

# ORACLE 11g – SQL TUNING

## SKY IT SOLUTIONS

Course scheduled to

Duration : 4 Days

### Course benefits

This course will help participants learn effective application tuning techniques for optimizing performance in the Oracle server environment. Topics in this course are troubleshooting application performance, by analyzing the various options available in Oracle 11g like hints and creating/ modifying existing physical, logical structures, understanding various new structures available in Oracle to improve application performance.

Oracle Database 11g offers improved administration and maintenance features, including an expanded automation toolset. This assists in maintaining vital data and allows organizations to ensure high availability, performance and integrity of their database systems.

In this hands-on course, you gain the knowledge and skills to understand a Oracle 11g *basic database concepts*, write and tune sqls, and deploy them to maintain your organization's database and ensure its availability.

### Who should attend?

This course is valuable for candidates who have **good knowledge in Oracle 11g SQL, PLSQL and some prior knowledge in DB concepts.**

Sessions reinforce the learning objectives and provide participants the opportunity to gain immediate, hands-on reinforcement of the ideas you are learning.

**SKY IT SOLUTIONS**

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### Session 1

#### **Performance Tuning Duties Of The DBA**

- ⇒ What is Performance Tuning?
- ⇒ Trade-offs Between Response Time and Throughput
- ⇒ Steps for Tuning
- ⇒ Measurable Tuning Goals

#### **Oracle Database Memory Structures: Overview**

- ⇒ Background Process Roles
- ⇒ Automatic Shared Memory Management
- ⇒ Automatic Memory Management

#### **Tune the Logical Structure of the Database**

- ⇒ Types of Tablespace
- ⇒ Segment space management
- ⇒ Extent Management (local, dictionary)
- ⇒ Using Oracle blocks efficiently
  - About multiple block sizes in oracle
  - Improving I/O by using multiple block sizes
  - Creating Indexes using multiple block sizes
  - How to Choose Data Block Size

#### **Lunch**

#### **Database structures and SQL**

- ⇒ Effect of PCTFREE & PCTUSED on DML
- ⇒ Row Chaining & Row Migration
- ⇒ Table high-water mark, Free and Unused space
- ⇒ Row-resequencing and Oracle SQL I/O performance
- ⇒ Table partitioning – List, range, hash, Interval, system, reference

#### **Understanding ROWID**

- ⇒ How is rowid used within Oracle
- ⇒ Different Structures and usage of Rowid
- ⇒ Using Rowid to make select faster

#### **Materialized View**

- ⇒ Purpose of Materialized views
- ⇒ Refreshing MV
- ⇒ Query Rewrite
- ⇒ Rewrite or Error

#### **About sorts**

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- ⇒ Automatic PGA memory management
- ⇒ Tuning sorts in Oracle
- ⇒ PGA advisor

### Histogram

- ⇒ Extended statistics

## Session 2

### Coding, Structures that enhances SQL/plsql performance

#### REF CURSOR

- ⇒ Types of Ref Cursors
- ⇒ Advantages
- ⇒ Usage
- ⇒ Passing as parameters

#### GLOBAL TEMPORARY TABLES

- ⇒ Ways of creating it
- ⇒ Advantages of each

#### DYNAMIC SQL

- ⇒ Why use Dynamic SQL
- ⇒ DBMS\_SQL package
- ⇒ EXECUTE IMMEDIATE

#### PLSQL TABLE

- ⇒ Advantages of using PLSQL table
- ⇒ Using PLSQL table in Application Development
- ⇒ Attributes

#### INLINE QUERY, SCALAR SUBQUERY

- ⇒ About Inline Query
  - ⇒ Advantages and realtime usage of Inline Queries
- Lunch

#### LARGE OBJECTS

- ⇒ Usage BLOB, CLOB, BFILE
- ⇒ Package used specific for Large Objects
- ⇒ Large Object Principles
- ⇒ Using DBMS\_LOB

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### AUTONOMOUS TRANSACTION

- ⇒ Understanding a transaction
- ⇒ What is Autonomous transaction
- ⇒ Their usage within a transaction

### Lunch

### BULK BINDS

- ⇒ Use bulk binding for multi-row operations
- ⇒ Selecting huge volume of data
- ⇒ Inserting
- ⇒ Bulk Exceptions

### COLLECTIONS

- ⇒ Varray
- ⇒ Nested Table

### External Tables

- ⇒ Use Oracle\_loader to load from the external files
- ⇒ Using Oracle\_Datapump driver

### Indexing techniques

- ⇒ B-Tree indexes
- ⇒ Bitmap Indexes
- ⇒ Function-based Indexes
- ⇒ Reverse Key
- ⇒ Cluster Index (overview)
- ⇒ IOT tables

## Session 3

### PLSQL Native Compilation

#### Appending data above HWM – Advantage

- ⇒ using hints
- ⇒ direct path load

#### PL/SQL Function Result Cache

- ⇒ Using result cache hint
- ⇒ Cached and not cached clause in Function
- ⇒ Result\_cache and relies\_on

#### SQL Result Cache

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- ⇒ RESULT\_CACHE\_MODE
- ⇒ Using and Managing Result cache

### Memory Structures that enhances SQL/plsql performance (continued)

#### Sizing Shared Pool

- ⇒ Interpreting the V\$LIBRARYCACHE Table
- ⇒ Reducing Library Cache Misses
- ⇒ Loading PL/SQL Objects into the Shared Pool

#### SQL Plan Management

- ⇒ SQL Plan Management: Overview
- ⇒ SQL Plan Baseline: Architecture
- ⇒ Evolving SQL Plan Baselines
- ⇒ SQL Plan Selection

#### Lunch

#### Sizing the Buffer Cache

- ⇒ Buffer Cache
- ⇒ Examining Buffer Cache Activity via the Cache Hit Ratio
- ⇒ Calculating the Cache Hit Ratio
- ⇒ When to Use Multiple Buffer Pools - KEEP, RECYCLE and DEFAULT
- ⇒ Choosing Data Block Size Examples

#### Tuning redo generation

- ⇒ Unnecessary index
- ⇒ Select for update
- ⇒ Update only the data of significance
- ⇒ Unnecessary commit
- ⇒ Global temp tables
- ⇒ External tables

#### Indexes: Overview

- ⇒ Using Indexes: Considering Nullable Columns
- ⇒ Guidelines for Managing Indexes
- ⇒ Monitoring Index Usage
- ⇒ Invisible Index
- ⇒ Virtual Index

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### Session 4

#### AWR and Advisories

##### Automatic Workload Repository (AWR)

- ⇒ AWR Features
- ⇒ Snapshots
- ⇒ Baselines
- ⇒ Moving window baseline
- ⇒ Single baseline
- ⇒ Repeating baseline
- ⇒ AWR Report

##### Automatic Database Diagnostic Monitor (ADDM)

- ⇒ Overview
- ⇒ ADDM Parameters
- ⇒ Finding
- ⇒ Recommendations
- ⇒ ADDM Report

##### SQL Tuning

- ⇒ The Oracle Optimizer
- ⇒ Cost-Based Optimization
- ⇒ About Optimizers in Oracle 10g
  - ⇒ Components of query optimizer
  - ⇒ Transforming queries
  - ⇒ Selectivity
  - ⇒ Cardinality
  - ⇒ Cost
  - ⇒ Generating plans

##### SQL Tuning Advisor

- ⇒ Overview
- ⇒ Automatic SQL Analysis
- ⇒ Creating SQL Tuning Tasks

##### Automated SQL tuning

##### Lunch

##### Building and deleting statistics

- ⇒ System statistics
- ⇒ Locking Statistics
- ⇒ Multicolumn Statistics: Overview

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- ⇒ Dynamic Sampling
- ⇒ Understanding a method of execution of a SQL
- ⇒ Hash Joins, Sort merge Join, Nested Loop
- ⇒ Using Indexes appropriately
- ⇒ Using Autotrace
- ⇒ Optimizer Mode
- ⇒ Optimizer hints (used in statement level)
- ⇒ Optimizer Modes meant for OLTP and DSS
- ⇒ Invoking the SQL Trace Facility
- ⇒ Tkprof
- ⇒ Formatting Trace Files with TKPROF
- ⇒ Interpreting the Output of the TKPROF Command
- ⇒ Optimizer Plan Stability (overview)
- ⇒ Bind variable Usage ( Soft Parse / Hard Parse (How to reduce)
- ⇒ Evaluating Large-table, full-table scans
- ⇒ Fasten Full Table Scan

### Adaptive Cursor Sharing

- ⇒ Effects of CURSOR\_SHARING Parameter(Benefits/BAD Effects)
- ⇒ About Bind-Aware Peeking
- ⇒ Bind-Aware Peeking views
- ⇒ Starting a system with bind-aware peeking

### Parallel query

- ⇒ About parallel query sets
- ⇒ Overview About of Parallel query explain plan

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