ORACLE®

ORACLE®

Oracle SQL Developer: PL/SQL Support and Unit Testing

Agenda

- SQL Developer 2.1 New Features
- Working with PL/SQL
- Remote Debugging
- Unit Testing
- Other PL/SQL Related Features

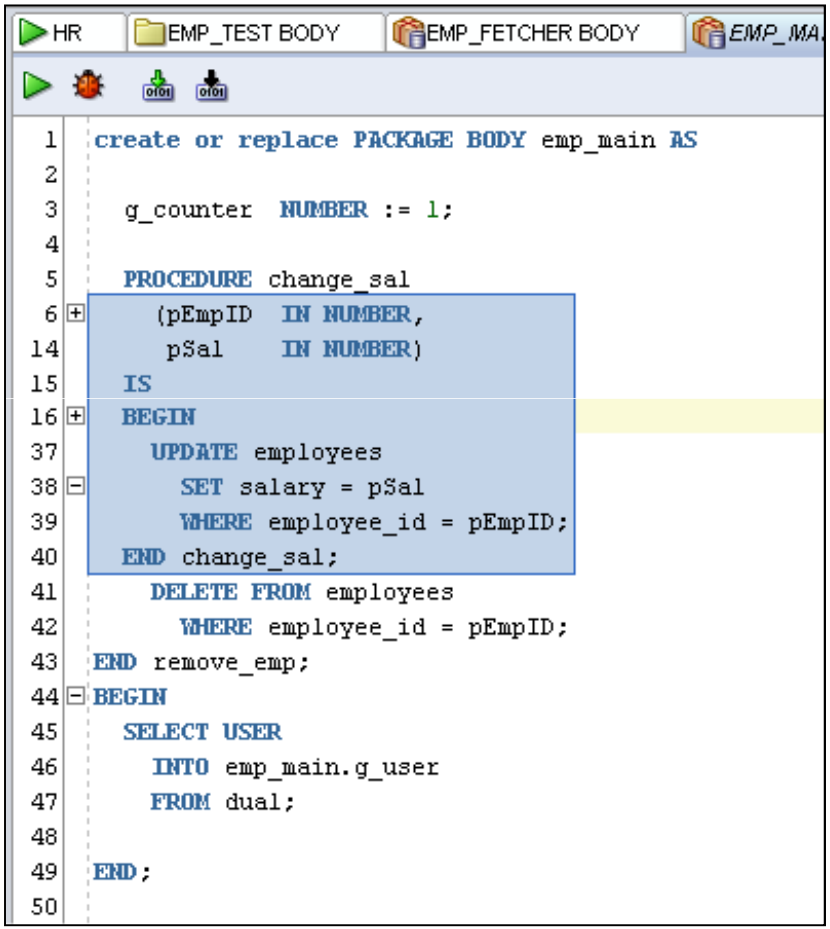
SQL Developer 2.1 – New Feature Overview

- PL/SQL Unit Testing
- Data Modeler Viewer
- Migration support for IBM DB2 UDB and Teradata
- Updated Data Grids
  - Manage columns, filter on data
- New SQL Worksheet
  - Dockable dbms_output, multiple worksheets
- Increased Connections navigator support for
  - Jobs, Editions (for 11gR2), XML DB Repository
- Updated display editors
  - PL/SQL edit mode, subpartitions
- Version Control support for Serena Dimensions, Perforce
- Updated filtering mechanism
  - Schema level, generated objects

Working with PL/SQL

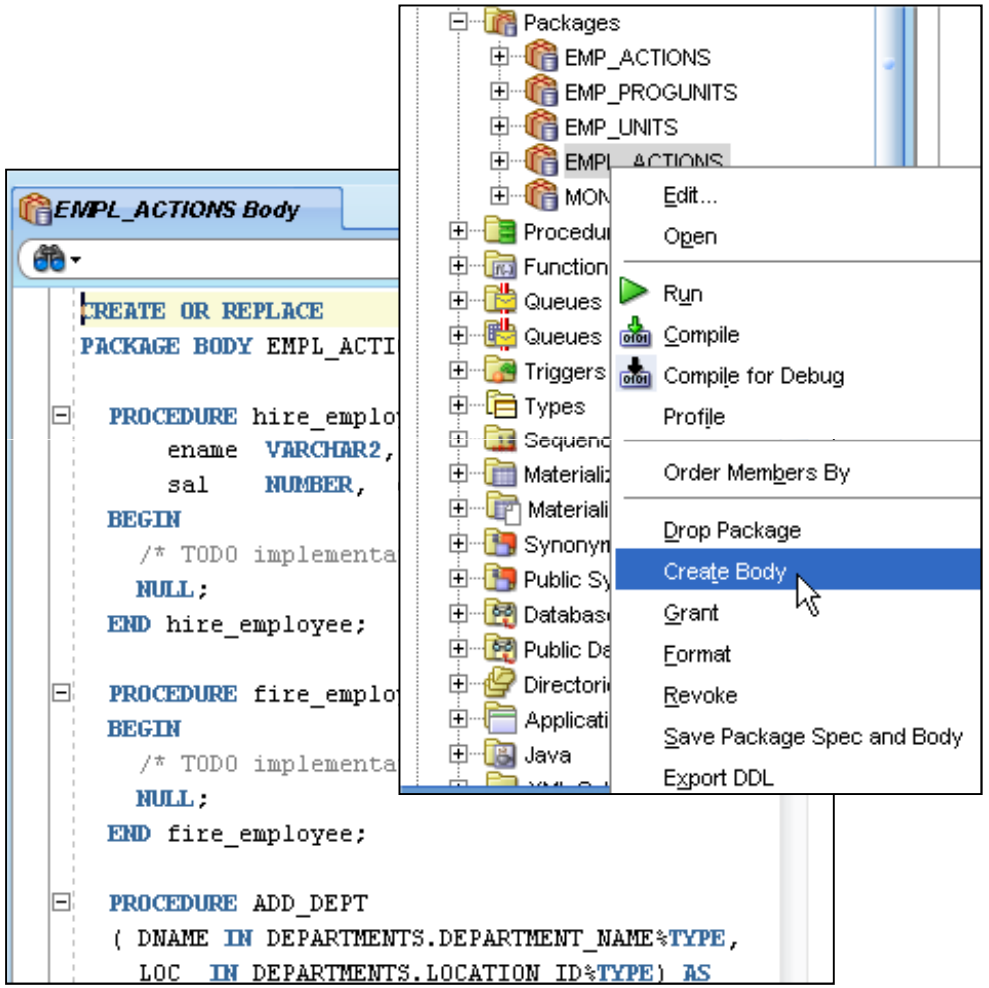
Creating and Editing PL/SQL

- Code editor
  - Syntax highlighting
  - Code formatter
  - Code insight (auto complete)
  - Code folding
  - Query Builder
- Code snippets
  - Drag and drop code snippets
  - Add and customize snippets
- Code templates



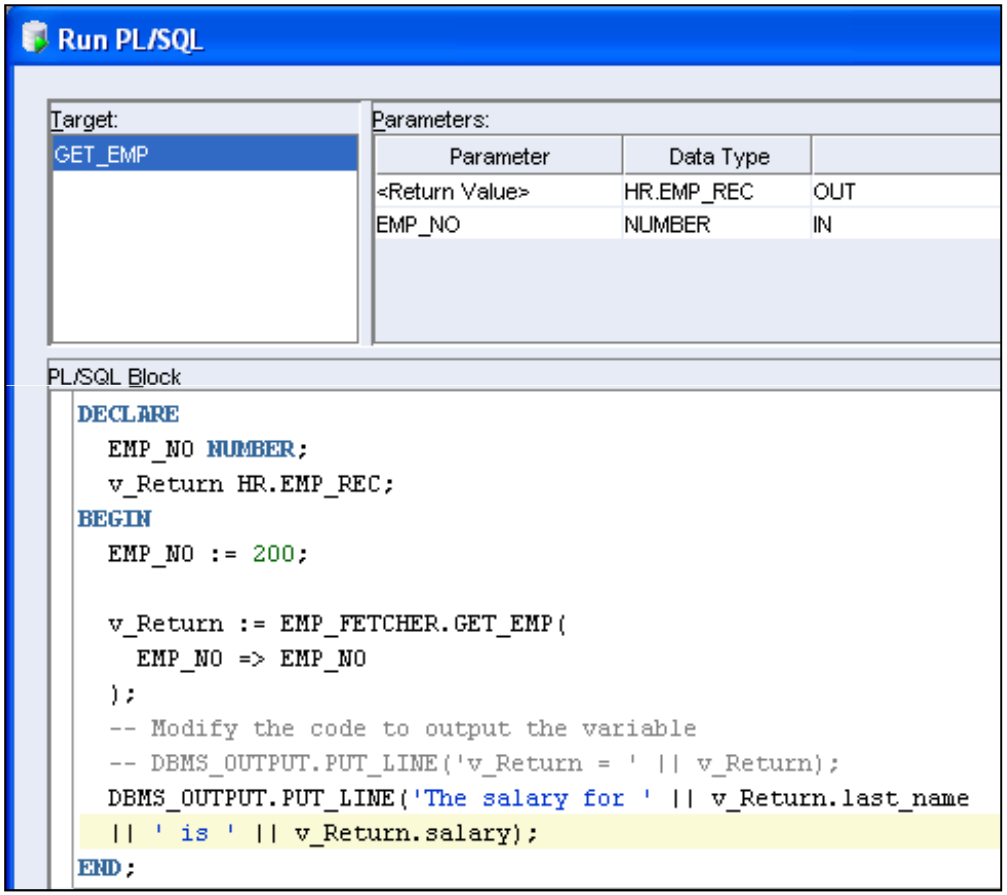
Preparing Code Skeletons with Dialogs

- Use dialog to create
  - Procedures & Functions
  - Triggers
  - Package spec & body
- Create Trigger
  - Table
  - View
  - Schema
  - Database



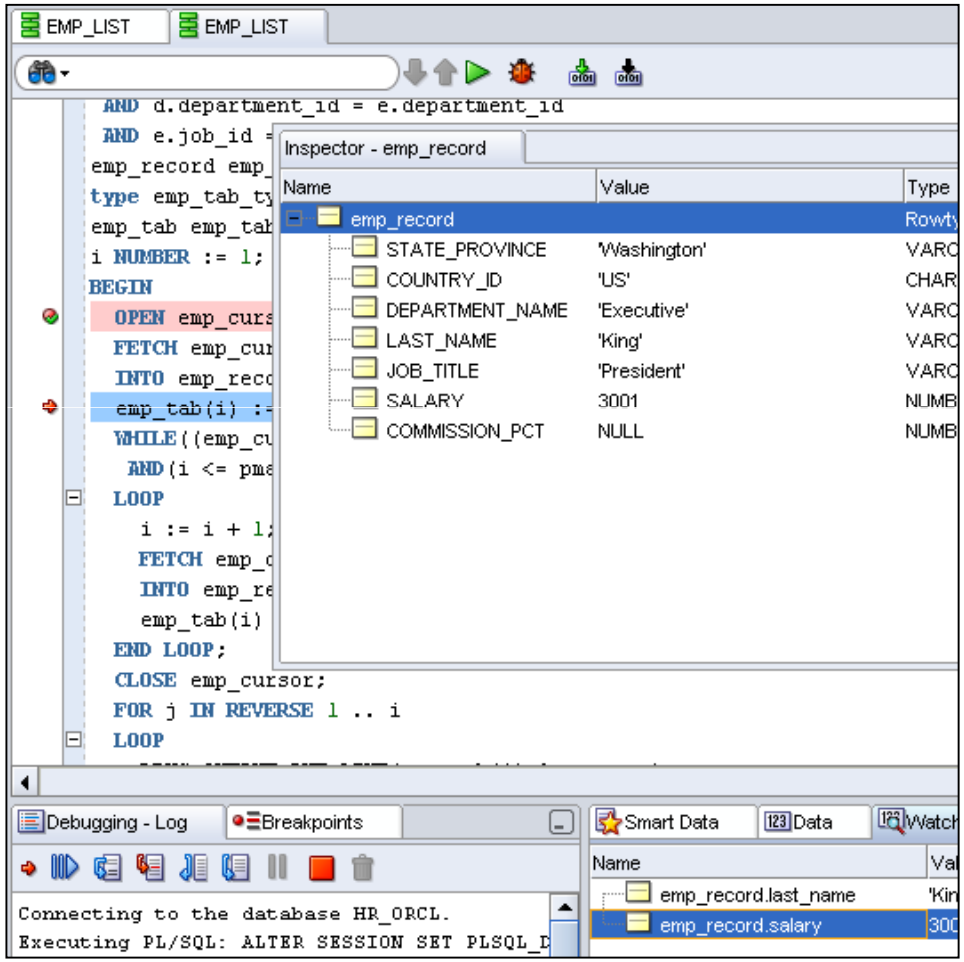
Compiling and Running PL/SQL

- Compiling
  - Inline error reporting
- Run procedures, functions, and packages
  - Use DBMS_OUTPUT
  - Function return values
  - OUT parameters
- Run PL/SQL dialog
  - Specifies run targets
  - Shows parameter detail
  - Generates editable PL/SQL block
    - For parameter values
    - For output parameters
    - Works with records



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



Remote Debugging

Problem: Test a procedure being executed in a separate application

- In SQL Developer
  - Select Remote Debug
  - Set up remote debug detail; machine, port
  - Browse to procedure
  - Set a breakpoint

```
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  /
```

- In remote session
  - execute DBMS_DEBUG_JDWP.CONNECT_TCP ('127.0.0.1', 4000)
  - Execute procedure
- In SQL Developer
  - Debug as normal

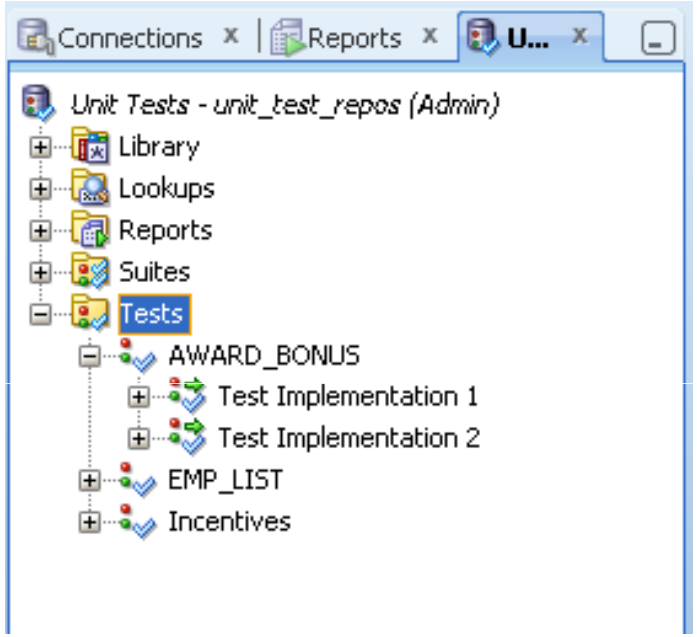
Use the environment variable
SET ORA_DEBUG_JDWP=host=127.0.0.1;port=4000

Working with PL/SQL Unit Testing

ORACLE

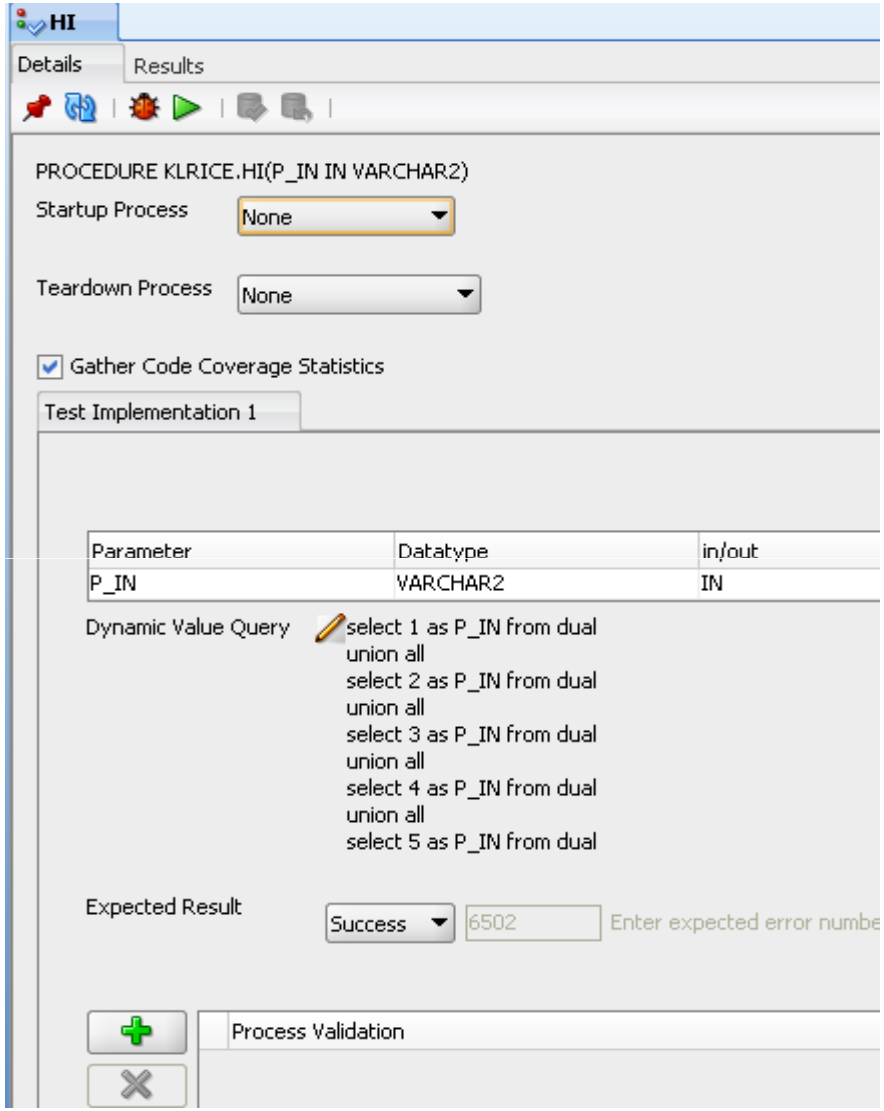
Unit Testing – Overview

- Tests
- Suites
- Reports
- Library
- Static and dynamic lookups
- Multi user repository based
- Code coverage
- Command line use
- Target any database



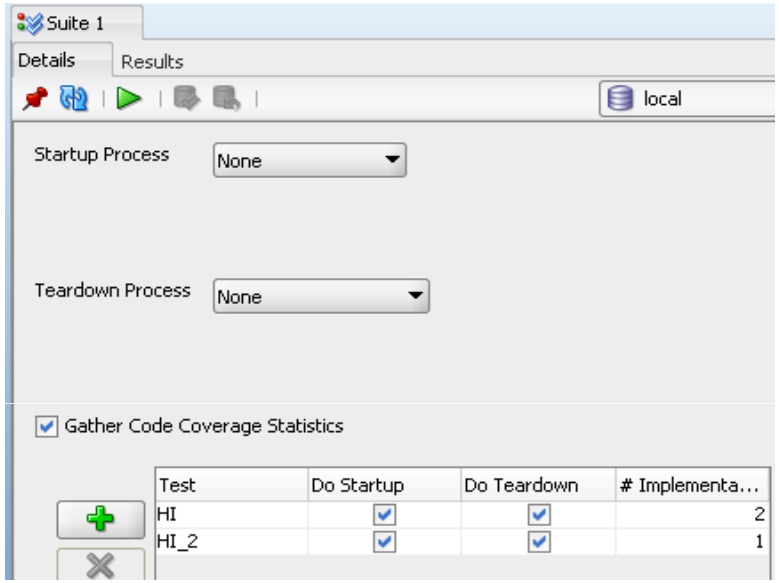
Unit Testing - Tests

- Input/Return
  - Static or Dynamic Values
- Startups/TearDown
  - Table Copy/Restore
  - Row Copy/Restore
  - Custom
- Code coverage
- Success or failure testing
- Validation
  - Custom



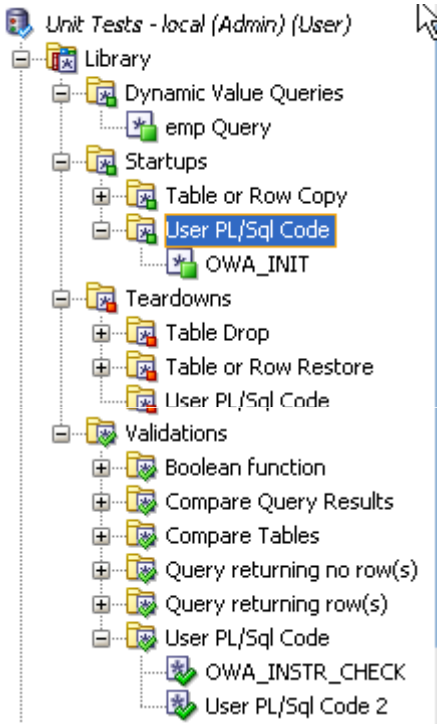
Unit Testing - Suites

- Startups/TearDown
  - Table Copy/Restore
  - Row Copy/Restore
  - Custom
- Code Coverage
- Tests are run sequentially
- Startup and teardowns for tests can be turned off



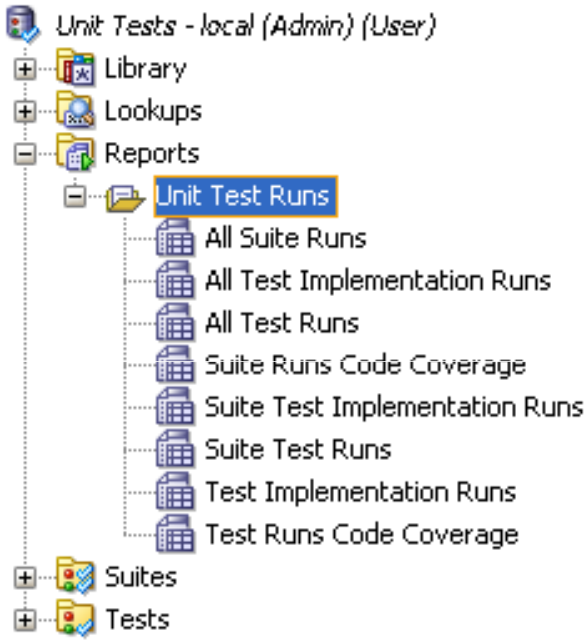
Unit Testing - Library

- Stores reusable items
  - Dynamic Values
  - Startups
  - Teardowns
  - Validations
- Referenced or copied to local tests



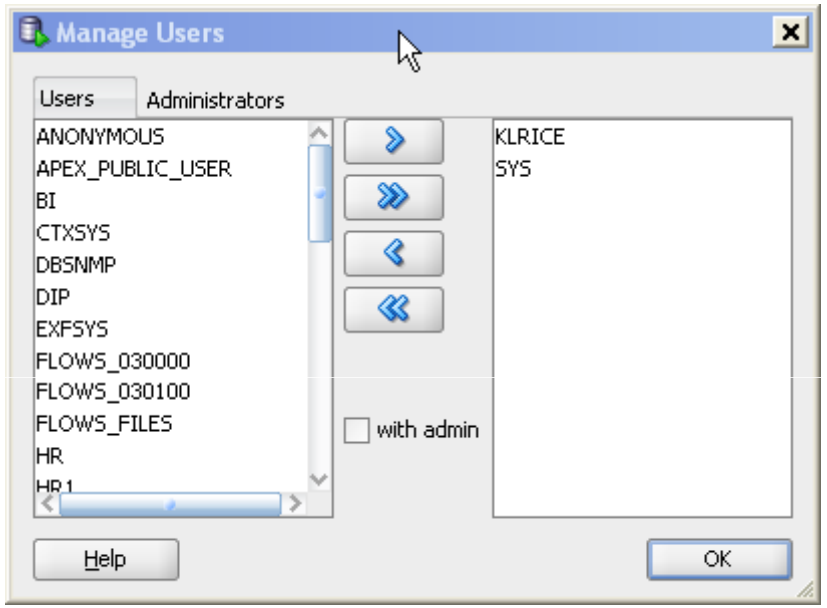
Unit Testing - Reports

- Includes Standard reports
  - Suites
  - Tests
  - Code Coverage
- Reports against the repository
- Users can query the repository directly



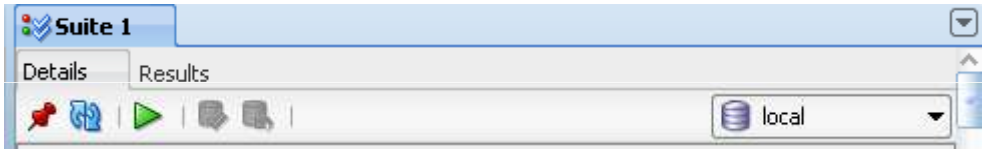
Unit Testing – Multi User

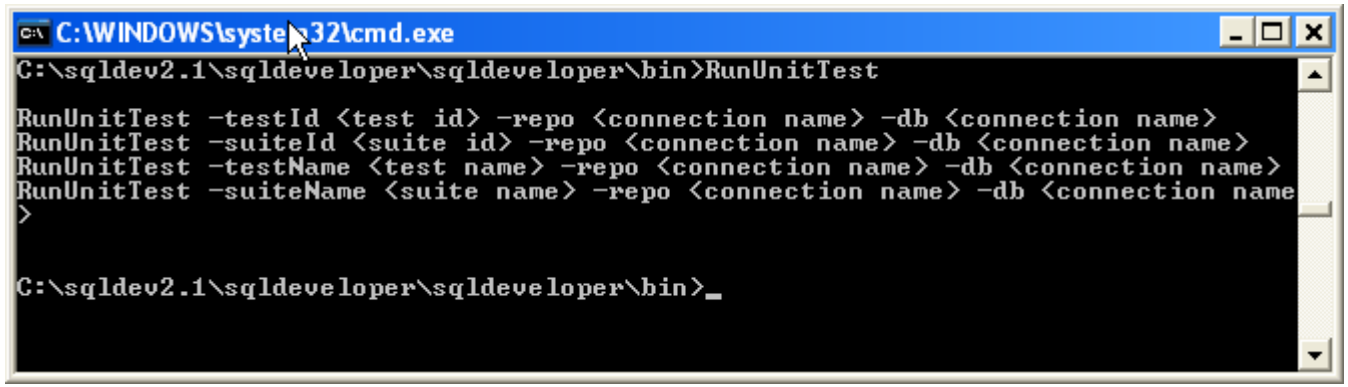
- Use database users
- Control
  - admin vs. user
- Managed with roles



Unit Testing – Running Suites/Tests

- Inside SQL Developer simply change the Combo List
- Command line by passing arguments
- Results are stored in the repository





Refactor, Review, Search, Tune and Monitor

SQL Developer provides a PL/SQL related utilities

- PL/SQL Hierarchical Profiler
- Extended Search using PL/SQL
- SQL Monitor
- SQL Developer PL/SQL Reports
- General refactoring
- APEX refactoring

Hierarchical Profiler

Oracle SQL Developer : PROCEDURE HR1.EMP_LIST@hr1_11g_orcl

File Edit View Navigate Run Source Versioning Migration Tools Help

Connections

- Connections
  - 10g
  - 11g
    - hr1_11g_orcl
      - Tables
      - Views
      - Indexes
      - Packages
      - Procedures
        - ADD_EVALUATION
        - ADD_JOB_HISTORY
        - EMP_LIST
        - EVAL
        - EVAL_DEPARTMENT
        - EVAL_LOOP_CONTROL
        - SECURE_DML
      - Functions
      - Queues
      - Queues Tables
      - Triggers
      - Types
      - Sequences
      - Materialized Views
      - Materialized Views Logs
      - Synonyms
      - Public Synonyms
      - Database Links

issues | hr1_11g_orcl | EMP_LIST | EMP_LIST

Code | Grants | Dependencies | References | Details | Execution Profiles

Actions...

RUNID	Timestamp	Comment	Total Elapsed Time (mksec)
1	14-Farvardin ...	(null)	2348
2	14-Farvardin ...	(null)	2872
3	28-Farvardin ...	(null)	675
4	09-Khordad ...	(null)	2346

Function | Module | Namespace | Hierarchy

Refresh: 0

Callee	Elapsed (mksec)	Aggregated	Calls#
HR1.EMP_LIST	171	2295	1
HR1.EMP_LIST.EMP_LIST.EMP_CURSOR	18	89	1
HR1.EMP_LIST.__static_sql_exec_line7	71	71	1
SYS.DBMS_OUTPUT.PUT_LINE	11	11	5
SYS.DBMS_OUTPUT.__pkg_init	11	11	1
HR1.EMP_LIST.__sql_fetch_line25	1922	1922	1
HR1.EMP_LIST.__sql_fetch_line30	91	91	4
SYS.DBMS_HPROF.STOP_PROFILING	0	0	1

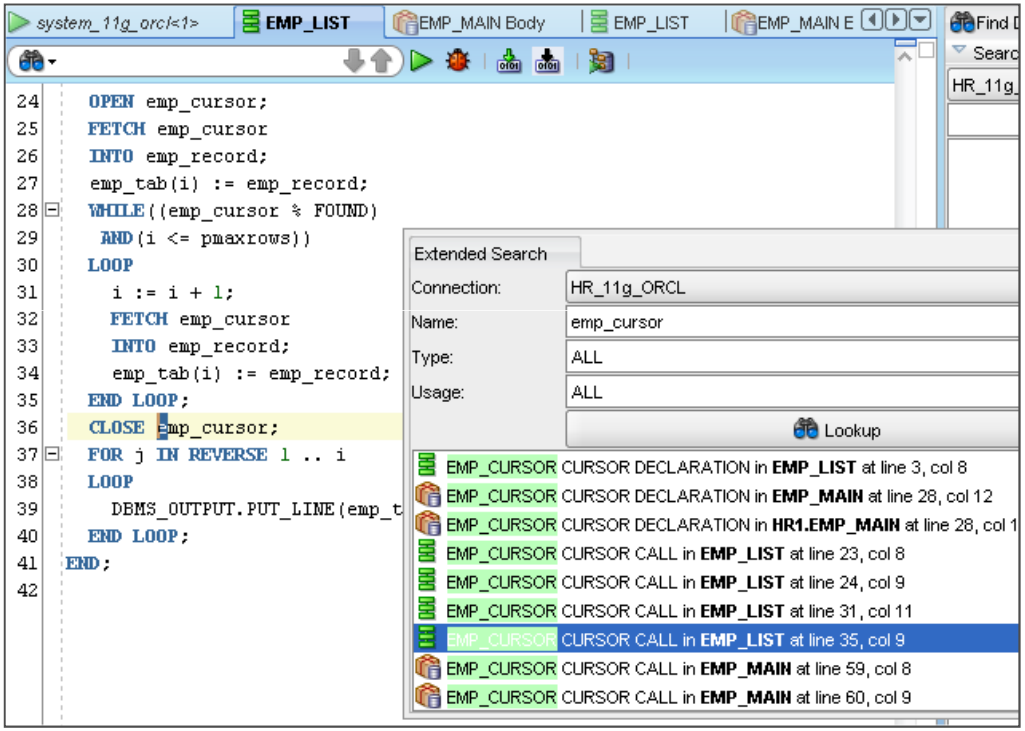
SQL History

All Rows Fetched: 2 | hr1_11g_orcl | HR1 | EMP_LIST Editing

Snippets

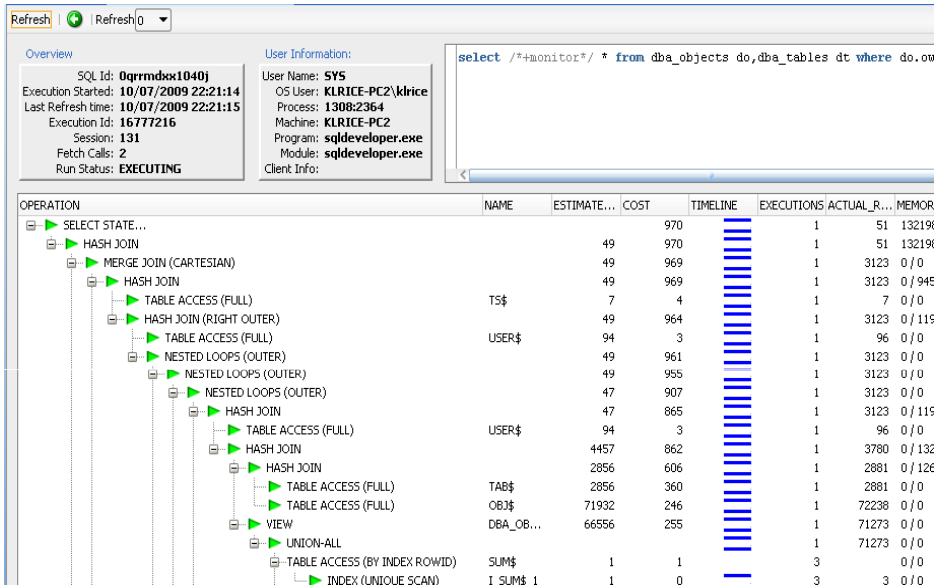
Searching

- Find (and replace) in all editors
- Find DB Objects
  - Across schemas
  - Navigate to object
- Extended search
  Across schemas
  - For object types
  - For usages
  - PLScope support
    (Oracle Database 11*g*)



Real-Time SQL Monitoring

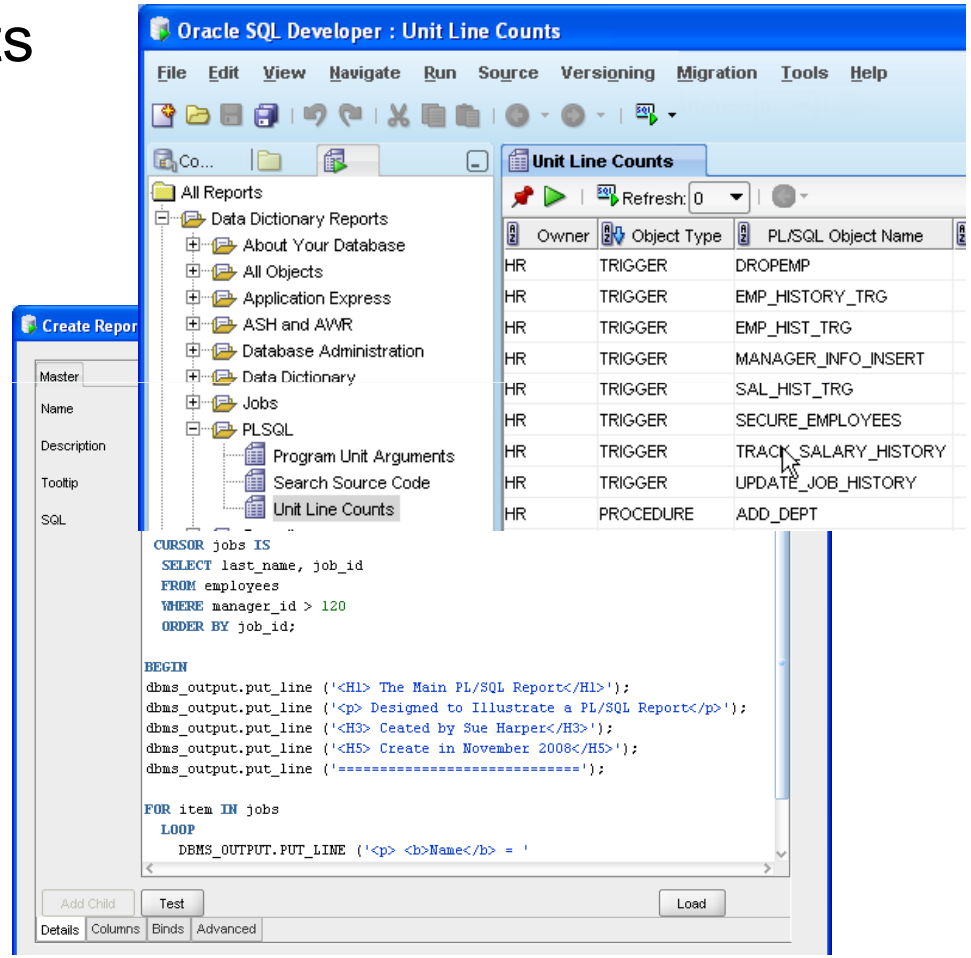
- Real time view of SQL
- Use /*+MONITOR*/
- Drill to view details
- Visual indicators for current step
- Queries over 5 seconds monitored



- DBMS_SQLTUNE.REPORT_SQL_MONITOR

SQL Monitor and PL/SQL Reports

- Shipped PL/SQL Reports
  - SQL Monitor
  - Search Source Code
  - Program Unit Arguments
- User Defined Reports
  - Using plsql-dbms_output
  - Formatting code



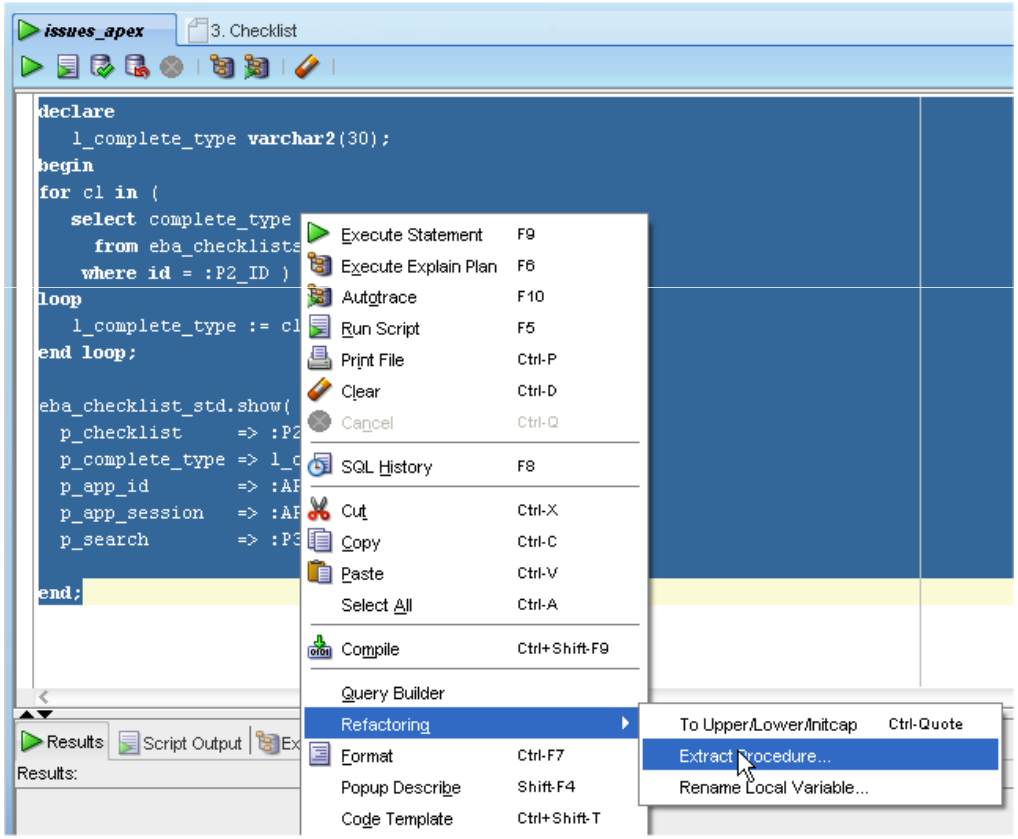
Refactoring

- Extract a procedure
- Surround blocks with
  - For
  - While
  - Begin block
- Variable renames
- Extract anonymous PL/SQL blocks from APEX apps

Integrating with Oracle APEX

Providing integration points to Oracle APEX

- Remote debugging
- Tuning SQL
- Refactoring PL/SQL code



Finding More Detail

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

- SQL Developer on OTN
  - White papers,Oracle by Example (OBE) and online demos
  - Team Blogs: Blogs, Magazine Articles & Podcasts
  - www.oracle.com/technology/products/database/sql_developer
- SQL Developer Exchange
  - Share reports, snippets, code, and add feature requests
  - http://sqldeveloper.oracle.com
- Forums
  - SQL Developer forums.oracle.com/forums/forum.jspa?forumID=260

Summary

- PL/SQL
  - Creating, editing, compiling and debugging
- Unit Testing
  - Creating, Running, Reporting
  - Batch processing
- Creating SQL Developer extensions
- Real-Time SQL Monitoring
  - Watch SQL as it runs
- Refactoring
  - Convert APEX anonymous blocks into a Package

For More Information

search.oracle.com

SQL Developer

or

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

ORACLE®

ORACLE IS THE INFORMATION COMPANY