Oracle9i : SQL Tuning Workshop

Duration 3 days

What you will learn:

This course is designed to give the student a firm foundation in the art of SQL tuning. The participant learns the necessary knowledge and skills to effectively tune SQL against the Oracle9i Server and Oracle8i Server. Students gain a thorough conceptual understanding of the Oracle9i and Oracle8i Rule-Based and Cost-Based Optimizer, and reinforce instructor-led learning with structured hands-on practices. The course uses a series of challenge-level workshops, allowing students to "play, discover, and learn" at their own level and pace. The students learn to use the Oracle diagnostic tools and facilities: EXPLAIN, SQL Trace and TKPROF and SQL*Plus AUTOTRACE. In addition, the participants also learn to influence the behavior of the Optimizer by changing the physical schema and modifying SQL statement syntax.

Audience:

Technical Support Professionals
Application Developers
Database Administrators
System Administrators
Consultants

Prerequisites:

Required Prerequisites:

A minimum of three months experience with writing SQL statements
Oracle9i: Program with PL/SQL
Introduction to Oracle9i: SQL

Course Objectives:

Understand Rule-Based Optimizer (RBO) and Cost-Based Optimizer (CBO) behavior
Use the diagnostic tools to gather information about SQL statement processing
Influence the optimizer behavior
Influence the physical data model so as to avoid performance problems
Describe the basic steps in processing SQL statements
Describe the causes of performance problems
Understand where SQL tuning fits in an overall tuning methodology
Describe alternative methods of accessing data

Course Topics:

Introduction to Tuning

Describing the Causes of Performance Problems
Identifying Performance Problems
Using a Tuning Methodology

Listing the Steps to Tune SQL
SQL Statement Processing
Listing the SQL Statement Processing Steps
Identifying Means to Minimize Parsing
Stating the Use of Bind Variables

Oracle memory Structures

Overview
Automated SQL memory management

SQL*Plus AUTOTRACE

Using the EXPLAIN PLAN Command
Identifying the AUTOTRACE Syntax
Interpreting EXPLAIN Output
Interpreting AUTOTRACE Statistics

SQL Trace and TKPROF

Invoking the SQL Trace Facility
Setting Up Appropriate Initialization Parameters
Formatting Trace Files with TKPROF
Interpreting the Output of the TKPROF Command

RBO Versus CBO

Identifying Rule-Based Optimization
Identifying Cost-Based Optimization
Understanding the Cost of an Execution Plan

Introduction to Indexes

Identifying Row Access Methods
Creating B*-Tree Indexes
Understanding B*-Tree Index Access and Index Merging

Collecting Statistics

Using the ANALYZE Command
Identifying Table, Column, and Index Statistics
Using the DBMS_STATS Package
Building Histograms

Influencing the Optimizer

Setting Up Appropriate Initialization Parameters
Using the ALTER SESSION Command
Using Hints

Sorting and Joining

Sorting Guidelines
Using Top-N SQL
Nested Loops Joins
Sort/Merge Joins

Outer Joins
Star Joins
Hash Joins

Optimizer Plan Stability

Purpose and Benefits of Optimizer Plan Stability
Creating Stored Outlines
Using the OUTLN_PKG Package

Advanced Indexes

Creating Bitmapped Indexes
Creating Function-Based Key Indexes
Optimizing Star Joins with Star Transformation

Materialized Views and Temporary Tables

Using the CREATE MATERIALIZED VIEW Syntax
Utilizing Query Rewrites
Creating and Using Temporary Tables

Alternative Storage Techniques

Creating Index-Organized Tables
Creating Index Clusters
Creating Hash Clusters

Datawarehousing Considerations

WITH clause
Grouping sets
Multitable Inserts
Merge
External tables

Workshops:

Single Table, Single Predicate Queries
Index Usage in Execution Plans
Effects of Expressions on Index Usage
Effects of Wildcards
Implicit Data Type Conversion
NULL Values and Negations

Sorting, Aggregation, and Set Operators

Order By
Group Functions
Top-N SQL
Select Distinct
Group By, Having
Union, Minus, Intersect, and Union All

Joins

Nested Loops Joins with and Without Indexes
Sort-Merge Joins
Outer Joins
Hash Joins

Subqueries

Regular Subqueries
Correlated Subqueries
Antijoins and Semijoins

Multiple Predicates

AND
OR
Concatenated Indexes
Bitmapped Indexes
Function-Based Indexes

Suggested Next Courses:

Oracle9i Database Administration Fundamentals II