

# Oracle Database 12c: New Features for Administrators Ed2

**Target Audience:**DBA/Developer/Technical Consultant/ Support Engineers

**Pre-Requisites :**Working Knowledge of Oracle

**Course Duration :** 5 Days

**Day 1:**

## **Basics of Multitenant Container Database (CDB)**

- Benefits of the multitenant architecture
- Differences between the root container and pluggable database containers
- Structure of the root
- Structure of Pluggable Database (PDB)
- CDB\_xxx and DBA\_xxx views
- Impacts in Security, Data Guard, Oracle GoldenGate, Oracle Streams, XStream, and Scheduler

## **Configuring and Creating CDB and PDBs**

- Tools: DBCA and SQL\*Plus
- Configuration and creation of CDB
- Exploring the Structure (CDB\_xxx views and EM)
- Tools used: SQL Developer, DBCA and SQL\*Plus and EM Database Express
- Create a new PDB from PDB\$SEED
- Create a PDB from a non-CDB
- Clone a PDB into the same CDB or into another CDB using DB links
- Plug in an unplugged PDB

## **Managing CDB and PDBs**

- Connect to CDB as administrator
- Connect to a PDB using a service name
- Start up a CDB
- Open / Close a PDB (SQL\*Plus, srvctl, EM)
- Open / Close all PDBs
- Shut down a CDB
- Preserve or discard the PDBs open mode when the CDB restarts
- Change PDB state



## **Managing Tablespaces, Common and Local Users, Privileges and Roles**

- Create permanent tablespaces in the root and PDBs
- Manage common and local schemas and users in the root and PDBs
- Manage system and object privileges to common and local grantees granted "commonly" or "locally"
- Manage common and local roles granted "commonly" or "locally"

## **Day 2:**

### **Managing Backup / Recovery / Flashback**

- Backup a whole CDB
- Backup a PDB
- Recover CDB from redo log files, control files, undo datafiles loss
- Recover PDB from PDB datafiles loss
- Flashback at CDB level
- Explain the two methods of migration

### **Online Datafile Move and Automatic Data Optimization**

- Data classification in 12c : tablespace, group, object, row levels
- Configure heat map
- Automatic movement and compression
- Compression levels and types
- Policy declaration: simple declarative SQL extension
- Customized automated action execution with user-defined function
- Execution in scheduled maintenance windows and by MMON
- Customized schedule with DBMS\_ILM package

### **In-Database Archiving**

- Challenges of old data in tables and 11g solutions
- In-database archiving new solutions
- Use ROW ARCHIVAL clause to enable row lifecycle state for applications
- Set ROW ARCHIVAL VISIBILITY for session level visibility control
- Use predicate on ORA\_ARCHIVE\_STATE column
- Temporal Validity versus Temporal History (Transaction Time of FDA)
- New clause of CREATE / ALTER TABLE to set a Temporal Validity: PERIOD FOR
- New SQL temporal data type

### **Auditing Enhancements**

- Review of 11g R2 audit trail implementation
- Overview of the Unified Audit Trail
- Enabling the Unified Audit Trail
- Creating a separate tablespace for the unified audit trail
- Granting the AUDIT\_ADMIN role to a user for audit trail configuration and management

- Configuring the Unified Audit Trail to set a tolerance level for loss of audit records
- Creating audit policies

### **Day 3:**

#### **Privileges Enhancements**

- Implementing Separation of Duty for Database Administration Tasks
- Using Database Privilege Analysis
- Overview of Database Privilege Analysis
- Granting the CAPTURE\_ADMIN role to enable management of privilege captures
- Creating and starting/stopping privilege captures
- Viewing privilege profile data
- Querying DBA\_PRIV\_CAPTURES
- Explaining the purpose of the default ORA\$DEPENDENCY profile

#### **Oracle Data Redaction**

- Overview of Oracle Data Redaction
- Types of Masking Policies
- Administering the EXEMPT REDACTION POLICY system privilege to enable a user to view unmasked values
- Managing Masking Policies
- Best practices for defining policy expressions
- Understanding Masking of Statements Containing Subqueries
- Viewing Information About Masking Policies by Querying REDACTION\_POLICIES and REDACTION\_COLUMNS

#### **General RMAN New Features and FDA Enhancements**

- Making Database Connections With RMAN
- Using the SYSBACKUP Privilege
- Using SQL, DESCRIBE Command, Duplication Operation with the NOOPEN option
- Backing up and Restoring Very Large Files
- Creating Multisection Backups
- Transporting Data Across Platforms
- Prerequisites and Limitations
- Transporting Data: Processing steps

#### **Monitoring DB Operations**

- Overview
- Use cases
- Current Tools
- Define a DB operation
- Monitoring: Bracketing an Operation
- Monitoring the Progress of Operations

- DB Operation Tuning
- DB Operation Active Report

#### **Day 4 :**

##### **Real-Time ADDM and Compare Period Advisor**

- Emergency Monitoring
- Real time ADDM
- Use cases
- Goals
- Define Workload dimensions
- Reported items
- Root Causes
- Requirements for a report

##### **ADR and Network Enhancements**

- ADR file types
- New File types
- New File locations
- New command for ADRCI
- Improve performance by Compression
- Setup Compression

##### **In-Memory Column Store**

- In-Memory Database option goals and benefits
- Row format and columnar format
- New SGA component:
- IMCU synchronization
- Deployment and behaviors
- Compression ratio
- New dictionary tables and added columns
- New statistics: IM %

##### **In-Memory Caching**

- Setting up Full Database In-Memory Caching
- Using Full Database In-Memory Caching
- Explaining the two buffer replacement algorithms of Automatic Big Table Caching
- Configuring Automatic Big Table Caching with PARALLEL\_DEGREE\_POLICY and DB\_BIG\_TABLE\_CACHE\_PERCENT\_TARGET Using Automatic Big Table Caching

#### **Day 5 :**

##### **SQL Tuning**

- Adaptive Execution Plans

- SQL Plan Directives
- Statistics Gathering Performance Improvements
- Histogram Enhancements
- Enhancements to Extended Statistics
- Adaptive SQL Plan Management

### **Resource Manager and Other Performance Enhancements**

- Manage resources between PDBs
- Manage resources within a PDB
- Manage resources with CDB and PDBs plans
- Manage runaway queries
- Control the in-memory database repopulation resource consumption
- Automated maintenance tasks
- Current Architecture: Unix multiprocess / one thread, NT/Windows one process / multithread
- New Architecture: Multiprocess / MultiThread

### **Index and Table Enhancements**

- Multiple indexes on the same set of columns as long as some characteristic is different
- Create table with INVISIBLE columns
- Support for invisible columns
- Describe online redefinition supports
- Explain LOCK timeout during FINISH\_REDEF\_TABLE
- Describe the Advanced Row Compression
- Using the following DDL statements in an online manner