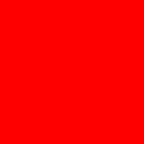


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The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.



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Effective Development with Oracle Databases

Christian Shay, David Gambino, David Peake, Kuassi Mensah

Agenda

- Part 1: Oracle Application Express
 - David Peake
- Part 2: Oracle and .NET
 - Christian Shay
- Part 3: Java, PHP, Python, and Ruby/Rails
 - Kuassi Mensah
- Part 4: Oracle SQL Developer
 - David Gambino



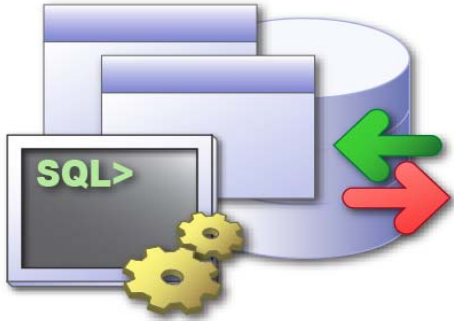
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Oracle Application Express (Version 3.1)

David Peake

Principal Product Manager – Database Tools

Oracle Application Express



- Unique mass market Web application development tool for the Oracle Database
- No client software – Only a Web browser
- Develop and deploy professional applications that are both fast and secure
- Declarative, database-centric web application development tool
- No Cost DB Feature
(requires 9iR2 or above)

Easy to develop • Easy to deploy • Easy to manage

Problem: Extending EBusiness Suite

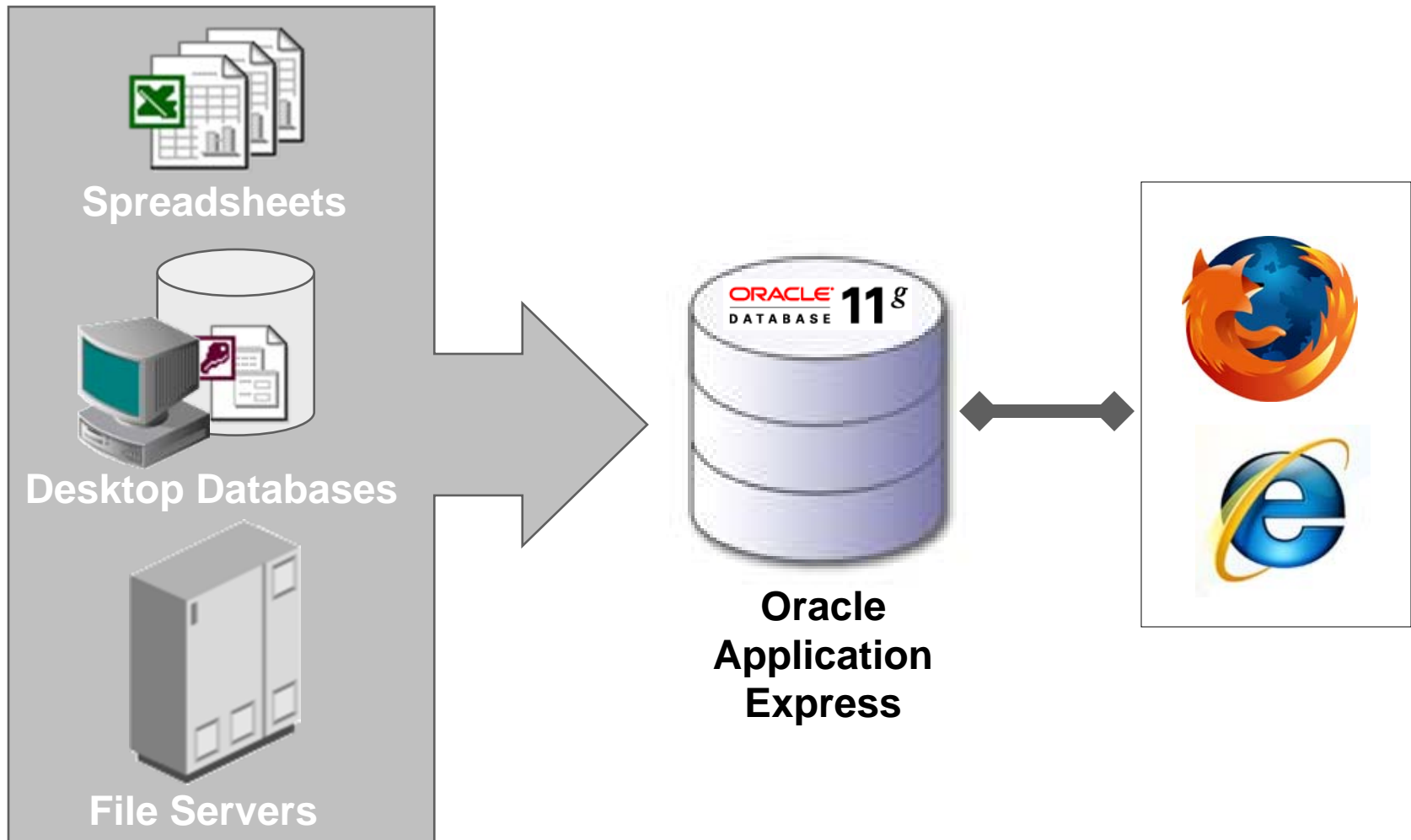
- ❑ Using Spreadsheets to load information
- ❑ Defining Alerts & Exceptions
- ❑ Auditing & Management reports and charts
- ❑ Uploading Personnel Data
- ❑ Creating and maintain Flexfield Hierarchies
- ❑ Managing Workflow responses
- ❑ Global view of customers across all operating units
- ❑ Manage day-to-day credit decisions on sales orders

Problem: Ability to Build Tactical Applications Quickly

- ✓ Centrally managed Enterprise Database
- ✓ Backed-up
- ✓ Secure
- ✓ Scalable
- ❑ Gain more data visibility
- ❑ Integrate data silos
- ❑ Additional reporting
- ❑ Increase productivity
- ❑ React to market forces
- ❑ Meet compliance requirements

Need to do more with fewer people and less budget

Consolidate with Oracle Application Express



Solution:

Oracle Application Express

EASY to Develop

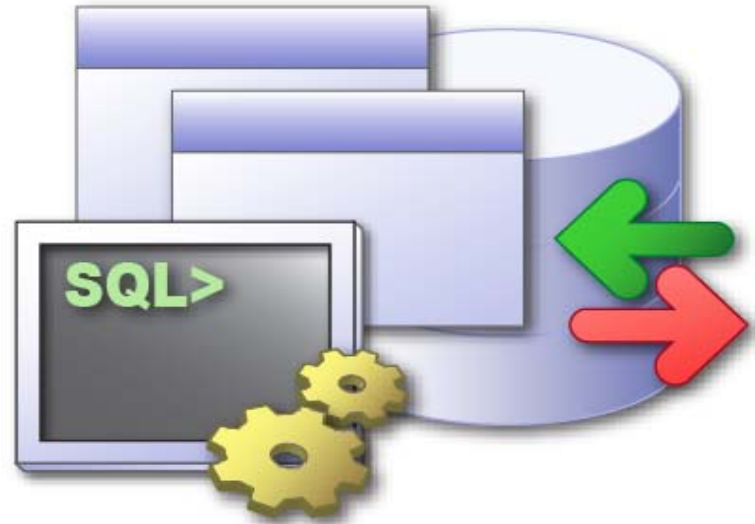
- Rapid Web application development
- Fully productive very quickly
- Declarative / Wizards

EASY to Deploy

- No client software
- Browser based
- Feature of the Oracle Database

EASY to Maintain

- Centrally managed metadata repository
- Multi-tenant hosting
- Robust framework



No Cost Option

Integrating with EBusiness Suite

- Use the APEX Wizards to create Forms, Reports and Charts directly on Applications Tables
- Use Applications security – Same Username / Password for APEX
- Use Applications Menus to link directly to APEX pages
- Have APEX call Applications APIs directly
- Create links in APEX Pages to Applications Forms
- Use Applications Responsibilities within APEX so that APEX functionality is only available to responsible users
- Applications 12 will not install mod_plsql by default but can be manually configured for use with APEX

Browser + Metadata Repository

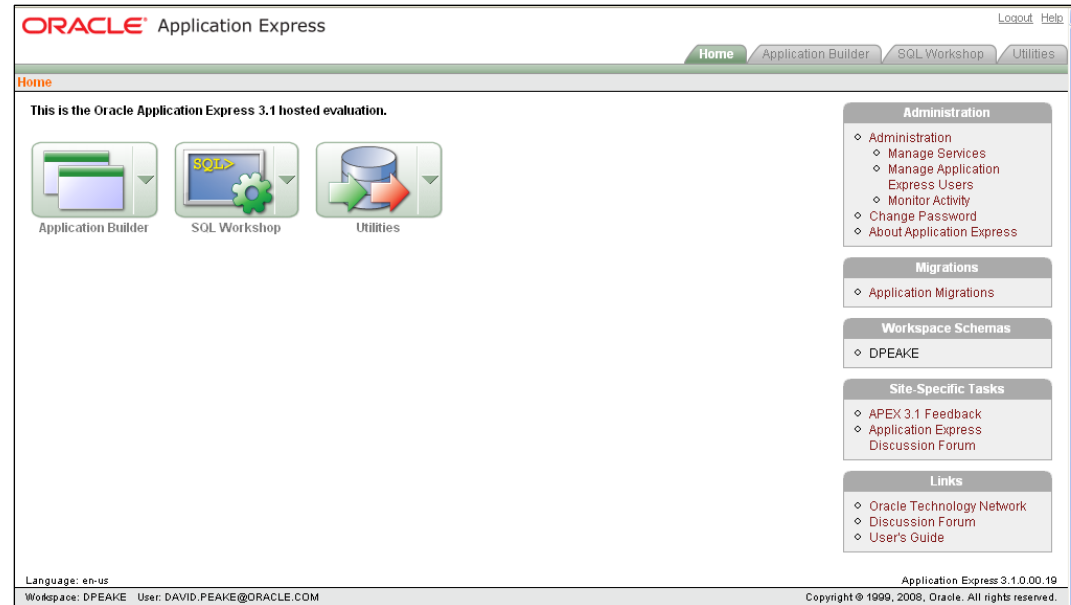
- No Client Software
- Browser Based Development, Deployment, and Runtime Environment
- Application Logic stored in metadata
- No separate executable(s)
- Comprehensive wizards enhance productivity
- You write some SQL and optionally PL/SQL snippets
- Declarative development yields fewer differences between developers

Functionality Overview

- Complete Environment

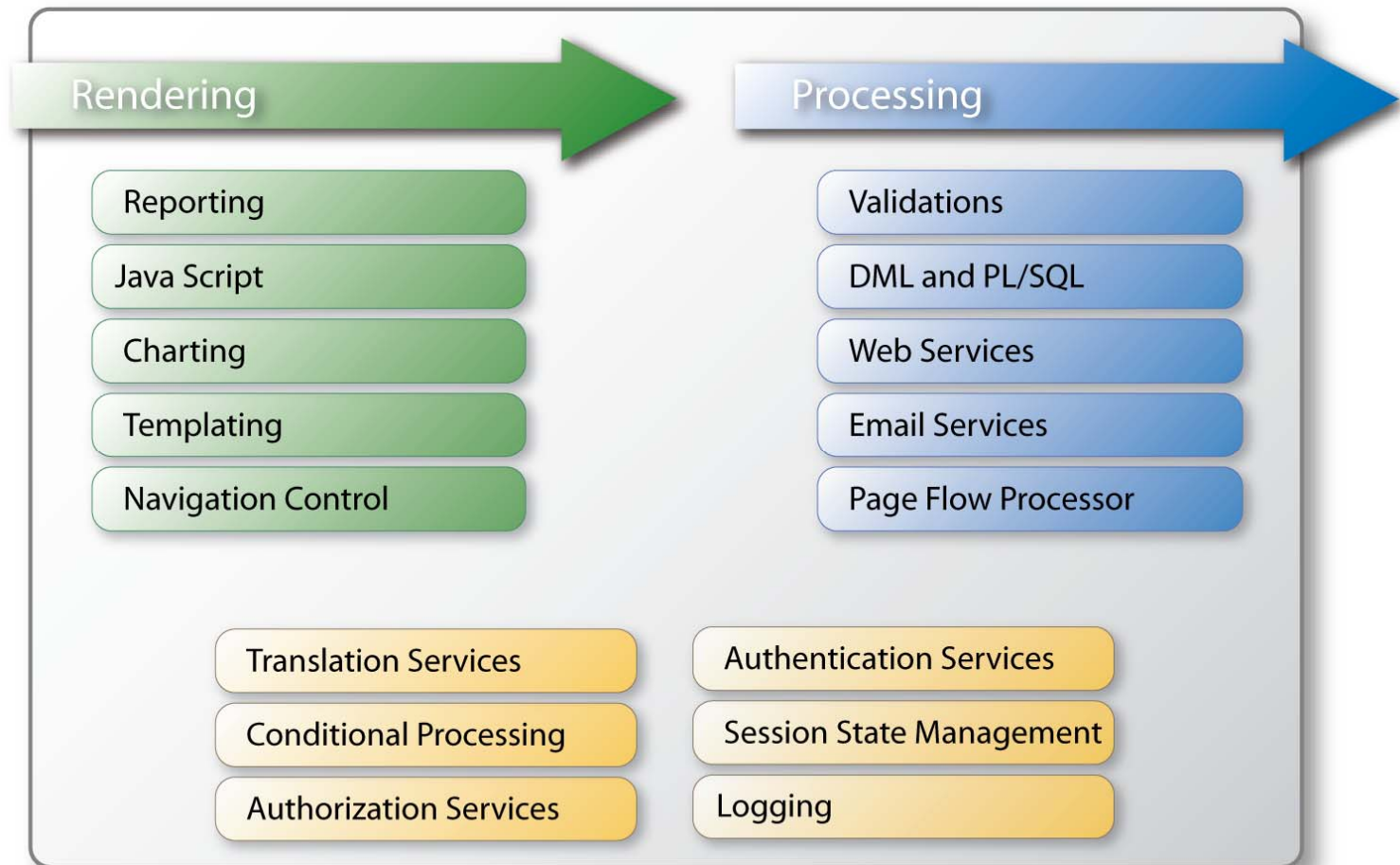
- Application Builder
- SQL Workshop
- Utilities

- Administration
- Migrations
- Site Specific Tasks



- Development Environment available in 9 languages

Out-of-the-box Development Features





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D E M O N S T R A T I O N

Rapid Application Development

Oracle Technology Network (OTN)

- Download latest Release
- Getting Started
- Documentation & Tutorials
- Hosted Environment
- Oracle By Example
- Community & Partners

The screenshot displays the Oracle Technology Network (OTN) website. At the top, the Oracle logo is on the left, and a user greeting "Welcome David" with links for "Sign Out" and "Account" is on the right. Below the logo is the "TECHNOLOGY NETWORK" header. A search bar with the text "secure search" and a dropdown menu for "Technology Network" is present. A navigation menu includes "Getting Started", "Downloads", "Documentation", "Forums", "Articles", "Sample Code", and "Tutorials".

The main content area features a "FREE DOWNLOAD" button for "Oracle Application Express". Below this, there are several news items:

- Dec 21: [New Whitepaper How to Improve Employee Productivity in Midsize Business: Highlighting Oracle Application Express.](#)
- Nov 21: [Register and participate in our Oracle APEX 3.1 Evaluation. Available now!](#)
- Oct 12: [Browse your applications and perform other activities using Oracle SQL Developer.](#)

On the left side of the main content, there are links for "What is Oracle APEX?", "Forum", "Hosted apex.oracle.com", "Documentation and Tutorials", and "Podcasts and Viewlets". On the right side, there are links for "3.0 New Features", "Packaged Applications", "Community and Partners", "Oracle by Example (OBE)", and "Oracle Magazine Articles".

At the bottom, there is a "News" section with several articles:

- GCN, [Army Corps ready to build on Oracle 11g](#) (and Oracle APEX too) (27-Aug-07)
- OTN, [A Practical Demonstration of SaaS using Oracle Application Express](#) (27-Aug-07)
- Tectonic, [Oracle aids African school administration](#) (01-Jun-07)

On the far right, there are sections for "Events" (listing dates and locations like "Jan 28-30, '08 - Ashburn, VA") and "Featured Application" (highlighting "Checklist Manager").

At the bottom left, there is a "SELECT COUNTRY" dropdown menu. At the bottom right, there is a "Related Technologies" section listing "Oracle Database 10g Express Edition".

Conclusion

Easy to Develop

Easy to Deploy

Easy to Manage

Next Steps

Information:

<http://otn.oracle.com/apex>

Hosted Development:

<http://apex.oracle.com>



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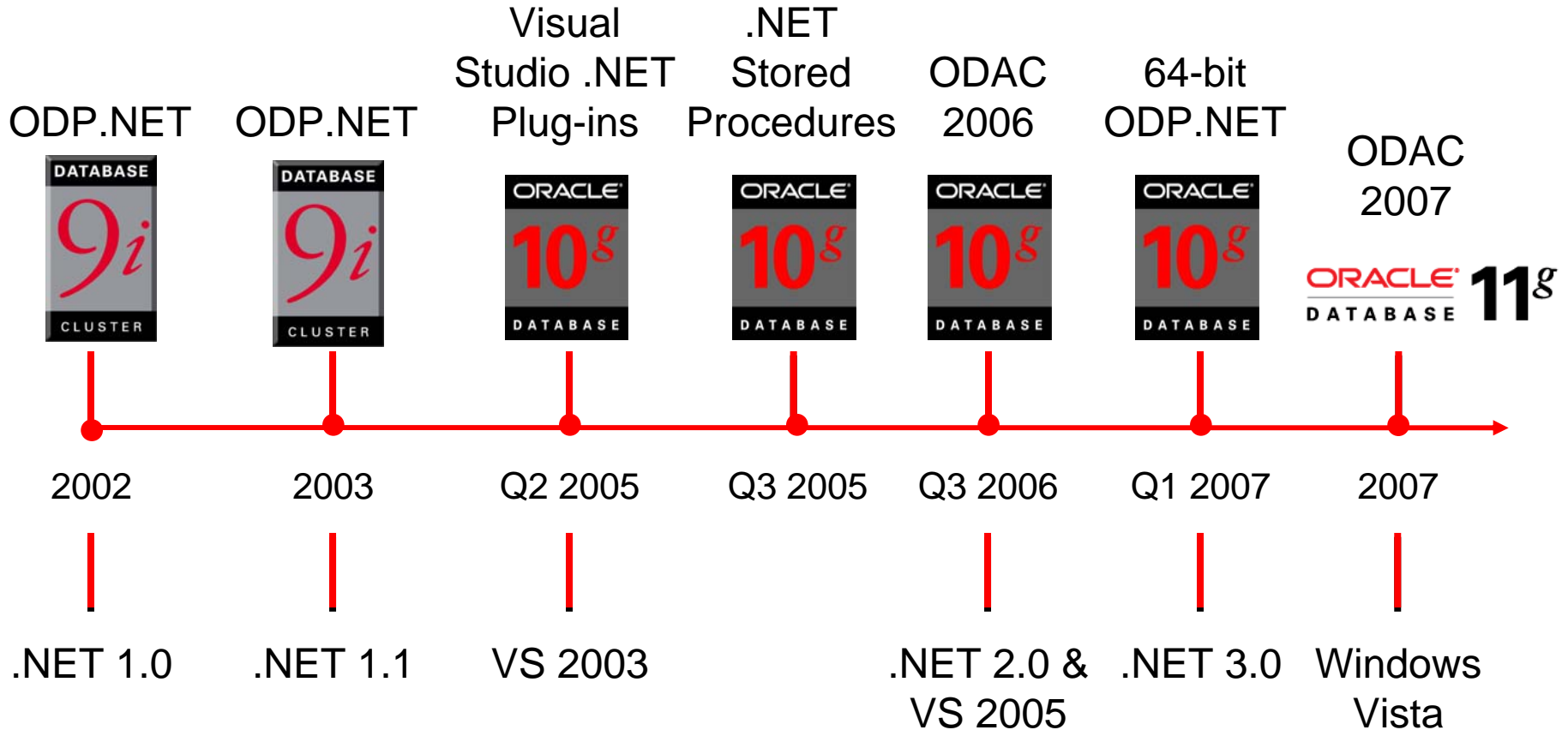


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Oracle and .NET

Christian Shay
Principal Product Manager

Oracle's Commitment to .NET



Relationship with Microsoft

Engineering

- Close collaboration with MS Engineering teams
- Access to pre-release drops of Microsoft products

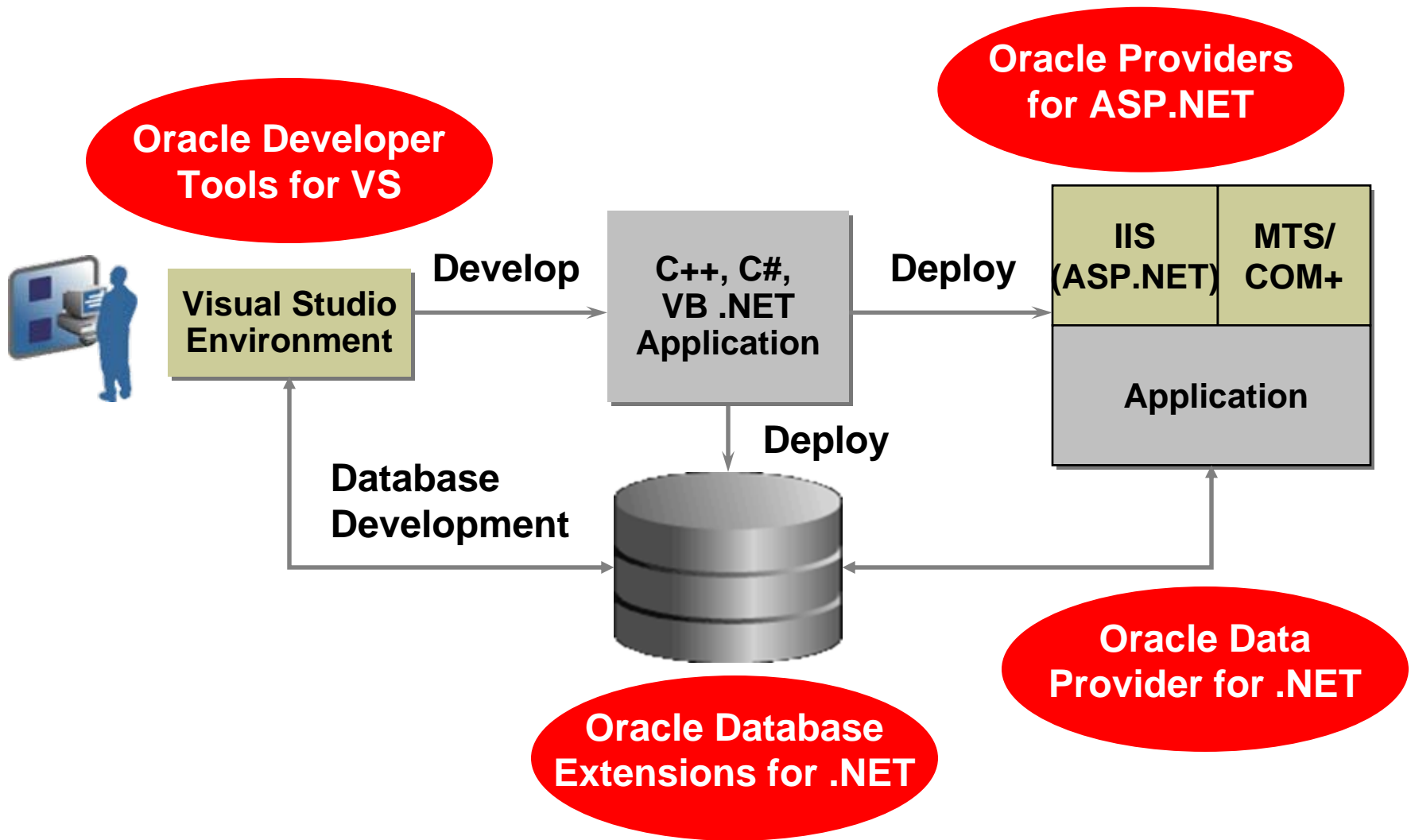
Marketing

- VSIP Premier Marketing partner
- Sponsorship at respective events
- Joint training, road shows, collateral etc.

Support

- Microsoft Premier Support Agreement
- Collaboration of support teams

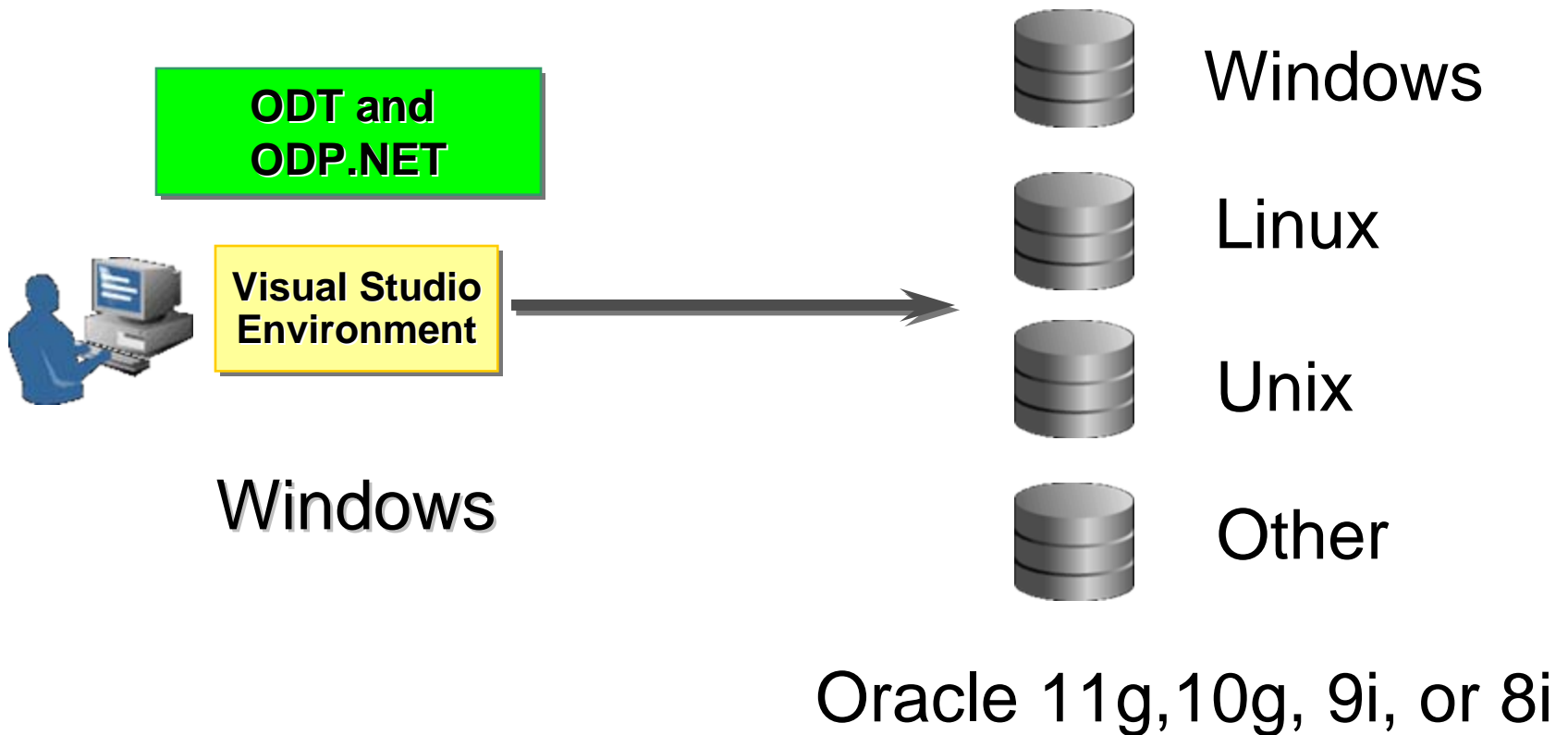
.NET Development Environment Support



Oracle Technology Network – .NET Developer Center

- <http://otn.oracle.com/dotnet>
- Free downloads of Visual Studio tools, ODP.NET and Oracle Database XE.
- Whitepapers
- Sample Code
- Demo Videos
- Help Forums
- “How to” step by step tutorials
- Latest Oracle on .NET News

Develop on Windows, Database on any Platform



Oracle Developer Tools for Visual Studio (ODT)



Ease of Development – Visual Studio

- Fully integrated with Visual Studio 2005 and 2008
 - Server Explorer
 - Data Sources Window
 - Data Source Configuration Wizard
 - Dataset Designer
 - TableAdapter Configuration Wizard
 - Query Builder/Query Designer
 - More
- Automatic code generation – Winform and ASP.NET
 - Data Sources Window
 - Integration with SQLDataSource control
 - Makes ASP.NET web application development very easy

Ease of Development – Visual Studio

- Oracle Wizards and Designers
 - Table/View Designer
 - Stored Procedure/Function/package Wizards
 - Grant/Revoke Privileges Wizard
 - Import Table Wizard – Migrate tables/data from databases, Excel, Access
 - Object, VARRAY, Nested Table Designers
 - UDT Custom Class Code Generation Wizard
- Full Oracle UDT Support
 - View UDTs in Server Explorer
 - Incorporate UDTs into tables and views
 - Retrieve UDT data
 - Use UDT types in other wizards (e.g. Table Designer)

Ease of Development – Visual Studio

- Oracle Database Project
 - Manage, Edit and Run SQL scripts
 - SQL*Plus is built in
 - Source control integration – SourceSafe and Team Foundation Server
- Integrated PL/SQL Editor and Debugger
- Oracle Query Window
 - Ad Hoc SQL
 - Explain Plan
 - Auto-commit toggle

Feature Overview

- Oracle Data Window
 - Customizable – control how many rows are fetched
- .NET Stored Procedure Deployment
- Integrated help system – SQL, PL/SQL keywords



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D E M O N S T R A T I O N

Visual Studio Integration

Oracle Data Provider for .NET (ODP.NET)

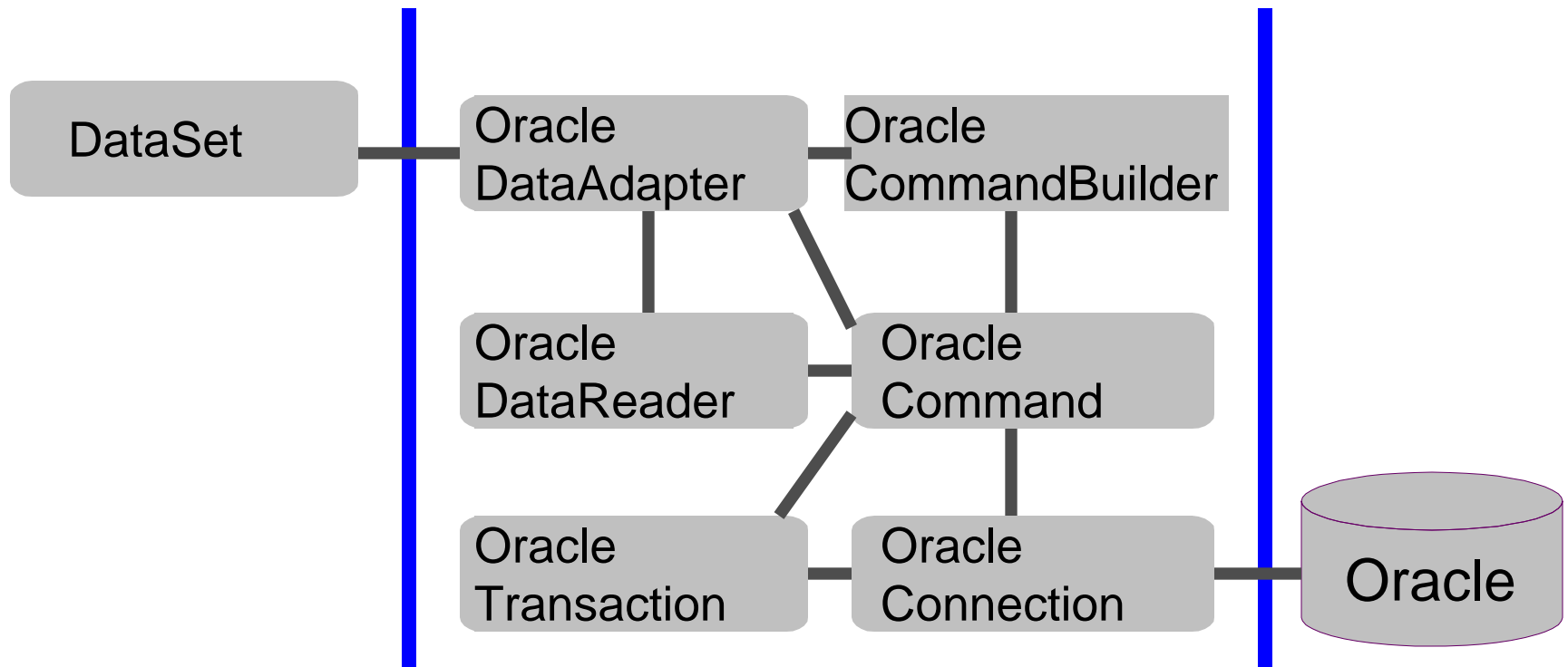


ODP.NET Object Model

Disconnected
Layer

Connected Layer
(ODP.NET)

Data
Layer



ODP.NET Features

- Full PL/SQL support
 - Packaged, non-packaged, anonymous, autonomous
 - Batch SQL available with anonymous PL/SQL
- Native Oracle data types
 - REF Cursors, LOBs, XMLType, TimeStamp, etc.
 - Safe type mapping to .NET data types
- Connection pooling
 - Min, Max, Timeout, Lifetime, Increment, Decrement

ODP.NET Features

- Transactions
 - Enterprise Services via Oracle Services for MTS
 - Local (Implicit and Explicit)
 - System.Transactions
 - Savepoints
- Parameters
 - PL/SQL Associative Array data type
 - LOBs
 - Ability to pre-fetch or defer LOB retrieval

ODP.NET Features

- XML
 - XMLType data type
 - Query and Save XML from the DB
 - Both relational and object-relational
 - Interoperate with MS XML APIs (e.g. XmlReader)
 - Supports XSLT, XPATH, and XML Schema
- RAC
 - Automatic load balancing
 - Automatic connection cleanup

ADO.NET Support

- Change Notification
- Factory and DbCommon Classes
- Systems.Transactions
- DataAdapter Batch Update
- Schema Discovery APIs
- Connection String Builder
- Server Enumeration

Instant Client XCopy Deployment

- Zip package of binaries
 - Install done manually or through a third-party installer easily
 - Great control over the installation process
- Install process
 - Step 1: Copy IC files to disk
 - Step 2: Run install.bat
 - Step 3: Add installation directories to Windows PATH
 - Step 4: Modify NLS_LANG to desired locale

Oracle Providers for ASP.NET



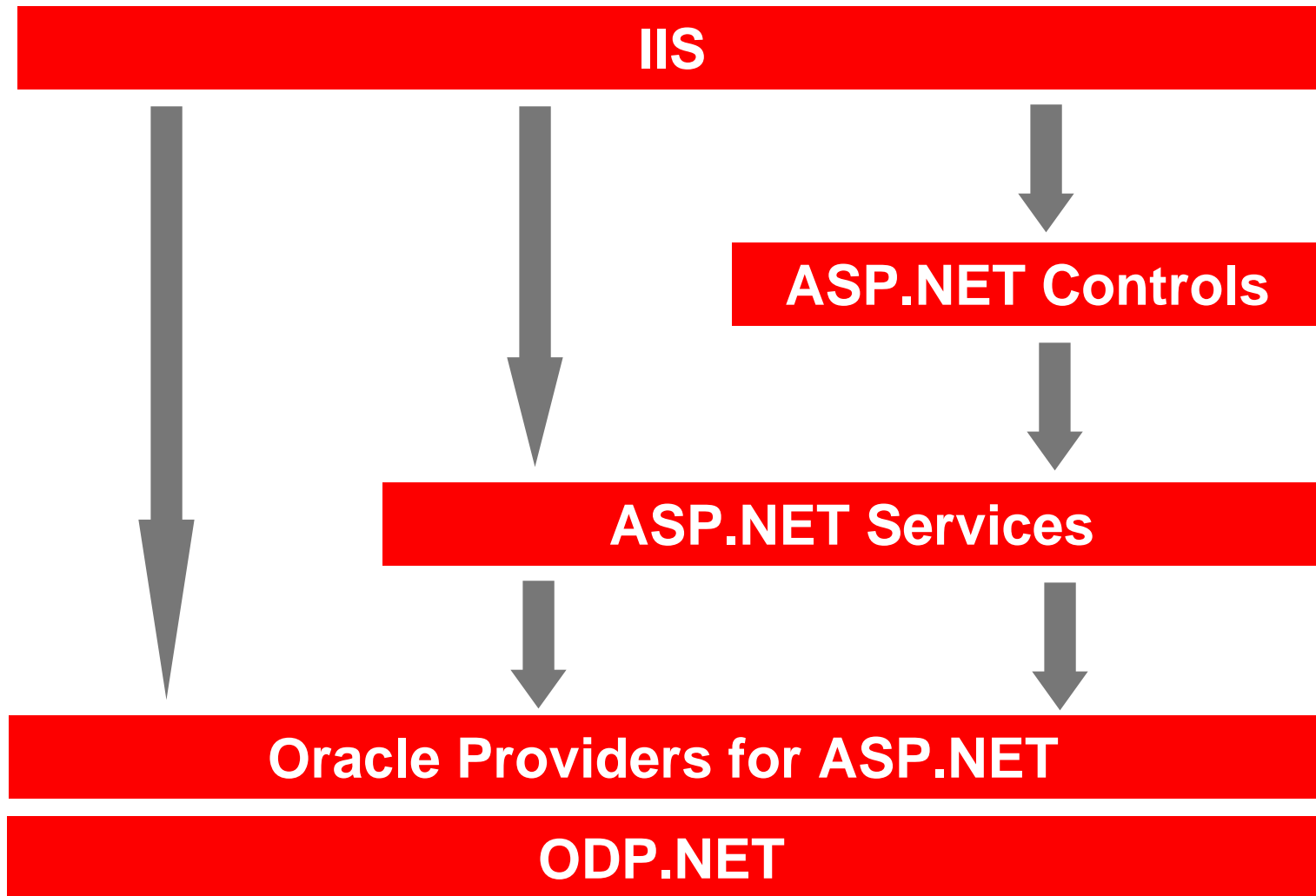
Ease of Development – ASP.NET

- Benefit: Improve web developer productivity via Oracle Providers for ASP.NET
- Pre-built services to store website state into Oracle
 - Services for commonly used website information
 - E.g. user info, user roles, shopping cart
- Easy to learn
 - Based on standard ASP.NET provider APIs and schema
 - Inherits from .NET Framework 2.0 base classes
 - Compatible with ASP.NET service classes
 - No unique extensions in Oracle ASP.NET providers

Oracle Providers for ASP.NET Features

- Seamless integration with ASP.NET services and controls
 - Reference to specific providers unnecessary
 - High level of abstraction: services and controls based programming
- Easy to switch from SQL Server to Oracle quickly
 - Configuration file determines which data source to use
- Easy to setup and manage
 - Can be managed by IIS or Website Admin Tool

Oracle Providers for ASP.NET



Available Providers

- Oracle Providers for ASP.NET components
 - Membership Provider
 - Role Provider
 - Profile Provider
 - Session State Provider
 - Site Map Provider
 - Web Parts Personalization Provider
 - Web Event Provider
 - Cache Dependency Provider
- Each provider is independent of one another
 - Administrators choose which provider(s) to use



ORACLE[®]
D E M O N S T R A T I O N

ASP.NET Providers

.NET Stored Procedures

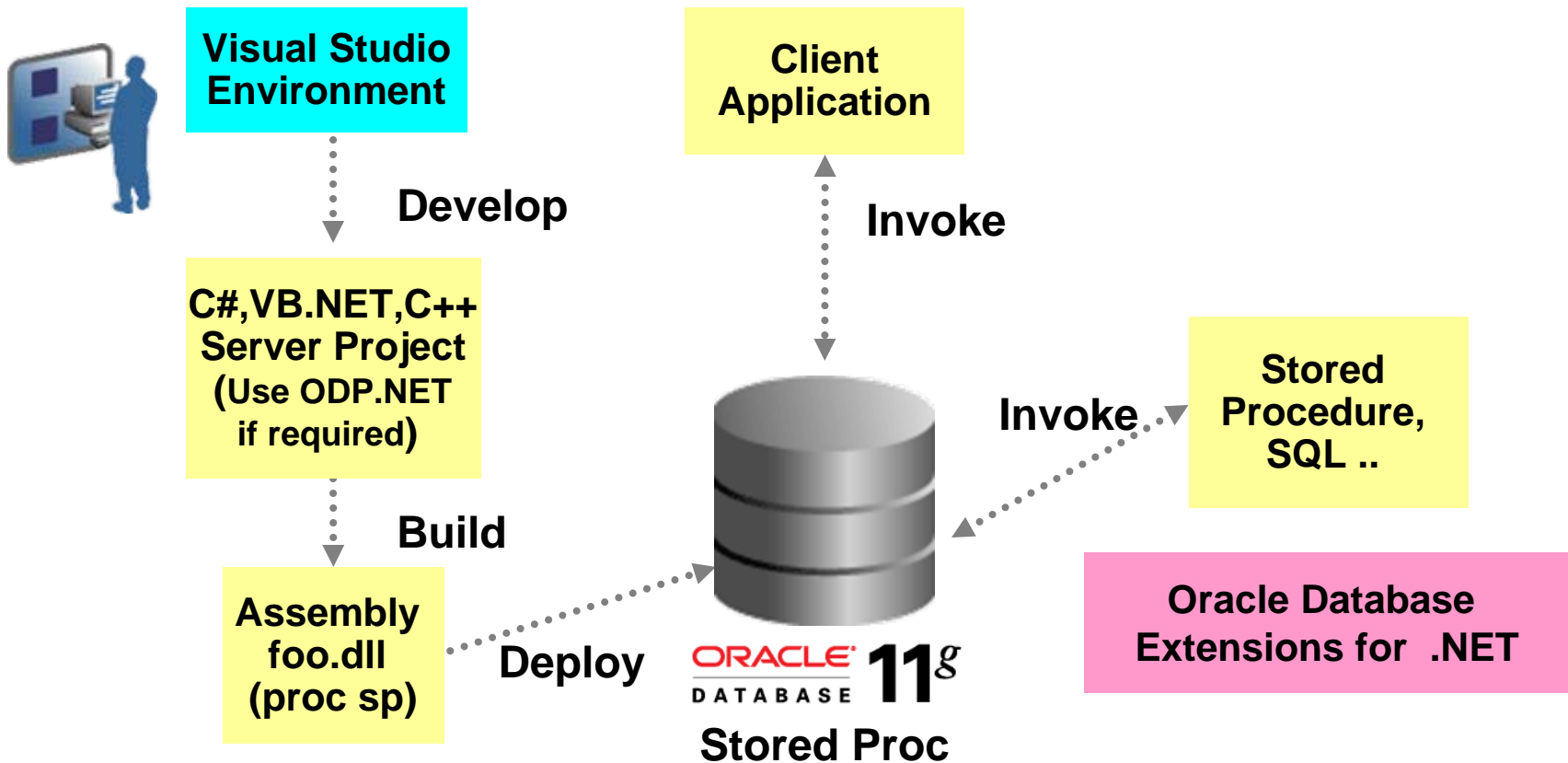


Oracle Database Extensions for .NET

- Database option
- DB server on Windows only
 - Both 32-bit and 64-bit supported
- Oracle Database 10g Release 2 or later

Oracle Database Extensions for .NET

Oracle Developer Tools
for Visual Studio .NET



More Information

- .NET Technology Center
 - <http://otn.oracle.com/dotnet>
- .NET Blog
 - <http://cshay.blogspot.com/>
- For more questions
 - christian.shay@oracle.com



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Java, PHP, Python, and Ruby/Rails Development with Oracle

Kuassi Mensah -- <http://db360.blogspot.com>

Server Technologies - Database Access and Programming Interfaces



Agenda

- ✓ Programming Languages
 - The Landscape
 - Static vs Dynamic Languages
 - The Rise of Dynamic Language
 - Database-backed Rich Internet Applications
- What Oracle Database 11g Brings to Java/PHP/Ruby/Python Applications

TIOBE Programming Community Index for March 2008

March Headline: Ruby after 4 months back in the top 10 again

The TIOBE Programming Community index gives an indication of the popularity of programming languages. The index is updated once a month. The ratings are based on the number of skilled engineers world-wide, courses and third party vendors. The popular search engines Google, MSN, Yahoo!, and YouTube are used to calculate the ratings. Observe that the TIOBE index is not about the *best* programming language or the language in which *most lines of code* have been written.

The index can be used to check whether your programming skills are still up to date or to make a strategic decision about what programming language should be adopted when starting to build a new software system. The definition of the TIOBE index can be found [here](#).

Position Mar 2008	Position Mar 2007	Delta in Position	Programming Language	Ratings Mar 2008	Delta Mar 2007	Status
1	1	=	Java	20.651%	+2.61%	A
2	2	=	C	15.593%	-0.04%	A
3	5	↑↑	(Visual) Basic	10.795%	+2.65%	A
4	4	=	PHP	10.138%	+0.68%	A
5	3	↓↓	C++	9.776%	-1.33%	A
6	6	=	Perl	5.781%	-0.64%	A
7	7	=	Python	4.593%	+0.70%	A
8	9	↑	C#	4.143%	+0.78%	A
9	12	↑↑↑	Delphi	2.697%	+0.94%	A
10	10	=	Ruby	2.661%	-0.11%	A
11	8	↓↓↓	JavaScript	2.462%	-1.02%	A
12	14	↑↑	D	1.107%	-0.16%	A
13	13	=	PL/SQL	0.747%	-0.80%	A



C# Code Checker

ClockSharp 2.1.4

C# coding rule checker supporting the well-known Philips C# coding standard

Download free trial!

Buy direct



Jacobe

Code Beautifier 7.3.9

Configurable FREE code beautifier for the JAVA language supporting SUN CS

Download free trial!

Buy direct

TIOBE Index



March 2008

Static vs Dynamic Languages

Static Languages

- Java, C, C++, C#, Visual Basic
- Strong/Static Typing
- Still Most Used and Most Popular Languages
- Compilation Required
- Mostly Closed Source
- General Purpose, System Programming

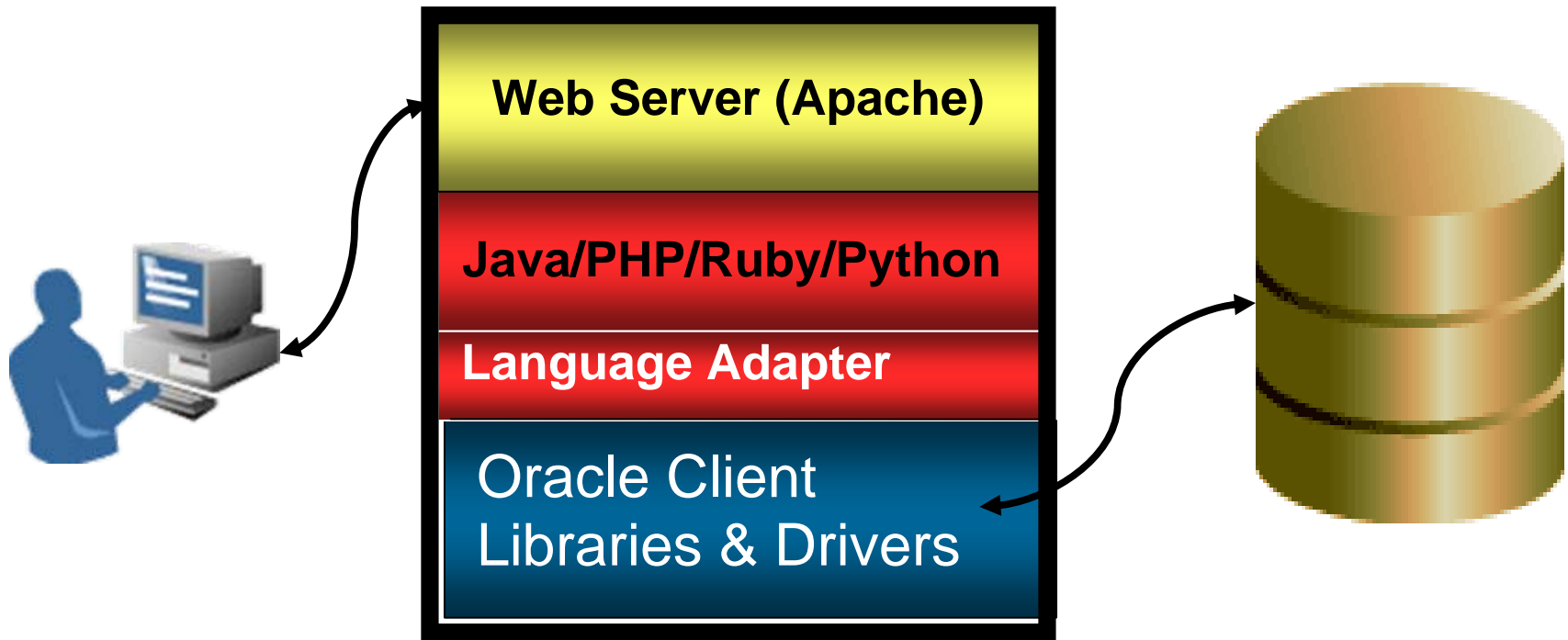
Dynamic Languages

- PHP, Perl, Python, Ruby, JavaScript
- Weak/Dynamic Typing
- Fastest Growing Adoption Rate (LAMP, WAMP, MAMP)
- Interpreted, Compiled, RAD
- Mostly Open Source
- Automation, Web Scripting
- Rich Internet Applications

The Rise of Dynamic Languages

- Dynamic Languages Boost Productivity and Allow Performing Complex Jobs More Quickly and Easily.
 - Database-backed Rich Internet Application Development
- Pervasive
 - Governments
 - Public Sector
 - Universities
 - Start-Ups
 - Enterprises
 - Web Economy
 - Open Source

Database-backed Rich Internet Applications



Agenda

- Programming Languages
- ✓ What Oracle database 11g Brings to Java/PHP/Ruby/Python
 - Application Development Highlights
 - Performance Highlights
 - Advanced Connection Management
 - High Availability
 - High Scalability
 - Manageability

Application Development Highlights



Java Standards

JDBC 4.0

- RowId
- NChar & Nclob
- Wrapper Interface
- SQLException Hierarchy
- conn.createBlob, createClob, etc
- SQLXML (TBD)

Java in the Database Goes Java 5

- i.e. JDK 1.5 in base 11.1 release

Java in the Database Got JMX

- JMX Instrumentation
- Support standard JMX-enabled tools(i.e., JConsole)

Advanced Security in JDBC-Thin

- AES Encryption
- SHA1 Check-Summing
- 3rd Party Authentication
 - Radius
 - Kerberos
 - SSL
- OS Authentication

JDBC Performance

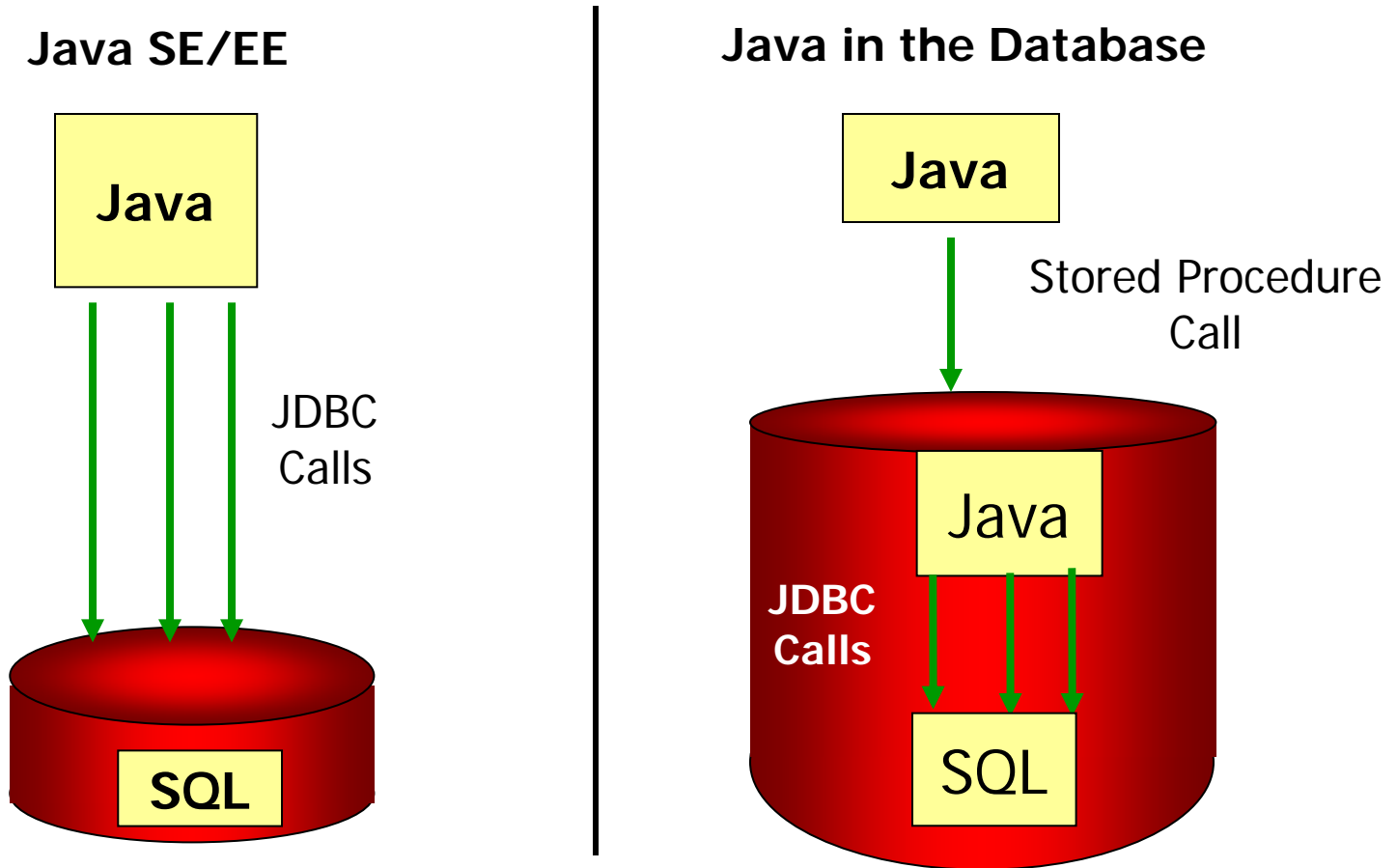
Prefetch in First Roundtrip (JDBC-Thin)

- Saves 1 database roundtrip per SELECT Statement
- Benefit for ad-hoc queries

New Native AQ protocol (JDBC-Thin)

- AQ/OJMS operations 40%-300% Faster
- Reduced server-side CPU Utilization

Java in the Database



Typically 10+ times Faster!

Java in the Database: What For

- Trigger-based Notification System using RMI
- Secure Credit-Card Processing using JSSE
- Custom Alert applications that monitor business data
- Sending emails with attachment from within the database
- Produce PDF files from Result Set
- Execute external OS commands and external procedures
- Implement Md5 CRC
- Publish Repository Content to Portal
- Portable Logistic Applications
- Implement Parsers for various File Formats (txt, zip, xml, binary)
- Implement Image Transformation and Format Conversion (GIF, PNG, JPEG, etc)
- Implement database-resident Content Management System
- HTTP Call-Out
- JDBC Call-Out
- RMI Call-Out to SAP
- Web Services Call-Out
- Messaging across Tiers
- Database Resident Lucene*
- RESTful Database Web Services*

Application Development Highlights

SQL Developer



- Migration Workbench
- Third party database support

Application Express



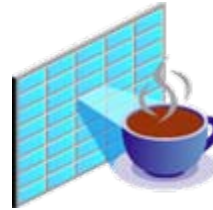
- Access migration
- Flash Charting, PDF output

PL/SQL



- FAST Native Compiler
- Fine Grained Dependency Tracking

Java



- JIT Compiler
- JDK-like environment

PHP



- Scalability with Database Resident Connection Pool

.NET



- Integration with Visual Studio 2005
- Microsoft ADO.NET 2.0 support

Partnership and Contributions

- Java
 - Active member of the JCP
 - Lead or Contribute to numerous Java Specification Requests
 - Strategic Developer and Member of Eclipse Foundation Board of Directors
 - Oracle Leads 3 Projects
 - Database Plug-in for Eclipse DTP Enablement
 - OC4J Adapter for Eclipse WTP
 - Contribution to Apache
- PHP
 - Active member of the PHP Community
 - Partnership with Zend -> Zend Core for Oracle
 - Contribution to OCI8 Extension
- Ruby/Rails, Python

Performance Highlight

Client Query Result Cache

Database Resident JIT

Cube Organized Materialized Views



Client Query Result Cache

- Database Server Configuration (init.ora)

```
client_result_cache_size=200M  
client_result_cache_lag=5000
```

- Client Configuration (sqlnet.ora)

```
OCI_QUERY_CACHE_SIZE=200M  
OCI_QUERY_CACHE_MAXROWS=20
```

- Hints for Caching the Result Set

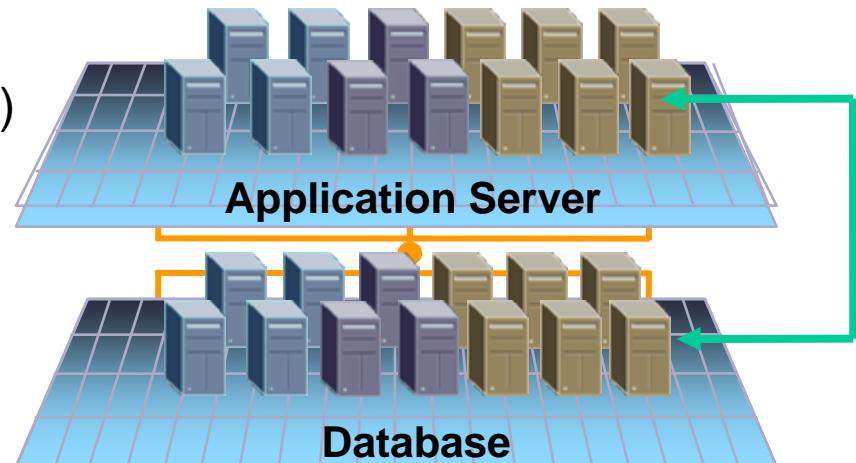
```
select /*+ result_cache */ * from employees
```

- Alternatively without code change

```
alter table emp result_cache (mode force);
```

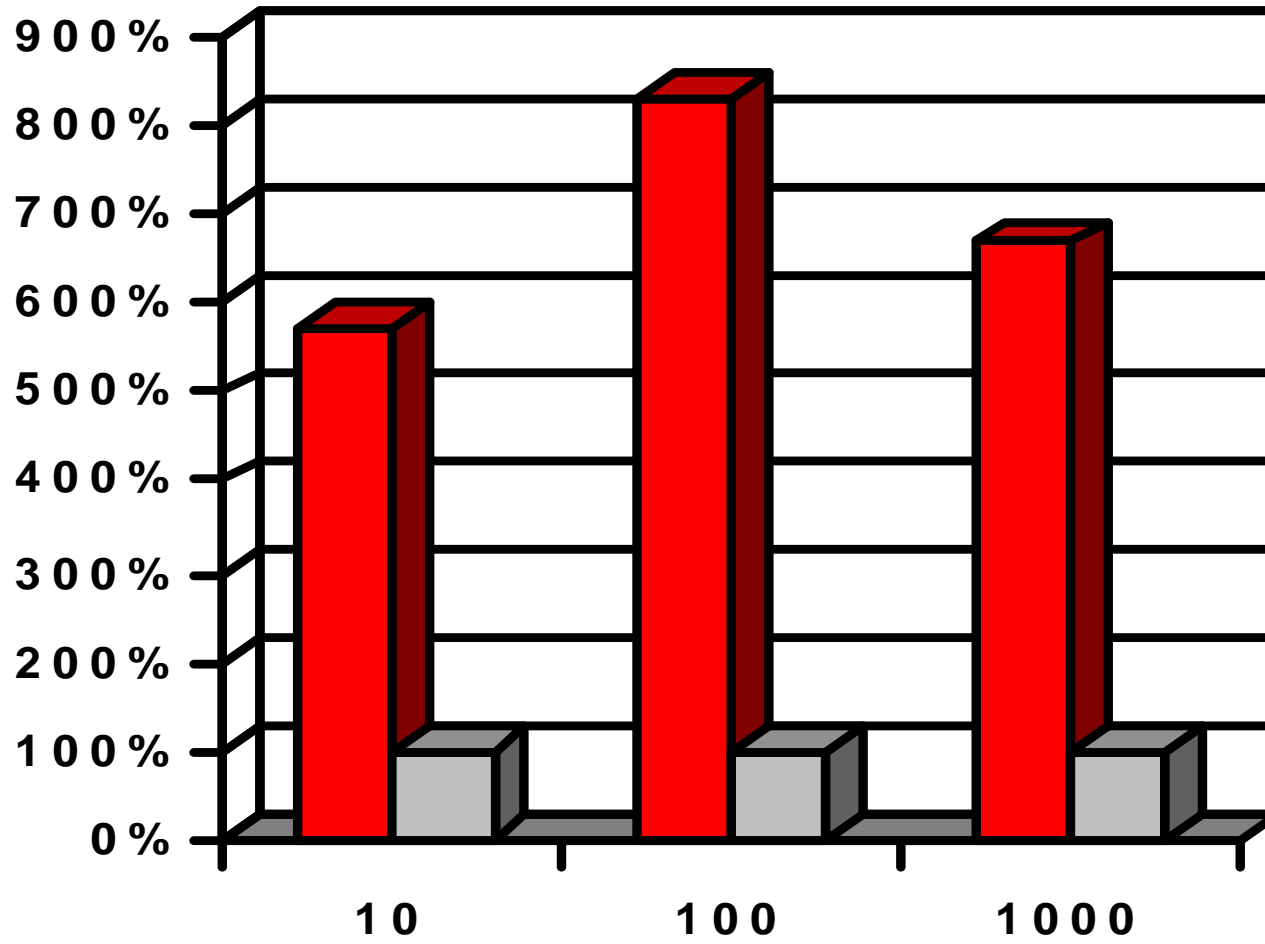
- The Cache is proactively invalidated upon changes to the Result Set on the server side

- Available with OCI, PHP, Ruby, ODP.Net, JDBC-OCI, ODBC

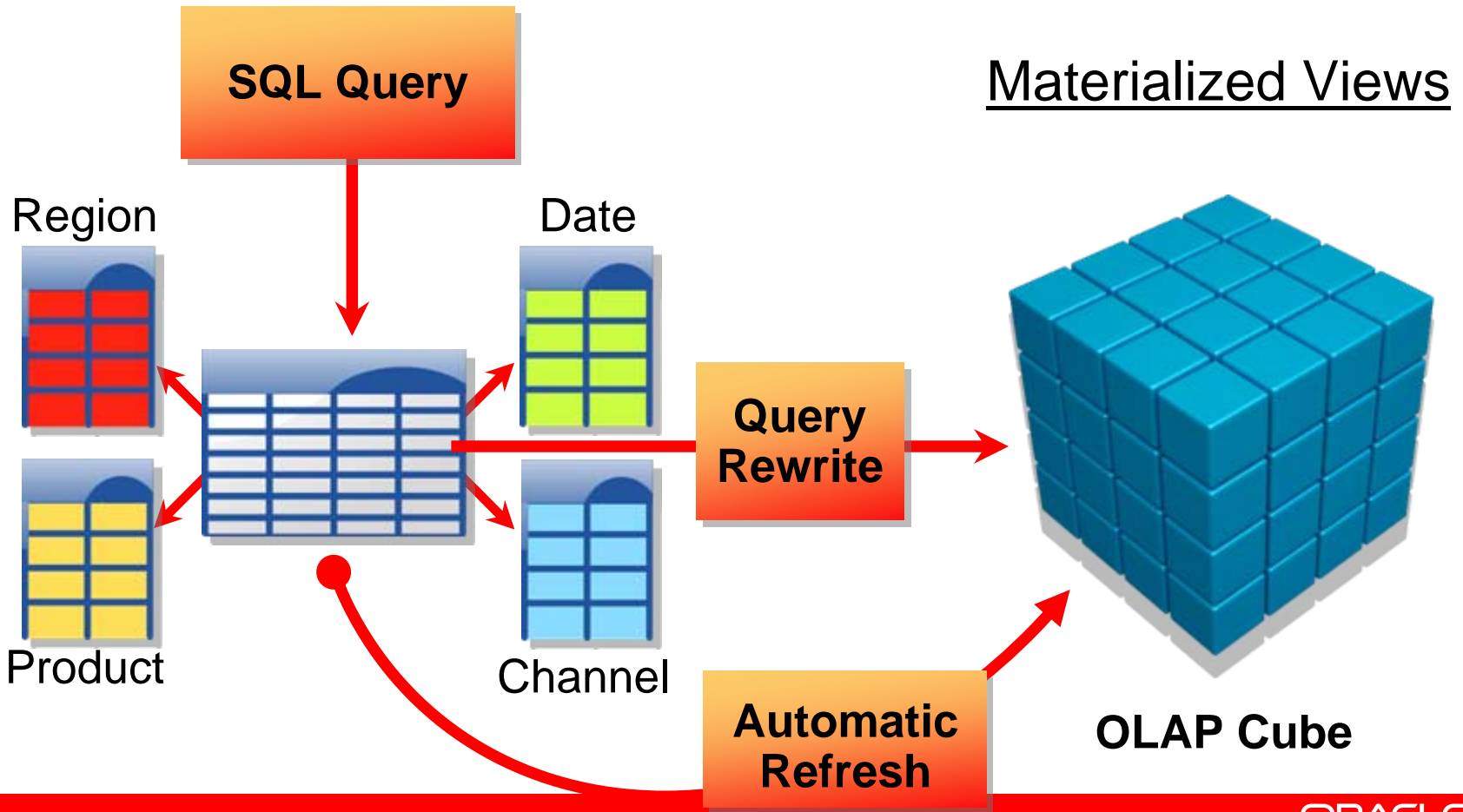


Client-Side Result Cache

5-8 x Faster

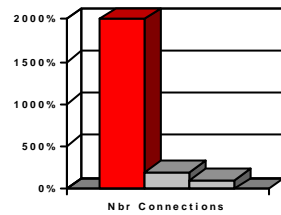


Cube Organized Materialized Views



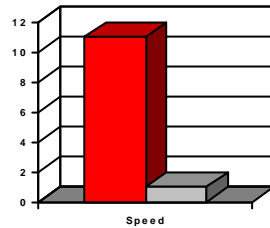
Oracle database 11g Performance Summary

Database Resident Connection Pool



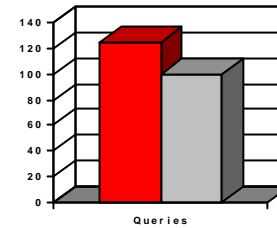
Up to
20 x connections

Java Just-In-Time Compiler



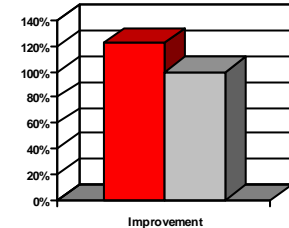
Up to
11 x Faster

Query Result Caching



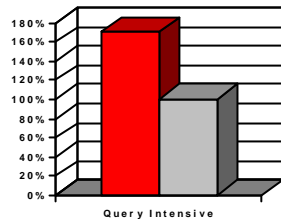
Up to
25% Faster

Client Side Caching



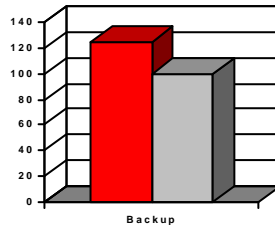
Up to
22% Faster

RAC Performance Enhancements



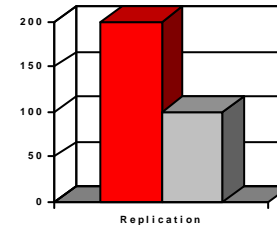
Up to
70% Faster

Oracle Secure Backup



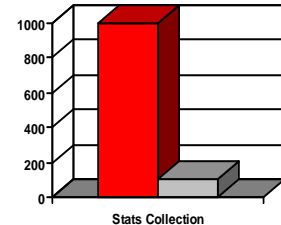
Up to
25% Faster

Oracle Streams Enhancements



Up to
2 x Faster

Optimizer Stats Collection



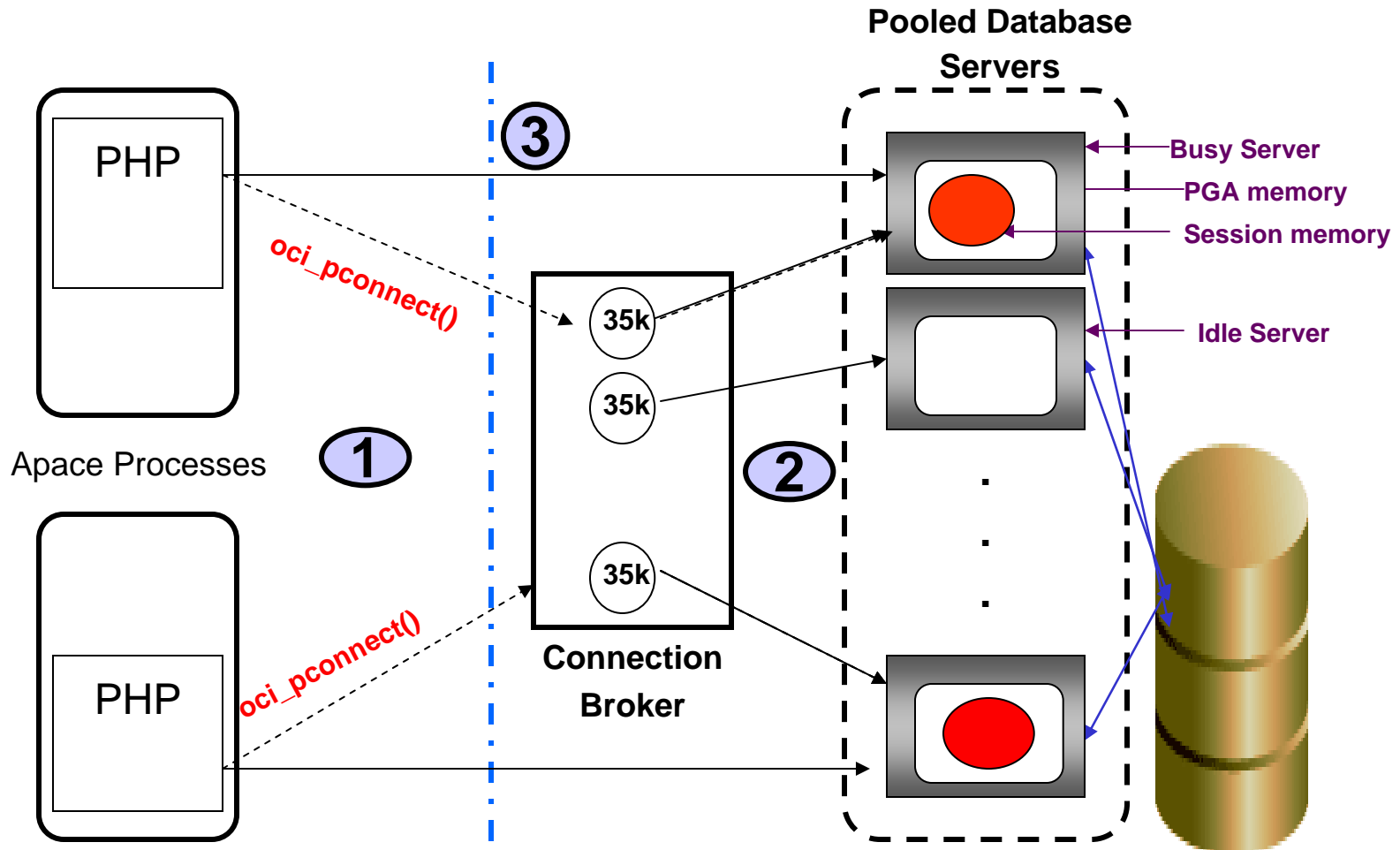
Up to
10 x Faster



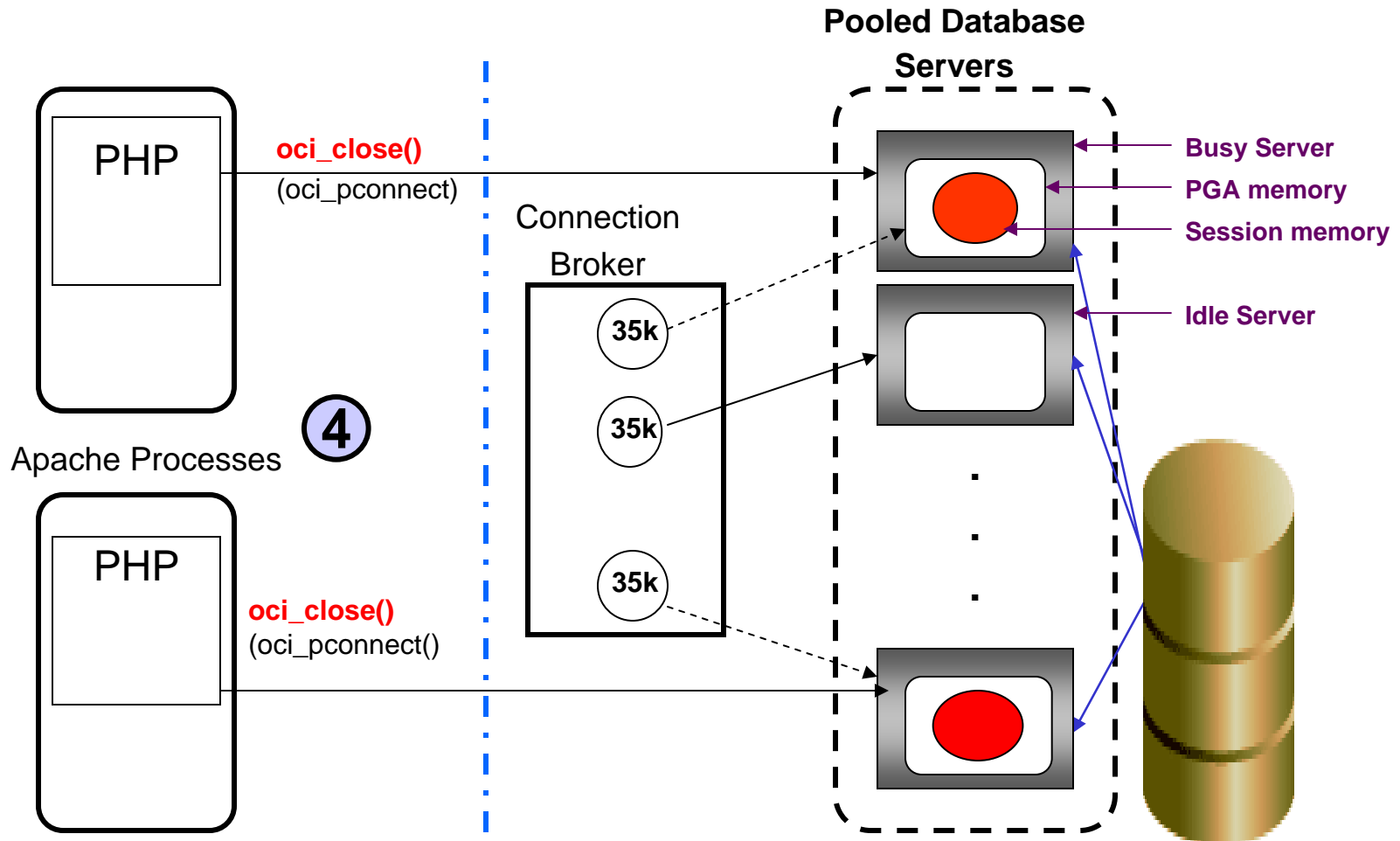
Advanced Connection Management

- Database Resident Connection Pool (PHP, OCI)
- Universal Connection Pool (Java)

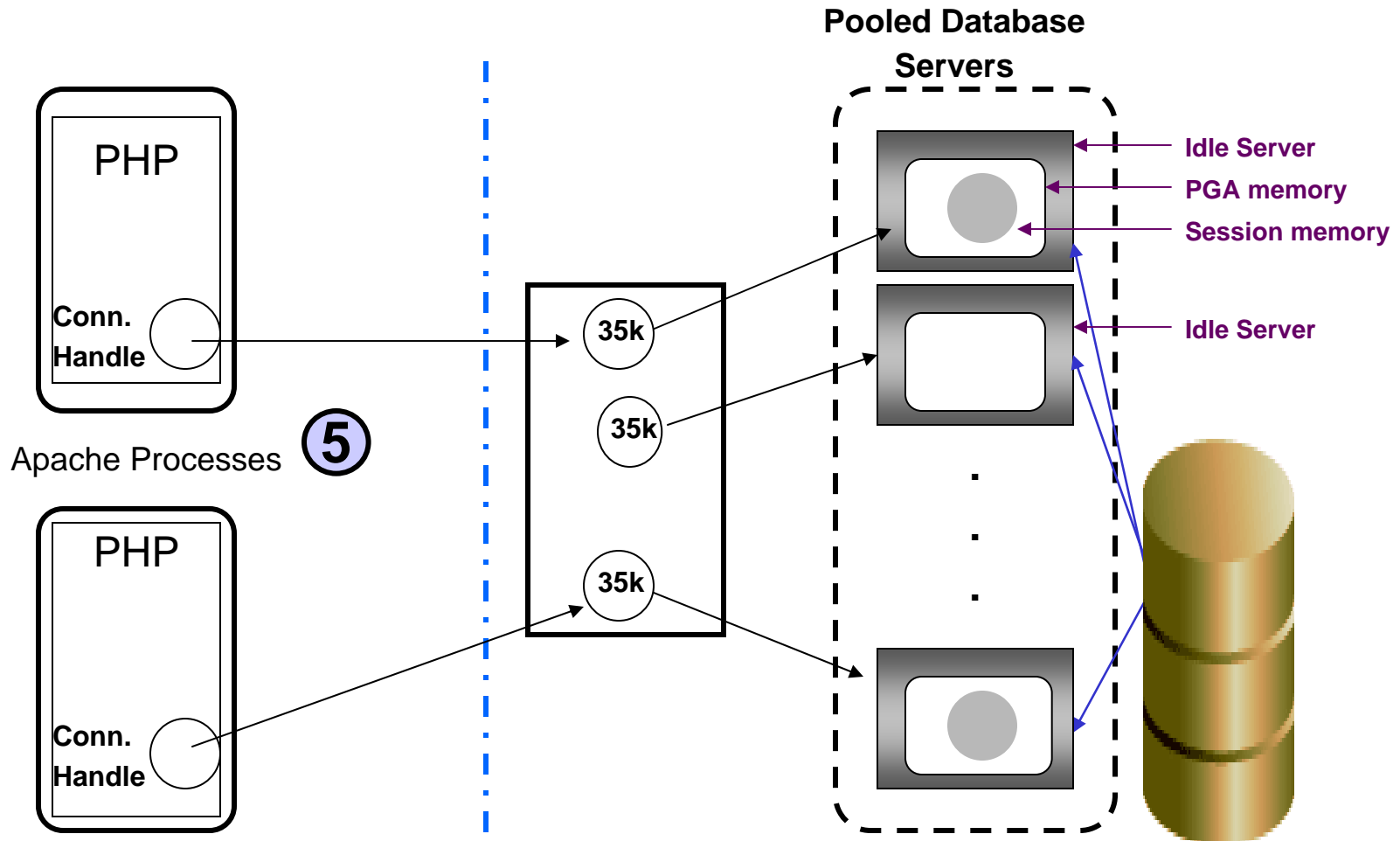
Creating a Persistent Connection



Closing a Persistent Connection



Connection Back to the Pool

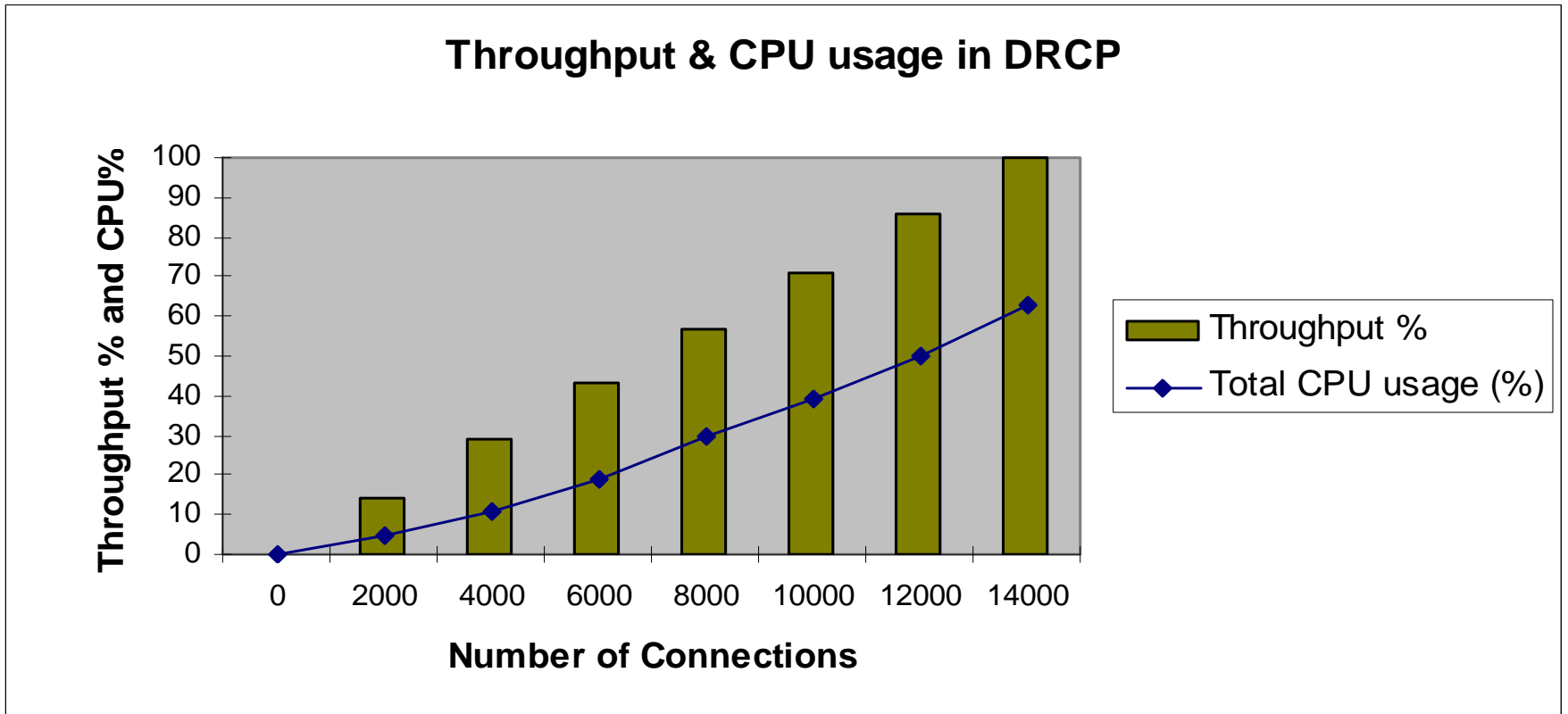


Memory Reduction with DRCP

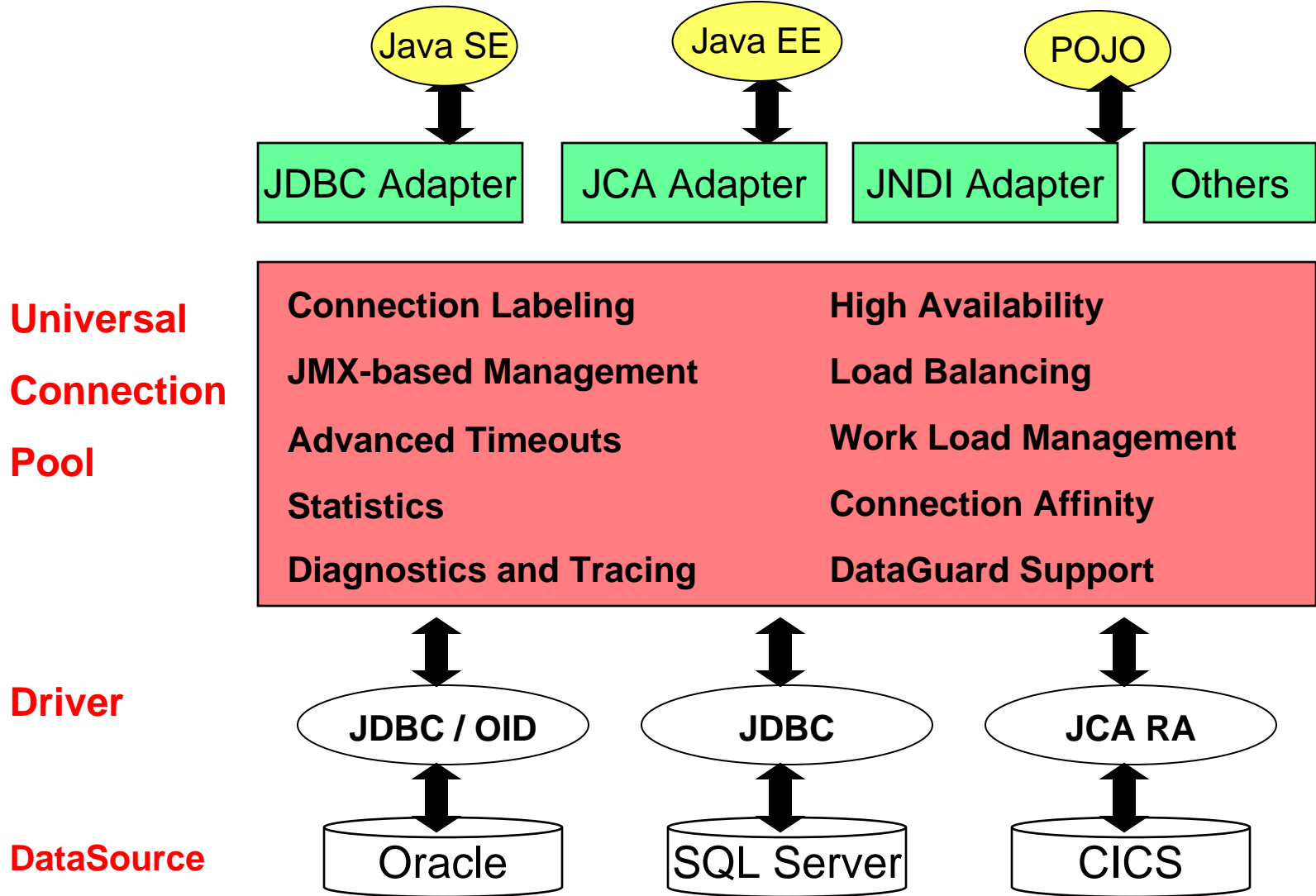
Sample Sizing for 5000 PHP Clients

	Dedicated Servers	Shared Servers	<i>DRCP Servers</i>
Database Servers	<i>5000 * 4 MB</i>	<i>100 * 4 MB</i>	<i>100 * 4 MB</i>
Session Memory	<i>5000 * 400 KB</i>	<i>5000 * 400 KB</i>	<i>100 * 400 KB</i>
<i>DRCP Memory Overhead</i>			<i>5000 * 35 KB</i>
Total Memory	22 GB	2.5 GB	615 MB

DRCP Scalability Benchmark



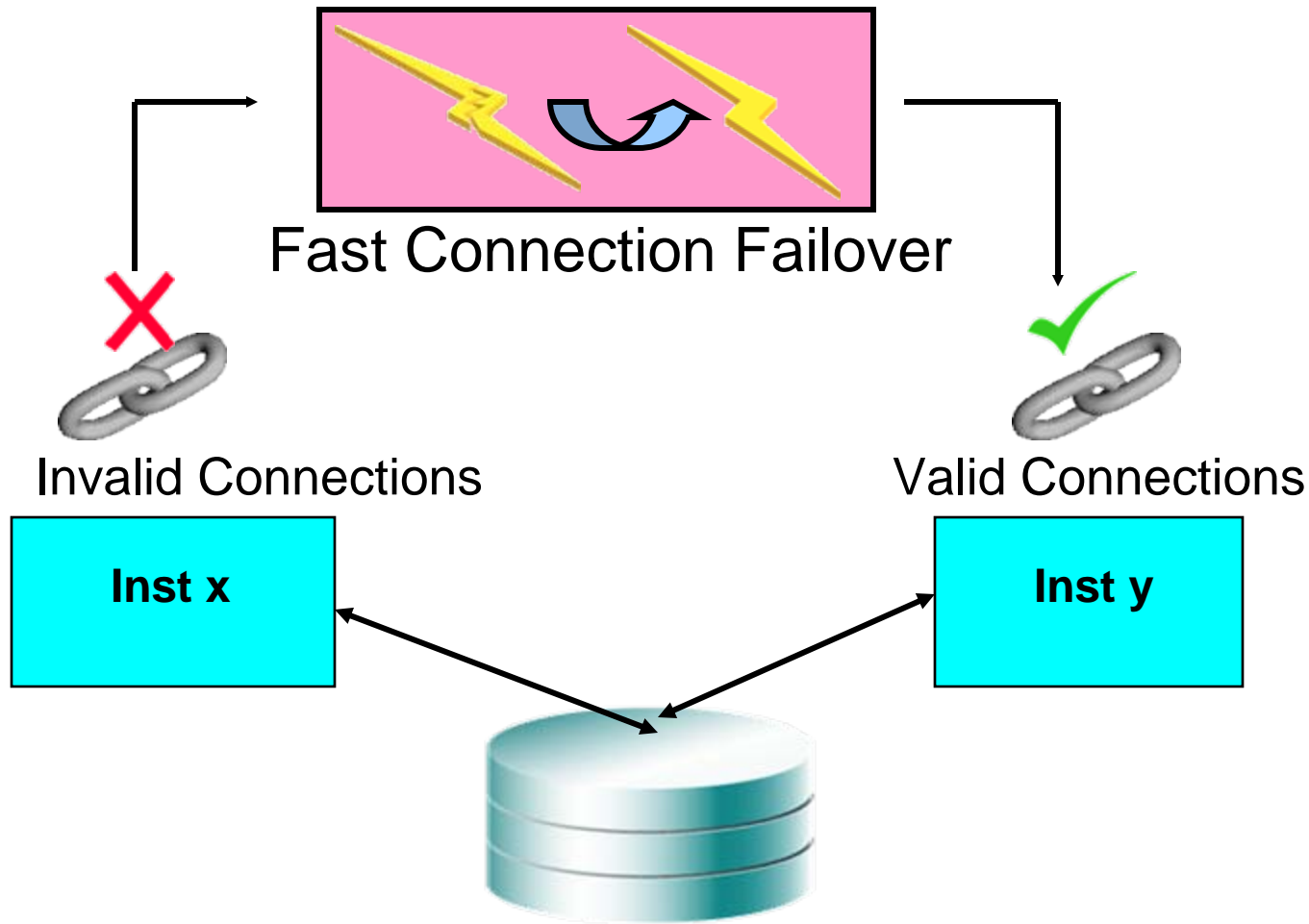
Universal Connection Pool



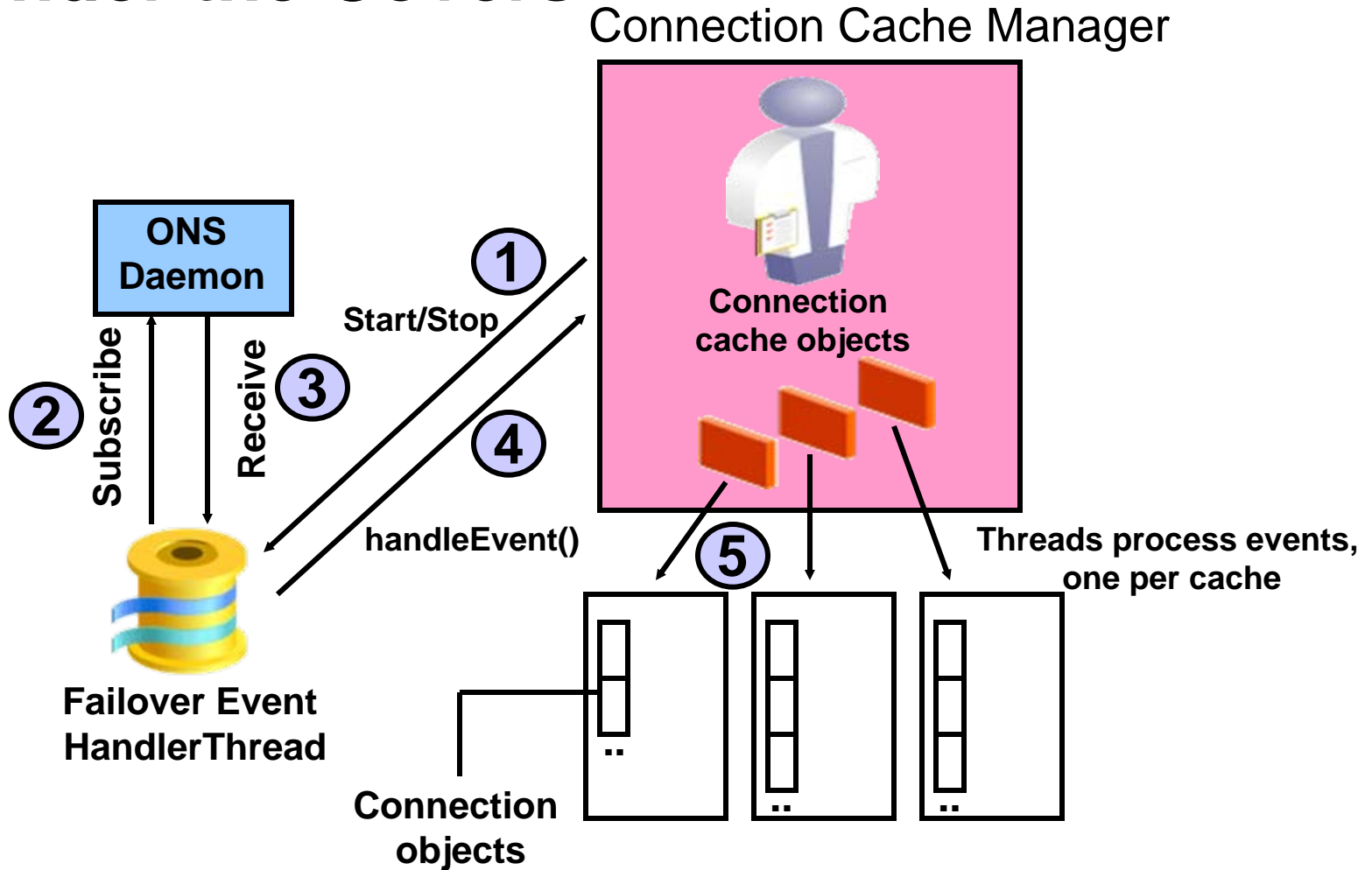
High Availability



Fast Connection Fail-Over – The Application View



Fast Connection Fail-Over – Under the Covers

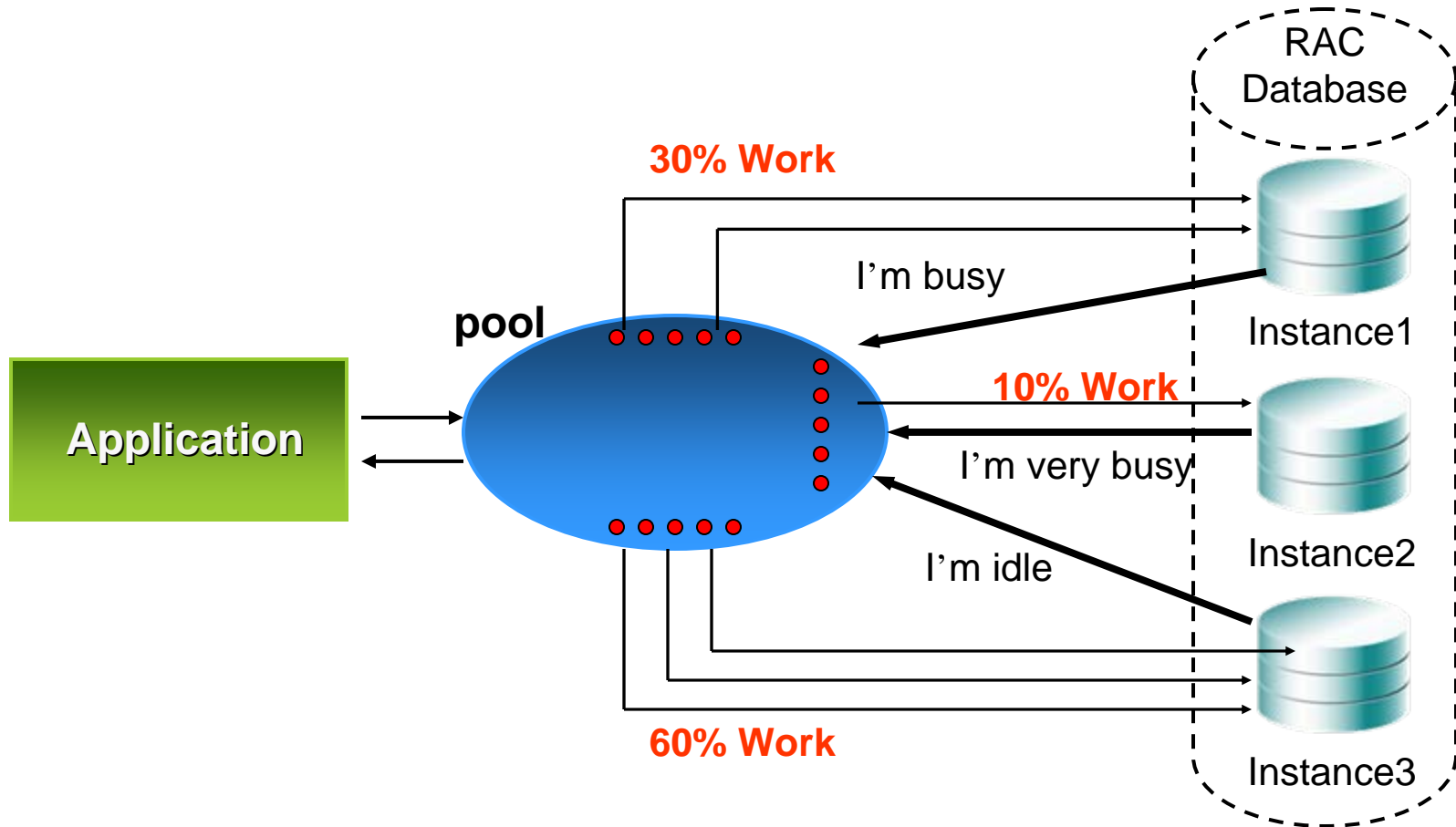


High Scalability

Runtime Load Balancing



Runtime Load Balancing – Non Intrusive



Enabling and Configuring RCLB 1/2

Enabling Runtime Connection Load Balancing

1. Enable Event Notification
2. Set RDBMS-side load balancing advisory GOAL for each service using DBMS_SERVICE

- NONE (default),
- GOAL_SERVICE_TIME – best service time overall
`DBMS_SERVICE.CREATE_SERVICE`
`('SERVICE1','SERVICE1.company.com',`
`goal => DBMS_SERVICE.GOAL_SERVICE_TIME)`
- GOAL_THROUGHPUT -- best throughput overall
`DBMS_SERVICE.CREATE_SERVICE`
`('SERVICE2','SERVICE2.company.com',`
`goal => DBMS_SERVICE.GOAL_THROUGHPUT)`

Alternatively, set service goal using the init.ora **goal** parameter.

Enabling and Configuring RCLB 2/2

3. Set CLB_GOAL for the listener

- CLB_GOAL_SHORT – for applications that have short-lived connections

```
DBMS_SERVICE.MODIFY_SERVICE  
('SERVICE1','SERVICE1.company.com',  
 clb_goal => DBMS_SERVICE.CLB_GOAL_SHORT)
```

- CLB_GOAL_LONG – for applications that have long-lived connections (i.e., connection pools) – the default

```
DBMS_SERVICE.MODIFY_SERVICE  
('SERVICE2','SERVICE2.company.com',  
 clb_goal => DBMS_SERVICE.CLB_GOAL_LONG)
```

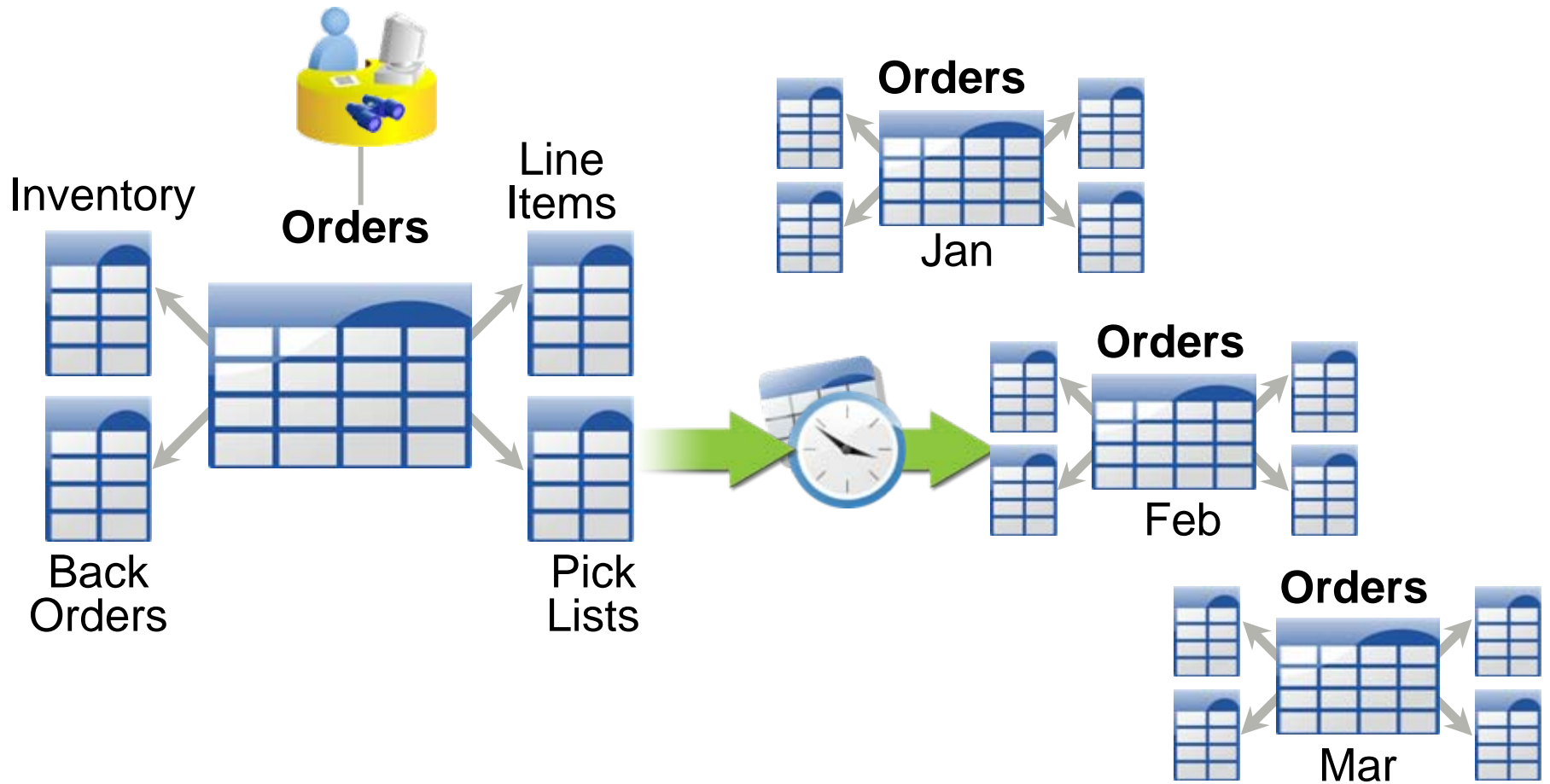
Alternatively, set connection balancing goal using the `init.ora` `clb_goal` parameter.

Manageability



Advanced Partitioning

Automated, Advisor, Reference



Advanced Data Compression



Storage

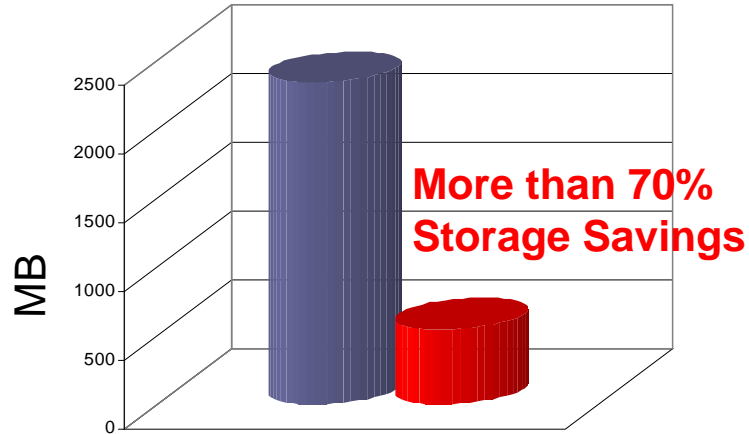
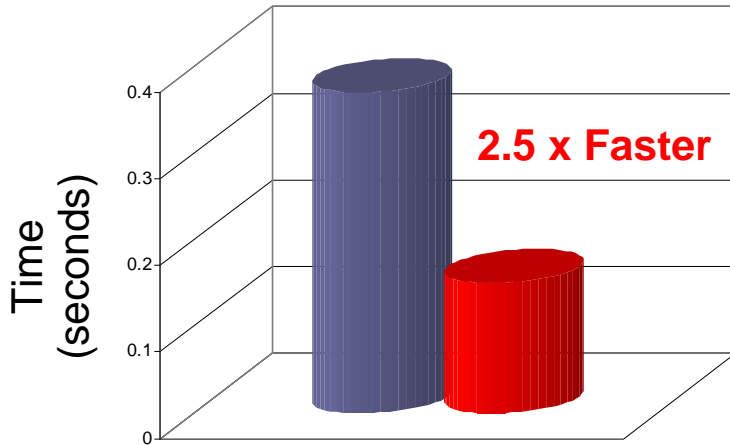
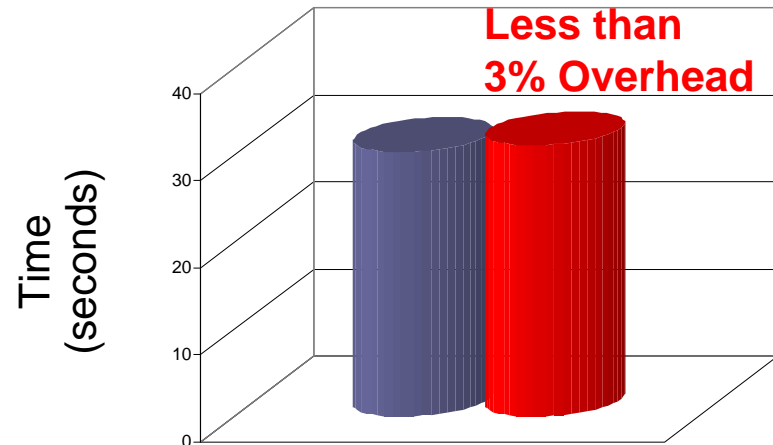


Table Scan Performance



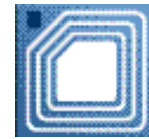
DML Performance



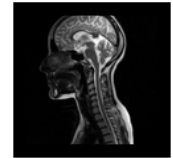
Integrating Unstructured Data



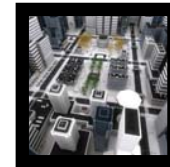
New in Oracle Database 11g



RFID



DICOM



3D



Binary XML

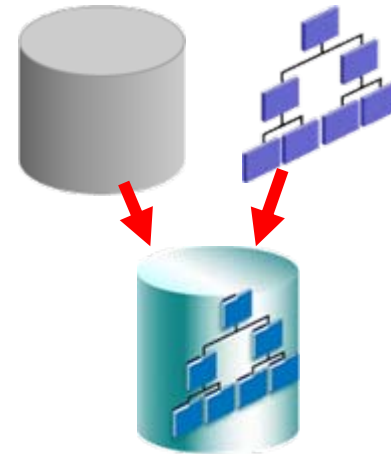


SecureFiles

Oracle SecureFiles

Consolidated Secure Management of Data (Unstructured + Structured)

- Similar to LOBs but much faster, and with more capabilities
 - Transparent encryption
 - Compression, Deduplication
 - Superset of LOB interfaces for easy migration from LOBs
- Benefits
 - Single security model
 - Single view of data
 - Single management of data
 - High performance



Oracle Technology Network Java Resources ...

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ORACLE 11g Java, JDBC & Database Web Services

For enhancements related to Java in the database and JDBC, read the [Java and Web Services Developer's Perspective on Oracle Database 11g white paper](#).

For enhancements related to **Database Web Services** read the [Oracle XDB New Features](#)

Previous releases:

- [What's New for Java, JDBC, and Web Services in Oracle database 10g \(R1 and R2\)](#)
- [Oracle Database 10g R1 Java, JDBC, and Web Services Features Overview](#)
- [Oracle9 Database Release 2 Java, and JDBC Features Overview](#)

Focus Areas

- ▢ [JDBC, SQLJ and JPublisher](#)
- ▢ [JPublisher and Database Web Services](#)
- ▢ [Java in the Database -- Java Stored Procedures](#)

Technical Information

- ▢ [Java and Web Services Developer's Perspective on Oracle Database 10g \(R1 and R22\)](#)
- ▢ [Unleash the Power of Java Stored Procedures \(Whitepaper PDF\)](#)
- ▢ [JDBC Developer's Guide and Reference Release 2](#)

Technical Articles

Related Products

- [JDBC, SQLJ, JPublisher](#)
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Sample Code

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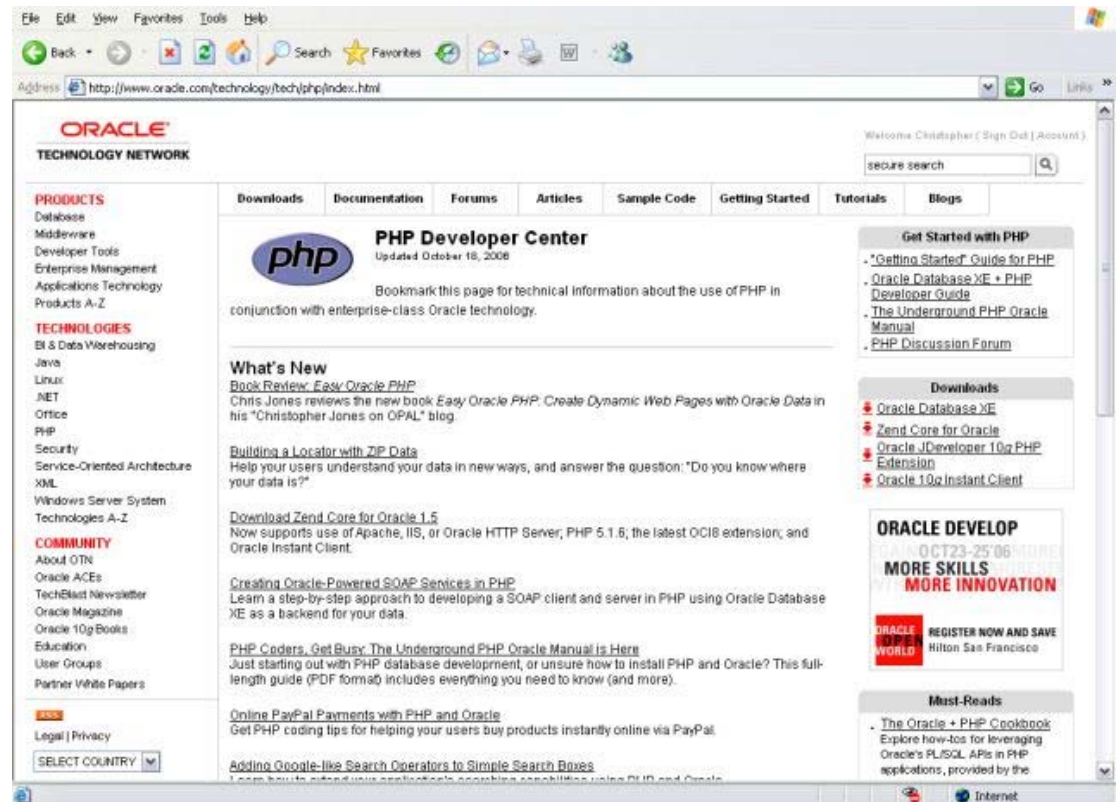
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Oracle and Open Source

Oracle has been, and continues to be, committed to offering choice, flexibility, and a lower cost of computing for end users. By investing significant resources in developing, testing, optimizing, and supporting open source technologies such as Linux, PHP, Apache, Eclipse, Berkeley DB, and InnoDB, Oracle is clearly embracing and offering open source solutions as a viable choice for development and deployment.

Today, many customers are using Oracle together with open source technologies in mission-critical environments and are reaping the benefits of lower costs, easier manageability, higher availability, and reliability along with performance and scalability advantages.

KEY OPEN SOURCE INITIATIVES

- **Linux in the Enterprise**—Oracle Database is #1 on Linux with 82.6% of the market, and Oracle Unbreakable Linux delivers enterprise-quality support for Linux at a lower cost.
- **Eclipse**—Oracle is an Eclipse board member and strategic developer, and has donated Oracle TopLink to the open source community. Oracle also contributes developers and leadership to three Eclipse projects: Dali JPA Tools, JavaServer Faces (JSF), and BPEL.
- **Easing PHP Development**—Oracle is committed to taking PHP into the enterprise, with Zend Core for Oracle.
- **Open Source Tooling Projects**—Oracle contributes to several open-source tooling projects, including Project Trinidad (ADF Faces), Eclipse, Spring, and SASH.
- **Oracle Fusion Middleware and SASH**—SASH integrates the open source technologies Spring,

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News

- TechTarget: ValueCentric migrates from MySQL on Red Hat Enterprise Linux to Oracle Database on Oracle Enterprise Linux
- ValueCentric Succeeds with Oracle Unbreakable Linux
- CDW to Sell Oracle Unbreakable Linux Support
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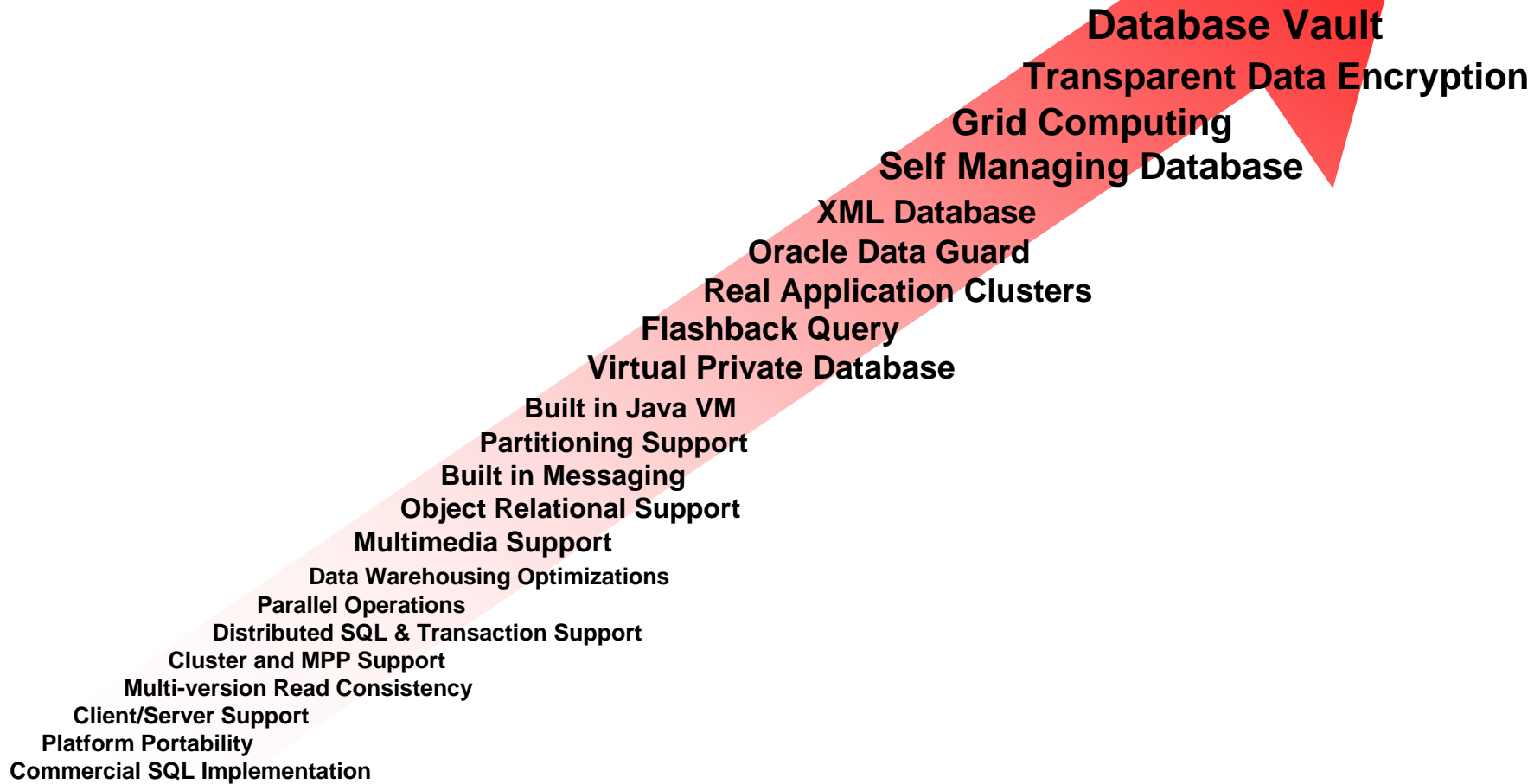
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Oracle Database

30 Years of Sustained Innovation



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Oracle SQL Developer Overview, New Features and the Future

David Gambino
Director, Product Manager



Agenda

- What is SQL Developer?
- Technical Information
- Reviewing SQL Developer Features
 - Database Connections
 - Database Objects
 - Schema Data
 - PL/SQL
 - Reports
 - Extensibility
 - Migration Workbench
 - Oracle APEX support
- Focus areas for the next release
- Summary



What is Oracle SQL Developer?

- A graphical interface to Oracle database provides
 - An uncluttered, intuitive interface
 - Enhanced productivity
 - Simplified database development tasks
- Includes
 - Object Browsing
 - Object Creation
 - SQL Worksheet for commands and scripts
 - PL/SQL editing, debugging
 - Developer centric, user extensible reports
 - Migration from third-party databases to Oracle
 - Support for Oracle Application Express 3.0.1
 - Extensible development environment
- Targets the Oracle Database Developer

Technical Information

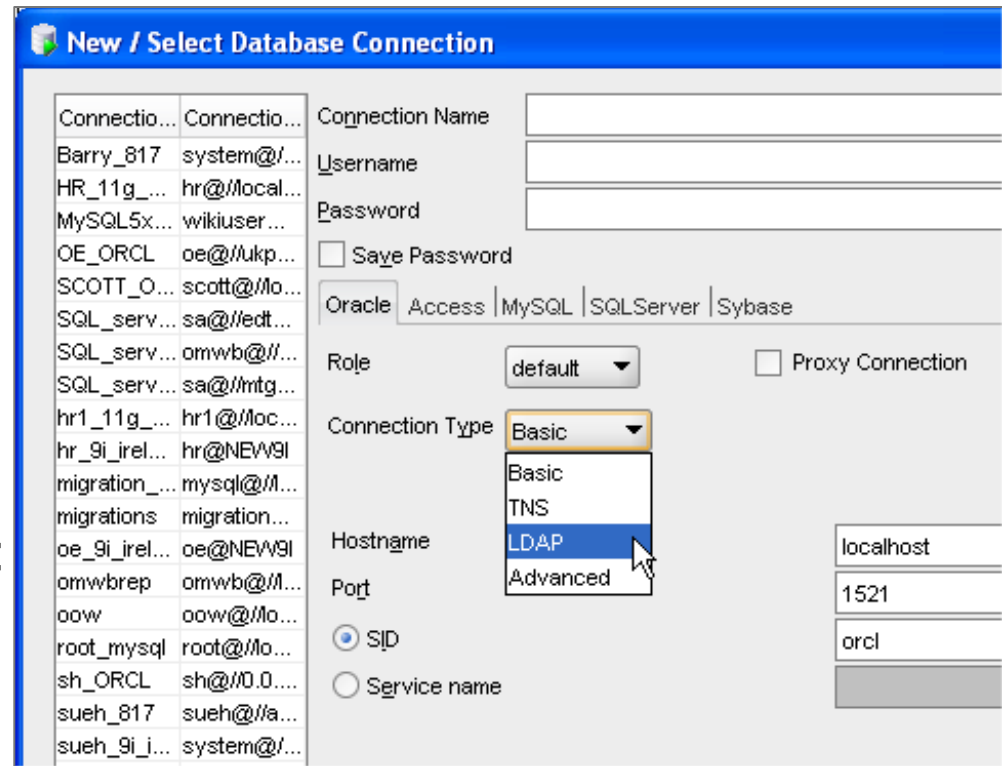
- Developed in the JDeveloper IDE
 - Leveraging a robust extensible IDE Framework
 - First independently branded product on JDeveloper IDE
- Support for Oracle Database 9.2.0.1, and above; including Oracle Database 11g R1
- Multi-platform support: Windows, Linux and Mac OSX
- Multi-database support: Microsoft SQL Server, MS Access, MySQL
- Uses JDBC Thin driver
 - No Oracle Home required
 - JDBC Type 2 driver also supported
- Bundled with JRE 1.5
- Provides framework for extensions
 - Migration Workbench
 - TimesTen

SQL Developer Features

- Creating Database Connections
- Creating and Browsing Objects
- Querying and Updating Data
- Importing Data, Exporting Data and Objects
- Using the SQL Worksheet
- Running the Query Builder
- Creating and Running PL/SQL
- Running and Defining Reports
- Building Extensions

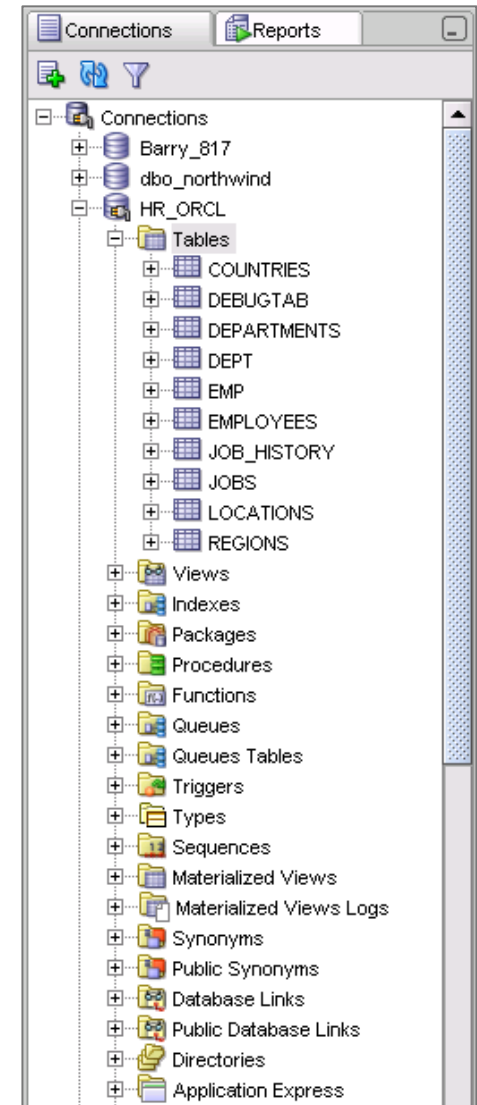
Database Connections

- Create, save and test
 - Multiple databases
 - Multiple schemas
- Import and export
- Reuse
 - Database browsing
 - PL/SQL Development
 - Running reports
- Oracle SQL Developer 1.5:
 - External authentication
 - Proxy connections
 - LDAP support
 - Connect to Sybase
 - Password expiration
 - Force thick driver for strong authentication



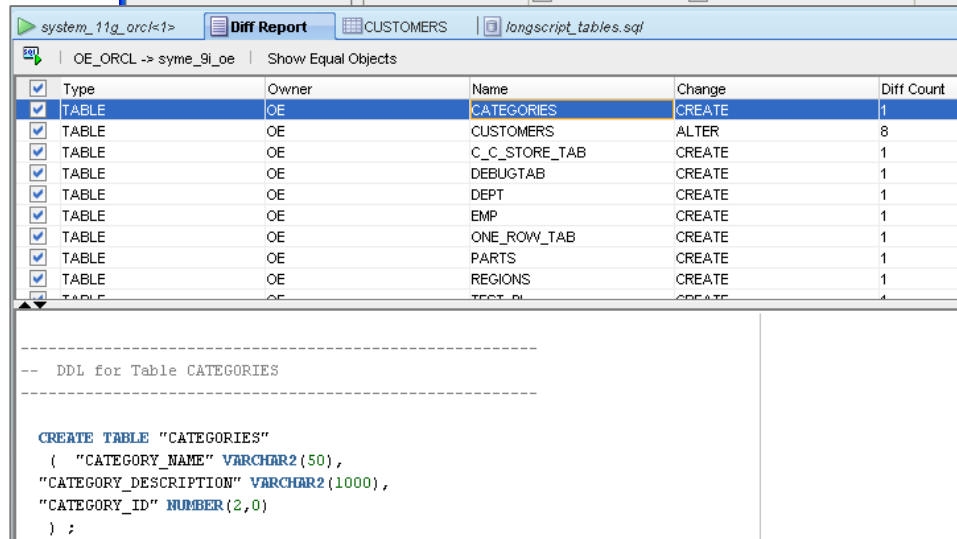
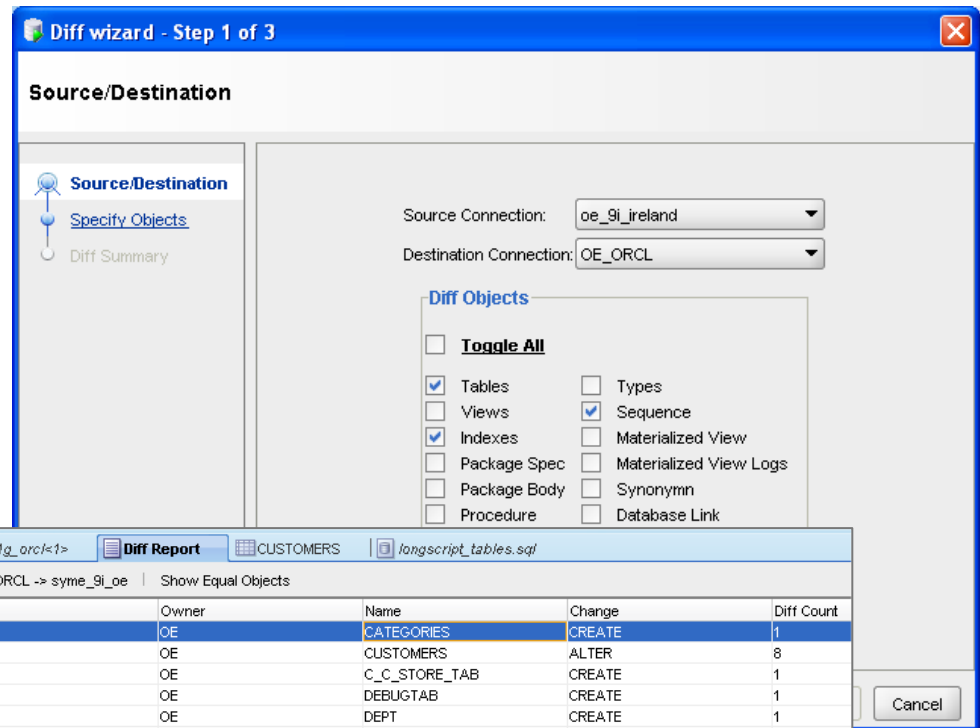
Creating and Browsing Objects

- Connection Navigator - Tree based object browser
- Context menu utilities
- Create and edit database objects
 - Tables, Views, Indexes, Sequences
 - Packages, Procedures, Functions, Triggers, Types
 - Materialized Views and Logs
 - Synonyms (public and private)
 - Directories, Database Links (includes Public)
 - Application Express
 - XML Schemas
 - Recycle Bin
 - Other Users
- Oracle SQL Developer 1.5
 - Queues, Queue Tables
 - Browse and Load Java



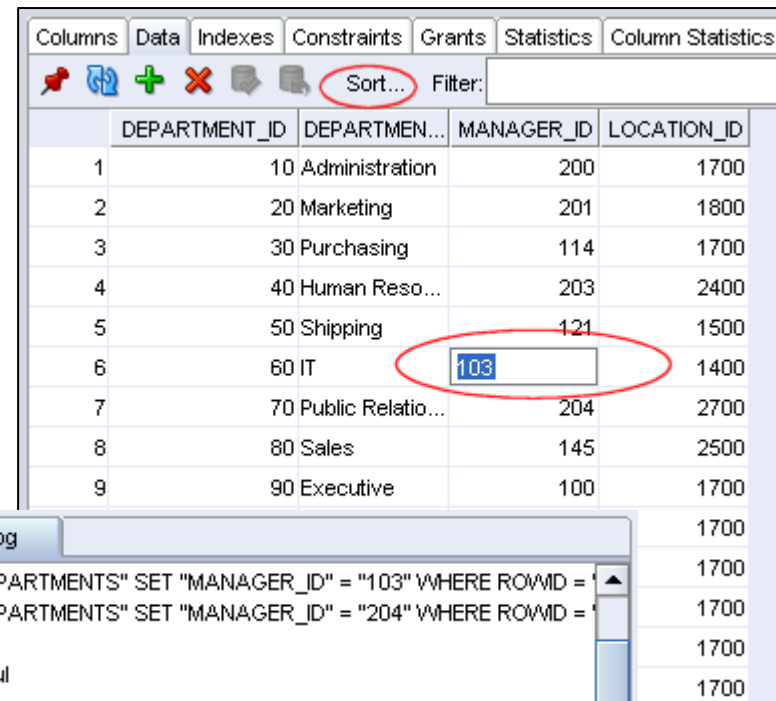
Schema Copy and Compare Release 1.5

- Schema Copy
 - Create new objects
 - Truncate objects
 - Drop objects
 - Summary report of actions
 - Log output to SQL Worksheet
- Schema Compare
 - Specify object types
 - Specify objects
 - Review diff summary
 - Summary report
 - Statements sent to SQL Worksheet

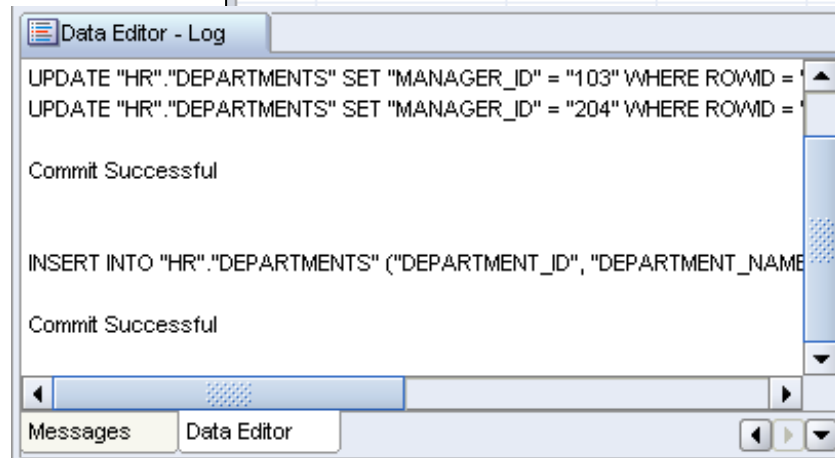


Querying and Updating Data

- Browse table and views data grid
 - Filter, Sort
- Context menus offer
 - Single record view
 - Duplicate row
 - Count rows
- Run scripts for mass updates
- Single value updates in data grid
- Track updates in message log
- Oracle SQL Developer 1.5
 - Recall filters
 - Persist sort
 - Clear grid settings



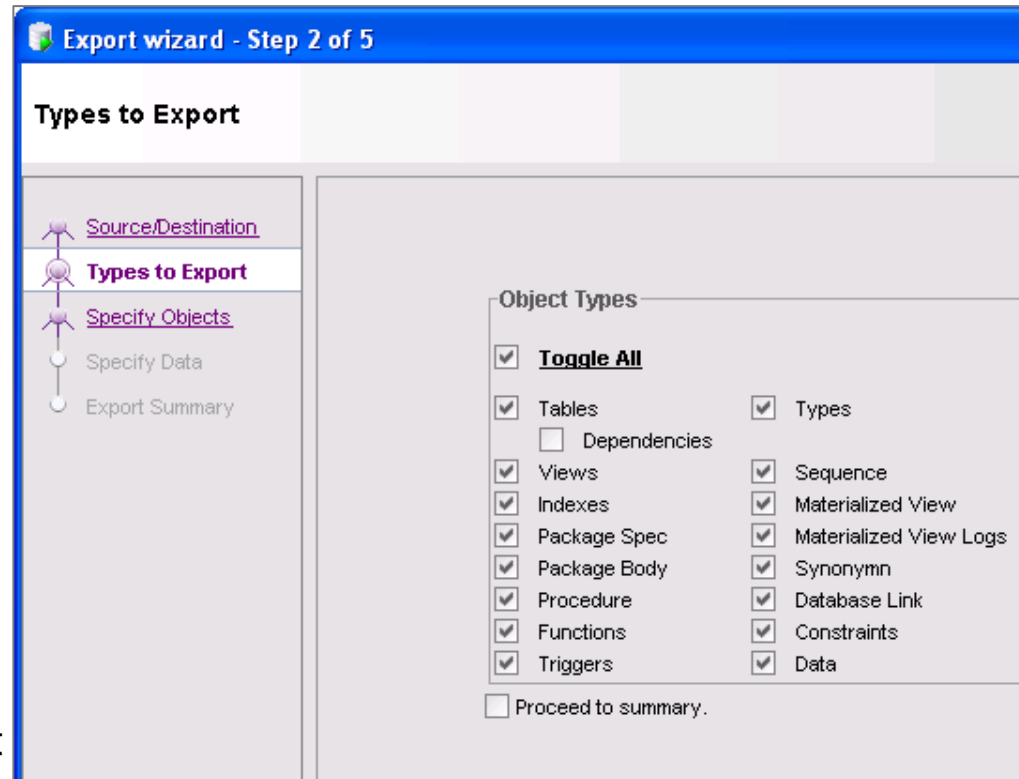
	DEPARTMENT_ID	DEPARTMENTEN...	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	30	Purchasing	114	1700
4	40	Human Reso...	203	2400
5	50	Shipping	121	1500
6	60	IT	103	1400
7	70	Public Relatio...	204	2700
8	80	Sales	145	2500
9	90	Executive	100	1700



```
Data Editor - Log
UPDATE "HR"."DEPARTMENTS" SET "MANAGER_ID" = "103" WHERE ROWID =
UPDATE "HR"."DEPARTMENTS" SET "MANAGER_ID" = "204" WHERE ROWID =
Commit Successful
INSERT INTO "HR"."DEPARTMENTS" ("DEPARTMENT_ID", "DEPARTMENT_NAME
Commit Successful
Messages Data Editor
```

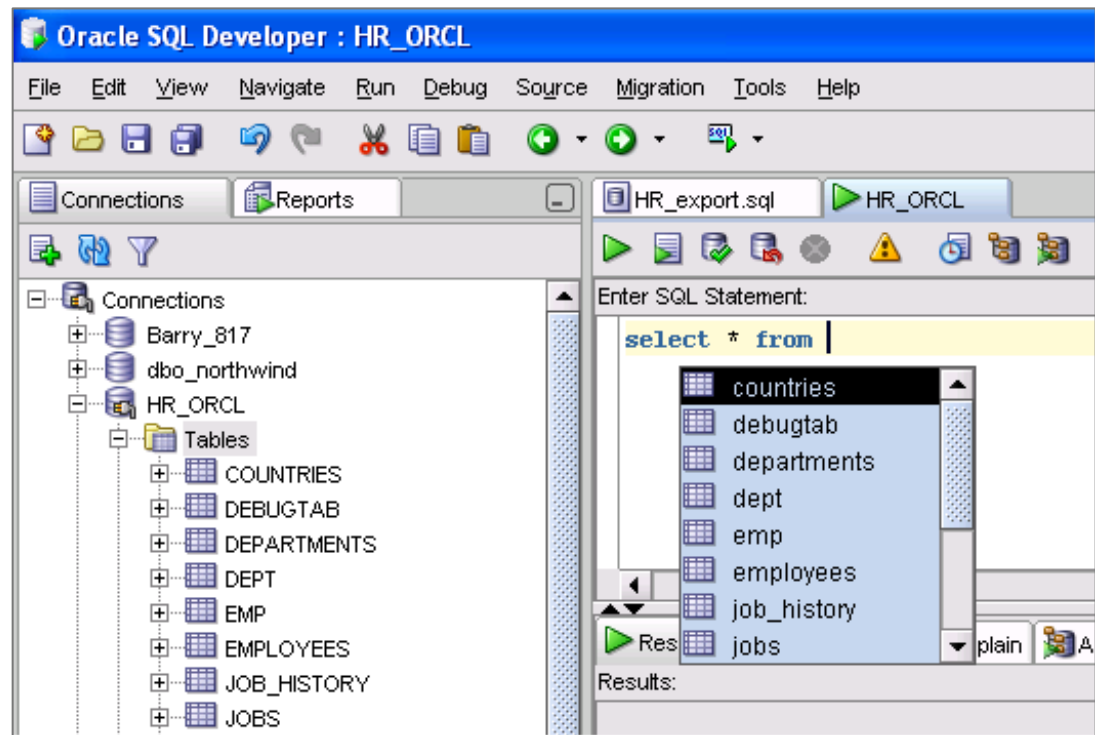
Exporting and Importing

- Context menu DDL and data export
- Data Export
 - Text, CSV, Insert, Loader, XML, HTML, XLS
- Import Data
 - MS Excel
- Multiple Object Export
- Parameters to include:
 - Schema owner
 - Drop statements
 - Storage syntax
 - Inline constraints syntax
 - Export data
- Oracle SQL Developer 1.5
 - Export wizard
- Create table on import
 - Export opens in SQL Worksheet
 - Export grants



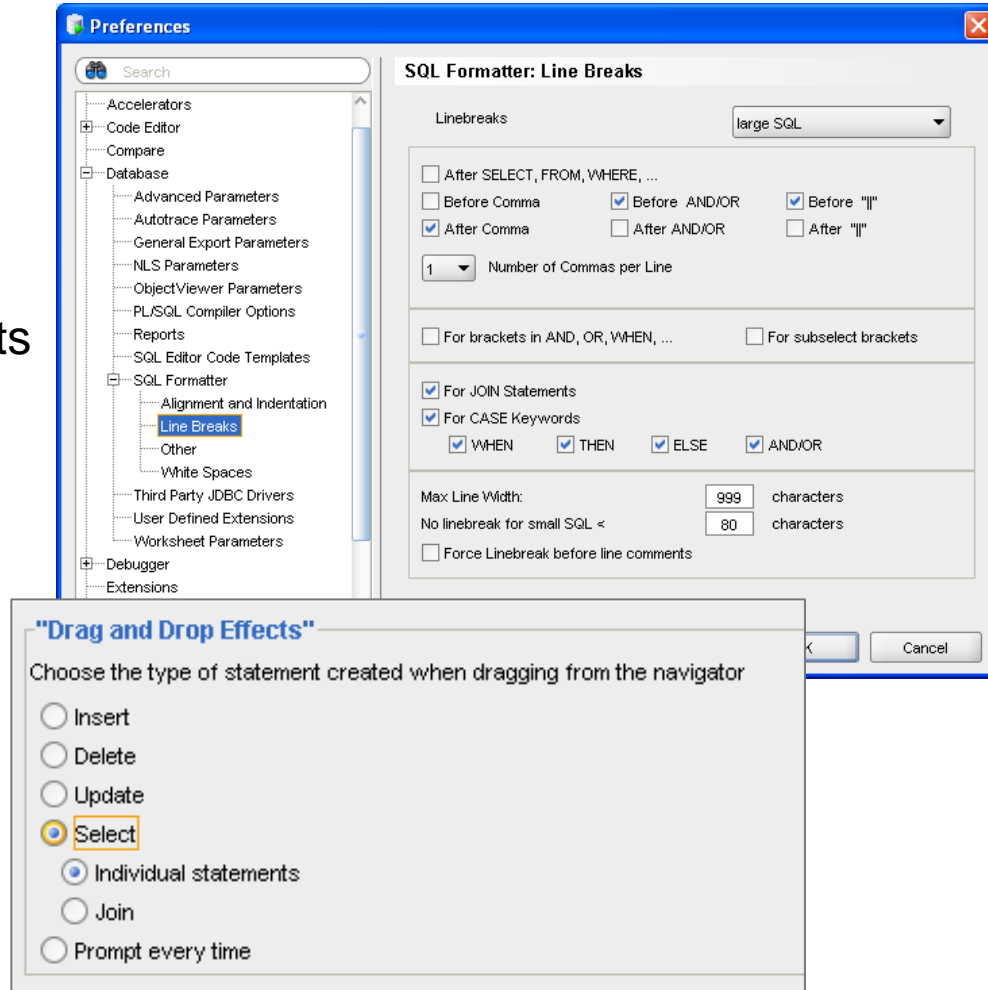
Using the SQL Worksheet

- Execute queries, scripts
 - Single Statement Execution
 - Script Execution
- Editing statements
 - Syntax Highlighting
 - Code Insight
 - Code Formatting
 - Bind Variable Support
- Other options
 - Command History
 - Explain Plan
 - Autotrace
 - HTP and OWA output
- SQL*Plus Commands



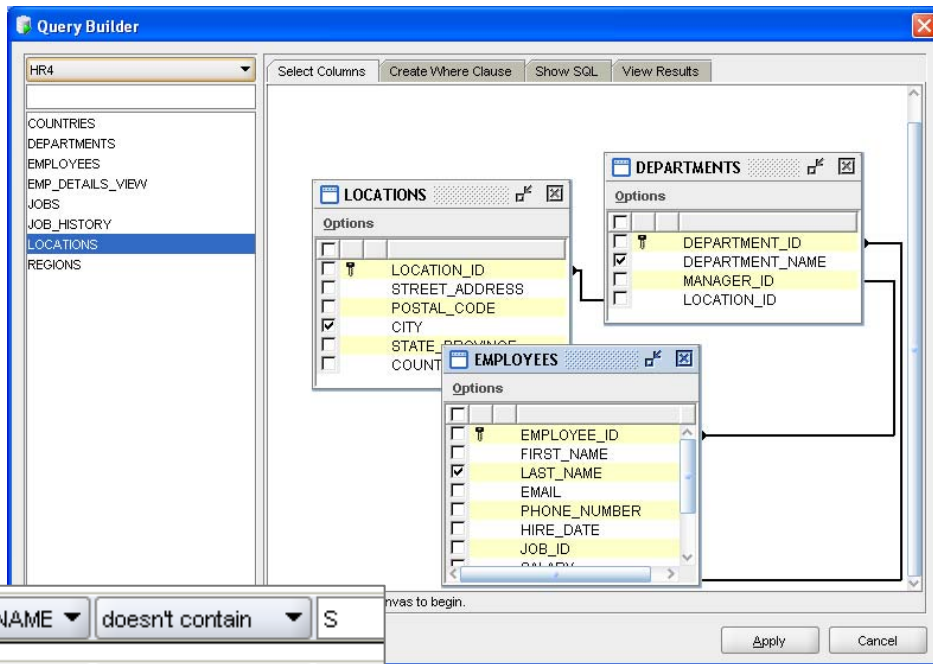
SQL Worksheet: Release 1.5

- New SQL Formatter
- Code refactoring options
- Increased code insight
- Drag and Drop choices
 - Select for individual statements
 - Select and join
 - Insert, Update, Delete
- Recall window sizing
- Flashback
- Multiple unshared worksheets
 - Ctrl-shift-N
- Dockable SQL History
 - Ctrl-Up or ctrl-down
- Code Templates
 - Ctrl-shift-T



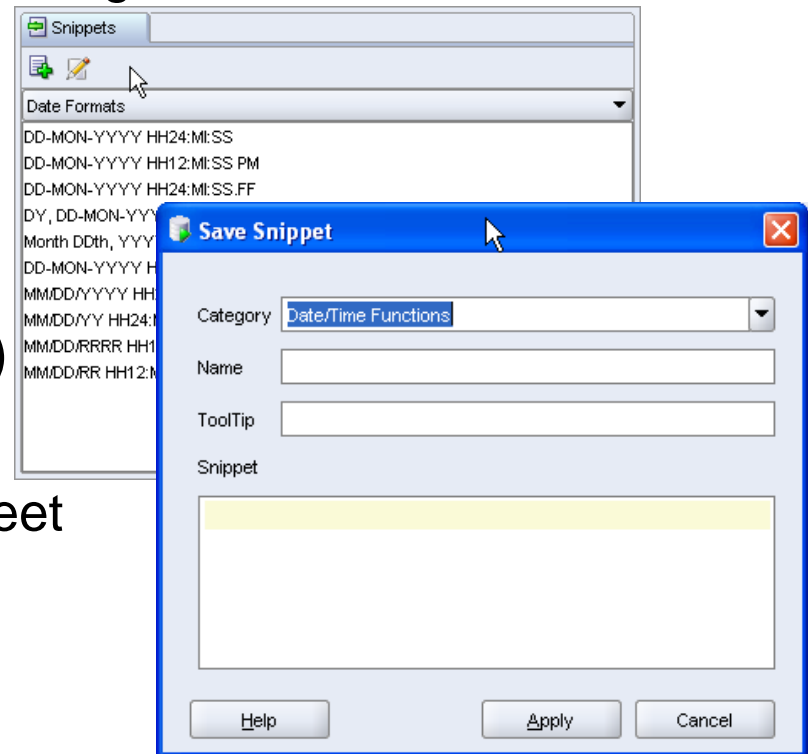
SQL Query Builder

- Drag & Drop Query Building
 - Context menu option
 - Multiple schema view
 - Automatic FK joins
 - Complex where clause
 - Preview SQL
 - Preview results
 - Add query to SQL Worksheet



Code Snippets and Templates

- Code Snippets
 - Drag and drop code from snippet categories to SQL Worksheet or Code editor
 - Create new
 - Categories
 - Snippets
- Code Templates (Release 1.5)
 - Add code in preferences
 - Ctrl-shift-J to add to SQL Worksheet



Searching

- Find (and replace) in all editors
- Find DB Objects
 - Across schemas
 - Navigate to object
- SQL Developer 1.5
 - Extended search
 - Across schemas
 - For object types
 - For usages

The screenshot displays the Oracle SQL Developer interface. The main editor window shows a PL/SQL script with the following code:

```
24 OPEN emp_cursor;
25 FETCH emp_cursor
26 INTO emp_record;
27 emp_tab(i) := emp_record;
28 WHILE (emp_cursor % FOUND)
29 AND (i <= pmaxrows)
30 LOOP
31 i := i + 1;
32 FETCH emp_cursor
33 INTO emp_record;
34 emp_tab(i) := emp_record;
35 END LOOP;
36 CLOSE emp_cursor;
37 FOR j IN REVERSE 1 .. i
38 LOOP
39 DBMS_OUTPUT.PUT_LINE(emp_t
40 END LOOP;
41 END;
```

The 'EMP_CURSOR' declaration on line 36 is highlighted in yellow. An 'Extended Search' dialog box is open, showing the search results for 'emp_cursor' across the database. The search parameters are:

- Connection: HR_11g_ORCL
- Name: emp_cursor
- Type: ALL
- Usage: ALL

The search results list the following occurrences:

- EMP_CURSOR CURSOR DECLARATION in EMP_LIST at line 3, col 8
- EMP_CURSOR CURSOR DECLARATION in EMP_MAIN at line 28, col 12
- EMP_CURSOR CURSOR DECLARATION in HR1.EMP_MAIN at line 28, col 12
- EMP_CURSOR CURSOR CALL in EMP_LIST at line 23, col 8
- EMP_CURSOR CURSOR CALL in EMP_LIST at line 24, col 9
- EMP_CURSOR CURSOR CALL in EMP_LIST at line 31, col 11
- EMP_CURSOR CURSOR CALL in EMP_LIST at line 35, col 9
- EMP_CURSOR CURSOR CALL in EMP_MAIN at line 59, col 8
- EMP_CURSOR CURSOR CALL in EMP_MAIN at line 60, col 9



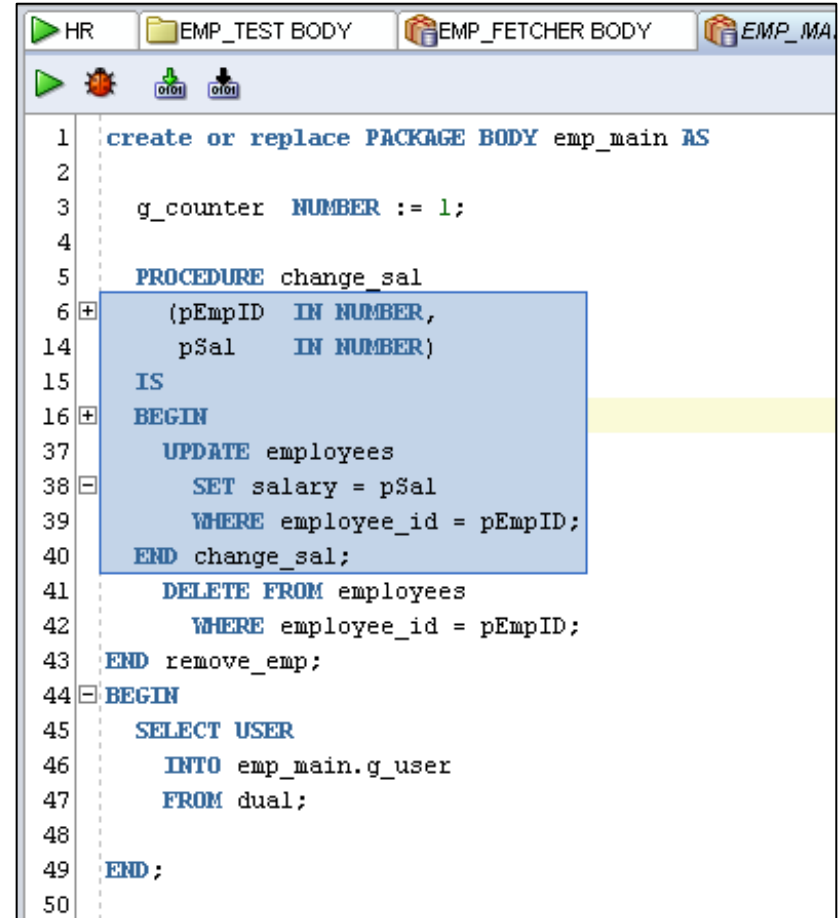
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D E M O N S T R A T I O N

SQL Developer

Creating and Running PL/SQL

- Code editor
 - Syntax highlighting
 - Code formatter
 - Code insight (auto complete)
 - Code folding
 - Code bookmarks
- Drag and drop code snippets
- Compile, Run and Debug
 - Inline error reporting
 - Remote debug
- SQL Developer 1.5
 - Include code templates
 - Hierarchical profiler



The screenshot shows the SQL Developer code editor with a PL/SQL package body named 'emp_main'. The code is as follows:

```
1  create or replace PACKAGE BODY emp_main AS
2
3      g_counter  NUMBER := 1;
4
5      PROCEDURE change_sal
6      (pEmpID  IN NUMBER,
7       pSal    IN NUMBER)
14     IS
15
16     BEGIN
17
37         UPDATE employees
38             SET salary = pSal
39             WHERE employee_id = pEmpID;
40     END change_sal;
41
42     DELETE FROM employees
43         WHERE employee_id = pEmpID;
44     END remove_emp;
45
46     BEGIN
47         SELECT USER
48             INTO emp_main.g_user
49             FROM dual;
50     END;
```

Debugging PL/SQL

- Set breakpoints
 - Configure conditions
- Compile for Debug
- Control program execution (Step into, over...)
- Run to Cursor
- Inspect and modify variables
- Review
 - Smart Data
 - Data
- Watches expressions
- View debug log

Inspector - emp_record

Name	Value	Type
emp_record		Rowtype
STATE_PROVINCE	'Washington'	VARCHAR2(255)
COUNTRY_ID	'US'	CHAR(2)
DEPARTMENT_NAME	'Executive'	VARCHAR2(30)
LAST_NAME	'King'	VARCHAR2(100)
JOB_TITLE	'President'	VARCHAR2(100)
SALARY	3001	NUMBER(8,2)
COMMISSION_PCT	NULL	NUMBER(2,2)

Smart Data

Name	Value
emp_record.last_name	'King'
emp_record.salary	3001

Debugging - Log

Connecting to the database HR_ORCL.
Executing PL/SQL: ALTER SESSION SET PLSQL_DEBUGGER=ON

Remote Debugging

Problem: Test a procedure being executed in a separate application

- SQL Developer
 - Select Remote Debug
 - Set up remote debug detail; machine, port
 - Browse to procedure
 - Set a breakpoint
- Remote session
 - execute DBMS_DEBUG_JDWP.CONNECT_TCP ('127.0.0.1', 4000)
 - Execute procedure
- SQL Developer
 - Debug

```
SQL> show user
USER is "HR"
SQL> exec DBMS_DEBUG_JDWP.CONNECT_TCP( '127.0.0.1', 4000 );

PL/SQL procedure successfully completed.

SQL> DECLARE
2     hdate      varchar2(20);
3     hname      varchar2(20);
4 BEGIN
5     Get_emp_name(100, hdate, hname);
6 END;
7 /
```



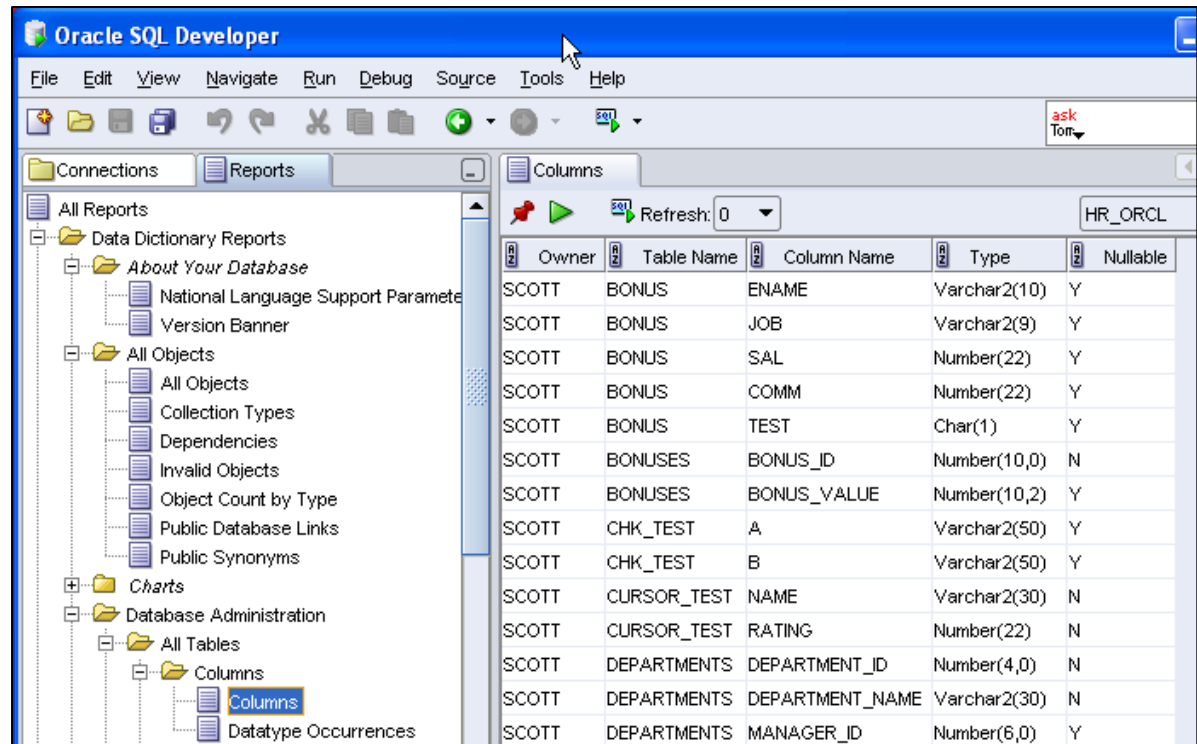

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D E M O N S T R A T I O N

SQL Developer

Creating and Running Reports

- Shipped Reports
 - DBA
 - System
 - Oracle APEX
 - Migration
- User Defined
 - Charts
 - Gauges (1.5)
 - Master/detail
- Drill down and navigation



The screenshot shows the Oracle SQL Developer interface. The 'Columns' window is open, displaying a table of columns from the HR database. The table has the following columns: Owner, Table Name, Column Name, Type, and Nullable. The data is as follows:

Owner	Table Name	Column Name	Type	Nullable
SCOTT	BONUS	ENAME	Varchar2(10)	Y
SCOTT	BONUS	JOB	Varchar2(9)	Y
SCOTT	BONUS	SAL	Number(22)	Y
SCOTT	BONUS	COMM	Number(22)	Y
SCOTT	BONUS	TEST	Char(1)	Y
SCOTT	BONUSES	BONUS_ID	Number(10,0)	N
SCOTT	BONUSES	BONUS_VALUE	Number(10,2)	Y
SCOTT	CHK_TEST	A	Varchar2(50)	Y
SCOTT	CHK_TEST	B	Varchar2(50)	Y
SCOTT	CURSOR_TEST	NAME	Varchar2(30)	N
SCOTT	CURSOR_TEST	RATING	Number(22)	N
SCOTT	DEPARTMENTS	DEPARTMENT_ID	Number(4,0)	N
SCOTT	DEPARTMENTS	DEPARTMENT_NAME	Varchar2(30)	N
SCOTT	DEPARTMENTS	MANAGER_ID	Number(6,0)	Y

Master-Detail Reports

- Create Master
 - Test report
 - Add binds
- Create Detail
 - Include Join Clause
 - Add Binds
 - Test full report

The screenshot shows the 'Create Report Dialog' window with the following configuration:

Master

- Name: MasterDept
- Style: Table
- Description: This is the Master Report
- SQL: `Select * from departments`
- Buttons: Add Child, Test, Load

Child1

- Type: Child
- Style: Table
- Name: DetailEmployees
- Description: This is the detail, child report
- SQL: `Select * from employees where department_id = :DEPARTMENT_ID`
- Buttons: Remove, Load

Navigation tabs: Details, Columns, Binds, Advanced, Table Details

Drill Down Reports

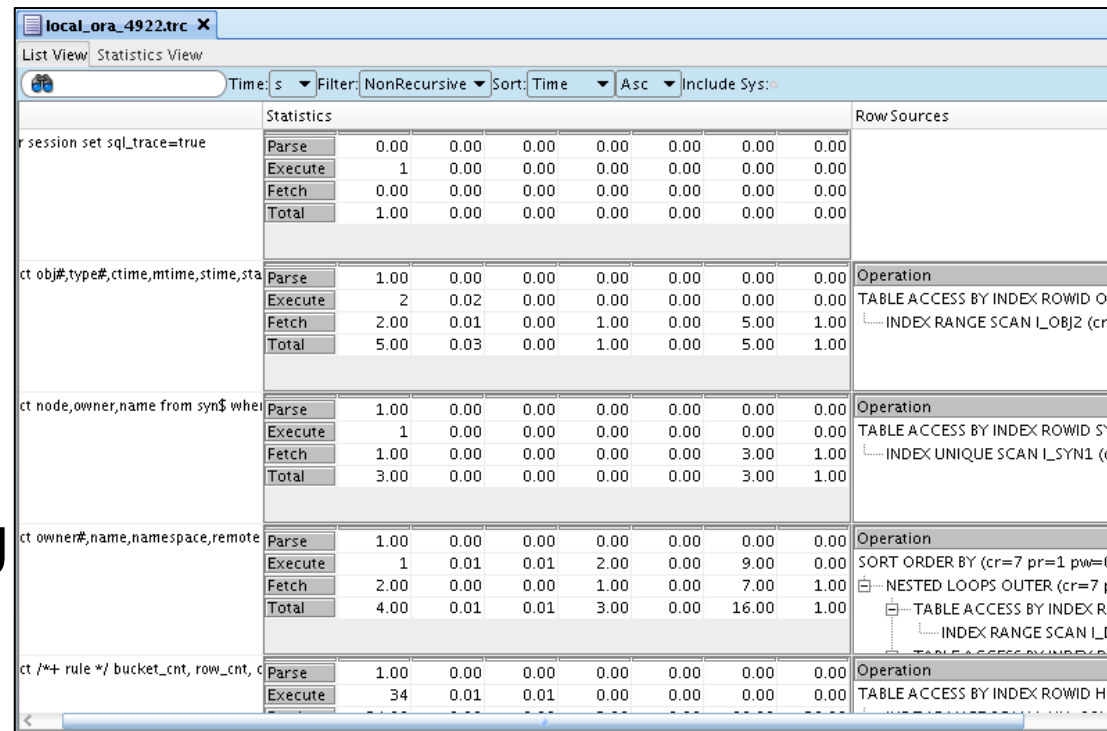
- Create reports to navigate from one report to the next
- Provide each report with a report ID
- Walk through the flow selecting report ids as the driver

DEPARTMENT ID	DEPARTMENT NAME	MANAGER ID	LOCATION ID
10	Administration	200	1700
20	Marketing	201	1800
30	Purchasing	114	1700
40	Human Resources	203	2400
50	Shipping	121	1500
60	IT		400
70	Public Relations		1700
80	Sales		1500
90	Executive		1700
100	Finance		
110	Accounting		
120	Treasury		
130	Corporate Tax	(null)	1700
140	Control And Credit	(null)	1700

The screenshot shows a report interface with a table of departments. A context menu is open over the 'IT' row (60). The menu options are: Single Record View, Auto-fit All Columns, Auto-fit Selected Column, Count Rows, Reports, and Export Data. The 'Reports' submenu is open, showing 'User Reports' and 'Auto Reports'. The 'User Reports' submenu is also open, showing 'Employees per Department'.

Support for SQL Tuning: Release 1.5

- Generate execution plans
- Generate trace information using auto trace
- Hierarchical Profiler
- Real time monitoring
- Parse SQL Trace files



The screenshot displays the 'Statistics View' of an Oracle SQL Trace file named 'local_ora_4922.trc'. The interface includes a search bar, a 'Time' dropdown set to 's', a 'Filter' dropdown set to 'NonRecursive', a 'Sort' dropdown set to 'Time', and an 'Include Sys' checkbox. The main content is a table with two columns: 'Statistics' and 'Row Sources'. The 'Statistics' column is further divided into 'Parse', 'Execute', 'Fetch', and 'Total' rows for each SQL statement. The 'Row Sources' column provides details about the operations performed, such as 'TABLE ACCESS BY INDEX ROWID' and 'INDEX RANGE SCAN'. The table shows several SQL statements with their respective execution statistics and row sources.

SQL Statement	Parse	Execute	Fetch	Total	Row Sources
session set sql_trace=true	0.00	1	0.00	1.00	
ct obj#,type#,ctime,mtime,stime,sta	1.00	2	2.00	5.00	Operation TABLE ACCESS BY INDEX ROWID O INDEX RANGE SCAN I_OBJ2 (cr
ct node,owner,name from syn\$ whe	1.00	1	1.00	3.00	Operation TABLE ACCESS BY INDEX ROWID SY INDEX UNIQUE SCAN I_SYN1 (c
ct owner#,name,namespace,remote	1.00	1	2.00	4.00	Operation SORT ORDER BY (cr=7 pr=1 pw=0 NESTED LOOPS OUTER (cr=7 p TABLE ACCESS BY INDEX R INDEX RANGE SCAN I_L
ct /*+ rule */ bucket_cnt, row_cnt, c	1.00	34	0.01	35.01	Operation TABLE ACCESS BY INDEX ROWID H



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D E M O N S T R A T I O N

SQL Developer

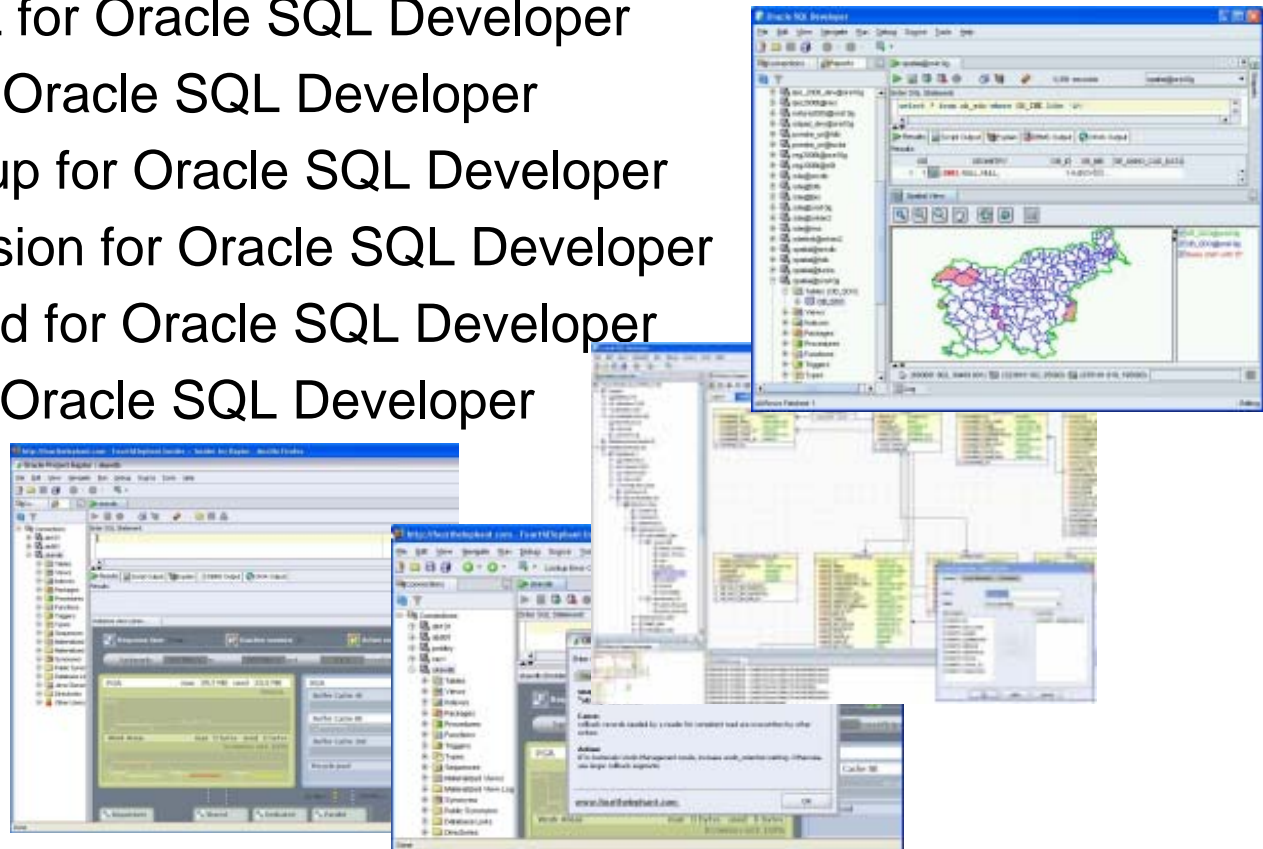
Extensibility

- SQL Developer leverages the JDeveloper IDE, thus giving developers the option to extend the functionality
- Oracle custom extensions:
 - Migration Workbench
 - TimesTen (early adopter)
 - Data Mining (coming soon)
 - Rdb (coming soon)



User Developed Extensions

- Users writing their own extensions
 - CWD4ALL for Oracle SQL Developer
 - Insider for Oracle SQL Developer
 - Error lookup for Oracle SQL Developer
 - GIS extension for Oracle SQL Developer
 - OrindaBuild for Oracle SQL Developer
 - Digger for Oracle SQL Developer



SQL Developer Migration Workbench

- Create database connections for MySQL, Microsoft SQL Server and Microsoft Access
- Browse and review database objects and data for third-party databases
- Access the SQL Worksheet and perform basic ANSI SQL
- Migrate Database Objects and Data from MySQL, Microsoft SQL Server, Sybase(in Release 1.5) and Microsoft Access
- Quick Migrate Utility provides a one-step migration of database objects and data to Oracle
- Manual migration alternatives offer step-by-step migration
- Scratch Editor provides translation of T-SQL, MySQL or Access to the Oracle equivalent

SQL Developer and Oracle Application Express 3.0.1

- Connect to and browse all Oracle APEX applications associated with a database schema
 - Application level
 - Page level
- Run a number of reports that allow users to report on:
 - Workspaces
 - Applications
 - Pages
 - Schemas
- Export and Import Oracle APEX applications using a context menu

Additional Focus Areas: Release 1.5

Planned Integration:

- Source Code Control
 - Subversion and CVS
- File Based development

SQL Developer Exchange

<http://sqldeveloper.oracle.com>

The screenshot shows a Mozilla Firefox browser window displaying the Oracle SQL Developer Exchange website. The page title is "Feature Request - Mozilla Firefox". The address bar shows the URL: http://htmldb.oracle.com/pls/otn/f?p=42626:37:3016287415489956::fsp_sort_7_desc::RP&. The page header includes the Oracle logo and "TECHNOLOGY NETWORK". Navigation links include Snippets, Reports, Tips & Tricks, News, F.A.Q., Features, and a welcome message for Susan with links for Sign Out and Account. A menu bar contains Downloads, Documentation, Discussion Forums, Articles, Sample Code, Training, RSS, and Resources For. The main content area is titled "Feature Requests" and includes a "Create" button. A notice states: "Features requested here are not guaranteed to be implemented. The Product Development team will be using these requests to assist in deciding the product direction. Do not log bugs here. This is for new functionality to be implemented. Use the forums or metalink for bug reports." Below this is a search bar with a status dropdown set to "Scheduled for Release 1.5" and a "Go" button. A table lists the feature requests with columns for Title, Description, Status, Score, Created, Updated, and Weight.

Title	Description	Status	Score	Created	Updated	Weight
Open in edit mode	When does doubleclick in packages,,packages bodies,procedures,triggers Open in edit mode	Scheduled for Release 1.5	0.00	03-JUL-07	20-SEP-07	0.00
Drag-and-drop text moving in SQL Worksheet	Enable drag-and-drop moving of selected blocks of text in SQL Worksheet, as exists in PL/SQL Editor.	Scheduled for Release 1.5	6.00	21-FEB-07	20-SEP-07	12.00
Regarding History Commands	When you press F8 it shows the list of history commands. When double click a statement , that statem	Scheduled for Release 1.5	8.00	06-APR-07	20-SEP-07	16.00
Change Case	I would like an Upper Case and Lower Case editing options so that I could highlight some code and ch	Scheduled for Release 1.5	3.00	14-JUN-07	20-SEP-07	9.00

Summary

- Lightweight, easy install
- Browse schemas, users and data
- Create and update objects
- Create, execute and debug PLSQL
- Run and create user defined reports
- Migrate from third-party databases using the Migration Workbench
- Browse Oracle Application Express 3.0.1. content
- Extend development environment

For More Information

<http://search.oracle.com>

or

http://www.oracle.com/technology/products/database/sql_developer



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