

Course 262: Oracle SQL Tuning, Hands-On (5 Days)

Course Description...

Delivering data is one thing, but delivering accurate, reliable information in a timely manner is paramount to effective business operations. In this hands-on course you will gain experience with the manual and automated tools and techniques used to write well tuned, high performing SQL queries. You will learn investigative methods and the tools to use to reveal varying levels of detail about how the Oracle database executes a SQL statement. You will learn the different ways in which data can be accessed, which ones are most efficient under specific circumstances, and how to ensure that the best method is used. Partitioning topics are covered including the new Oracle 11g partitioning methods. Learn to take advantage of hints, bind variables, adaptive cursor sharing, different types of indexes, and optimal storage structures. You will gain an in-depth understanding of the cost-based optimizer and the methods for controlling it. This course is based on and will use Oracle Database 11g Release 2.

Learning Objectives...

- Understand Tuning Concepts
- Learn tools for identifying and diagnosing performance problems
- Discuss various access paths and join methods
- Learn how to generate and maintain statistics
- Use indexes, various table storage options, and partitioning to improve performance of data retrieval
- Control the optimizer with hints and plan stability
- Discover different ways to improve performance by re-structuring and re-writing SQL statements

Who should attend...

Any one involved in complex data retrieval and analysis who wants to understand how to diagnose and tune applications. Typical job functions include application developers, DBAs, report writers, and technical consultants.

Prerequisites...

Course 267, "Introduction to Oracle 11g" or equivalent SQL knowledge is assumed.

See next page for a detailed course outline...



Course Outline

Unit 1: Tuning Concepts

- Oracle's tuning methodology
- Basic tuning concepts
- Plan and manage the tuning process
- Design issues related to performance

Unit 2: Tools for Diagnosing Performance Problems

- How SQL statements are processed
- The role of the optimizer
- Optimizer approaches and goals
- Utilize Explain Plan for diagnostics
- Cost Based Optimizer architecture
- Generate and analyze statistics using SQL Trace and TKPROF

Unit 3: Oracle Automated Tuning Tools

- SQL Tuning Advisor
- SQL Access Advisor
- Automatic SQL Tuning
- Real-Time SQL Monitoring

Unit 4: Access Paths and Join Methods

- Access paths
 - Table access paths
 - Index access paths
 - Other storage structures access paths
- Join methods
 - Sort-merge join
 - Nested-loops join
 - Hash join
 - Cartesian join
 - Star join

Unit 5: Generating and Maintaining Statistics

- The optimizer and its use of statistics
- Gather statistics
- Statistics management
- Column statistics and histograms
- Deferred statistics management

Unit 6: Providing the Optimizer with a Better Way: Indexes

- Indexing options
 - B-tree indexes
 - Variations of B-tree indexes
 - Reverse key indexes
 - Function-based indexes
 - Bitmap indexes
 - Star join transformation
 - Bitmap join indexes
- Monitoring index usage
- Index key compression



Unit 7: Providing the Optimizer with a Better Way: Table Storage

- Index Organized Tables
- Clusters
- Hash Clusters
- Sorted hash clusters
- External Tables
- Materialized Views

Unit 8: Providing the Optimizer with a Better Way: Partitioning

- Partitions and their uses
- Table partitioning options
 - Range partitioning
 - List partitioning
 - Hash partitioning
 - Interval partitioning
 - Reference partitioning
 - Virtual column partitioning
 - System partitioning
 - Composite partitioning
- Examine index partitioning options
 - Local prefixed
 - Local non-prefixed
 - Global prefixed

Unit 9: Controlling the Optimizer: Hints and SQL Plan Management

- Optimizer hints
- SQL Plan Management architecture
- SPA process and use

Unit 10: Tuning SQL Statements

- Establish tuning goals
 - Reduce the workload
 - Balance the workload
 - Parallelize the workload
- Identify and gather data on resource-intensive SQL
- Write SQL to effectively utilize indexes
- Dynamic sampling to minimize table scans
- Restructure SQL statements for optimal performance
- Bind variables and adaptive cursor sharing
- Using sets for multiple access of same data
- Other tuning considerations
- SQL Query Result Cache

Unit 11: Course Summary

- Summary

Please contact your ROI representative to discuss course tailoring!!!