

ORACLE®

Oracle Database 10g

New Features:

Maximizing the Capabilities of
Oracle Database 10g

Oracle Database 10g Goals

- **Highest Quality of Service**
 - Highest Availability, Reliability, Security
 - Highest Performance, Scalability
- **Easiest to Manage**

Agenda

- Getting Started
- Server Manageability
- Performance Tuning
- Availability and Recovery
- Business Intelligence
- Application Development
- Enterprise Manager (Grid Control)

Getting Started

- Upgrading to 10g
- Sysaux Tablespace
- Automatic Storage Management
- Real Application Clusters

Getting Started: Upgrading to 10g

- Easy upgrade from 8.0.6, 8.1.7, 9.0.1, 9.2
- Four upgrade options
 - Use Oracle Database Upgrade Assistant (DBUA)
 - Perform manual upgrade
 - Use exp/imp to copy your database
 - Use SQL*Plus copy command or create table as select command

Getting Started: SYSAUX tablespace

- New tablespace required by 10g
- Secondary tablespace for storage of a number of database components previously stored in SYSTEM tablespace (Ultrasearch, OLAP, Spatial, RMAN)

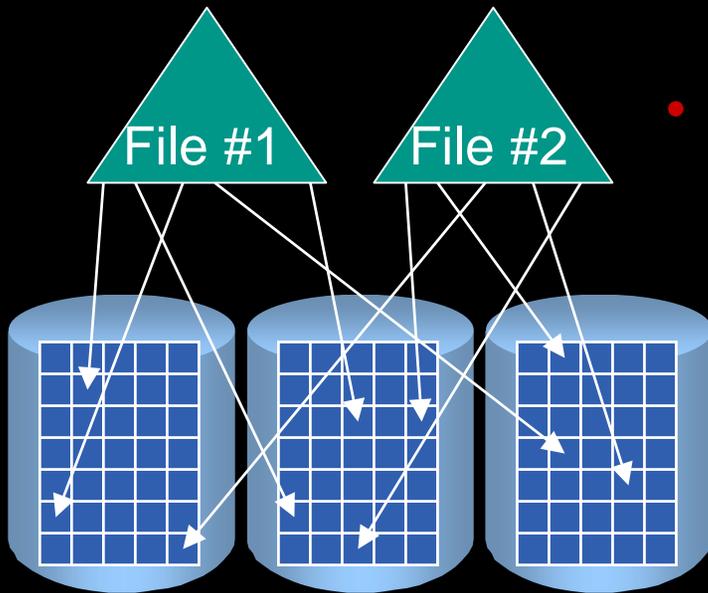
Getting Started

Automatic Storage Management

- Service that provides management of disk drives
- Alternative to the use of raw or file systems
- “Database File system”

What is Database File System

Files automatically spread across disks to balance load



Disks allocation uses large uniform units

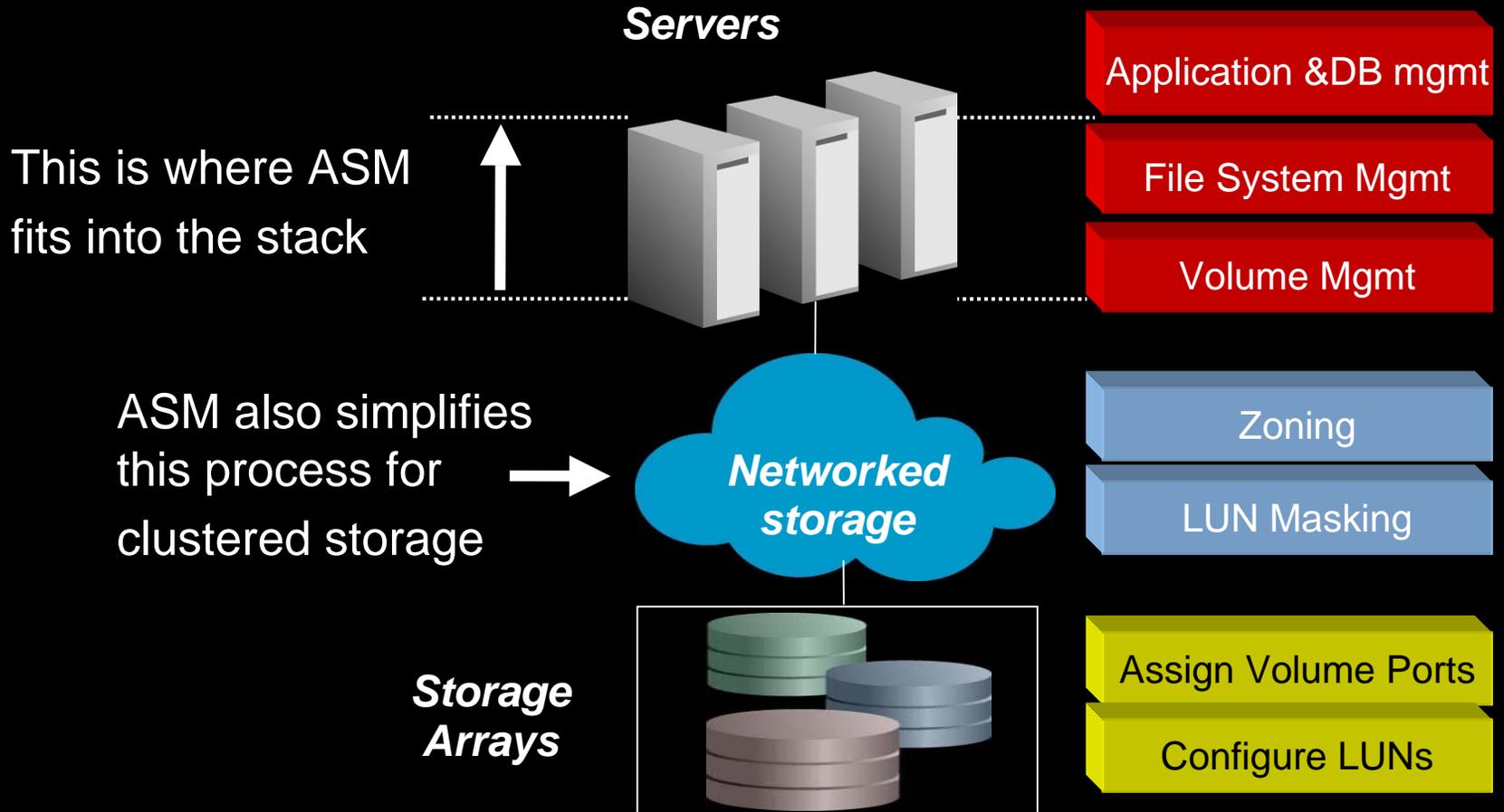
- Replaces file system & volume manager
- Partitions total disk space into uniform sized megabyte units
- Combines units into files
 - No intermediate volumes
- Units assigned to a file are tracked using database oriented indexing techniques
 - No rigid math function like normal striping
 - Index allows units to be flexibly positioned and moved
 - Allows efficient add/remove of disk to stripe set with automatic rebalancing

Getting Started

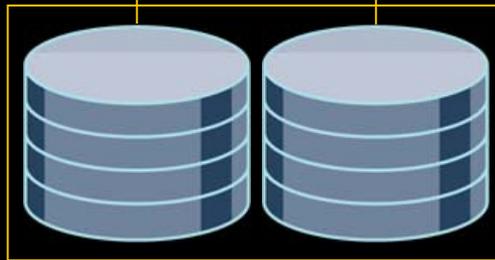
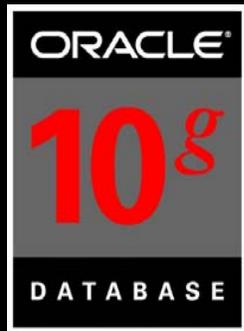
Automatic Storage Management

- ASM features
 - Simplified daily administration
 - Performance of raw disk I/O for all ASM files
 - Compatible with any type of disk configuration, such as Just a Bunch of Disks (JBOD) or Storage Area Network (SAN)
 - Prevention of accidental deletion of files since there is no file system interface and ASM is solely responsible for file management
 - Load Balancing
 - Mirroring

Database Storage Provisioning and Management



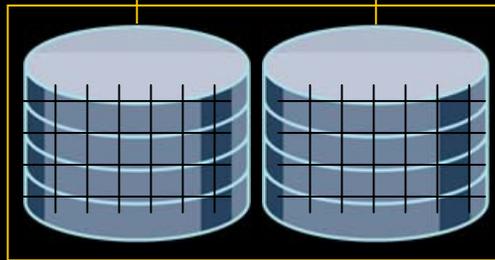
ASM Disk Groups



Disk Group

- A pool of disks managed as a logical unit

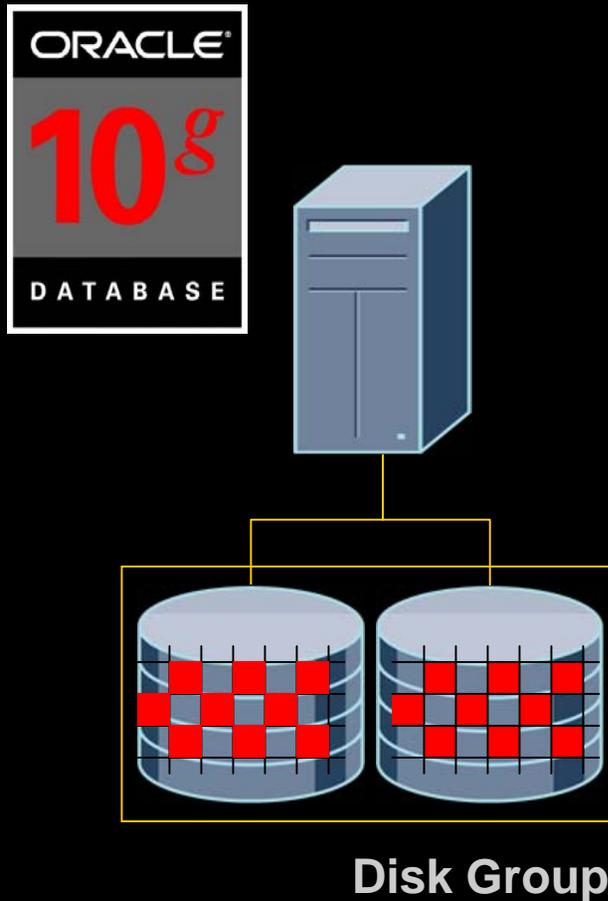
ASM Disk Groups



Disk Group

- A pool of disks managed as a logical unit
- Divides total disk space into uniform sized megabyte units

ASM Disk Groups



- A pool of disks managed as a logical unit
- Divides total disk space into uniform sized megabyte units
- ASM spreads each Oracle file evenly across all disks in a disk group

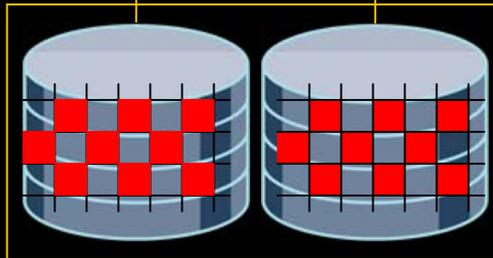
Traditional vs ASM – Add Disk

1. Add Disk to OS
2. Create volume(s) with Volume Manager
3. Create File System over volume
4. Figure out data to move to new disk
5. Move data to new files
6. Rename files in database
7. Re-tune I/O

1. Add Disk to OS
2. Issue the Add Disk command

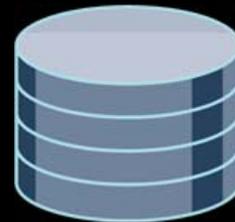


Adding a Disk with ASM

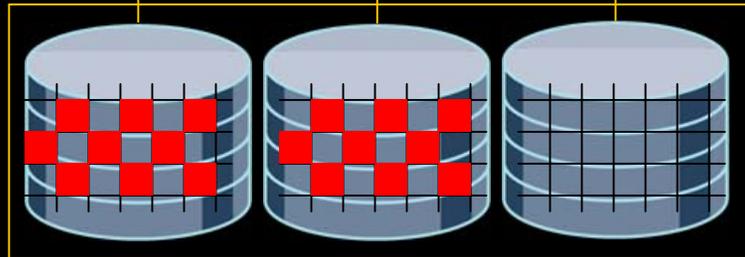


Disk Group

- DBA issues the request to add a disk to the existing disk group



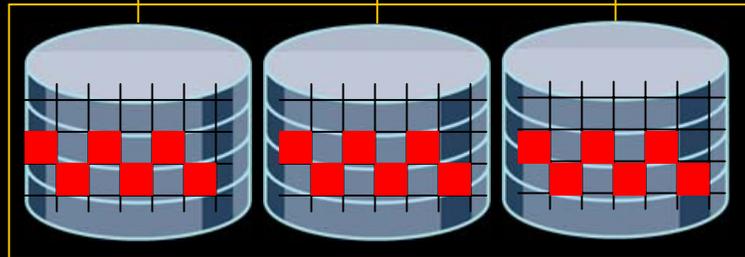
ASM Dynamic Rebalancing



Disk Group

- Automatic online rebalance whenever storage configuration changes

ASM Dynamic Rebalancing



Disk Group

- Automatic online rebalance whenever storage configuration changes
- Only move data proportional to storage added

Traditional vs ASM – Remove Disk

1. List all data that is on disk
2. Choose existing filesystem to hold data from dropped disk
3. Move data to new files
4. Rename files in database
5. Remove disk from OS
6. Re-tune I/O

1. Issue drop disk command
2. Remove the disk from OS when Oracle says it is done



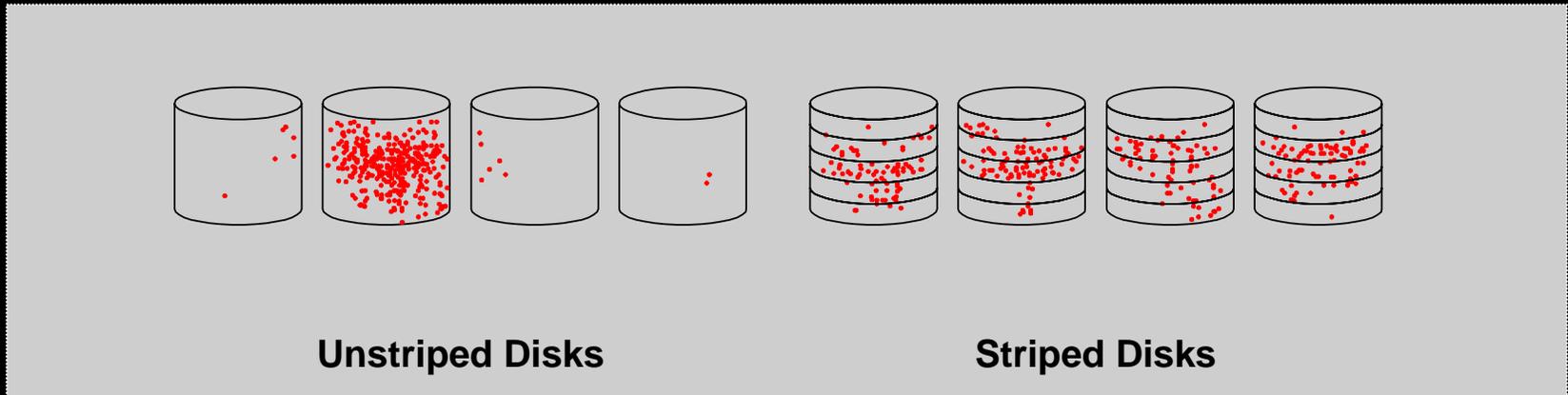
Traditional vs ASM – Tune I/O

1. Daily monitor I/O performance
2. Discover hot spots
3. Figure out how to remove hot spots
4. Move data to new files
5. Rename files in database
6. Verify that hot spot is gone

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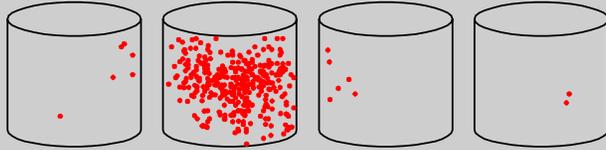


Data Distribution

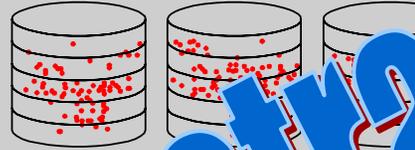


Automatic Storage Management Extends SAME

- Allows dynamic online Storage reconfiguration
- Efficient relocation of data during rebalance
- Eliminate manual I/O tuning in all storage configurations



Unstriped Disks



Striped Disks

ASM Demonstration

Server Manageability

- Statistics Collection
- Database Resource Manager
- Scheduler Changes
- Tablespaces
 - User defined default
 - Tablespace groups
 - Renaming
- Drop database
- Automatic Undo Retention
- Shrinking and Compacting Segments On-line

Server Manageability

Statistics Collection

- By default Oracle will create a job at DB creation time that automatically collects database statistics
- Job is scheduled with new database job scheduler
- Sometimes you may not want statistics to be overwritten, new PL/SQL procedure to lock statistics for a given table and all dependent objects
- Statistics collection during index creation and rebuilds is now automatic process in 10g.
 - Compute statistics clause of create index and alter index command is now obsolete

Server Manageability Rule Based Optimizer

- Though still there, RBO is desupported with 10g

Server Manageability Resource Manager

- Revert to original consumer group at the end of an operation that caused a change of consumer group
- Set idle timeout values for consumer groups
- Create mappings to assign a specific consumer group to a given session based on either login or run-time attributes
 - Username, service name, client OS username, client program name, client machine, etc...

Server Manageability

Job Scheduler

- New scheduling facility in 10g replacing the previous `dbms_jobs` package
- Improved functionality over old job package
 - Allow execution of a variety of code (pl/sql), native binary executables, and shell scripts
 - Object being run is called a program and includes related metadata about the program such as arguments passed to it
 - Different users can use a program at different times, eliminating the need to redefine a program each time you wish to schedule a job

Server Manageability

Tablespaces

- User configurable default tablespaces
- Ability to define tablespace groups
- Renaming tablespaces (does not change name of underlying datafile in any way)

Performance Tuning

- Improvements to Wait Interface
- Database Common Management Infrastructure
- Automatic SGA tuning

Performance Tuning: Wait Interface Improvements

- New and Improved database views to assist in performance tuning
- Wait events are fleeting and hard to catch
 - V\$SESSION_WAIT_HISTORY View
 - Last 10 wait events for each active session

Performance Tuning Common Management Infrastructure

- Automatic Workload Repository
 - Collects and stores performance related statistics
 - Services to process and maintain this information
 - Server based advisors to assist DBA in identifying various database problems
 - Automated administrative tasks supported through the new job scheduler
 - Server generated alerts

Performance Tuning

Common Management Infrastructure

- Automatic Database Diagnostics Monitor
 - Assists DBA in proactive management and tuning tasks
 - ADDM's job is to analyze database workload and find bottlenecks impacting performance
 - Identifies problem areas then works through problem resolution tree to eliminate areas not causing problem and highlighting areas that are causing problems

Performance Tuning Common Management Infrastructure

- SQL Tuning Advisor
 - Analyzes existing SQL statements and provides tuning recommendations to be implemented
 - Assist in implementation of these suggestions
- SQL Access Advisor
 - Helps with tuning of materialized views
 - Guides you in meeting requirements of fast refresh and query rewrites

Performance Tuning

Common Management Infrastructure

- Server Generated Alerts
 - Database sends alert to DBA along with suggested response
 - Monitoring criteria can be internal to database or externally defined (by DBA)
- Automated SGA Tuning
 - Define SGA_TARGET
 - Oracle allocates memory best for buffer cache, shared pool, large pool, and java pool

Security

Virtual Private Database

- Column Level Privacy
 - Enforce VPD only if specific columns are accessed
- New VPD policies
 - Static (one object)
 - Shared static (shared by multiple objects)
 - Context sensitive (one object)
 - Shared context sensitive (shared)
 - Dynamic (default)
- VPF now supports Parallel Query!

Security Auditing

- Changes to the audit trail view
 - Type of query executed
 - Proxy sessionid
 - Os process
- 9i only select audited, 10g audits update, insert, delete

Availability and Recovery

- General Improvements
- RMAN Improvements
- New Flashback Features

Availability and Recovery: General Improvements

- Easier recovery through reset logs
 - Useful when doing incomplete recovery
- Nothing different you have to do, it is all internal to database

Availability and Recovery: RMAN

- Uses Flash Recovery Area
 - Centralized area for storage of all recovery related files
- Using backup copies and fast recovery
- Dropping database in RMAN
- Unregistering database
- Compressing RMAN backups

Availability and Recovery: Flashback

- Flashback Database
 - Flashes back changes to entire database
 - Powerful feature to help in resolution of user errors that cause changes to database
 - Much faster method of recovering data than other methods (tablespace point in time recovery, logical backups, or log miner)

Availability and Recovery: Flashback

- Flashback Drop
 - Allow you to undo the effects of a drop table
 - Concept of a recycle bin
- Flashback Versions Query
 - Allows you to see all versions of data for a given row over a period of time
- Flashback Transaction
 - Reconstructs the SQL statements that have been previously executed in the database

Availability and Recovery: Flashback

- Flashback Table
 - Flashback a table based on a timestamp of database SCN to the time you are interested in

Availability and Recovery: Flashback

- Flashback Table
 - Flashback a table based on a timestamp of database SCN to the point you are interested in

Flashback Demonstration

Business Intelligence

- Oracle Data Pump
- Big File Tablespace
- Cross-platform tablespaces
- Enhanced External Table Functionality

Oracle ETL Features

Addressing the entire spectrum

Extract

Load

Transform

Insert

Data Pump

Transportable Tablespaces

Change Data Capture

Distributed Queries

SQL*Loader

External Tables

Table Functions

Multi-Table Insert

MERGE

ETL Enhancements in Oracle10g

- Enhancing the extraction and transportation between Oracle systems
 - Cross Platform Transportable Tablespaces
 - Asynchronous Change Data Capture
 - Data Pump
 - Very fast, parallel import / export
 - Data Pump Unload through External Tables
- Performance optimization for existing functionality
 - Merge optimizations

Business Intelligence Oracle Data Pump

- Replaces traditional imp/exp
- Imp/Exp still supported

Oracle10g Data Pump

- **High performance import and export**
 - 60% faster than 9i export (single thread)
 - 15x-20x faster than 9i import (single thread)
- **Scales with parallel threads**
- **Network transfer data between databases with no intermediate representation**

Business Intelligence

Data Pump Export New Features

- Ability to estimate files resulting from expdp
- Suspend/resume expdp at will
- Ability to do fine-grained object selection
 - Thus can choose to only export procedures or functions
- Export external tables
- Support for network node operations
 - Load another database without intermediate file

Business Intelligence Data Pump Import New Features

- Support use of metadata filters
 - Control which object types you import
- Ability to suspend/resume job at will
- Support for network node operation
- Support for direct mode import!!

Business Intelligence Big File Tablespace

- BFT contains only one datafile and can range in maximum size of 8T to 128T depending on database block size
- Biggest benefit is that they increase the overall storage capacity of the database with fewer, but larger datafiles to manage

Business Intelligence

Transportable Tablespaces

- Transportable tablespaces can now be moved across platforms
 - Windows OS datafiles can be moved to UNIX and vice-versa
- Benefits
 - Efficient publication of data between different content providers
 - Easy movement of data between data warehouses and OLTP systems
 - Easy migration of databases across platforms

Business Intelligence

External Tables

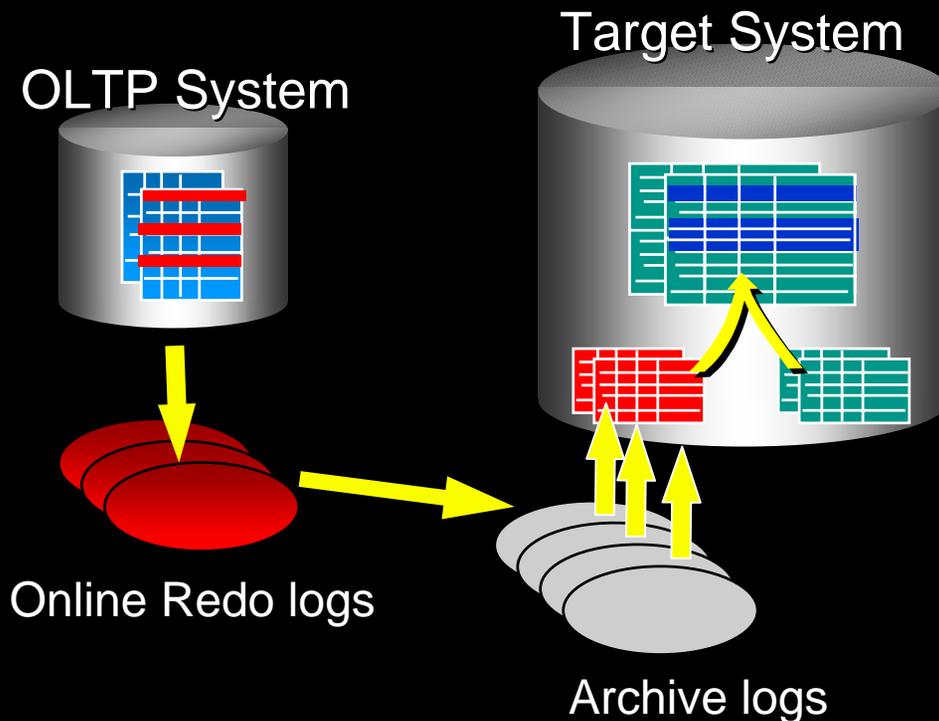
- Writing to External tables now supported
- Project column
 - Allows you to determine how access driver will validate rows in table
 - You decide whether to have load error out or to continue processing and skipping the invalid column

Business Intelligence Enhanced MERGE Functionality

- Conditional UPDATE and INSERT clauses
 - Add a where clause to the update or insert operation of a merge statement
 - Example (update only occurs if pay_code column is not equal to the value of RETIRED:

```
Merge into emp_history eh  
Using emp_history_adds eha  
On (eh.empno = eha.empno)  
WHEN NOT MATCHED THEN  
UPDATE SET eh.total_pay = 123.50  
WHERE eh.pay_code <> 'RETIRED'
```

Change Data Capture



- Mining of archive logs
- No impact to OLTP system
- Low Latency
- Data is exposed as change tables for further bulk ETL processing via SQL
- Publish/Subscribe
- “Change window” mgmt

Oracle Warehouse Builder

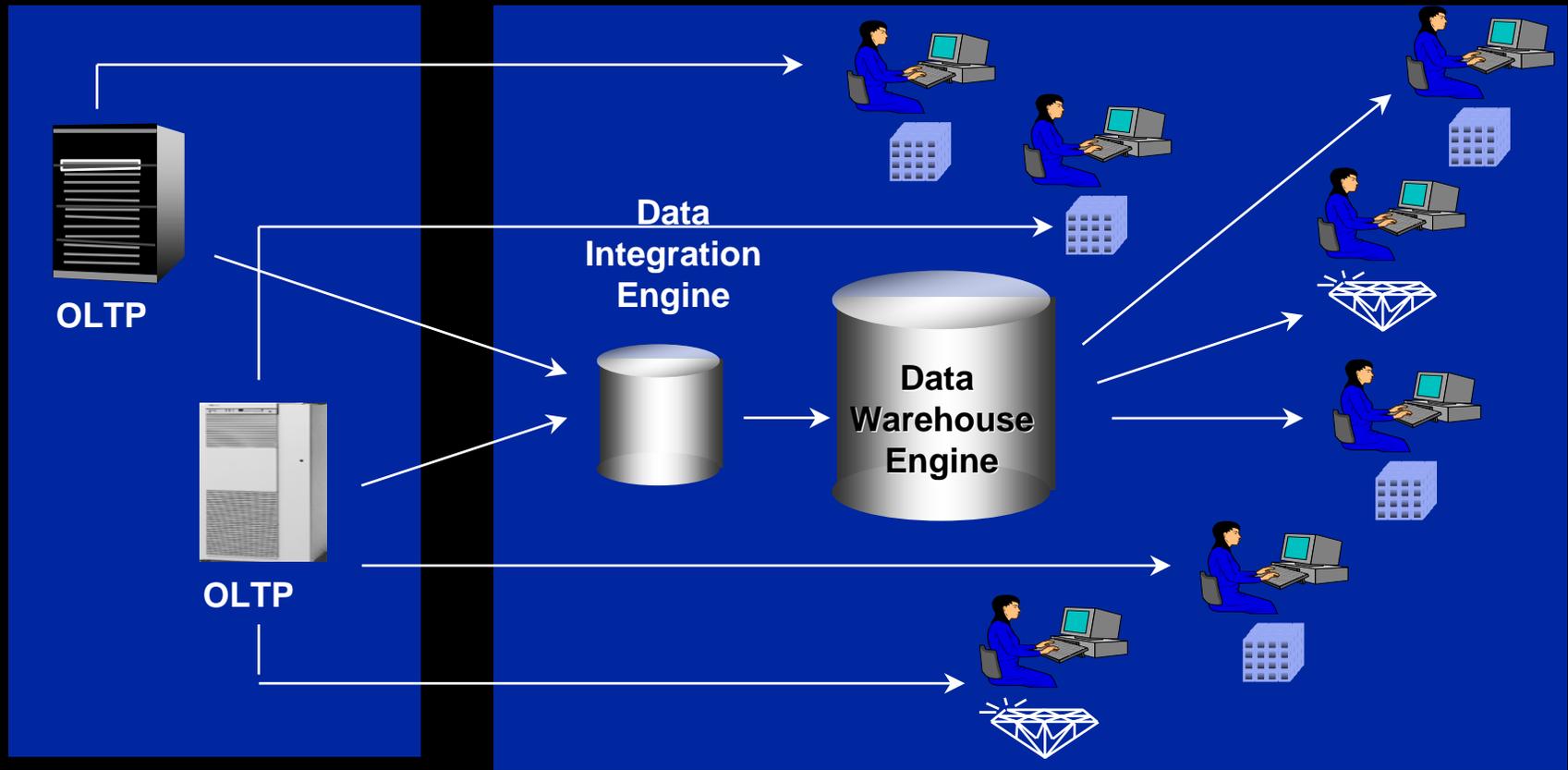
- Packaging change: OWB will be shipped with the Database as of 10g
- New OWB features including
 - Integrated Data Flow Debugger
 - Integrated Data Quality features
 - Name & Address cleansing
 - Complete Match/Merge algorithms
 - Enhanced cube generation from general logical design

Oracle 10g

Data Warehousing and Business Intelligence

- Reduced Total Cost of Ownership
 - Reduced complexity & deployment cost
 - Consolidation
 - Doing more with less
- More value from your data
 - Extensive set of integrated BI capabilities
- Intelligence when you need it
 - Faster, more scalable ETL
- Oracle's BI Architecture and the Grid

Business Intelligence the Old Way



- Multiple Inconsistent and Isolated Copies of Data
- Complex deployment, expensive to maintain

Business Intelligence with Oracle

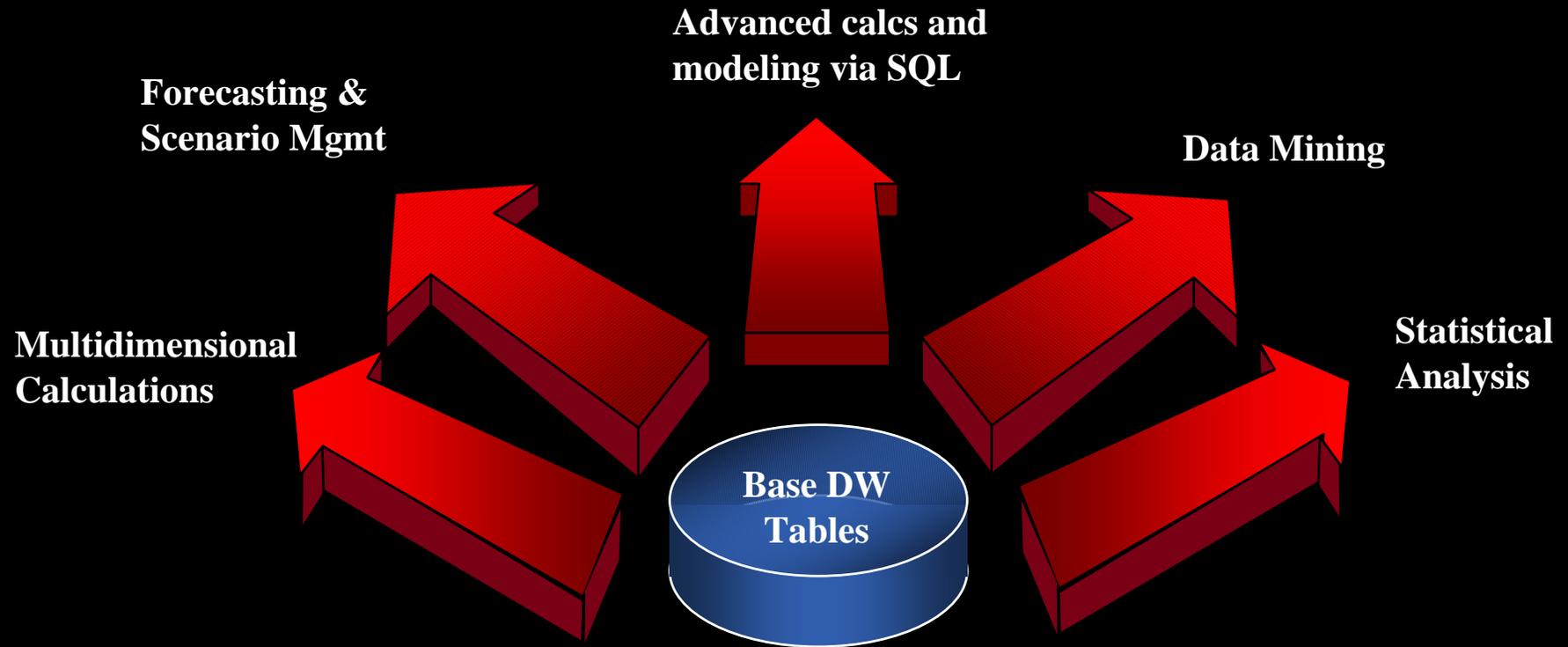
Single, Integrated Business Intelligence Engine



- Consistency
- Collaboration
- Accuracy
- Scalability
- Security
- Ease of Development

- Reduced Complexity & Deployment Costs

More value from your data



More analytics against your core data
Results available to all your applications

Oracle OLAP: What's New in 10g

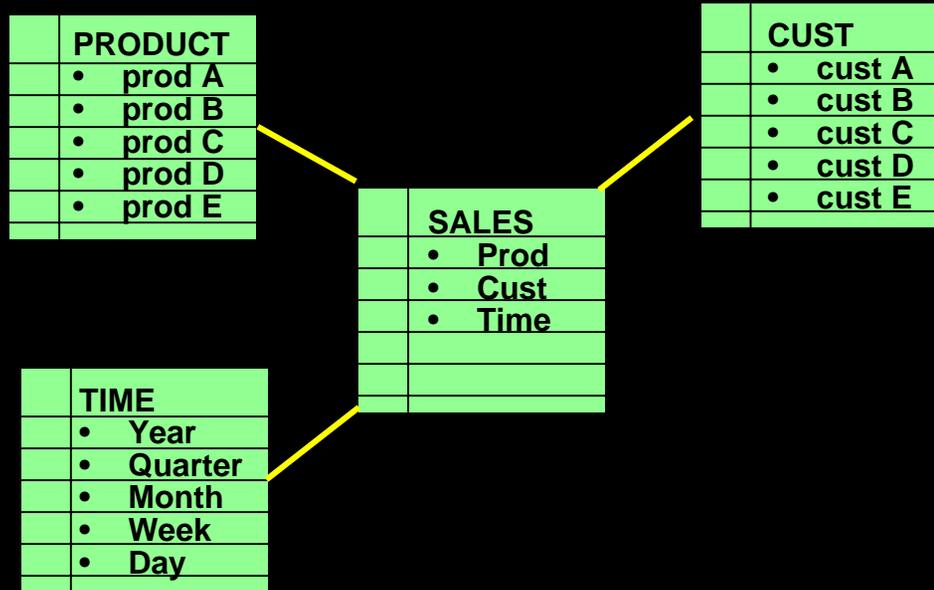
- Scalability
 - Multi-Writer
 - Partitioning (Range partitioning of AWs)
 - Parallel Cube Build
 - Support for Very Large Dimensions
- Manageability
 - Self-Tuning OLAP Page Pool
 - XML Specification of data model & cube build
- New Analytic Features
 - Native Custom Members and Measures
 - Hierarchical sorting
 - Attribute based aggregation
 - Dimensional Reduction

Purely Relational, ROLAP, or MOLAP?

A Look At
Relational
Database Technology
ROLAP

Purely Relational, ROLAP, or MOLAP?

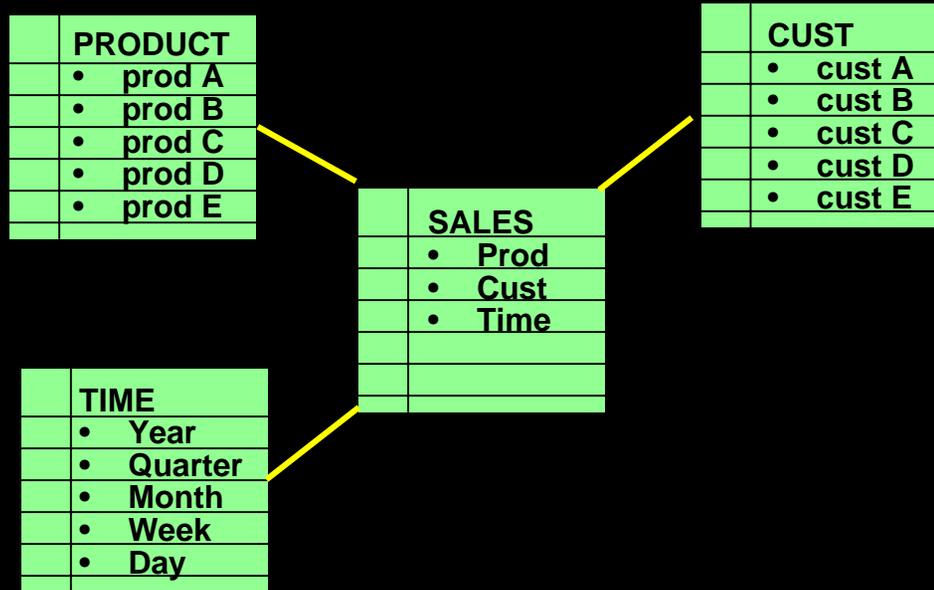
Relational Technology



Relational database technology is based on a table/row/column model.

Purely Relational, ROLAP, or MOLAP?

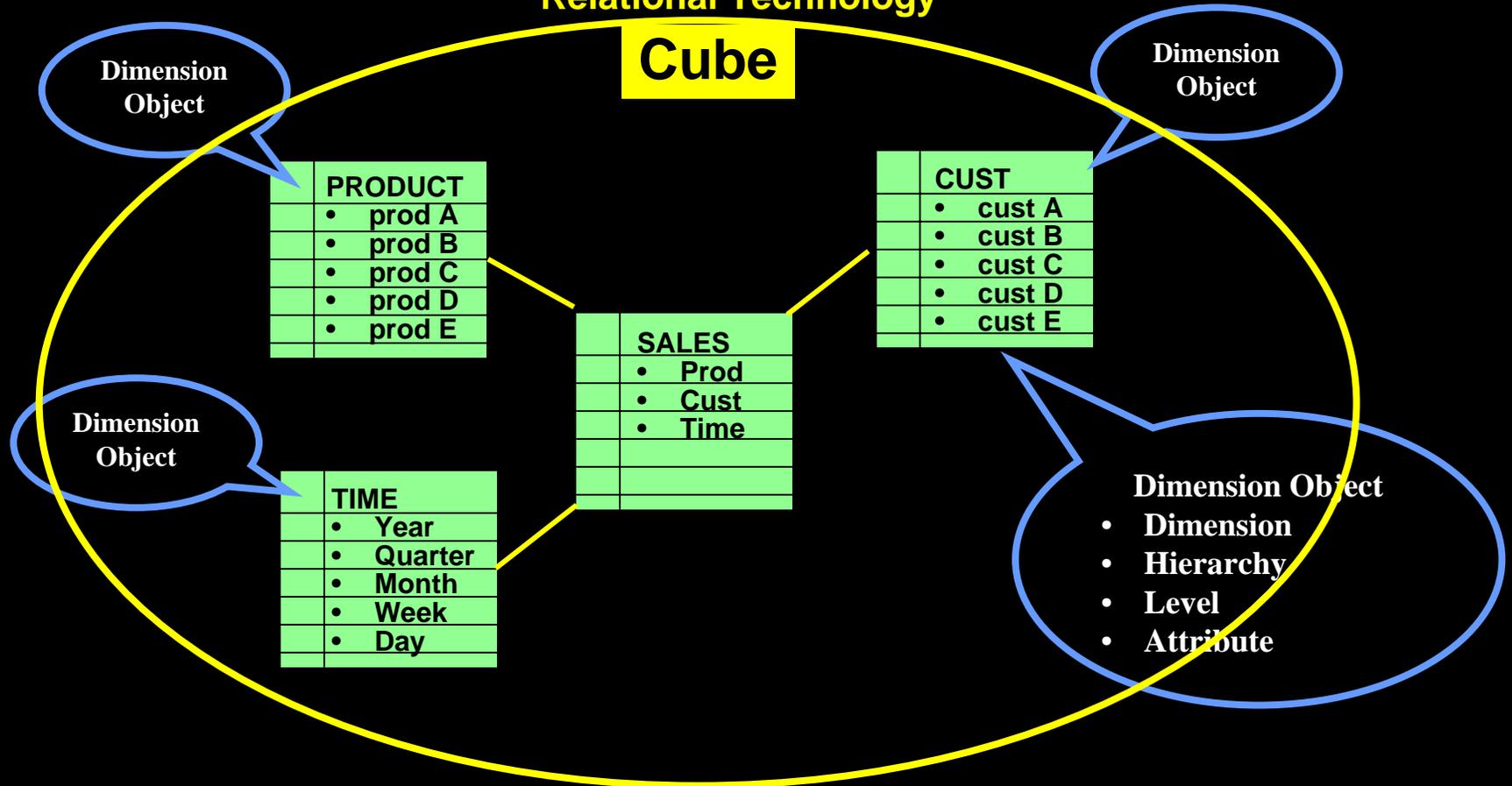
Relational Technology



A **purely relational** implementation is designed and optimized to support the efficient movement and calculation of large volumes of data.

Purely Relational, ROLAP, or MOLAP?

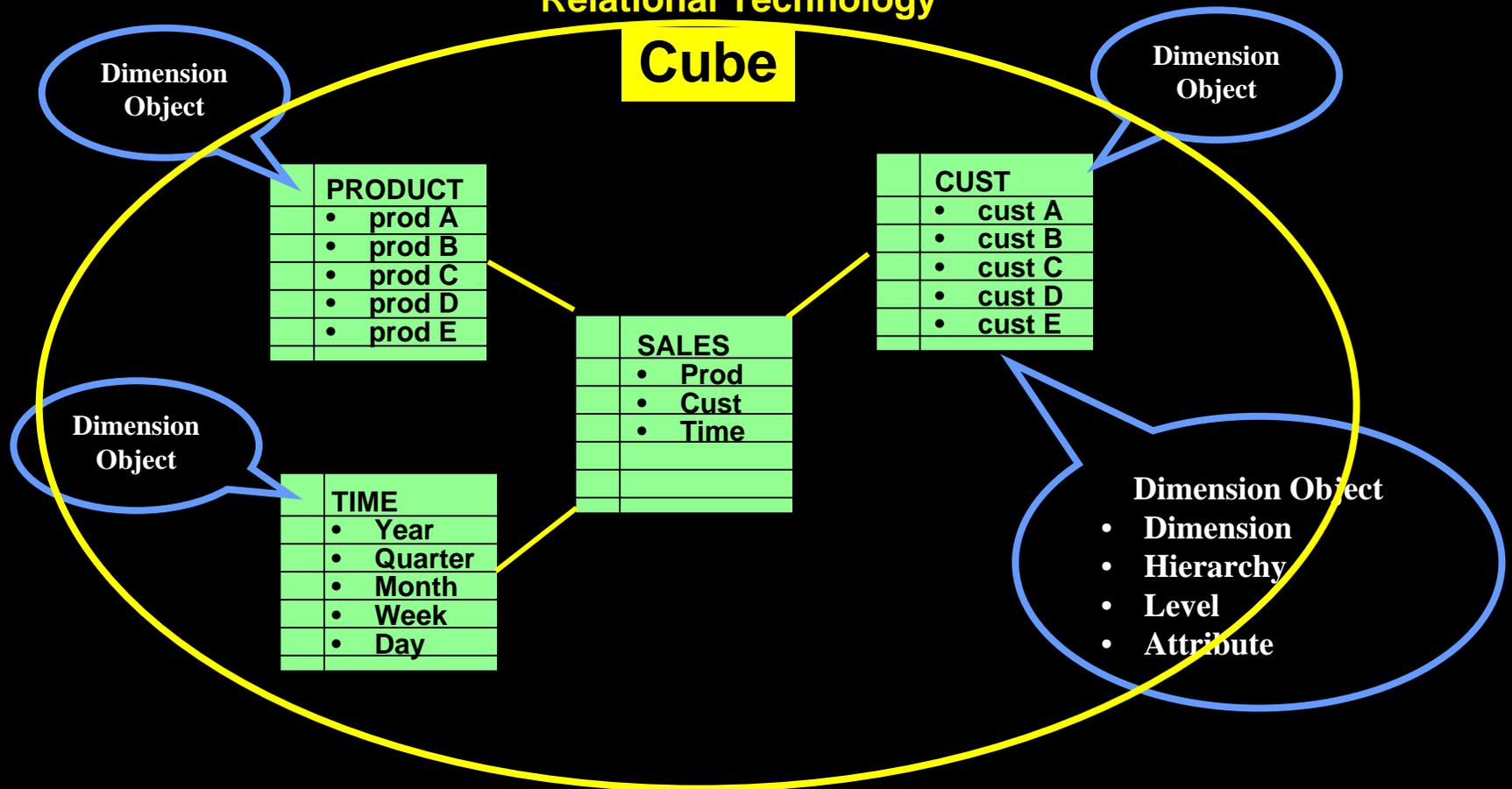
Relational Technology



In order to perform multidimensional analysis over a relational data model, a dimensional perspective must be imposed over it.

Purely Relational, ROLAP, or MOLAP?

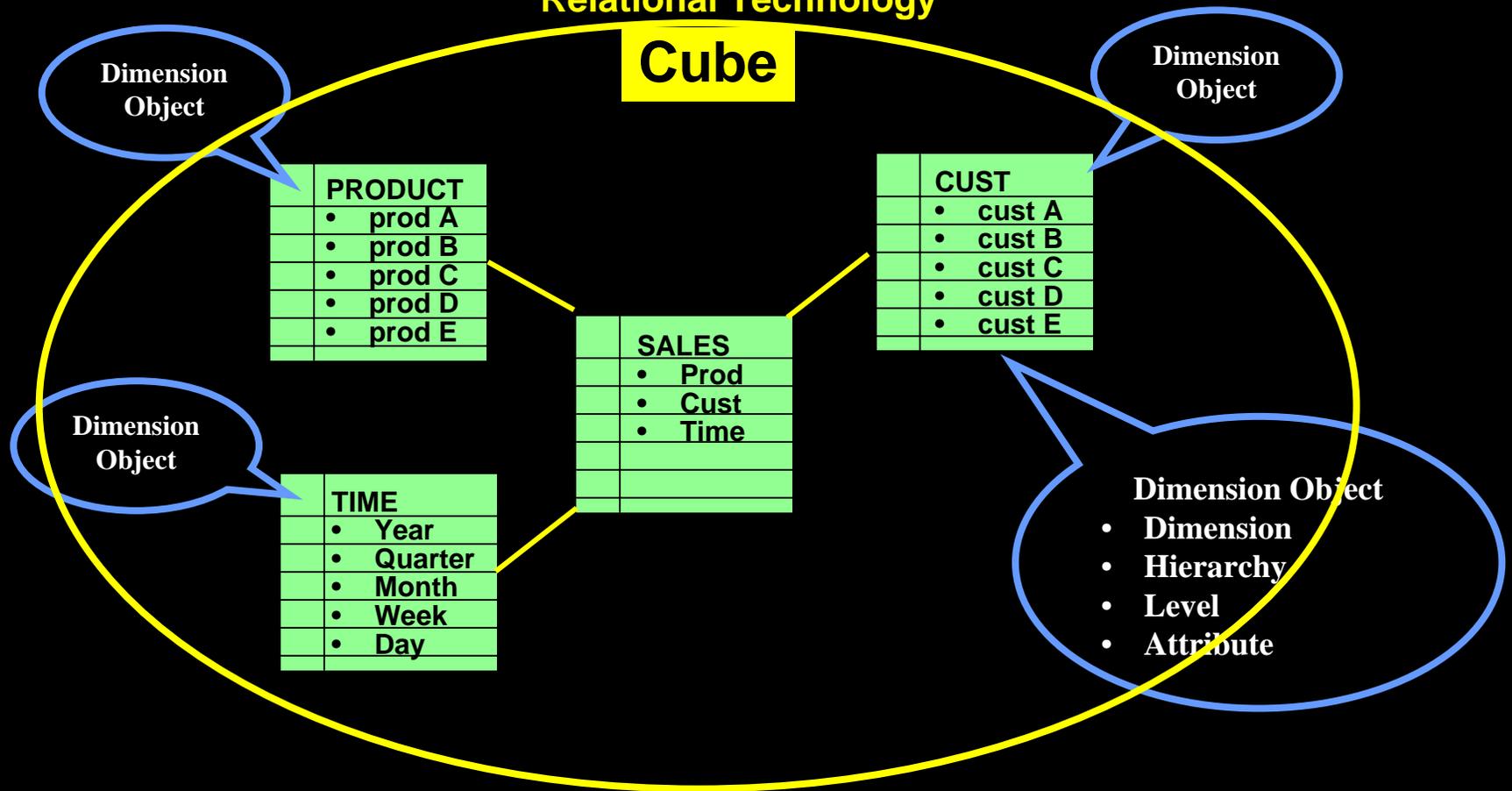
Relational Technology



Analytic queries are written in SQL.

Purely Relational, ROLAP, or MOLAP?

Relational Technology



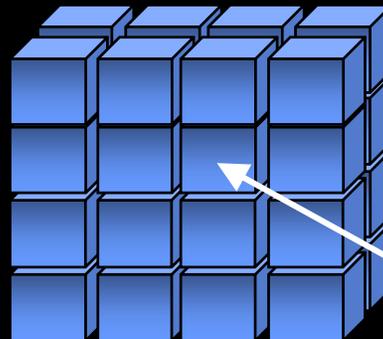
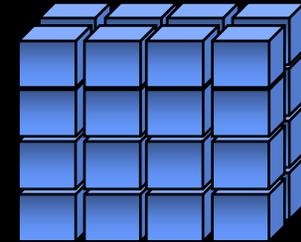
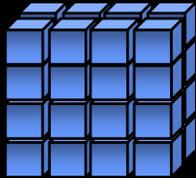
This is a **ROLAP** IMPLEMENTATION.

Purely Relational, ROLAP, or MOLAP?
Multidimensional Technology

A Look At **Multidimensional** Database Technology

Purely Relational, ROLAP, or MOLAP?

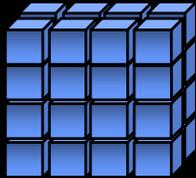
Multidimensional Technology



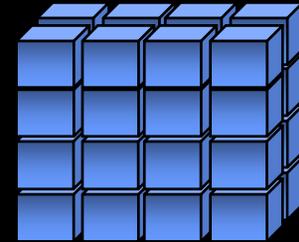
SALES(product **x**, customer **y**, time **z**)

The **multidimensional** database technology that underlies the Analytic Workspace is based on an indexed multidimensional array model.

Purely Relational, ROLAP, or MOLAP? Multidimensional Technology



Cube

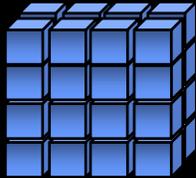


SALES dimensioned by
PRODUCT,
CUSTOMER,
TIME

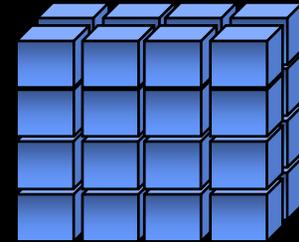
This model provides **direct cell access**, and is designed and optimized for the efficient computation, storage and retrieval of multidimensional data.

Purely Relational, ROLAP, or MOLAP?

Multidimensional Technology



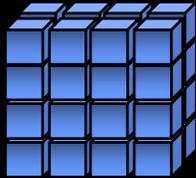
Cube



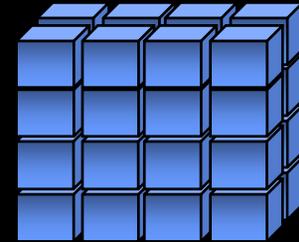
**SALES dimensioned by
PRODUCT,
CUSTOMER,
TIME**

The OLAP DML language, one component of Oracle OLAP, provides an easy way to express complex multidimensional calculations.

Purely Relational, ROLAP, or MOLAP? Multidimensional Technology



Cube



SALES dimensioned by
PRODUCT,
CUSTOMER,
TIME

This is a **MOLAP** implementation

Purely Relational, ROLAP, or MOLAP?

Select a **purely relational** implementation when ...

- The analytic requirements of the business are met by the capabilities of SQL.
- There are appropriate in-house SQL skills.
- The relational engine provides satisfactory query performance.

Purely Relational, ROLAP, or MOLAP?

Select a **ROLAP** implementation when ...

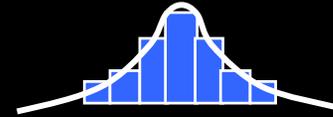
- The analytic requirements of the business are met by the capabilities of SQL.
- User is looking for an easier way to formulate complex queries.
- The detail data is very sparse.
- ★ Use Materialized Views to optimize performance.

Purely Relational, ROLAP, or MOLAP?

Select a **MOLAP** implementation ...

- **When the analytic requirements of the business need the extended analytic, forecasting and planning functionality of Multidimensional Database Technology.**
- **When the analysis includes lots of calculated and aggregated Key Performance Indicators**
- **Need an easier way to define complex or proprietary calculations.**
- **Need a transaction model that supports what-if analysis.**

Statistical Analysis



- **Descriptive Statistics:**
 - average, standard deviation, variance, min, max, **median** (via `percentile_count`), **mode**, group-by & roll-up
 - **DBMS_STAT_FUNCS:** summarizes numerical columns of a table and returns count, min, max, range, mean, `stats_mode`, variance, standard deviation, median, quantile values, +/- 3 sigma values, top/bottom 5 values
- **Correlations:** Pearson's correlation coefficients, Spearman's and Kendall's (both nonparametric).
- **Cross Tabs:** Enhanced with % statistics: chi squared, phi coefficient, Cramer's V, contingency coefficient, Cohen's kappa
- **Hypothesis Testing:** t-test , F-test, ANOVA, Chi-square, Mann Whitney, Kolmogorov-Smirnov, Wilcoxon signed ranks
- **Distribution Fitting:** normal, uniform, Poisson, exponential, Weibull

New Oracle 10g features are in **yellow**

Application Development

- Regular Expressions
- New PL/SQL Packages of Note
- New connect string format
- Location Based Services
- HTMLDB

Application Development

Regular Expressions

- Very familiar to UNIX developers
- Set of symbols and elements of syntax that allow you to match patterns of text within a given expression
 - Example
 - * matches zero or more occurrences (Ad* matches Ada AdB but not Acd or add)
 - ? Matches one character occurrence
 - ^ matches start of line (^abc matches abch but not habc)
 - Example: find all records where 'b' is the second character in the column

```
Select * from test_expressions  
Where regexp_like(char_value, '^b');
```

Application Development

Case-insensitive queries

- With 10g you can force queries to be case-insensitive at either the session or system level
- Specify `nls_sort` at create index level
Create index t on
t(nlsort (data, 'NLS_SORT=BINARY_CI'));

Application Development

Case-insensitive queries

- With 10g you can force queries to be case-insensitive at either the session or system level
- Specify `NLS_SORT=BI` at the index level

`ALTER INDEX schema.index_name REBUILD (NLS_SORT=BI);`

Demonstration

Application Development

New Connect String Format

- If running on TCP/IP network, Oracle clients like SQL*Plus can connect without tnsnames.ora entry
- Just need to supply host, port, and service
 - `Sqlplus test/test@//myhost.oracle.com:1521/prod`

Application Development HTMLDB

- **Builds database-driven Web applications**
- **For non-programmers**
- **App developers and app users just need a web browser**
- **Addresses MS Access proliferation problem**
 - **Supports hosted development and deployment environment**

Do You...

- Use spreadsheets as databases?
- Use personal databases as workgroup, departmental, or even enterprise databases?
- Wish your workgroup systems were better integrated with the Web?

Workgroup Information Management

FRAGMENTED
Data in Many Places

PLATFORM DEPENDENT
Limit Data Accessibility

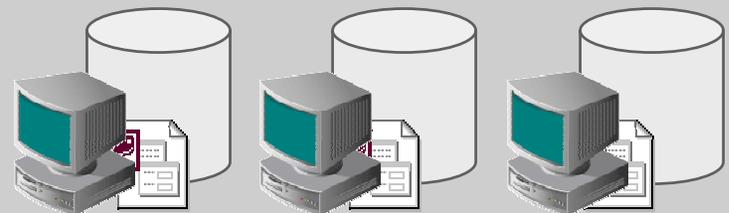
WEB UNFRIENDLY
Need to Install Client Software

UNTIMELEY
Data not Accessible

VULNERABLE
Data not Secure

INACCURATE
Multiple Inconsistent Copies of Data

COSTLY
Inefficient use of IT Resources

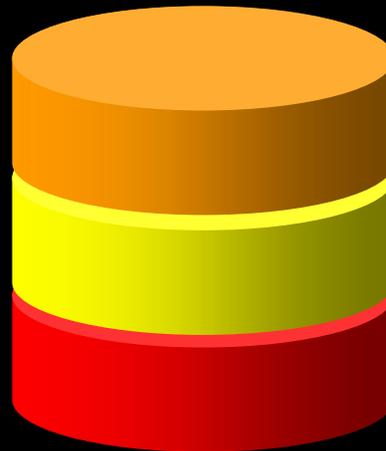
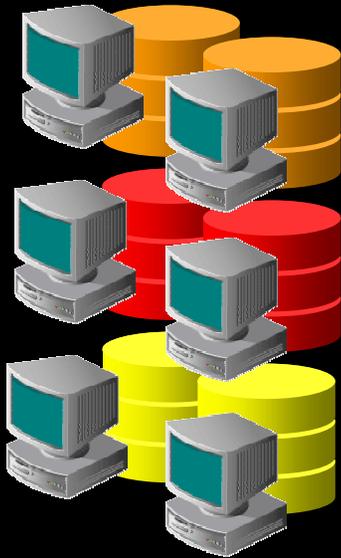


The Solution: HTML DB

- The Qualities of a Personal Database
 - Productivity
 - Ease of Use
 - Flexibility
- The Qualities of an Enterprise Database
 - Security
 - Integrity
 - Scalability
 - Availability
 - Portability
- Built for the Web

Shared Workgroup Database Service

- Centrally deployed and managed
- Accessed anywhere via a browser
- Declarative development style

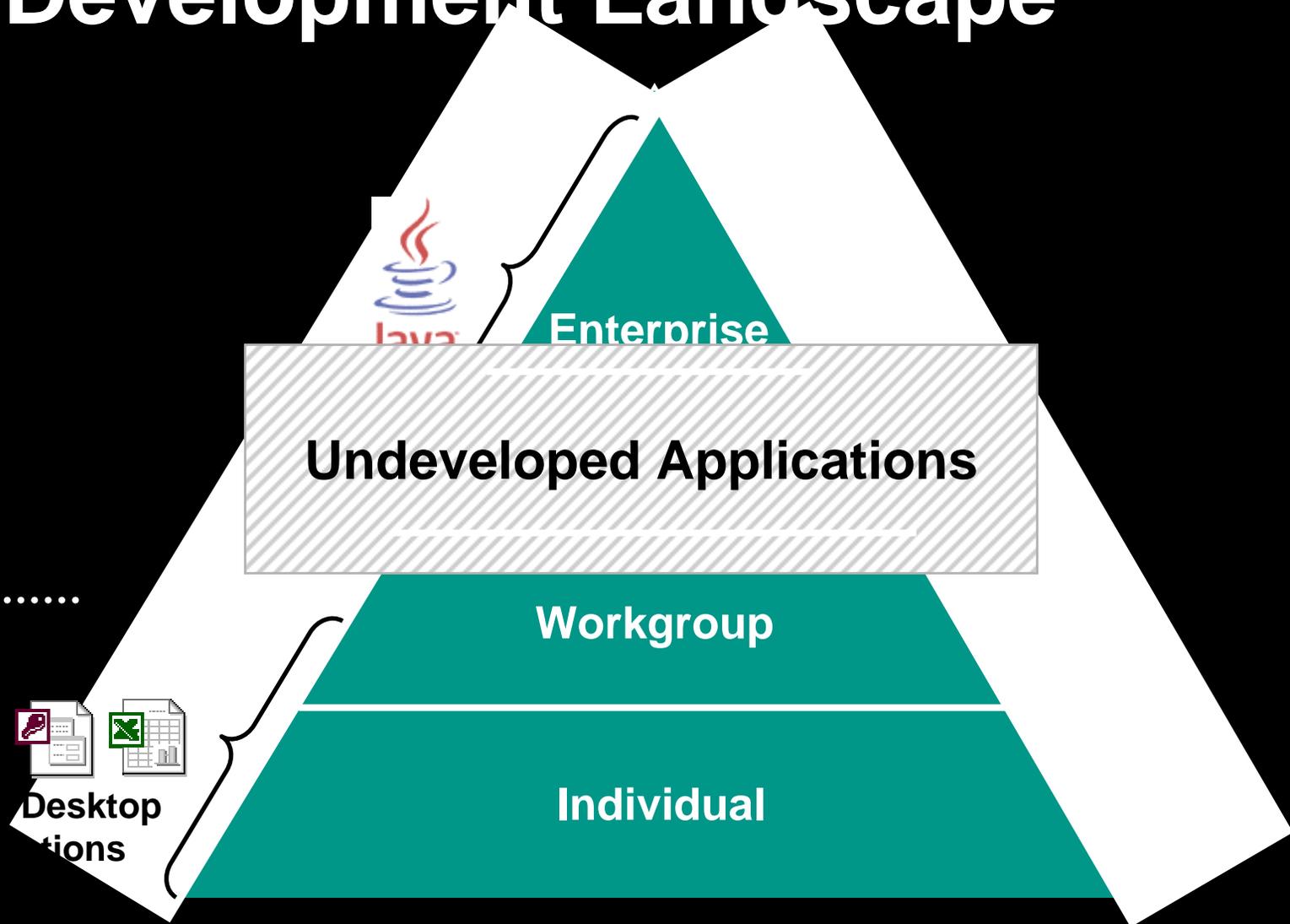


HTML DB



Browser

Web Development Landscape



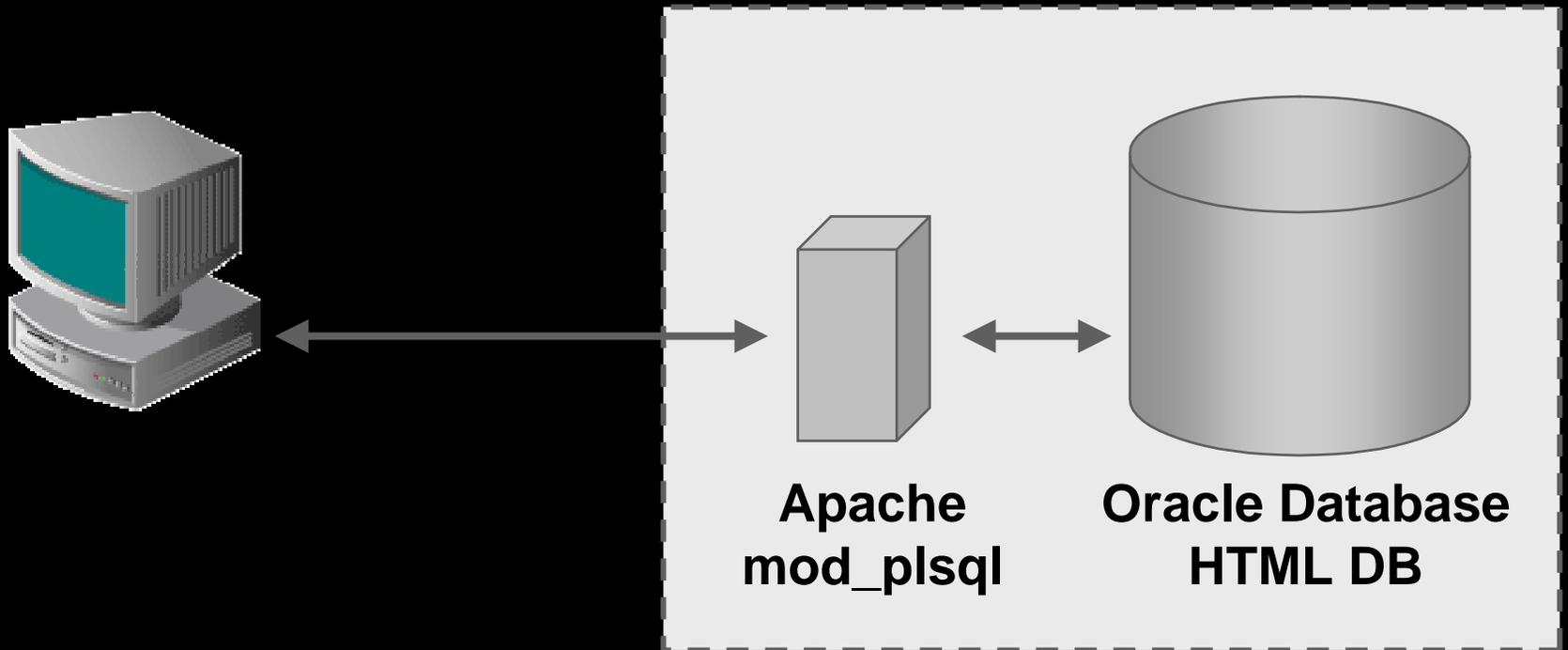
Availability

- Oracle Database 10g and 9iR2 (9.2.0.3)
- Standard and Enterprise Edition
- NO CHARGE

HTML DB Value Proposition

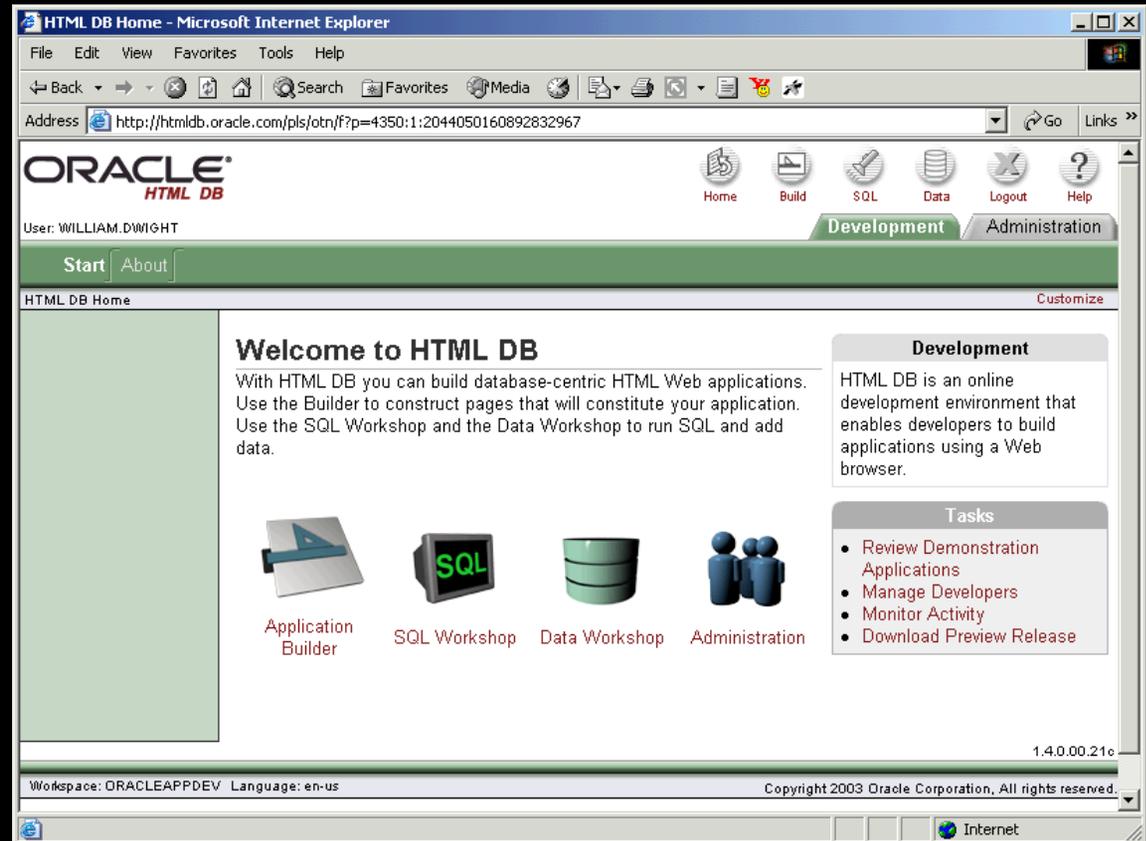
- Manage workgroup data more effectively and efficiently
- Build “tactical” or “opportunistic” data-centric web applications that you are
 - Not building today
 - Building with the wrong technology

Architecture



Functionality Overview

1. Administration
2. Data Workshop
3. SQL Workshop
4. Application Builder



Administration

- Manage workspaces
- Manage users and developers
- Provision resources
- Monitor usage

Oracle HTML DB Service Administration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://htmldb.oraclecorp.com/pls/htmldb/f?p=4050:3:14917917444017231605>

ORACLE[®]
HTML DB

User: WILLIAM.DWIGHT

Home Service Administration Workspace Administration Monitoring

Administration Home

HTML DB Administration

Manage HTML DB Service

- Manage Engine Settings
- Manage Logs
- Manage Session State
- Toggle Provisioning Status

Manage Workspaces

- Create New Workspace
- Import Workspace
- Export Workspace
- Manage Workspaces
- Report Workspace Attributes
- Remove Workspace
- Manage Schema to Workspace Assignments
- Manage Application Developers

Monitor

Administration

This page provides links to commonly performed tasks accomplished performed to administer the HTML DB service.

Notifications

- Service Requests (37, 3 pending)
- Change Requests (1, 0 pending)

1.4.0.00.21b

Workspace: INTERNAL Language: en-us Copyright 2003 Oracle Corporation, All rights reserved.

Internet

Data Workshop

- Import Data
- Export Data
- Text, XML, Spreadsheets

The screenshot shows the Oracle HTML DB Data Workshop interface within a Microsoft Internet Explorer browser window. The browser title is "Data Home - Microsoft Internet Explorer" and the address bar shows the URL "http://htmldb.oracle.com/pls/otn/f?p=4300:9:2044050160892832967". The page header includes the Oracle logo and "HTML DB" text, along with navigation links for Home, Build, SQL, Data, Logout, and Help. The user is identified as "WILLIAM.DWIGHT". The main navigation bar includes "Data Workshop", "Data Import", "Data Export", and "Repository". A "Start" button is visible in a green bar. The main content area is titled "HTML DB Home > Data Workshop" and is divided into two main sections: "Data Import" and "Data Export".

Data Import
Load data from your computer from various file formats into your online database.

- Import Text Data (represented by an icon with "ABC")
- XML Data (represented by an icon with "<XML>")
- Import Spreadsheet Data (represented by a database cylinder and a spreadsheet icon)

Data Export
Extract data from database schemas online to files on your computer.

- Export Text Data (represented by an icon with "ABC")
- XML Export (represented by an icon with "<XML>")

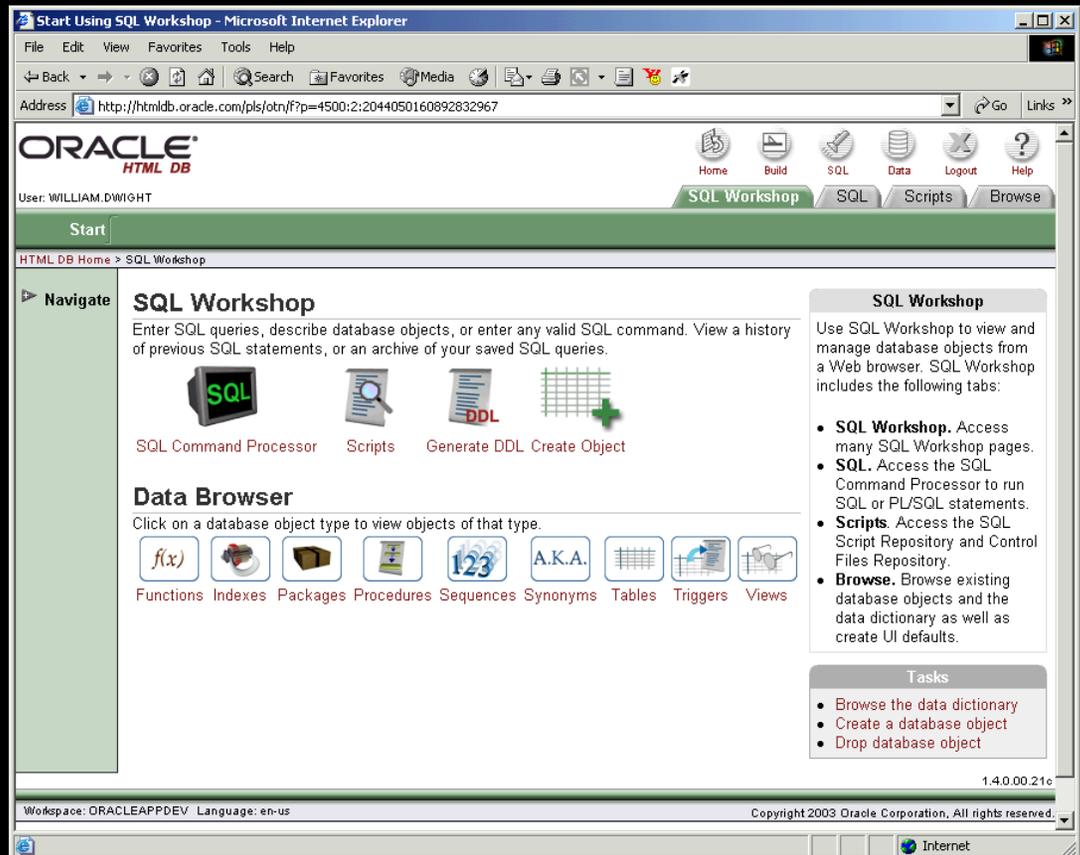
Data Workshop
Data Workshop enables you to import data into and export data from your hosted Oracle database.

You can import data into the database from text files, XML files, and data stored in a spreadsheet.

You can export data from the database to text files or XML files. Click the appropriate link to manage your data.

SQL Workshop

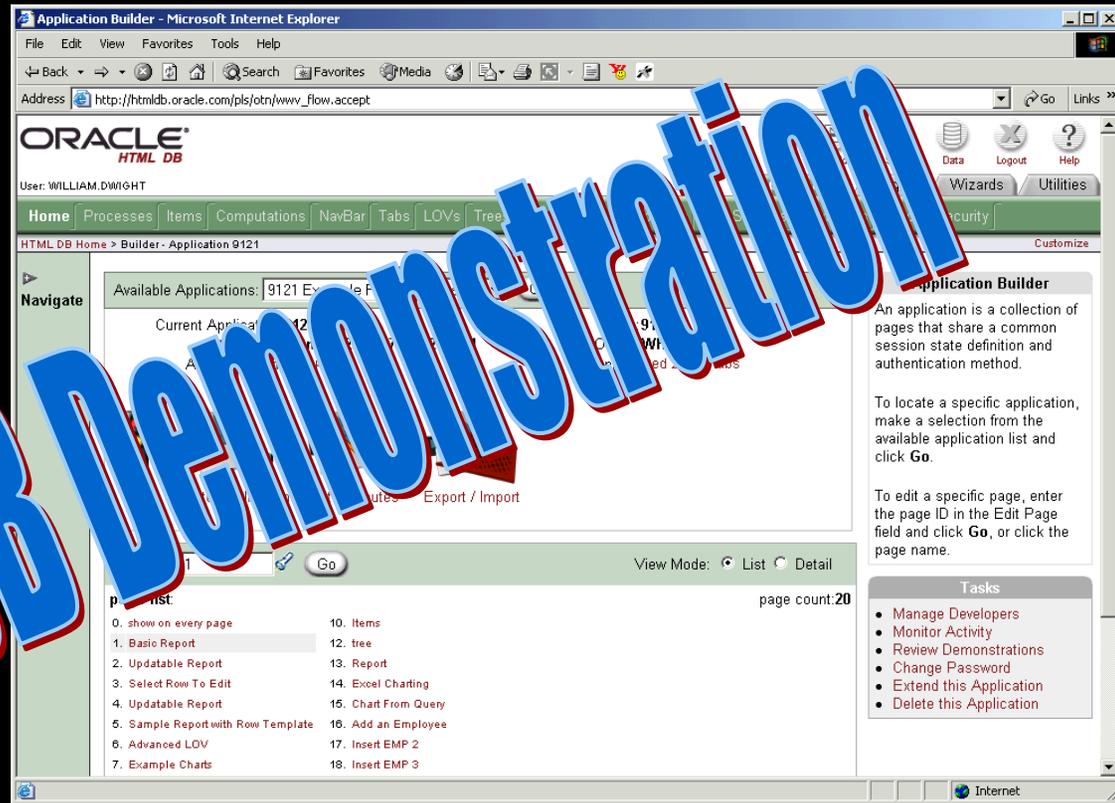
- View Database Objects
- Create Database Objects
- Query by Example
- Browse Data Dictionary
- Run Scripts



Application Builder

- Navigation
- Reports
- Forms
- Charts
- Templates
- Security
- Internationalization

HTMLDB Demonstration



Application Builder

- Navigation
- Reports
- Forms
- Charts
- Templates
- Security
- Internationalization

Application Builder - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://htmldb.oracle.com/pls/otn/www_flow.accept

ORACLE
HTML DB

User: WILLIAM.DWIGHT

Application Pages Wizards Utilities

Home Processes Items Computations NavBar Tabs LOVs Trees Lists Menus Shortcuts WebServices Templates Builds Security

HTML DB Home > Builder - Application 9121

Available Applications: 9121 Example Flows Application Go

Current Application: 9121
Updated: Monday 2003.07.21 12:21:51
Authentication: INTERNAL

Alias: 9121
Owner: WHD
Template: Red 2 level tabs

Run Create Application Edit Attributes Export / Import

Edit Page: 1 Go View Mode: List Detail

page list page count: 20

0. show on every page	10. Items
1. Basic Report	12. tree
2. Updatable Report	13. Report
3. Select Row To Edit	14. Excel Charting
4. Updatable Report	15. Chart From Query
5. Sample Report with Row Template	16. Add an Employee
6. Advanced LOV	17. Insert EMP 2
7. Example Charts	18. Insert EMP 3

Application Builder

An application is a collection of pages that share a common session state definition and authentication method.

To locate a specific application, make a selection from the available application list and click **Go**.

To edit a specific page, enter the page ID in the Edit Page field and click **Go**, or click the page name.

Tasks

- Manage Developers
- Monitor Activity
- Review Demonstrations
- Change Password
- Extend this Application
- Delete this Application

Internet

Oracle Database Leads in

- High Availability
- Scalability
- Performance
- Business Intelligence
- Security
- Reliability

Except, perhaps in...

- Manageability

Oracle Database 10g takes this last card off the table

Complete

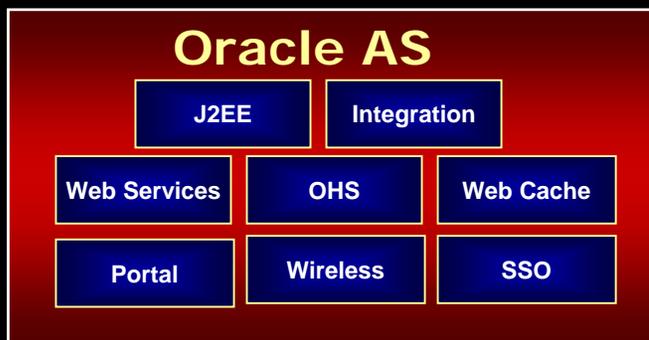
Enables Application Management, Accelerates Problem Resolution



Oracle Collab Suite

Oracle eBus Suite

Application Service Level Management



Integrated Suite Management



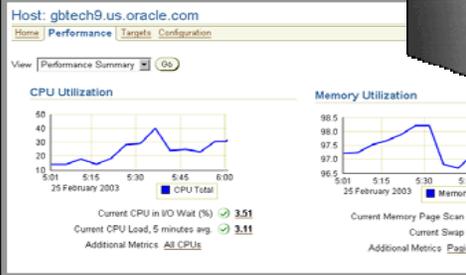
Component Level Management

Management for Oracle Eco-System



Enterprise Manager (10g): One Tool Lowers Learning Curve, Improves Quality of Service

Host and Hardware



Database



State

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

OracleAS



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

View: Top Applications by Average Servlet/JSP Processing Time

Name	OC4J Instance	Total Processing Time (seconds)	Average Servlet/JSP Processing Time (seconds)	Servlet/JSP Requests Processed	Servlet Processing Time (sec)
hrapp	home	167.28	12.69	11	1
default	home	562.77	0.17	3,235	5

Network and Load Balancer



Alerts

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

Administration Monitoring Provisioning Security

Enterprise Manager



Applications



Collaboration Suite: My Collab Suite

Component Status

Metric Name	Target Name	Target Type	Severity Alert Triggered
Calendar	My Collab Suite Collaboration Suite	Host	Oct 17, 2002 6:15:42 PM
Files	Host	Host	Oct 16, 2002 6:43:42 AM
Database	Database1	Database	Oct 14, 2002 12:00:03 PM
Outgoing Mail	Outgoing Mail	Outgoing Mail	Oct 11, 2002 1:59:02 PM
Filesystem Space Available	Host2	Host	Oct 10, 2002 4:41:32 PM

Storage



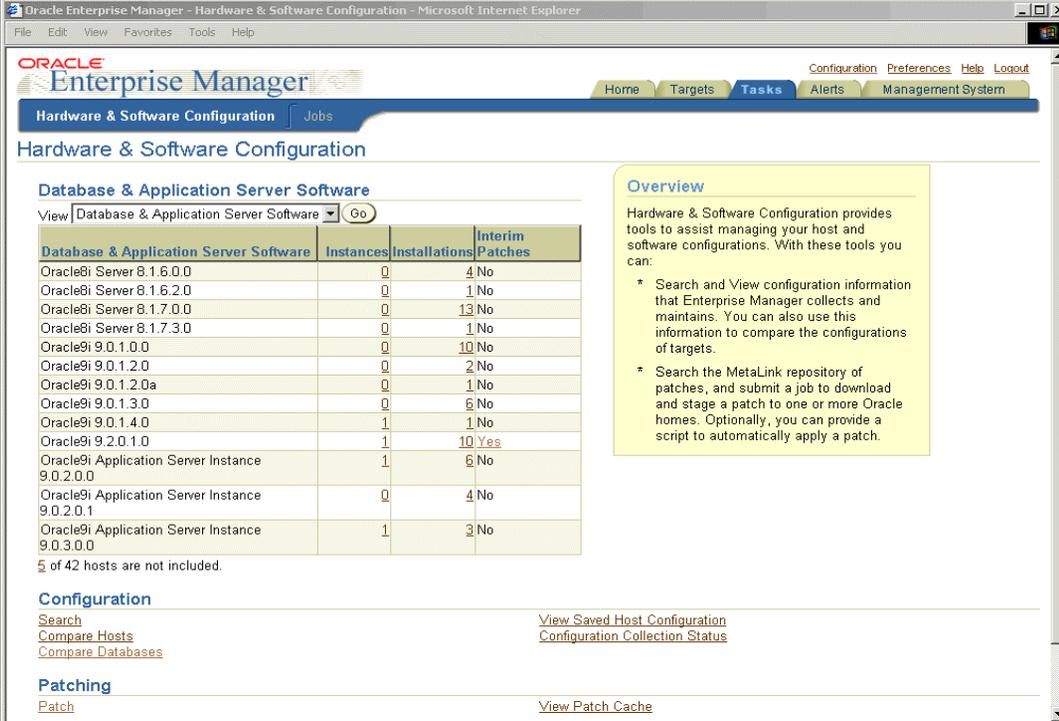
Qtrees (ordered by Used (%))

Status	Name	Volume	Total(GB)	Used(GB)	Used (%)
⊗	slot3	db04	60.0	58.82	98.03
⊗	edw_top	applt0p04	250.0	231.48	92.59
⚠	local_backup	backup04	250.0	219.68	87.87
⚠	opm_top	applt0p04	350.0	298.65	85.33
✓	slot1	db04	60.0	48.51	80.85
✓	slot2	db04	60.0	47.92	79.87
✓	slot4	db04	60.0	47.65	79.41
✓	anubackup	backup04	100.0	62.67	62.67
✓	ap981_sun	applt0p04	50.0	26.3	52.61

Configuration Analysis - Search

“How many iAS instances need to have a given patch applied? – Is my O/S at the right patch level?”

- Search across enterprise
- Complete inventory of all Oracle software
 - Versions
 - Patch levels
- Configuration details for all Oracle products
- Related software and hardware configuration details



The screenshot displays the Oracle Enterprise Manager interface for Hardware & Software Configuration. The main content area shows a table titled "Database & Application Server Software" with columns for "Database & Application Server Software", "Instances", "Installations", and "Interim Patches". The table lists various Oracle software versions and their corresponding instance and installation counts, along with whether interim patches are applied.

Database & Application Server Software	Instances	Installations	Interim Patches
Oracle8i Server 8.1.6.0.0	0	4	No
Oracle8i Server 8.1.6.2.0	0	1	No
Oracle8i Server 8.1.7.0.0	0	13	No
Oracle8i Server 8.1.7.3.0	0	1	No
Oracle9i 9.0.1.0.0	0	10	No
Oracle9i 9.0.1.2.0	0	2	No
Oracle9i 9.0.1.2.0a	0	1	No
Oracle9i 9.0.1.3.0	0	6	No
Oracle9i 9.0.1.4.0	1	1	No
Oracle9i 9.2.0.1.0	1	10	Yes
Oracle9i Application Server Instance 9.0.2.0.0	1	6	No
Oracle9i Application Server Instance 9.0.2.0.1	0	4	No
Oracle9i Application Server Instance 9.0.3.0.0	1	3	No

5 of 42 hosts are not included.

Configuration
[Search](#)
[Compare Hosts](#)
[Compare Databases](#)

Patching
[Patch](#)

Overview
Hardware & Software Configuration provides tools to assist managing your host and software configurations. With these tools you can:
* Search and View configuration information that Enterprise Manager collects and maintains. You can also use this information to compare the configurations of targets.
* Search the MetaLink repository of patches, and submit a job to download and stage a patch to one or more Oracle homes. Optionally, you can provide a script to automatically apply a patch.

[View Saved Host Configuration](#)
[Configuration Collection Status](#)

[View Patch Cache](#)

Configuration Analysis – Change History

“When a system stop working, the first thing we do is try to figure out what has changed”

–EM Beta Customer

History of OS-Registered Software

Refresh Time	Operation	Product	Vendor	Version	Location	Description
January 22, 2003 6:05:57 PM PST	UPDATE	Creator	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)
January 22, 2003 7:19:14 PM PST	UPDATE	Creator	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(22-SEP-2002 00:00:00=>22-SEP-2002 17:00:00)
January 22, 2003 6:05:57 PM PST	UPDATE	XIL API Header Files	Sun Microsystems, Inc.	1.4.2	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)
January 22, 2003 7:19:14 PM PST	UPDATE	XIL API Header Files	Sun Microsystems, Inc.	1.4.2	/usr	INSTALLATION_DATE(22-SEP-2002 00:00:00=>22-SEP-2002 17:00:00)
January 22, 2003 6:05:57 PM PST	UPDATE	db	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)
January 22, 2003 7:19:14 PM PST	UPDATE	db	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(22-SEP-2002 00:00:00=>22-SEP-2002 17:00:00)
January 22, 2003 6:05:57 PM PST	UPDATE	dcam1394	Sun Microsystems, Inc.	graphics_581	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)
January 22, 2003 7:19:14 PM PST	UPDATE	dcam1394	Sun Microsystems, Inc.	graphics_581	/usr	INSTALLATION_DATE(22-SEP-2002 00:00:00=>22-SEP-2002 17:00:00)
January 22, 2003 6:05:57 PM PST	UPDATE	dcam1394	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)
January 22, 2003 7:19:14 PM PST	UPDATE	dcam1394	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(22-SEP-2002 00:00:00=>22-SEP-2002 17:00:00)
January 22, 2003 6:05:57 PM PST	UPDATE	fbconfig	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)
January 22, 2003 7:19:14 PM PST	UPDATE	fbconfig	Sun Microsystems, Inc.	graphics_8	/usr	INSTALLATION_DATE(22-SEP-2002 00:00:00=>22-SEP-2002 17:00:00)
January 22, 2003 6:05:57 PM PST	UPDATE	sotregis	Sun Microsystems, Inc.	1.1	/usr	INSTALLATION_DATE(2002-09-22 17:00:00=>2002-09-22 00:00:00)

Configuration Analysis - Comparing

- Define and enforce reference configs
- Compare systems

ORACLE Enterprise Manager 10g
Grid Control

Setup Preferences Help Logout
Home Targets Configuration Alerts Jobs Management System

Hardware & Software

Comparison Results Summary > Comparison Results: Hardware

Comparison Results: Hardware

First Host **demostage01** Second Host **demostage05**
Date **Sep 4, 2003 6:57:12 PM** Date **Sep 5, 2003 2:01:15 PM**

System Details

	Comparison Result	demostage01	demostage05
Hardware Provider	=	Sun Microsystems	Sun Microsystems
System Configuration	≠	Sun Enterprise 420R	Sun Ultra 80 UPA/PCI
Machine Architecture	=	64-bit sparcv9 sun4u	64-bit sparcv9 sun4u
Clock Frequency (MHz)	=	113	113
Memory Size (MB)	=	4096	4096
Local Disk Capacity (GB)	≠	123.097	132.65
Number of CPUs	=	4	4
Number of CPU boards	=	1	1
Number of IO devices	=	4	4

CPUs

CPUs	demostage01	demostage05
(No Differences found.)		

IO Devices

IO Devices	demostage01	demostage05
(No Differences found.)		

Network Interfaces

Network Interfaces	demostage01	demostage05
(No Differences found.)		

Configuration Analysis – Feature Usage

- Automatically track features enabled and used in a system
- Information can be used to determine applicable patches, support needs, diagnostics...etc.

Database Feature Usage Statistics

Feature Usage [High Water Marks](#)

Database Feature Usage Statistics provide an approximation of how often various database features are used.

Database **mgmt10i_030530_dsunrd03**
Instance Name **mgmt10i**
Database Version **10.1.0.0.0**
Last Sampled At **Jun 2, 2003 1:32:48 PM**
Next Sampled At **Jun 9, 2003 1:32:48 PM**
Sample Period (days) **0.0**

Usage Statistics

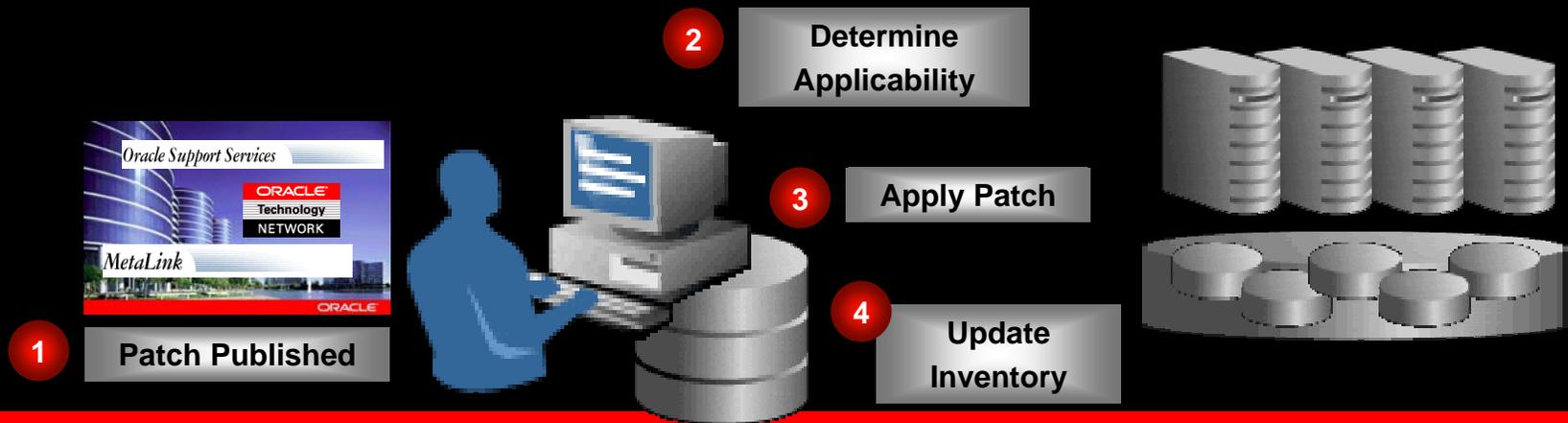
⊖ Previous | 1-25 of 52 | Next 25 ⊕

Feature Name	Currently Used	Detected Usages	Total Samples	First Usage Date	Last Usage Date	Version
Advanced Replication	No	0	1			10.1.0.0.0
Advanced Security	No	0	1			10.1.0.0.0
Audit Options	No	0	1			10.1.0.0.0
Automatic SQL Execution Memory	Yes	1	1	Jun 2, 2003 1:32:48 PM	Jun 2, 2003 1:32:48 PM	10.1.0.0.0
Automatic Segment Space Management	No	0	1			10.1.0.0.0
Automatic Undo Management	No	0	1			10.1.0.0.0
Change-Aware Incremental Backup	No	0	1			10.1.0.0.0
Client Identifier	No	0	1			10.1.0.0.0
Data Guard	No	0	1			10.1.0.0.0
Data Guard Broker	No	0	1			10.1.0.0.0
Data Mining	No	0	1			10.1.0.0.0
Dynamic SGA	Yes	1	1	Jun 2, 2003 1:32:48 PM	Jun 2, 2003 1:32:48 PM	10.1.0.0.0

Automated Patch Management

Slammer virus exploited known security flaw to which patch was available 6 months prior to attack

- Real-time discovery of new patches
 - ✓ Security patch rapid deployment dramatically reduces vulnerabilities
- Automatic staging and application
 - From hours to minutes
- Rolling RAC upgrade



Critical Patch Advisor

- Automatic tracking by EM of critical bug advisories on Metalink
- Daily inspection of all installations and flagging of “violators”
- In-context launch of patch wizard to deploy and apply appropriate patches

Critical Patch Advisor

The screenshot shows the Oracle Enterprise Manager Critical Patch Facility interface. The browser window title is "Critical Patch Facility - Microsoft Internet Explorer". The address bar shows the URL: <http://groyal-sun.us.oracle.com:4889/em/console/ecm/policy?rule=Critical%20Patch%20Facility&ignored=N&type=host&pageName=/ecm/policy/ruleDrill>. The page header includes the Oracle logo and "Enterprise Manager" navigation tabs: Home, Targets, Configuration, Alerts, Jobs, and Management System. The breadcrumb trail is: Host: groyal-sun.us.oracle.com > Oracle Home: /private/home/oracle/oraHome91 > Policy Violations > Critical Patch Facility. The main heading is "Critical Patch Facility" with "Revert" and "Apply" buttons. The status shows: Priority (with a red 'x' icon), Violation Count 2, Last Evaluation Jul 11, 2003 2:09:50 PM, and Non-Compliant Since Jul 11, 2003 2:08:51 PM. A section titled "Violations" contains a paragraph explaining the need for patches and a "View" dropdown set to "Violations" with a "Go" button. Below is a table of advisories:

Advisory	Impact	Patch Id	Abstract	Ignore
Alert 51	Security Update	2620726	Buffer Overflow in the Oracle Executable of Oracle Database Server. A potential security vulnerability has been discovered in the Oracle executable of the Oracle Database. A knowledgeable and malicious user whose has not authenticated to the database server can potentially execute arbitrary code by exploiting a buffer overflow in this executable	<input type="checkbox"/>
Alert 54	Security Update	2749511	Buffer Overflow in Oracle Net Services for Oracle Database Server. A potential security vulnerability has been discovered in Oracle Net services for the Oracle Database server. A knowledgeable and malicious user can cause a buffer overflow in an Oracle database link that may result in a Denial of Service (DoS) attack and/or the execution of arbitrary code against the Oracle Database server	<input type="checkbox"/>

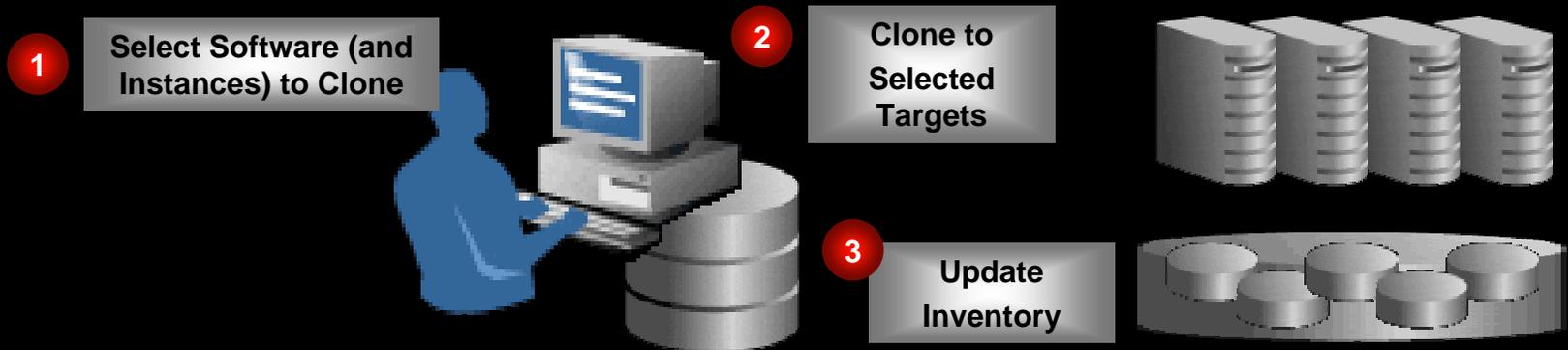
At the bottom of the table, there are "Revert" and "Apply" buttons. The footer contains navigation links: Home | Targets | Configuration | Alerts | Jobs | Management System | Setup | Preferences | Help | Logout, and copyright information: Copyright © 1996, 2003, Oracle. All rights reserved. About Oracle Enterprise Manager. The system tray shows "Local intranet".

Automated Software Cloning Operations

“Our DBAs spend about 25% of their time on database installs and cloning”

-Verizon Information Services DBA

- Reduce manual labor in software life-cycle
 - From hours to minutes
- Automate mass provisioning of reference systems



Automated Software Cloning Operations

“Our DBAs spend about 25% of their time on cloning and installs”

-Verizon Information Services DBA

- Reduce manual tasks in software life-cycle
 - From manual provisioning to automated provisioning of reference systems

