Oracle SQL Developer: Unit Testing, Tuning and Other Advanced Features

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Agenda

- SQL Developer 2.1 New Features
- Working with PL/SQL
- Remote Debugging
- Unit Testing
- User Defined Extensions
- Tuning
SQL Developer 2.1 – Features

SQL Developer 2.1 Early Adopter Available for download

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

```sql
DECLARE
  hdate  varchar2(20);
BEGIN
  hdate := user;  
  get_emp_name(hdate, hname);  
END;
```

Use the environment variable

```bash
SET ORA_DEBUG_JDWP=host=127.0.0.1;port=4000
```

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

- Find (and replace) in all editors
- Find DB Objects
  - Across schemas
  - Navigate to object
- Extended search
  - Across schemas
  - For object types
  - For usages
  - PL/Scope support
    (Oracle Database 11g)
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 plssql-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
Working with PL/SQL

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 tear downs 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
Creating Extensions

Extensible Framework

- Easily extended
  - Based on the JDeveloper IDE
- Oracle custom extensions:
  - Migration Workbench
  - TimesTen (SQL Developer 1.5)
  - Data Mining (SQL Developer 1.2.1)
  - Rdb (under development)
  - Spatial (under development)
Customer Developed Extensions

- Users writing their own extensions
  - 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

Adding XML Extensions

- Create XML
- Associate Extension type with file location
User Defined XML Extensions

- XML Extensions include:
  - Reports
  - Editors
  - Actions
  - Navigators

XML Extension – Adding Extra Tabs

```xml
<items>
  <item type="editor" node="TableNode" vertical="true">
    <title><![CDATA[SubPartitions]]></title>
    <query>
      <sql><![CDATA[Select SUBPARTITION_NAME, HIGH_VALUE
                     from ALL_TAB_SUBPARTITIONS
                     where table_owner = :OBJECT_OWNER and
                     table_name = :OBJECT_NAME]]></sql>
    </query>
  </item>
</items>
```
Node Name Examples

<display objectType="DATABASE LINK">
<display node="DirectoryNode">
<display node="IndexNode">
<display objectType="JAVA">
<display objectType="MATERIALIZED VIEW">
<display node="MVViewLogNode">
<display node="PlSqlBaseNode">
<display objectType="TABLE">
<display node="TriggerNode">
<display objectType="VIEW">
<display node="XmlSchemaNode">
<display objectType="SYNONYM">
<display objectType="SEQUENCE">
<display type="" node="SchemaFolder">

SQL Developer SDK on the Wiki

SQL Developer SDK
Oracle SQL Developer is built on an extensible framework and, as such, is extensible itself.
Using XML/SQL or Java, SQL Developer can be extended to provide new functionality.
User Defined XML extensions are so easy to implement, all users of SQL Developer should investigate how they can help them work.
Feel free to update this wiki and help share your knowledge of extending SQL Developer.
• Getting Started
• How To
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

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