ProTech Professional Technical Services, Inc.

Oracle Database 19c Performance Management and Tuning

Course Summary

Description

This course will help you to learn how to use Oracle Database automatic tuning features such as SQL Tuning Advisor, SQL Access Advisor, Automatic Workload Repository and Automatic Database Diagnostic Monitor, and practice these tuning methods.

Objectives

At the end of this course, students will be able to:

- Describe Performance Management
- Use AWR Performance Statistics
- Use AWR Based Tools
- Improve SQL Statement Performance
- Influence the Optimizer

- Use Tuning Analyzers and Advisors
- Monitor Operations and applications
- Manage Memory
- Manage Database Memory
- Use In-Memory Column Store Feature

Topics

- Overview
- Defining the Scope of Performance Issues
- Using the Time Model to Diagnose Performance Issues
- Using Statistics and Wait Events to Diagnose Performance Issues
- Using Log and Trace Files to Monitor Performance
- Using Enterprise Manager Cloud Control and SQL Developer to Monitor Performance
- Using Statspack to View Performance Data
- Using Automatic Workload Repository
- Using Metrics and Alerts
- Using Baselines
- Managing Automated Maintenance Tasks
- Using ADDM to Analyze Performance
- Using Active Session History Data for First Fault System Analysis
- Using Emergency Monitoring and Real-Time ADDM to Analyze Performance Issues``
- Overview of SQL Statement Processing
- Maintaining Indexes
- Maintaining Tables
- Introduction to Query Optimizer
- Understanding Execution Plans
- Viewing Execution Plans by Using SQL Trace and TKPROF

- Managing Optimizer Statistics
- Using Automatic SQL Tuning
- Using the SQL Plan Management Feature
- Overview of the SQL Advisors
- Using the SQL Tuning Advisor
- Using the SQL Access Advisor
- Overview of Real Application Testing Components
- Using SQL Performance Analyzer to Determine the Impact of Changes
- Using Database Replay to Test System Performance
- Implementing Real-Time Database Operation Monitoring
- Using Services to Monitor Applications
- Overview of Memory Structures
- Managing Shared Pool Performance
- Managing Buffer Cache Performance
- Managing PGA and Temporary Space Performance
- Configuring the Large Pool
- Using Automatic Shared Memory Management
- Introduction to In-Memory Column Store
- Configuring the In-Memory Column Store Feature
- Using the In-Memory Column Store Feature to Improve SQL Performance
- Using In-Memory Column Store with Oracle Database Features

Course Outline

Oracle Database 19c Performance Management and Tuning

Course Summary (cont'd)

Audience

The targeted audience for this course is Administrators and Database Administrators.

Prerequisites

The course focuses on the tuning tasks expected of a DBA: reactive tuning of SQL statements, maintaining SQL statement and operation performance, and tuning the Oracle Database Instance components.

Students should have familiar with
- A working knowledge of SQL and PL/SQL packages
- Basic understanding of Oracle Database architecture
- Familiarity with Oracle Database installation

Duration

Five days

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Course Outline

I. **Overview**
- A. Overview
- B. Preparing the Databases

II. **Defining the Scope of Performance Issues**
- A. Objectives
- B. Tuning Life Cycle Phases
- C. Using Enterprise Manager to Identify OS Issues

III. **Using the Time Model to Diagnose Performance Issues**
- A. Introduction
- B. Viewing the Top Wait Events and the Time Model

IV. **Using Statistics and Wait Events to Diagnose Performance Issues**
- A. Instance Activity and Wait Event Statistics
- B. Viewing System Statistics and Wait Events

V. **Using Log and Trace Files to Monitor Performance**
- A. Viewing Performance Information in the Alert Log

VI. **Using Enterprise Manager Cloud Control and SQL Developer to Monitor Performance**
- A. Using Enterprise Manager to Monitor Performance
- B. Using SQL Developer to Monitor Performance Part 1
- C. Using SQL Developer to Monitor Performance Part 2

VII. **Using Statspack to View Performance Data**
- A. Installing Statspack
- B. Creating Snapshots
- C. Generating Statspack Reports
- D. Using Statspack to Examine Segment Statistics

VIII. **Using Automatic Workload Repository**
- A. Managing AWR Data in a Multitenant Environment
- B. Creating and Managing AWR Snapshots
- C. Generating and Viewing an AWR Report
- D. Generating and Viewing a Compare Periods Report

IX. **Using Metrics and Alerts**
- A. Setting Up and Viewing Server-Generated Alerts

X. **Using Baselines**

XI. **Managing Automated Maintenance Tasks**
- A. Configuring Automatic Maintenance Tasks (Part 1)
- B. Configuring Automatic Maintenance Tasks (Part 2)

XII. **Using ADDM to Analyze Performance**
- A. Compare Periods ADDM: Analysis
- B. Using AWR-Based Tools to Identify Performance Issues
- C. Performing an ADDM Analysis of a PDB

XIII. **Using Active Session History Data for First Fault System Analysis**
- A. Generating and Reviewing an ASH Report to Identify Performance Issues

XIV. **Using Emergency Monitoring and Real-Time ADDM to Analyze Performance Issues**

XV. **Overview of SQL Statement Processing**
- A. Overview
- B. Processing a DML Statement

XVI. **Maintaining Indexes**
- A. Automatic Indexing Task
- B. Coalescing an Index

XVII. **Maintaining Tables**
- A. Block Space Management with Free Lists
- B. Shrinking Segments: Overview
- C. Advanced Index Compression
- D. Analyzing the Impact of Excess Blocks

XVIII. **Introduction to Query Optimizer**
- A. Introduction
- B. Using Initialization Parameters to Control Optimizer Behavior

XIX. **Understanding Execution Plans**
- A. SQL*Plus AUTOTRACE
- B. Using AUTOTRACE and EXPLAIN PLAN

XX. **Viewing Execution Plans by Using SQL Trace and TKPROF**
- A. Using SQL TRACE and the TKPROF Utility

Course Outline

Course Outline (cont'd)