
Oracle Database 11g DBA Performance & Tuning

5 days

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Oracle Database 11g DBA Performance & Tuning Course Overview

Delegates will be introduced to the main concepts of Oracle performance tuning and will gain practical experience in analyzing and tuning database performance. They will learn to identify tuning contentions and be able to take corrective action. By the end of the course, delegates will be able to:

- use different tuning methodologies
- use the database advisors to proactively tune a database
- use AWR tools to tune a database
- detect and tune common database performance problems
- use Enterprise Manager to monitor an Oracle database

This Oracle Database 11g DBA Performance & Tuning course covers the main topics of the Oracle beta test examination **1Z1-054 Oracle Database 11g Performance Tuning Certified Expert**.

Skills Gained

The delegate will practice:

- Tuning goals and methodology
- Planning initial database configuration
- Tuning database applications for optimal performance
- Identifying and resolving common tuning problems
- Using diagnostic sources
- Logging a SR with Oracle support
- Managing statistics
- Structuring SQL statements for performance
- Using the SQL optimizers
- Using Indexes effectively
- Examining the execution plan of a SQL statement using Explain Plan
- Examining the efficiency of SQL statements using SQL trace and autotrace
- Using table joins
- Monitoring statistics and wait events
- Using metrics, alerts and baselines
- Using statspack
- Using the Automatic Workload Repository
- Tuning the SGA and Shared Pool
- Tuning the data block buffers
- Using Automatic Memory Management
- Setting the PGA and temporary space
- Tuning checkpoint and redo logs
- Managing disk I/O
- Managing undo information

- Tuning block space
- Improving performance with materialized views
- Using parallel execution
- Using Database Replay
- SQL performance management and analysis

Who will the Course Benefit?

The Oracle Database 11g DBA Performance & Tuning course is suitable for database administrators, application developers and technical support staff who are required to monitor and tune an Oracle Database 11g or Oracle Database 10g.

Course Objectives

To provide the skills needed to monitor and tune an Oracle Database 11g or Oracle Database 10g.

Requirements

Delegates should have a working knowledge of SQL*Plus, PL/SQL and Oracle Database Administration. This can be obtained by attendance on the Oracle SQL and Oracle Database 10g DBA Part I courses. Some operating system experience is essential.

Knowledge of PL/SQL is desirable. Some operating system experience is essential.

Pre-Requisite Courses

- Oracle SQL
- Oracle Database 11g DBA - Part I
- Oracle Database 10g DBA - Part I

Follow-On Courses

- Oracle Database 11g DBA Backup & Recovery with RMAN
- Oracle Database 11g Data Guard

Oracle Database 11g DBA Performance & Tuning Training Course

Course Contents - DAY 1

Course Introduction

- Administration and Course Materials
- Course Structure and Agenda
- Delegate and Trainer Introductions

Session 1: INTRODUCTION TO ORACLE PERFORMANCE TUNING

- Tuning Overview
- Resolving Performance Problems
- The Oracle Approach to Tuning
- Items to Evaluate
- Where to Look
- Plan a Routine Monitoring Regime
- Build a New Database for Performance
- Tune an Existing Database for Performance
- Set Suitable Goals

Session 2: DIAGNOSING PROBLEMS

- Diagnostic Sources
- Log a Performance Service Request (SR)
- Tips for Avoiding Problematic Queries

Session 3: TOOLS FOR EVALUATING SQL STATEMENTS

- Overview of SQL Statement Tuning
- Explain Plan and autotrace
- SQL Trace and the tkprof Program
- Interpreting SQL Trace

Session 4: THE OPTIMIZER

- The SQL Optimizer
- The Rule Based Optimizer
- The Cost Based Optimizer
- The Analyze Command
- Manage Statistics with DBMS_STATS

Session 5: INDEXES

- Index Overview
- B*Tree Indexes
- Access Paths with Indexes
- Index Scans
- Conditions which Stop Indexes Being Used
- Parameters Affecting Optimizer Index Choice

Oracle Database 11g DBA Performance & Tuning Training Course

Course Contents - DAY 2

Session 6: ADVANCED INDEXES

- Bitmap Indexes
- Key Compressed Indexes
- Index Organized Tables
- Function-Based Indexes
- Descending Indexes

Session 7: TYPES OF TABLE JOINS

- Joining Tables
- Nested Loops Join
- Cluster Join and Hash Join
- Anti Join and Semi Join
- Outer Join
- Star Join

Session 8: METRICS, ALERTS AND BASELINES

- System Generated Alerts
- Threshold Based Alerts
- Event Based Alerts
- Retrieve Threshold Information
- View Alert Data
- Manage Metrics Using EM
- Blackouts
- Baselines and Adaptive Thresholds

Session 9: STATSPACK

- Overview Of Statspack
- Statspack Architecture
- Install Statspack
- Adjust the Statspack Collection Level
- Create, View and Delete Snapshots
- Generate a Report
- Analyze the Reports to Generate an Execution Plan for a Given SQL Statement
- Resolve Wait Events
- Remove Statspack from the Database

Session 10: AUTOMATIC WORKLOAD REPOSITORY

- Automatic Workload Repository
- Create Snapshots and Compare Snapshots
- Use Baselines
- Generate AWR Reports
- Compare AWR Periods Reports
- Generate Active Session History (ASH) Report
- Automatic Database Diagnostic Monitor (ADDM)
- Generate and Analyze ADDM Reports

Session 11: REACTIVE TUNING

- Use Enterprise Manager to Identify Common Problems
 - Eliminate Operating System Contentions
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Course Contents - DAY 3

Session 12: TUNING THE SHARED POOL

- Overview of the Shared Pool
- Alter and Tune the Shared Pool Size
- Tune the Data Dictionary Cache and the Library Cache
- Shared Pool Advisory Statistics
- Pin objects in the Shared Pool
- Cursor Sharing
- Using the Large Pool
- Latches and Mutexes

Session 13: TUNE THE BUFFER CACHE

- Memory Structures
- Data Block Buffer Pool
- Multiple Buffer Caches
- Manage Free Buffers
- Establish the Buffer Pool Efficiency
- Cache Tables in the Buffer Pools
- Common Performance Issues and the Buffer Cache

Session 14: AUTOMATIC MEMORY MANAGEMENT

- Automatic Memory Management
- Automatic Shared Memory Management
- Memory Allocation Advisors
- The Memory Advisor
- The Shared Pool and Buffer Cache Advisors

Session 15: TUNE PGA AND TEMPORARY SPACE

- PGA Overview
- Automatic PGA Mode
- Configure the PGA for a New Instance
- The Program Global Area Advisor
- PGA Management Data Dictionary Views
- Tune the PGA_AGGREGATE_TARGET

- SQL Operations that Use Sorts
- Sorting to Disk
- Multiple Temporary Tablespaces
- Allocate Temporary Disk Space for Sorting
- Temporary Tablespace Shrink
- Data Dictionary Views and Sort Segments

Session 16: CHECKPOINT AND REDO TUNING

- Checkpoint and Redo Issues
 - Instance Recovery Performance Tuning
 - Redo Log File Size Advisor
 - Size the Redo Log Buffer
 - Set Multiple Database Writers
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Course Contents - DAY 4

Session 17: TUNE I/O

- Database I/O Management
- Layout the Files Using OS or Hardware Striping
- Manually Distribute Files to Reduce I/O Contention
- When to Separate Files
- Sample Configurations
- Select the Data Block Size
- Synchronous I/O Benefits
- FILESYSTEMIO_OPTIONS Parameter
- Automatic Storage (ASM) Monitoring

Session 18: USE ORACLE BLOCKS EFFICIENTLY

- Determine the Database Block Size
- Tablespace, Table and Index Storage Parameters
- Automatic Segment Space Management
- Detect and Resolve Freelist Contention
- Rebuild Tables and Indexes
- The DBMS_SPACE Package
- Row Migration
- Chained Rows
- Bigfile Versus Smallfile Tablespaces
- Extended ROWID Format
- Convert from Dictionary Managed Tablespaces
- Convert to Automatic Segment Space Management

Session 19: MATERIALIZED VIEWS

- Overview of Materialized Views
- Materialized View Creation
- Materialized View Refresh
- Query Rewrite
- Materialized View Data Dictionary Views

Session 20: PARALLEL EXECUTION

- Overview of Parallel Execution
- Enabling and Using Parallel Execution
- The Degree of Parallelism
- SQL Hints
- Restrictions on the Use of Parallel Execution
- Dictionary Views on Parallel Execution
- Specific Automatic Parallel Query Optimization
- Nologging Options

Session 21: TRACING SERVICES

- End to End Tracing
- Enable and Disable Tracing
- Check for Tracing Enabled
- The trcess Utility
- Session Based Tracing
- Enable and View SQL Tracing with Enterprise Manager
- Analyze Trace Results

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Course Contents - DAY 5

Session 22: NEW 11G SQL AND PL/SQL TUNING FEATURES

- SQL Query Result Cache
- PL/SQL Function Cache
- Adaptive Cursors
- Invisible Indexes

Session 23: DATABASE REPLAY

- Overview of Database Replay
- The Database Replay Process
- Capture a Workload
- Pre-process the Captured Workload

- Replay the Workload
- Database Replay Usage
- The DBMS_WORKLOAD Packages

Session 24: SQL PERFORMANCE MANAGEMENT AND ANALYSIS

- Statistics Gathering
 - SQL Performance Analyzer
 - SQL Plan Management
 - Automatic SQL Tuning
 - Manual Creation and Use of SQL Tuning Sets
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Pre-Requisite Courses

- Oracle SQL
 - Oracle Database 11g DBA - Part I
 - Oracle Database 10g DBA - Part I
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Follow-On Courses

- Oracle Database 11g DBA Backup & Recovery with RMAN
 - Oracle Database 11g Data Guard
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