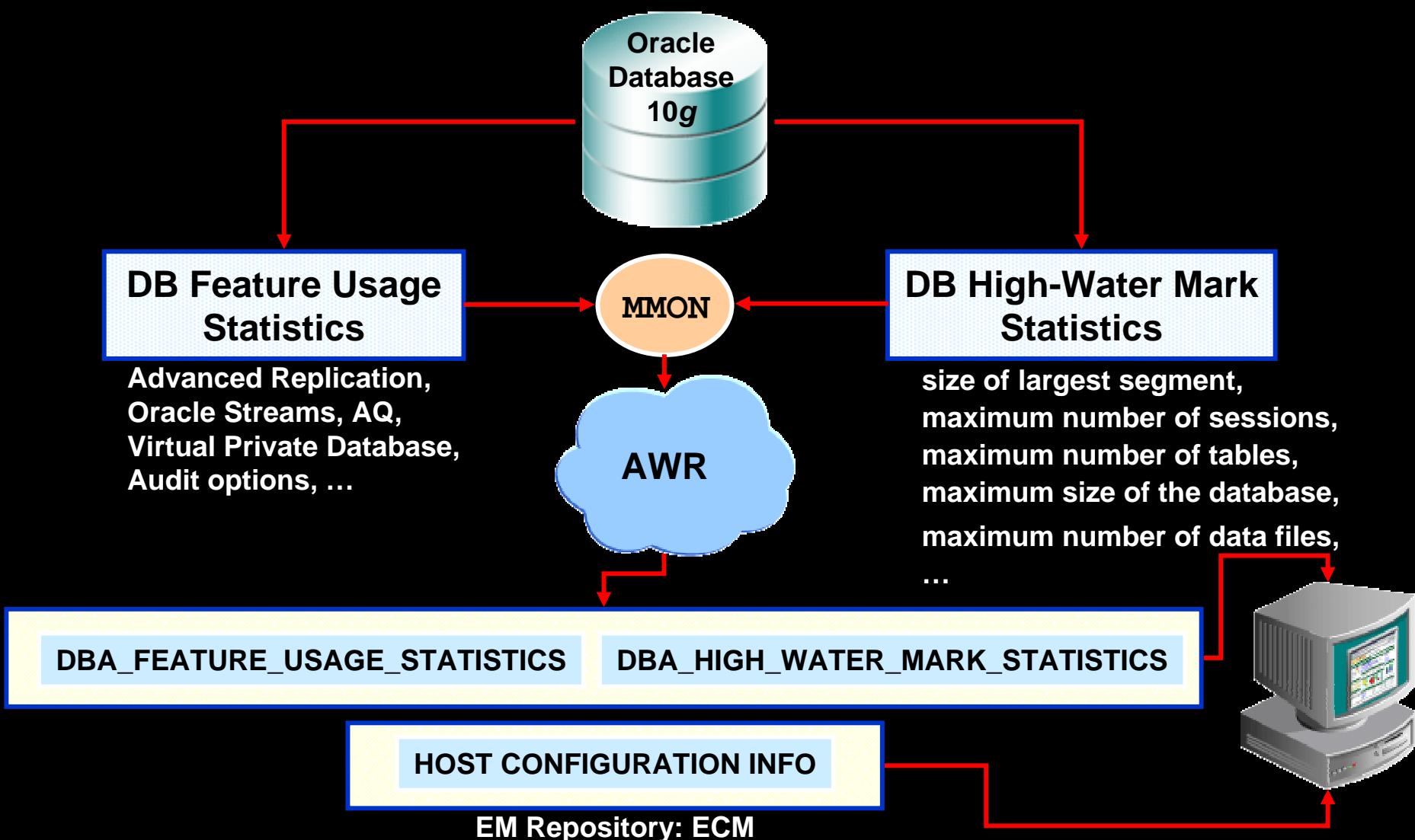
Number of Snapshots 164
Number of Baselines 2
Latest Snapshot Time Apr 4, 2003 3:30:28 AM
Earliest Snapshot Time Mar 31, 2003 5:58:31 PM

Manually Creating Snapshots

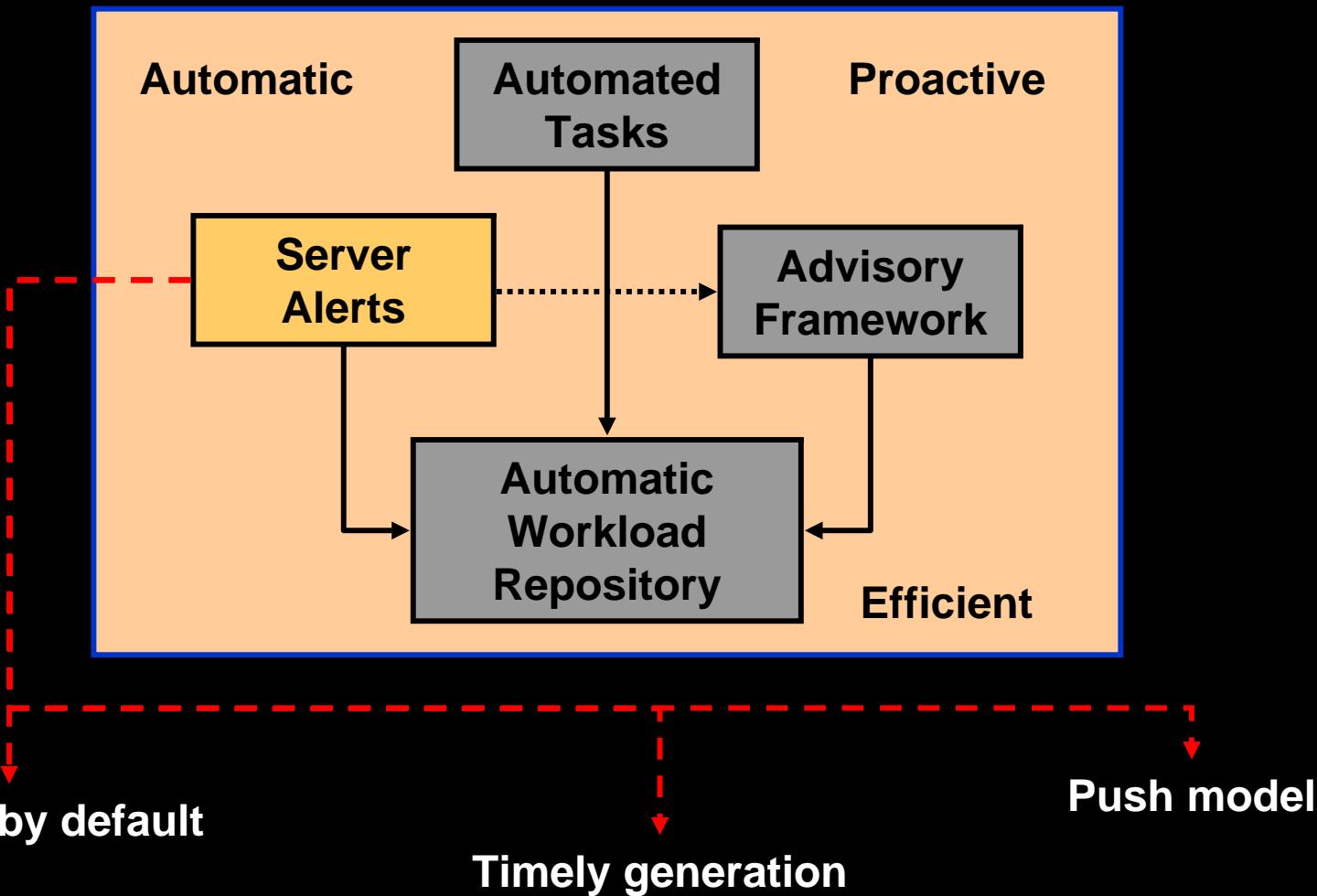
The screenshot shows the Oracle Enterprise Manager Targets interface. The top navigation bar includes links for Home, Targets (which is selected), Configuration, Alerts, Jobs, and Management System. Below the navigation is a breadcrumb trail: Host: dlsun1972.us.oracle.com > Database: svrman_dlsun1972 > Workload Repository > Snapshots. The main content area is titled "Solutions" and displays a section about snapshots. It states: "A snapshot is a collection of database statistics at a single point in time. You can use the information in snapshots to diagnose database problems." Below this, a message says: "Select a beginning snapshot from the list. Then choose an action to perform, and click 'Go'." A search bar at the bottom left allows searching by time (5/26/03) and date (12:00 AM). On the right, there is a "Create Snapshot" button, which is highlighted with a red box. The main table lists six snapshots with columns for Select, Snapshot ID, Instance Number, Capture Time, Collection Level, and Within Baseline Range. The first snapshot (ID 1) is selected.

Select	Snapshot ID	Instance Number	Capture Time ▲	Collection Level	Within Baseline Range
<input checked="" type="radio"/>	1		1 May 20, 2003 11:56:28 AM	Typical	
<input type="radio"/>	2		1 May 23, 2003 2:58:16 PM	Typical	
<input type="radio"/>	3		1 May 23, 2003 3:30:17 PM	Typical	
<input type="radio"/>	4		1 May 23, 2003 4:00:15 PM	Typical	
<input type="radio"/>	5		1 May 23, 2003 4:30:07 PM	Typical	
<input type="radio"/>	6		1 May 23, 2003 5:14:40 PM	Typical	

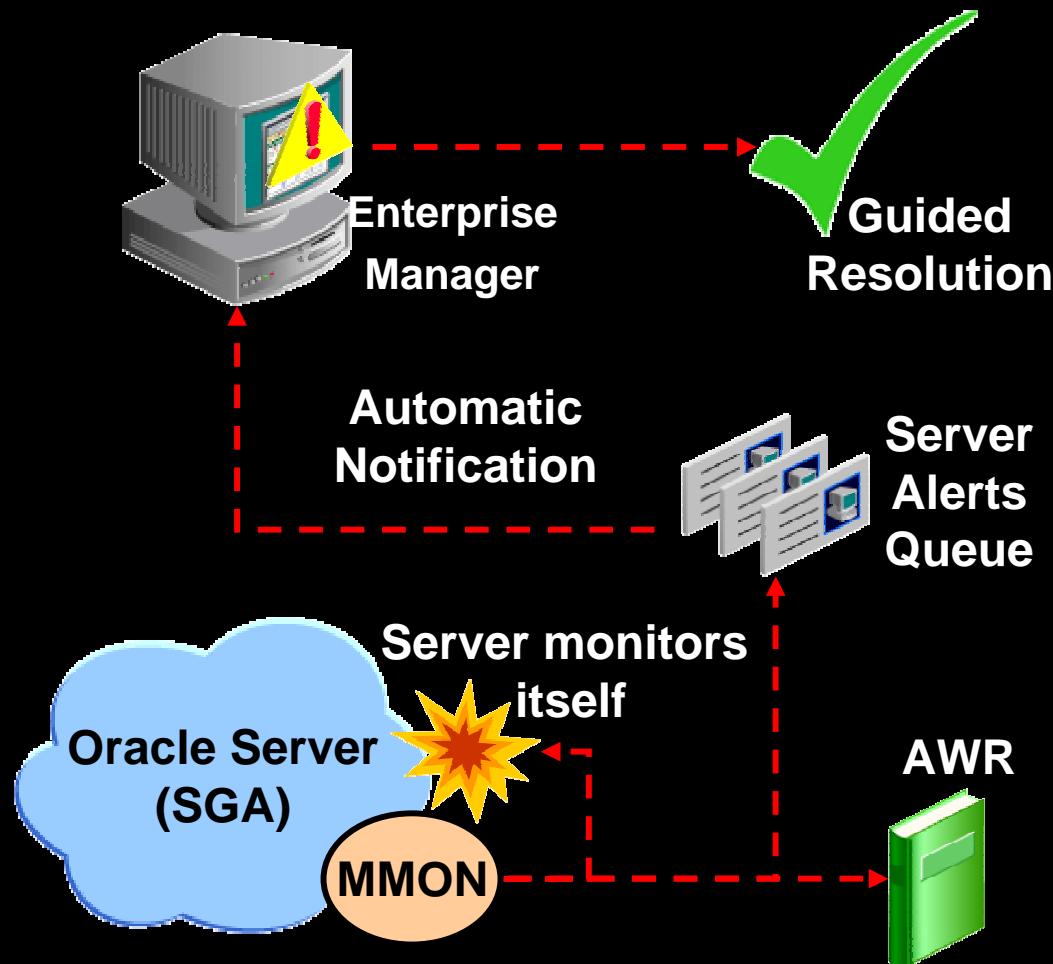
Database Feature Usage Metric Collection



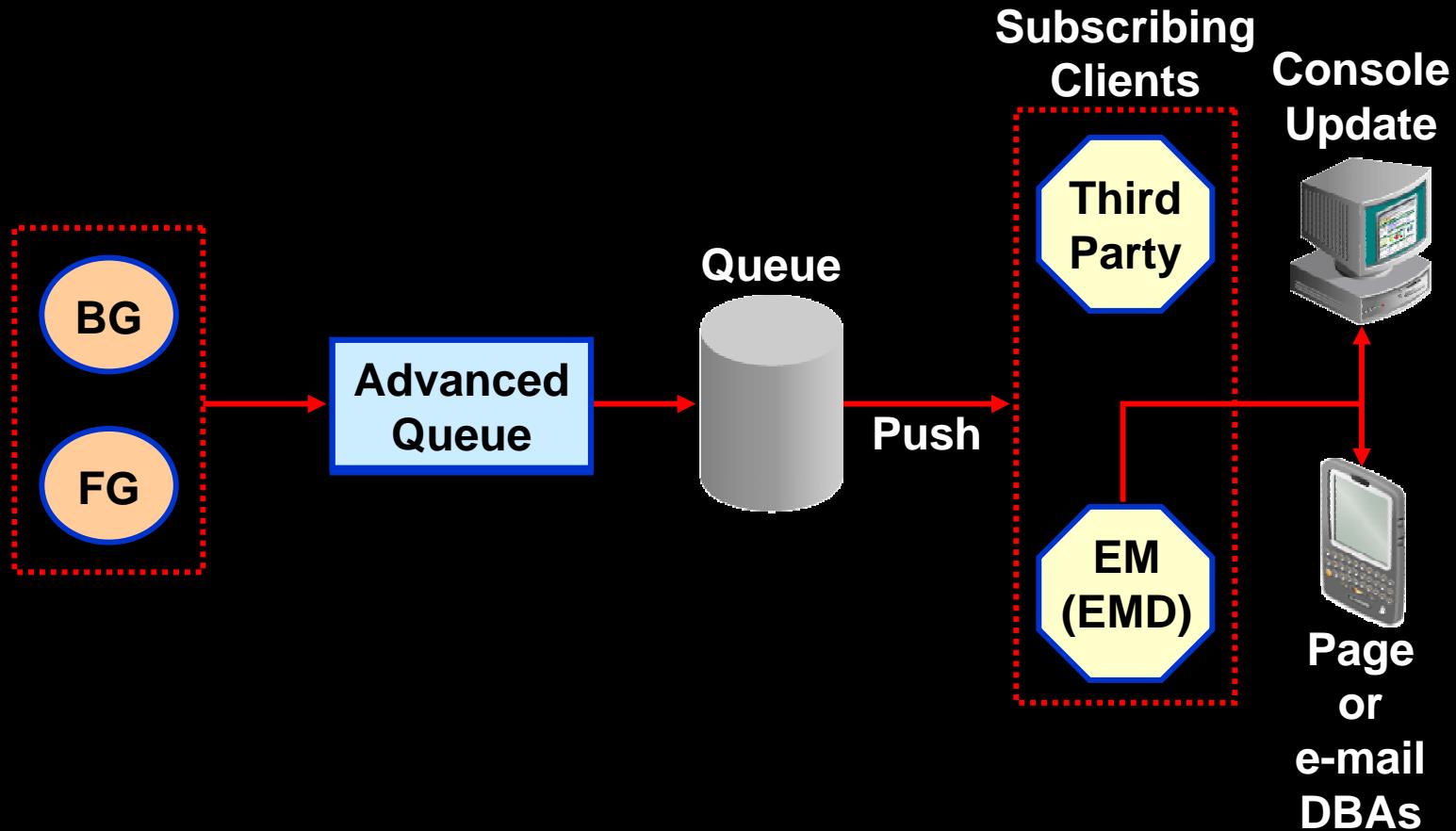
Common Manageability Infrastructure: Server Alerts



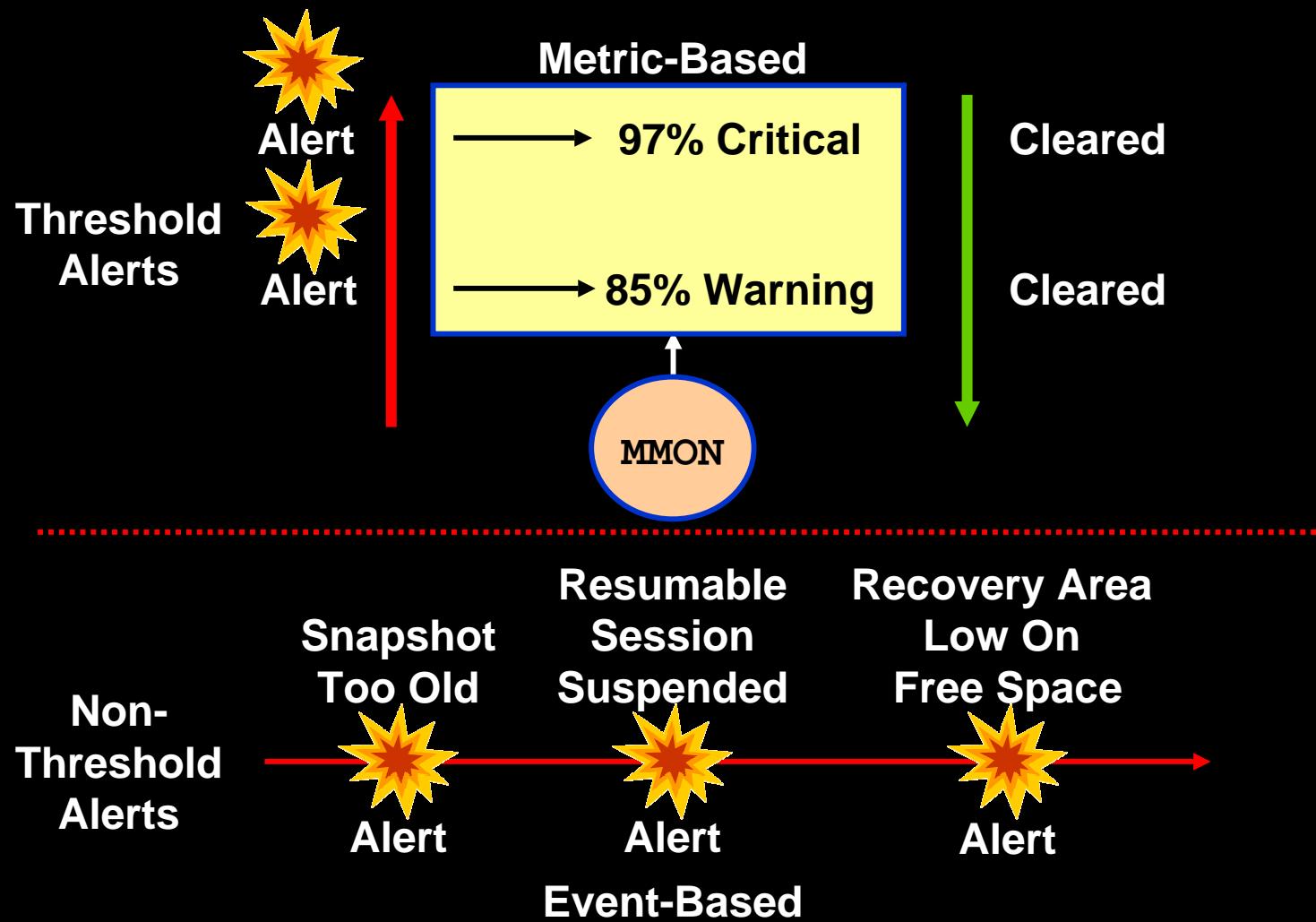
Server Alerts



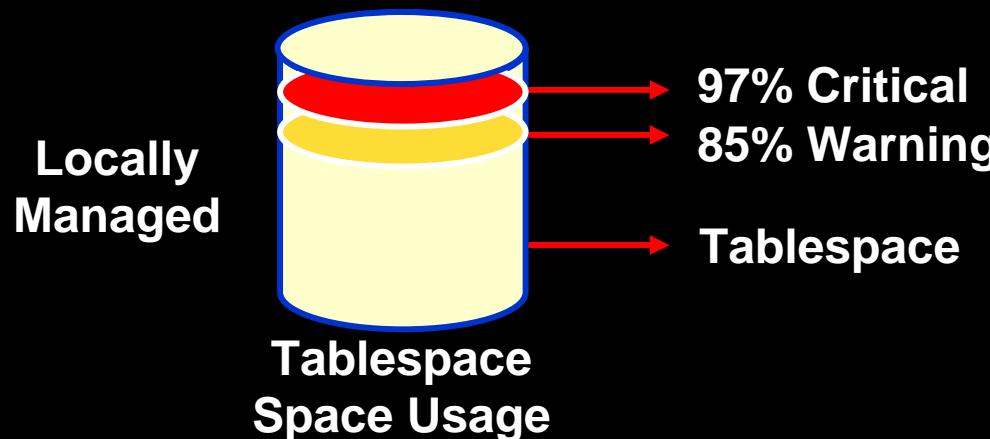
Server Alerts Delivery Process



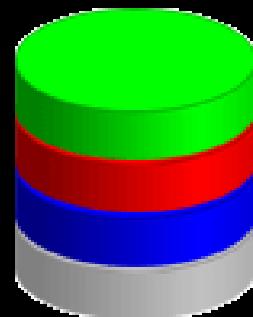
Server-Generated Alert Types



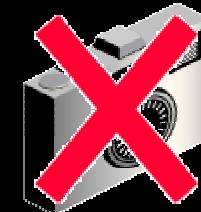
Out-of-the-box Alerts



Resumable
Session
Suspended



Recovery Area
Low On
Free Space



Snapshot
Too Old

EM Interface to Alerts

Oracle Enterprise Manager (SYSMAN) - Database: mgmt10i_030530_dsunrdf03 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Home Search Favorites Media Links EM - SGA EM - SQL

Address http://dsunrap22:7777/em/console/database-instance/sitemap?target=mgmt10i_030530_dsunrdf03&ctxType=Database&type=oracle_database&event=doLoad Go

Database: mgmt10i_030530_dsunrdf03

Home Performance Administration Maintenance

Latest Data Collected From Target Jun 4, 2003 10:45:29 AM Refresh

View Data Real Time: Manual Refresh

General

Status Up Shutdown

Up Since Jun 3, 2003 3:47:11 PM

Time Zone PDT

Availability (%) 99.22 (Last 24 hours)

Instance Name mgmt10i

Version 10.1.0.0

Host dsunrdf03.us.oracle.com

Oracle Home /ade/oracle_mgmt10i/oracle

Alert Log Jun 3, 2003 3:49:04 PM

Host CPU

Run Queue 3.22

Paging (pages per second) 0.14

Active Sessions

Active Sessions 0

SQL Response Time (%) 105.49 (compared to baseline)

Space Usage

Problem Tablespaces 1

Fragmentation Issues 0

Dump Area Used (%) 73

Advice

ADDM Findings 3

Configuration 8

High Availability

Estimated Crash Recovery Time (seconds) 31

Last Backup n/a

Archiving Disabled

Archive Area Used (%) n/a

Alerts

Severity	Category	Name	Message	Alert Triggered	Last Value	Time
✗	Tablespaces	Tablespace Space Used (%)	TBS_1 tablespace is 99.8% used.	Jun 2, 2003 12:19:14 PM	1.22	Jun 4, 2003 10:30:20 AM
⚠	Response Time	Response Time (s) per Call	Response time per call is 0.38 seconds. Click here to see the latest ADDM analysis.	Jun 3, 2003 5:56:08 PM	0.12	Jun 4, 2003 10:45:07 AM

Local intranet

Setting Alert Thresholds

ORACLE Enterprise Manager

Home Targets Configuration Alerts Jobs Management System

Databases Hosts Application Servers Web Applications Groups All Targets

Database: svrman_dlsun1972 > Edit Metric Thresholds

svrman_dlsun1972: Edit Metric Thresholds

Use these metrics to monitor conditions as they reach their critical and warning thresholds. Alerts are generated when thresholds are reached. Change the thresholds as required.

TIP A Response Action is a user-specified command or script that is executed automatically by the Management Agent when the metric reaches the Warning or Critical state. The command or script specified must include a fully qualified path and must be accessible to the Management Agent.

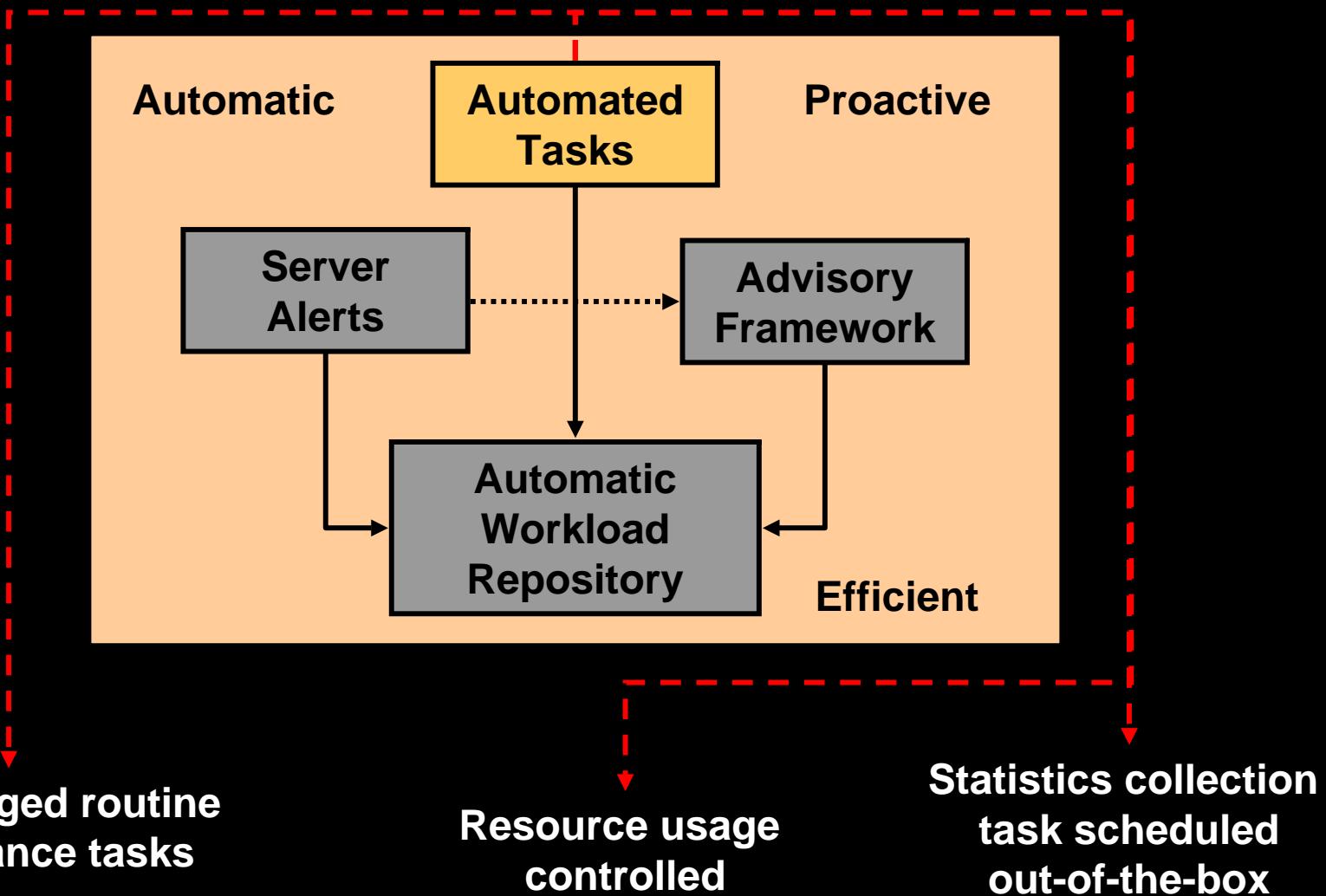
Related Link [Response to Target Down](#)

Cancel Copy Thresholds From Current Target Go Revert Apply Submit

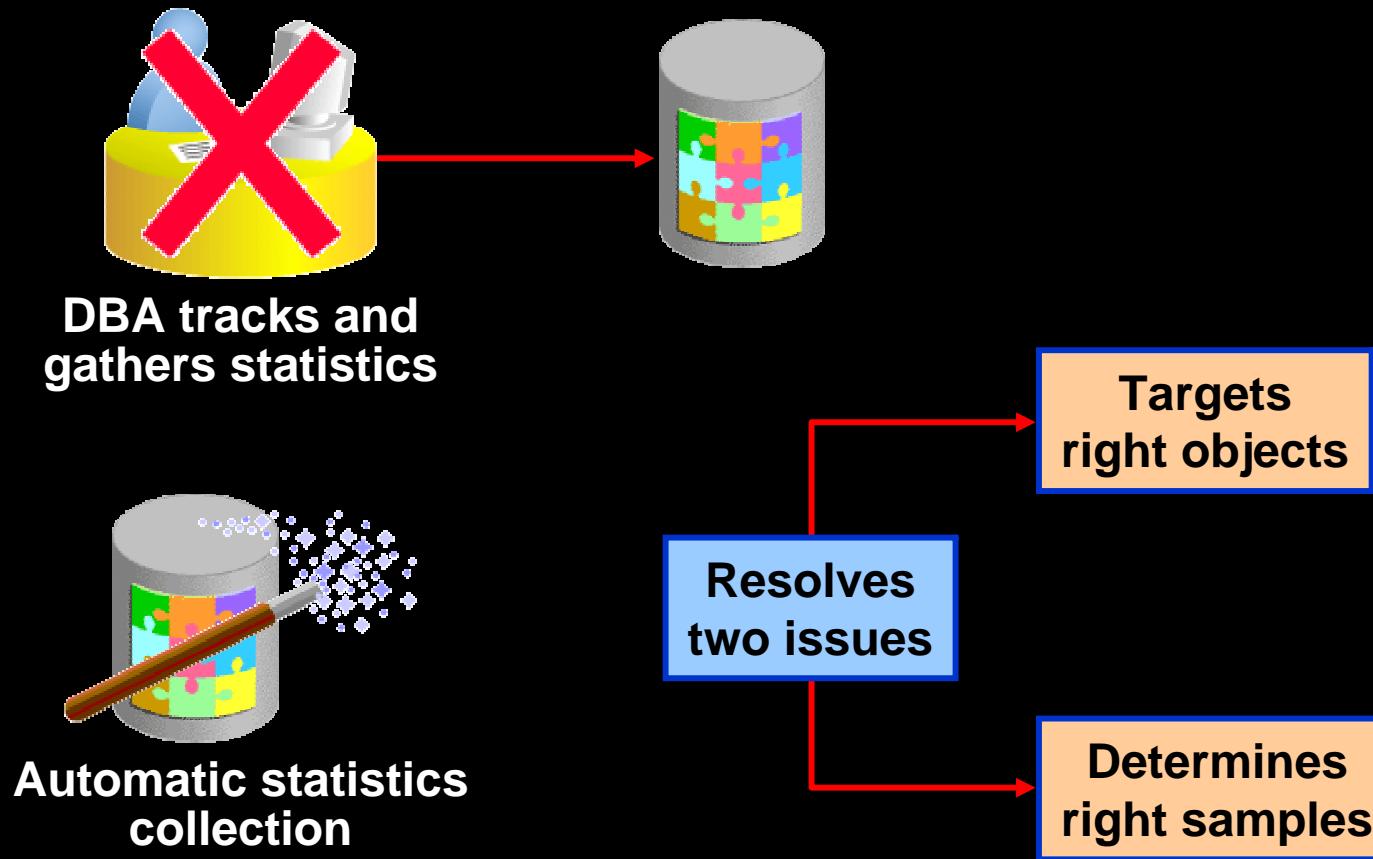
Select Metric	Comparison Operator	Warning Threshold	Critical Threshold	Response Actions
Active Sessions Waiting: I/O (%)	>	75		
Active Sessions Waiting: Other (%)	>	75		
Archive Area Used (%)	>	70	80	
Archiver Hung Alert Log Error	Contains		ORA-	
Archiver Hung Alert Log Error Status	>		0	
Audited User	=		SYS	
Blocking Session Count	>		0	
Broken Job Count	>		0	
Buffer Cache Hit (%)	<			

Manage Metric Indexes

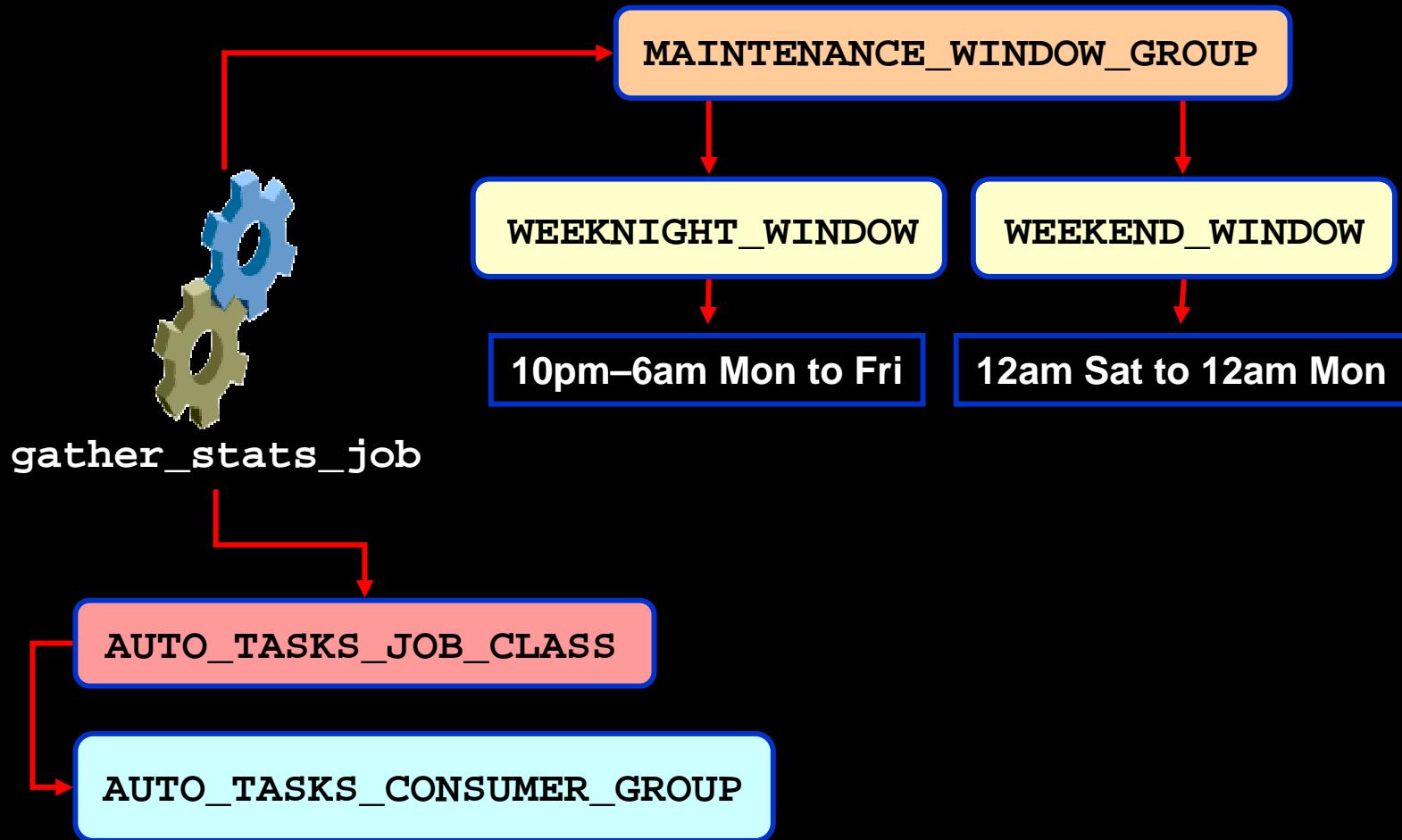
Common Manageability Infrastructure: Automated Tasks



Automatic Optimizer Statistics Collection



Gather Statistics Job

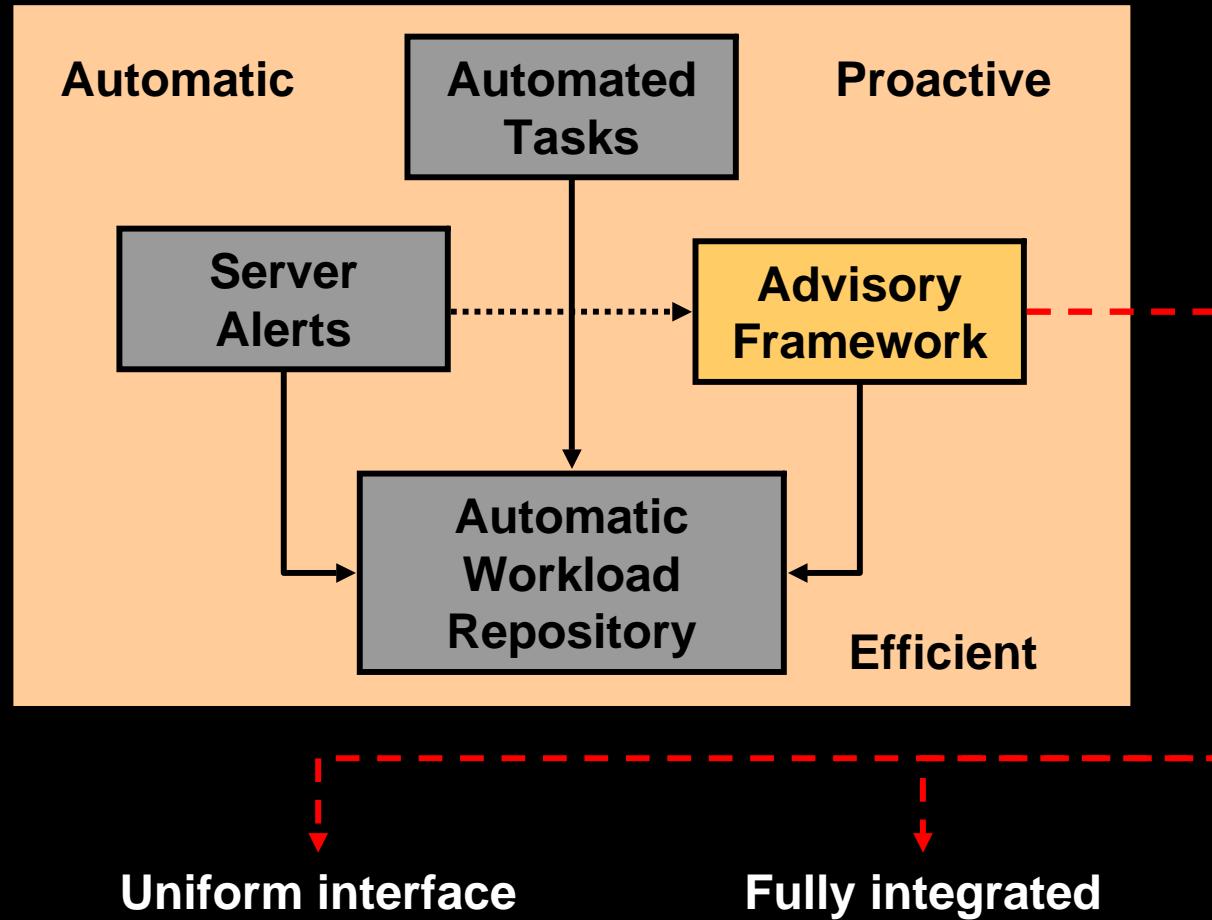


Adding New Tasks Using EM

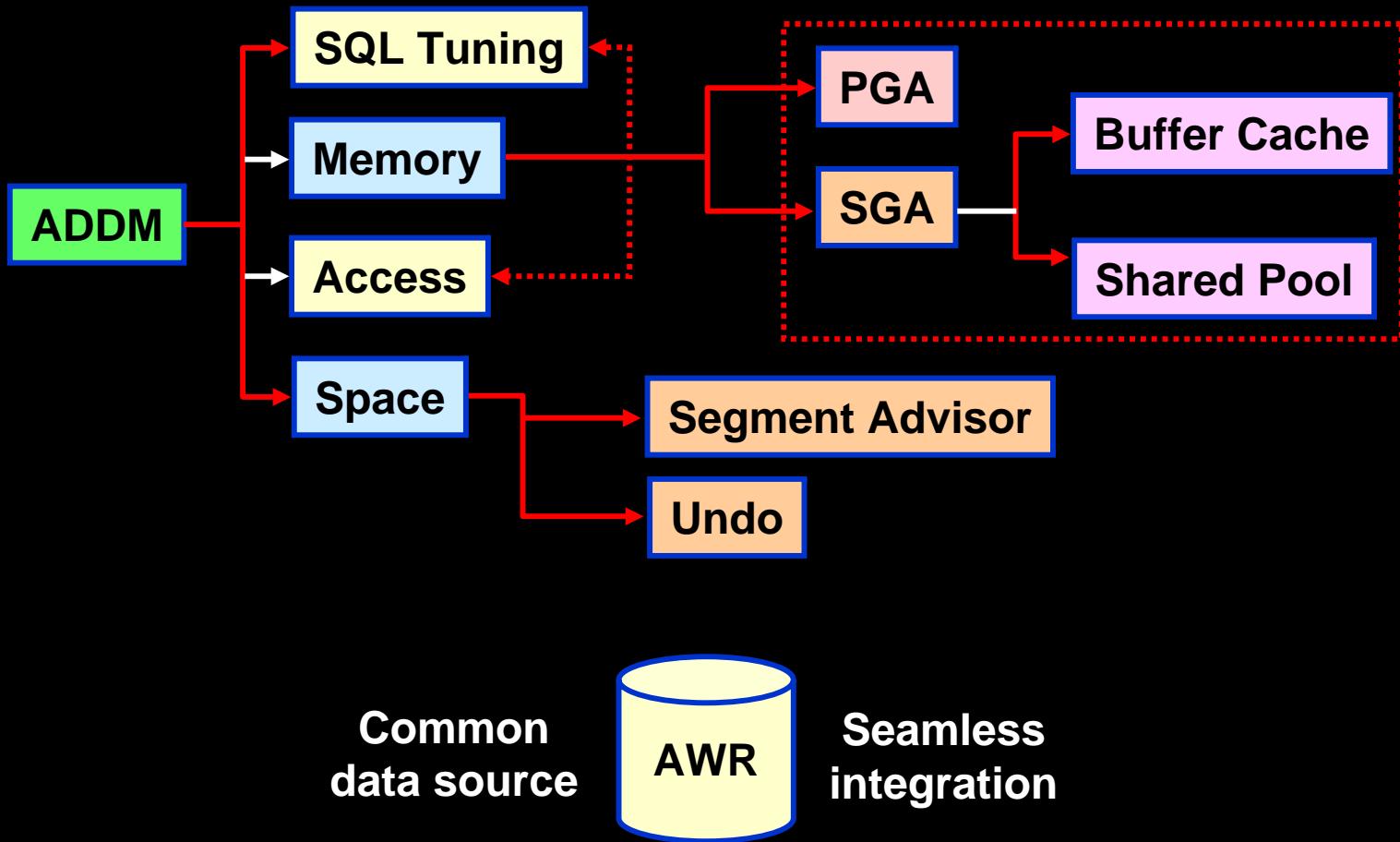
The screenshot shows the Oracle Enterprise Manager interface for managing jobs. The top navigation bar includes links for Home, Targets (which is selected), Configuration, Alerts, Jobs, and Management System. Below the navigation is a breadcrumb trail: Host: dsunrdf03.us.oracle.com > Database: mgmt10i_030530_dsunrdf03_2 > Jobs. The main content area is titled 'Jobs' and shows a table of scheduled tasks. The table has columns for Select, Name, Owner, Execution Date, Class Name, and Executes. Two tasks are listed: ADV_TASK_00002 (SYSTEM, Jun 4, 2003 4:48:01 PM) and ADV_TUNETASK1 (SYSTEM, Jun 11, 2003 4:45:32 PM). A red box highlights the 'Create Job' button at the top right of the table. Below the table, there are tabs for Scheduled, Running, Unscheduled, and History. The bottom of the page includes a footer with links to Home, Targets, Configuration, Alerts, Jobs, Management System, Setup, Preferences, Help, and Logout, along with copyright information: Copyright © 1996, 2003, Oracle. All rights reserved.

Select	Name	Owner	Execution Date	Class Name	Executes
<input checked="" type="radio"/>	ADV_TASK_00002	SYSTEM	Jun 4, 2003 4:48:01 PM	DEFAULT_JOB_CLASS	0
<input type="radio"/>	ADV_TUNETASK1	SYSTEM	Jun 11, 2003 4:45:32 PM	DEFAULT_JOB_CLASS	0

Common Manageability Infrastructure: Advisory Framework



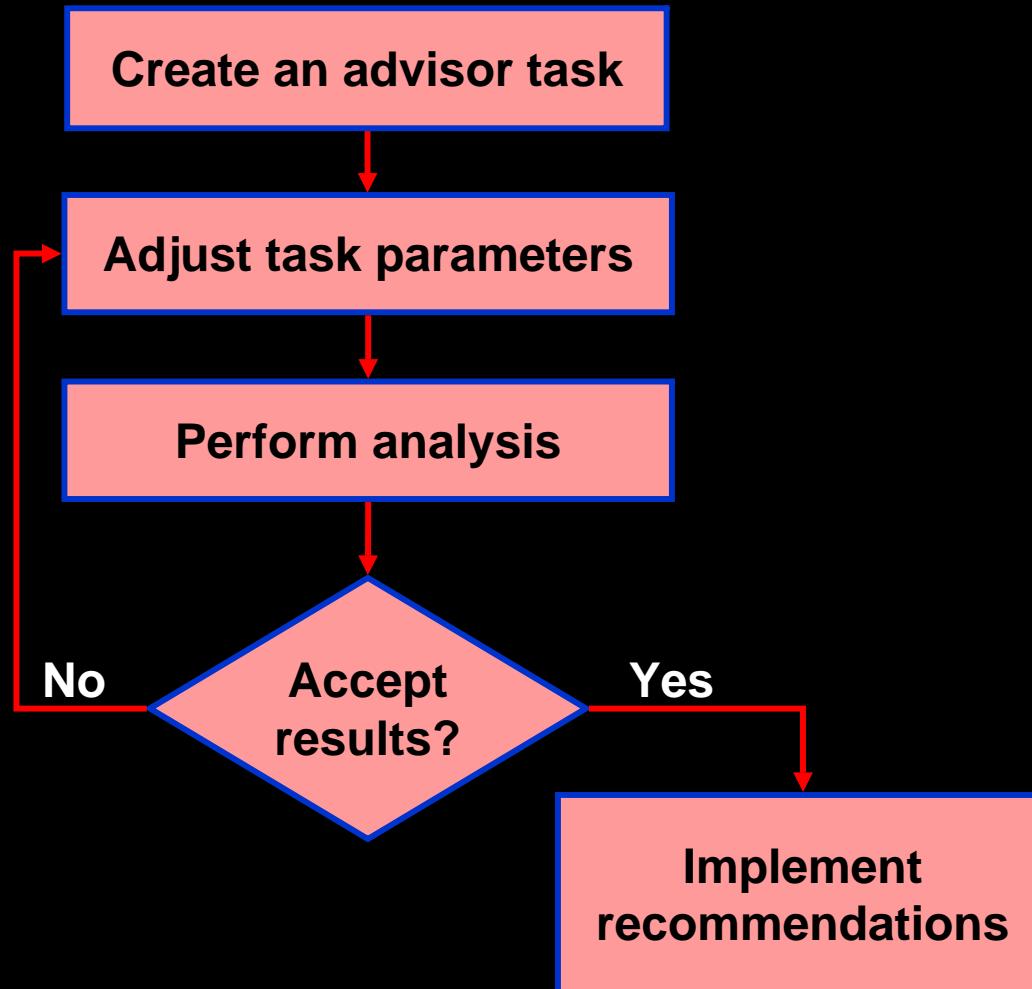
Advisory Framework



Guided Tuning Session



Enterprise
Manager
Database
Console



Advisory Central

The screenshot shows the Oracle Enterprise Manager interface for 'Advisory Central'. The top navigation bar includes links for Home, Targets, Configuration, Alerts, and Management System. A sub-menu for 'Advisory Central' is open, showing options like 'Launch Advisor', 'SQL Tuning Advisor', and buttons for 'View', 'Delete', 'Re-Schedule', and 'Go'. The main content area displays a table of advisor tasks:

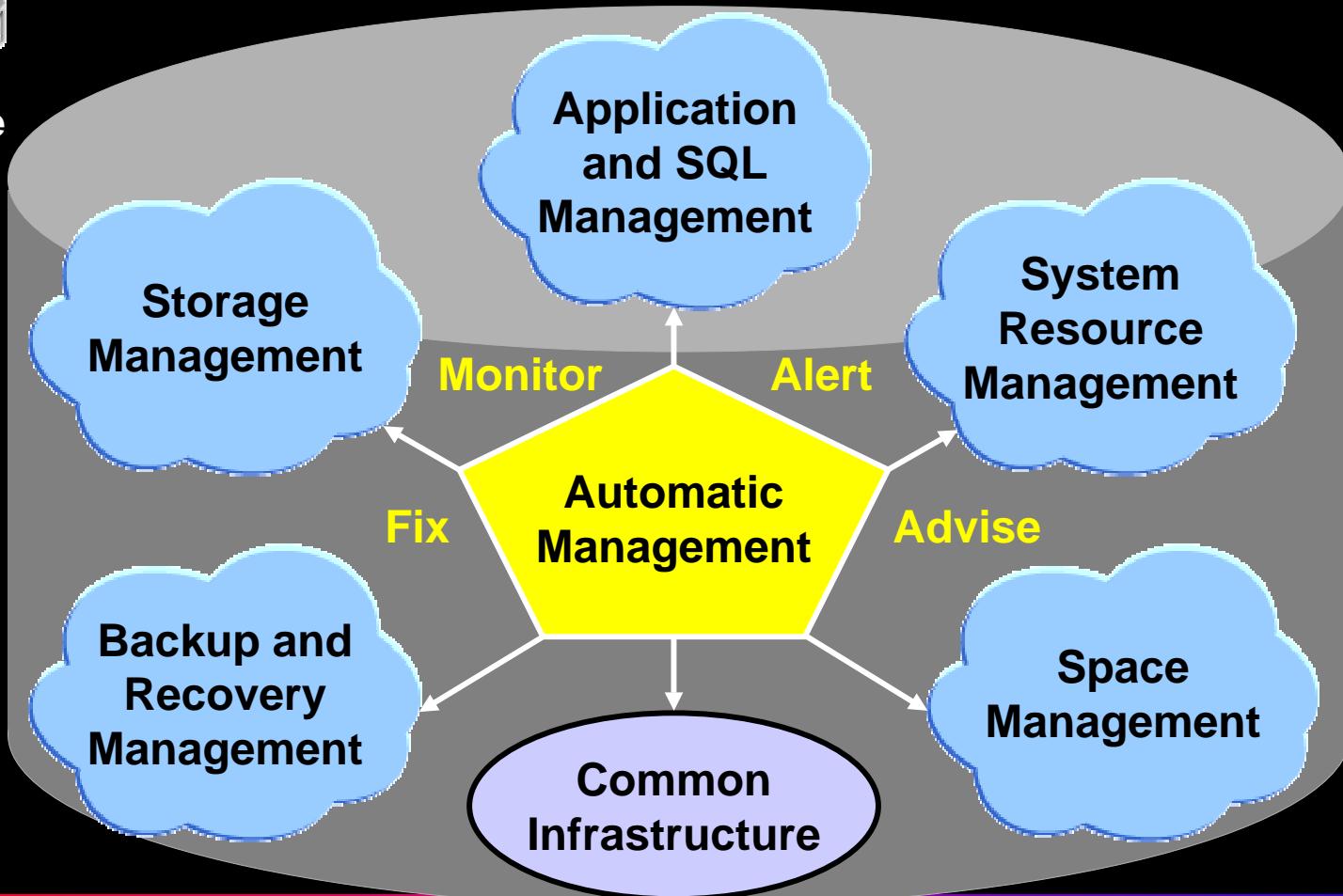
Select Advisory Type	Name (# Recommendations)	Description	User	Status	Start Time	End Time	Expires In
<input type="radio"/> HDM	TASK_00001(0)			SYS INITIAL			30
<input checked="" type="radio"/> SQL Access Advisor	TASK_00002(4)	sql access	SYS	SYS COMPLETE	2003-03-11 12:39:59.9	2003-03-11 14:28:47.0	30
<input type="radio"/> Undo Advisor	TASK_00003(0)	undo	SYS	SYS RUNNING	2003-03-13 11:17:38.8		30
<input type="radio"/> SQL Tuning Advisor	TASK_00004(0)			SYS COMPLETE	2003-03-11 16:27:55.0	2003-03-11 17:52:38.8	30
<input type="radio"/> Object Space Create Table	TASK_00005(0)	space advisor	SYS	SYS INITIAL			30
<input type="radio"/> HDM	TASK_00010(0)	hdm run	SYS	FATAL ERROR	2003-03-12 15:09:22.0	2003-03-12 15:09:24.0	30

At the bottom of the page, there are links for Home, Targets, Configuration, Alerts, Management System, Setup, Preferences, Help, and Logout. A copyright notice at the very bottom states: 'Copyright © 1996, 2003, Oracle. All rights reserved. About Oracle Enterprise Manager Version 4.1.0.0.0'.

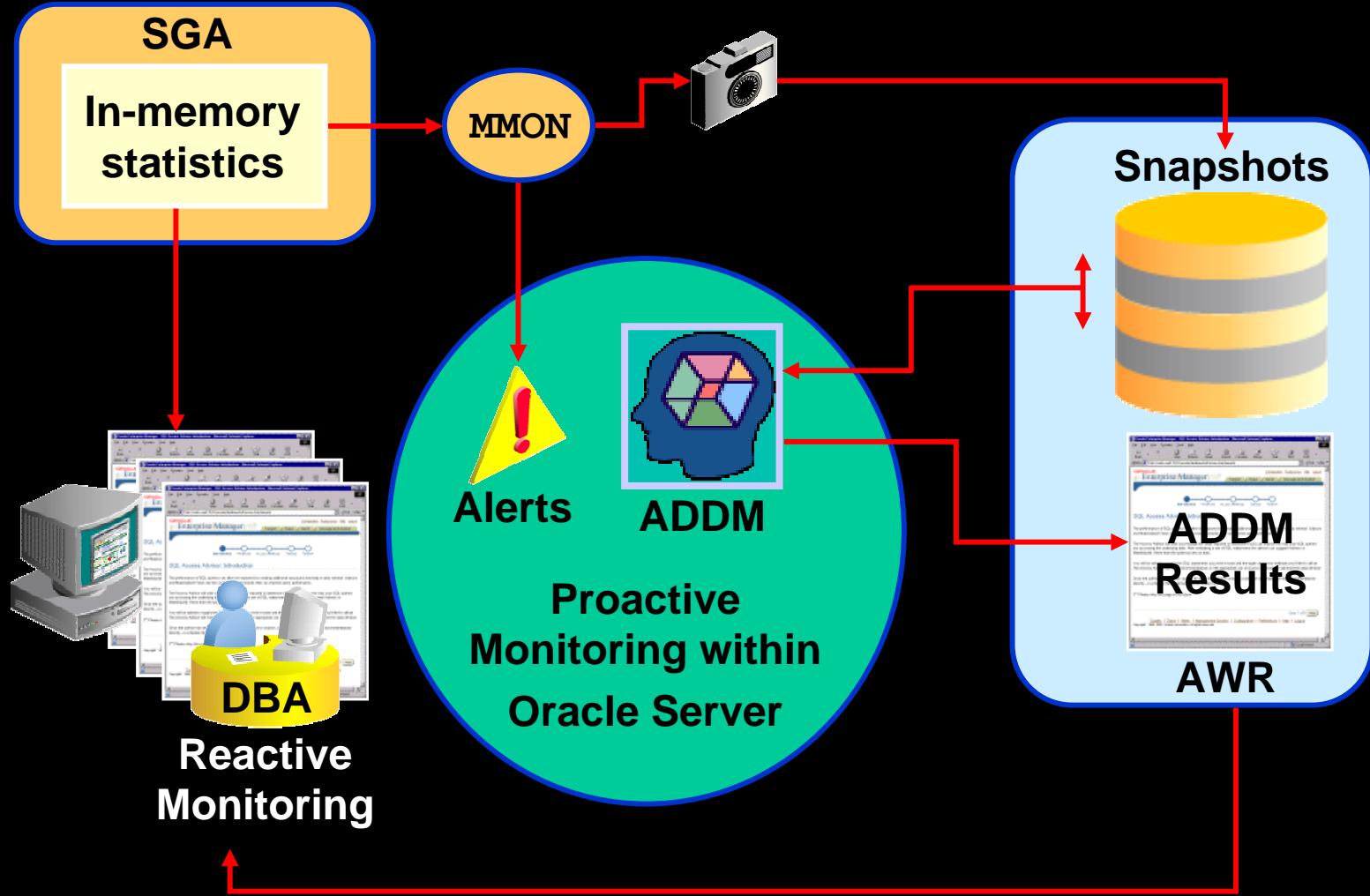
Solution: Self-Managing Database



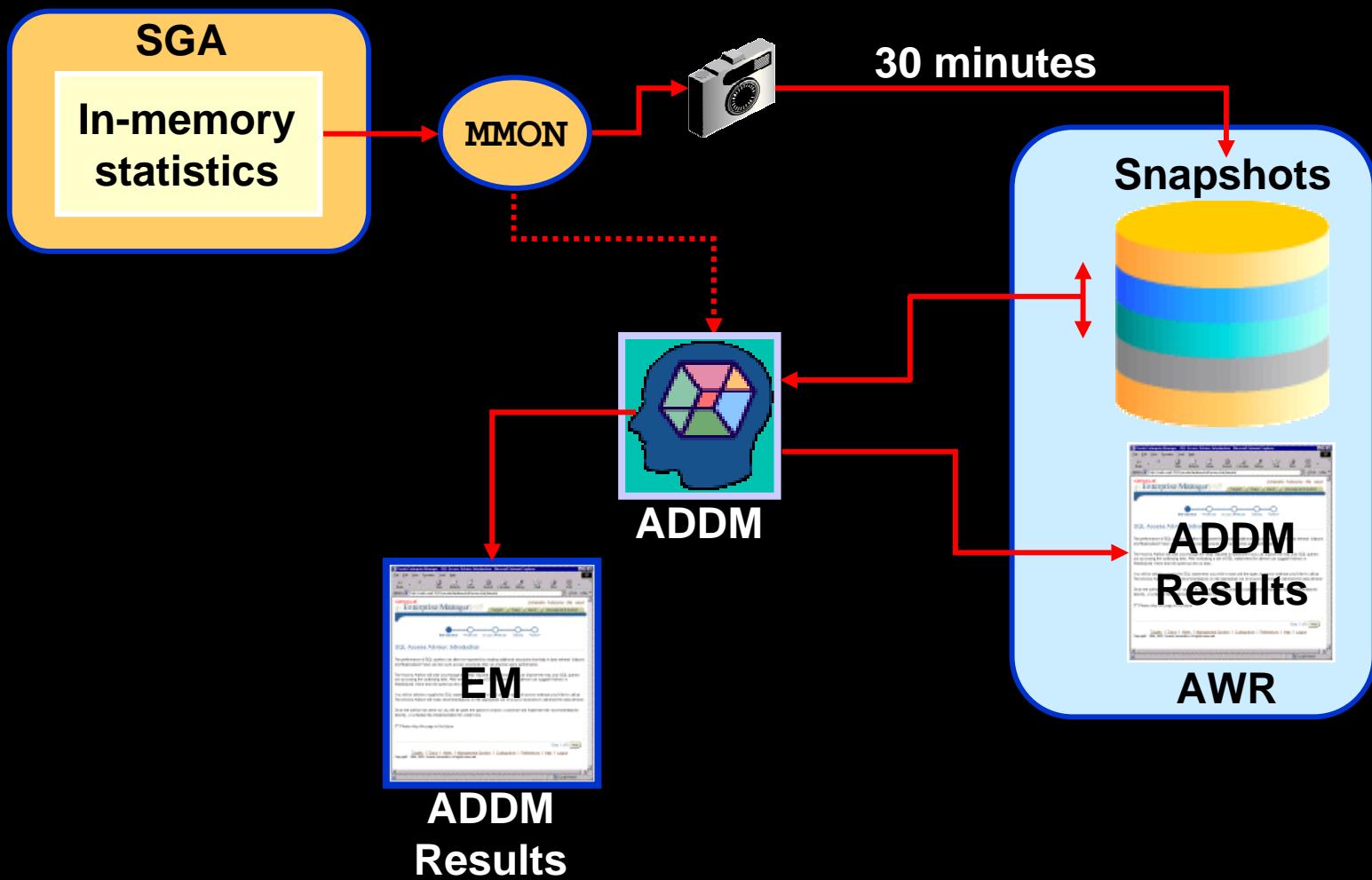
Enterprise
Manager
Database
Console



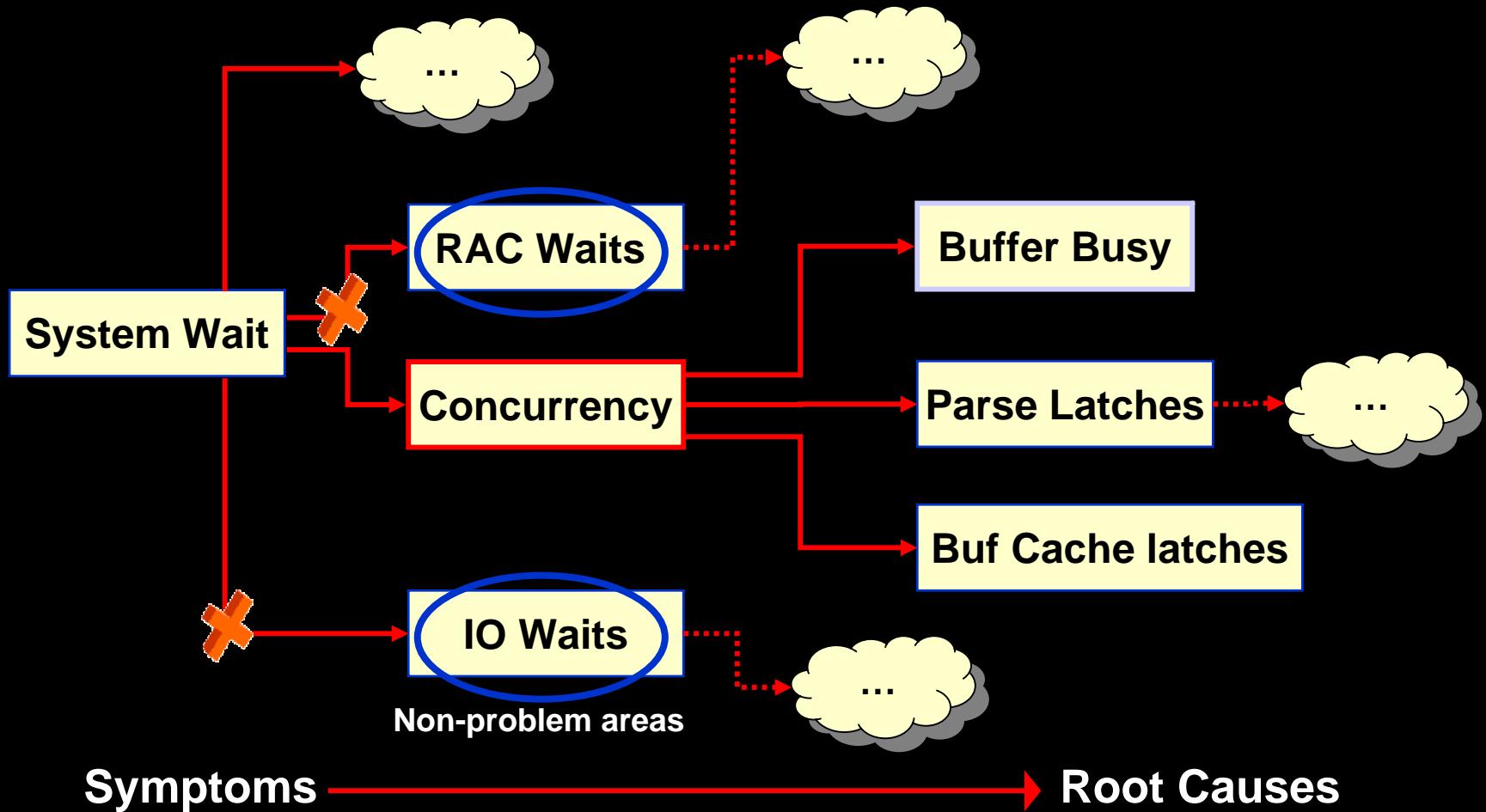
Performance Monitoring Solutions



ADDM Performance Monitoring



ADDM Problem Classification System



Accessing ADDM Advice

Database: [svrman_dlsun1972](#)

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

Latest Data Collected From Target Jun 10, 2003 8:04:27 PM [Refresh](#)

[View Data](#) [Real Time: Manual Refresh](#)

General



[Shutdown](#)

Status **Up**

Up Since [Jun 10, 2003 6:41:28 PM](#)

Time Zone **PDT**

Availability (%) **85.44**

(Last 24 hours)

Instance Name **svrman**

Version **10.1.0.0.0**

Host [dlsun1972.us.oracle.com](#)

Oracle Home [/ade/sxkumar_svrman/oracle](#)

Alert Log [Jun 10, 2003 6:34:07 PM](#)

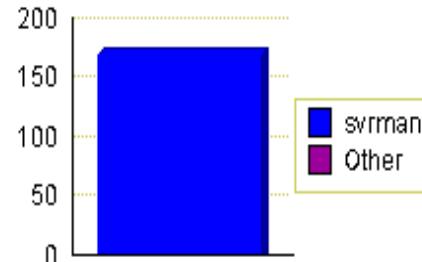
Space Usage

Problem Tablespaces **0**

Fragmentation Issues **0**

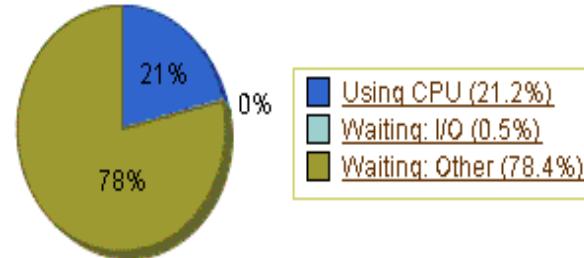
Dump Area Used (%) **78**

Host CPU



Run Queue **10.05**
Paging (pages per second) **-1.0**

Active Sessions



Active Sessions **7**
SQL Response Time (%) **1,444.93**
(compared to baseline)

Advice

ADDM Findings **2**

Configuration **0**

High Availability

Instance Recovery Time (seconds) **69**
Last Backup **n/a**
Archiving **Enabled**
Archive Area Used (%) **78**

ADDM Recommendations

Host: usunrddi20 > Database: mgmt10i_usunrddi20 > Advisor Central > ADDM Task > ADDM Finding Details

ADDM Finding Details

Analysis Start Time Jun 10, 2003 9:30:30 AM
Analysis Duration (minutes) 29.75

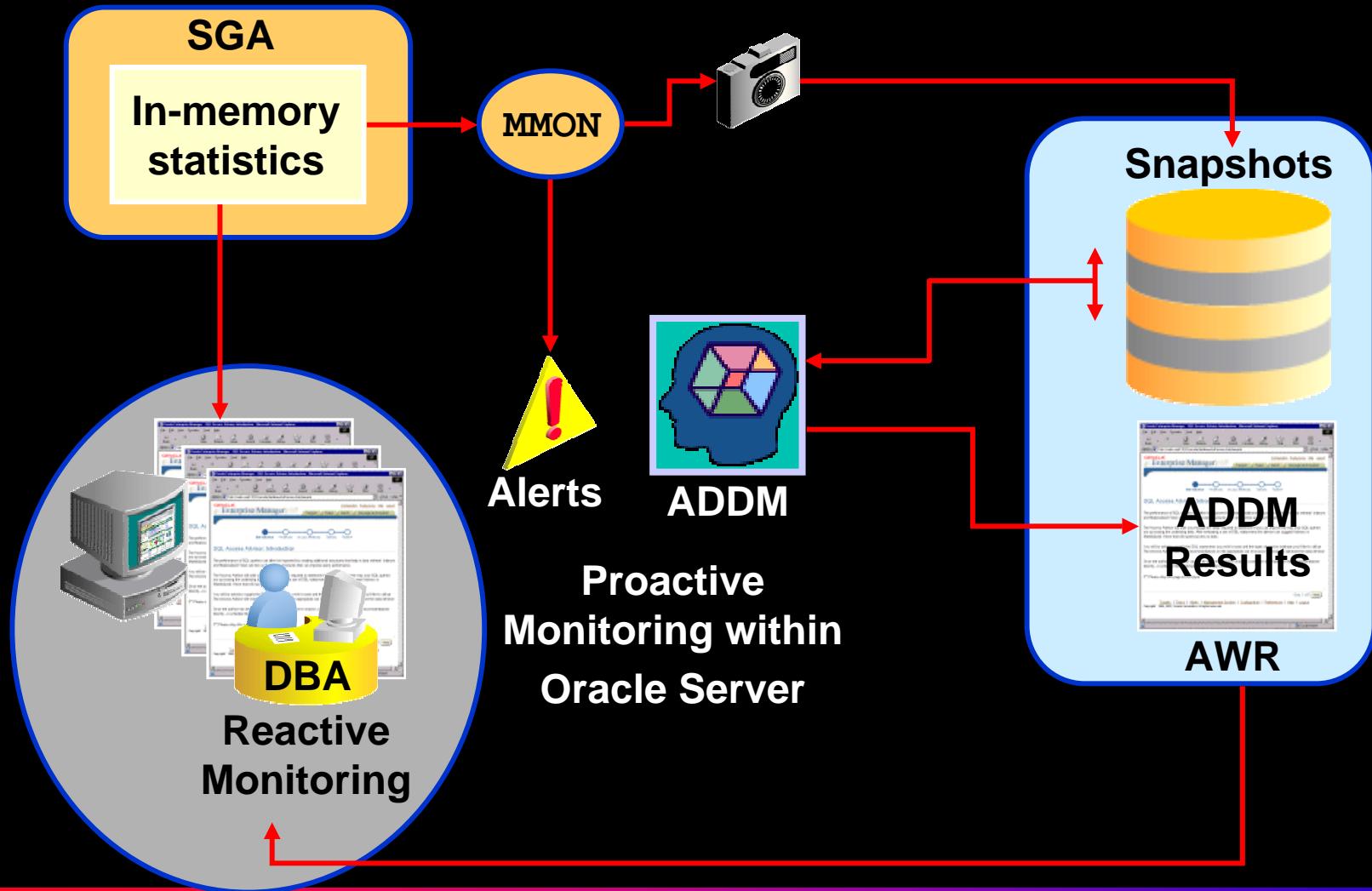
Finding	Read and write contention on database blocks was consuming significant database time.
Database Time (minutes)	274.16
Impact (minutes)	98.23
Impact (%)	35.83

Recommendations

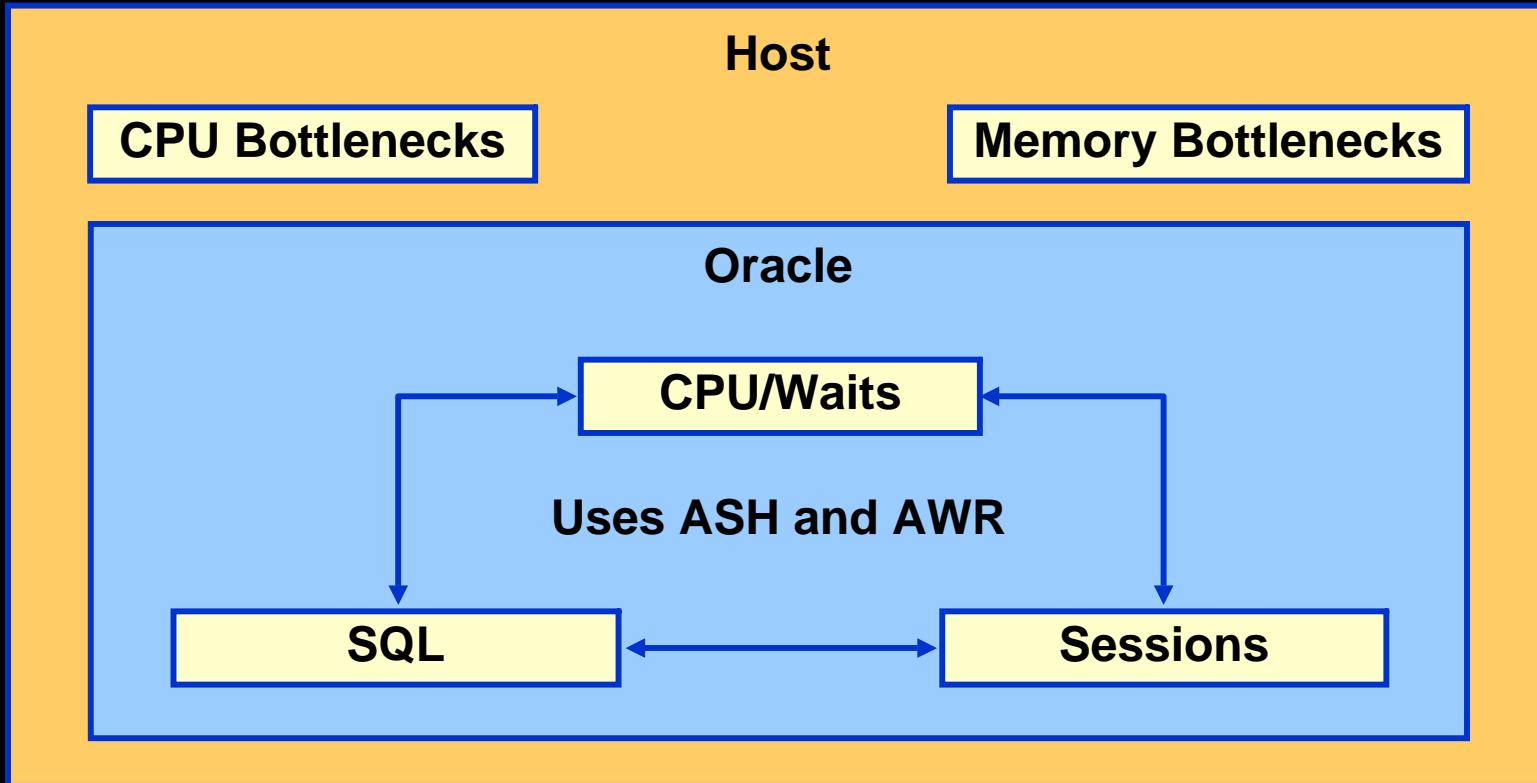
Show All Details | Hide All Details

Details	Category	Benefit (minutes)
 Hide	SCHEMA	57.56
Action	Consider using ORACLE's recommended solution of bitmapped segments in a locally managed tablespace for the tablespace "USERS" containing the database object "SCOTT.TOTO" with object id 41560.	
 Hide	SCHEMA	57.56
Action	Consider partitioning "SCOTT.TOTO" with object id 41560 in a manner that will evenly distribute concurrent DML across multiple partitions.	
 Hide	SCHEMA	57.56
Action	A temporary solution may be achieved by increasing the number of free lists in segment "SCOTT.TOTO".	

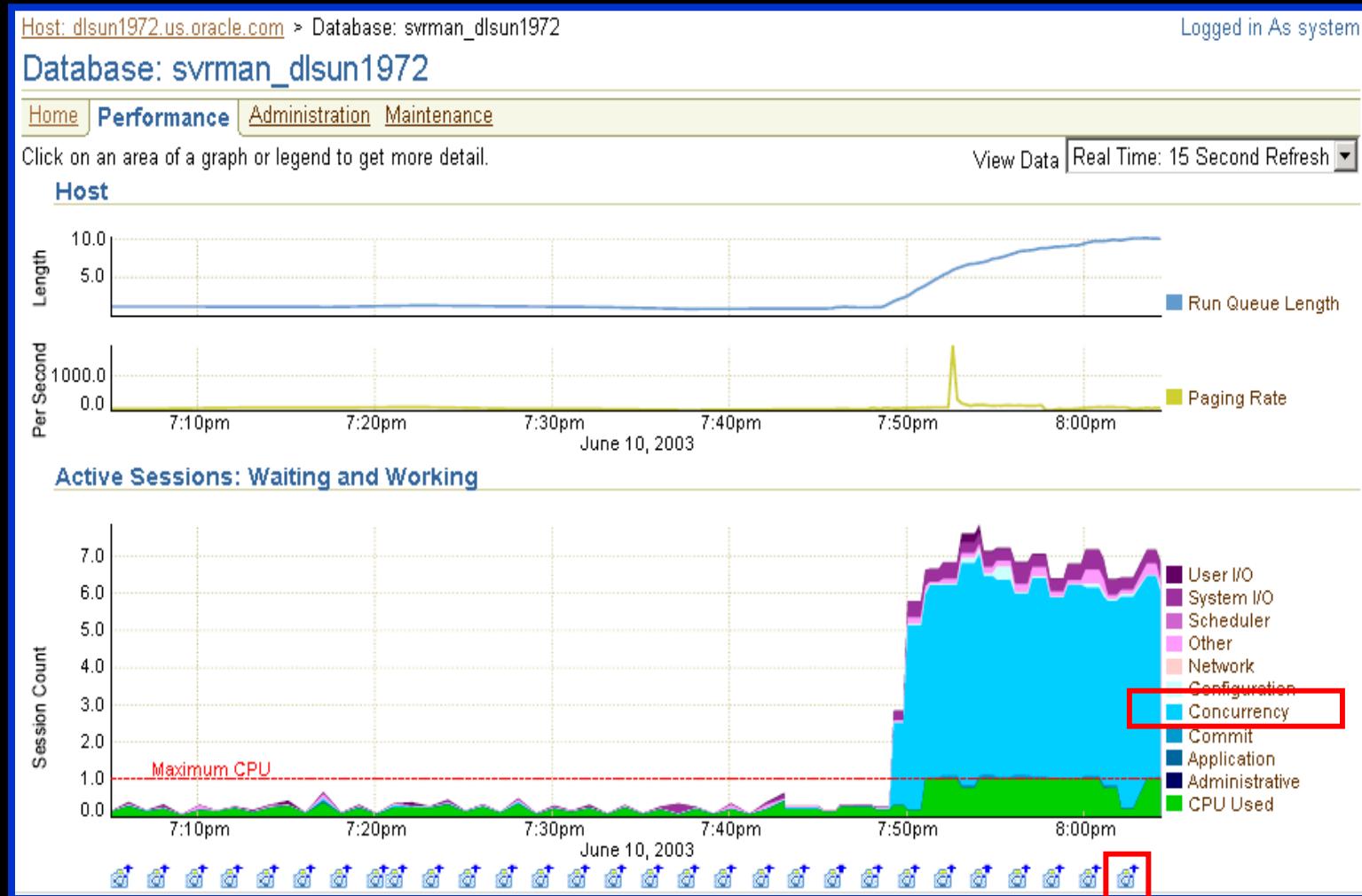
Performance Monitoring Solutions



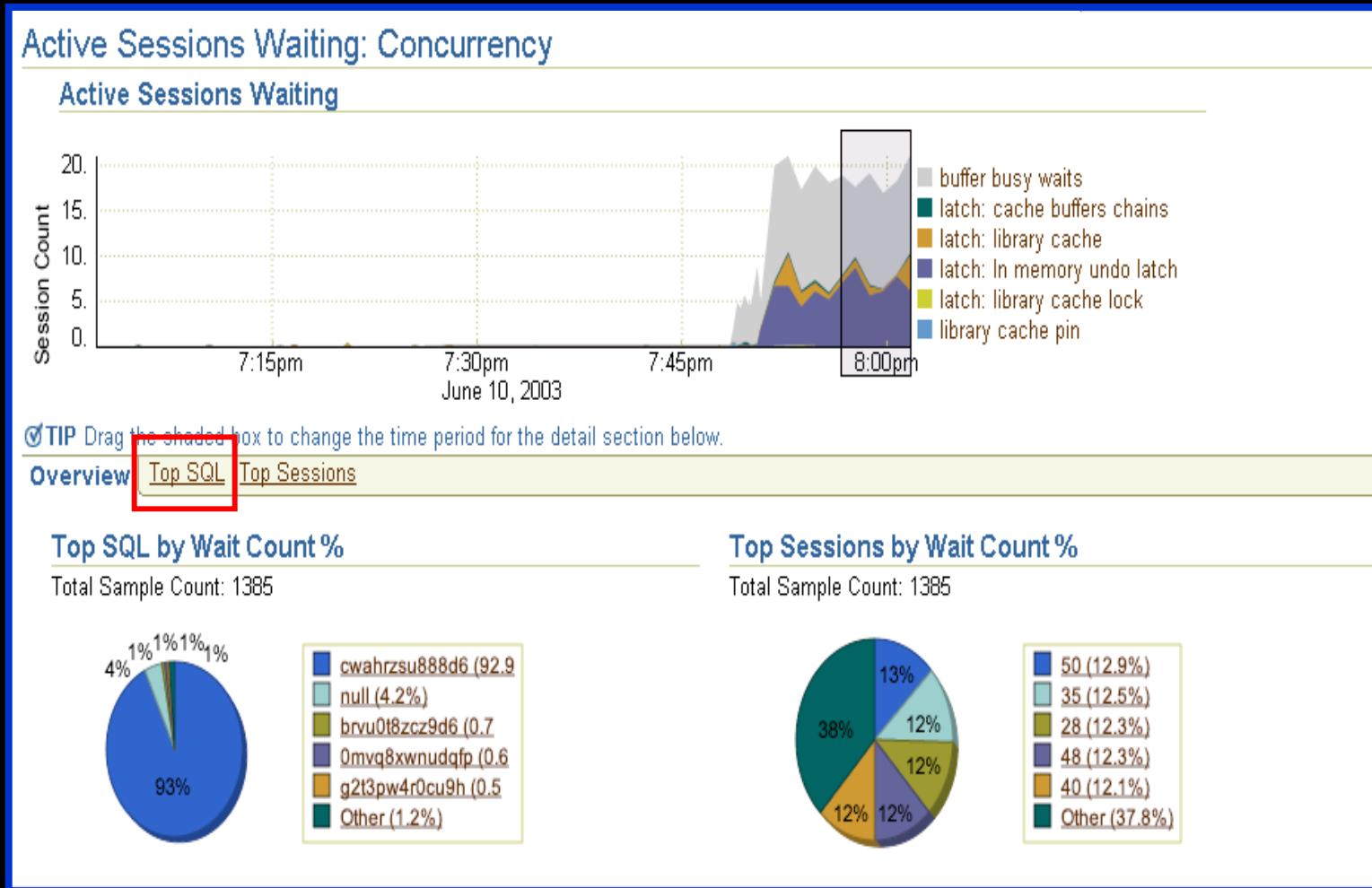
Performance Management Approach



Database Performance Page



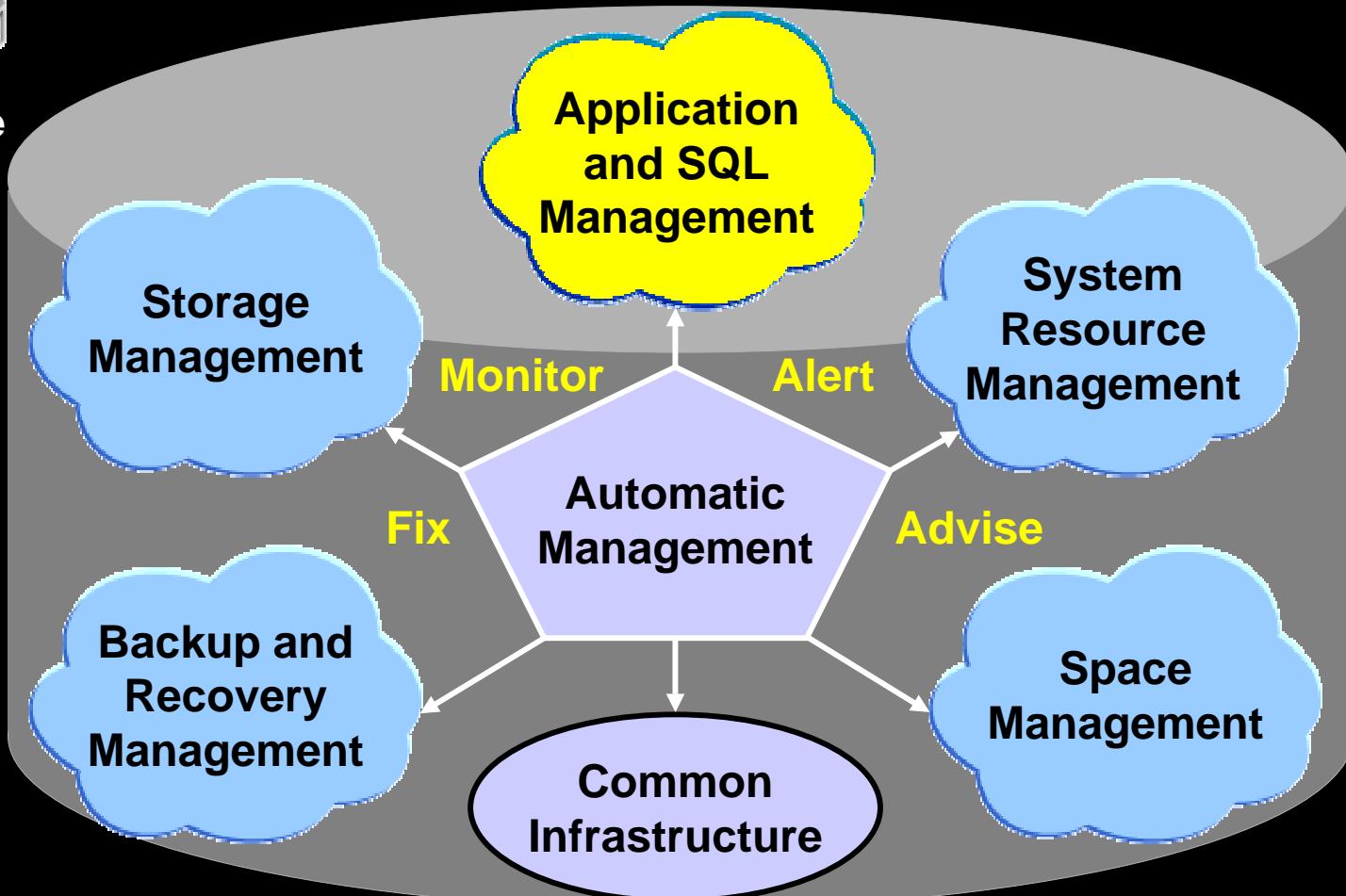
Concurrency Wait Class: Drill Down



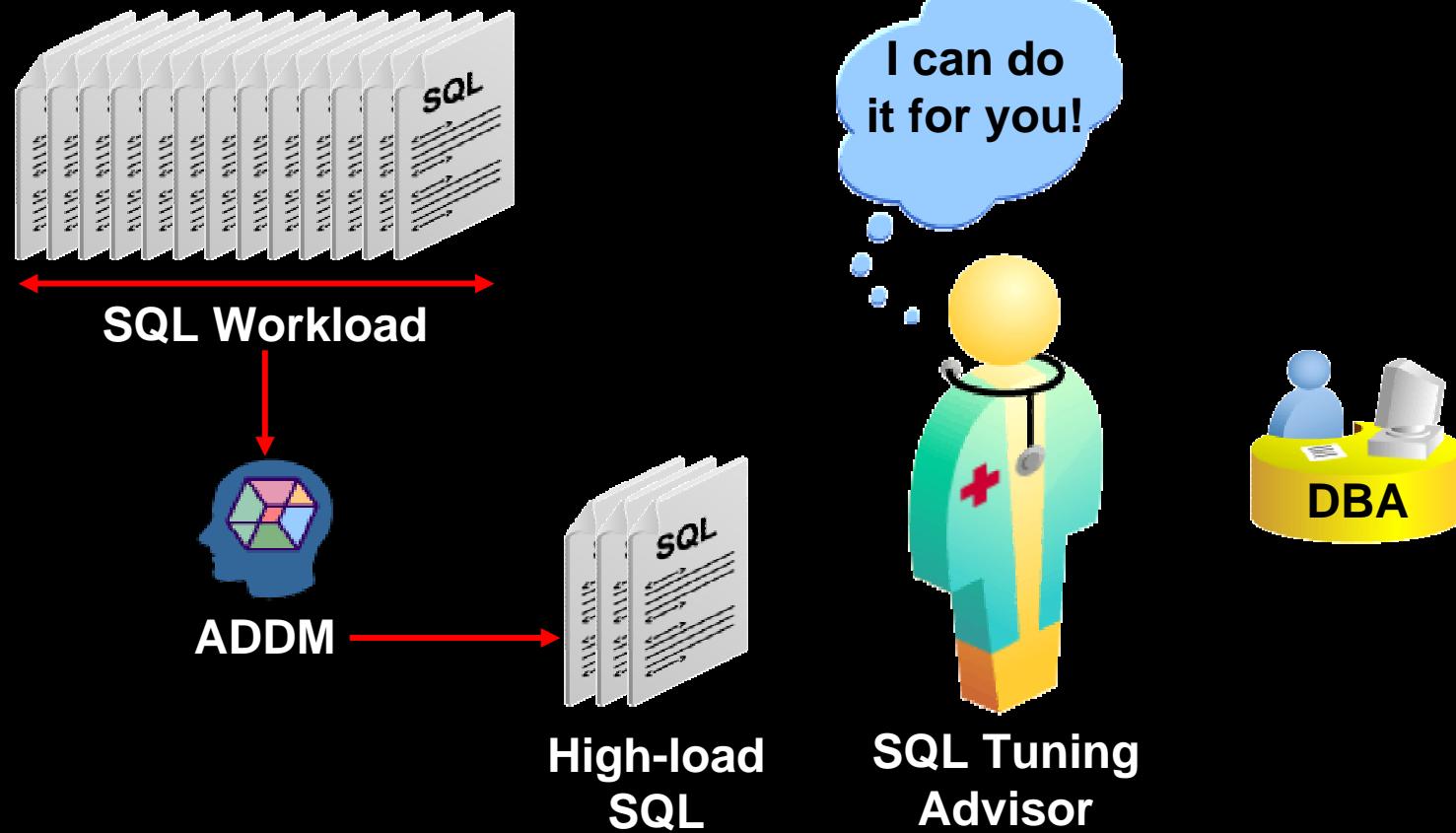
Solution: Self-Managing Database



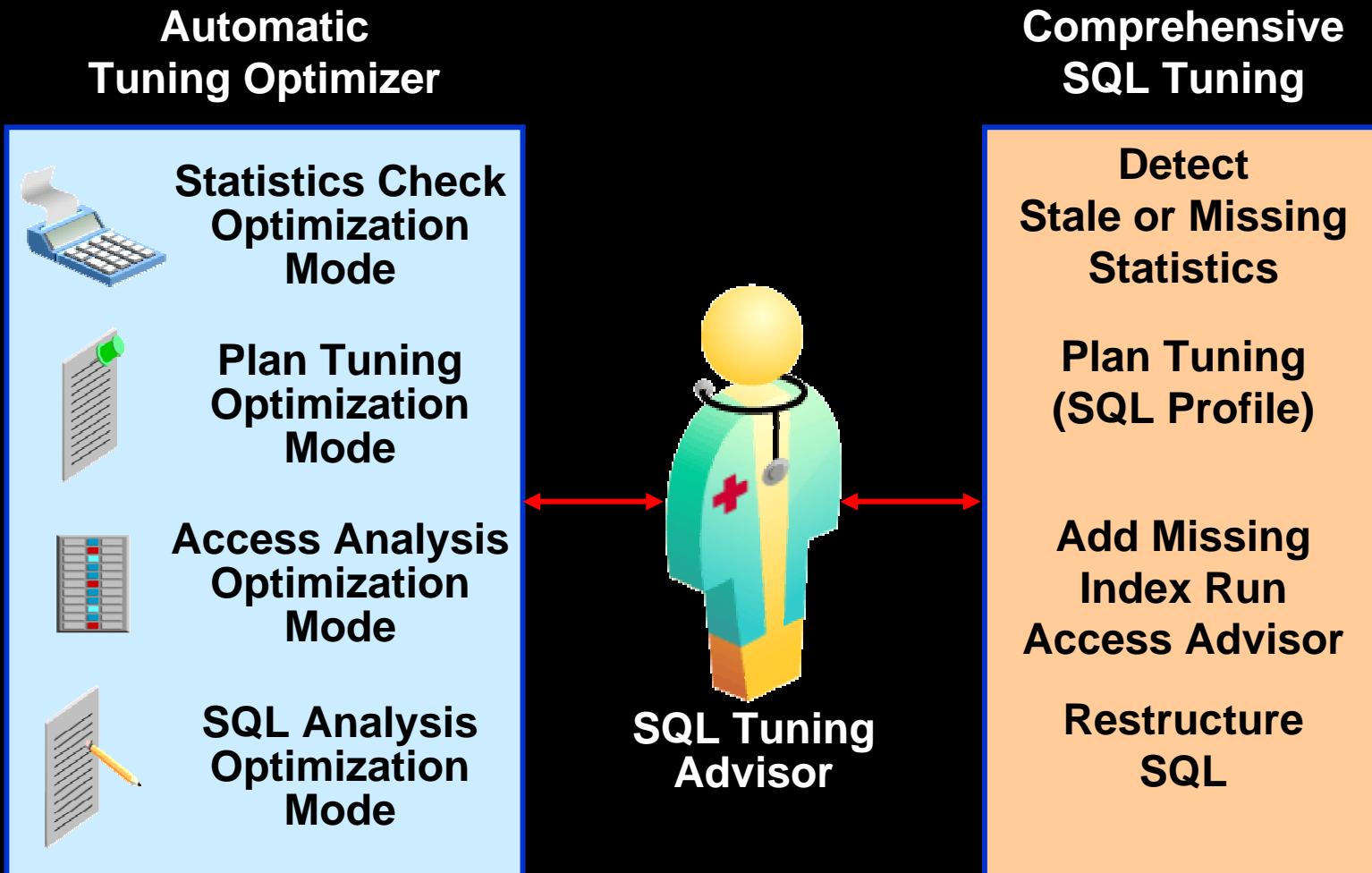
Enterprise
Manager
Database
Console



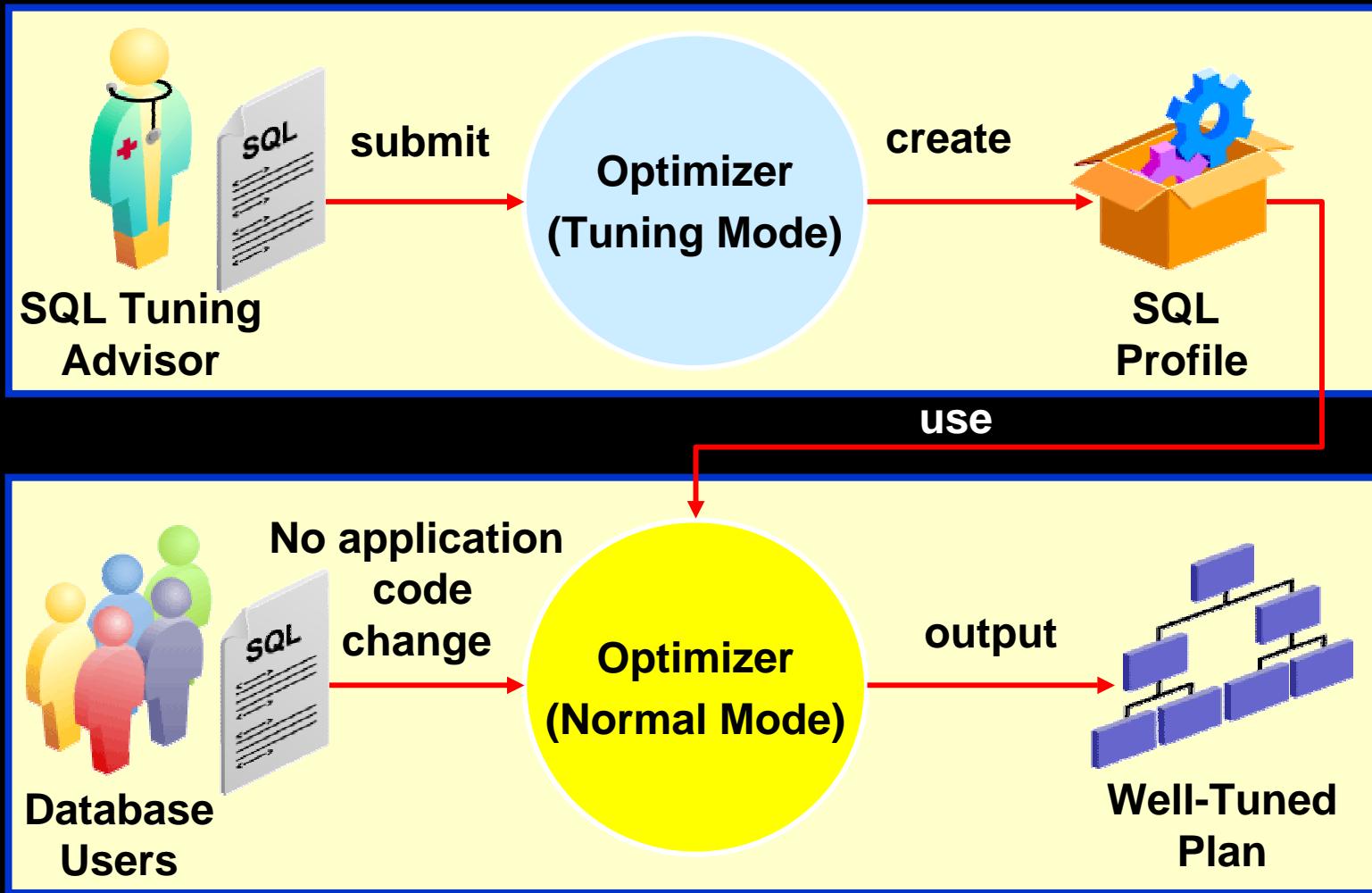
Automate the SQL Tuning Process



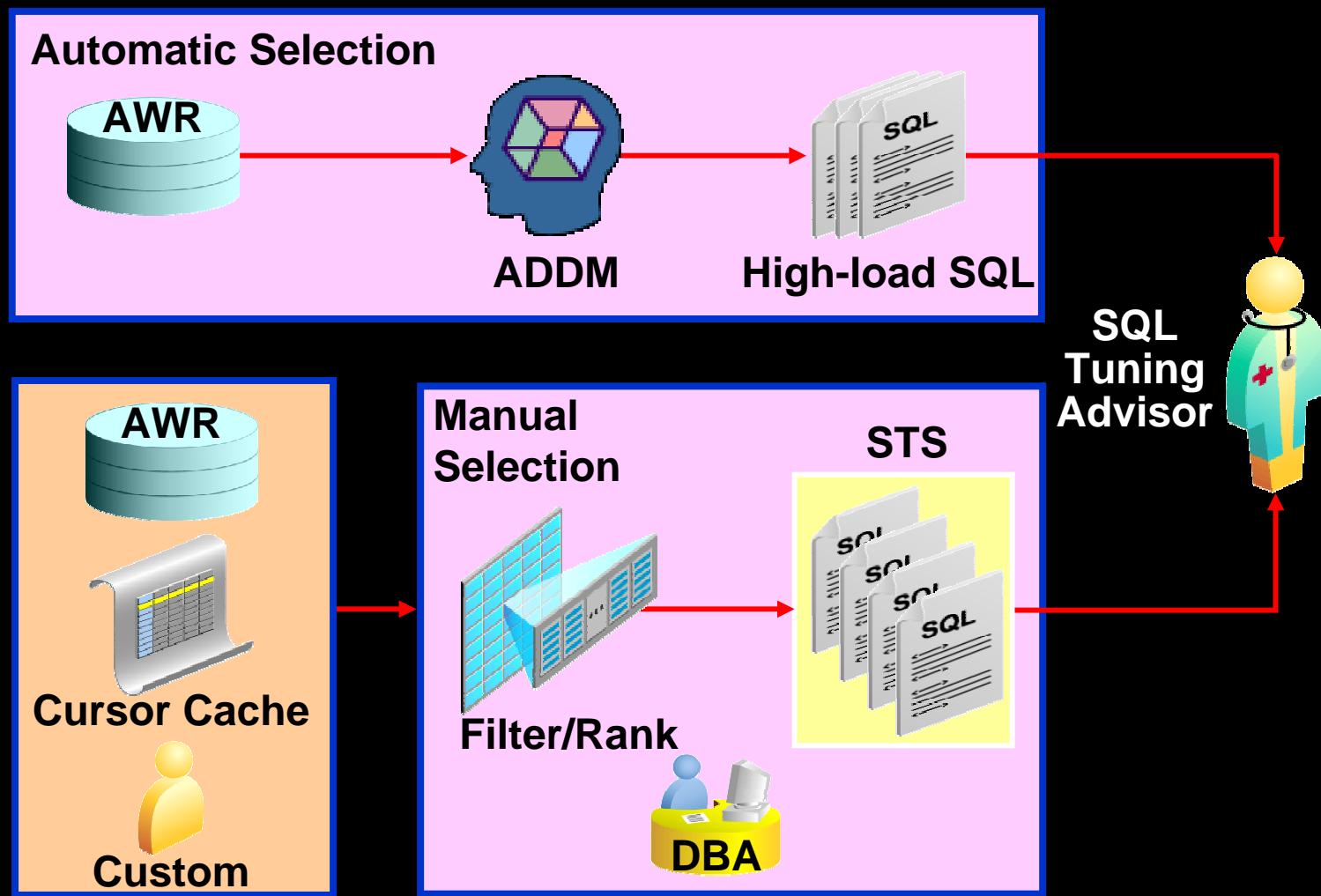
SQL Tuning Advisor Overview



Plan Tuning Flow



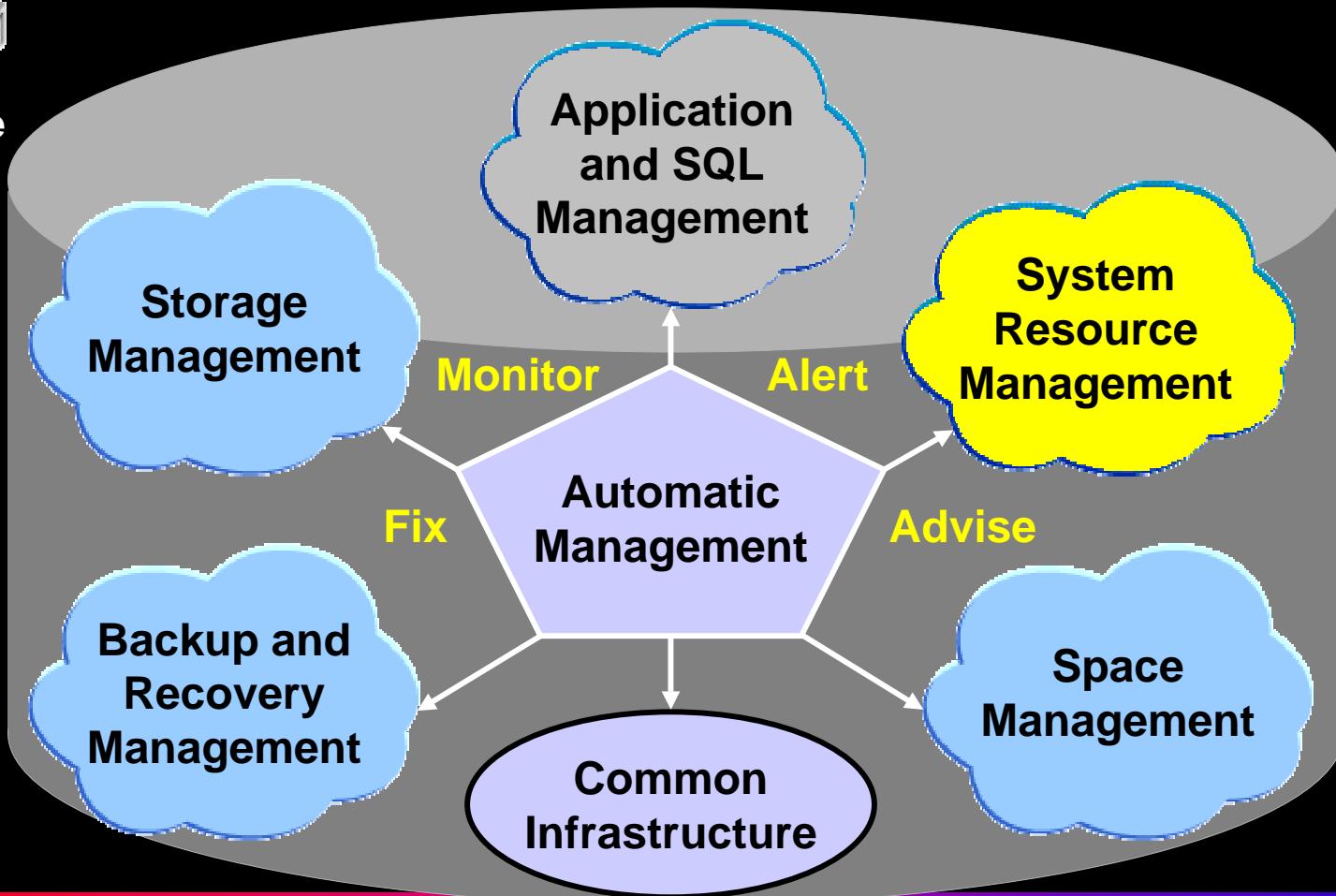
SQL Tuning Advisor Usage Model



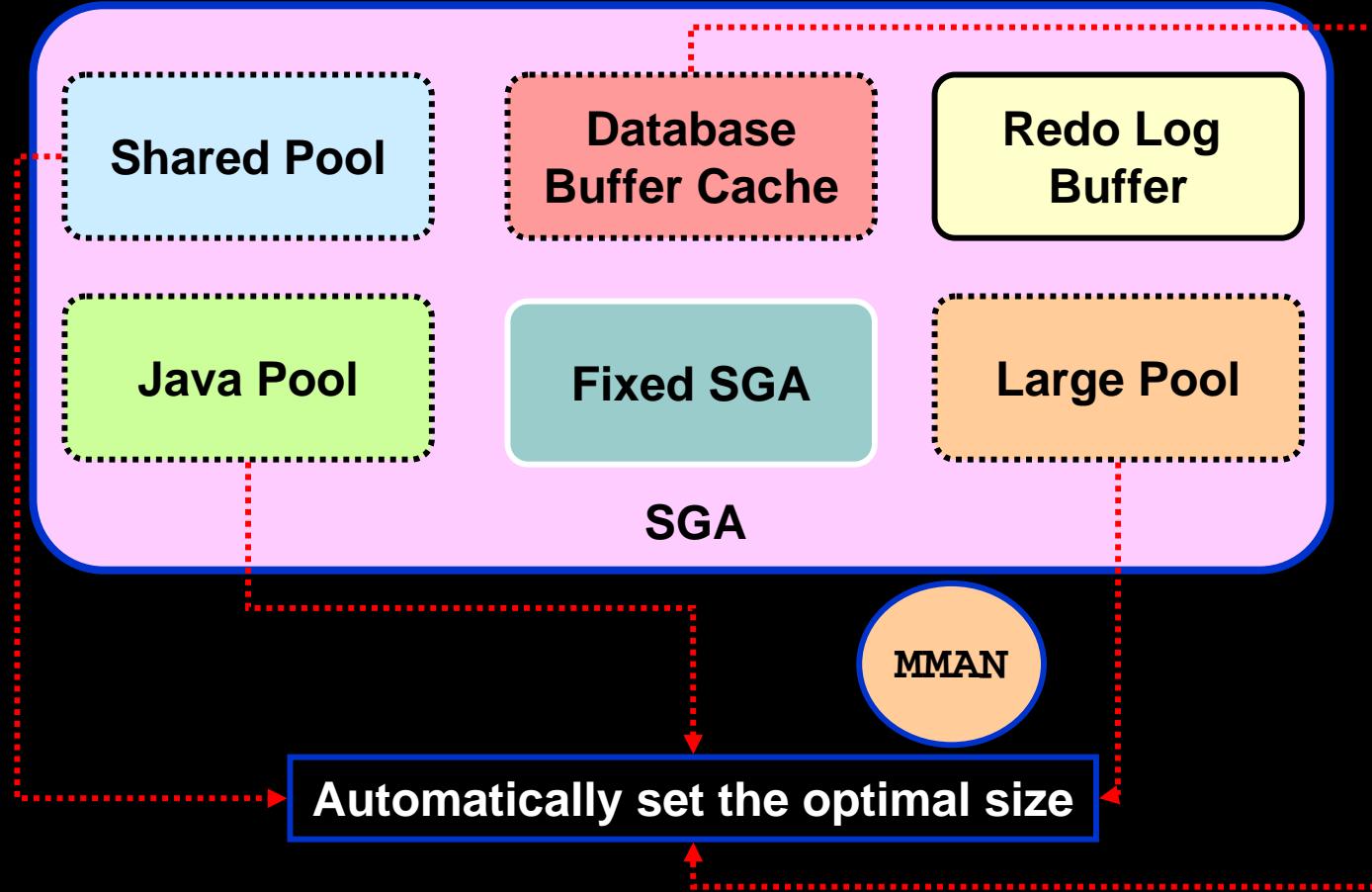
Solution: Self-Managing Database



Enterprise Manager Database Console

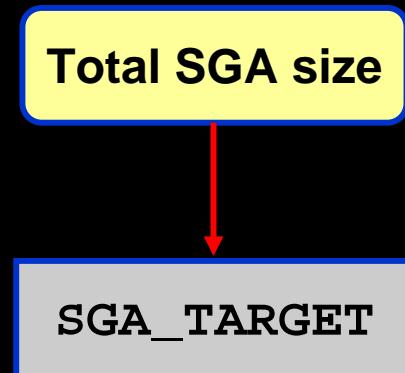


Overview of Automatic Shared Memory Management



Benefits of Automatic Shared Memory Management

DB_CACHE_SIZE
SHARED_POOL_SIZE
LARGE_POOL_SIZE
JAVA_POOL_SIZE



Using EM to Configure Automatic Shared Memory Management

ORACLE Enterprise Manager

Home Targets Configuration Alerts Jobs Management System

Databases Production Hosts Application Servers Web Applications Groups All Targets

Host: dsunrd03.us.oracle.com > Database: mgmt10i_030530_dsunrd03 > Memory Parameters

⚠ You are not logged on with SYSDBA privilege. Only controls for dynamic parameters are editable

Memory Parameters

Collected From Target June 4, 2003 10:11:51 AM PDT Refresh

SGA PGA

The System Global Area (SGA) is a group of shared memory structures that contains data and control information for one Oracle database system. The SGA is allocated in memory when an Oracle database instance is started.

Automatic Shared Memory Management **Disabled** Enable (Red box)

Shared Pool MB Advice

Buffer Cache MB Advice

Large Pool B B

Java Pool MB MB

Other (MB) MB

Total SGA (MB) **241.231**

Maximum SGA Size MB

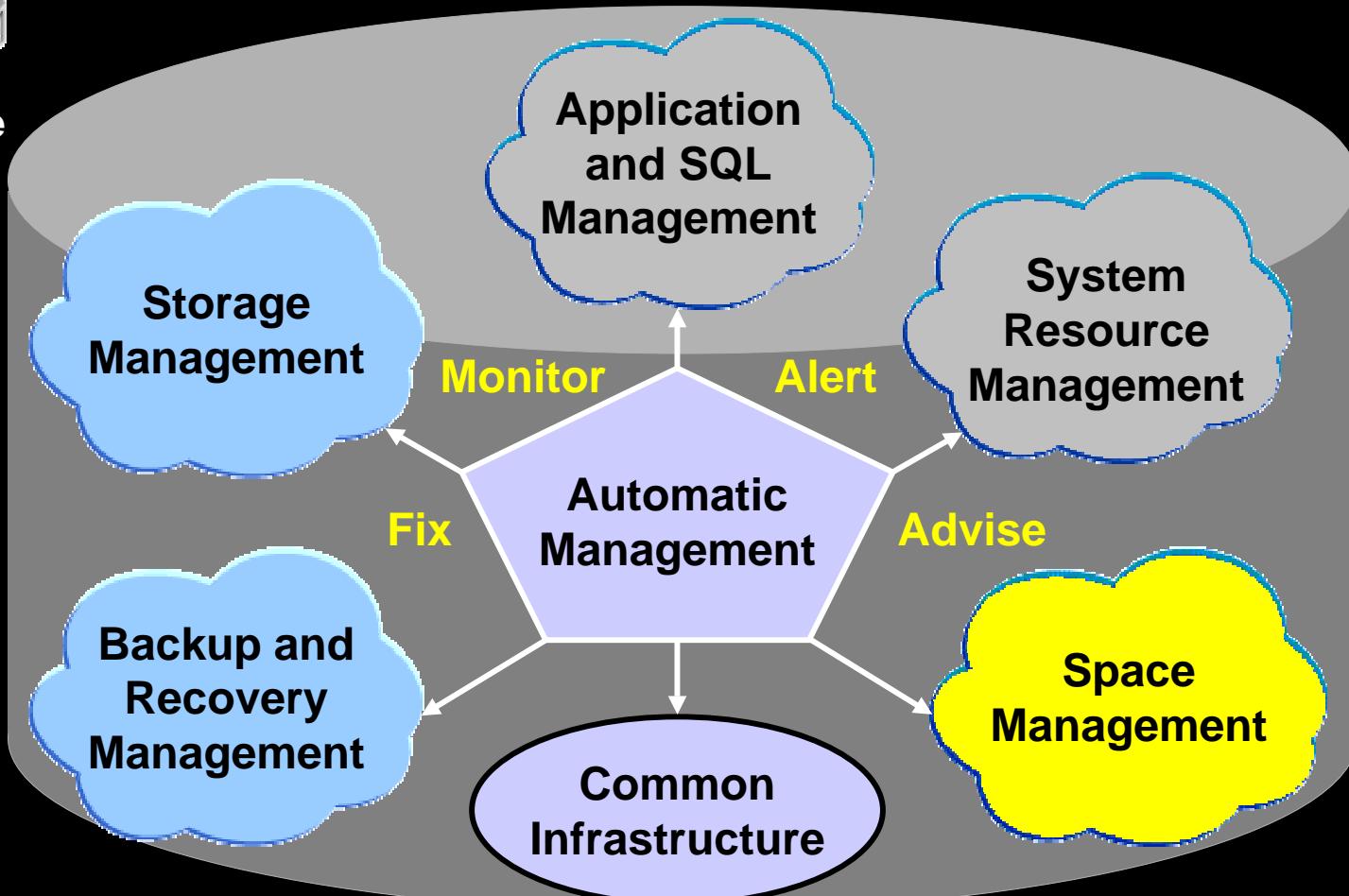
SGA PGA

Pool	Size (MB)	Percentage
Shared Pool	208	86.7%
Buffer Cache	16	6.7%
Large Pool	0	0%
Java Pool	16	6.7%

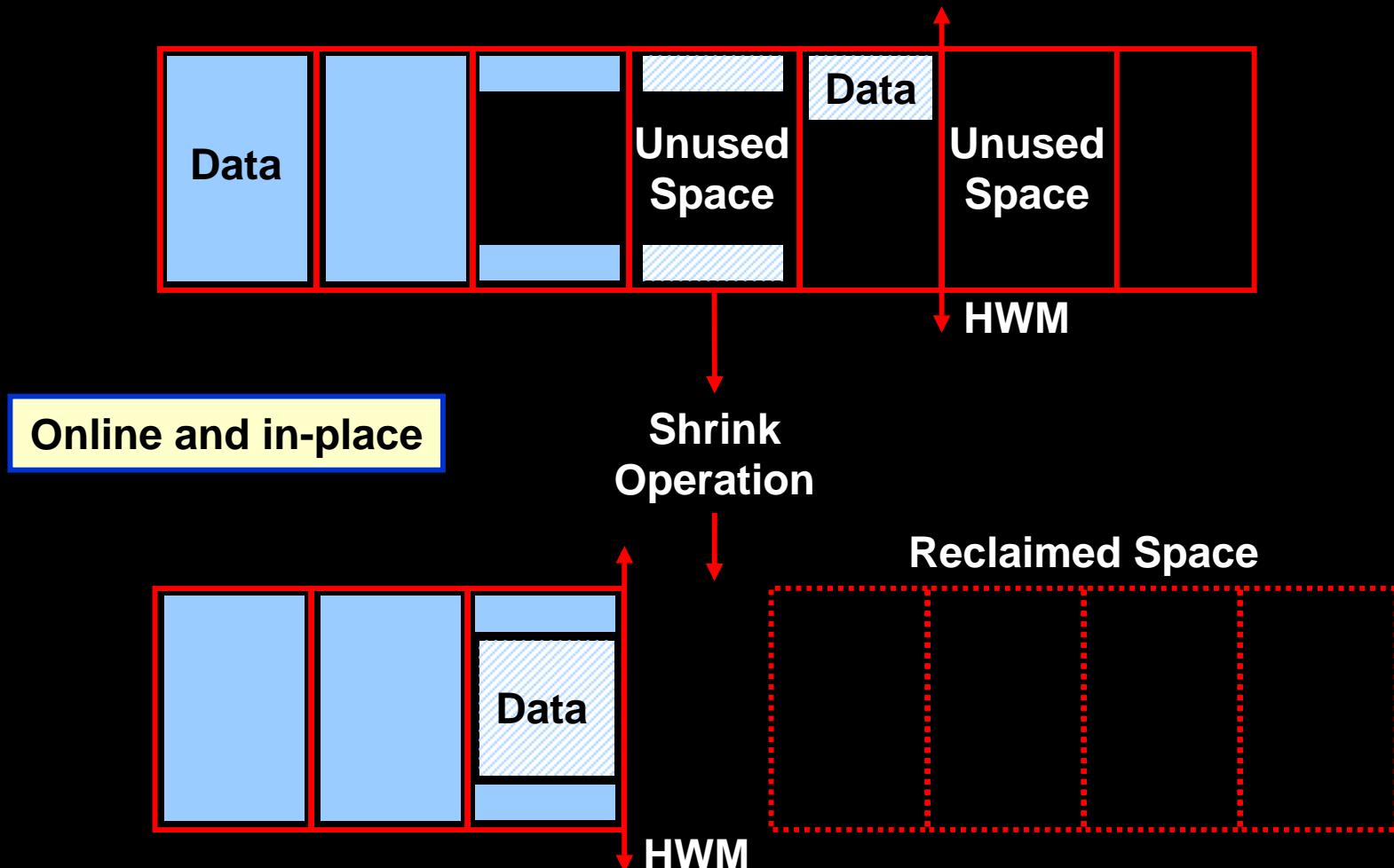
Solution: Self-Managing Database



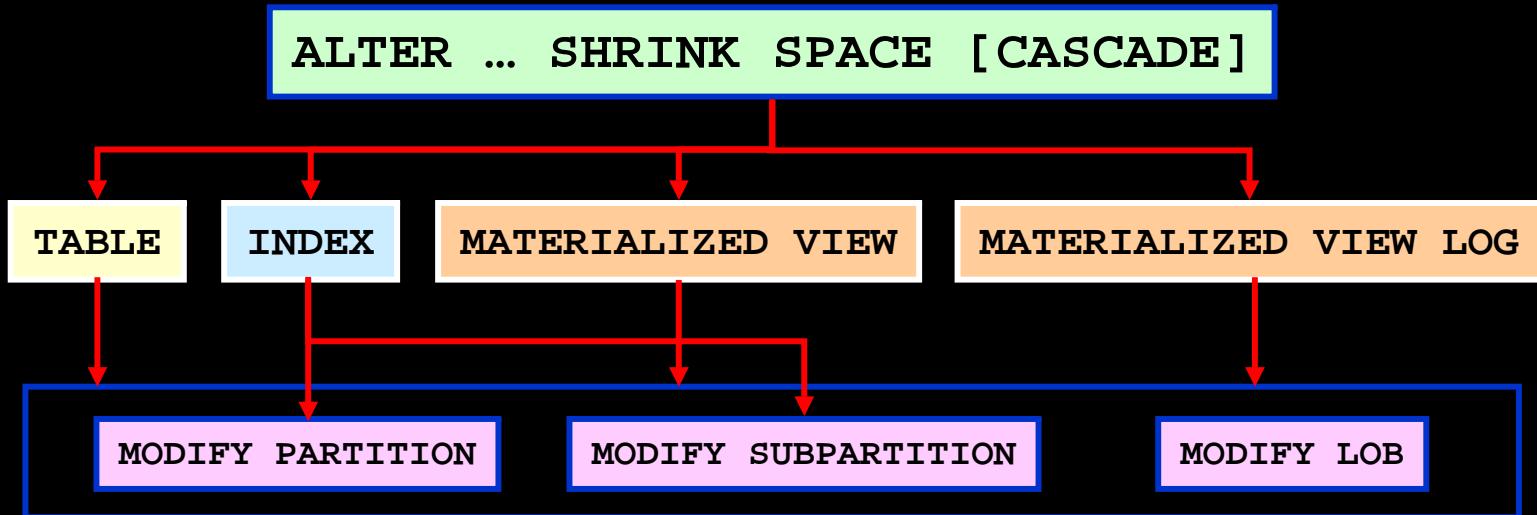
Enterprise Manager Database Console



Segment Shrink Overview



How Can I Shrink Segments?



```
ALTER TABLE employees ENABLE ROW MOVEMENT;
```

1

```
ALTER TABLE employees SHRINK SPACE CASCADE;
```

2

Segment Advisor

ORACLE® Enterprise Manager

Setup Preferences Help Logout

Home Targets Configuration Alerts Jobs Management System

Databases Hosts Application Servers Web Applications Groups All Targets

Host: dsunrdf03.us.oracle.com > Database: mgmt10i_030530_dsunrdf03 > Segment Advisor

Segment Advisor

You can get shrink advice for individual schema objects or entire tablespaces

Tablespaces
 Schema Objects

Comprehensive: complete analysis of all segments
The advisor will sample selected objects as needed, and generate more complete recommendations. The analysis may take a long time to finish and will be scheduled as a job.

Limited: analysis based on available statistics
The analysis will finish within 30 seconds. Due to the time limitation, the advisor may not be able to finishing evaluating all segments and generate recommendations for them.

Overview

The segment advisor determines whether objects have unused space that can be released, taking estimated future space requirements into consideration.

Cancel Continue

Cancel Continue

[Home](#) | [Targets](#) | [Configuration](#) | [Alerts](#) | [Jobs](#) | [Management System](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[About Oracle Enterprise Manager](#)

Growth Trend Report

Oracle Enterprise Manager - Space Usage Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search Favorites Media Home Links Aria Customize Links DB2 CBT DB2 Universal Database FilesOnline Hotmail EM 4.0 Demo 10i EM Demo Stanalone EM ISIS Tickets

Y! Search Sign In My Yahoo! News Yahoo! Mail Games Shopping Finance >

Dependent Segments

Select	Schema	Segment Name	Type	Tablespace
<input checked="" type="radio"/>	HR	COUNTRIES	TABLE	
<input type="radio"/>	HR	COUNTRY_C_ID_PK	INDEX	EXAMPLE
<input type="radio"/>	SH	COUNTRIES_PK	INDEX	EXAMPLE

TIP Select a segment and click the 'Refresh' button to see the Space Usage Trend.

Space Usage Trend

From 6/3/03 To 6/11/03 Refresh

MB

50
40
30
20
10
0

2 April 3 4 5 6 7 8 9 10 11 12 13

2003

MB Allocated MB Used Projected

TIP Putting in a future date will generate a prediction for the space usage on that date. Getting the Space Usage Trend is a time consuming operation and could take a while.

General Constraints Segments Storage Options IOT Properties

Show SQL Revert Apply

Database | Setup | Preferences | Help | Logout

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Done Local intranet

Segment Resource Estimation

Oracle Enterprise Manager - Table General - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search Favorites Media Home Links Aria Customize Links DB2 CBT DB2 Universal Database FilesOnline Hotmail EM 4.0 Demo 10i EM Demo Stanalone EM ISIS Tickets Network Request Oracle Email Prefs

Address http://dlsunrap22:7777/em/console/database/schema/table?target=srvman_dlsun1972&type=oracle_database&cancelURL=/em/console/database/databaseObjectsSearch%3DlastEvent%3Dcreate%26event Go

ORACLE Enterprise Manager Setup Preferences Help Logout

Databases Hosts Application Servers Web Applications Groups All Targets Home Targets Configuration Alerts Jobs Management System

Host: dlsun1972.us.oracle.com > Database: srvman_dlsun1972 > Tables > Create Table

Create Table

Show SQL Cancel OK

General Constraints Storage Options Partitions

* Name Employee
Schema HR
Tablespace <Default>  Estimate Table Size

Organization Standard, Heap Organized

Define Using Column Specification Set Default LOB Attributes Insert Abstract Data Type Column Advanced Attributes Delete

Columns

Select	Name	Data Type	Size	Scale	Not NULL	Default Value
<input checked="" type="radio"/>	Empname	VARCHAR2	60		<input checked="" type="checkbox"/>	
<input type="radio"/>	Empid	NUMBER	15		<input checked="" type="checkbox"/>	
<input type="radio"/>	Dept	NUMBER	10		<input checked="" type="checkbox"/>	
<input type="radio"/>	Salary	NUMBER	25		<input checked="" type="checkbox"/>	
<input type="radio"/>	Managerl	VARCHAR2	60		<input type="checkbox"/>	

Add 5 Table Columns

 TIP Only table columns with a data type of BLOB, CLOB, NCLOB and TableType have advanced attributes.

General Constraints Storage Options Partitions

Show SQL Cancel OK

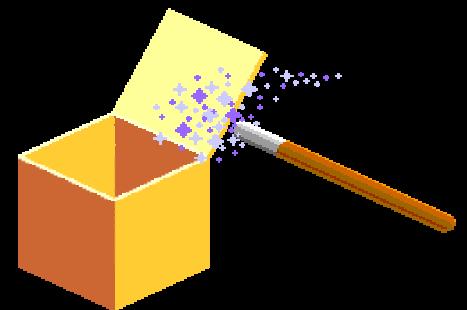
Home | Targets | Configuration | Alerts | Jobs | Management System | Setup | Preferences | Help | Logout

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About Oracle Enterprise Manager

Local Intranet

Automatic Undo Retention Tuning

- Proactive tuning
 - Undo retention is tuned for longest-running query.
 - Query duration information is collected every 30 seconds.
- Reactive tuning
 - Undo retention is gradually lowered under space pressure.
 - Oldest unexpired extents are used first.
- Enabled by default



Undo Advisor

Oracle Enterprise Manager - Undo Management - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Forward Home Search Favorites Media Home Targets Configuration Alerts Jobs Management System Setup Preferences Help Logout

Address http://dlsunrap22:7777/em/console/database/instance/undoAdvisory?event=reset&id=2&advisoryCentralURL=/em/console/database/instance/advisorTasks%3Fevent=reload&target=srvman_dlsun1972&type= Go

Links Aria Customize Links DB2 CBT DB2 Universal Database FilesOnline Hotmail EM 4.0 Demo 10i EM Demo Stanalone EM ISIS Tickets Network Request Oracle Email Prefs

ORACLE Enterprise Manager

Hosts Databases Application Servers Web Applications Groups All Targets

Host: dlsun1972.us.oracle.com > Database: srvman_dlsun1972 > Undo Management

Undo Management Undo Advisor

Configuration

Automatic Undo Retention **Enabled**
Undo Retention **Automatic**
Undo Retention Guarantee **No**

Undo Tablespace **undots** [Change Tablespace](#)
Size (MB)
Auto-Extensible **Yes**

Recommendations

Choose the time period that best represents the system activity to get the recommendations for undo retention length and undo tablespace size.

Analysis Time Period **Last Seven Days** [Update Analysis](#)
Selected Analysis Time Period **6/5/03 1:00 PM - 6/12/03 1:00 PM**

Potential Problems **No Problem Found**
Recommendations **No Recommendation**

System Activity and Tablespace Usage

The recommendations are based on system activity and undo tablespace usage for the selected analysis time period.

Longest Running Query (seconds) **588**
Average Undo Generation Rate (KB/minute) **0.0**
Maximum Undo Generation Rate (KB/minute) **0.0**

[Show Graph](#) Undo Advisor

Home | Targets | Configuration | Alerts | Jobs | Management System | Setup | Preferences | Help | Logout

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[About Oracle Enterprise Manager](#)

Local intranet

Redo Logfile Size Advisor

ORACLE Enterprise Manager

Setup Preferences Help Logout

Hosts Databases Application Servers Web Applications Groups All Targets

Host: dsunrdf03 > Database: mgmt10i DB > Redo Log Groups Logged in As system

Update Message
The recommended optimal redo log file size is 49 MB.

Redo Log Groups

Search

Name Go

Example: Entering Test will return all items beginning with upper case TEST, i.e. TEST_A, except for Java Source and Java Class which use case sensitive searches. Use double quotes to preserve case and embed wildcards(%).

Results

Create Edit View Delete Actions Clear logfile Go

Select	Group	Status	# of Members	Archived	Size (KB)	Sequence	First Change#
<input checked="" type="radio"/>	1	Inactive		1 No	25600	94	182565932
<input type="radio"/>	2	Current		1 No	25600	95	182611380

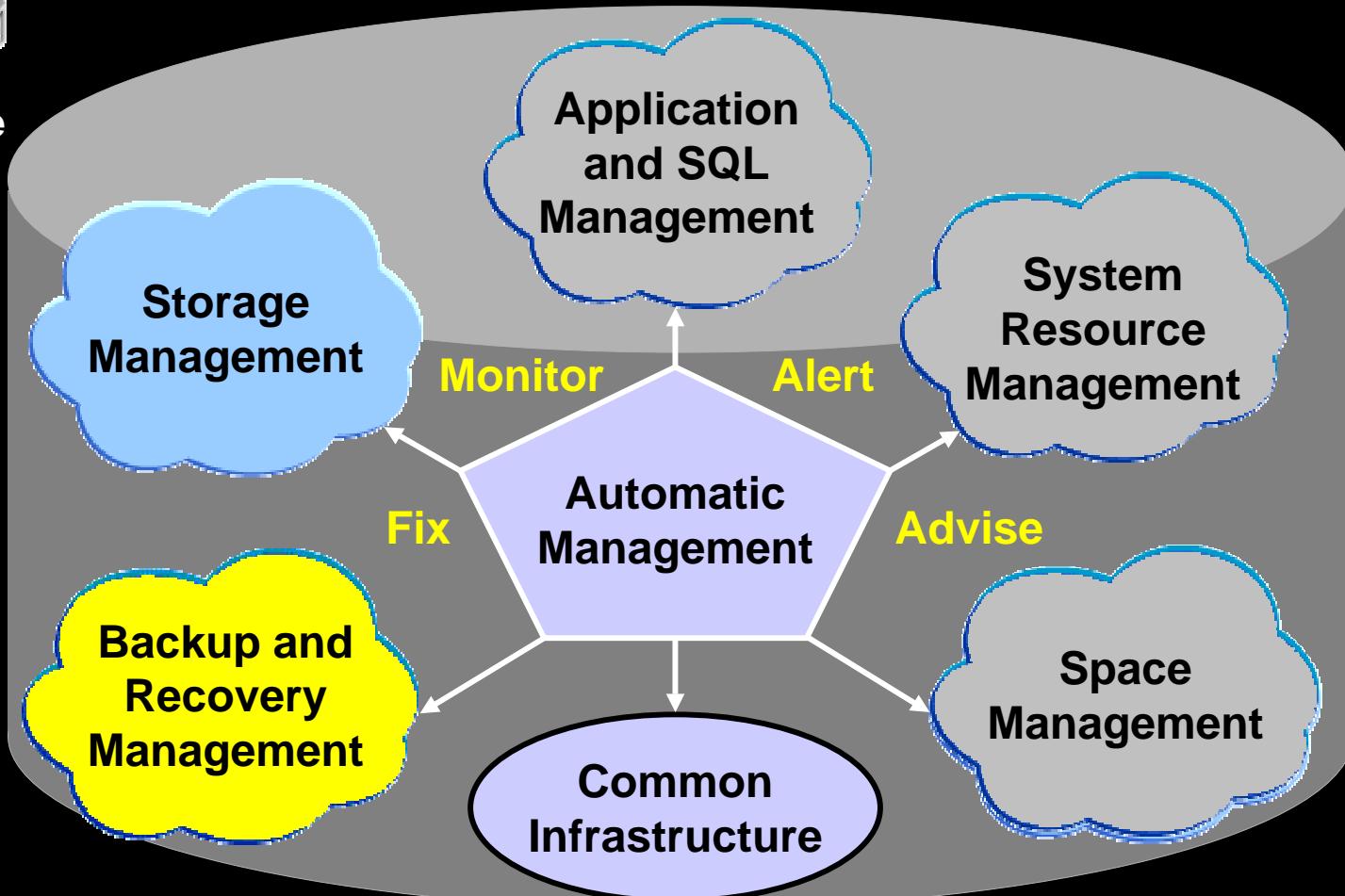
[Home](#) | [Targets](#) | [Configuration](#) | [Alerts](#) | [Jobs](#) | [Management System](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[About Oracle Enterprise Manager](#)

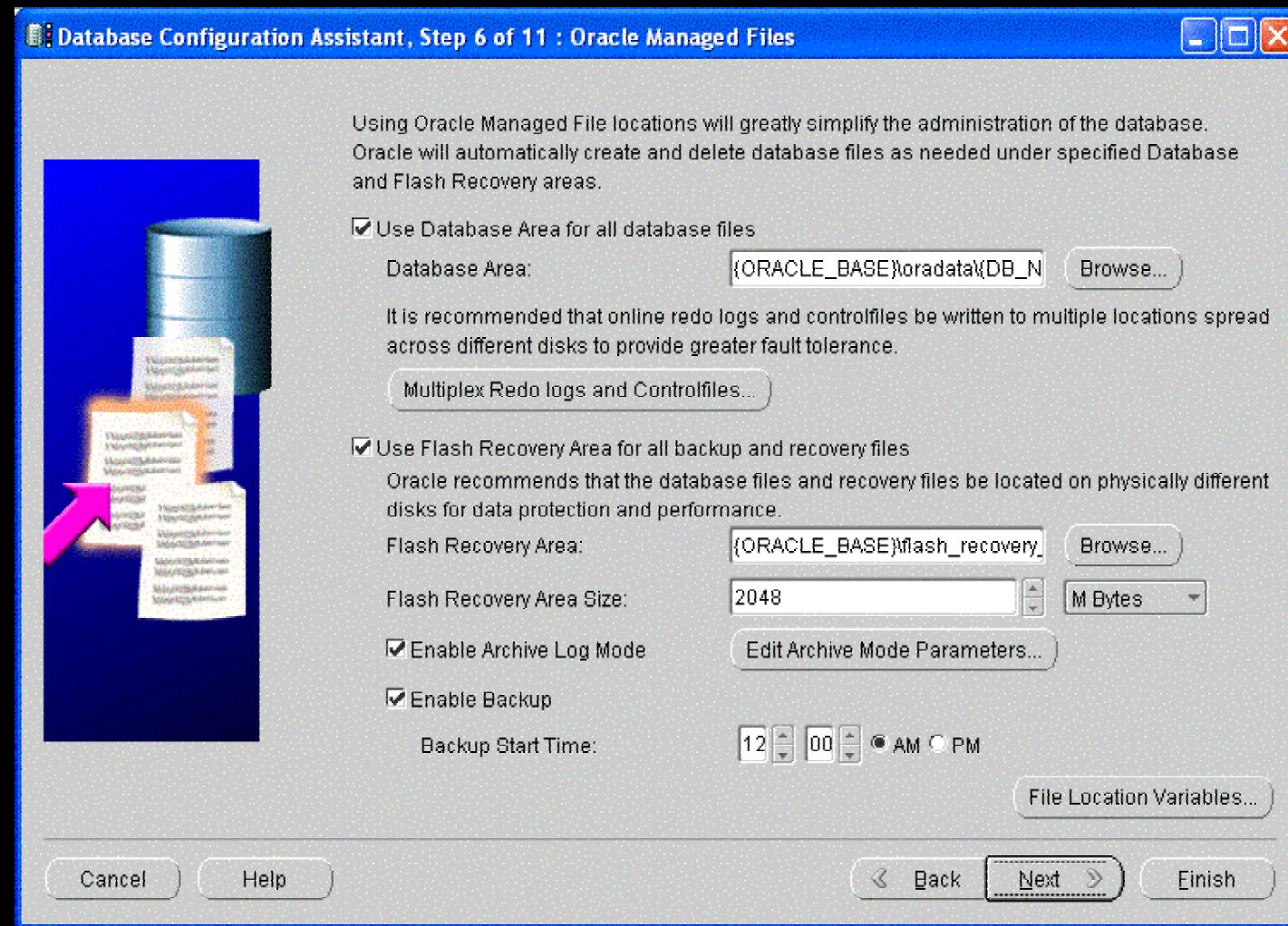
Solution: Self-Managing Database



Enterprise Manager Database Console

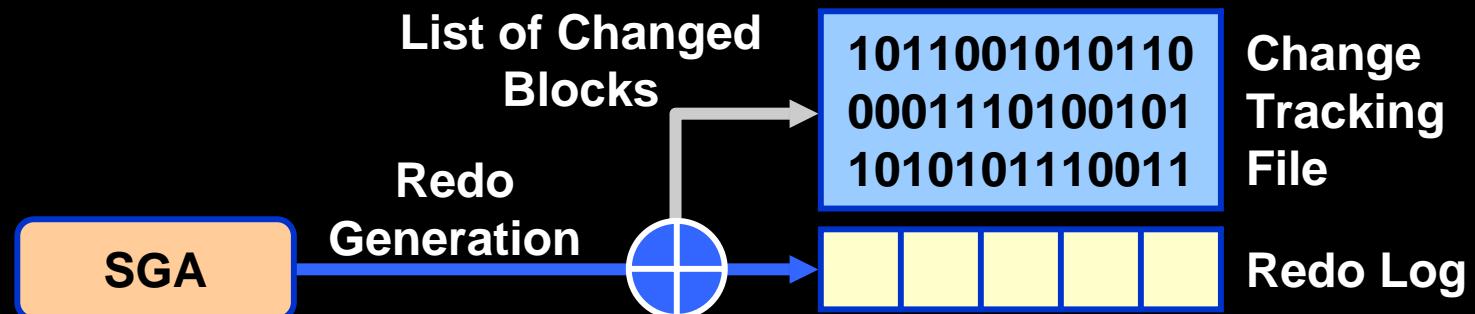


Automatic Backup (DBCA Setup)



Optimized Incremental Backup

- Optimizes incremental backups
 - Tracks which blocks have changed since last backup
- Oracle Database 10^g has integrated change tracking.
 - New Change Tracking File is introduced.
 - Changed blocks are tracked as redo is generated.
 - Database backup automatically uses changed block list.



Defining Flash Recovery Area

The screenshot shows the Oracle Enterprise Manager (OEM) interface for defining a Flash Recovery Area (FRA). The URL in the address bar is `http://dsunrap23:7777/em/console/database-instance/recovery?target=as19_db&type=oracle_database`.

The 'USE_DB_RECOVERY_FILE_DEST' parameter is set to 10, marked as VALID and Local.

Flash Recovery Area

It is highly recommended to use flash recovery area to automate your disk backup management.

Flash Recovery Area Location: `/private/oracle/recovery_area`

Flash Recovery Area Size: 3 GB

Flash Recovery Area Size must be set when the location is set

Enable flashback logging for fast database point-in-time recovery*

The flash recovery area must be set to enable flashback logging. Using flashback logs, you may recover your entire database to a prior point-in-time without restoring files. Flashback is the preferred point-in-time recovery method in the recovery wizard when appropriate.

Specify how far back you wish to flash the database in the future

Flashback Retention Time: 24 Hours

Current size of the flashback logs: n/a

Lowest SCN in the flashback data: n/a

Time of the lowest SCN in the flashback data: n/a

TIP * indicates controls, if changed, must restart database to invoke.

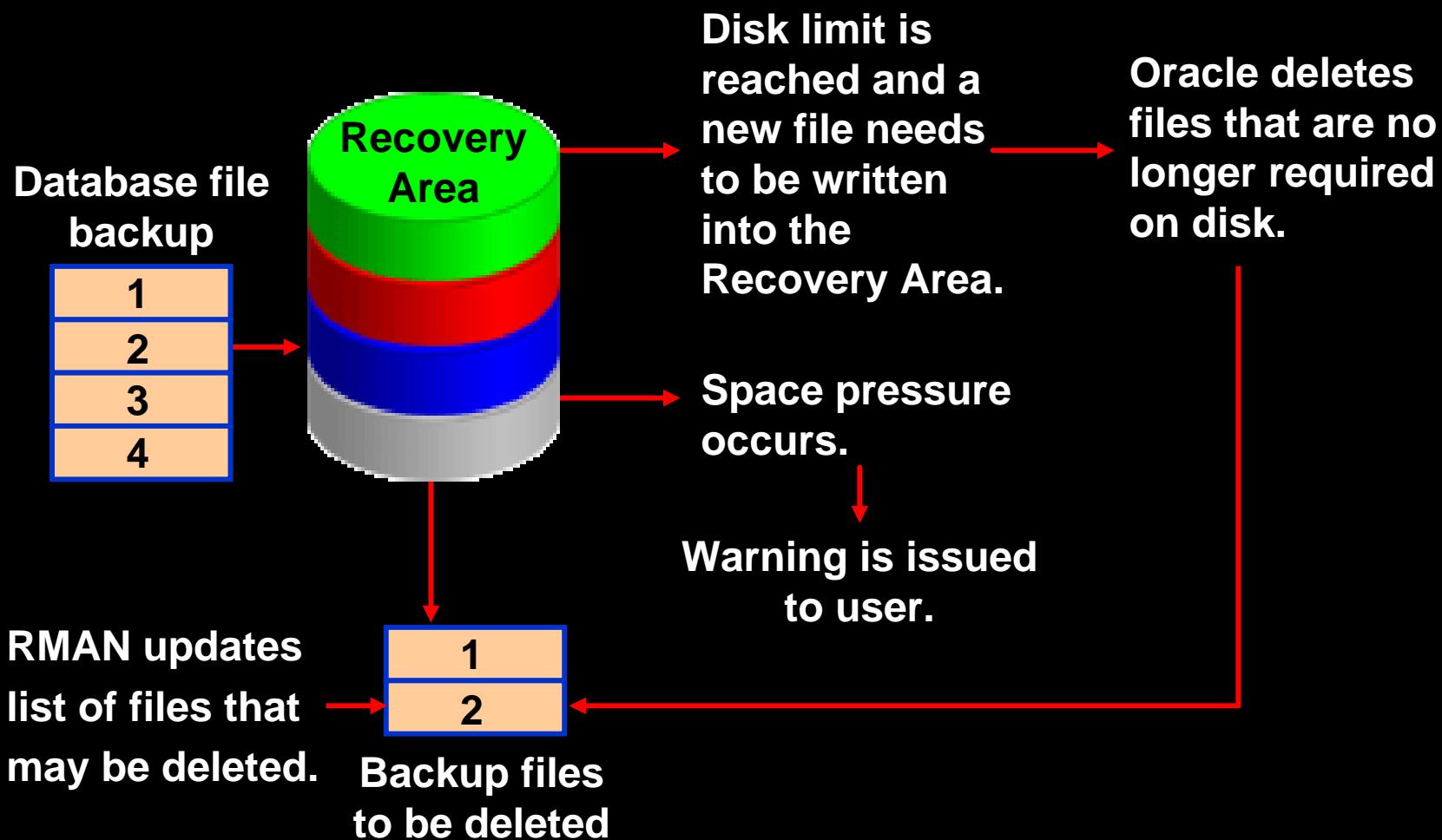
Buttons at the bottom: Show SQL, Revert, Apply

Navigation links at the bottom: Home | Targets | Configuration | Alerts | Jobs | Management System | Setup | Preferences | Help | Logout

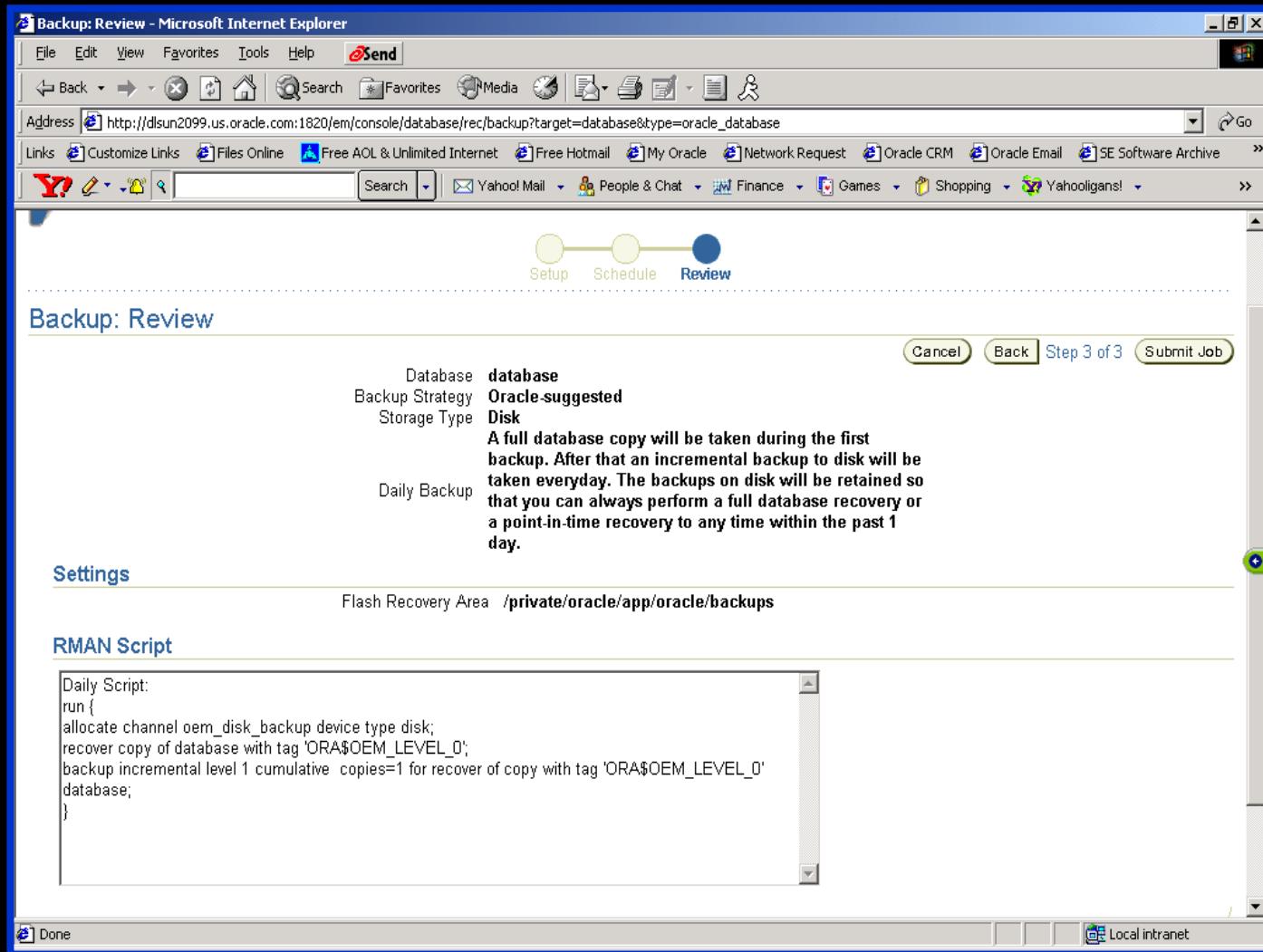
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About Oracle Enterprise Manager

Done | Local intranet

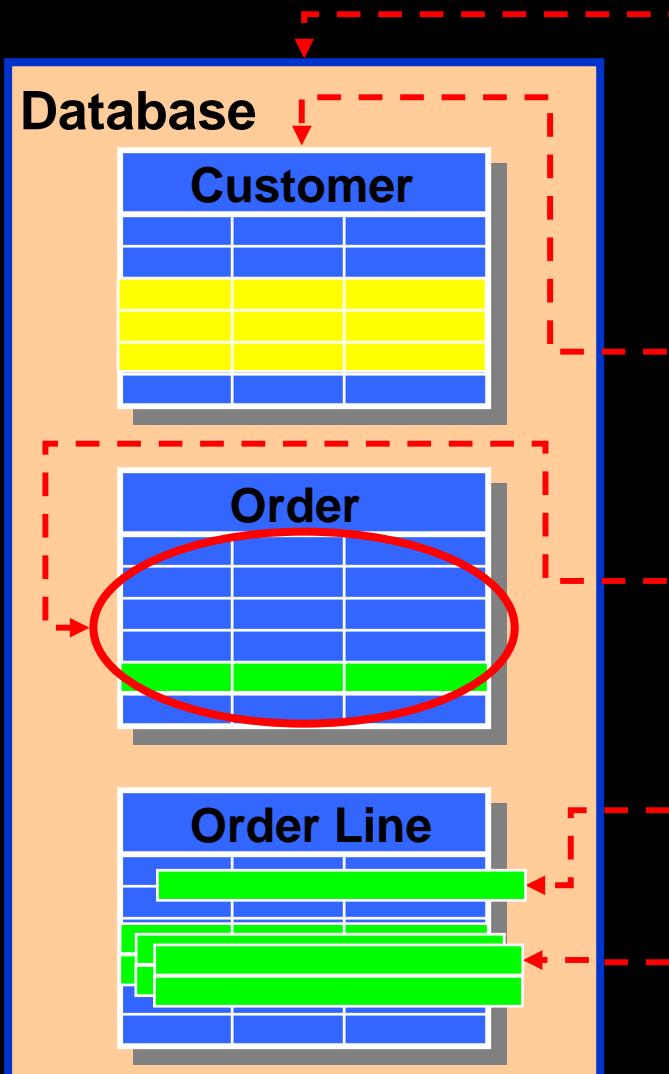
Flash Recovery Area Space Management



Suggested Strategy



Flashback Error Correction

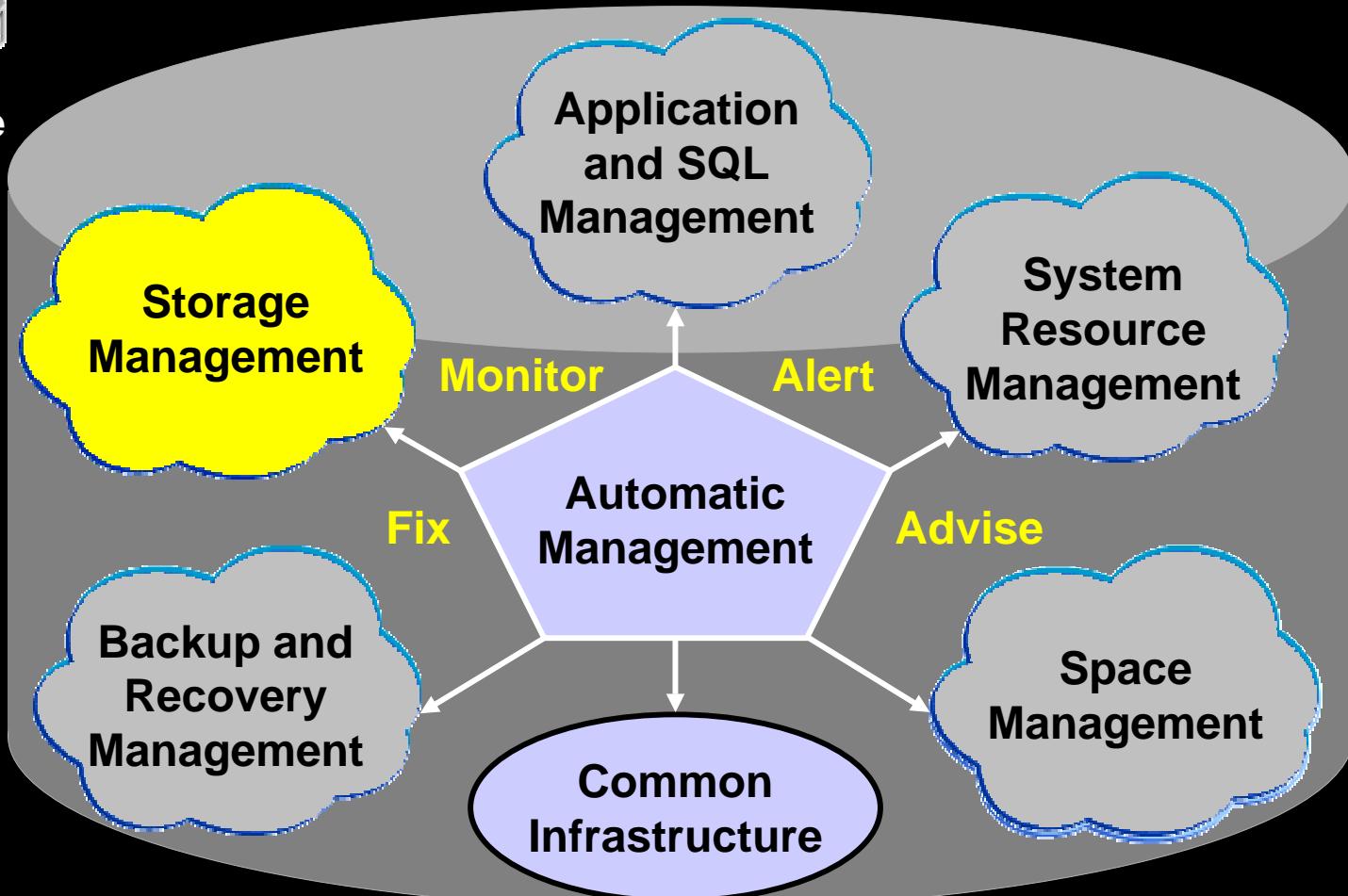


- Flashback Database
 - Restore database to time
 - Uses flashback logs
- Flashback Drop
 - Restore dropped table
 - Uses recycle bin
- Flashback Table
 - Restore all rows in table to time
 - Uses UNDO in database
- Flashback Transaction Query
 - Query a committed Txn
- Flashback Versions Query
 - Query changes to rows over time

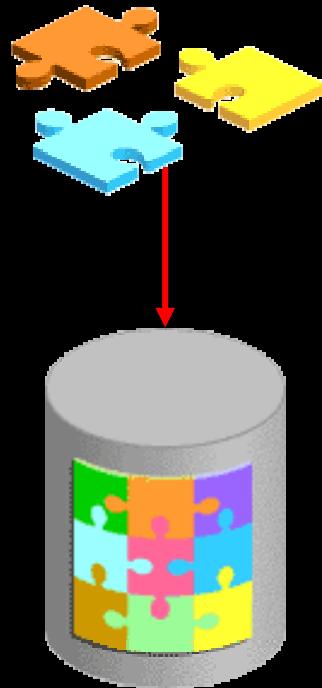
Solution: Self-Managing Database



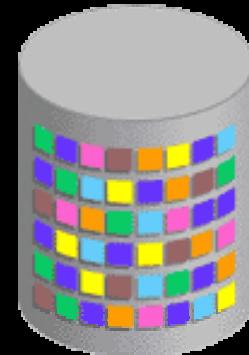
Enterprise Manager Database Console



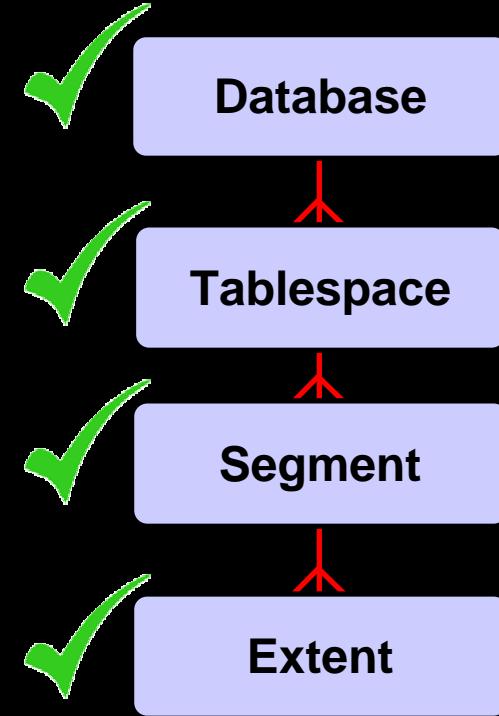
What Is Automatic Storage Management



ASM manages
Oracle files.

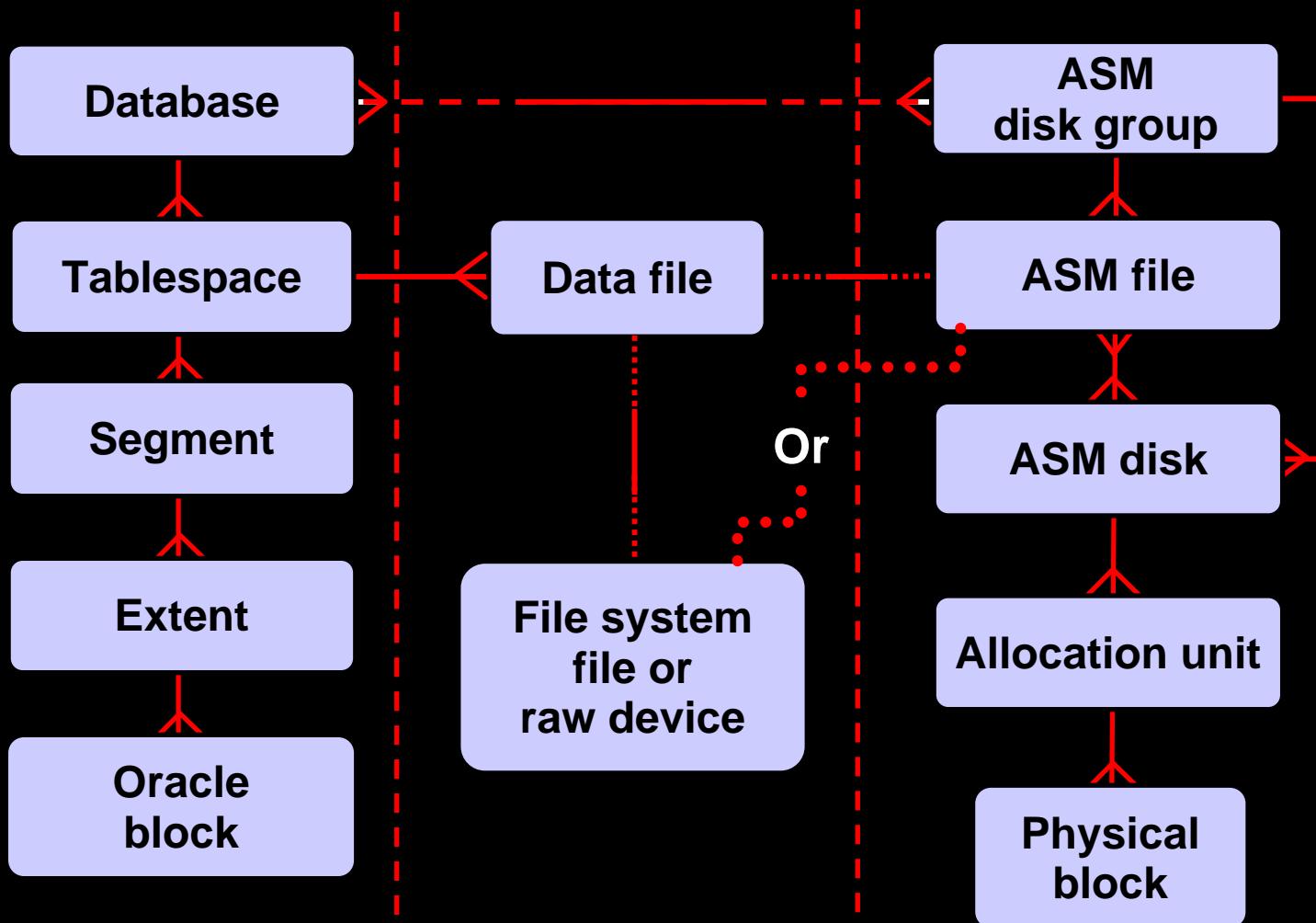


ASM solves
management problems
of Oracle databases.



ASM does *not*
replace existing
concepts.

Hierarchy



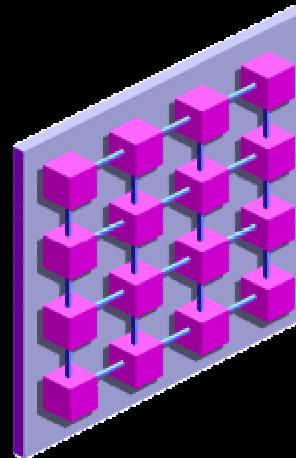
ASM Benefits



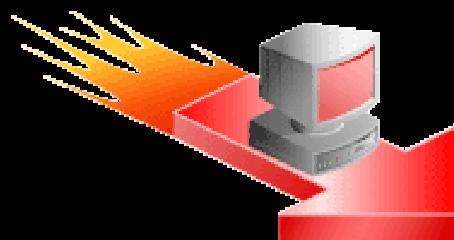
Reduces the cost
of managing storage



Reduces
administration
complexity



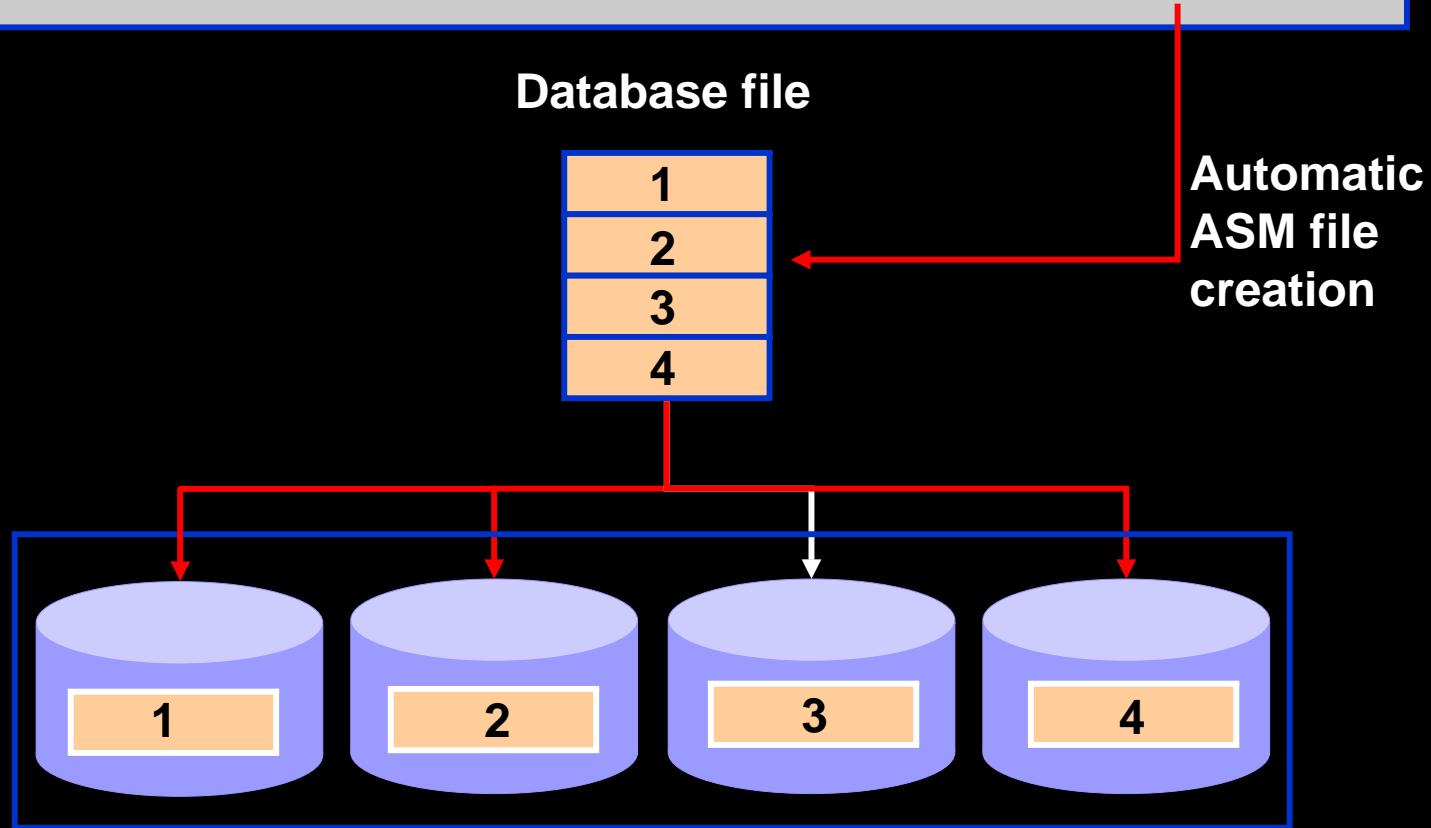
Supports
RAC



Improves
performance,
scalability,
and reliability

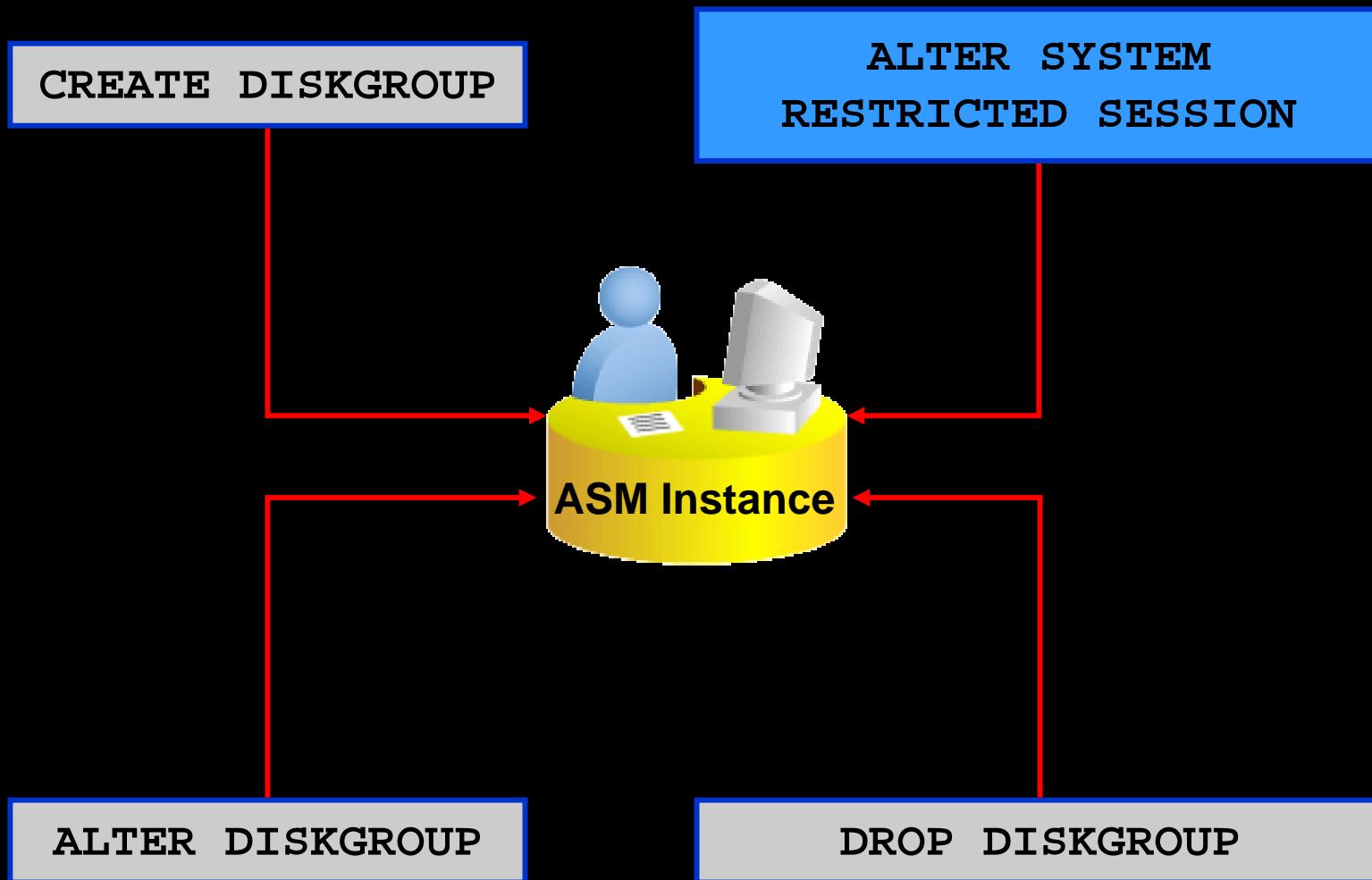
ASM Files

```
CREATE TABLESPACE sample DATAFILE '+dgroupA';
```



ASM file automatically spread inside disk group dgroupA

SQL Statements Issued to ASM Instances



Enterprise Manager and ASM

ORACLE Enterprise Manager

Setup Preferences Help Logout

Home Targets Configuration Alerts Management System

Hosts Databases Application Servers Web Applications Groups All Targets

Oracle Storage Manager: OSM

Home Performance Administration Configuration

Data Retrieved January 30, 2003 4:05:42 AM EST

General

Current Status **Up** [Change Status](#)

Up Since **Jan 29, 2003 10:06:12 AM**

Availability (%) **100%**
(Last 24 hours)

Instance Name **+OSM**

Version **10.1.0.0.0**

Host **spanchum-sun.us.oracle.com**

Oracle Home **/ade/spanchum/osm/oracle**

Latest Alert Log Entry **No ORA- errors**

DiskGroup Usage (in MB)

DiskGroup	Size (MB)	Percentage
System	1,894	76%
Free	89	4%
OSMDB	517	21%

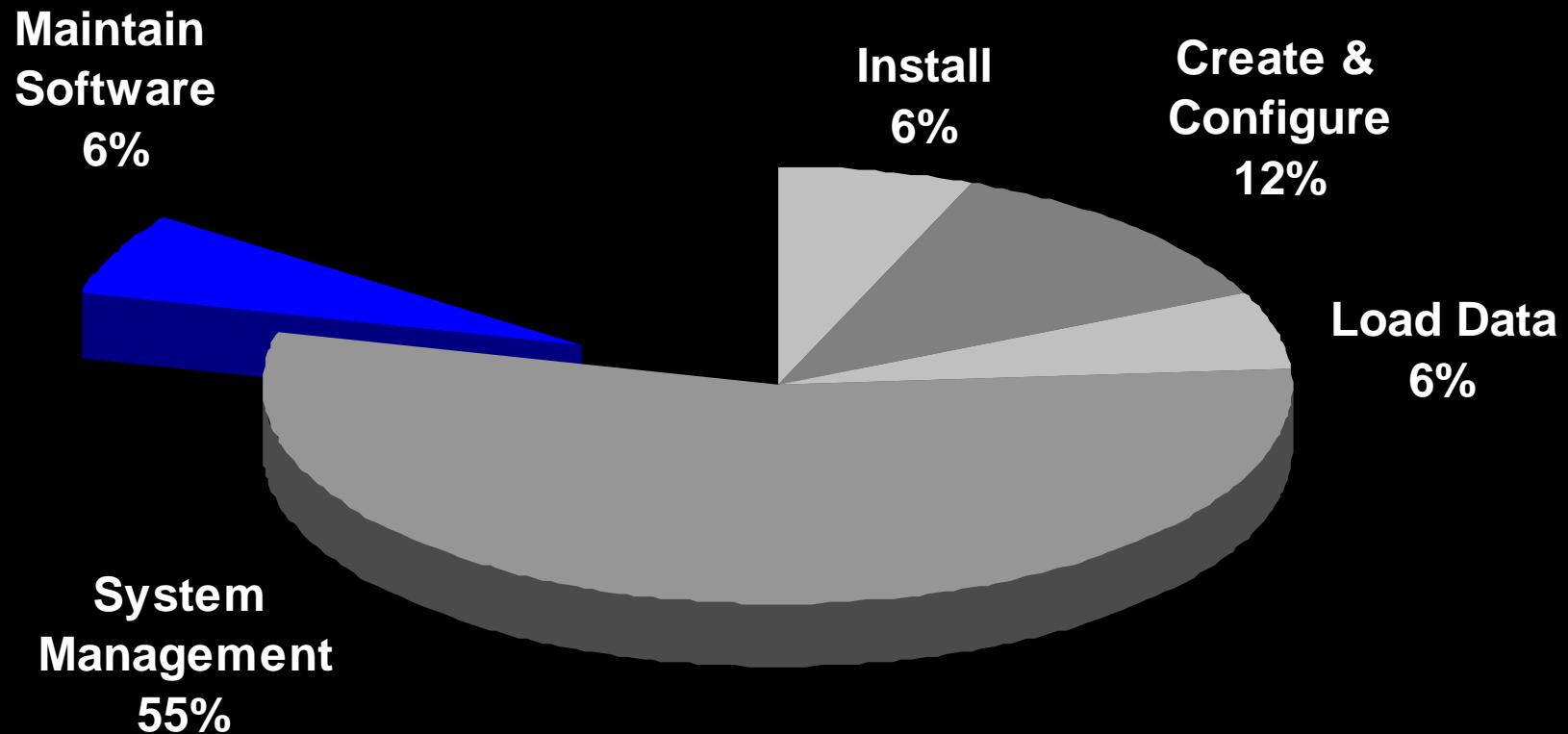
Serviced Databases

Database Name	DiskGroup(s)	Total (in MB)	Availability	Alerts
OSMDB	DATA	517	Not Monitored	Not Monitored

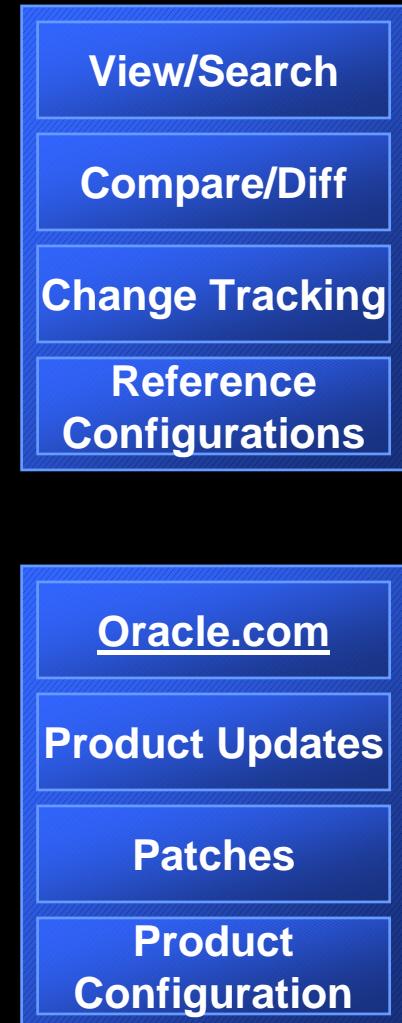
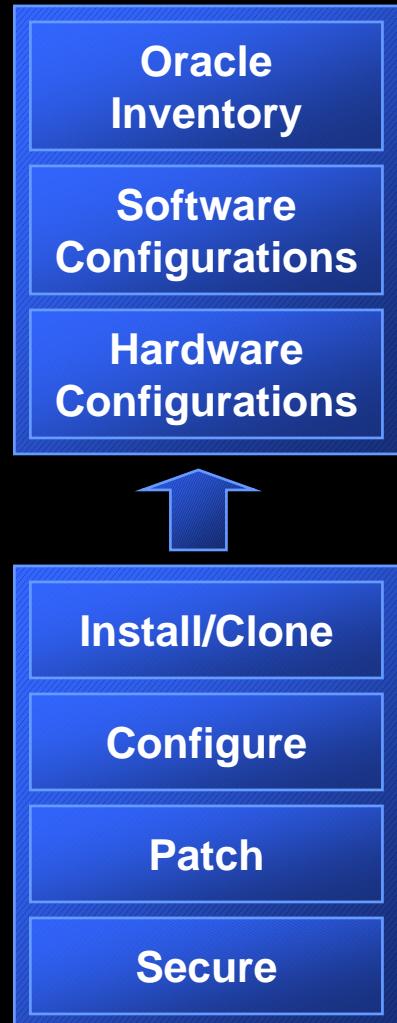
Summary

- Oracle Database 10^g's self-management capabilities work out-of-the-box.
- Customization of Oracle Database 10^g's self-management capabilities can be done through Enterprise Manager.
- Oracle Database 10^g is a self-managing database which reduces administration overhead and enables DBAs to become proactive strategists.

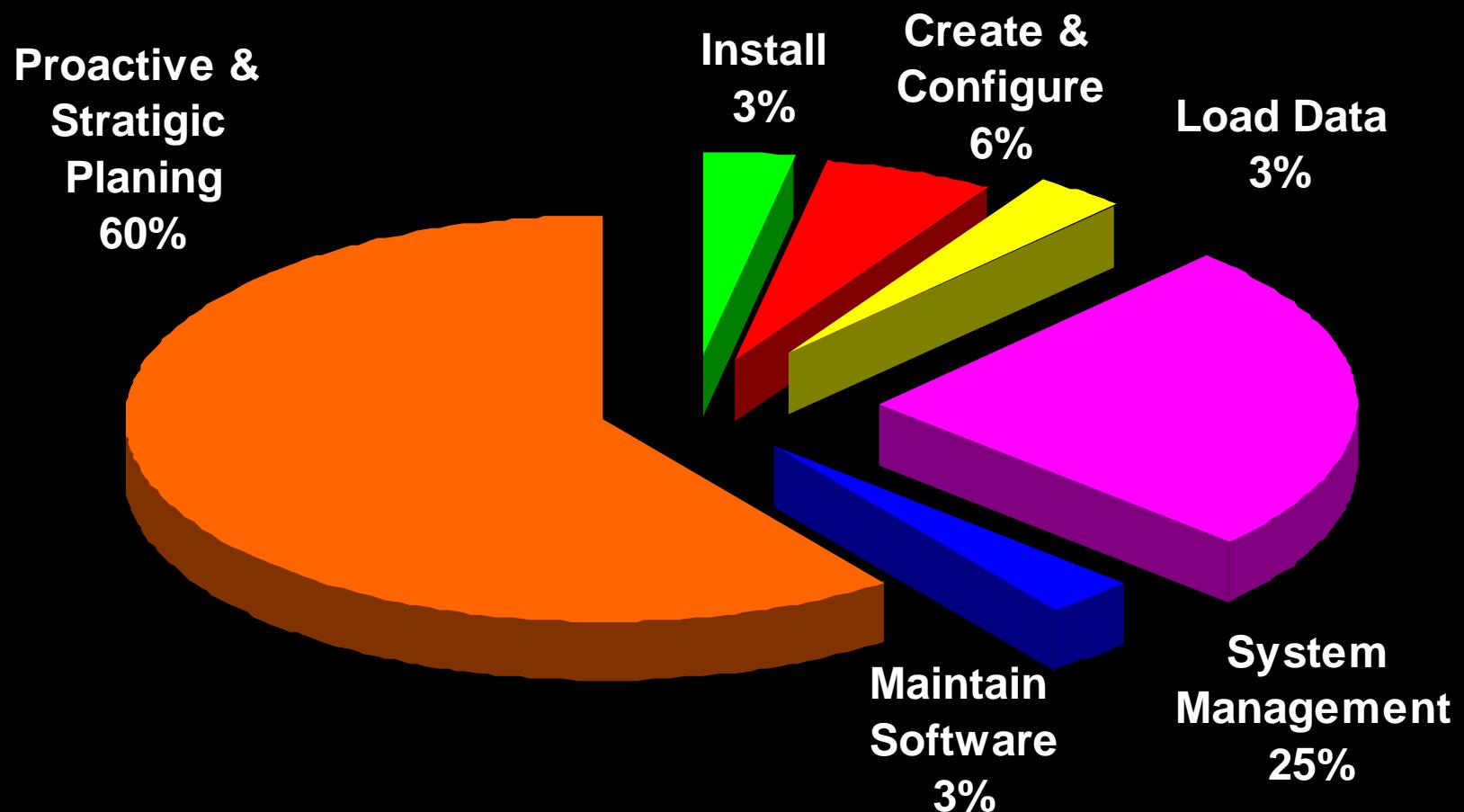
How DBAs Spend Their Time?



Enterprise Configuration Management

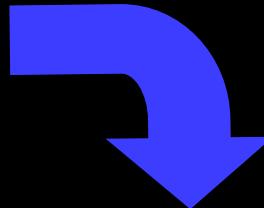
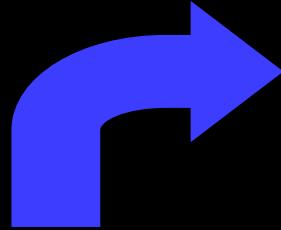


How Oracle Database 10^g DBAs Spend Their Time



Oracle Database 10g

Simplified Creation & Configuration



*Fast Lightweight
Install*

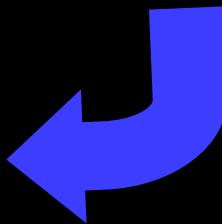
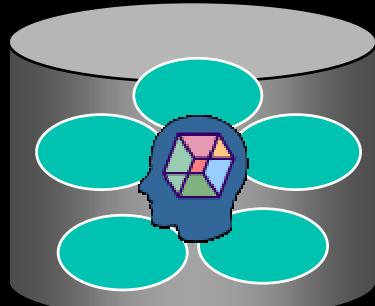
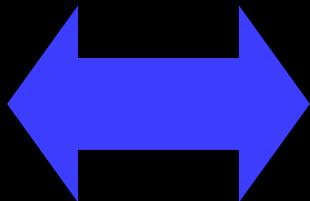


$\frac{1}{2}$ COST

*Efficient
Data Load*

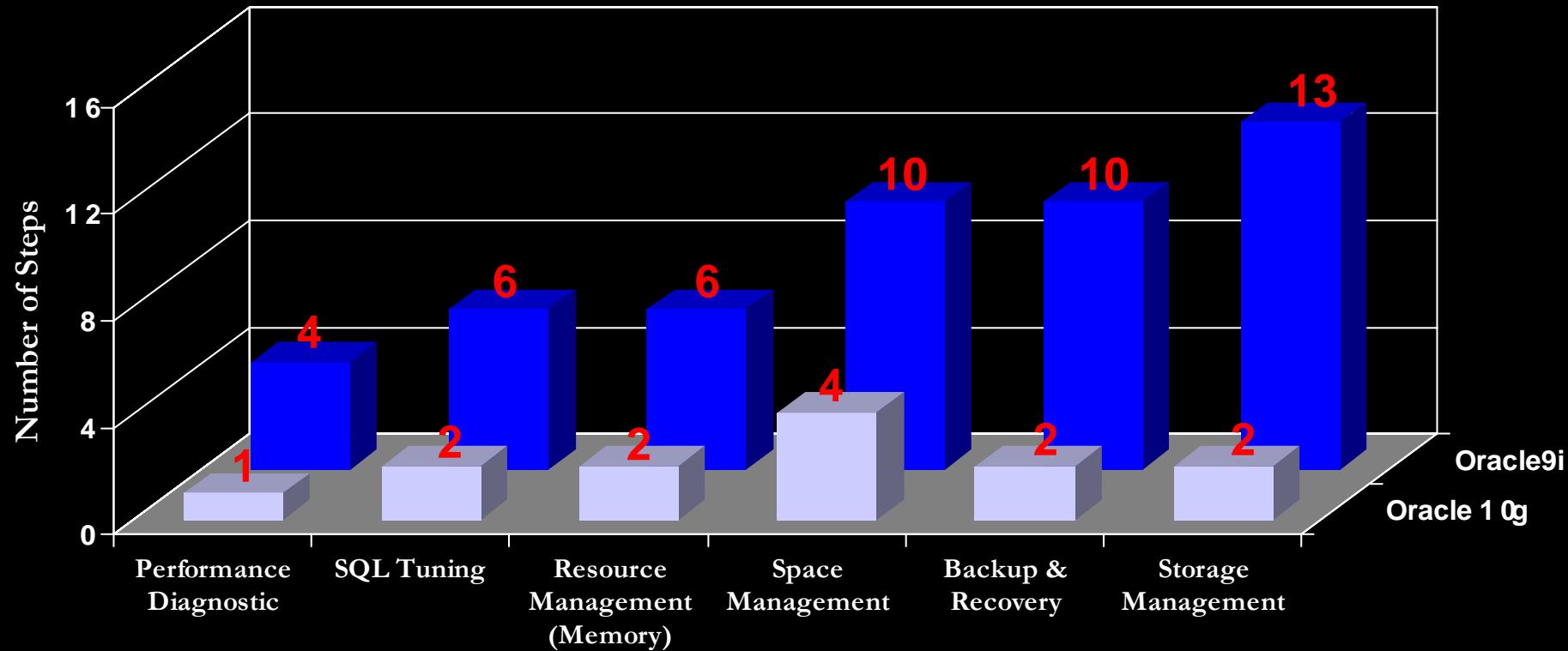


*Enterprise
Configuration
Management*



Self-Managing Database

Oracle 10g : Twice as Manageable as Oracle9i



Result Summary

Oracle 10g required **44%** less time and **47%** fewer steps than Oracle9i.

What Does It Mean to You?

DBA of the Future Does **MORE**

- **MORE** sleep at nights!
- **MORE** weekends off!
- **MORE** databases
- **MORE** applications: OLTP, DW, OCS, iAS
- **MORE** users, larger databases
- **MORE** mission-critical applications
- **MORE** proactive and strategic
- **MORE** important and valuable!

LESS Cost for Businesses

For customers

- Less Administration Cost
- Less Capital Expenditure
- Less Failures

For Application ISV Partners

- Less Deployment Cost
- Less Development Cost
- Less Support Cost

Summary

- Oracle Database 10^g's self-management capabilities work out-of-the-box.
- Customization of Oracle Database 10^g's self-management capabilities can be done through Enterprise Manager.
- Oracle Database 10^g is a self-managing database which reduces administration overhead and enables DBAs to become proactive strategists.

FIN

Thank You

hpaiss@hpcc.co.il
toledano@hi-tech.co.il