Oracle AI Database: Administration Workshop Live Class

Oracle Database

DURATION	MODULES	COURSE CODE
5 Days	**30 Lectures**	**—**

Course Overview

This course is targeted at Database Administratorsand begins with explaining the architecture of an Oracle Database instance and the tools used to access it. The course includes creating and managing a database, configuring and managing Oracle Net Services along with creating and administering pluggable databases (PDBs). You learn how to create and manage database storage, users, backup, and implement database security. Additionally, the course covers protection of database against failures, loading, and transporting data.

What You Will Learn

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- Target Audience I-2
- Prerequisites I-3
- Learning Outcomes I-4
- Course Outline I-6
- What’s Next? I-8

Introduction to Oracle Database

- Objectives
- Oracle Database Server Architecture: Overview
- Oracle Database Instance Configurations
- Oracle Multitenant Container Database: Introduction
- Oracle Multitenant Container Database: Architecture
- Oracle Database Memory Structures
- Shared Pool
- Database Buffer Cache
- Redo Log Buffer
- Large Pool
- Java Pool and Streams Pool
- Program Global Area (PGA)
- Process Architecture

- Process Structures
- Database Writer Process (DBWn)
- Log Writer Process (LGWR)
- Checkpoint Process (CKPT)
- System Monitor Process (SMON)
- Process Monitor Process (PMON)
- Recoverer Process
- Archiver Processes (ARCn)
- Database Sharding: Introduction
- Oracle Database Server: Interactive Architecture Diagram
- Summary

Accessing an Oracle Database

- Objectives
- Connecting to an Oracle Database Instance
- Oracle Database Tools
- Database Tool Choices
- SQL*Plus
- Oracle SQL Developer
- Oracle SQL Developer: Connections
- Oracle SQL Developer: DBA Actions
- Database Configuration Assistant (DBCA)
- Oracle Enterprise Manager Database Express
- Enterprise Manager Cloud Control 13c Features
- Oracle Enterprise Manager Component Overview
- Single Pane of Glass for Enterprise Management
- Oracle Enterprise Manager Database Management
- Summary

Creating an Oracle Database by Using DBCA

- Objectives
- Planning the Database
- Choosing a Database Template
- Choosing the Appropriate Character Set
- How are character sets used?
- Setting NLS_LANG Correctly on the Client
- Using the Database Configuration Assistant
- Using DBCA in Silent Mode
- Summary

Creating an Oracle Database by Using a SQL Command

- Objectives
- Creating a Container Database (CDB)
- Creating a CDB by Using a SQL Command: Example

- Using the SEED FILE_NAME_CONVERT Clause
- Using the ENABLE PLUGGABLE DATABASE Clause
- Summary

Starting Up and Shutting Down a Database Instance

- Objectives
- Starting the Oracle Database Instance
- Shutting Down an Oracle Database Instance
- Comparing SHUTDOWN Modes
- Opening and Closing PDBs
- Configuring PDBs to Automatically Open
- Summary

Managing Database Instances

- Objectives
- Working with Initialization Parameters
- Initialization Parameters
- Modifying Initialization Parameters
- Viewing Initialization Parameters
- Working with the Automatic Diagnostic Repository
- Automatic Diagnostic Repository
- Viewing the Alert Log
- Using Trace Files
- Administering the DDL Log File
- Querying Dynamic Performance Views
- Considerations for Dynamic Performance Views
- Data Dictionary: Overview
- Querying the Oracle Data Dictionary
- Summary

Oracle Net Services: Overview

- Objectives
- Connecting to the Database Instance
- Oracle Net Services: Overview
- Defining Oracle Net Services Components
- Tools for Configuring and Managing Oracle Net Services
- Oracle Net Listener: Overview
- The Default Listener
- Comparing Dedicated and Shared Server Architecture
- Summary

Configuring Naming Methods

- Objectives
- Establishing Oracle Network Connections

- Connecting to an Oracle Database Instance
- Name Resolution
- Establishing a Connection
- User Sessions
- Naming Methods
- Easy Connect
- Local Naming
- Directory Naming
- Using Database Services to Manage Workloads
- Creating Database Services
- Summary

Configuring and Administering the Listener

- Objectives
- Review: Oracle Net Services Overview
- Oracle Net Listener: Overview
- The Default Listener
- Configuring Dynamic Service Registration
- Configuring Static Service Registration
- Summary

Configuring a Shared Server Architecture

- Objectives
- Shared Server Architecture: Overview
- Comparing Dedicated and Shared Server Architecture: Review
- Enabling Shared Server
- Controlling Shared Server Operations
- SGA and PGA Usage
- Shared Server Configuration Considerations
- Summary
- Practice Overview

Creating PDBs from Seed

- Objectives
- Provisioning New Pluggable Databases
- Tools
- Creating a New PDB from PDB$SEED
- Using the FILE_NAME_CONVERT Clause
- Using OMF or the PDB_FILE_NAME_CONVERT Parameter
- Summary

Using Other Techniques to Create PDBs

- Objectives
- Cloning Regular PDBs

- Migrating Data from a Non-CDB into a CDB
- Plugging a Non-CDB into CDB Using DBMS_PDB
- Replicating a Non-CDB into a CDB by Using GoldenGate
- Cloning a Non-CDB or Remote PDB
- Using DBCA to Clone a Remote PDB
- Plugging an Unplugged Regular PDB into CDB
- Plugging in a PDB Using an Archive File
- Cloning Remote PDBs in Hot Mode
- Near-Zero Downtime PDB Relocation
- Using DBCA to Relocate a Remote PDB
- Proxy PDB: Query Across CDBs Proxying Root Replica
- Creating a Proxy PDB
- Summary

Managing PDBs

- Objectives
- Changing the PDB Mode
- Modifying PDB Settings
- Impact of Changing Initialization Parameters
- Changing Initialization Parameters: Example
- Using the ALTER SYSTEM Command in a PDB
- Configuring Host Name and Port Number per PDB
- Dropping PDBs
- Summary

Database Storage Overview

- Objectives
- Database Storage Architecture
- Logical and Physical Database Structures
- Segments, Extents, and Blocks
- Tablespaces and Data Files
- Default Tablespaces in a Multitenant Container Database
- SYSTEM and SYSAUX Tablespaces
- Types of Segments
- How Table Data Is Stored
- Database Block Content
- Understanding Deferred Segment Creation
- Controlling Deferred Segment Creation
- Monitoring Tablespace Space Usage
- Summary

Creating and Managing Tablespaces

- Objectives
- Creating Tablespaces

- Creating a Tablespace: Clauses
- Creating Permanent Tablespaces in a CDB
- Defining Default Permanent Tablespaces
- Temporary Tablespaces
- Altering and Dropping Tablespaces
- Viewing Tablespace Information
- Implementing Oracle Managed Files (OMF)
- Enlarging the Database
- Moving or Renaming Online Data Files
- Examples: Moving and Renaming Online Data Files
- Summary

Improving Space Usage

- Objectives
- Space Management Features
- Block Space Management
- Row Chaining and Migration
- Free Space Management Within Segments
- Allocating Extents
- Using Unusable Indexes
- Using Temporary Tables
- Creating Global Temporary Tables
- Creating Private Temporary Tables
- Table Compression: Overview
- Table Compression: Concepts
- Compression for Direct-Path Insert Operations
- Advanced Row Compression for DML Operations
- Specifying Table Compression
- Using the Compression Advisor
- Resolving Space Usage Issues
- Reclaiming Space by Shrinking Segments
- Shrinking Segments
- Results of a Shrink Operation
- Managing Resumable Space Allocation
- Using Resumable Space Allocation
- Resuming Suspended Statements
- What operations are resumable?
- Summary

Managing Undo Data

- Objectives
- Undo Data: Overview
- Transactions and Undo Data
- Storing Undo Information
- Comparing Undo Data and Redo Data

- Managing Undo
- Comparing SHARED Undo Mode and LOCAL Undo Mode
- Configuring Undo Retention
- Categories of Undo
- Guaranteeing Undo Retention
- Changing an Undo Tablespace to a Fixed Size
- Temporary Undo: Overview
- Temporary Undo Benefits
- Enabling Temporary Undo
- Monitoring Temporary Undo
- Summary

Creating and Managing User Accounts

- Objectives
- Database User Accounts
- Oracle-Supplied Administrator Accounts
- Creating Oracle Database Users in a Multitenant Environment
- Creating Common Users in the CDB and PDBs
- Creating Schema-Only Accounts
- Authenticating Users
- Using Password Authentication
- Using Password File Authentication
- Using OS Authentication
- OS Authentication for Privileged Users
- Assigning Quotas
- Summary

Configuring Privilege and Role Authorization

- Objectives
- Privileges
- System Privileges
- System Privileges for Administrators
- Schema-Level Privileges
- New Developer Role and Simplified Schema Privileges
- Object Privileges
- Granting Privileges in a Multitenant Environment
- Granting Privileges: Example
- Using Roles to Manage Privileges
- Assigning Privileges to Roles and Assigning Roles to Users
- Oracle-Supplied Roles
- Granting Roles in a Multitenant Environment
- Granting Roles: Example
- Making Roles More Secure
- Revoking Roles and Privileges
- Granting and Revoking System Privileges

- Granting and Revoking Object Privileges
- Summary

Configuring User Resource Limits

- Objectives
- Profiles and Users
- Creating Profiles in a Multitenant Architecture
- Creating Profiles: Example
- Profile Parameters: Resources
- Profile Parameters: Locking and Passwords
- Oracle-Supplied Password Verification Functions
- Assigning Profiles in a Multitenant Architecture
- Summary

Implementing Oracle Database Auditing

- Objectives
- Database Security
- Monitoring for Compliance
- Types of Activities to be Audited
- Mandatorily Audited Activities
- Understanding Auditing Implementation
- Administering the Roles Required for Auditing
- Database Auditing: Overview
- Configuring Auditing
- Creating a Unified Audit Policy
- Creating an Audit Policy: Systemwide Audit Options
- Creating an Audit Policy: Object-Specific Actions
- Creating an Audit Policy: Specifying Conditions
- Enabling and Disabling Audit Policies
- Auditing Actions in the CDB and PDBs
- Modifying a Unified Audit Policy
- Auditing Top-Level Statements Only
- Viewing Audit Policy Information
- Value-Based Auditing
- Fine-Grained Auditing
- FGA Policy
- Audited DML Statements: Considerations
- FGA Guidelines
- Archiving and Purging the Audit Trail
- Purging Audit Trail Records
- Summary

Introduction to Loading and Transporting Data

- Objectives

- Moving Data: General Architecture
- Oracle Data Pump: Overview
- Oracle Data Pump: Benefits
- SQL Loader: Overview
- Summary

Loading Data

- Objectives
- SQL Loader: Review
- Creating the SQL*Loader Control File
- SQL*Loader Loading Methods
- Protecting Against Data Loss
- SQL*Loader Express Mode
- Using SQL*Loader to Load a Table in a PDB
- Summary

Transporting Data

- Objectives
- Data Pump Export and Import Clients
- Data Pump Interfaces and Modes
- Data Pump Import Transformations
- Using Oracle Data Pump with PDBs
- Exporting from a Non-CDB and Importing into a PDB
- Exporting and Importing Between PDBs
- Full Transportable Export/Import
- Full Transportable Export/Import: Example
- Transporting a Database Over the Network: Example
- Using RMAN to Transport Data Across Platforms
- RMAN CONVERT Command
- Transporting Data with Minimum Down Time
- Transporting a Tablespace by Using Image Copies
- Determining the Endian Format of a Platform
- Transporting Data with Backup Sets
- Transporting a Tablespace
- Transporting Inconsistent Tablespaces
- Summary

Using External Tables to Load and Transport Data

- Objectives
- External Tables
- External Tables: Benefits
- ORACLE_LOADER Access Driver
- ORACLE_DATAPUMP Access Driver
- External Tables

- Viewing Information About External Tables
- Summary
- Practice Overview

Automated Maintenance Tasks: Overview

- Objectives
- Proactive Database Maintenance Infrastructure
- Automated Maintenance Tasks: Components
- Predefined Automated Maintenance Tasks
- Maintenance Windows
- Predefined Maintenance Windows
- Automated Maintenance Tasks
- Summary

Automated Maintenance Tasks: Managing Tasks and Windows

- Objectives
- Configuring Automated Maintenance Tasks
- Enabling and Disabling Maintenance Tasks
- Creating and Managing Maintenance Windows
- Resource Allocations for Automated Maintenance Tasks
- Changing Resource Allocations for Maintenance Tasks
- Summary
- Practice Overview

Database Monitoring and Tuning Performance Overview

- Objectives
- Performance Management Activities
- Performance Planning Considerations
- Database Maintenance
- Automatic Workload Repository (AWR)
- Automatic Database Diagnostic Monitor (ADDM)
- Configuring Automatic ADDM Analysis at the PDB Level
- Advisory Framework
- Performance Tuning Methodology
- Summary

Monitoring Database Performance

- Objectives
- Server-Generated Alerts
- Setting Metric Thresholds
- Reacting to Alerts
- Alert Types and Clearing Alerts
- Database Server Statistics and Metrics
- Performance Monitoring

- Viewing Statistics Information
- Monitoring Wait Events
- Monitoring Sessions
- Monitoring Services
- Summary

Analyzing SQL and Optimizing Access Paths

- Objectives
- SQL Tuning Process
- Oracle Optimizer
- Optimizer Statistics
- Optimizer Statistics Collection
- Setting Optimizer Statistics Preferences
- Optimizer Statistics Advisor
- Optimizer Statistics Advisor Report
- Executing Optimizer Statistics Advisor Tasks
- SQL Plan Directives
- Adaptive Execution Plans
- SQL Tuning Advisor: Overview
- SQL Access Advisor: Overview
- SQL Performance Analyzer: Overview
- Managing Automated Tuning Tasks
- Summary