Oracle SQL Performance Tuning Tips & Techniques

Course Summary

Description

Give your technical staff that competitive edge with this local Oracle Workshop.

The focus of this tuning course is to illustrate coding techniques that insure a consistent response time between instances and releases of the Oracle database. This course works closely with performance tuning of actual SQL statements as well as covering a variety of Oracle Server tuning topics. This course covers Oracle10, Oracle11, and Oracle12 SQL tuning topics.

The course starts out with a complete overview of the Oracle architecture so students can get an understanding how their SQL and applications can take advantage of the computing environment. This course includes a discussion on the differences of the various Explain Plan steps such as Merge-Join and Nested-Loop, and when is it best to use each. The instructor goes into considerable detail, with SQL examples, on how the optimizers (both rule and cost) make their decisions. Students will work with a variety of SQL statements, reviewing explain plans and making changes to make these SQL statements perform better. Students will also experience how to monitor their application environment, their indexes, and see how to find problem SQL in their applications. This course takes a close look at indexes: how Oracle selects them, why they are sometimes not used, and how to tell if indexes are being used/not being used.

The focus this course is tuning SQL via coding style. The instructor finds that tuning in this fashion maintains the performance of the SQL when migrating to other Oracle environments (upgrades to newer releases). Students will also experience how to monitor their application environment, their indexes, and see how to find problem SQL in their applications using Stats Pack and the V$ dictionary tables.

This course covers hints, index utilization, as well as a variety of useful tools such as Oracle Trace, PL/SQL Profiler, StatsPack and Advanced Workload Repository.

The course utilizes a variety of current tools. Students will have the opportunity to learn more about TOAD, SQL Developer, TextPAD, as well as the Oracle tools like SQL*Plus, TKProf, and Stats Pack.

Objectives
At the end of this course, students will have learned:

- How Oracle arrives at an Execution Plan
- Index Review/Index Statistics/How Oracle Selects Indexes
- Advanced problem-solving topics using V$ Table information
- A review of how Oracle computes row cardinality
- In-depth look at Explain Plans
- SQL Trace/Stats Pack/AWR
- Oracle Memory Structures
- Finding Problem SQL/SQL Troubleshooting/problem solving
- Setting up/using Result Cache
- Using SQL Profiles
- External Tables, Database Replay, and more

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Course Summary (cont'd)

Topics

- Oracle RDBMS Architecture Overview
- Understanding/Reading/Interpreting Explain Plans
- Understanding the Cost-based Optimizer
- Understanding Parallel Explain Plans
- Working with Hints
- Index Review/Tips & Techniques
- SQL Tuning
- A Close Look at Sub-Query Coding Techniques
- Where Clause and Controlling Cardinality
- A Close Look at CBO Statistics
- Tuning Tool Review: Statspack, Events, Tracing/Tkprof
- Profiling and Tuning PL/SQL
- Hint Review and Tips
- Advanced SQL Troubleshooting Tips and Techniques
- Review SGA Memory Structures
- Library Cache Trace File Analysis
- A Close Look at Other Useful Oracle Traces
- Oracle Internals: How Oracle Writes
- Finding Problem SQL Using v$ Information
- Using Automated Workload Repository
- Review Database Replay and External Tables
- Review the SQL Tuning Advisor

Audience

This course is perfect for developers who need to know more on how Oracle works and how to get their SQL to perform better. This course is also good for those who are light on SQL tuning or perhaps are new to the Oracle RDBMS.

Prerequisites

A working knowledge of the SQL language is required. Knowledge of SQL Explain Plans is helpful but not necessary.

Duration

Three days

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Course Outline

I. Oracle RDBMS Architecture overview

A. Understanding/Reading/Interpreting Explain Plans
B. Understanding the Cost-based Optimizer
C. Understanding Parallel Explain Plans
D. Working with Hints
E. Index Review/Tips & Techniques

II. SQL Tuning

A. A Close Look at Sub-Query Coding Techniques
B. Where Clause and controlling Cardinality
C. A Close Look at CBO Statistics
D. Tuning Tool Review: Statspack, Events, Tracing/Tkprof
E. Profiling and Tuning PL/SQL
F. Hint Review and Tips

III. Advanced SQL Troubleshooting Tips and Techniques

A. Review SGA Memory Structures including:
   1. Buffer Cache
   2. Result Cache
   3. SQL Directives
   4. How Oracle12 Adaptive Plan Management works
      a)How to control it!
B. Library Cache Trace File Analysis
   1. Using SQL TXPlan (new free Oracle SQL analysis tool), TOAD
   2. Advanced syntax to show valuable SQL plan and statistics
C. A close look at other useful Oracle Traces
   1. 10053 CBO Trace
   2. 10030 & 31 Sort Traces
   3. 10104 Hash Join Traces
D. Oracle Internals: How Oracle writes
   1. Various Space Management Issues discussed
   2. Monitoring Sorting
E. Finding Problem SQL using v$ information
F. Using Automated Workload Repository
G. Review Database Replay and External Tables
H. Review the SQL Tuning Advisor

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