



## Oracle Database 12c: New Features For Administrators



ora12c299-ver4

Learning Resources Available From The Sideris Training Portal

5 Days

### General Description

This is a multi-volume textbook kit that covers the major new features of the Oracle 12c database of interest to database and other enterprise administrators.

The single most important new capability introduced with the Oracle 12c release of the database is the multitenant database feature. With this technology, the Oracle database can be a full participant in a cloud computing-based application architecture. Even a traditional on-premise systems architecture can be dynamically and dramatically transformed as a result of this feature. Many traditional and new database features are enhanced or introduced when a multitenant database configuration is used.

Introduced with the Oracle 12c release of the database are many advanced storage administration features. Some of these new features support various forms of in-memory storage, advanced compression and other capabilities targeted for high-performance environments and massive scalability.

### Target Audience

The primary target audiences for this textbook are:

- Database administrators
- Storage administrators
- System administrators
- Implementation specialists
- Data center support engineers

### Prerequisites

In order to fully benefit from this textbook one must have extensive experience working with the Oracle 11g release as a database or other administration specialist.

### Certification

This textbook considers subjects helpful for certification as an Oracle Database 12c Administrator Certified Professional (OCP) for "Exam: 1Z0-060: Upgrade to Oracle Database 12c".

### Content

This textbook is the first module of a kit provided for this training session. When delivered as an instructor-led or live virtual training session, the expected duration is 5 days.

Volumes: 4  
Pages: 1,227  
Hands-on Workshops: 12  
Exercises: 112

### Suggested Next

Readers may next wish to proceed onto these textbooks from the Sideris Textbook Series For Oracle Administrators:

- Oracle Enterprise Manager Cloud Control 12c: Install & Upgrade Workshop

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831 Beacon Street, Suite 295, Newton, MA 02459

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- Oracle Enterprise Manager Cloud Control 12c: Administer the Enterprise

The objectives for this course are as follows:

- This training course covers the following topics:
- Enhancements to the administration framework of the database, including the Enterprise Manager Cloud Control, Enterprise Manager Database Express and SQL Developer database administration capabilities.
- Enhancements to the security framework of the database, including unified auditing, fine-grained super administrator privileges, data redaction and privilege analysis.
- Expanded performance options such as in-memory columnar storage, the in-memory database option and big table caching.
- Performance monitoring enhancements, such as database operation monitoring, emergency monitoring and real-time ADDM.
- Database consolidation using consolidated databases (cDBs) consisting of dozens or even hundreds of pluggable databases (pDBs).
- Advanced database storage options such as advanced compression, enhanced columnar compression and online movement of objects.
- Advanced compression techniques for tables and indexes.
- Columnar vs. row-oriented database storage and the use of hybrid columnar compression.
- Heat map tracking of segment access to measure hot, warm and cold areas of the database that could be targeted for optimization.
- ILM data management and support for that framework with available features of the Oracle database.
- Automatic data optimization and policies that automatically implement the ILM concepts of row-level compression tiering, segment-level compression tiering and segment-level storage tiering.
- Implementing custom ILM storage management policies.
- In-memory storage of database objects, including big table caching, full database caching and in-memory column stores.
- Archiving inactive data inside the database while not degrading performance while limiting added storage costs.
- Introduce temporal validity into a table and perform flashback query operations using temporal validity criteria.
- Data redaction that allows data privacy policies to be dynamically enforced during queries.

### Objectives

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### Contents

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#### Oracle 12c & The Database Utilities

- About Oracle 12c
- Oracle 12c Universal Installer
- EM Cloud Control
- EM Database Express
- EM Database Express Framework & XML DB
- Access EM Database Express
- SQL Developer
- Instance Threaded Mode
- Invisible Columns

#### Database Security Enhancements

- Database Security Principles
- Database Privilege Changes
- Database Role Changes
- User Password Complexity
- Privilege Analysis
- Auditing Modes & Unified Auditing
- Configuring Unified Auditing & Enabling Policies
- Viewing & Maintaining The Audit Trail

#### ADR & Network Enhancements

- Fault Diagnosability Infrastructure
- Advanced Network Compression

#### Performance Improvements

- SQL Statement Execution
- Real-Time Operation Monitoring
- Real-Time ADDM Analysis
- Emergency Monitoring
- Real-Time ADDM

#### Fundamentals: The Multitenant Database Architecture

- Cloud Computing Principles
- Peering Into The Architecture
- Multitenant Database Instance
- Multitenant Storage Architecture
- Multitenant Data Dictionary
- Benefits Of The Architecture
- Challenges Of The Architecture

#### Fundamentals: Creating & Connecting To Multitenant Databases

- About cDB Capacity Planning
- cDB & pDB Creation
- Using Oracle Installer
- Using DBCA
- cDB & pDB Connections
- Using SQL\*Plus
- EM Cloud Control

#### Fundamentals: Multitenant Database Security Management

- Multitenant Security Model
- Multitenant Privileges & Roles
- Common Users
- Local Users
- Common & Local Roles & Privileges
- Commonly & Locally Defined
- Commonly & Locally Granted
- Common & Local Profiles

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- Common & Local Dictionary Access
- Multitenant Unified Auditing
- Local Audit Policies
- Querying The Unified Audit Trail
- Common Audit Policies
- Auditing Management With EM CC

### Provisioning: Provisioning pDBs From pdb\$seed

- Provision & Decommission pDBs
- EM CC Provisioning Prerequisites
- pDB File Location Prerequisites
- Provision A pDB From pdb\$seed
- Provision Using SQL
- Provision Using EM CC
- Post Provisioning Checklist
- Drop A pDB
- Querying cDB & pDB Metadata

### Provisioning: Additional pDB Provisioning

- Clone A pDB
- Unplug & Plug-In A pDB
- Migrate A Non-cDB To A pDB
- pDB Provisioning Using EM CC
- pDB Provisioning Using DBCA

### Administration: Administering Multitenant Databases

- About Multitenant Administration
- cDB Administration
- cdb\$root Administration
- pDB Administration

### Administration: Multitenant Storage Management

- Manage Permanent Tablespaces

- Manage Temporary Tablespaces

### Administration: Multitenant Backup & Recovery

- Devising Multitenant Recovery Plan
- RMAN Multitenant Usage
- RMAN Multitenant Backup
- EM CC Multitenant Backup
- RMAN Multitenant Recovery
- Complete Recovery
- Incomplete cDB / pDB Point-in-time Recovery (PITR)
- Incomplete Table Point-in-time Recovery (PITR)
- Multitenant Flashback Database
- EM CC Multitenant Recovery
- Multitenant Database Duplication
- cDB Duplication
- pDB Duplication

### Administration: Multitenant Resource Management

- About Resource Management
- cDB Resource Plans & Directives
- pDB Resource Plans & Directives

### Advanced Compression

- About Compression
- Table Compression
- Basic Table Compression
- Advanced Row Compression
- Additional Table Compression Considerations
- Index Compression
- Key Compression
- Advanced Index Compression

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- Hybrid Columnar Compression
- Compression Analysis
- Using SQL Metadata Queries
- Using DBMS\_COMPRESSION()
- Using EM CC

### Heat Map Tracking & Automatic Data Optimization (ADO)

- About ILM
- The Oracle Database & ILM Support
- Heat Map Tracking
- Automatic Data Optimization (ADO)
- Adding ADO Policies Using SQL
- Managing ADO Policies Using SQL
- Managing ADO Policy Evaluation
- Managing ADO Policies Using EM CC

### In-Memory Storage

- About Traditional Table Caching
- Big Table Caching
- Full Database Caching
- In-Memory Column Store
- IMCS Internals
- Configuring The IMCS
- Assigning Objects To The IMCS
- Assigning Columns To The IMCS
- Monitoring IMCS Using EM CC

### In-Database Archiving

- About In-Database Archiving
- In-Database Archival Tables
- In-Database Archiving Of Rows
- Temporal Validity

### Data Redaction

- About Data Redaction
- The Redaction Functions
- Using Function Type dbms\_redact.random
- Using Function Type dbms\_redact.partial
- Function Type dbms\_redact.partial Shortcuts
- Using Function Type dbms\_redact.regexp
- Function Type dbms\_redact.regexp Shortcuts
- Defining Redaction Policies
- Managing Redaction Policies
- Customizing Full Redaction
- Viewing Redaction Metadata
- Using EM Cloud Control
- Inference Attacks

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