



# ORACLE

## Oracle Database 19c: Administration Workshop

## **Titulo:** Oracle Database 19c: Administration Workshop

**Clave :** D107509GC10

**Duración:** 05 días

Este curso proporciona información detallada sobre la arquitectura de una instancia y base de datos de Oracle Database, lo que le permite administrar los recursos de su base de datos de manera efectiva. Aprenderá a crear estructuras de almacenamiento de bases de datos apropiadas para las aplicaciones comerciales compatibles con su base de datos. Además, aprenderá a crear usuarios y administrar la seguridad de la base de datos para cumplir con los requisitos de su negocio. Este curso proporciona información básica sobre técnicas de respaldo y recuperación. Para proporcionar un tiempo de respuesta aceptable a los usuarios y administrar los recursos de manera efectiva, aprenderá cómo monitorear su base de datos y administrar el rendimiento.

## **Temario**

### **1 Introduction to Oracle Database**

- Objectives 1-2
- Oracle Database Server Architecture: Overview 1-3
- Oracle Multitenant Container Database: Introduction 1-4
- Oracle Multitenant Container Database: Architecture 1-5
- Oracle Database Instance Configurations 1-6
- Database Sharding: Introduction 1-7
- Oracle Database Server: Interactive Architecture Diagram 1-8
- Summary 1-9

### **2 Accessing an Oracle Database**

- Objectives 2-2
- Connecting to an Oracle Database Instance 2-3
- Oracle Database Tools 2-5
- Database Tool Choices 2-6
- SQL\*Plus 2-7
- Oracle SQL Developer 2-9
- Oracle SQL Developer: Connections 2-10
- Oracle SQL Developer: DBA Actions 2-11
- Database Configuration Assistant (DBCA) 2-12

Oracle Enterprise Manager Database Express 2-13  
Enterprise Manager Cloud Control 13c Features 2-15  
Oracle Enterprise Manager Component Overview 2-17  
Single Pane of Glass for Enterprise Management 2-18  
Oracle Enterprise Manager Database Management 2-19  
Summary 2-21

### **3 Creating an Oracle Database by Using DBCA**

Objectives 3-2  
Planning the Database 3-3  
Choosing a Database Template 3-4  
Choosing the Appropriate Character Set 3-5  
How Are Character Sets Used? 3-7  
Setting NLS\_LANG Correctly on the Client 3-8  
Using the Database Configuration Assistant 3-9  
Using DBCA in Silent Mode 3-10  
Summary 3-11  
Practice Overview 3-12

### **4 Creating an Oracle Database by Using a SQL Command**

Objectives 4-2  
Creating a Container Database (CDB) 4-3  
Creating a CDB by Using a SQL Command: Example 4-4  
Using the SEED FILE\_NAME\_CONVERT Clause 4-5  
Using the ENABLE PLUGGABLE DATABASE Clause 4-6  
Summary 4-7  
Practice Overview 4-8

### **5 Starting Up and Shutting Down a Database Instance**

Objectives 5-2  
Starting the Oracle Database Instance 5-3  
Shutting Down an Oracle Database Instance 5-4  
Comparing SHUTDOWN Modes 5-6  
Opening and Closing PDBs 5-8  
Configuring PDBs to Automatically Open 5-9  
Summary 5-10  
Practice Overview 5-11

## **6 Managing Database Instances**

- Objectives 6-2
- Working with Initialization Parameters 6-3
- Initialization Parameters 6-5
- Modifying Initialization Parameters 6-7
- Viewing Initialization Parameters 6-9
- Working with the Automatic Diagnostic Repository 6-11
- Automatic Diagnostic Repository 6-12
- Viewing the Alert Log 6-13
- Using Trace Files 6-14
- Administering the DDL Log File 6-16
- Querying Dynamic Performance Views 6-17
- Considerations for Dynamic Performance Views 6-18
- Data Dictionary: Overview 6-19
- Querying the Oracle Data Dictionary 6-20
- Summary 6-22
- Practice Overview 6-23

## **7 Oracle Net Services: Overview**

- Objectives 7-2
- Connecting to the Database Instance 7-3
- Oracle Net Services: Overview 7-4
- Defining Oracle Net Services Components 7-5
- Tools for Configuring and Managing Oracle Net Services 7-6
- Oracle Net Listener: Overview 7-7
- The Default Listener 7-8
- Comparing Dedicated and Shared Server Architecture 7-9
- Summary 7-10

## **8 Configuring Naming Methods**

- Objectives 8-2
- Establishing Oracle Network Connections 8-3
- Connecting to an Oracle Database Instance 8-4
- Name Resolution 8-5
- Establishing a Connection 8-6
- User Sessions 8-7
- Naming Methods 8-8
- Easy Connect 8-9
- Local Naming 8-10
- Directory Naming 8-11

Using Database Services to Manage Workloads 8-12

Creating Database Services 8-13

Summary 8-14

Practice Overview 8-15

## **9 Configuring and Administering the Listener**

Objectives 9-2

Review: Oracle Net Services Overview 9-3

Oracle Net Listener: Overview 9-4

The Default Listener 9-5

Configuring Dynamic Service Registration 9-6

Configuring Static Service Registration 9-8

Summary 9-10

Practice Overview 9-11

## **10 Configuring a Shared Server Architecture**

Objectives 10-2

Shared Server Architecture: Overview 10-3

Comparing Dedicated and Shared Server Architecture: Review 10-4

Enabling Shared Server 10-5

Controlling Shared Server Operations 10-6

SGA and PGA Usage 10-7

Shared Server Configuration Considerations 10-8

Summary 10-9

Practice Overview 10-10

## **11 Configuring Oracle Connection Manager for Multiplexing and Access Control**

Objectives 11-2

Oracle Connection Manager: Overview 11-3

Oracle Connection Manager Processes 11-4

Oracle Connection Manager: Architecture 11-5

Using Filtering Rules 11-6

Implementing Intranet Access Control 11-7

Implementing Internet Access Control 11-8

Using Session Multiplexing 11-9

Configuring Oracle Connection Manager 11-10

Configuring the cman.ora File 11-11

Example of a cman.ora File 11-12

Configuring Clients 11-13

Configuring the Database Server 11-14  
Configuring the Database Server for Multiplexing (Optional) 11-15  
Using the Oracle Connection Manager Control Utility 11-16  
Review of Oracle Connection Manager Features 11-17  
Summary 11-18

## **12 Creating PDBs from Seed**

Objectives 12-2  
Provisioning New Pluggable Databases 12-3  
Tools 12-4  
Creating a New PDB from PDB\$SEED 12-5  
Using the FILE\_NAME\_CONVERT Clause 12-6  
Using OMF or the PDB\_FILE\_NAME\_CONVERT Parameter 12-7  
Summary 12-8  
Practice Overview 12-9

## **13 Using Other Techniques to Create PDBs**

Objectives 13-2  
Cloning Regular PDBs 13-3  
Migrating Data from a Non-CDB into a CDB 13-4  
Plugging a Non-CDB into CDB Using DBMS\_PDB 13-5  
Replicating a Non-CDB into a CDB by Using GoldenGate 13-6  
Cloning a Non-CDB or Remote PDB 13-7  
Using DBCA to Clone a Remote PDB 13-8  
Plugging an Unplugged Regular PDB into CDB 13-9  
Plugging in a PDB Using an Archive File 13-10  
Cloning Remote PDBs in Hot Mode 13-11  
Near-Zero Downtime PDB Relocation 13-12  
Using DBCA to Relocate a Remote PDB 13-14  
Proxy PDB: Query Across CDBs Proxying Root Replica 13-15  
Creating a Proxy PDB 13-16  
Summary 13-17

## **14 Managing PDBs**

Objectives 14-2  
Changing the PDB Mode 14-3  
Modifying PDB Settings 14-4  
Impact of Changing Initialization Parameters 14-5  
Changing Initialization Parameters: Example 14-6

Using the ALTER SYSTEM Command in a PDB 14-7  
Configuring Host Name and Port Number per PDB 14-8  
Dropping PDBs 14-9  
Summary 14-10  
Practice Overview 14-11

## **15 Database Storage Overview**

Objectives 15-2  
Database Storage Architecture 15-3  
Logical and Physical Database Structures 15-5  
Segments, Extents, and Blocks 15-7  
Tablespaces and Data Files 15-8  
Default Tablespaces in a Multitenant Container Database 15-9  
SYSTEM and SYSAUX Tablespaces 15-10  
Types of Segments 15-11  
How Table Data Is Stored 15-12  
Database Block Content 15-13  
Understanding Deferred Segment Creation 15-14  
Controlling Deferred Segment Creation 15-15  
Monitoring Tablespace Space Usage 15-16  
Oracle Database Storage Structures: Interactive Architecture Diagram 15-17  
Summary 15-18

## **16 Creating and Managing Tablespaces**

Objectives 16-2  
Creating Tablespaces 16-3  
Creating a Tablespace: Clauses 16-4  
Creating Permanent Tablespaces in a CDB 16-7  
Defining Default Permanent Tablespaces 16-8  
Temporary Tablespaces 16-9  
Altering and Dropping Tablespaces 16-10  
Viewing Tablespace Information 16-12  
Implementing Oracle Managed Files (OMF) 16-13  
Enlarging the Database 16-15  
Moving or Renaming Online Data Files 16-16  
Examples: Moving and Renaming Online Data Files 16-17  
Summary 16-18  
Practice Overview 16-19



## **17 Improving Space Usage**

- Objectives 17-2
- Space Management Features 17-3
- Block Space Management 17-4
- Row Chaining and Migration 17-5
- Free Space Management Within Segments 17-6
- Allocating Extents 17-7
- Using Unusable Indexes 17-8
- Using Temporary Tables 17-9
- Creating Global Temporary Tables 17-10
- Creating Private Temporary Tables 17-11
- Table Compression: Overview 17-12
- Table Compression: Concepts 17-13
- Compression for Direct-Path Insert Operations 17-14
- Advanced Row Compression for DML Operations 17-15
- Specifying Table Compression 17-16
- Using the Compression Advisor 17-17
- Resolving Space Usage Issues 17-18
- Reclaiming Space by Shrinking Segments 17-19
- Shrinking Segments 17-20
- Results of a Shrink Operation 17-21
- Managing Resumable Space Allocation 17-22
- Using Resumable Space Allocation 17-23
- Resuming Suspended Statements 17-25
- What Operations Are Resumable? 17-27
- Summary 17-28
- Practice Overview 17-29

## **18 Managing Undo Data**

- Objectives 18-2
- Undo Data: Overview 18-3
- Transactions and Undo Data 18-5
- Storing Undo Information 18-6
- Comparing Undo Data and Redo Data 18-7
- Managing Undo 18-8
- Comparing SHARED Undo Mode and LOCAL Undo Mode 18-9
- Configuring Undo Retention 18-10
- Categories of Undo 18-11
- Guaranteeing Undo Retention 18-12
- Changing an Undo Tablespace to a Fixed Size 18-13



Temporary Undo: Overview 18-14  
Temporary Undo Benefits 18-15  
Enabling Temporary Undo 18-16  
Monitoring Temporary Undo 18-17  
Summary 18-18  
Practice Overview 18-19

## **19 Creating and Managing User Accounts**

Objectives 19-2  
Database User Accounts 19-3  
Oracle-Supplied Administrator Accounts 19-5  
Creating Oracle Database Users in a Multitenant Environment 19-6  
Creating Common Users in the CDB and PDBs 19-7  
Creating Schema Only Accounts 19-8  
Authenticating Users 19-9  
Using Password Authentication 19-10  
Using Password File Authentication 19-11  
Using OS Authentication 19-12  
OS Authentication for Privileged Users 19-14  
Assigning Quotas 19-15  
Summary 19-17  
Practice Overview 19-18

## **20 Configuring Privilege and Role Authorization**

Objectives 20-2  
Privileges 20-3  
System Privileges 20-4  
System Privileges for Administrators 20-6  
Object Privileges 20-7  
Granting Privileges in a Multitenant Environment 20-8  
Granting Privileges: Example 20-9  
Using Roles to Manage Privileges 20-10  
Assigning Privileges to Roles and Assigning Roles to Users 20-11  
Oracle-Supplied Roles 20-12  
Granting Roles in a Multitenant Environment 20-13  
Granting Roles: Example 20-14  
Making Roles More Secure 20-15  
Revoking Roles and Privileges 20-16  
Granting and Revoking System Privileges 20-17  
Granting and Revoking Object Privileges 20-18

Summary 20-19  
Practice Overview 20-20

## **21 Configuring User Resource Limits**

Objectives 21-2  
Profiles and Users 21-3  
Creating Profiles in a Multitenant Architecture 21-4  
Creating Profiles: Example 21-5  
Profile Parameters: Resources 21-6  
Profile Parameters: Locking and Passwords 21-8  
Oracle-Supplied Password Verification Functions 21-10  
Assigning Profiles in a Multitenant Architecture 21-11  
Summary 21-12  
Practice Overview 21-13

## **22 Implementing Oracle Database Auditing**

Objectives 22-2  
Database Security 22-3  
Monitoring for Compliance 22-5  
Types of Activities to be Audited 22-6  
Mandatorily Audited Activities 22-7  
Understanding Auditing Implementation 22-8  
Administering the Roles Required for Auditing 22-9  
Database Auditing: Overview 22-10  
Configuring Auditing 22-11  
Creating a Unified Audit Policy 22-12  
Creating an Audit Policy: System-Wide Audit Options 22-13  
Creating an Audit Policy: Object-Specific Actions 22-14  
Creating an Audit Policy: Specifying Conditions 22-15  
Enabling and Disabling Audit Policies 22-16  
Auditing Actions in the CDB and PDBs 22-17  
Modifying a Unified Audit Policy 22-19  
Auditing Top-Level Statements Only 22-20  
Viewing Audit Policy Information 22-21  
Value-Based Auditing 22-22  
Fine-Grained Auditing 22-24  
FGA Policy 22-25  
Audited DML Statement: Considerations 22-27  
FGA Guidelines 22-28  
Archiving and Purging the Audit Trail 22-29

Purging Audit Trail Records 22-30  
Summary 22-31  
Practice Overview 22-32

## **23 Introduction to Loading and Transporting Data**

Objectives 23-2  
Moving Data: General Architecture 23-3  
Oracle Data Pump: Overview 23-4  
Oracle Data Pump: Benefits 23-5  
SQL Loader: Overview 23-7  
Summary 23-9

## **24 Loading Data**

Objectives 24-2  
SQL Loader: Review 24-3  
Creating the SQL\*Loader Control File 24-4  
SQL\*Loader Loading Methods 24-6  
Protecting Against Data Loss 24-7  
SQL\*Loader Express Mode 24-8  
Using SQL\*Loader to Load a Table in a PDB 24-9  
Summary 24-10  
Practice Overview 24-11

## **25 Transporting Data**

Objectives 25-2  
Data Pump Export and Import Clients 25-3  
Data Pump Interfaces and Modes 25-4  
Data Pump Import Transformations 25-6  
Using Oracle Data Pump with PDBs 25-7  
Exporting from a Non-CDB and Importing into a PDB 25-8  
Exporting and Importing Between PDBs 25-9  
Full Transportable Export/Import 25-10  
Full Transportable Export/Import: Example 25-12  
Transporting a Database Over the Network: Example 25-13  
Using RMAN to Transport Data Across Platforms 25-14  
RMAN CONVERT Command 25-15  
Transporting Data with Minimum Down Time 25-16  
Transporting a Tablespace by Using Image Copies 25-17  
Determining the Endian Format of a Platform 25-18

- Transporting Data with Backup Sets 25-19
- Transporting a Tablespace 25-20
- Transporting Inconsistent Tablespaces 25-22
- Database Transport: Data Files 25-23
- Transporting a Database 25-24
- Transporting a Database: Conversion 25-25
- Transporting a Database: Example 1 25-26
- Transporting a Database: Example 2 25-27
- Transporting a Database: Considerations 25-28
- Transporting a Database with Backup Sets 25-29
- Summary 25-31
- Practice Overview 25-32

## **26 Using External Tables to Load and Transport Data**

- Objectives 26-2
- External Tables 26-3
- External Tables: Benefits 26-4
- ORACLE\_LOADER Access Driver 26-5
- ORACLE\_DATAPUMP Access Driver 26-6
- External Tables 26-7
- Viewing Information About External Tables 26-8
- Summary 26-9
- Practice Overview 26-10

## **27 Automated Maintenance Tasks: Overview**

- Objectives 27-2
- Proactive Database Maintenance Infrastructure 27-3
- Automated Maintenance Tasks: Components 27-4
- Predefined Automated Maintenance Tasks 27-5
- Maintenance Windows 27-6
- Predefined Maintenance Windows 27-7
- Viewing Maintenance Window Details 27-8
- Automated Maintenance Tasks 27-9
- Summary 27-10

## **28 Automated Maintenance Tasks: Managing Tasks and Windows**

- Objectives 28-2
- Configuring Automated Maintenance Tasks 28-3
- Enabling and Disabling Maintenance Tasks 28-4
- Creating and Managing Maintenance Windows 28-5

Resource Allocations for Automated Maintenance Tasks 28-6  
Changing Resource Allocations for Maintenance Tasks 28-7  
Summary 28-8  
Practice Overview 28-9

## **29 Database Monitoring and Tuning Performance Overview**

Objectives 29-2  
Performance Management Activities 29-3  
Performance Planning Considerations 29-4  
Database Maintenance 29-6  
Automatic Workload Repository (AWR) 29-7  
Automatic Database Diagnostic Monitor (ADDM) 29-8  
Configuring Automatic ADDM Analysis at the PDB Level 29-9  
Advisory Framework 29-10  
Performance Tuning Methodology 29-12  
Summary 29-13

## **30 Monitoring Database Performance**

Objectives 30-2  
Server-Generated Alerts 30-3  
Setting Metric Thresholds 30-4  
Reacting to Alerts 30-5  
Alert Types and Clearing Alerts 30-6  
Database Server Statistics and Metrics 30-7  
Performance Monitoring 30-8  
Viewing Statistics Information 30-9  
Monitoring Wait Events 30-11  
Monitoring Sessions 30-12  
Monitoring Services 30-13  
Summary 30-14

## **31 Analyzing SQL and Optimizing Access Paths**

Objectives 31-2  
SQL Tuning Process 31-3  
Oracle Optimizer 31-4  
Optimizer Statistics 31-5  
Optimizer Statistics Collection 31-6  
Setting Optimizer Statistics Preferences 31-8  
Optimizer Statistics Advisor 31-10  
Optimizer Statistics Advisor Report 31-11

|                                              |       |
|----------------------------------------------|-------|
| Executing Optimizer Statistics Advisor Tasks | 31-12 |
| SQL Plan Directives                          | 31-13 |
| Adaptive Execution Plans                     | 31-14 |
| SQL Tuning Advisor: Overview                 | 31-16 |
| SQL Access Advisor: Overview                 | 31-18 |
| SQL Performance Analyzer: Overview           | 31-19 |
| Managing Automated Tuning Tasks              | 31-21 |
| Summary                                      | 31-22 |