**Training**

## ORACLE DBA - COURSE CONTENTS

**Duration     :  6 Weekends (Sat & Sun :  4 Hours Each Day)**
**No. Of Hours :  48 Hours.**

### Architecture & Configuration

### Overview of Oracle DBA tasks
Oracle as a flexible, complex & robust RDBMS
The evolution of hardware and the relation to Oracle
Different DBA job roles(VP of DBA, developer DBA,production DBA, database babysitter)
The changing job role of the Oracle DBA
Environment management (network, CPU, disk and RAM)
Instance management (managing SGA regions)
Oracle table and index management
Instance Architecture

### Instance vs. database
Components of an instance
Creating the OFA file structure ($DBA, bdump, udump, pfile)
Oracle Instance Internals

### SGA vs. PGA
Background processes
Interfaces with server and disk I/O subsystem
Using SQL*Plus for DBA management

### Connecting and executing SQL
Using the "as sysdba" syntax
Overview of SQL*Plus DBA commands (startup, etc.)
Control file, UNDO and REDO management
Explaining the use of control files
Listing the Contents of the control File
File locations for control Files
Obtaining Control File Information
Listing control file contents
Displaying and Creating Undo segments
Altering Undo Segments
Determining the Number and Size of Undo segments
Understanding flashback technology
Troubleshooting Undo – snapshot too old
Redo log concepts for recovery
Online redo log (log_buffer) online redo logs and archived redo logs
Oracle ARCH and LGWR background processes
Redo log dictionary queries

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Redo log switch frequency and performance
Multiplexing the Online Redo Log Files
Archiving the Oracle Redo Logs
Recovery using the redo log files
User and privilege management
Creating New Database Users
Using pre-spawned Oracle connections
Auditing User activity
Identifying System and Object Privileges
Granting and Revoking Privileges
Creating and Modifying Roles
Displaying user security Information from the Data Dictionary
Oracle database management

## Overview of instance management
Parameter files (init.ora, listener.ora, tnsnames.ora)
Rules for sizing SGA components
Automated Oracle memory management (AMM)
Initialization file management

## Creating the init.ora file
Using spfile
Displaying init.ora values with vparameter
Oracle*Net configuration
Creating the listener.ora file
Creating the tnsnames.ora file
Data buffer configuration & sizing
Inside the Oracle data buffers
Using the KEEP pool
Monitoring buffer effectiveness
Using multiple blocksizes (multiple buffer pools)
Shared pool and PGA configuration & Sizing
Shared pool concepts and components
Understanding the library cache
Relieving shared pool contention
Overview of PGA for sorting and hash joins
Using sort_area_size, hash_area_size and pga_aggregate_target
Troubleshooting network connectivity
Verifying network connectivity with ping and tnsping
Testing database links
Oracle object management

## Oracle tables, views and materialized views
Types of Oracle tables (regular, IOT, sorted hash clusters, nested tables)
Oracle Views
Oracle materialized views
Oracle indexes
Types of Oracle indexes (b-tree, bitmap, bitmap join index)

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Creating B*-Tree, bitmap and function-based Indexes
Function-based indexes
Finding indexing opportunities
Index maintenance
Oracle constraints

## Costs & benefits of constraints

Types of Oracle indexes constraints (check, not null, unique, PK, FK)
Cascading constraints
Schema, File & tablespace management
Describing the relationship between data files, tablespaces and table
Understanding Oracle segments
Creating Tablespaces – using the autoextend option
Changing the Size of Tablespaces – alter database datafile command
Defining a TEMP tablespace
Changing the default storage Settings for a tablespace
Review of the storage parameters in DBA views (ASM, ASSM, pctfree, pctused and freelists)
Monitoring Chained rows (fetch continued rows)
Monitoring Insert and Update performance (pctused, APPEND)
Database Maintenance
Reason for reorgs – chained rows, imbalanced freelists
Reorganizing Tables using Export and Import
Using CTAS to reorganize data
Index rebuilding
Backup & Recovery overview (hot & cold Backups, RMAN, block change tracking)

## Oracle DBA Utilities

Data pump (Imp and exp utilities)
SQL*Loader
LogMiner ,Flashback  Introduction DataGuard
Creating and Modifying Roles
Oracle DBA utilities – Oracle dbms packages (dbms_redefinition)
Introduction Replication (Streams, multimaster, materialized views)
Monitoring Oracle
This section explores the methods used for monitoring all active components
of the Oracle database.

## Dictionary and v$ views

The dba_, all_ and user_ structures
Querying the tables, indexes, and segments views
Querying the AWR (STATSPACK) tables
Table & index monitoring
Monitoring table extents and fragmentation
Using the dba_tables and dba_segments views
Monitoring table CBO statistics
Monitoring table extents and fragmentation
Locating chained rows

Monitoring table & index growth
Monitoring index usage
Monitoring index fragmentation
Locating un-used indexes
Identifying IOT candidates
Reorganizing Indexes with alter index rebuild
Dropping Indexes
Getting Index Information from the Data Dictionary
Instance monitoring

## Monitoring with the AWR and STATSPACK

Creating a time-series performance report
Using www.statspackanalyzer.com
Scripts for AWR and STATSPACK
Plotting performance data (WISE, Excel)
Finding performance trends and signatures
Oracle environment monitoring
Displaying and managing Oracle sessions (v$session, v$process)
Using AWR to monitor disk, network and CPU consumption
Monitoring the alert log
Oracle trace/dump files
STATSPACK and AWR performance management

## Installing STATSPACK

Running STATSPACK reports
Interpreting a STATSPACK report
Getting time series reports with STATSPACK
Finding performance signatures with STATSPACK
Performance Management
    This section explores the methods used for performance management in Oracle and shows tips and scripts for monitoring all components of any Oracle database. You will also learn the proper action to take when any area of Oracle becomes a bottleneck.

## Bottleneck performance analysis

Drill-down into AWR reports
Top-5 timed events
External Server Bottlenecks (Network, I/O, RAM, CPU)
Network troubleshooting
Instance Tuning
Changing init.ora optimizer parameters (index_optimizer_cost_adj, optimizer_mode)
Managing region parameters (shared_pool_size, db_cache_size)
Understanding instance contention (e.g. Buffer busy waits, library cache contention)
SQL and CBO behavior

## Introduction to cost-based optimization

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Changing the default optimizer modes
Optimizer parameters
Dynamic sampling
Collecting table and index statistics (dbms_stats)
Using column histograms and skewonly
Tracing SQL Execution

## Using EXPLAIN PLAN

Using "set autotrace"
Interpreting EXPLAIN PLAN Output
Using TKPROF / SQL*Trace
SQL Execution Internals

## Review of Basic joining methods

Merge join
Hash Join
Nested Loop join
Advanced SQL operators
Between operator
SQL Tuning

## Using hints to improve SQL performance

Using parallel query to improve performance
SQL reusability within the library cache
Table high-water mark
Table striping and table partitions
Using indexes to improve performance
Identifying full-table scans
Re-writing SQL queries
Tuning sub-queries
Oracle High Availability tools

## Continuous availability and disaster recovery

Quantifying the cost of unplanned downtime
Oracle multi-master replication
Introduction to DataGuard
Introduction to Oracle Streams
Introduction to Real Application Clusters
Backup & Recovery

## OS-level backups

Hardware-level backup & recovery
Block-level change tracking
Disk mirroring
Backup & recovery and RAID level
Oracle-level backups (exp, expdp & RMAN)
Hot vs. Cold backups

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