

# Oracle Database 19c: Performance Management and Tuning

**Duration:**  
5 days

Students 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. 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.

## Course Objectives

Upon completion of this course, the student should be able to:

- Use the Oracle Database tuning methodology appropriate to the available tools
- Utilize database advisors to proactively tune an Oracle Database Instance
- Use the tools based on the Automatic Workload Repository to tune the database
- Diagnose and tune common SQL related performance problems
- Diagnose and tune common Instance related performance problems
- Use Enterprise Manager performance-related pages to monitor an Oracle Database

## Benefits To You

Demonstrate fluency in and strong understanding of Oracle Database 19c performance analysis, management, and tuning for optimal performance in a complex environment.

## Prerequisites

### Suggested Prerequisite

- Oracle Database: Deploy, Patch and Upgrade Workshop
- Familiarity with Oracle Database installation
- Familiarity with Oracle Database configuration concepts

### Required Prerequisite

- Oracle Database 19c: Administration Workshop
- Basic knowledge of Linux operating system
- A working knowledge of SQL and PL/SQL packages
- Basic understanding of Oracle Database architecture
- Familiarity with basic database monitoring procedures

## Audience

- Administrator
- Database Administrator

## Course Topics

### 1. Overview

- Practice: Preparing the Databases

### 2. Defining the Scope of Performance Issues

- Tuning Life Cycle Phases
- Practice: Using Enterprise Manager to Identify OS Issues

### 3. Using the Time Model to Diagnose Performance Issues

- Practice: Viewing the Top Wait Events and the Time Model

#### **4. Using Statistics and Wait Events to Diagnose Performance Issues**

- Instance Activity and Wait Event Statistics
- Practice: Viewing System Statistics and Wait Events

#### **5. Using Log and Trace Files to Monitor Performance**

- Practice: Viewing Performance Information in the Alert Log

#### **6. Using Enterprise Manager Cloud Control and SQL Developer to Monitor Performance**

- Practice: Using Enterprise Manager to Monitor Performance
- Practice: Using SQL Developer to Monitor Performance Part 1
- Practice: Using SQL Developer to Monitor Performance Part 2

#### **7. Using Statspack to View Performance Data**

- Practice: Installing Statspack
- Practice: Creating Snapshots
- Practice: Generating Statspack Reports
- Practice: Using Statspack to Examine Segment Statistics (Optional)

#### **8. Using Automatic Workload Repository**

- Managing AWR Data in a Multitenant Environment
- Practice: Creating and Managing AWR Snapshots
- Practice: Generating and Viewing an AWR Report
- Practice: Generating and Viewing a Compare Periods Report

#### **9. Using Metrics and Alerts**

- Practice: Setting Up and Viewing Server-Generated Alerts

#### **10. Using Baselines**

#### **11. Managing Automated Maintenance Tasks**

- Practice: Configuring Automatic Maintenance Tasks (Part 1)
- Practice: Configuring Automatic Maintenance Tasks (Part 2)

#### **12. Using ADDM to Analyze Performance**

- Compare Periods ADDM: Analysis
- Practice: Using AWR-Based Tools to Identify Performance Issues
- Practice: Performing an ADDM Analysis of a PDB

#### **13. Using Active Session History Data for First Fault System Analysis**

- Practice: Generating and Reviewing an ASH Report to Identify Performance Issues

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

#### **15. Overview of SQL Statement Processing**

- Processing a DML Statement

#### **16. Maintaining Indexes**

- Automatic Indexing Task
- Practice: Coalescing an Index

#### **17. Maintaining Tables**

- Block Space Management with Free Lists
- Shrinking Segments: Overview
- Advanced Index Compression
- Practice: Analyzing the Impact of Excess Blocks

#### **18. Introduction to Query Optimizer**

- Using Initialization Parameters to Control Optimizer Behavior

## 19. Understanding Execution Plans

- SQL\*Plus AUTOTRACE
- Practice: Using AUTOTRACE and EXPLAIN PLAN

## 20. Viewing Execution Plans by Using SQL Trace and TKPROF

- Practice: Using SQL TRACE and the TKPROF Utility

## 21. Managing Optimizer Statistics

- Extended Statistics
- Practice: Capturing Extended Statistics
- Practice: Determining the Impact of Stale Statistics
- Practice: Using the Optimizer Statistics Advisor to Improve Statistics Collection Quality

## 22. Using Automatic SQL Tuning

### 23. Using the SQL Plan Management Feature

- Practice: Using SQL Plan Management (Part 1)
- Practice: Using SQL Plan Management (Part 2)

## 24. Overview of the SQL Advisors

### 25. Using the SQL Tuning Advisor

- Practice: Using the SQL Tuning Advisor

### 26. Using the SQL Access Advisor

- Practice: Using the SQL Access Advisor to Improve SQL Performance

## 27. Overview of Real Application Testing Components

### 28. Using SQL Performance Analyzer to Determine the Impact of Changes

- Practice: Using SQL Performance Analyzer (Part 1)
- Practice: Using SQL Performance Analyzer (Part 2)
- Practice: Seeding SQL Plan Baselines from SQL Performance Analyzer

### 29. Using Database Replay to Test System Performance

- Database Replay Packages
- Practice: Configuring and Using Database Replay at the PDB Level

### 30. Implementing Real-Time Database Operation Monitoring

- Practice: Monitoring a Composite Database Operation
- Practice: Monitoring a PL/SQL Operation

### 31. Using Services to Monitor Applications

- Creating Services
- Service Aggregation Configuration
- Practice: Using Services in a Single-Instance Oracle Database (Part 1)
- Practice: Using Services in a Single-Instance Oracle Database (Part 2)
- Practice: Tracing Services in a Single-Instance Environment

## 32. Overview of Memory Structures

### 33. Managing Shared Pool Performance

- Avoid Hard Parses
- Sizing the Shared Pool
- Practice: Sizing the Shared Pool
- Practice: Tuning a Hard-Parse Workload
- Practice: Tuning a Soft-Parse Workload
- Practice: Keeping Objects in the Shared Pool

### **34. Managing Buffer Cache Performance**

- Buffer Cache Hit Ratio
- Caching Tables
- Multiple Block Sizes
- Practice: Sizing the Buffer Cache
- Practice: Using the Keep Pool

### **35. Managing PGA and Temporary Space Performance**

- Monitoring SQL Memory Usage
- Practice: Adjusting the Value of PGA\_AGGREGATE\_TARGET

### **36. Configuring the Large Pool**

### **37. Using Automatic Shared Memory Management**

- Using the V\$SYSTEM\_PARAMETER View
- Practice: Enabling Automatic Shared Memory Management

### **38. Introduction to In-Memory Column Store**

### **39. Configuring the In-Memory Column Store Feature**

- Configuring the In-Memory Column Store Feature
- Practice: Configuring In-Memory Column Store
- Practice: Configuring In-Memory Objects
- Practice: Querying In-Memory Objects and Viewing Execution Plans

### **40. Using In-Memory Column Store with Oracle Database Features**

- Practice: Exporting and Importing In-Memory Objects