

Oracle Database 11g: SQL Tuning Workshop

Duration: 3 Days

What you will learn

This Oracle Database 11g: SQL Tuning Workshop Release 2 training assists database developers, DBAs and SQL developers in identifying and tuning inefficient SQL statements. You'll explore investigative methods to reveal varying levels of detail about how the Oracle database executes the SQL statement; this helps you determine the root causes of the inefficient SQL statements.

Learn To:

Use Oracle tools to identify inefficient SQL statements.

Use Automatic SQL Tuning.

Use Real Time SQL monitoring.

Write more efficient SQL statements.

Monitor and trace high load SQL statements.

Manage optimizer statistics on database objects.

Interpret execution plans, and the different ways in which data can be accessed.

Benefits to You

Gain expertise in relational database data management as you learn how to effectively use SQL commands against your business data. These features will help you query and manipulate data within the database, use the dictionary views to retrieve metadata and create reports about their schema objects.

Explore the Optimizer

Expert instructors will also help you explore how the optimizer chooses the path. You'll also learn how to influence the optimizer to ensure the best method is used.

Automatic SQL Tuning Tools

This course covers Automatic SQL Tuning tools and resources available in the Automatic Workload Repository. Furthermore, take advantage of bind variables, trace files and different types of indexes.

Note: this course is based on Oracle Database 11g Release 2.

Application Developers
Data Warehouse Administrator
Data Warehouse Developer
Database Administrators
Developer

PL/SQL Developer
Support Engineer

Related Training

Required Prerequisites

Oracle Database: Introduction to SQL

Course Objectives

Trace an application through its different levels of the application architecture

Understand how the Query Optimizer makes decisions about how to access data

Define how optimizer statistics affect the performance of SQL

List the possible methods of accessing data, including different join methods

Identify poorly performing SQL

Modify a SQL statement to perform at its best

Course Topics

Exploring the Oracle Database Architecture

Oracle Database Server Architecture: Overview

Connecting to the Database Instance

Physical Structure

Oracle Database Memory Structures: Overview

Automatic Shared Memory Management

Automated SQL Execution Memory Management

Database Storage Architecture, Logical and Physical Database Structures

Segments, Extents, and Blocks & SYSTEM and SYSAUX Tablespaces

Introduction to SQL Tuning

Reason for Inefficient SQL Performance

Performance Monitoring Solutions

Monitoring and Tuning Tools: Overview

CPU and Wait Time Tuning Dimensions

Scalability with Application Design, Implementation, and Configuration

Common Mistakes on Customer systems & Proactive Tuning Methodology

Simplicity in Application Design

Data Modeling, Table Design, Index Design, Using Views, SQL Execution Efficiency, Overview of SQL*Plus & SQL Deve

Introduction to the Optimizer

Structured Query Language

SQL Statement Parsing: Overview

Why Do You Need an Optimizer?

Optimization During Hard Parse Operation

Transformer & Estimator

Cost-Based Optimizer

Plan Generator

Controlling the Behavior of the Optimizer, Optimizer Features and Oracle Database Releases

Interpreting Execution Plans

What Is an Execution Plan? Where To Find Execution Plans and Viewing Execution Plans

Plan Table & AUTOTRACE

Using the V\$SQL_PLAN View

Automatic Workload Repository (AWR)

SQL Monitoring: Overview

Interpreting an Execution Plan

Reading More Complex Execution Plans and Reviewing the Execution Plan

Looking Beyond Execution Plans

Application Tracing

End-to-End Application Tracing Challenge

Location for Diagnostic Traces

What is a Service? Use Services with Client Applications & Tracing Services

Use Enterprise Manager to Trace Services

Session Level Tracing: Example

The trcsess Utility and SQL Trace File Contents

Invoking the tkprof Utility and Output of the tkprof Command

tkprof Output with and without Index: Example

Optimizer: Table and Index Operations

Row Source Operations, Main Structures and Access Paths

Full Table Scan

Indexes: Overview and B*-tree Indexes and Nulls

Using Indexes: Considering Nullable Columns

Index-Organized Tables

Bitmap Indexes, Bitmap Operations and Bitmap Join Index

Composite Indexes and Invisible Index

Guidelines for Managing Indexes and Investigating Index Usage

Optimizer Join Methods

Nested Loops Join

Nested Loops Join: 11g Implementation

Sort Merge join

Hash Join and Cartesian Join

Equijoins and Nonequijoins

Outer Joins

Semijoins

Antijoins

Optimizer: Other Operators

When Are Clusters Useful?

Sorting Operators and Buffer Sort Operator

Inlist Iterator and View Operator

Count Stop Key Operator

Min/Max and First Row Operators and Other N-Array Operations

Filter operations and Concatenation Operations
UNION [ALL], INTERSECT, MINUS
Result Cache Operator

Case Study: Star Transformation

The Star Schema Model and The Snowflake Schema Model
Star Transformation
Retrieving Fact Rows from One Dimension and from All Dimensions
Joining the Intermediate Result Set with Dimensions
Star Transformation Plan Examples
Star Transformation Hints
Using Bitmap Join Indexes
Bitmap Join Indexes: Join Model 1 to 4

Optimizer Statistics

Types of Optimizer Statistics
Table, Index and Column Statistics
Index Clustering Factor
Histograms, Frequency Histograms and Histogram Considerations
Multicolumn Statistics and Expression Statistics Overview
Gathering System Statistics and Statistic Preferences
Manual Statistics Gathering
Locking Statistics, Export/Import Statistics and Set Statistics

Using Bind Variables

Cursor Sharing and Different Literal Values
Cursor Sharing and Bind Variables
Bind Variable Peeking
Cursor Sharing Enhancements
The CURSOR_SHARING Parameter
Forcing Cursor Sharing
Adaptive Cursor Sharing
Interacting with Adaptive Cursor Sharing

Using SQL Tuning Advisor

Tuning SQL Statements Automatically
Application Tuning Challenges
SQL Tuning Advisor: Overview
Stale or Missing Object Statistics and SQL Statement Profiling
Plan Tuning Flow and SQL Profile Creation
SQL Tuning Loop, Access Path Analysis and SQL Structure Analysis
Database Control and SQL Tuning Advisor
Implementing Recommendations

Using SQL Access Advisor

SQL Access Advisor: Overview
Possible Recommendations
SQL Access Advisor Session: Initial Options
SQL Access Advisor: Workload Source
SQL Access Advisor: Recommendation Options
SQL Access Advisor: Schedule and Review
SQL Access Advisor: Results

Using Automatic SQL Tuning

SQL Tuning Loop

Automatic SQL Tuning

Automatic Tuning Process

Configuring Automatic SQL Tuning

Automatic SQL Tuning: Result Summary

Automatic SQL Tuning: Result Details

Automatic SQL Tuning Result Details: Drilldown

Automatic SQL Tuning Considerations

SQL Performance Management

Maintaining SQL Performance and SQL Plan Management: Overview

SQL Plan Baseline: Architecture

Important Baseline SQL Plan Attributes

SQL Plan Selection

Possible SQL Plan Manageability Scenarios

SQL Performance Analyzer and SQL Plan Baseline Scenario

Loading a SQL Plan Baseline Automatically and Purging SQL Management Base Policy

Enterprise Manager and SQL Plan Baselines

Related Courses

Oracle Database 11g: SQL Tuning Workshop