

Oracle Database 12c: Performance Management and Tuning NEW

Duration: 5 Days

What you will learn

In the Oracle Database 12c: Performance Management and Tuning course, learn about the performance analysis and tuning tasks expected of a DBA: proactive management through built-in performance analysis features and tools, diagnosis and tuning of the Oracle Database instance components, and diagnosis and tuning of SQL-related performance issues.

Learn To:

Use the Oracle tuning methodology.

Use Oracle-supplied tools for monitoring and diagnosing SQL and instance performance issues.

Use database advisors to proactively correct performance problems.

Identify and tune problem SQL statements.

Monitor instance performance by using Enterprise Manager.

Tune instance components.

Benefits to You:

The DBA will analyze the SQL performance with available tools. The DBA will be introduced to various methods of identifying the SQL statements that require tuning and the diagnostic tools used to find ways to improve performance. This will include the use of statistics, profiles to influence the optimizer, and using the SQL Advisors.

Maintain SQL Performance

A major task of DBAs is to maintain SQL performance across changes. This course introduces Database Replay and SQL Performance Analyzer which help the DBA test and minimize the impact of change.

Influence Instance Behavior

Instance tuning uses the same general method of observing a problem, diagnosing the problem, and implementing a solution. The instance tuning lessons cover the details of major tunable components and describe how you can influence the instance behavior. For each lesson, we will examine the relevant components of the architecture. The course only discusses the architecture to the level required to understand the symptoms and solutions. More detailed explanations are left to other courses, reference material, and the Oracle documentation.

Audience

Data Warehouse Administrator Database Administrators

Related Training

Required Prerequisites

Oracle Database 12c: Administration Workshop

Suggested Prerequisites

Oracle Database 12c: Install and Upgrade Workshop

Course Objectives

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

Course Topics

Introduction

Course Objectives

Course Organization

Course Agenda

Topics Not Included in the Course Who
Tunes?

What Does the DBA Tune?

How to Tune

Tuning Methodology

Basic Tuning Diagnostics

Performance Tuning Diagnostics

Performance Tuning Tools

Tuning Objectives

Top Timed Events

DB Time

CPU and Wait Time Tuning Dimensions

Time Model

Dynamic Performance Views

Using Automatic Workload Repository

Automatic Workload Repository Overview

Automatic Workload Repository Data

Enterprise Manager Cloud Control and AWR

Snapshots

Reports

Compare Periods

Defining the Scope of Performance Issues

- Defining the Problem
- Limiting the Scope
- Setting the Priority
- Top SQL Reports
- Common Tuning Problems
- Tuning During the Life Cycle
- ADDM Tuning Session
- Performance versus Business Requirements

Using Metrics and Alerts

- Metrics and Alerts Overview
- Limitation of Base Statistics
- Benefits of Metrics
- Viewing Metric History Information
- Viewing Histograms
- Server-Generated Alerts
- Setting Thresholds
- Metrics and Alerts Views

Using Baselines

- Comparative Performance Analysis with AWR Baselines
- Automatic Workload Repository Baselines
- Moving Window Baseline
- Baselines in Performance Page Settings
- Baseline Templates
- AWR Baselines
- Creating AWR Baselines
- Managing Baselines with PL/SQL

Using AWR-Based Tools

- Automatic Maintenance Tasks
- ADDM Performance Monitoring
- Using Compare Periods ADDM
- Active Session History
- New or Enhanced Automatic Workload Repository Views
- Emergency Monitoring Real-time ADDM

Real-Time Database Operation Monitoring

- Overview
- Use Cases
- Defining a Database Operation
- Scope of a Composite Database Operation
- Database Operation Concepts
- Identifying a Database Operation

Enabling Monitoring of Database Operations
Identifying, Starting, and Completing a Database Operation

Monitoring Applications What

is a Service?

Service Attributes

Service Types

Creating Services

Managing Services in a Single-Instance Environment

Where are Services Used? Using Services with

Client Applications Services and Pluggable

Databases

Identifying Problem SQL Statements

SQL Statement Processing Phases

Role of the Oracle Optimizer

Identifying Bad SQL

Top SQL Reports SQL

Monitoring What is an

Execution Plan?

Methods for Viewing Execution Plans Uses

of Execution Plans

Influencing the Optimizer

Functions of the Query Optimizer

Selectivity

Cardinality and Cost

Changing Optimizer Behavior

Optimizer Statistics

Extended Statistics

Controlling the Behavior of the Optimizer with Parameters Enabling

Query Optimizer Features

Reducing the Cost of SQL Operations

Reducing the Cost

Index Maintenance

SQL Access Advisor

Table Maintenance for Performance

Table Reorganization Methods

Space Management

Extent Management Data

Storage

Using SQL Performance Analyzer

Real Application Testing: Overview

Real Application Testing: Use Cases

SQL Performance Analyzer: Process

Capturing the SQL Workload

Creating a SQL Performance Analyzer Task
SQL Performance Analyzer: Tasks
Parameter Change
SQL Performance Analyzer Task Page

SQL Performance Management

Maintaining SQL Performance
Maintaining Optimizer Statistics
Automated Maintenance Tasks
Statistic Gathering Options
Setting Statistic Preferences
Restore Statistics
Deferred Statistics Publishing
Automatic SQL Tuning

Using Database Replay

Using Database Replay
The Big Picture
System Architecture
Capture Considerations
Replay Considerations: Preparation
Replay Considerations
Replay Options
Replay Analysis

Tuning the Shared Pool

Shared Pool Architecture
Shared Pool Operation
The Library Cache
Latch and Mutex
Diagnostic Tools for Tuning the Shared Pool
Avoiding Hard Parses
Reducing the Cost of Soft Parses Sizing
the Shared Pool

Tuning the Buffer Cache

Oracle Database Architecture: Buffer Cache
Buffer Cache: Highlights
Database Buffers
Buffer Hash Table for Lookups
Working Sets
Buffer Cache Tuning Goals and Techniques
Buffer Cache Performance Symptoms Buffer
Cache Performance Solutions

Tuning PGA and Temporary Space

- SQL Memory Usage
- Performance Impact
- Automatic PGA Memory
- SQL Memory Manager
- Configuring Automatic PGA Memory
- Setting PGA_AGGREGATE_TARGET Initially
- Limiting the size of the Program Global Area (PGA)
- SQL Memory Usage

Automatic Memory

- Oracle Database Architecture
- Dynamic SGA
- Granule
- Memory Advisories
- Manually Adding Granules to Components
- Increasing the Size of an SGA Component
- Automatic Shared Memory Management: Overview
- SGA Sizing Parameters: Overview

Performance Tuning Summary with Waits

- Commonly Observed Wait Events
- Additional Statistics
- Top 10 Mistakes Found in Customer Systems
- Symptoms