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## Using Oracle SQL Developer and SQL Developer Data Modeler to aid your Oracle Application Express development

Marc Sewtz | Software Development Manager | Oracle Application Express

Oracle USA Inc.

520 Madison Avenue, New York, NY 10022

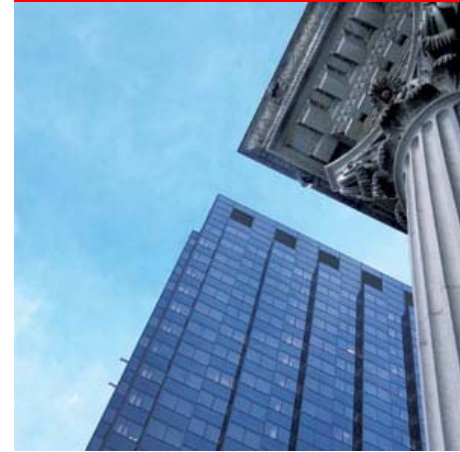
[marc.sewtz@oracle.com](mailto:marc.sewtz@oracle.com)



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# Agenda

- Oracle Application Express Overview
- SQL Developer Overview
- Data Modeler Overview
- Demonstration

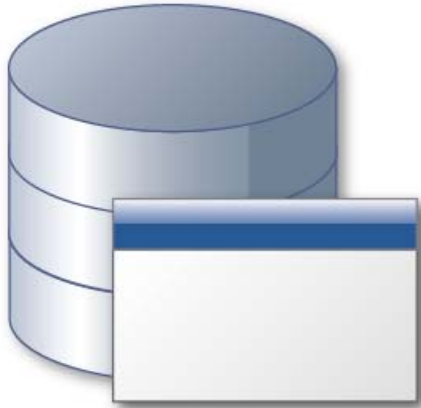


# Oracle Application Express

## Overview



# Oracle Application Express Overview

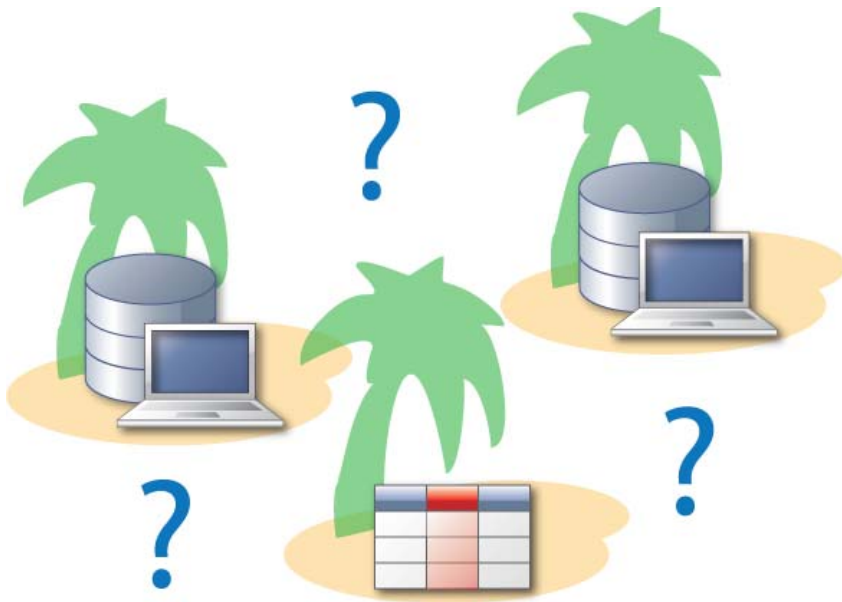


- Unique Rapid Application Development (RAD) tool for the Oracle Database
- Browser based for Development, Deployment and Use
- Allows to declaratively build professional Web 2.0 applications that are fast and secure
- Leverages full Oracle database capabilities and existing SQL & PL/SQL skills
- Standard component of the database
- Fully supported, “no-cost” option with all editions of the Oracle Database

**Easy to develop • Easy to deploy • Easy to manage**

# Proliferation of Departmental Databases

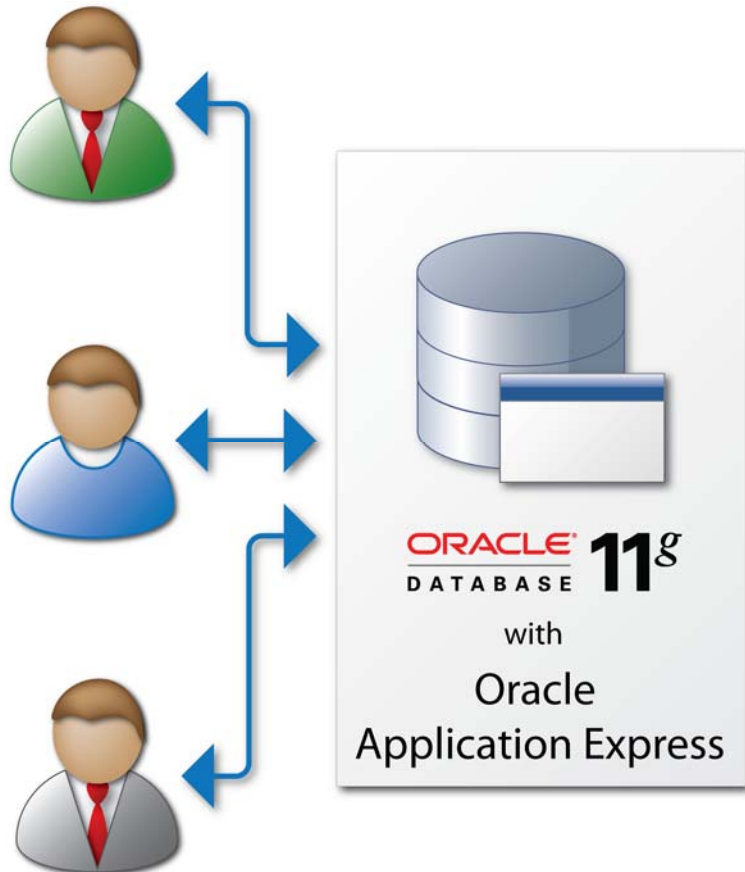
## Inefficient, Ad-hoc Deployments



- Departments continuously create decentralized databases to solve tactical issues
- Need solutions NOW that they control
- Often contain business critical data
- Security, sharing, data accuracy, and high availability are problematic
- Costs are driven up as hundreds of these systems are created
- Users work against IT, not with IT

# The APEX Consolidated Model

## Decentralized Development, Centralized Management



- Consolidate departmental data and the application development service into Oracle Database 11g with Application Express (APEX)
- Departments maintain full control over application development
- IT provides professional data management
- End users experience dramatically improved data access via modern Web based applications
- Oracle Database 11g ensures that APEX applications are secure, reliable and scalable

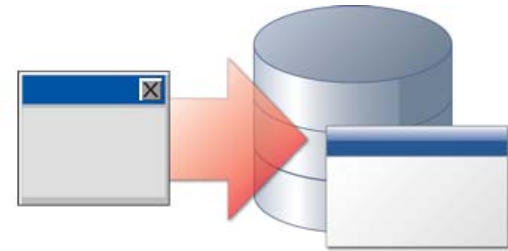


# Oracle Application Express Overview



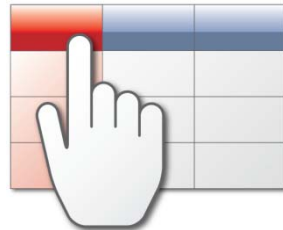
## Data-driven Applications

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

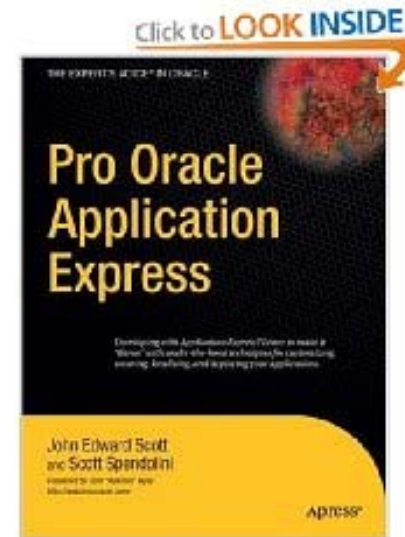
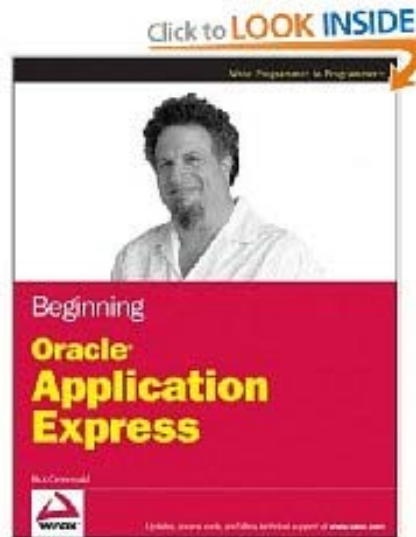
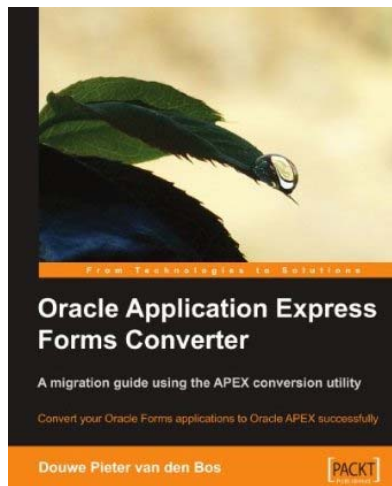


## Access Replacement

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

# Oracle Application Express Momentum

- **Developer community - Estimated at 250k, 100k+ downloads / year**
- **apex.oracle.com - 5m page views / week, 15k workspaces**
- **Active Discussion Forum – 4.2m views, 47k threads, #3 on OTN**
- **5 Books, 80 Consulting companies, 50 BLOGs, 10 Hosting Partners**
- **Major Focus of ODTUG including APEXposed Conference**



# APEX within Oracle

- Oracle Store – *Multi-lingual, multi-currency, Web services and Apps integration*

- ARIA People – *Most reliable, heavily used application in Oracle*

- Project Management – *Software Projects, Customer Wikis, Consulting Summaries*

- Internet Sites – *AskTom, ThinkQuest, apex.oracle.com*





# APEX Internet Applications



- Commercial Sites
- Company Web Sites
- User Groups / Associations – *ODTUG, IOUG, etc.*
- Government / Non-*Profit* – *UDOT, ProMED Mail*

# APEX Hosting Companies



# APEX 4.0 New Features

- Team Development
- Websheets
- Improved Charting
- REST Web Services
- Improved Application Builder
- Improved Interactive Reports
- Declarative Tabular Forms
- AJAX Client-Side Validations
- Improved Tree Controls
- Improved Error Handling



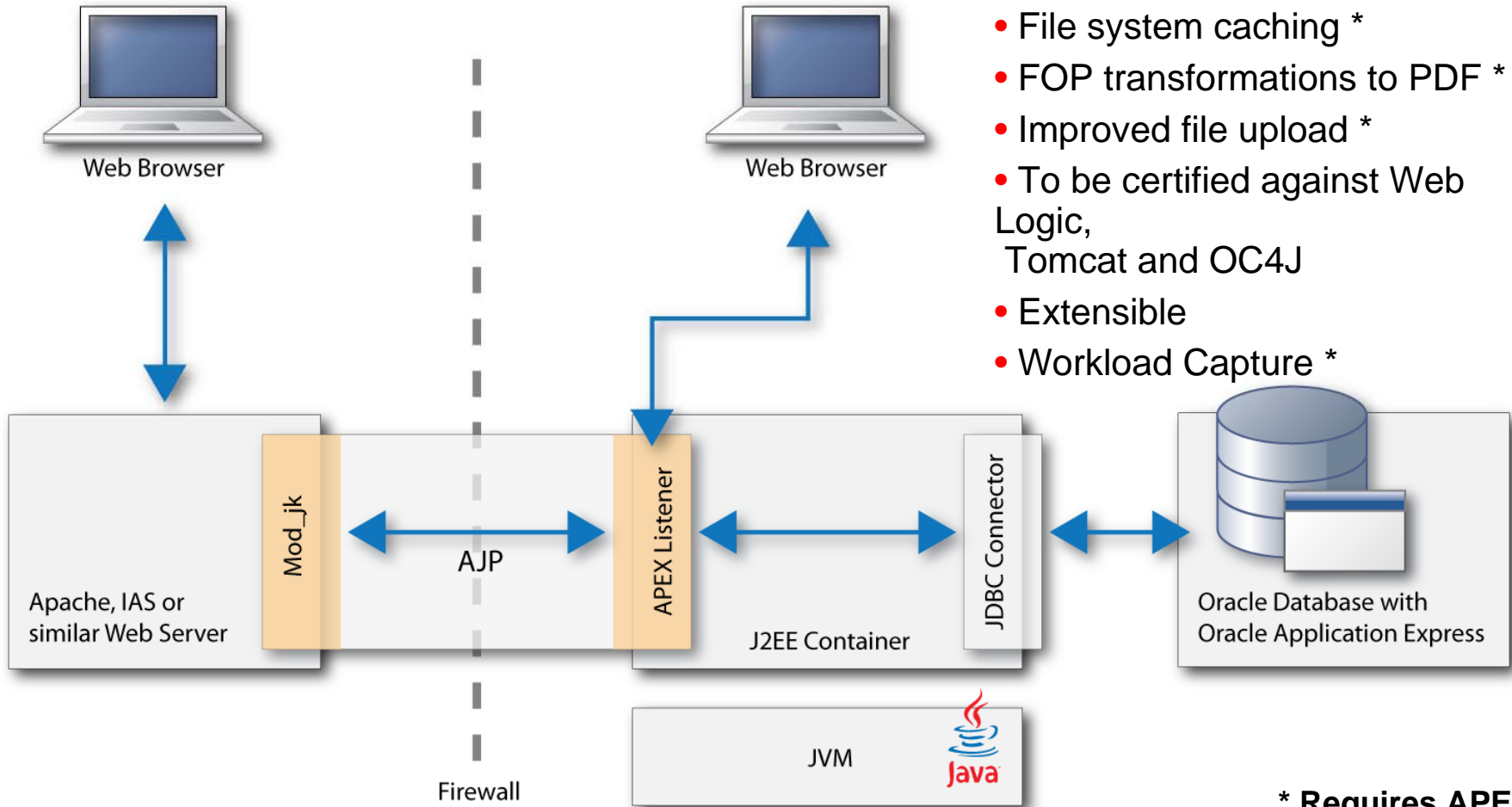
# APEX 4.0 New Features

- Dynamic Actions
- Plug-Ins
- Integrate jQuery and jQuery UI
- Improved Item Properties
  - Additional Attributes
  - Textareas: Resizable
  - Combo Box (editable select list)
  - JavaScript Date pickers





# Oracle APEX Listener



- Java based
- mod\_plsql replacement
- Support latest APEX releases
- File system caching \*
- FOP transformations to PDF \*
- Improved file upload \*
- To be certified against Web Logic, Tomcat and OC4J
- Extensible
- Workload Capture \*

\* Requires APEX 4.0

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# Oracle SQL Developer

## Overview



# SQL Developer Features

- Creating database connections
- Creating and browsing objects
- Querying and updating data
- Running the Query Builder
- Importing / 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+
- Integrating with TimesTen
- Working with files and version control

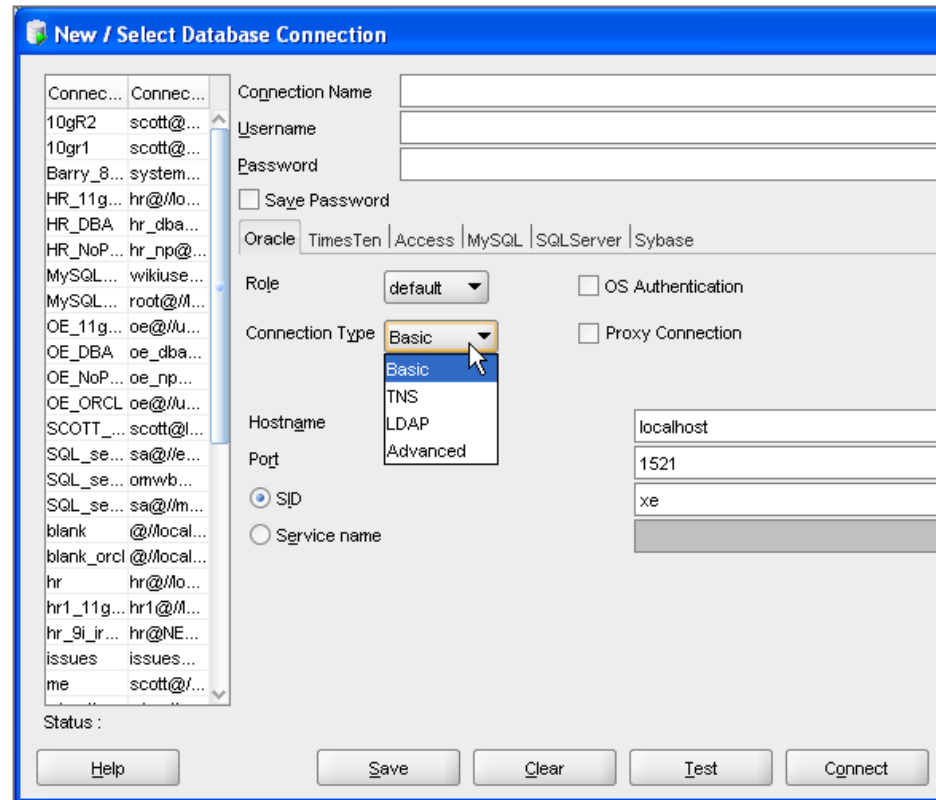
The screenshot displays the Oracle SQL Developer interface. On the right, the 'Connections' pane shows a tree view of the 'HR\_ORCL' database, including tables like COUNTRIES, DEPARTMENTS, EMPLOYEES, and EMP. In the center, the 'Extended Search' dialog is open for the 'emp\_cursor' connection. Below it, a table of data is displayed with columns DEPARTMENT\_ID, DEPARTMENT\_NAME, MANAGER\_ID, and LOCATION\_ID. The value '103' in the MANAGER\_ID column of the 6th row is circled in red. At the bottom, the 'SQL Editor' window shows a PL/SQL package body named 'emp\_main' with procedures 'change\_sal', 'remove\_emp', and 'select\_user'.

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		
14	140 Control		

```
1 create or replace PACKAGE BODY emp_main
2
3   g_counter NUMBER := 1;
4
5   PROCEDURE change_sal
6   (pEmpID IN NUMBER,
7    pSal IN NUMBER)
8   IS
9   BEGIN
10    UPDATE employees
11     SET salary = pSal
12     WHERE employee_id = pEmpID;
13   END change_sal;
14
15   PROCEDURE remove_emp
16   (pEmpID IN NUMBER)
17   IS
18   BEGIN
19    DELETE FROM employees
20     WHERE employee_id = pEmpID;
21   END remove_emp;
22
23   PROCEDURE select_user
24   (pEmpID IN NUMBER)
25   IS
26   BEGIN
27    SELECT USER
28     INTO emp_main.g_user
29     FROM dual;
30   END select_user;
31
32 END;
```

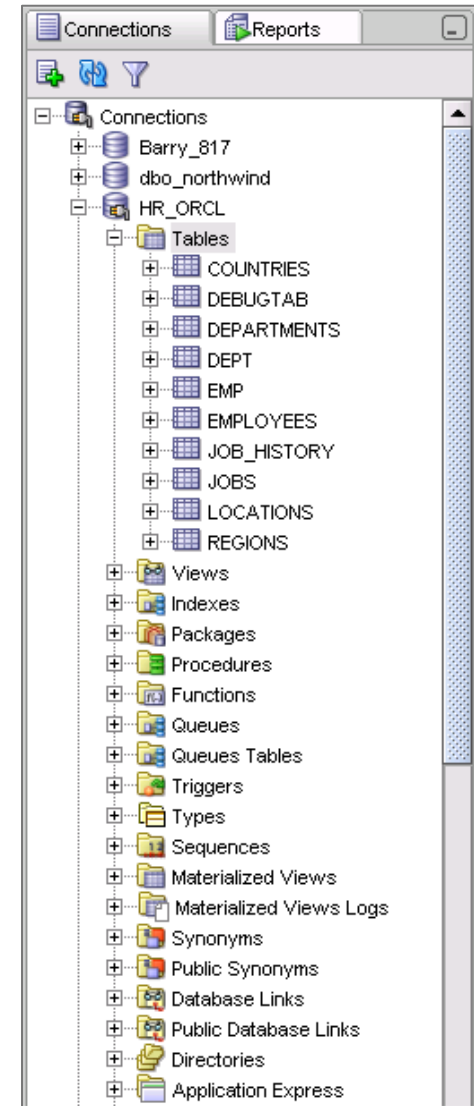
# Database Connections

- Create, save and test
  - Multiple databases
  - Multiple schemas
- Import and export
- Reuse
  - Database browsing
  - PL/SQL development
  - Running reports



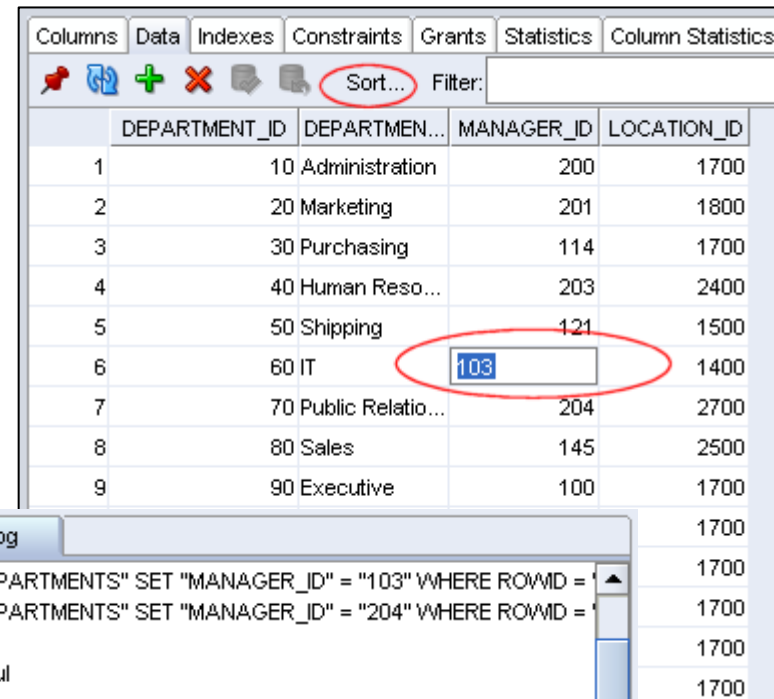
# Creating and Browsing Objects

- 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
  - Queues, Queue Tables (SQL Developer 1.5)
  - Browse and Load Java (SQL Developer 1.5)
  - XML Schemas
  - Recycle Bin
  - Other Users
- Generate DB Doc (SQL Developer 1.5)
- Run Manage Database report (SQL Developer 1.5)

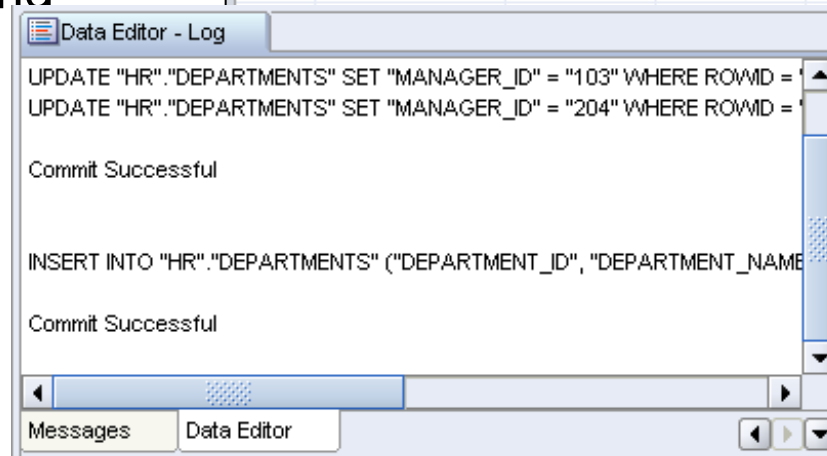


# Querying and Updating Data

- 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
- SQL Developer 1.5
  - Recall filters
  - Persist sort
  - Clear grid settings



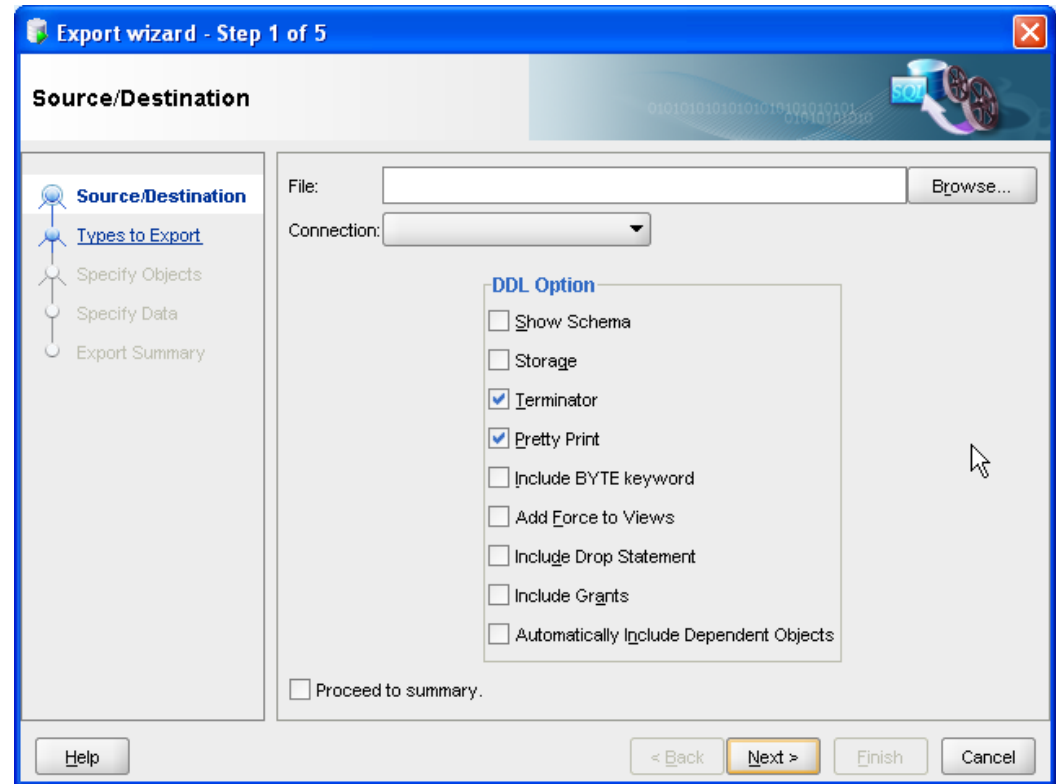
	DEPARTMENT_ID	DEPARTMENTEN...	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	30	Purchasing	114	1700
4	40	Human Reso...	203	2400
5	50	Shipping	121	1500
6	60	IT	103	1400
7	70	Public Relatio...	204	2700
8	80	Sales	145	2500
9	90	Executive	100	1700



```
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
```

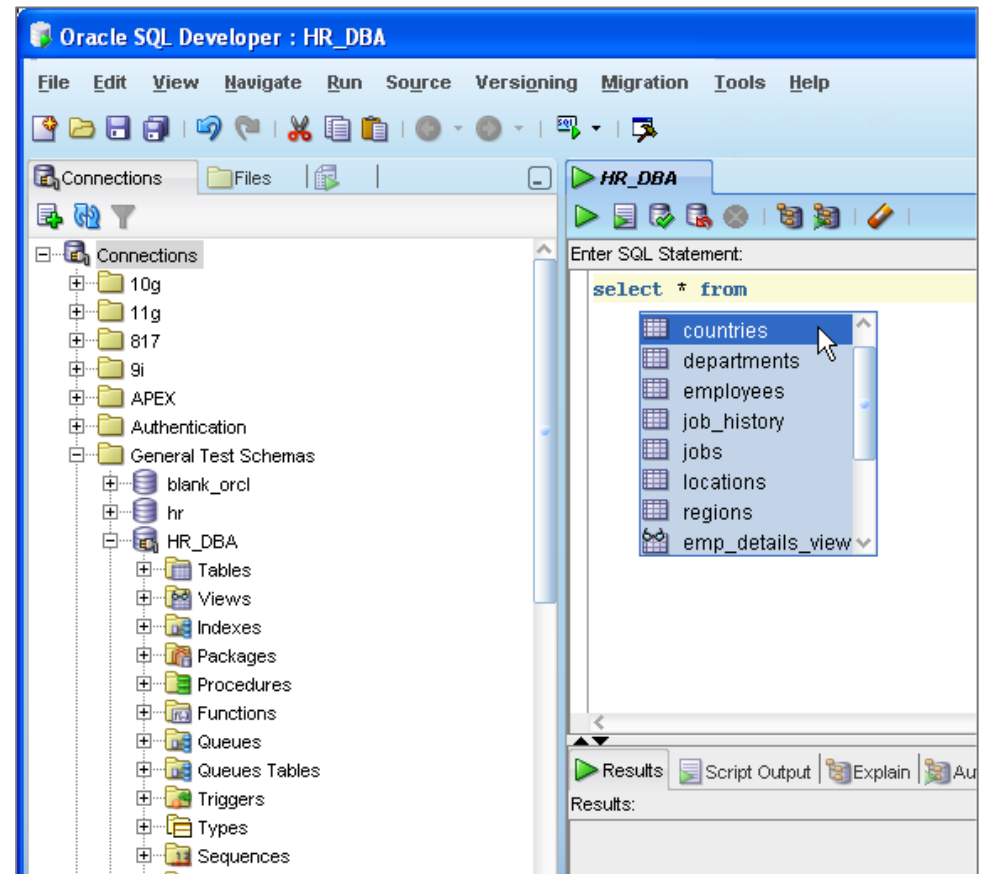
# Exporting and Importing

- Context menu DDL and data export
- Data Export
  - Text, CSV, Insert, Loader, XML, HTML, XLS
- Import Data
  - MS Excel
- Multiple object export
- SQL Developer 1.5
  - Export wizard



# SQL Worksheet

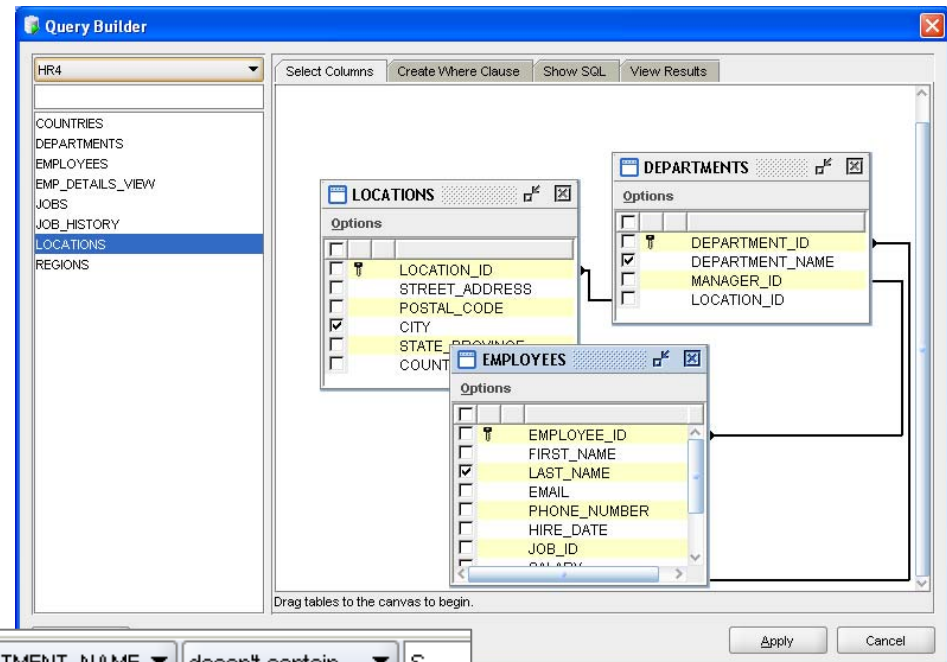
- Execute queries, scripts
  - Single statement execution
  - Script execution
- Editing statements
  - Syntax highlighting
  - Code insight
  - Code formatting
  - Bind variable support
- Other options
  - Command history
  - Explain Plan
  - Autotrace
  - HTP and OWA output
- SQL\*Plus commands





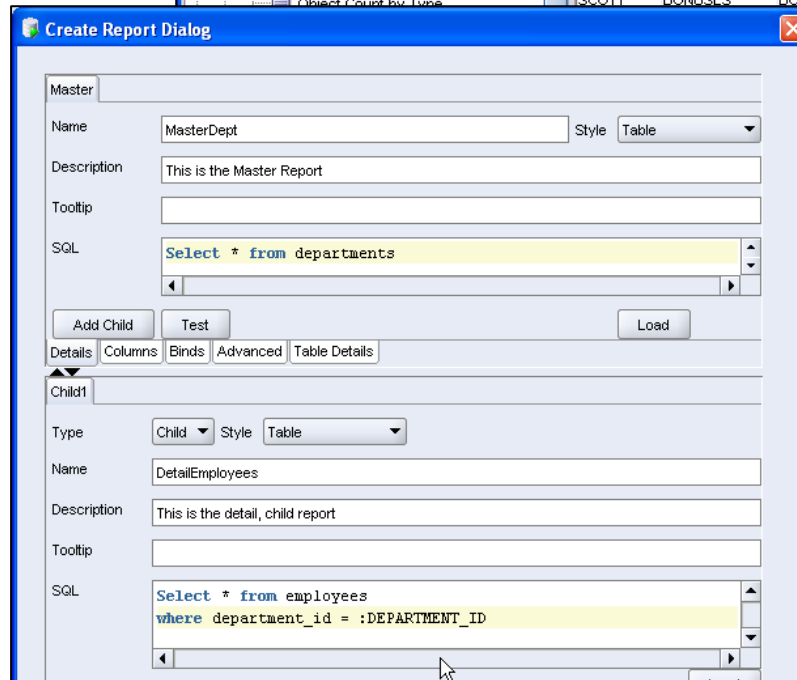
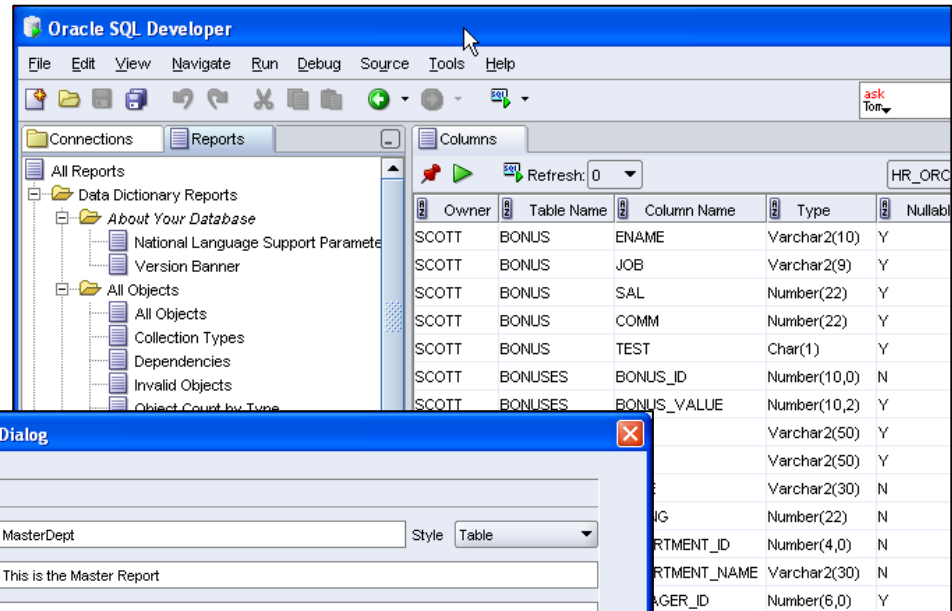
# SQL Query Builder

- 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



# Creating and Running Reports

- Shipped Reports
  - DBA
  - System
  - Oracle APEX
  - Migration
- User Defined
  - Charts
  - Gauges (SQL Dev 1.5)
  - Master/detail
  - Drill down
  - Script
  - HTML
  - Code

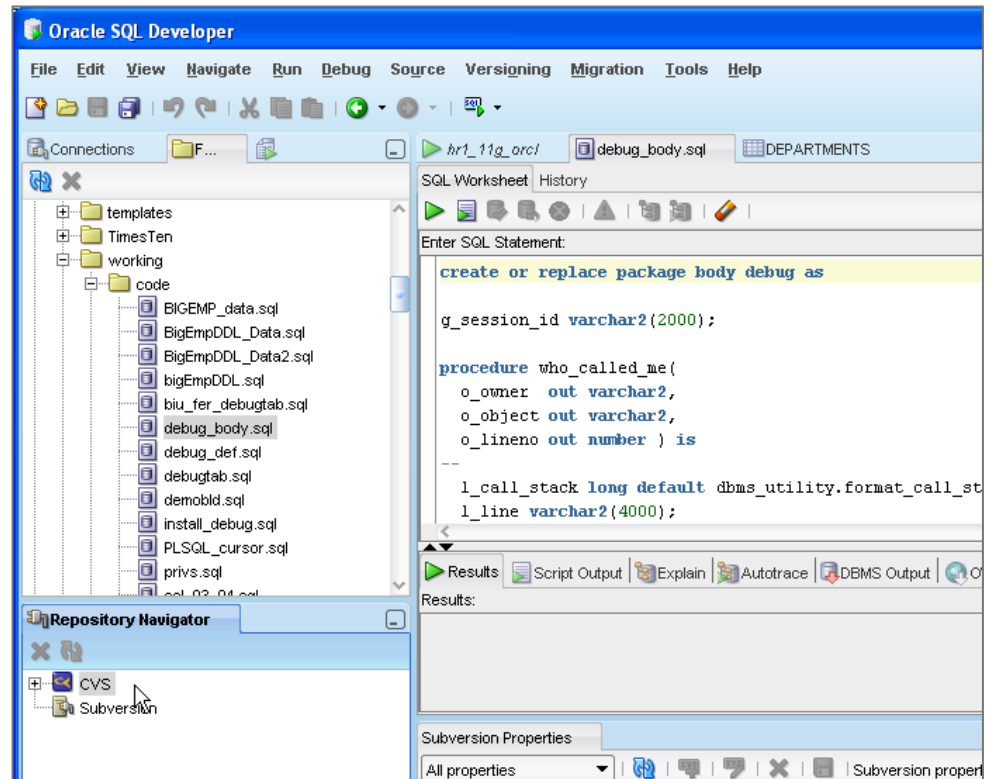


# File Based Development

New in SQL Developer 1.5

SQL Developer supports file based development

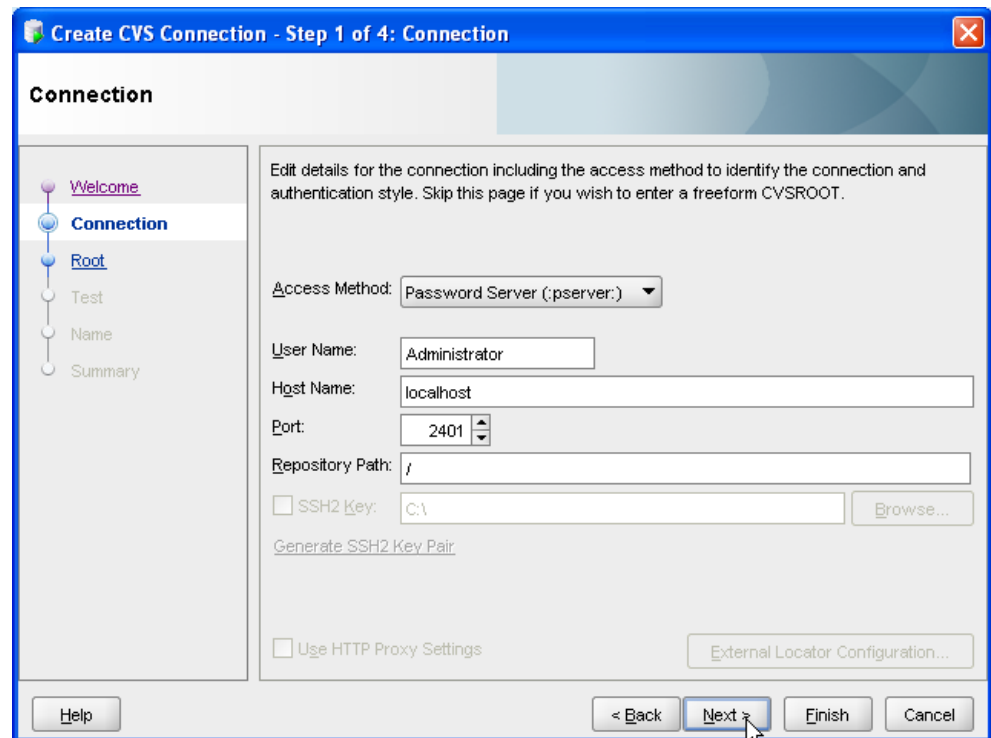
- Explore files in the File Navigator
- Open files in the SQL Worksheet
- Place files under version control



# Integrated Version Control Support

## New in SQL Developer 1.5

- SQL Developer provides integrated support for versioning and source control systems:
  - CVS (Concurrent Versions System)
  - Subversion
- Access using Versioning menu



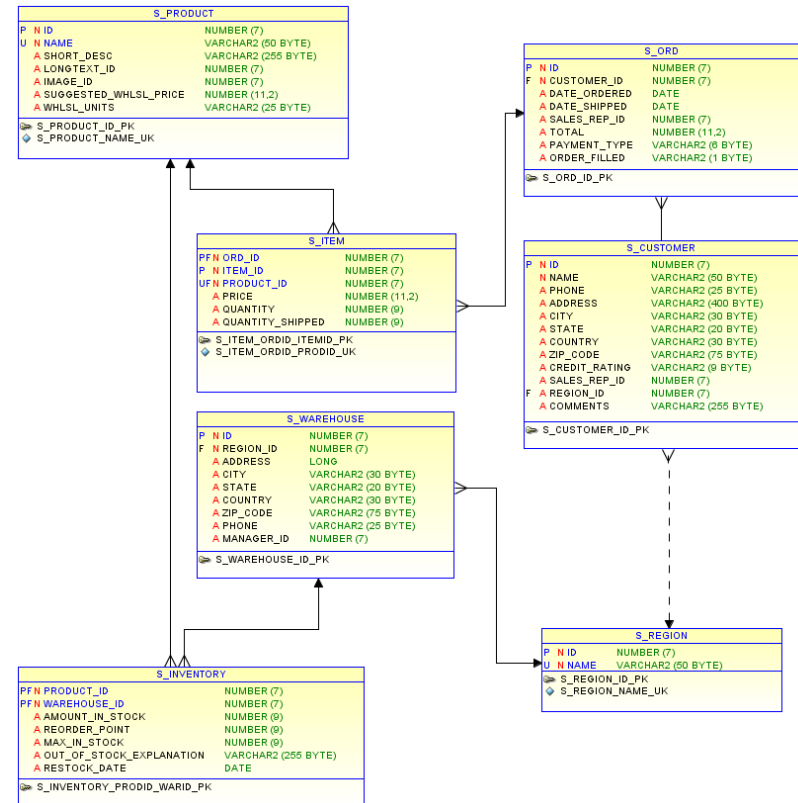
# Oracle SQL Developer Data Modeler

## Overview



# Oracle SQL Developer Data Modeling

- Supports a variety of visual models
  - Entity Relationship (ERD) - supports Barker and Bachman notation (EAR)
  - Relational
  - DataTypes (SQL99)
  - Multi-Dimensional (MD)
  - Data Flow
- Records details for
  - Physical implementation
  - Business information
  - Domains



# Oracle SQL Developer Data Modeling

- Imports from various sources including
  - DDL and Dictionary import from Oracle Database
  - Oracle Designer repository
  - DDL and Dictionary import from SQL Server, UDB and DB2
  - General JDBC based dictionary import for non-Oracle databases
  - Other modeling tools
- Exports to various sources
  - DDL for Oracle and non-Oracle Databases
  - Oracle Analytical Workspaces
  - Multi-Dimensional XMLA format

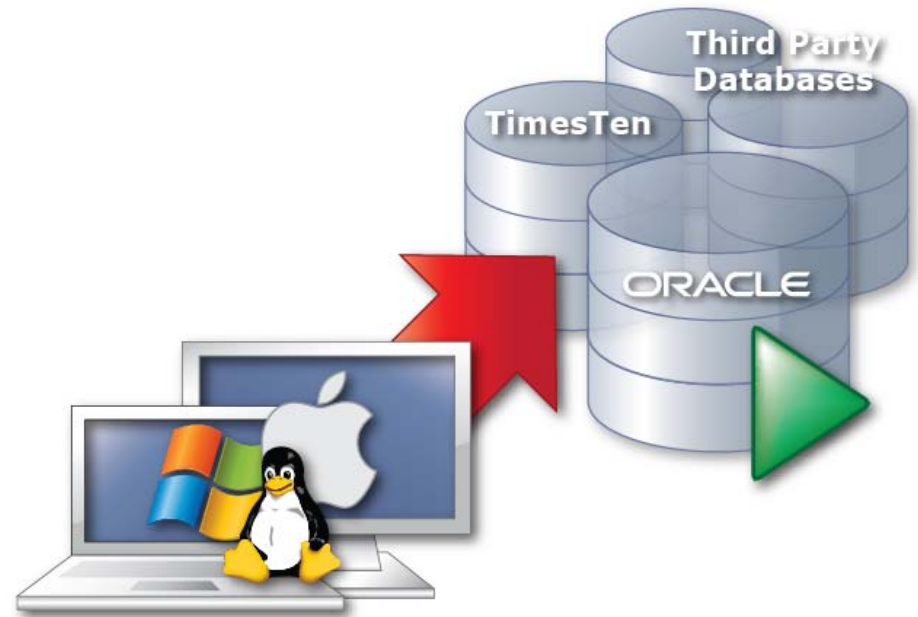
# Data Modeling and the Audience

- Analysis (Logical – Platform independent)
  - Gather data requirements without implementation detail
  - Create and transform ERD to one or more relational designs
  - Supports data analysts, enterprise and data architects
- Design (Physical)
  - Create new or update engineered relational model
  - Create one or more physical implementations from the relational model
  - Generate DDL for implementation
  - Execute DDL to create database objects
  - Supports database administrators
- Read-only Viewer
  - Print diagrams and consult model properties
  - Supports application developers, business and end users



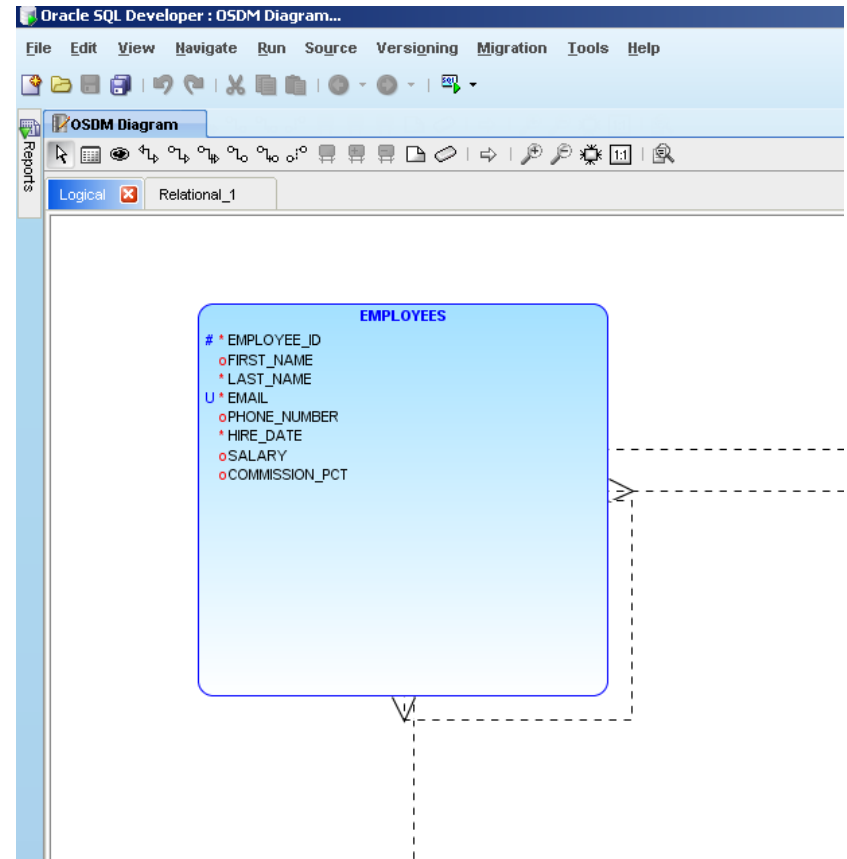
# Technology

- Technology and Architecture
  - Implemented as standalone and as an extension to SQL Developer
  - Java based
- Database support
  - Oracle 9i, 10g, and Oracle 11g
  - Third-party databases
    - Microsoft SQL Server
    - DB2
- Platform support
  - Windows
  - Linux
  - Mac OSX



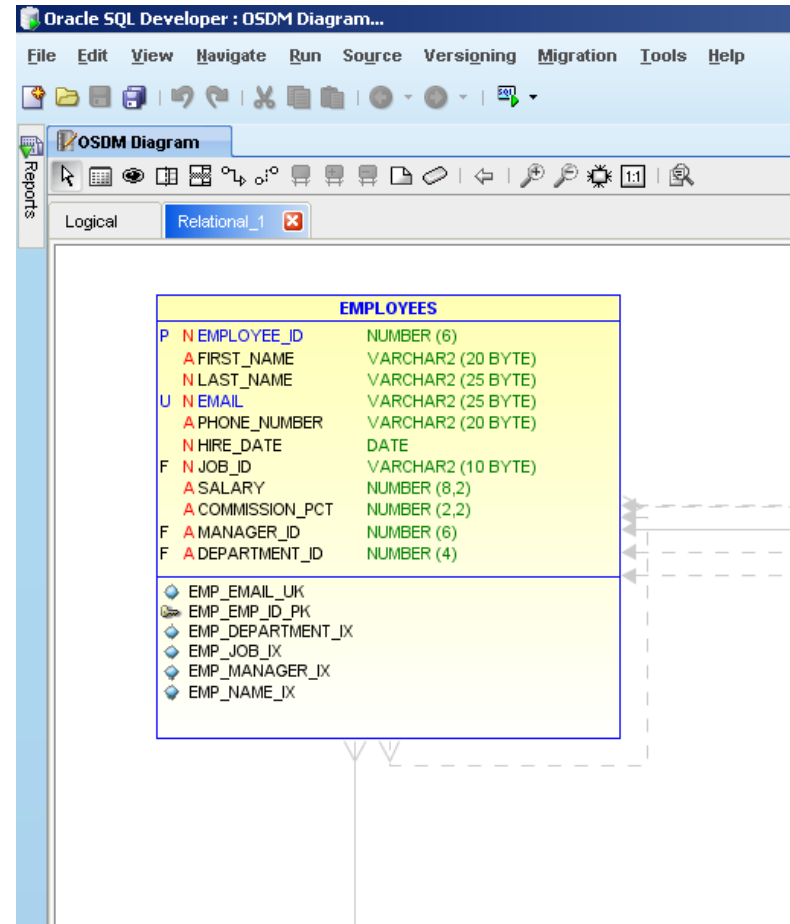
# Logical Modeling

- Model entities, attributes and relations
- Supports
  - Super type
  - Sub types
- One logical for many relational and multi-dimensional models
- Forward and reverse engineering



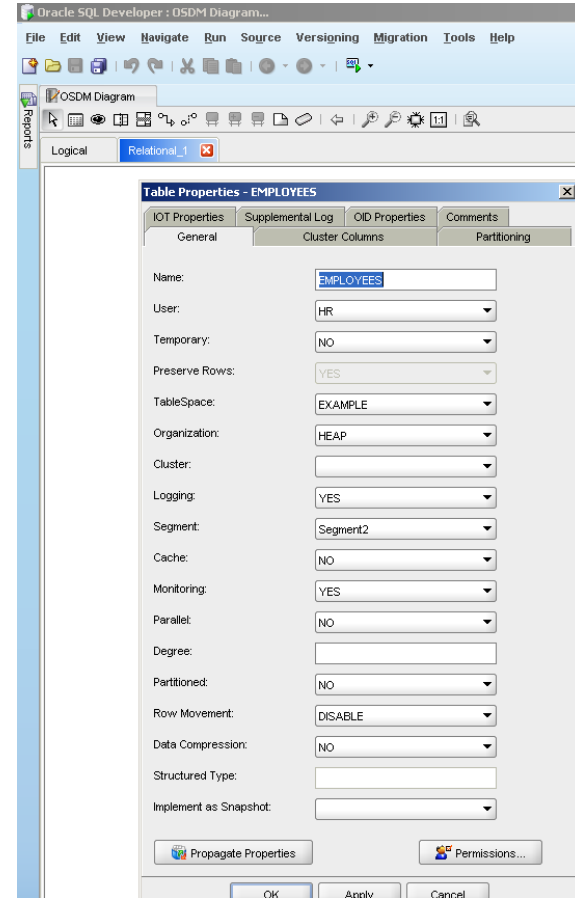
# Relational Modeling

- Model tables, columns and FKs
- One logical for many relational models
- Forward and reverse engineering



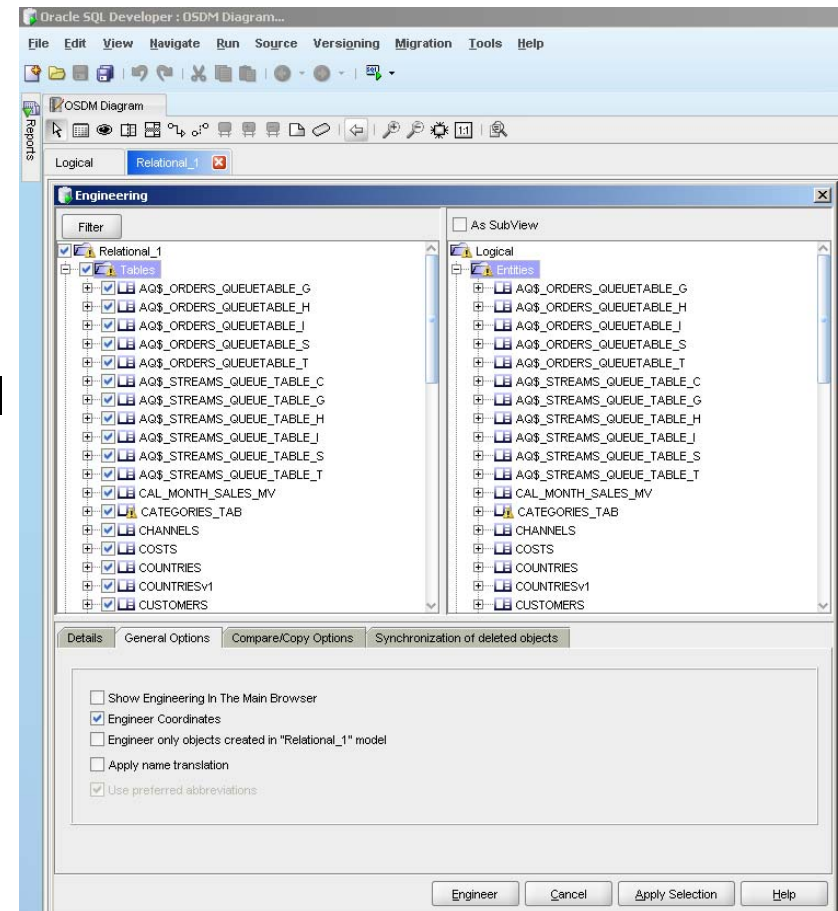
# Physical Modeling

- One relational model for many physical models
- Supports
  - Oracle Database 9i, 10g and 11g
  - Microsoft SQL Server
  - IBM UDB and DB2
- DDL file editor supports
  - Design Rules
  - Object selection
  - Drop objects
  - Table scripts



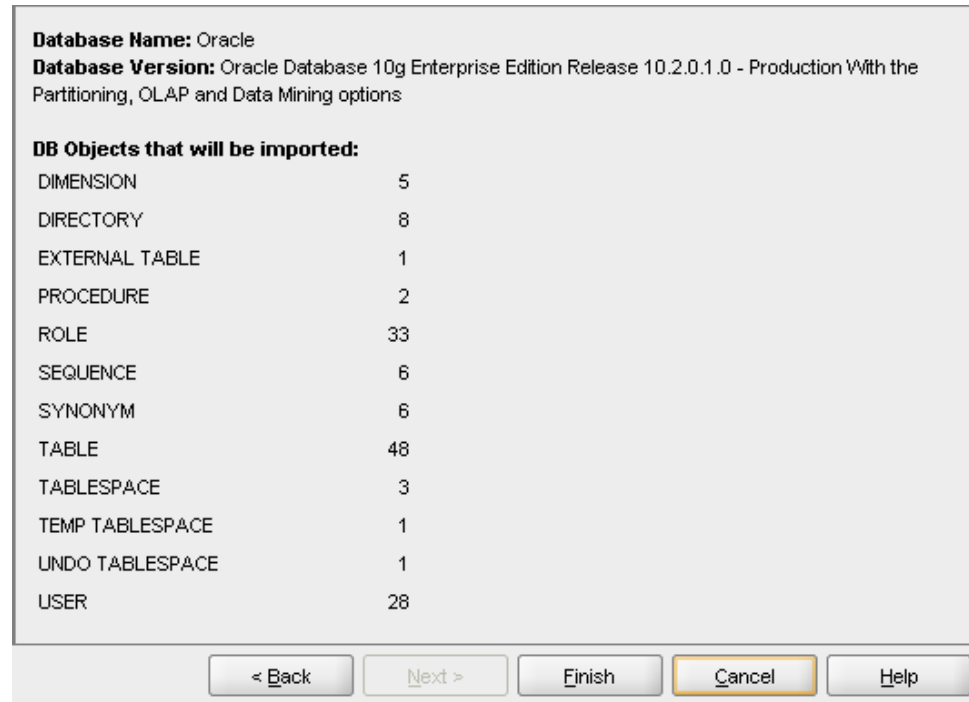
# Forward and Reverse Engineering

- Mapping from one logical model
  - To one or more relational models
- Mapping from a relational model
  - To one logical model
- Mapping from one relational model
  - To one or more physical models
- Mapping from one physical model
  - To one relational model
- Options
  - General
  - Compare/copy
  - Synchronization



# Importing

- Oracle Database 9i, 10g and 11g
  - Database catalog
  - Scripts
- Oracle Designer repository import
- Generic JDBC based Dictionary
  - Examples: MySQL, Terradata
- SQL Server, DB2 and UDB
  - Database catalog
  - Scripts
- Multi-Dimensional
  - Cube views
  - XMLA
- Other Modeling tools
  - CA ERwin
  - Bachman



**Database Name:** Oracle  
**Database Version:** Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production With the Partitioning, OLAP and Data Mining options

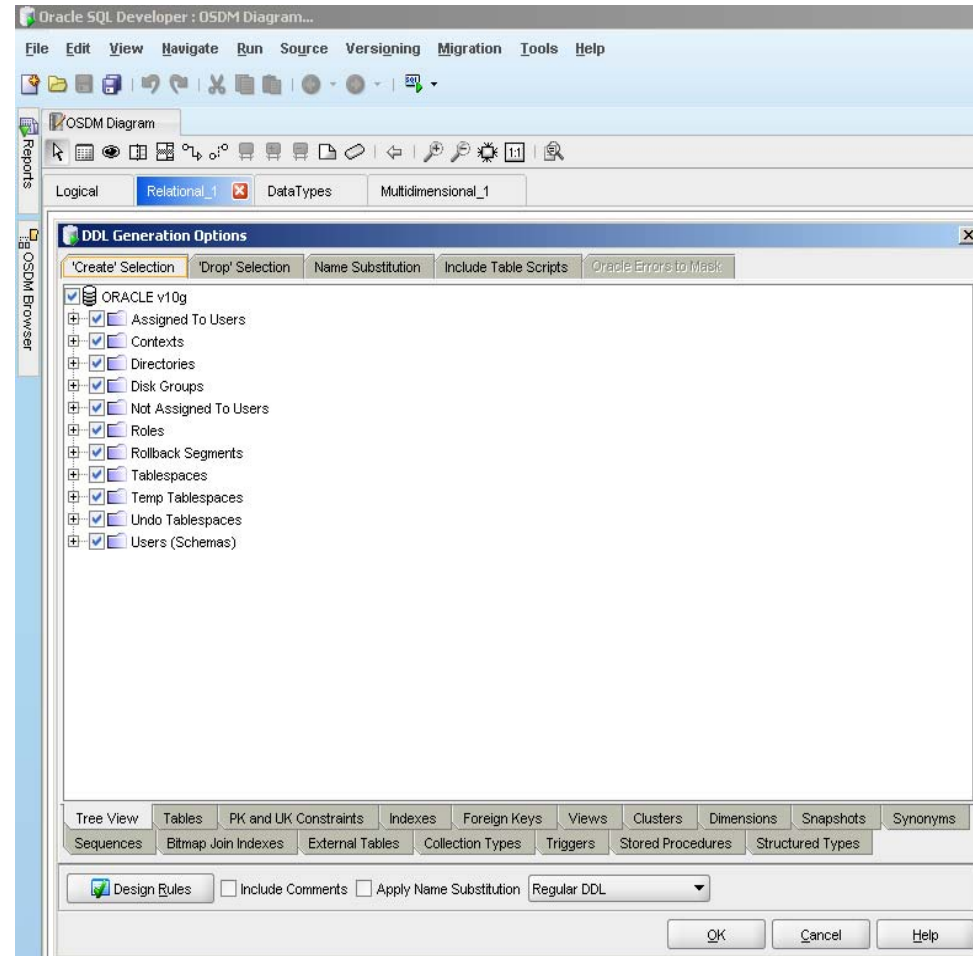
**DB Objects that will be imported:**

DIMENSION	5
DIRECTORY	8
EXTERNAL TABLE	1
PROCEDURE	2
ROLE	33
SEQUENCE	6
SYNONYM	6
TABLE	48
TABLESPACE	3
TEMP TABLESPACE	1
UNDO TABLESPACE	1
USER	28

< Back   Next >   Finish   Cancel   Help

# Exporting and Code Generation

- Standard database scripts
  - Oracle,
  - IBM DB2 and UDB
  - MicroSoft SQL Server
- Multi-Dimensional Oracle AW, Cube Views and XMLA
- CSV export



# File or Repository Based

- File Based
  - All details and diagrams stored in XML files on the desktop or file server
  - Can be placed under source code control (not integrated in Data Modeling)
- Repository
  - Customer demand for repository based model development
  - Oracle Database
- Advantages of a Repository
  - Single location, easy for impact analysis
  - Relational database open, good base for queries and reports
  - Concurrent access: several people might work together on the same model
  - Security
    - Modeling Objects
    - User access
    - Roles
  - Find, share and re-use modeling objects

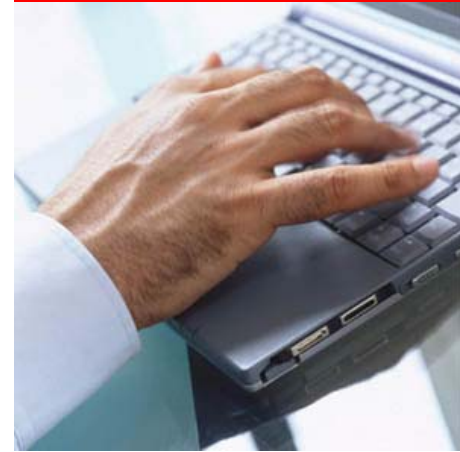


# Packaging Choices

- SQL Developer Data Modeling
  - Independent standalone product
  - File or repository based
- SQL Developer Data Modeling
  - Data Modeling an extension to SQL Developer
  - File or repository based
- SQL Developer Data Modeling Viewer
  - Integrated into SQL Developer 2.0
  - File or repository based

# **Demonstration**

## **Database Tools**



# Finding More Detail

[www.oracle.com/technology/products/database/sql\\_developer](http://www.oracle.com/technology/products/database/sql_developer)

- SQL Developer on OTN
  - Whitepapers, Oracle by Example (OBE) and online demos
  - [http://www.oracle.com/technology/products/database/sql\\_developer](http://www.oracle.com/technology/products/database/sql_developer)
- Application Express on OTN
  - Whitepapers, Oracle by Example (OBE) and online demo
  - <http://otn.oracle.com/apex>
- My Blog:
  - <http://marcsewtz.blogspot.com>



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