



## ORADB\_MMA - Oracle Database 12c/19c/23ai: Managing Multitenant Architecture

Oracle - Oracle DBA - Sistemistica

Durata:

**3 Giorni**

Lingue:

**Italiano**

Certificazione:

-

### Descrizione del corso

This Oracle Database: Managing Multitenant Architecture course covers all aspects of the multitenant architecture, providing detailed information on the components of an Oracle multitenant container database and its regular and application pluggable databases.

### Programma

#### Enterprise Manager and Other Tools

- Enterprise Manager (EM) Cloud Control home page
- Enterprise Manager Express home page versus Enterprise Manager Database Control
- SQL Developer with new functionalities
- OUI, DBCA

#### 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,

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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
- 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
- Triggers ON PLUGGABLE DATABASE
- 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”

## **Managing Backup / Recovery / Flashback and Migration**

- Backup a whole CDB
- Backup a PDB
- Recover CDB from redo log files, control files, undo datafiles loss
- Recover PDB from PDB datafiles loss

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- Flashback at CDB level

## **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

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- Creating audit policies

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

## **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

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## **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

## **Schema and Data Changes**

- Explain the Schema Change Plan flow
- Change requests
- Schema synchronization
- Explain the Data Comparison flow
- DBMS\_COMPARISON package
- Guidelines and steps
- Comparison job and results

## **SQL Tuning**

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

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

- Emergency Monitoring
- Real time ADDM
- Use cases
- Goals
- Define Workload dimensions
- Reported items

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- Root Causes
- Requirements for a report

### **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
- Automated maintenance tasks
- Describe the Multi-process Multi-threaded Oracle architecture
- Learn how to use this architecture in Oracle 12c Database
- Demonstrate the changes to shutdown procedures

### **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
- Advanced Row Compression
- Describe online redefinition supports
- Explain LOCK timeout during FINISH\_REDEF\_TABLE
- Using DDL statements in an online manner

### **ADR and Network Enhancements**

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

### **Oracle Data Pump, SQL\*Loader, External Tables and Online Operations Enhancements**

- Use FULL Transportable export and import
- Oracle Data Pump enhancements

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- SQL\*Loader enhancements
- SQL\*Loader and External table common enhancements
- SQL\*Loader Express Mode usage

## **Partitioning Enhancements**

- Move a partition online
- ALTER TABLE ... SPLIT PARTITION, ALTER TABLE ... MERGE PARTITION ,  
ALTER TABLE...ADD PARTITION Clauses: Overview
- Split Partition Operation Enhancement
- ALTER TABLE SPLIT SUBPARTITION
- Merge Partition Operation
- Add Partition Operation
- Drop Partition Operation
- ALTER TABLE DROP SUBPARTITION

## **SQL Enhancements**

- Enumerate Increase in the length limits for VARCHAR2, NVARCHAR2,  
and RAW data types in Oracle SQL to 32767 (32k) byte
- Enumerate miscellaneous enhancements
- Using SQL Row limiting clause in a query

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