

## Oracle Database 12c R2: New Features for Administrators Part 2

**Duration:** 5 Days

### What you will learn

Throughout the lessons of the Oracle Database 12c R2: New Features for Administrators Part 2 course constituted by five modules; the Securing Data module, the Making Data Available module, the Partitioning Data module, the Managing Information Lifecycle module and the Monitoring DB Operations and Managing Performance module, students receive a good knowledge of the Oracle Database 12c Release 2 new and enhanced features in different areas of database administration like Unified Auditing, Transparent Data Encryption (TDE) and other areas of security, Recovery Manager, online operations, Oracle Data Pump, SQL\*Loader, new partitioning methods, Automatic Data Optimization, In-Memory Column Store, Full Database In-Memory Caching, and Automatic Big Table Caching.

### Learn To:

Gain an understanding of the new and enhanced features of Oracle Database 12c Release 2 (12.2.0.1) amongst different areas such as security, availability, partitioning, performance, and Information Lifecycle Management (ILM).

### Benefits To You

Benefit from getting a thorough understanding of the following lessons:

The lessons of the Securing Data module cover enhancements in auditing like role based conditional auditing, in privilege administration like new system administrative privilege for RAC, in Privilege Analysis and Data Redaction, in Transparent Sensitive Data Protection with new types of policies for FGA and TDE, and finally also in Transparent Data Encryption (TDE).

The lessons of the Making Data Available module cover enhanced features in RMAN like table recovery, transport data across platforms, enhancements related to online operations, and finally ongoing enhancements with Oracle Data Pump, SQL\*Loader and external tables.

The lesson of the Partitioning Data module covers enhancements and new partitioning methods.

The lessons of the Managing Information Lifecycle module introduce Heat Map and Automatic Data Optimization with heat map statistics tracking and ADO policies. The lessons also cover Temporal functionalities such as temporal history and temporal validity. In-Database Archiving provides a new feature, the Row-archival.

The lessons of the Monitoring DB Operations and Managing Performance module explain the new features to improve the performance of the databases with SQL Performance Analyzer, DB Replay and SQL Plan Management, and to improve query execution with the Optimizer Statistics Advisor, JOIN processing. You will also learn about In-Memory Database option.

### Related Training

#### *Required Prerequisites*

Knowledge of Oracle Database 11g R2

Knowledge of Oracle Multitenant Container Database architecture

#### *Suggested Prerequisites*

Oracle Database 12c R2: New Features for Administrators Part 1 Ed 1

Oracle Enterprise Manager Cloud Control 13c: Install & Upgrade Ed 1

Oracle Enterprise Manager Cloud Control 13c: Install & Upgrade Ed 2

## Course Objectives

Manage security by using Unified Auditing

Manage security by using privileges and profiles

Manage security by using Privilege Analysis

Manage security by using Data Redaction

Manage security by using Transparent Data Encryption

Manage security by using Transparent Sensitive Data Encryption

Describe the new RMAN enhancements

Manage data availability by using new features of Oracle Data Pump

SQL\*Loader and external tables

Manage data availability by performing online operations

Manage data partitioning

Manage Information Lifecycle by using ADO

Manage Information Lifecycle by using In-Database Archiving and Temporal features

Describe database operations

Configure and use In-Memory Column Store

Use In-Memory Caching

Use Real Application Testing enhancements

## Course Topics

### Introduction

Global objectives of the course

Lessons grouped by modules

Schedule of the week

### Auditing Using Unified Audit

Quick review of 11g R2 audit trail implementation

Overview of the Unified Audit Trail

Creating and enabling audit policies for all users to whom the role is granted directly

Capturing VPD (Virtual Private Database) generated predicates

### Controlling Data Access Using Privileges and Profiles

New 12.2 administrative privileges

Password file enhancements

Enhance the security of administrative users

Enforce the associated profile's password limits

Using mandatory INHERIT PRIVILEGES privilege to execute invoker's rights procedure

Using mandatory INHERIT PRIVILEGES privilege to select from BEQUEATH current\_user views

Using new INHERIT (ANY) REMOTE PRIVILEGES privilege

### Controlling Data Access Using Privilege Analysis

Overview of database privilege analysis

Granting the CAPTURE\_ADMIN role to enable management of privilege captures

Creating and starting/stopping privilege captures and runs

Viewing privilege analysis result

Querying DBA\_PRIV\_CAPTURES

### Redacting Data

Overview of Oracle Data Redaction

Types of Data Redaction Policies

New redaction format library in EM GUI

Redaction policy expression

Redacting with Nullify redaction function

### Encrypting Data

Encrypt / decrypt / rekey tablespaces online  
Configure automatic tablespace encryption

### **Controlling Data Access Using Transparent Sensitive Data Protection**

Configure and use TSDP with VPD  
Configure and use TSDP with Data Redaction  
Configure and use TSDP with Unified Auditing  
Configure and use TSDP with Fine-Grained Auditing (FGA)  
Configure and use TSDP with Transparent Data Encryption (TDE)

### **Making Data Available by Using RMAN Features**

RMAN enhancements  
Transport Data Across Platforms  
Table recovery  
Automate the manual recovery process by using Recover Database Until Available Redo  
REPAIR FAILURE command extended

### **Making Data Available by Using Oracle Data Pump, SQL\*Loader and External Tables**

Oracle Data Pump enhancements  
SQL\*Loader enhancements  
Querying against external tables and overriding external table clauses

### **Making Data Available by Performing Online Operations**

Describe online redefinition supports  
Move and compress table partitions ONLINE

### **Partitioning Data**

Enable reference partitioning with interval partitioned parent tables  
Incorporate the CASCADE option for TRUNCATE PARTITION and EXCHANGE [SUB]PARTITION operations  
Convert partitioning Range to Interval and vice-versa  
Convert subpartitioning Range to Interval and vice-versa  
Simplify the maintenance of (sub) partitioned tables  
Composite partitioning

### **Managing Information Lifecycle Using ADO**

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

### **Managing Information Lifecycle Using In-Database Archiving and Temporal**

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)  
Set a Temporal Validity by using PERIOD FOR clause of CREATE / ALTER TABLE

New SQL temporal data type

## **Monitoring DB Operations and Performance**

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

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

In-Memory Database option goals and benefits

Row format and columnar format

New SGA component

Deployment

Compression and priority in-memory segments attributes

Dictionary tables, added columns, IM statistics and IM Advisor

IM FastStart

Interaction with other products

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

Caching results of frequently evaluated expressions and virtual columns

Optimizing joined columns by creating join groups

## **Improving Performance Using In-Memory Caching**

Setting up Full Database In-Memory Caching

Explaining the two buffer replacement algorithms of Automatic Big Table Caching

Configuring Automatic Big Table Caching with DB\_BIG\_TABLE\_CACHE\_PERCENT\_TARGET initialization parameter

Using Automatic Big Table Caching

## **Improving SQL Performance**

Statistics gathering performance improvements: Optimizer Statistics Advisor

Adaptive Execution Plan

Benefit from automatic dynamic sampling

## **Using Real Application Testing Enhancements**

SQL Performance Analyzer enhancements

SQL Plan Management enhancements

Database Replay enhancements

## **Improving Performance Using Other Features**

Manage session PGA limit

Multiple indexes on the same set of columns

Describe Advanced Row Compression and Advanced Index Compression HIGH level

Reduce Cursor Invalidations for DDLs

Define real-time materialized views with on query computation and ON STATEMENT refresh materialized views

Using multi-process multi-threaded Oracle architecture

Describe Database Smart Flash Cache enhancements

Use temporary undo for your temporary tables