



ORACLE®

Increasing your Return on Oracle Investment: Top Features You Might Be Overlooking

David Bayard
April 2009



Top Things

- **Knowledge**
- **Tools**
- **Core Features**
- **Performance Features**



Knowledge



Oracle Technology Network



secure search

Technology Network ▾



PRODUCTS

Database
Middleware
Developer Tools
Enterprise Management
Applications Technology
Products A-Z

TECHNOLOGIES

BI & Data Warehousing
Embedded
Java
Linux
.NET
PHP
Security
Technologies A-Z

ARCHITECTURE

Enterprise 2.0
Grid
Service-Oriented Architecture
Virtualization

COMMUNITY

Join OTN
Oracle ACEs
Oracle Mix
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RECENTLY POSTED



Tech Article: High-Performance Oracle JDBC Programming

Learn how to improve performance of Oracle-driven JDBC programs by leveraging connection and statement pooling features.

posted 4/10/09 21:23 GMT - Tags: [jdbc](#), [database](#), [performance](#)

Free Oracle Fusion Middleware Hands-on Labs at Collaborate 2009

Get hands-on experience to service-enable Oracle E-Business Suite, PeopleSoft, JDE E1, or Siebel with Oracle SOA Suite; see AIA in action; and deep-dive into other apps-on-Fusion Middleware topics in these free workshops on May 4-6. No JEE or BPEL experience necessary.

posted 4/10/09 21:20 GMT - Tags: [apps](#), [middleware](#), [events](#)

Tech Article: High Concurrency with Python and Oracle Database

Learn how to improve the throughput and responsiveness of Oracle Database-backed Python applications with the help of threading and concurrency.

posted 4/7/09 18:43 GMT - Tags: [python](#), [database](#), [scripting](#)

FEATURED DOWNLOADS

- ↓ [Oracle Database 11g Rel 1](#)
- ↓ [Oracle WebLogic Server 10.3](#)
- ↓ [Oracle Database 10g Rel 2 for Mac OS X/Intel x86-64](#)
- ↓ [Oracle Enterprise Pack for Eclipse 11g Free product](#)
- ↓ [Oracle JDeveloper 11g Free product](#)
- ↓ [Oracle SQL Developer Free product](#)
- ↓ [Oracle Database XE Free product](#)

► [MORE DOWNLOADS](#)

DEVELOPER EVENTS

[OTN Developer Day - Fusion Development Experience](#)
4/16/2009 — Boston

[OTN Developer Day - Fusion Development Experience](#)
4/21/2009 — Salt Lake City

[OTN Developer Day - Fusion Development Experience](#)



Oracle 11g 2 Day



“2 Day” Manuals (both 10g and 11g)

[Advanced Search](#) • [Master Book List](#) •
[Master Index](#) • [Master Glossary](#) • [Error Messages](#)

[Expand All](#) | [Collapse All](#) | [Help](#)

- ⊕ [Installing and Upgrading](#)
- ⊕ [Getting Started](#)
- ⊕ [Database Administration](#)
- ⊕ [Application Development](#)
- ⊕ [Grid Computing](#)
- ⊕ [Performance](#)
- ⊕ [High Availability](#)
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- ⊕ [Unstructured Data and Content Management](#)
- ⊕ [Information Integration](#)
- ⊕ [Security](#)
- [Favorites](#)

Oracle Database

Documentation Library

11g Release 1 (11.1)

DBA Essentials

Manage all aspects of your Oracle databases with the Enterprise Manager GUI.

2 Day DBA	HTML	PDF
2 Day + Security Guide	HTML	PDF
2 Day + Performance Tuning Guide	HTML	PDF
2 Day + Real Application Clusters Guide	HTML	PDF
2 Day + Data Replication and Integration Guide	HTML	PDF

New to Oracle Database 11g

Information you need for the latest release.

New Features Guide	HTML	PDF
Readme	HTML	PDF

Supporting Documentation

Supporting documentation provides in-depth conceptual, task-based and reference material beyond the scope of the *2 Day DBA*, *2 Day Developer* and *2 Day +* Guides.

Administrator's Guide	HTML	PDF
Concepts	HTML	PDF
Reference	HTML	PDF
SQL Language Reference	HTML	PDF

Upgrade Information

If you are familiar with earlier Oracle releases and are moving to



[Home](#)



[Customize](#)



[Help](#)



[Contact Us](#)

Developer Essentials

Build applications around Oracle databases using the languages and platforms of your choice.

2 Day Developer's Guide	HTML	PDF
2 Day + Application Express Developer's Guide	HTML	PDF
2 Day + Java Developer's Guide	HTML	PDF
2 Day + PHP Developer's Guide	HTML	PDF
2 Day + .NET Developer's Guide for Microsoft Windows	HTML	PDF

Tips

Each page in the library lists the essential books in a specific topic area first. The *2 Day* and *2 Day +* guides cover the most essential tasks and concepts in a specific topic area. The remainder of the page lists books that contain more detailed or advanced information.

Online Resources

[Oracle Technology Network](#)

- [Getting Started with Oracle Database](#)
- [Getting Started for Database Administrators](#)
- [Getting Started for Developers](#)

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Oracle By Example



Oracle By Example Tutorials

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TECHNOLOGY NETWORK

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Oracle Websites ▾

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ARCHITECTURE

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Oracle By Example (OBE)

The Oracle by Example (OBE) series provides hands-on, step-by-step instructions for implementing Oracle solutions. OBE solutions are built for practical real-world situations, allowing you to gain a foundation for production implementation, dramatically reducing time to deployment. For more information, see product training at the [Oracle University Knowledge Center](#).

Expand the folder of the product area or component you are interested in.

Oracle VM

☒ Oracle VM 2.1

Database

Oracle Open World 2008 Hands On Sessions
Database 11g Release 1
Database 10g Release 2
Demos
☒ Archives

Fusion Middleware

Fusion Middleware start
☒ Oracle Identity and Access Management Suite
☒ OracleAS 10g 10.1.3
Oracle Coherence
Oracle Data Integrator
Oracle WebLogic Server 10.3
Oracle Web Services Manager (OWSM)
Fusion Middleware for Oracle Applications
☒ Oracle Enterprise Content Management

- ☒ [Installation](#) (5 tutorials)
- ☒ [Performance](#) (3 tutorials)
- ☒ [Manageability](#) (8 tutorials)
- ☒ [Storage Management](#) (2 tutorials)
- ☒ [Availability](#)
 - ☒ [Oracle Secure Backup](#) (3 tutorials)
 - ☒ [Oracle Data Guard](#) (4 tutorials)
 - ☒ [RAC](#) (1 tutorial)
 - ☒ [Other](#) (2 tutorials)
- ☒ [Application Development](#)
 - ☒ [Oracle Application Express](#) (21 tutorials)
 - ☒ [Oracle SQL Developer](#) (7 tutorials)
 - ☒ [.NET](#) (9 tutorials)
 - ☒ [PHP](#) (2 tutorials)
 - ☒ [JDBC, OCI, Diagnosing and Tuning](#) (4 tutorials)
 - ☒ [Ruby on Rails](#) (1 tutorial)
- ☒ [Business Intelligence and Data Warehousing](#)
 - ☒ [OLAP](#) (4 tutorials)
 - ☒ [Oracle Warehouse Builder](#)
 - ☒ [Other](#) (2 tutorials)
- ☒ [Security and Compliance](#)
 - ☒ [Oracle Label Security](#) (1 tutorial)
 - ☒ [Data Masking](#) (1 tutorial)
 - ☒ [Oracle Database Vault](#) (2 tutorials)
 - ☒ [Other](#) (2 tutorials)
- ☒ [Extended Data Management](#)
 - ☒ [XML](#) (4 tutorials)
 - ☒ [SecureFiles](#) (1 tutorial)

ons to business problems.
resented solutions as the
can also access more



oracle lifetime support



Lifetime Support Brochure Details

ORACLE

Table of Contents

PRODUCTS AND SERVICES

ORACLE SUPPORT

Premier Support
Advanced Customer Service
Lifetime Support
Unbreakable Linux
Oracle Support Resources
PeopleSoft Support Resources
Acquired Product Support
Support News
Resource Library
Support Policies

Oracle Database Releases
Oracle Fusion Middleware Releases
Oracle's Ikan Releases
Oracle Collaboration Suite Releases
Oracle Enterprise Manager Releases
Oracle Rdb and Oracle CODASYL Database Releases
Oracle's Siebel Technology Releases
Oracle TimesTen In-Memory Database Releases
Oracle Berkeley DB (Formerly Sleepycat) Releases
Oracle Database Lite Releases
Oracle's HotSip Releases
Oracle's OctetString Releases
Oracle's Oblix Releases
Oracle's Thor Technologies Xellerate Releases
Oracle Reliably Backup Release
Oracle Data Integrator (Formerly Sunopsis) Releases

4 on Out]

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Oracle Database Releases

Release	GA Date	Premier Support Ends	Extended Support Ends	Sustaining Support Ends
8.1.7	Sep 2000	Dec 2004	Dec 2006	Indefinite
9.2	Jul 2002	Jul 2007	Jul 2010	Indefinite
10.1	Jan 2004	Jan 2009	Jan 2012	Indefinite
10.2	Jul 2005	Jul 2010	Jul 2013	Indefinite
11.1	Aug 2007	Aug 2012	Aug 2015	Indefinite

Oracle's BEA Releases
Oracle's ClearApp Releases
Oracle's mValent Releases

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technology network oracle database upgrade



11g Upgrade Tips

shortcuts

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ORACLE **11g** Oracle Database Upgrade
DATABASE

Upgrading to Oracle Database 11g provides the latest in efficient, reliable, secure data management for mission-critical on-line transaction processing applications, query-intensive data warehouses, and content management and Web2.0 applications. The right planning, preparation, and upgrade steps will make the upgrade process simpler, faster, and more predictable from start to finish.

Latest (March 2009)

Technical Information

Database Upgrade Services
The Database Upgrade Partner Program includes Oracle partners who offer Oracle Database 11g Upgrade Services to customers who might not have the time, resources, or expertise to perform their own database upgrades. These partners have vast upgrade experience and use best practices for upgrading Oracle databases. If you wish to find out more about the Database Upgrade Project, or wish to become a Database Upgrade Partner, send an [Email to Product Management](#) requesting more information.

OpenWorld 2008

Documentation

Upgrade Resources/Papers

Support

- [11g R1 Upgrade Workshop Presentation](#)
- [Part 1 of 3](#) (February 2009 - ~6M)
- [Part 2 of 3](#) (February 2009 - ~6M)
- [Part 3 of 3](#) (February 2009 - ~1.5M)
- [Upgrade Oracle 9i->11g: A Customer Experience](#) (November 2008)
- [Benefits of Upgrading to Oracle Database 11g](#) (July 2008)
- [Database Rolling Upgrade Using Transient Logical Standby](#)
- [Oracle Data Guard 11g](#) (June 2008)
- [Database Rolling Upgrade Using Data Guard SQL Apply - Oracle Database 11g and 10gR2](#) (April 2008)

- [Different Upgrade Methods for Upgrading your Database](#) (Metalink)
- [Complete Checklist for Manual Upgrades - 11gR1](#) (Metalink)
- [Complete Checklist for Upgrades - 11gR1 Using DBUA](#) (Metalink)
- [Database Server Upgrade/Downgrade Compatibility Matrix](#) (Metalink)

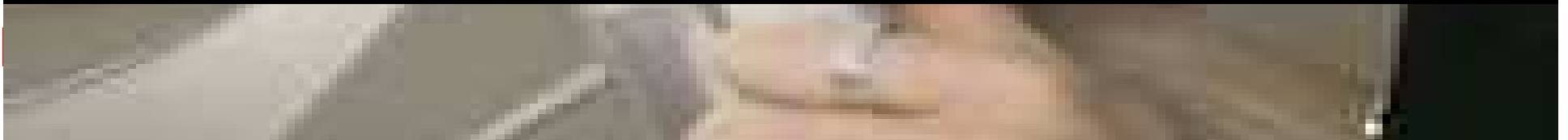
- [11g Upgrade Companion](#) (Metalink)
- [Oracle 11g Release 1 Documentation](#)
- [Oracle 11g Release 1 Upgrade Guide](#)

- [Best Practices - Upgrading to Oracle Database 11g](#) (Nov. 2007)
- [Interoperability Notes E-Business Suite R12/Oracle Database 11gR1](#) (Metalink) (Oct. 2008)
- [Upgrade to Oracle RAC 11g - Linux](#) (OTN) (Oct. 2007)
- [Innovate Faster with Oracle Database 11g](#) (Aug. 2007)
- [Discussion Forum](#)

- [11g Upgrade Companion](#) (Metalink)



Tools





oracle grid control



ORACLE Enterprise Manager 10g

Grid Control

Home Targets Deployments Alerts Compliance Jobs Reports

Hosts | Databases | Application Servers | Web Applications | Groups | All Targets | Collaboration Suites

Cluster: dbs.crs > Cluster Database: ORACLE.COM > Database Instance: ORCL

Top Activity

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

Active Sessions

Apr 5, 2008

Detail for Selected 5 Minute Interval

Start Time Apr 5, 2008 10:29:32 AM CDT

Top SQL

Select All Select None	SQL ID	SQL
<input type="checkbox"/> 12.10	bbxb6c4kmgmmq	SEL
<input type="checkbox"/> 7.19	b2yz2b9vga7h	SEL
<input type="checkbox"/> 6.60	8znv5trv71d4a	SEL
<input type="checkbox"/> 6.30	9c09ntcqunu1u	SEL
<input type="checkbox"/> 5.82	cn96qsdrmaub	SEL
<input type="checkbox"/> 4.66	93sgq7vmg35xv	SEL
<input type="checkbox"/> 4.50	bxygj7qmvrfan	SEL

ORACLE Enterprise Manager 10g

Grid Control

Home Targets Deployments Alerts Compliance Jobs Reports

General | Provisioning

Patch Application Server:

Software Updates

Staging Location %emd_root%

Application Server Updates

Software Update Name / p4527606_10.1.2.0.2_46

TIP To look for the RE Metalink credentials

Upgrade OPatch

OPatch Upgrade Enabled

Target List

Application Server targets to

Name
ias_if.stacc04.us.oracle.coi
midtier101202_2.stacc261.u

Credentials

ORACLE Enterprise Manager 10g

Grid Control

Home Targets Deployments Alerts Compliance Jobs Reports

Page Refreshed Aug 23, 2007 3:28:41 PM CEST

Overview

View All Targets

Total Monitored Targets 53

All Targets Status

Down(9) Unknown(5) Up(37)

All Targets Alerts

Critical 85 Warning 122 Errors 115

All Targets Policy Violations

Critical 179 Warning 205 Informational 50

All Targets Jobs

Problem Executions (last 7 days) 6 Suspended Executions (last 7 days) 0

Target Search

Search All

Security Policy Violations

Critical 166 Warning 205 Informational 24 New in Last 24 Hours 0

Critical Patch Advisories for Oracle Homes

Patch Advisories 1 Affected Oracle Homes 10

Deployments Summary

View Database Installations

Database Installations	Targets	Installations	Interim Patches Applied
Oracle Database 10g 10.1.0.4.0	2	2	No
Oracle Database 10g 10.1.0.5.0	1	1	No
Oracle Database 10g 10.2.0.1.0	0	1	No
Oracle Database 10g 10.2.0.2.0	0	1	No
Oracle Database 10g 10.2.0.3.0	8	4	Yes
Oracle Database 11g 11.1.0.5.0	1	1	No
Oracle8i Server 8.1.7.4.0	1	1	No

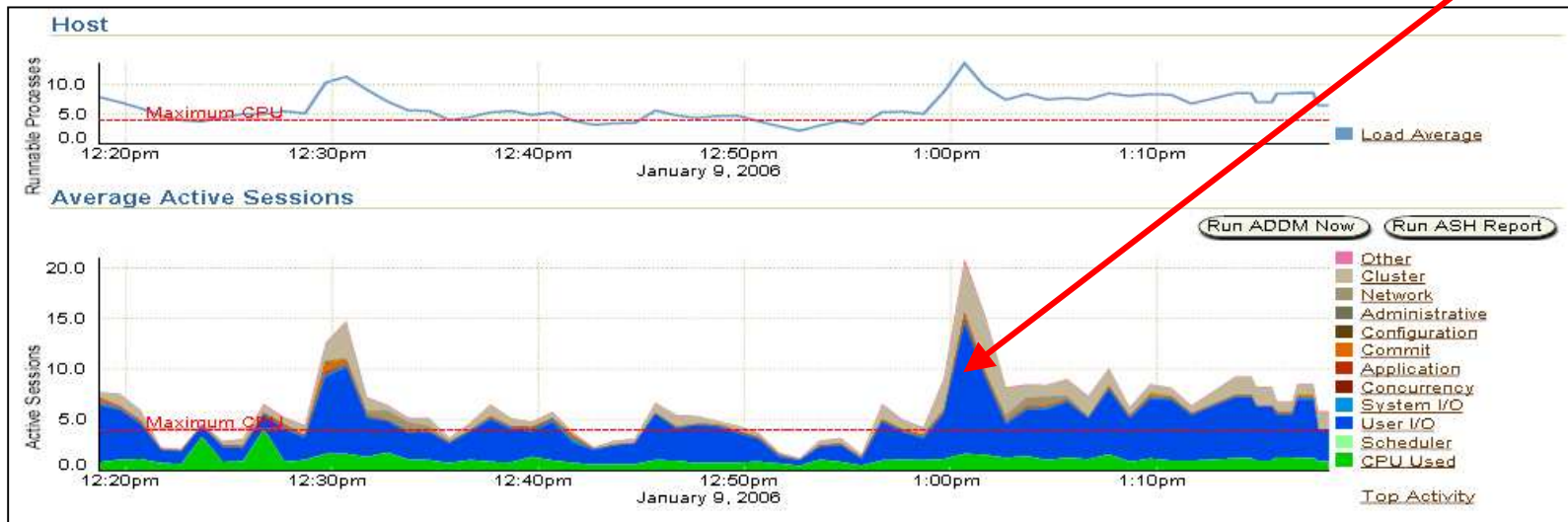
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Oracle's Performance Methodology

- How to tune your system for a given workload?
 - Identify operations consuming most DB Time
 - Identify resource/capacity related bottlenecks
 - Reduce “DB Time” consumed for the workload
- EM *Diagnostics and Tuning Packs* embody Methodology + Best Practice
 - Workflows based on Methodology
 - Problem determination is few mouse clicks away

Oracle's Performance Methodology **Click!**



- How do you tune an Oracle database?
 - Simplest Answer: "Follow ADDM Recommendations"
 - Simple Answer: "Click on the biggest block of color"

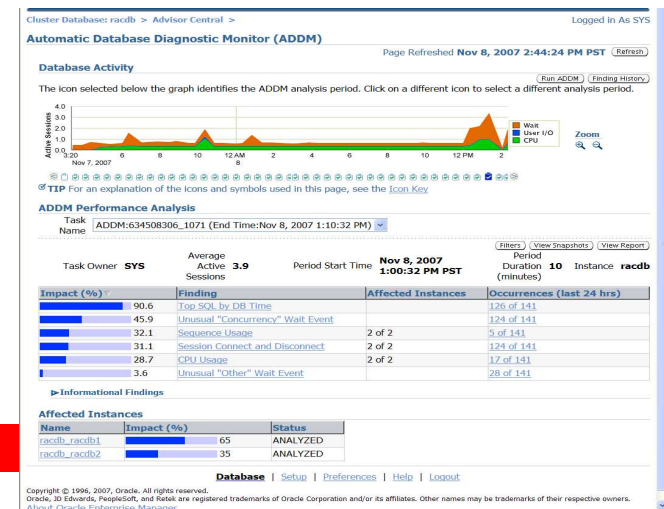


oracle database diagnostics pack



Database Diagnostics Pack

- Automatic Workload Repository
- Automatic Database Diagnostic Monitor (ADDM)
- Active Session History (ASH)
- Data Dictionary objects:
 - DBMS_WORKLOAD_REPOSITORY, DBMS_ADDM, DBMS_ADVISOR(ADDM), V\$ACTIVE_SESSION_HISTORY, DBA_HIST_* ...





oracle database tuning pack



Database Tuning Pack

- SQL Access Advisor
- SQL Tuning Advisor
- SQL Tuning Sets
- Automatic Plan Evolution of SQL Plan Management
- SQL Monitoring
- Reorganize objects
- Data Dictionary Objects:
 - DBMS_SQLTUNE, DBMS_ADVISOR (SQL Tuning Advisor or SQL Access Advisor), V\$SQL_MONITOR, V\$SQL_PLAN_MONITOR

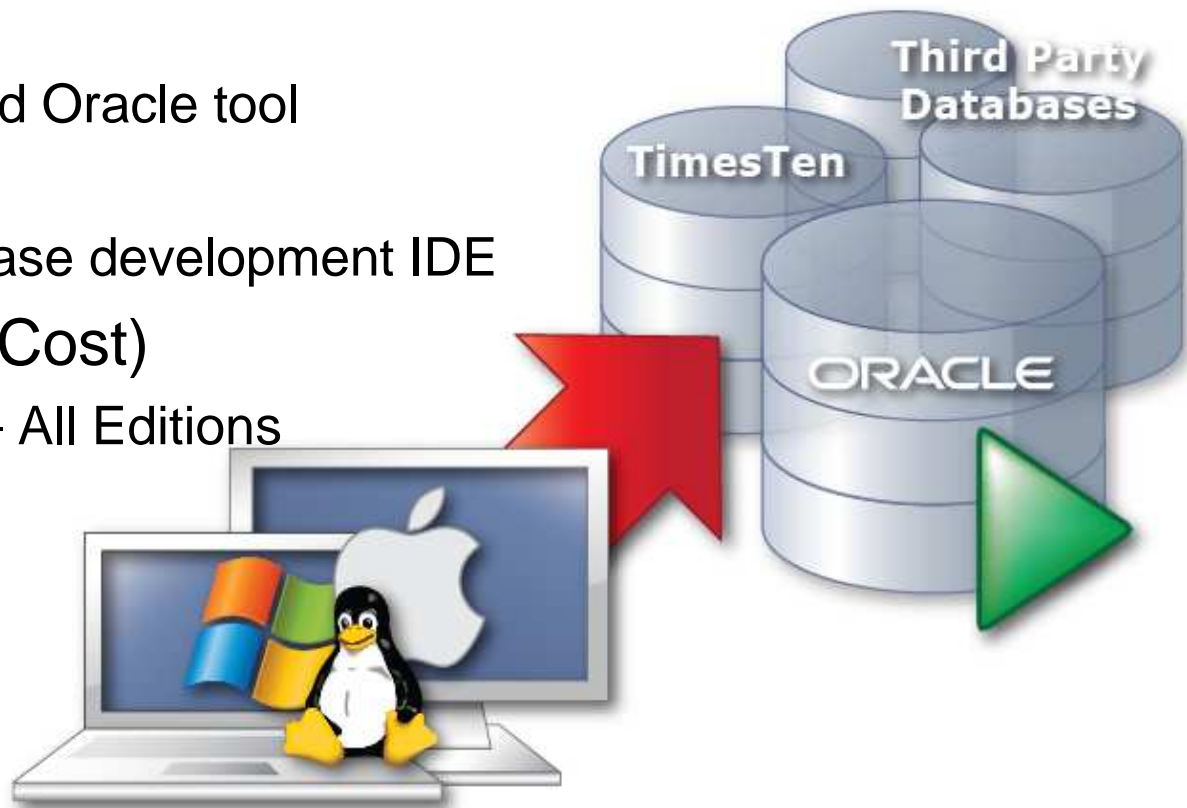


oracle sql developer



SQL Developer

- Database Development IDE
- Popular
 - Most downloaded Oracle tool
 - 1.5m users
 - #1 Oracle database development IDE
- Distribution (No Cost)
 - With Database – All Editions
 - OTN download
- Benefits
 - Productivity
 - Ease of use



Introduced March 2006

ORACLE



oracle sql developer



SQL Developer

- Creating database connections
- Creating and browsing objects
- Querying and updating data
- Using the SQL Worksheet
- Running the Query Builder
- Importing data, exporting data and objects
- Creating and running PL/SQL
- Running and defining reports
- Building extensions
- Browsing and migration from third-party databases
- Integrating with Oracle APEX 3.0.1+
- Working with files and version control

The screenshot displays the Oracle SQL Developer interface. On the right, the 'Connections' pane shows a tree view of database connections, including 'Barry_817', 'dbo_northwind', and 'HR_ORCL'. The 'HR_ORCL' connection is expanded, showing a list of tables and views. In the center, the 'Extended Search' pane is open, showing a search for 'EMP_CURSOR' in the 'EMP_LIST' table. Below this, a table of results is displayed with columns: DEPARTMENT_ID, DEPARTMENT_NAME, MANAGER_ID, and LOCATION_ID. The table contains 14 rows of data. The 'Sort...' button in the table's toolbar is circled in red. On the bottom right, the 'SQL Worksheet' is open, showing a PL/SQL package body named 'emp_main'. The package contains a procedure 'change_sal' and a function 'remove_emp'.

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	10 Administration	200	1700
2	20 Marketing	201	1800
3	30 Purchasing	114	1700
4	40 Human Resources	203	2400
5	50 Shipping	121	1500
6	60 IT	103	1400
7	70 Public Relations	204	2700
8	80 Sales	145	2500
9	90 Executive		
10	100 Finance		
11	110 Accounting		
12	120 Treasury		
13	130 Corporate Affairs		
14	140 Control Administration		

```
create or replace PACKAGE BODY emp_main
IS
    g_counter NUMBER := 1;

    PROCEDURE change_sal
    (pEmpID IN NUMBER,
     pSal IN NUMBER)
    IS
    BEGIN
        UPDATE employees
        SET salary = pSal
        WHERE employee_id = pEmpID;
    END change_sal;

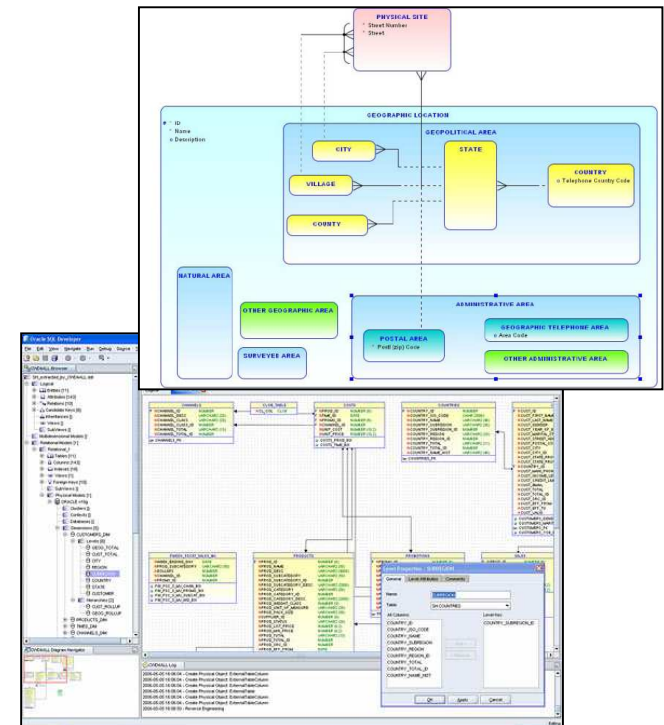
    DELETE FROM employees
    WHERE employee_id = pEmpID;
    END remove_emp;

    BEGIN
        SELECT USER
        INTO emp_main.g_user
        FROM dual;
    END;
```

Oracle SQL Developer Data Modeling

SQL Developer 2.0 (Watch for Preview Release)

- Oracle SQL Developer Data Modeling supports
 - Designing logical Entity Relation Diagrams (ERD)
 - Building physical schema designs
 - Generating and executing DDL scripts
 - Reverse engineering of existing data structures
 - Import of data models from Erwin and Designer
- Provides modeling for multiple databases
 - Oracle Database
 - DB2 (Mainframe & UDB)
 - Microsoft SQL Server
- Support includes
 - Multi-dimensional modeling
 - Multi-level logical and physical design environment
 - Spatial modeling
 - Model validation rules
- Increases migration productivity
 - Migrate and model using one product



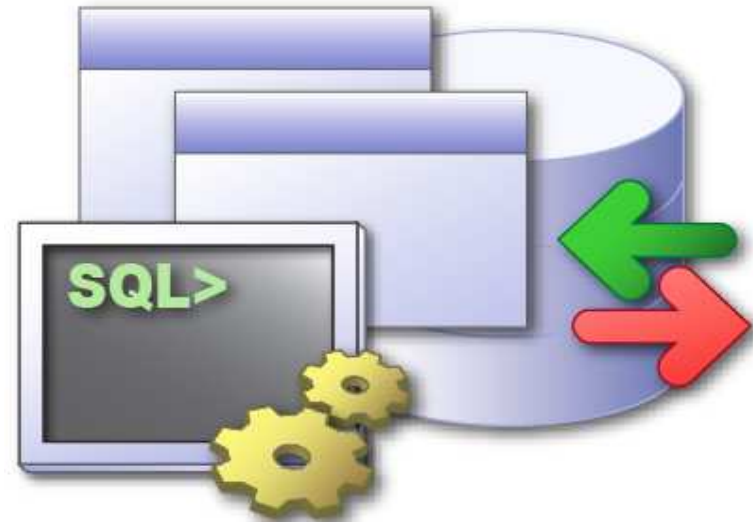


oracle application express



Oracle Application Express

- Browser Based
- Declarative
- Robust Framework
- Multi-Tenant Hosting
- MS Access Replacement
- Packaged Applications
- Feature of the Oracle database
- Community Focused

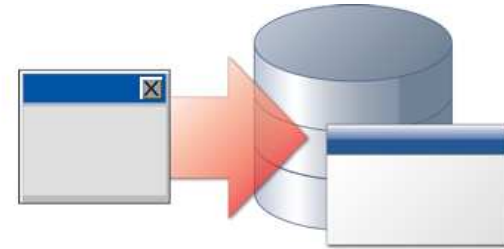


Use Cases



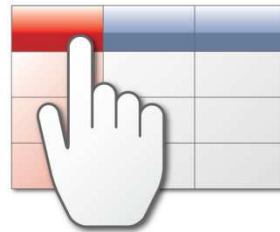
Data-driven Applications

Develop opportunistic and departmental productivity applications



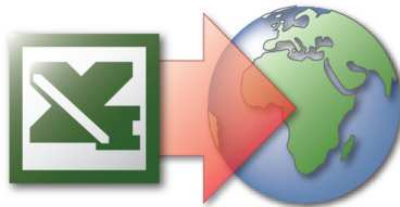
Oracle Forms Modernization

Leverage SQL & PL/SQL declarative programming skills to move Forms applications to HTML / Web 2.0



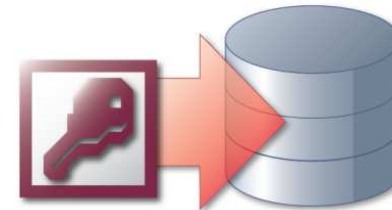
Online Reporting

Build SQL-based reporting applications on existing database schemas



Spreadsheet Web-ification

Convert spreadsheets to Web applications where they can be concurrently viewed and edited



Access Replacement

Consolidate outgrown Access applications to the Oracle database with an APEX Web front end

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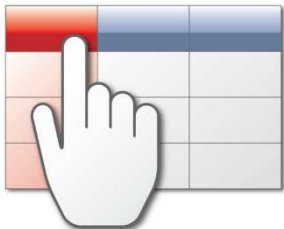
APEX Typical Use Examples

Data Driven Applications



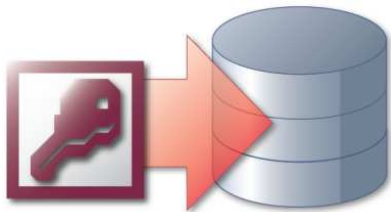
- Commercial telecommunications management - *Paetec Software Corp*
- Physical store sales tracking - *Deutsche Telecom*
- Standard corporate development tool – *WAMU*
- Database management and monitoring – *Iron Mountain*

Online Reporting



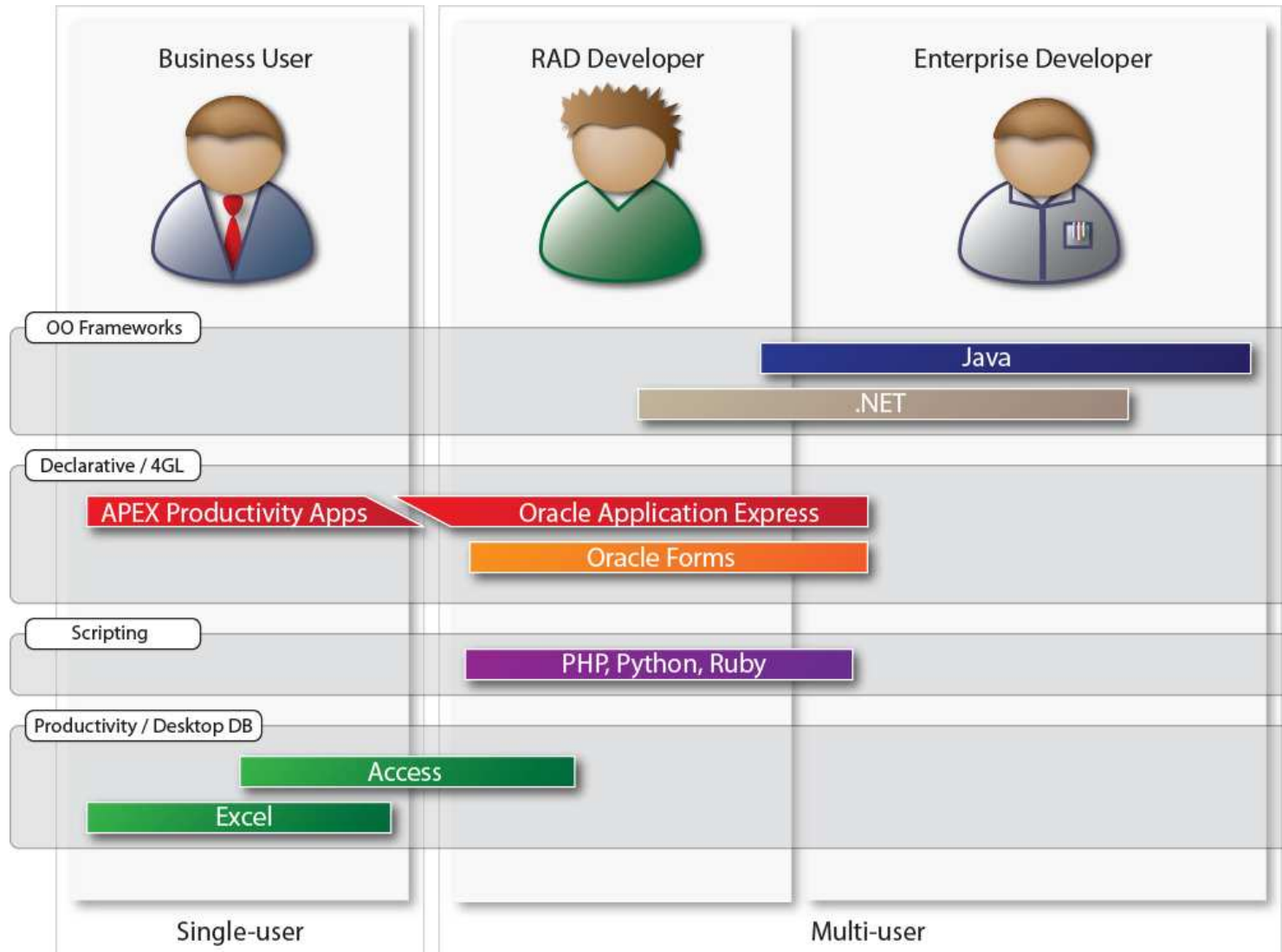
- Tournament Purse Management and Payment System – *PGA Golf*
- Microsoft Access and Microsoft Excel consolidation – *Lansing Community College*

Access Replacement



- Training & safety registration applications - *CERN*
- Computer assets tracking – *University of San Diego*
- AskTom Discussion Forum – *Tom Kyte, Oracle*

APEX – Target Development Community



Functionality

The screenshot displays the Oracle Application Express web interface. At the top, the 'ORACLE' logo is followed by 'Application Express'. Navigation tabs include 'Home', 'Application Builder', 'SQL Workshop', and 'Utilities'. A breadcrumb trail shows 'Home > Application Builder > Application 463'. The main area is titled 'Application: 463 - Sample Application' and contains four large icons: 'Run Application' (traffic light), 'Supporting Objects' (3D bar chart), 'Shared Components' (compass), and 'Export / Import' (arrows). Below these is a search bar with 'Page' and 'Go' buttons, and a 'Create Page >' button. A grid of ten smaller icons represents different pages: '1 - Sample Application' (house), '2 - Customers' (hand cursor), '3 - Add/Modify Customers' (gear), '4 - Orders' (calendar), '5 - Cluster Bar' (bar chart), '6 - Add/Modify Products' (document), '7 - Products' (hand cursor), '8 - Manage Users' (document), '9 - Enter New Order' (compass), and '10 - Calendar' (calendar). Yellow callout boxes point to specific features: 'Build Applications' points to the 'Application Builder' tab; 'Browse and create database objects' points to the 'SQL Workshop' tab; 'Load Data' points to the 'Utilities' tab; 'Deploy Applications' points to the 'Export / Import' icon; 'Flash Charting' points to the '5 - Cluster Bar' icon; 'Reporting & Publishing' points to the '10 - Calendar' icon; 'Data Entry Forms' points to the '6 - Add/Modify Products' icon; 'Interactive Reports' points to the '7 - Products' icon; 'Tabular Forms' points to the '8 - Manage Users' icon; 'Navigation' points to the '9 - Enter New Order' icon; and 'Calendar' points to the '10 - Calendar' icon.

Build Applications

Browse and create database objects

Load Data

ORACLE Application Express

Home Application Builder SQL Workshop Utilities

Home > Application Builder > Application 463

Page 1

Application: 463 - Sample Application

Run Application Supporting Objects Shared Components Export / Import

Page View Icons Display 15 Go Create Page >

1 - Sample Application 2 - Customers 3 - Add/Modify Customers 4 - Orders 5 - Cluster Bar

6 - Add/Modify Products 7 - Products 8 - Manage Users 9 - Enter New Order 10 - Calendar

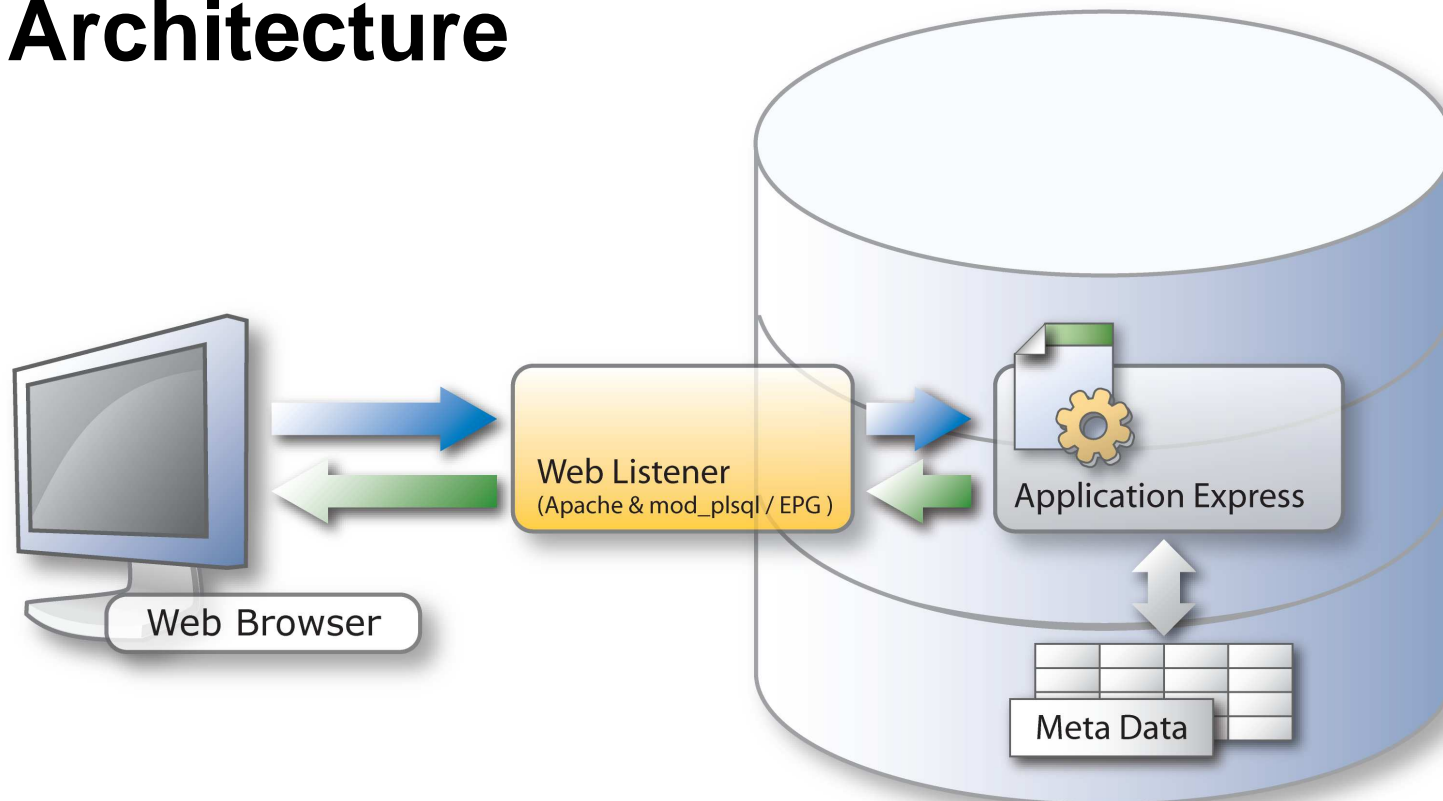
Deploy Applications

Flash Charting

Reporting & Publishing

Data Entry Forms Interactive Reports Tabular Forms Navigation Calendar

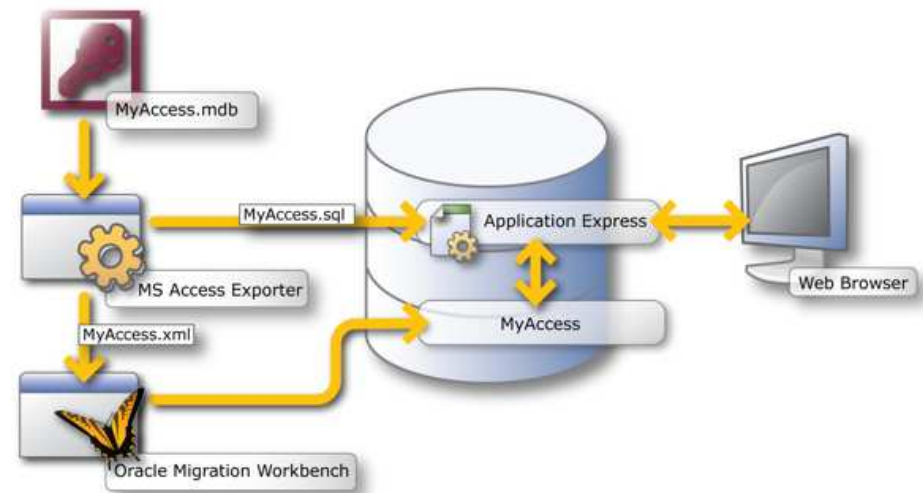
Architecture



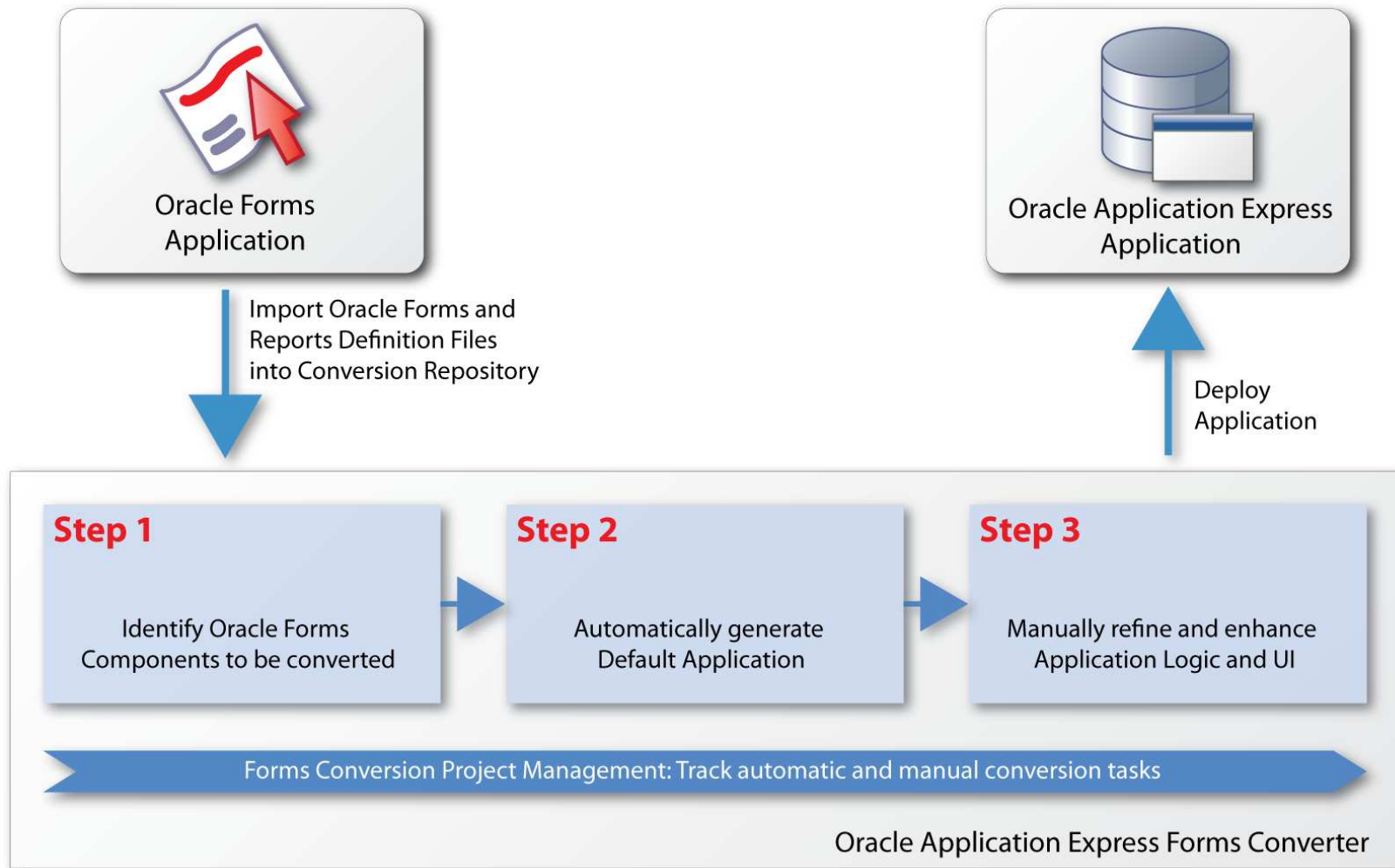
- Integrated within the database 9iR2, 10g, 11g and XE
- Supports all Oracle DB operating systems
- Uses Embedded PL/SQL Gateway or Apache with mod_plsql
- Metadata driven

Access Migration

- Export MS Access metadata
- Migrate the Microsoft Access database to Oracle
- Create an Oracle Application Express Workspace
- Create a migration project
- Analyze the Microsoft Access application
- Generate the Oracle Application Express Application
- Customize your Application Express application



Oracle APEX Forms Conversion Overview





Core Features

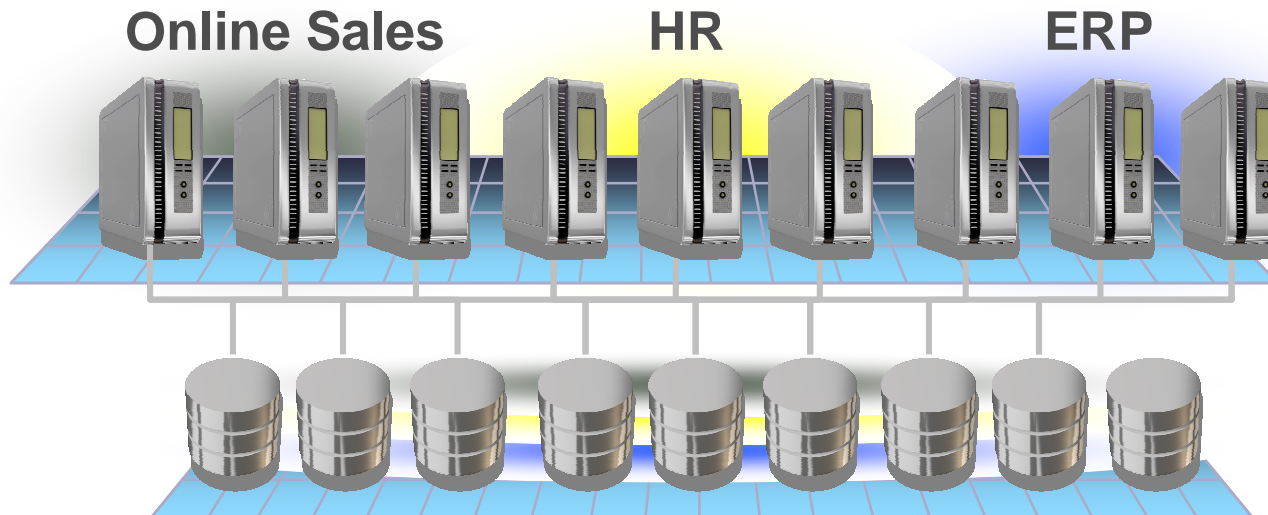


oracle asm



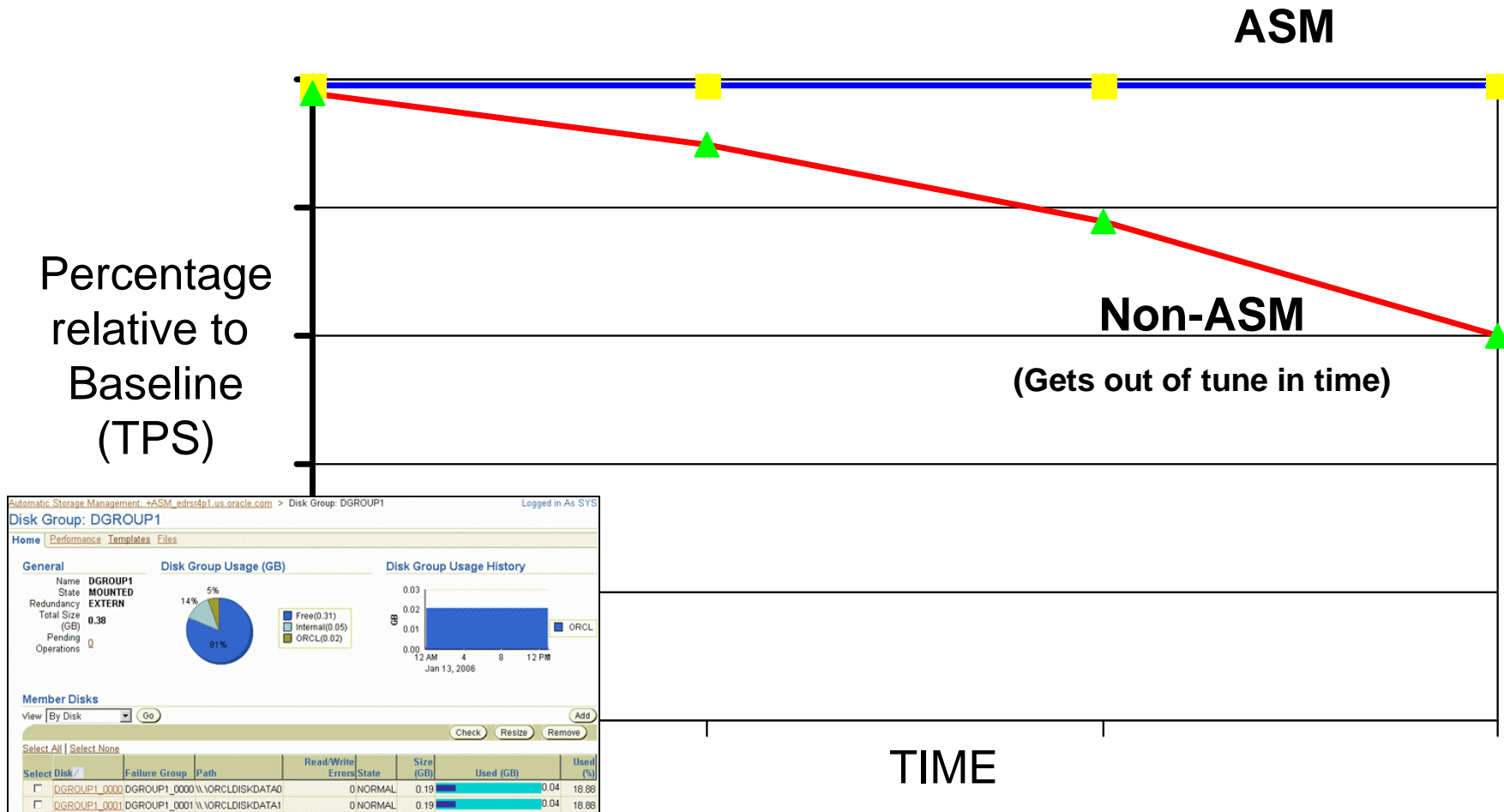
Automatic Storage Management

Lowest the cost of data management



- Virtualize and share storage resources
- Advanced data striping for maximum I/O performance
- Online addition and migration of storage

Optimal ASM Performance



Graphical representation only (not a benchmark)



oracle maa



Oracle Maximum Availability Architecture

- Blueprints and Best Practices
- Spans Oracle Database, Oracle Applications, Oracle Fusion Middleware, Oracle Grid Control

HA Best Practices for Oracle Database

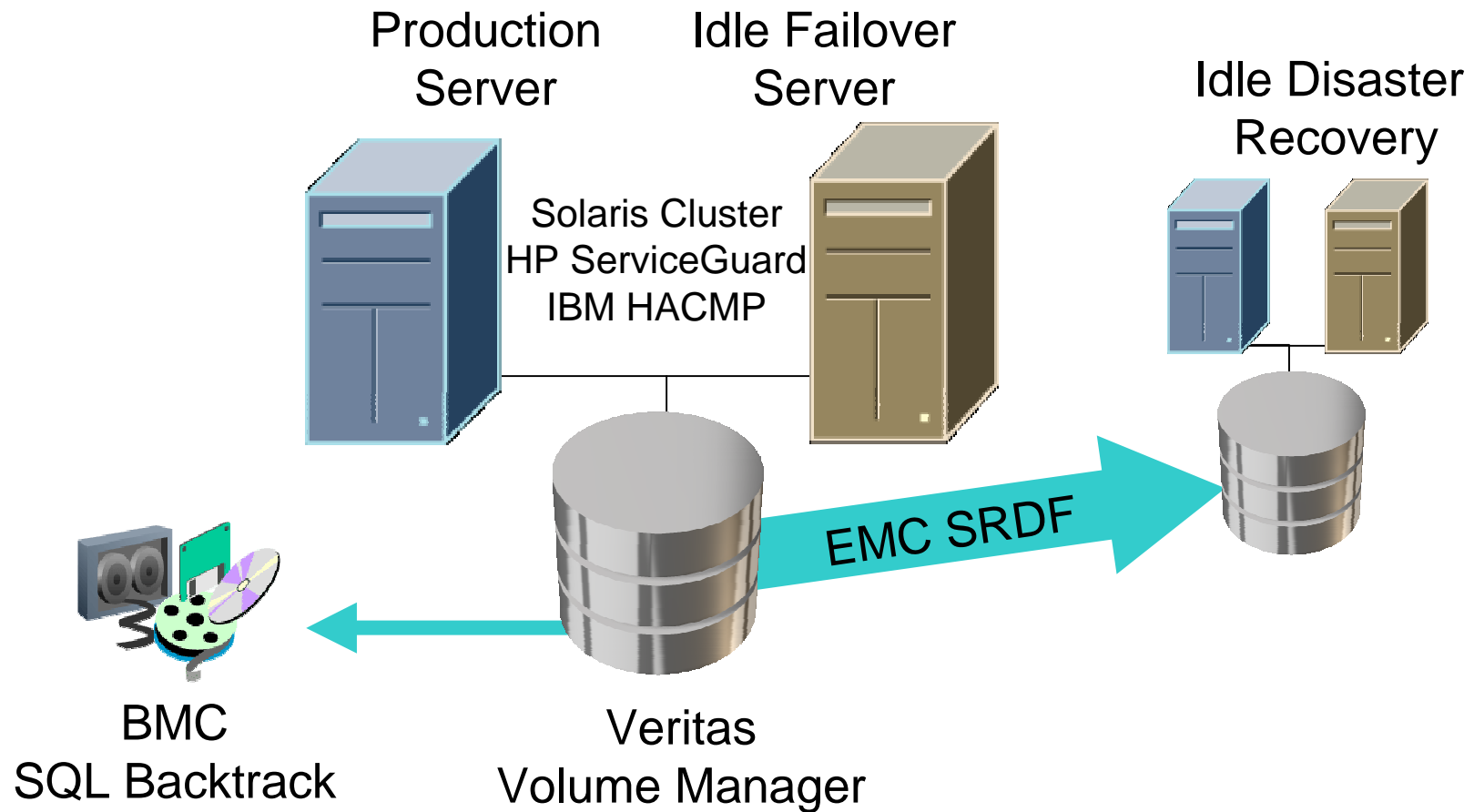
Oracle Database 11g

- ❑ [Oracle Database High Availability Overview 11g Release 1 - Documentation](#)
- ❑ [Best Practices for Migrating to Oracle Exadata Storage Server](#)
- ❑ [Validation Report on Active Data Guard 11g, RMAN Network Duplicate, Snapshot Standby, Apply Performance and Fast-Start Failover by Hitachi Ltd. / Oracle Japan GRID Center](#)
- ❑ [Validation Report on Data Guard Redo Transport Compression and Proper Network Configuration by Hitachi Ltd./Oracle Japan GRID Center](#)
- ❑ [Reducing Siebel Downtime with a Local Standby Database **New!**](#)
- ❑ [Active Data Guard 11g Best Practices \(includes best practices for Redo Apply\) **Updated!**](#)
- ❑ [Configuring Oracle Business Intelligence Enterprise Edition Server with Active Data Guard **New!**](#)
- ❑ [Data Guard 11g Installation and Configuration Best Practices on Oracle RAC](#)
- ❑ [SQL Apply Best Practices - Data Guard 11g](#)
- ❑ [Rolling Database Upgrades using Data Guard SQL Apply](#)
- ❑ [Rolling Database Upgrades for Physical Standby Databases using Transient Logical Standby 11g](#)
- ❑ [Extended Datatype Support: SQL Apply and Streams](#)
- ❑ [Database Upgrade Using Transportable Tablespaces: Oracle Database 11g **New!**](#)
- ❑ [Platform Migration Using Transportable Tablespaces: Oracle Database 11g **New!**](#)
- ❑ [Platform Migration using Transportable Database 11g](#)
- ❑ [Oracle 11g Upgrade Companion - for upgrading from Oracle9i to Oracle11g](#)

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Traditional High Availability

Expensive, idle redundancy



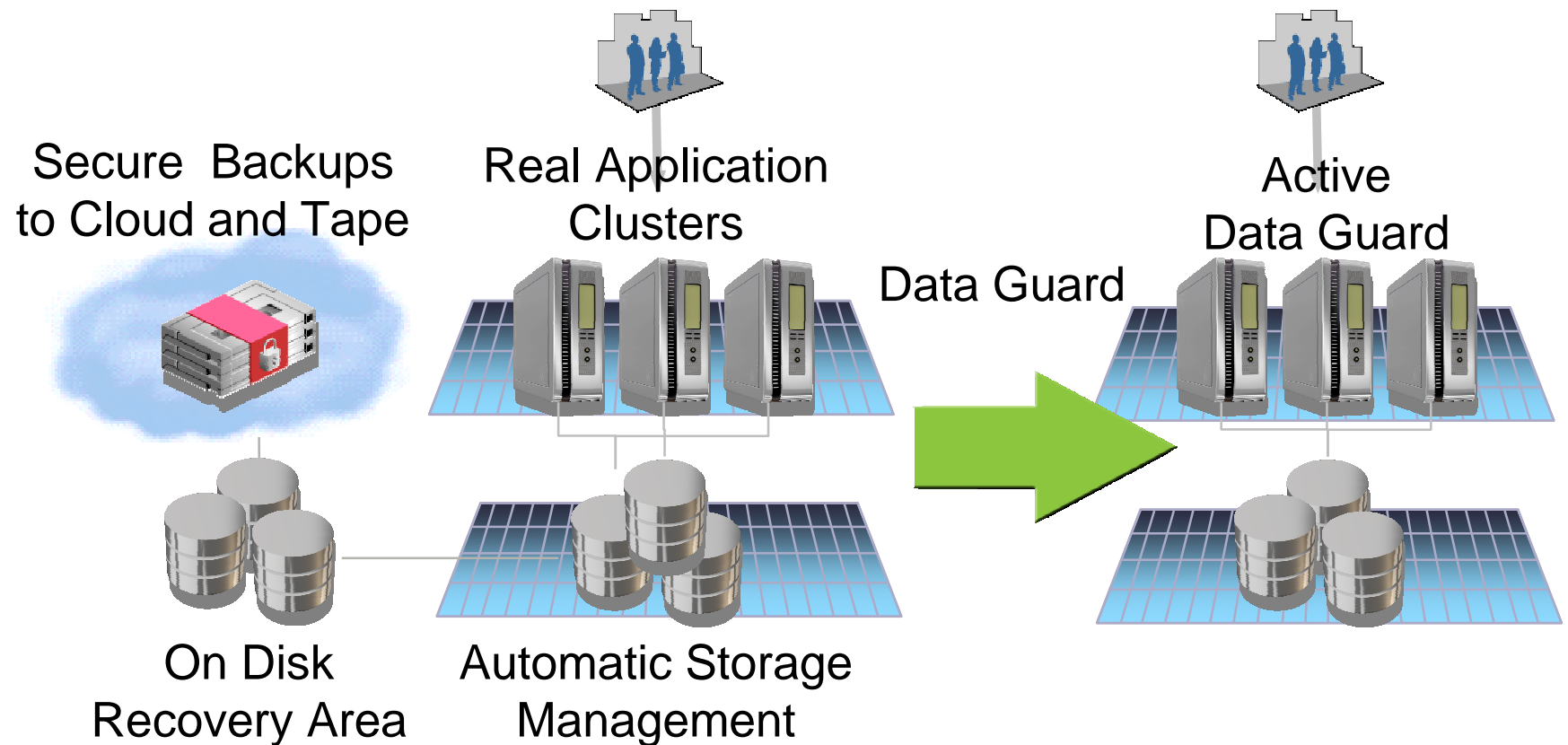


oracle maa



Oracle Maximum Availability Architecture

Low Cost, Fully Utilized Redundancy





Change without Risk

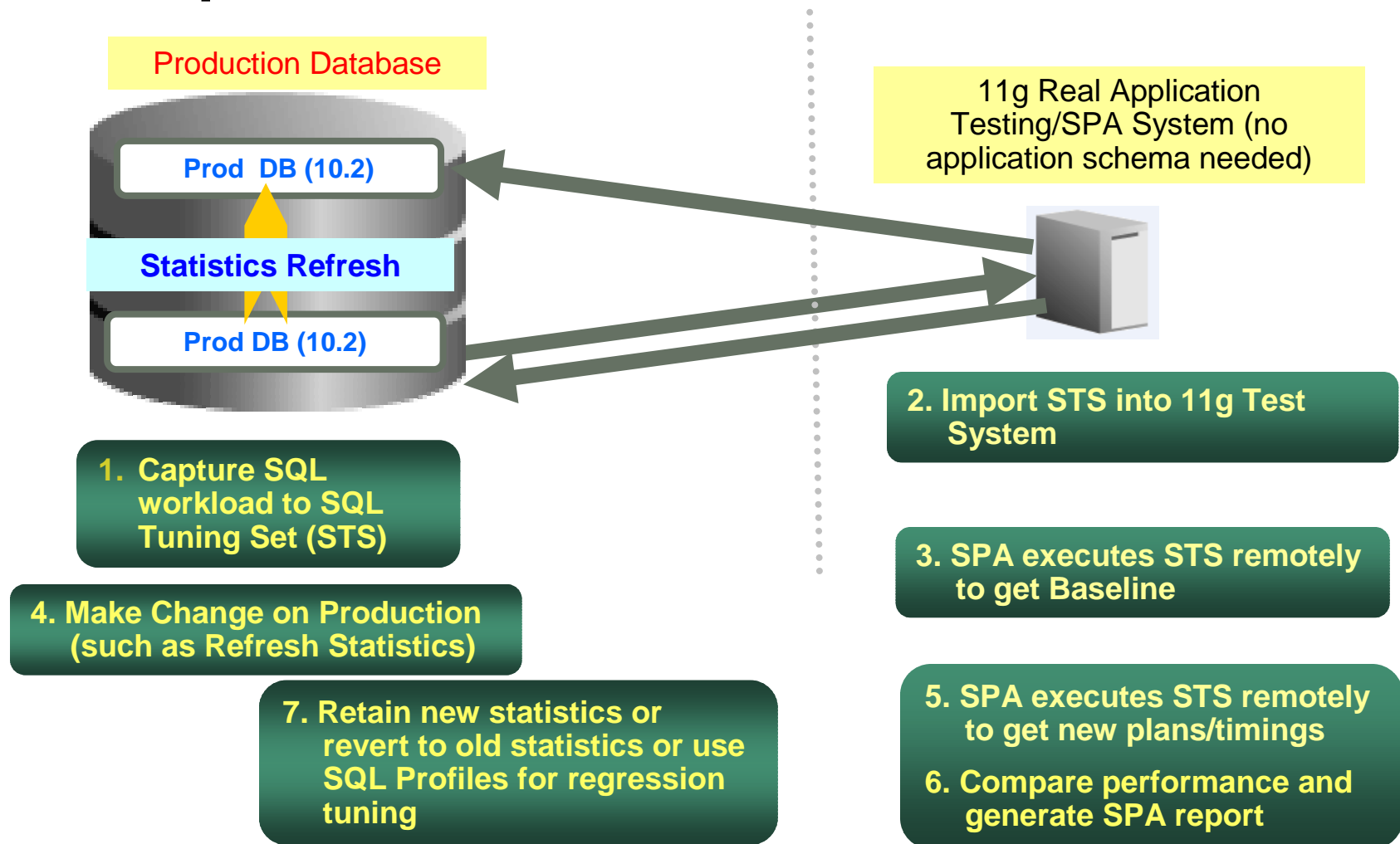
- Businesses want systems that are performant and meet SLA's
- **SQL performance regressions** are #1 cause of poor system performance
- Solution for proactively detecting all SQL regressions resulting from changes not available
- DBA's use ineffective and time-consuming manual scripts to identify problems



Real Application Testing Option identifies all changes in SQL performance before impacting users

Works with 10.2:

Example: Statistics Refresh



Database Instance: prod.tdsrat01-d1.oracleads.com > [Advisor Central](#) > [SQL Performance Analyzer](#) > [SQL Performance Analyzer Task: SYSTEM.SPA_SYSTEM](#)

SQL Performance Analyzer Task Result: SYSTEM.SPA_TRIAL_RUN

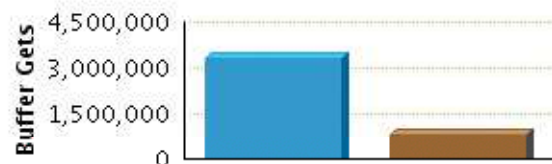
Task Name **SPA_TRIAL_RUN**
Task Owner **SYSTEM**
Task Description

SQL Tuning Set Name [HR_WORKLOAD](#)
STS Owner **APPS**
Total SQL Statements **50**
SQL Statements With Errors [0](#)

Replay Trial 1 **TRIAL_REPLAY_BEFORE_CHANGES**
Replay Trial 2 **TRIAL_REPLAY_AFTER_CHANGES**
Comparison Metric **Buffer Gets**

Global Statistics

Projected Workload Buffer Gets



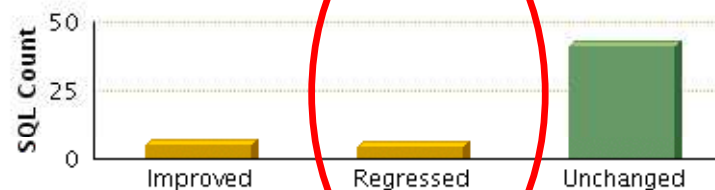
■ TRIAL_REPLAY_BEFORE_CHANGES
■ TRIAL_REPLAY_AFTER_CHANGES

Improvement Impact [97%](#) ↑

Regression Impact [-22%](#) ↓

Overall Impact [75%](#) ↑

SQL Statement Count



Change in Buffer Gets

■ [Plan Changed](#) ■ [Plan Unchanged](#)

Recommendations

Run SQL Tuning Advisor to tune regressed SQL statements.

[Schedule SQL Tuning Advisor](#)



Top 10 SQL Statements Based on Impact on Workload

	SQL ID	Net Impact on Workload (%)	Buffer Gets		Net Impact on SQL (%)	% of Workload	
			TRIAL_REPLAY_BEFORE_CHANGES	TRIAL_REPLAY_AFTER_CHANGES		TRIAL_REPLAY_BEFORE_CHANGES	TRIAL_REPLAY_AFTER_CHANGES
↑	73s2sgy2svfrw	48.410	1,638,843.000	32,105.000	98.040	49.380	3
↑	gg2a407mv2hsy	48.410	1,638,843.000	32,105.000	98.040	49.380	3
↓	2wtgxbjz6u2by	-21.650	32,105.000	750,725.000	-2,238.340	0.970	90
↓	fbp9za0hqk2km	-0.080	6.000	2,708.000	-45,033.330	0.000	0
↓	1h3c2y092ds9d	-0.070	6.000	2,254.000	-37,466.670	0.000	0
↓	654xs8xs5wp42	-0.070	6.000	2,254.000	-37,466.670	0.000	0
↑	21ytccyhkpznw	0.040	2,513.000	1,281.000	49.030	0.080	0
↑	80vgft5yjldkd	0.020	1,945.000	1,276.000	34.400	0.060	0
↑	a36pf93r61y04	0.020	571.000	6.000	98.950	0.020	0
⇒	fgfxpcdb6nwq4	0.000	1,276.000	1,276.000	0.000	0.040	0

SQL Text

Single Execution Statistics

Execution Statistic Name	Net Impact on Workload (%)	Execution Statistic Collected		Net Impact on SQL (%)	% of Workload	
		BEFORE_CHANGE	AFTER_CHANGE		BEFORE_CHANGE	AFTER_CHANGE
↓ Elapsed Time	-4.350	1.892	4.945	-161.360	2.700	52.84
↓ Parse Time	-56.540	0.010	0.131	-1,210.000	4.670	39.58
↓ CPU Time	-4.600	1.891	4.940	-161.240	2.850	52.90
↓ Buffer Gets	-23.670	218,621.000	1,102,519.000	-404.310	5.850	70.96
↑ Optimizer Cost	15.400	10,477.000	760.000	92.750	16.610	1.41
↑ Disk Reads	15.600	3,166.000	1,358.000	57.110	27.320	21.41
↔ Direct Writes	0.000	0.000	0.000	0.000	0.000	0.00
↔ Rows Processed	0.000	135.000	135.000	0.000	0.000	0.00

Problem Findings

The performance of this SQL has regressed.

Symptom Findings

The structure of the SQL execution plan has changed.

Plan Comparison

BEFORE_CHANGE

Plan Hash Value 1511732424

[Expand All](#) | [Collapse All](#)

Operation	Line ID	Object	Rows	Cost	Predicate
SELECT STATEMENT	0		1	10,477	
HASH	1		1	10,477	
NESTED LOOPS	2				
NESTED LOOPS	3		1	10,476	
HASH JOIN	4		1	10,466	"T1"."PERIOD_ID"="T7"."VALUE_I...
TABLE ACCESS	5	LU_ELEMENTGROUP_REL	1	2	
INDEX	6	LU_ELEMENTGROUP_REL_IDX1	25	1	"T7"."ELEMENTGROUP_ID"=14659
HASH JOIN	7		487	10,463	"T1"."ITEM_ID"="T2"."ITEM_ID" ...
MERGE JOIN	8		14	715	
SORT	9		5,391	712	
HASH JOIN	10		5,391	639	"T2"."PG_FEATUREVALUE_01_ID"=...
INLIST ITERATOR	11				
TABLE ACCESS	12	LU_ELEMENTGROUP_REL	123	10	
INDEX	13	LU_ELEMENTGROUP_REL_IDX1	123	6	"T5"."ELEMENTGROUP_ID"=1959 OR...
HASH JOIN	14		5,352	629	"T2"."PG_FEATUREVALUE_15_ID"=...

AFTER_CHANGE

Plan Hash Value 3517011486

[Expand All](#) | [Collapse All](#)

Operation	Line ID	Object	Rows	Cost	Predicate
SELECT STATEMENT	0		1	760	



Advanced
Performance
Features



upgrading optimizer what to expect



Upgrading from Oracle Database 9i to 10g: What to expect from the Optimizer

*An Oracle White Paper
July 2008*

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Upgrading from Oracle Database 9i to 10g: What to expect from the Optimizer

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- Compare Execution plan Estimates to Actuals
 - **DBMS_XPLAN.DISPLAY_CURSOR with Runtime Statistics** – Gets “runtime plan” from v\$sql_plan and run statistics from v\$sql_plan_statistics

```
SQL> select /*+ gather_plan_statistics */ ....;
```

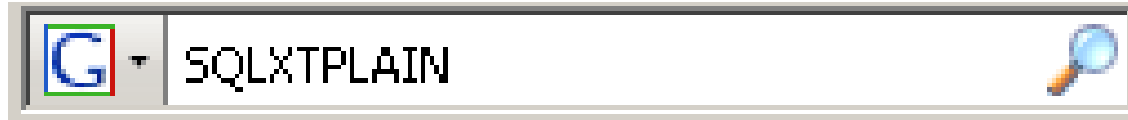
```
...
```

```
SQL> select * from table(dbms_xplan.display_cursor(null,null,'ALLSTATS'));
```

Id	Operation	Name	Starts	E-Rows	A-Rows	A-Time	Buffers

...							
* 26	TABLE ACCESS BY INDEX ROWID	TR_POLICY	419	1	3	00:00:01.77	92589
* 27	INDEX RANGE SCAN	TR_POLICY_FK10	419	13	662K	00:00:00.01	3297

- E-Rows = Estimated Rows: analogous to regular plan_table #'s
- A-Rows = Actual rows: like the row source statistics in a tkprof output



- Enhanced Explain Plan and related diagnostic info for one SQL statement (MetaLink note 215187.1)
- Outputs
 - Comprehensive report with related diagnostic info
 - Event 10053
 - Metadata script
 - CBO Stats export file (manual step)
- Optional execution of Trace Analyzer over Event 10046 (MetaLink note 224270.1)

Example SQLXTPLAIN output

SQLT XTRACT 11.2.8 Report: sqlt_s5325_v1117_coesrv20_main.html

- [Environment](#)
- [SQL Identification](#)
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- [Tables](#)
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- [Indexes](#)
- [Indexed Columns](#)

Indexes (DBA_INDEXES)

[-]

Index Type and indexed columns.

Table Owner.Table Name	Index Owner.Index Name	Oper ID	Index Type	Uniqueness	Num Cols	Idx Col Ids	Indexed Column Names	CBO Stats	Metadata
QTUNE.CUSTOMER	QTUNE.CUSTOMER_N1		NORMAL	NONUNIQUE	1	2	CUSTOMER_NAME	Stats	Metadata
QTUNE.CUSTOMER	QTUNE.CUSTOMER_N2		NORMAL	NONUNIQUE	2	3	CUSTOMER_TYPE CREDIT_LIMIT	Stats	Metadata
QTUNE.CUSTOMER	QTUNE.CUSTOMER_PK	10, 23, 36, 43	NORMAL	UNIQUE	1	1	CUSTOMER_ID	Stats	Metadata
QTUNE.ORDER_LINE	QTUNE.ORDER_LINE_N1		NORMAL	NONUNIQUE	1	2	ORDER_ID	Stats	Metadata
QTUNE.ORDER_LINE	QTUNE.ORDER_LINE_N2		NORMAL	NONUNIQUE	1	4	PART ID	Stats	Metadata

Observations

[-]

Partial list of issues that may require some further attention.

Object Type	Object Name	Observation
PLAN	V\$SQL	There exist(s) 1 distinct SQL Plans(s) in memory
PLAN	AWR	There exist(s) 1 distinct SQL Plans(s) in AWR
INDEX	QTUNE.CUSTOMER_PK	Clustering Factor (330) not between Blocks (378) and Number of Rows (40000)
INDEX	QTUNE.PART_PK	Clustering Factor (441) not between Blocks (508) and Number of Rows (60000)



11g SQL Plan Management

- First **preventive** and **fully transparent** database mechanism to ensure plan stability
- SQL execution plans will be recorded
- A SQL Baseline will be created
 - Consists of accepted execution plans
 - Contains only plans for statements being parsed/executed more than once
- Only known and verified and accepted plans will be used
- Enterprise Manager or PLSQL: **DBMS_SPM**



SQL Plan Management

- White Paper:
 - http://www.oracle.com/technology/products/manageability/database/pdf/ow07/spm_white_paper_ow07.pdf

SQL Plan Management in Oracle
Database 11g

*An Oracle White Paper
June 2007*



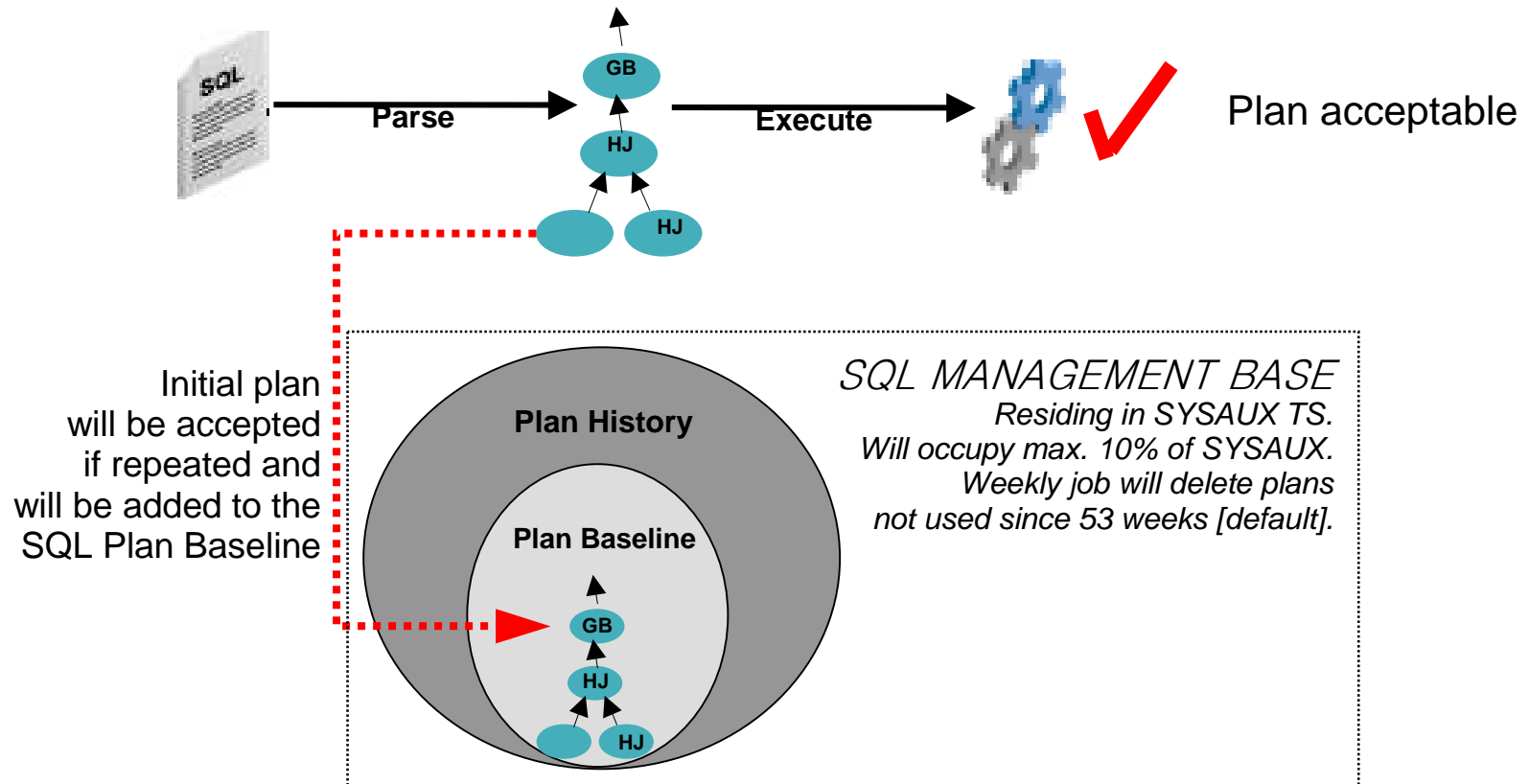
SQL Plan Management

- 3 phases for plan stability:
 - Capture
 - Create a SQL Baseline representing **trusted** execution plans
 - Baseline is stored in SQL Management Base in SYSAUX
 - Selection
 - Only accepted plans will be used
 - New execution plans will be recorded to the plan history
 - Evolution
 - Evaluate all unverified plans for a given statement in the plan history to become either accepted or rejected

SQL Plan Management

- Phase 1 - Capture

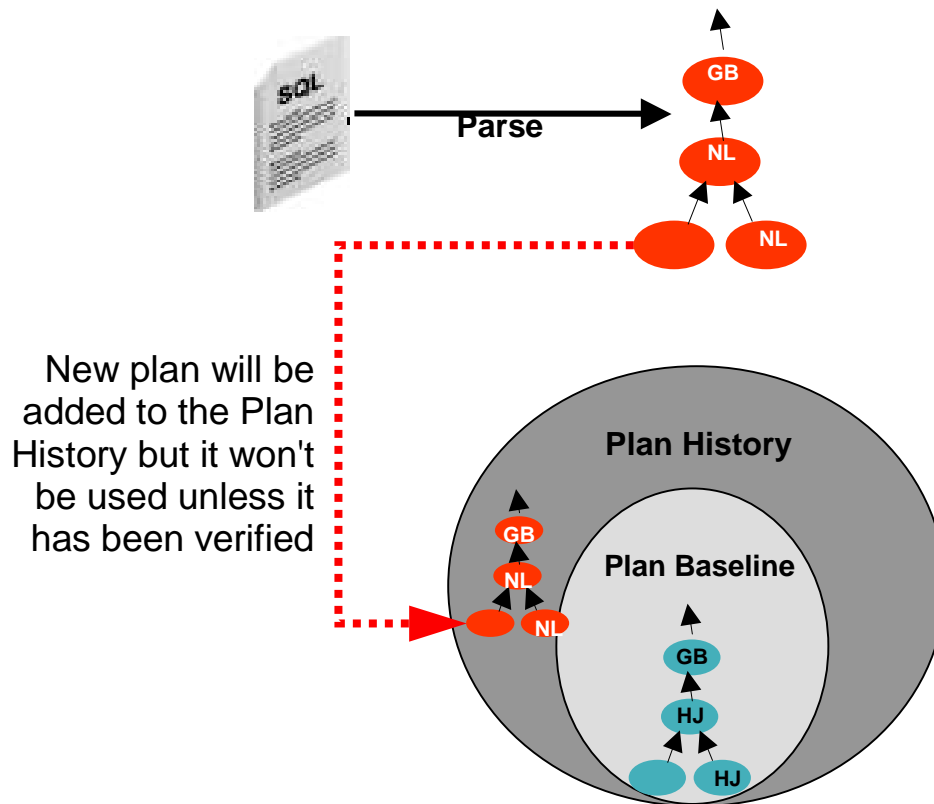
- `OPTIMIZER_CAPTURE_SQL_PLAN_BASELINE=TRUE` (Default: `FALSE`)



SQL Plan Management

- Phase 2 - Selection

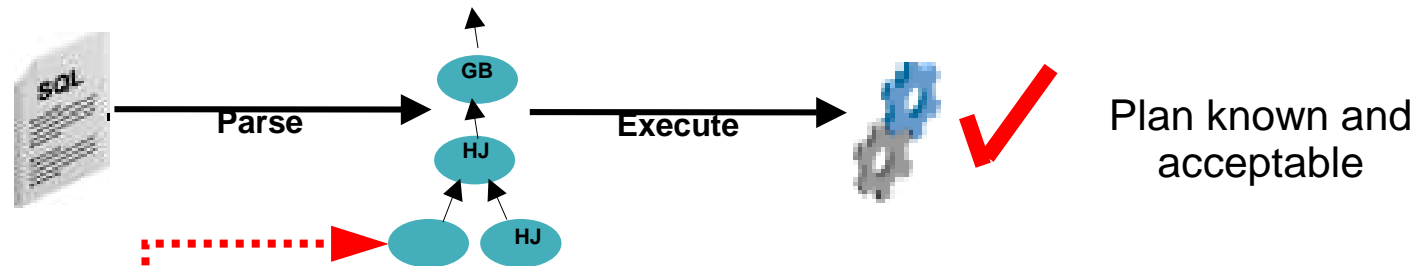
- `OPTIMIZER_USE_SQL_PLAN_BASELINE=TRUE` (Default: `TRUE`)
- Same statement parsed again but a different plan will be created



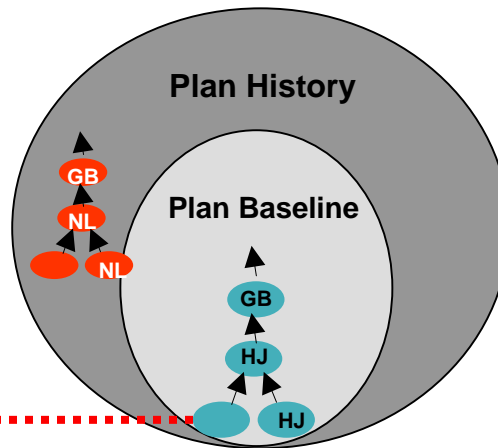
SQL Plan Management

- Phase 2 - Selection

- `OPTIMIZER_USE_SQL_PLAN_BASELINE=TRUE`

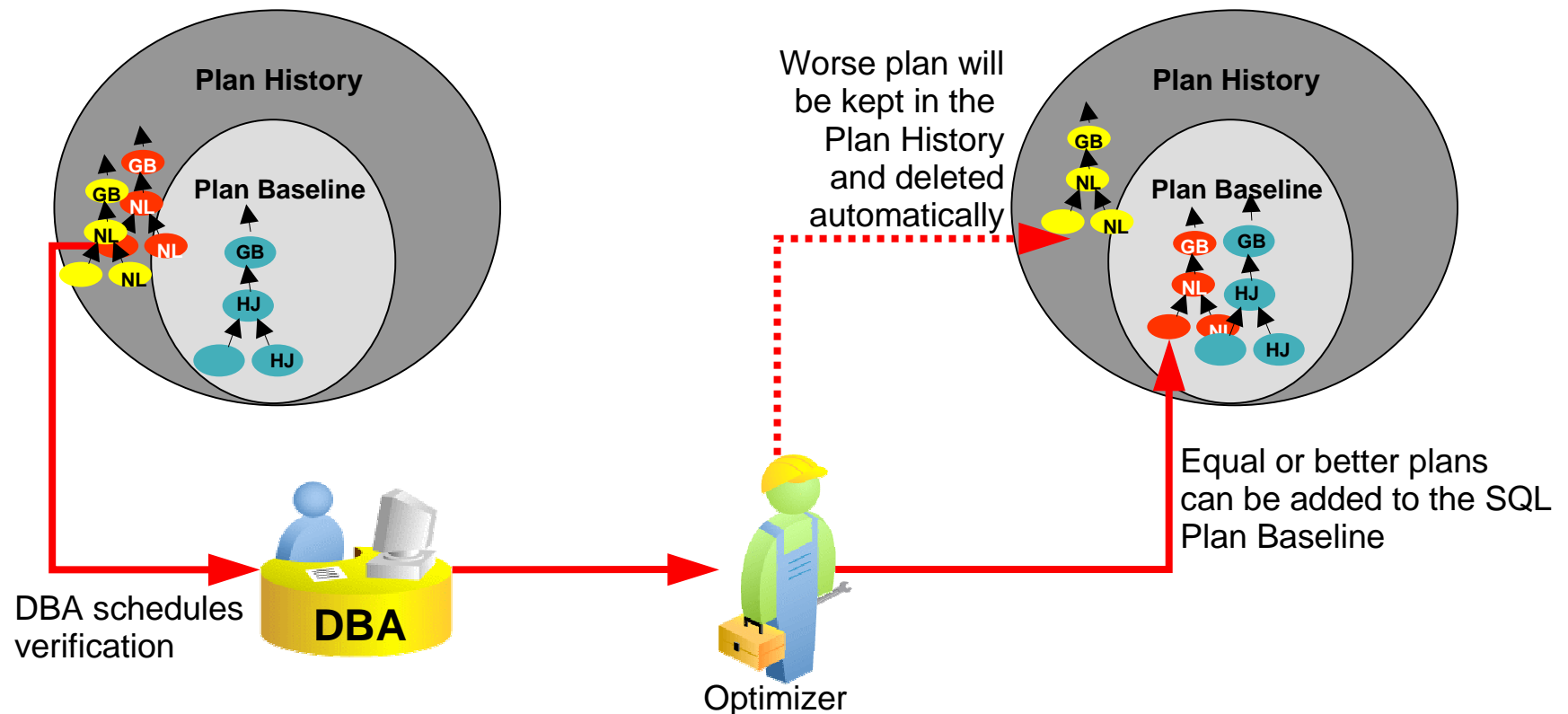


The optimizer will use only one of the VERIFIED plans stored in the SQL Baseline because only these will guarantee PLAN STABILITY



SQL Plan Management

- Phase 3 - Evolution





oracle exadata



Oracle Exadata

Oracle Exadata is a family of high-performance, smart-storage software from Oracle and Industry-standard hardware from HP that can improve data warehouse query performance by a factor of 10 or more.

Traditional Storage



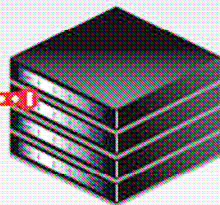
Key to fast query performance for data warehouses is sufficient processing power, storage capacity, and network bandwidth. Data warehouses can scale on grids with Oracle Database 11g, Oracle Real Application Clusters, and Oracle Partitioning.

Traditional Storage



100MB/sec

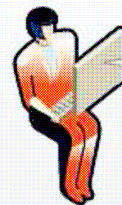
Oracle Database Server Grid



Storage Network Bandwidth

For large-scale data warehouses, traditional storage network bandwidth averaging 100MB/sec can limit query performance and concurrency, especially when data volumes and user demand continues to grow.

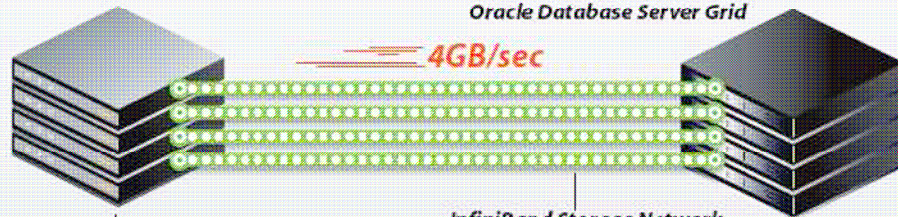
Oracle Exadata



Oracle Exadata employs a massively parallel architecture that dramatically increases data bandwidth between the database server and storage using InfiniBand connections. Query processing is handled closer to the data, and less data is moved through wider network connections.

Oracle Database Server Grid

4GB/sec



InfiniBand Storage Network

Each HP Oracle Exadata Storage Server has InfiniBand connections delivering up to 1GB/sec data bandwidth between storage servers and database servers. Incrementally adding HP Oracle Exadata Storage Servers linearly scales data warehouse storage capacity, processing power, and network bandwidth (for example: 4 HP Oracle Exadata Storage Servers equals 4GB/sec).

HP Oracle Exadata Storage Server

The HP Oracle Exadata Storage Server is a fast, reliable, high-capacity, industry-standard storage building block complete with its own processing capacity and smart software that can quickly process database queries, returning only relevant rows and columns to the database server.

Exadata – A New Architecture

Breaks Data Bandwidth Bottleneck

- Exadata Ships Less Data Through Pipes
 - Query processing is moved into storage to dramatically reduce data sent to servers while offloading server CPUs
- Exadata has More Pipes
 - Modular storage “cell” building blocks organized into Massively Parallel Grid
 - Bandwidth scales with capacity
- Exadata has Bigger Pipes
 - InfiniBand interconnect transfers data 5x faster than Fibre Channel

ORACLE®
EXADATA



**Exadata Moves a Lot
Less Data a Lot Faster**



ORACLE®







Walt Litzenberger
Director Enterprise Database Systems
The CME Group



“Oracle Exadata outperforms anything we’ve
tested to date by 10 to 15 times.
This product flat-out screams.”



Summary


 Oracle Technology Network 

 Oracle 11g 2 Day 


 Oracle By Example 


 oracle lifetime support 

 technology network oracle database upgrade 

 oracle grid control 



 oracle database diagnostics pack 

 oracle database tuning pack 


 oracle sql developer 

 oracle application express 

 oracle asm 

 oracle maa 

 oracle real application testing 

 upgrading optimizer what to expect 

 gather_plan_statistics 

 SQLXTPLAIN 

 oracle sql plan management 

 oracle exadata 



ORACLE®

Increasing your Return on Oracle Investment: Top Features You Might Be Overlooking

David Bayard
April 2009