
Oracle Database 12cR2 DBA Performance Tuning & Management

Duration: 5 Days **Course Code: O12CDBAPT** **Delivery Method: Company Event**

Overview:

Oracle Database 12cR2 DBA Performance Tuning & Management Course Overview

This Oracle Database 12cR2 DBA Performance Tuning & Management course introduces the DBA to the main concepts of Oracle Database performance tuning and management. DBAs will gain practical experience in analyzing and tuning database performance. Delegates on the Oracle Database 12cR2 DBA Performance Tuning & Management course will learn how to use tuning goals and methodologies to identify tuning contentions in an Oracle database and how to take corrective action, how to detect and tune common database performance problems, how to use the database advisors to proactively tune a database and how to use the various tools provided by Oracle to tune a database. Exercises and examples are used throughout the course to give practical hands-on experience with the techniques covered. Versions supported 12cR2, 18c, 19c.

Company Events

These events can be delivered exclusively for your company at our locations or yours, specifically for your delegates and your needs. The Company Events can be tailored or standard course deliveries.

Target Audience:

Who will the Course Benefit?

The Oracle Database 12cR2 DBA Performance Tuning & Management course is suitable for database administrators and technical support staff who are required to monitor and tune an Oracle Database.

Objectives:

- Course Objectives
 - The objective of the Oracle Database 12cR2 DBA Performance Tuning & Management course is to provide the skills needed to monitor and tune an Oracle Database.
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Prerequisites:

■ Delegates who wish to attend the Oracle Database 12cR2 DBA Performance Tuning & Management course should have practical knowledge of using SQL and administering an Oracle database. They should have attended the Oracle SQL and the Oracle Database 12cR2 Administration courses or have a good working knowledge of Oracle SQL and Oracle database administration. The ability to describe and use Oracle built-in packages would be highly advantageous but is not essential.

This course is run on a Linux operating system, a basic knowledge of Linux/UNIX is recommended but is not essential.

Where Oracle 19c courses are listed in pre-requisites or follow-on courses the equivalent Oracle 18c or Oracle 12cR2 courses would also suffice.

Follow-on-Courses:

Further Learning

- Oracle Database 19c Backup and Recovery with RMAN
 - Oracle Database 19c Data Guard
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Content:

Oracle Database 12cR2 DBA Performance Tuning ; Management 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 of Oracle Database Tuning
- Application Developer Tuning Responsibilities
- Oracle DBA Tuning Responsibilities
- Oracle Tuning Process
- Plan a Routine Monitoring Regime
- Setting Suitable Goals
- Syntax Considerations

Session 2: TOOLS FOR EVALUATING SQL STATEMENTS

- Overview of SQL Statement Tuning
- Tools to Assist in SQL Tuning
- Use Explain Plan, Autotrace and SQL Trace to Examine the Execution of a SQL Statement
- Interpreting a SQL Trace

Session 3: THE SQL OPTIMIZER

- The SQL Optimizer
- Statement Transformation
- The Optimizer_Mode Initialization Parameter
- Cost Based Optimizer
- Managing Statistics with DBMS_STATS
- Automatic Statistics Gathering
- Dynamic Statistics
- Adaptive Optimization
- Transferring Statistics between Databases

Session 4: SORTS

- How Oracle Processes Sorts
- Temporary Disk Space Assignment
- SQL Operations that Use Sorts

Session 5: INDEXES

- Index Overview
- Selecting Suitable Columns for an Index
- B*Tree Indexes
- Rebuild an Index
- Create Multiple Indexes on the Same Column
- Composite Indexes
- Descending Indexes
- Access Paths with Indexes
- Index Scans

Session 9: SEQUENCES AND VIEWS

- Sequence Caching
- Views
- View Merging
- Inline Views
- The WITH Clause

Session 10: USING HINTS

- Using Hints to Influence Execution Plan
- Optimization Mode and Goals
- Access Methods
- Query Transformations
- Join Orders
- Join Operations
- Hint Examples

Session 11: MISCELLANEOUS

- Tips for Avoiding Problematic Queries
- Oracle 12.2 SQL*Plus Performance Setting Options
- Array Size
- The Shared Pool
- Intelligent Cursor Sharing
- Virtual Columns
- Bind Variable Usage
- Result Caching
- Approximate Query Processing
- Reduce Cursor Invalidations for DDLs
- Some PL/SQL Performance Issues
- Oracle Database 12cR2 DBA Performance Tuning ; Management Training Course Course Contents - DAY 3

Session 12: BASIC TUNING DIAGNOSTICS

- Performance Tuning Diagnostics, Features, and Tools
- DB Time
- CPU and Wait Time Tuning Dimensions
- Time Model
- Dynamic Performance Views
- Database Statistics
- Wait Events
- Diagnostic Sources
- Log Files and Trace Files

Session 13: REDUCE THE COST OF SQL OPERATIONS

- Identify Unusable Objects
- Maintain Indexes
- Maintain Tables and Reorganize Tables
- Manage Extents
- Row Chaining and Row Migration
- Segment Shrink

Session 14: THE SQL PERFORMANCE ANALYZER

Session 19: TUNE PGA AND TEMPORARY SPACE

- Overview of the PGA
- SQL Memory Usage
- Automatic PGA Memory Mode Configuration
- Configure the PGA for a New Instance
- Data Dictionary Views and PGA Management
- PGA Target Advice Statistics and Histograms
- Temporary Tablespace Management
- Temporary Tablespace Group
- Multiple Temporary Tablespaces
- Monitoring Temporary Tablespaces
- Temporary Tablespace Shrink
- Data Dictionary Views and Sort Segments

Session 20: CREATE AND USE SNAPSHOTS AND BASELINES WITH THE AUTOMATIC WORKLOAD REPOSITORY

- An Overview of In-Built Automatic Tuning Capabilities
- An Overview of the Automatic Workload Repository
- AWR Data
- Create and Compare Snapshots
- Examine AWR Reports
- Static and Moving Window Baselines
- Baseline Templates
- AWR Reports
- Monitor AWR using SQL Developer
- Performance Hub Active Report

Session 21: USE AWR-BASED TOOLS

- Automatic Maintenance Tasks
- Maintenance Window Configuration
- ADDM Performance Monitoring
- ADDM Reports
- Active Session History
- Generate an ASH Report

Session 22: USE METRICS AND ALERTS

- An Overview of Metrics and Alerts
- The Benefits and Limitations of Metrics and Alerts
- System Generated, Threshold Generated and Event Based Alerts
- Set Thresholds
- View Metric History Information
- View Histograms
- Metric and Alert Views Oracle Database 12cR2 DBA Performance Tuning ; Management Training Course Course Contents - DAY 5

Session 23: REAL TIME DATABASE OPERATION MONITORING

- Conditions That Stop Indexes Being Used
- Parameters that Affect Optimizer Index Choice Oracle Database 12cR2 DBA Performance Tuning ; Management Training Course Course Contents - DAY 2

Session 6: ADVANCED INDEXES

- Bitmap Indexes
- Key Compressed Indexes
- Index Organized Tables
- Function Based Indexes
- Invisible Indexes
- Table Partitioning
- Serial Direct Path Reads

Session 7: JOIN OPERATIONS

- Understand Access Paths
- Joining Tables
- Nested Loops Join
- Merge Join
- Cluster Join
- Hash Join
- Anti Join and Semi Join
- Outer Joins
- Star Join
- Improve Optimization with Different Access Paths

Session 8: SQL TUNING ADVISOR USING SQL DEVELOPER

- Overview of the DBMS_SQLTUNE Package
- Using the SQL Tuning Advisor with SQL Developer

- An Overview of the SQL Performance Analyzer
- Usage of the SQL Performance Analyzer
- Capture a SQL Workload into a SQL Tuning Set
- Create a SQL Performance Analyzer Task
- Generate Comparison Reports
- Configuring Analysis Tasks
- Transfer SQL Tuning Sets

Session 15: SQL PERFORMANCE MANAGEMENT

- Maintenance of the Optimizer Statistics
- Optimizer Statistics Collection
- Gather Statistics Options
- Defer Publishing Statistics
- The Optimizer Statistics Advisor
- The Expression Statistics Store
- Adaptive Query Optimization
- Automatic SQL Tuning
- SQL Monitoring
- The SQL Access Advisor
- SQL Plan Management

Session 16: AUTOMATIC MEMORY MANAGEMENT

- Overview of Automatic Shared Memory Management
- Dynamic SGA
- Parameters for Sizing the SGA
- Enable and Disable Automatic Shared Memory Management
- Overview of Automatic Memory Management
- Enable and Disable Automatic Memory Management
- Monitor Dynamic Memory Allocation
- Use the Memory Advisors

Session 17: TUNE THE SHARED POOL

- Overview of the Shared Pool Architecture
- Tune the Shared Pool
- Tune the Data Dictionary Cache
- Tune the Library Cache
- Pin objects in the Shared Pool
- The Data Dictionary Cache
- Latches and Mutexes
- The SQL Query Result Cache Oracle Database 12cR2 DBA Performance Tuning ; Management Training Course Course Contents - DAY 4

Session 18: TUNE THE BUFFER CACHE

- Overview of the Database Buffer Cache Architecture
- Buffer Cache Tuning Goals and Techniques
- Buffer Cache Performance Symptoms and Solutions
- Buffer Cache Advisor

- Overview of Real Time Database Operation Monitoring
- Database Operation Concepts
- Define a Database Operation
- Enable the Monitoring of Database Operations
- Identify, Start and Complete a Database Operation
- Monitor the Progress of a Database Operation
- Database Operation Views

Session 24: MONITOR APPLICATIONS

- Aggregation of Services with Tracing
- The DBMS_Monitor Package
- Enable Tracing for a Client
- Enable Session Tracing
- Enable Tracing for a Module
- Analyze Trace Results

Session 25: BIG DATA AND DATA WAREHOUSE FEATURES

- Reduce Cursor Invalidations For DDLS
- Automatic Indexing with DBMS_AUTO_INDEX
- Real Time Statistics Gathering During DML Operations
- High Frequency Statistics Gathering
- Advanced Index Compression
- Basic and Advanced Table Compression
- Quarantine of Runaway SQL Statements
- Bitmap-Based COUNT(DISTINCT) SQL Functions
- Scaleable Sequences

Session 26: TUNE DATABASE I/O

- An Overview of Database I/O Management
- I/O Architecture and Modes
- Important I/O Metrics for Oracle Databases
- Layout Files using Operating System or Hardware Striping
- Manually Distribute Files to Reduce I/O Contention
- Sample Configurations
- Asynchronous and Synchronous I/O
- Multi-Threaded Oracle
- Automatic Storage Management(ASM)Overview

Session 27: A SUMMARY OF ORACLE PERFORMANCE TUNING

- The Potential Impact of Initialization Parameters on Performance
- Initially Size Memory for a Database
- Recommended Best Practices for Different Types of Tablespace
- Determine and Use Block Sizes
- Size the Redo Log Buffer and the Redo Log Files
- Configure Automatic Statistics Gathering

- Database Smart Flash Cache
 - Full Database Caching
 - When to Flush the Buffer Cache
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Further Information:

For More information, or to book your course, please call us on 0800/84.009

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