Oracle 11g SQL Statement Tuning (3 Days)

Overview

This course is designed to give students a foundation in SQL statement tuning. They are provided the necessary knowledge and skills to effectively tune SQL statements against the Oracle10g and 11g server. Students will focus on the Oracle Cost-Based Optimizer (CBO). The students learn to use the Oracle diagnostic tools and facilities: EXPLAIN, SQL*Plus AUTOTRACE, and other tools. Gathering and utilizing object and system statistics is covered in detail. In addition, the participants also learn to influence the behavior of the CBO by hinting and modifying physical database objects.

Intended audience

Experienced Oracle developers and application development support DBAs.

Course style

Lecture with frequent hands on labs.

Prerequisites

3 to 6 months of experience writing SQL in Oracle version 10 or 11.
Knowledge of SQL join syntax.

Topic Contents

Oracle's SQL tools
SQL*Plus
SQL Developer

The Petsaver database
Understanding the sample database

Introduction to tuning
Kinds of performance problems
Methods to measure performance
Techniques to improve SQL performance

SQL statement processing
Understanding SQL statement processing steps

The Oracle optimizer
The cost based optimizer (CBO)
Version specific optimization (OPTIMIZER_FEATURES_ENABLE)

Optimizing SHARED_POOL utilization
    Identifying ways to minimize parsing
    Using bind variables
    Using PL/SQL packages

Effective Indexing
    Creating B*-Tree indexes
    Utilizing "super" indexes and partial index utilization
    Indexes in the data dictionary
    Monitoring index usage

Using the EXPLAIN PLAN utility
    Creating a PLAN table
    Using the EXPLAIN PLAN command
    Interpreting EXPLAIN PLAN output
    Understanding row access method

SQL*Plus tuning tools
    Using statement TIMING
    Invoking the SQL Autorace Facility
    Interpreting AUTOTRACE Statistics

Collecting Statistics
    Using the ANALYZE Command
    Using the DBMS_STATS Package

Creating histograms
    Understanding histograms
    Creating histograms
    Verifying histogram usage

TKPROF
    Prerequisites for TKPROF
    Formatting trace files with TKPROF
    Interpreting TKPROF output

Choosing the driving table in JOINS
    Creating the query diagram
    Rules to choose the driving table

Using Hints to influence the Optimizer
    Using Hints
    Optimizer goal hints
    Access method hints
    Join hints
    Other hints

Optimizing sorts
    When does Oracle sort
    Sorting efficiently

Advanced Indexes
    Creating bitmap indexes
    Creating function-based Indexes
    Creating reverse key Indexes

Optimizing PL/SQL
    The RETURN clause
    Using DBMS_PROFILER to measure PL/SQL execution
    Using PL/SQL hinting
    BULK operations
    Dynamic SQL
    Native PL/SQL compilation
    Using DBMS_SHARED_POOL