

Course Outline

Oracle Database 12c: New Features for Administrators



Duration: 5 days (30 hours)

Learning Objectives:

- Create, manage and monitor multitenant container database and pluggable databases
- Manage datafile online operations, data lifecycle management with heat map and automatic data optimization, archive data using Row-archival or Temporal Validity and Temporal Histor
- Set up the unified audit trail
- Understand and use the new privileges, such as SYSBACKUP, SYSDG, SYSKM and manage privilege analysis
- Create and manage Data Redaction masking policies
- Use the Recovery Manager enhancements
- Manage the database performance with monitoring DB operations, Real-Time ADDM and Compare Period ADDM
- Compare two databases using Schema Change Plans to propagate changes from one environment to another
- Use Data Comparisons to compare data across environments
- Tune the SQL performance using Adaptive Execution Plans, SQL Plan Directives and statistics enhancements
- Manage resources in a multitenant container database and pluggable databases with enhanced Resource Manager
- Explore new Oracle Data Pump features and SQL*Loader Express Mode
- Use online operations during partition movement and compression, and other DDL operations
- Use partial global partitioned indexes
- Explain new SQL enhancements such as extended data type column and SQL row limiting clause

Target Audience

- Administrator
- Database Administrators
- System Administrator

Prerequisites:

- Good knowledge of Oracle Database 11g
- Good knowledge of Oracle Database 11

Topics Covered:

- 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, 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
 - 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
- 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
- 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
 - 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
 - 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