Oracle Database 12cR2 DBA Performance Tuning & Management

Duration: 5 Days   Course Code: O12CDBAPT   Delivery Method: Virtual Learning

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.
Versions supported 12c,18c,19c.

Virtual Learning

This interactive training can be taken from any location, your office or home and is delivered by a trainer. This training does not have any delegates in the class with the instructor, since all delegates are virtually connected. Virtual delegates do not travel to this course, Global Knowledge will send you all the information needed before the start of the course and you can test the logins.

Target Audience:

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:

- 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.

Prerequisites:

Delegates who wish to attend the Oracle Database 12c DBA Performance Tuning & Management course should have practical knowledge of using SQL and of 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 12c courses are listed in the Pre-requisite Courses section equivalent Oracle 11g courses would also suffice.

Follow-on-Courses:

- Oracle Database 12cR2 Backup and Recovery with RMAN (O12CBR)
- Oracle Database 12cR2 Data Guard (O12CDG)
- Oracle Database 12cR2 RAC and Grid Infrastructure Administration (O12CRAC)
- Oracle 18c Container and Pluggable Database Administration (O18CCPA)

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
- Optimizer Adaptive Parameters
- Dynamic Statistics

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
- Conditions That Stop Indexes Being Used

Session 9: SEQUENCES AND VIEWS

- Sequence Caching
- Views
- View Merging
- Inline Views

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
- The WITH Clause
- 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
- The SQL Access Advisor
- 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
- PGA Target Advice Statistics and Histograms
- Automatic PGA and AWR Reports
- 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
- Enterprise Manager and the AWR
- Create and Compare Snapshots
- Examine AWR Reports
- Create and Compare Baselines
- Moving Window Baseline
- Baseline Templates
- Baselines Views
- Performance Monitoring and Baselines
- Compare Periods Report
- Define Alert Thresholds Using a Static Baseline
- Configure Adaptive Thresholds
- Performance Hub Active Report

Session 21: 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

Session 22: USE AWR-BASED TOOLS

- Automatic Maintenance Tasks
- Maintenance Window Configuration
- ADDM Performance Monitoring
- Active Session History
- Generate an ASH Report
- Real-time ADDM   Oracle Database 12cR2 DBA Performance Tuning ; Management Training Course   Course

- 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_SQL_TUNE 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
- Create a SQL Performance Analyzer Task
- Generate Comparison Reports
- Tune Regressed Statements
- Guided Workflow Analysis
- SQL Performance Analyzer Views

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
- Continuous Adaptive Query Plans
- Automatic SQL Tuning
- SQL Monitoring
- SQL Monitoring with the SQL Tuning Advisor
- SQL Monitoring with Enterprise Manager and SQL Developer
- The SQL Access Advisor
- SQL Plan Management
- SQL Diagnostics and Repair

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
- Use the SGA Advisor
- Overview of Automatic Memory Management
- Enable and Disable Automatic Memory Management
- Monitor Automatic Memory Management
- The PGA Aggregate Limit

Session 17: TUNE THE SHARED POOL

- Overview of the Shared Pool Architecture
- Latches and Mutexes
- Diagnostic Tools for Tuning the Shared Pool
- Avoiding Hard Parses
- Pin Objects in the Shared Pool
- Size the Shared Pool
- Avoiding Fragmentation of the Shared Pool
- The Data Dictionary Cache
- The SQL Query Result Cache Oracle Database 12cR2 DBA Performance Tuning ; Management

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Session 23: REAL TIME DATABASE OPERATION MONITORING

- 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
- Database Operation Tuning
- Oracle Database 12cR2 New Features

Session 24: MONITOR APPLICATIONS

- The Attributes and Types of Services
- Create Services
- Use Services with Client Applications
- Use Services with the Resource Manager
- Use Services the Oracle Scheduler
- Services and Metric Thresholds
- Use Aggregation of Services with Tracing
- The Top Services Performance Page

Session 25: BIG DATA AND DATA WAREHOUSE FEATURES

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

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
- I/O Calibration
- I/O Statistics and Diagnostics
- 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)

Session 27: A SUMMARY OF ORACLE

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

PERFORMANCE TUNING

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

Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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