# Oracle12c Release 1 New Features for Administrators (3 Days)

**Course Description**

This course provides a complete, hands-on introduction to the newest release of Oracle Enterprise Edition. Key features of this product are fully discussed and demonstrated with a greatly reduced emphasis on Multitenant Architecture.

**Target Audience**

This course is appropriate for anyone needing to learn key new features of Oracle12c. That would include end users, business analysts, application developers, database administrators and IT management.

**Prerequisites**

A thorough knowledge of Oracle11g database administration is required. Full familiarity with Oracle 11g PL/SQL is highly desirable.

**Course Content**

**CHAPTER 1 – SQL ENHANCEMENTS**

    MAJOR ENHANCEMENTS
- Top N And Bottom N Queries
- Using Extended Datatypes
- Concurrent UNION / UNION ALL Execution
- Sequences With DEFAULT Values
- Sequences With Global Temporary Tables
- IDENTITY Columns
- New Sequence Functionality For Oracle Replay
- Invisible Columns
- Temporal Validity
- Pattern Matching

    MISCELLANEOUS NEW SQL FEATURES
    DATA MODEL REVIEW
    *LAB 1: SQL ENHANCEMENTS*

**CHAPTER 2 – PL/SQL ENHANCEMENTS**

    WHITE LISTS
    THE WITH CLAUSE FOR FUNCTIONS
    PRAGMA UDF
    NEW INQUIRY DIRECTIVES
    NEW DBMS_SQL FUNCTIONALITY
    ENHANCED LANGUAGE INTERFACE FEATURES
    MISCELLANEOUS NEW PL/SQL  FEATURES FOR ORACLE12C
    *LAB 2: PL/SQL ENHANCEMENTS*

**CHAPTER 3 – INSTALLATION / UPGRADING**
OVERVIEW OF DATABASE CREATION
THE ORACLE UNIVERSAL INSTALLER
PREREQUISE TASKS
- Memory Requirements
- Hardware Requirements
- Software Requirements
- Package Requirements
- What About Windows?

RUNNING THE INSTALLER
POST INSTALLATION
USING THE DATABASE CONFIGURATION ASSISTANT
USING THE DATABASE CONFIGURATION ASSISTANT – SHORT FORM
DATABASE TEMPLATES
UPGRADING THE DATABASE
REMOVING ORACLE SOFTWARE
*LAB 3: INSTALLATION / UPGRADING*

**CHAPTER 4 –ENTERPRISE MANAGER ENHANCEMENTS**
DATABASE MANAGEMENT USING EMDE
ENVIRONMENTAL VARIABLES
ACCESSING ENTERPRISE MANAGER DATABASE EXPRESS
- MODIFIED FUNCTIONALITY WITH EMDE Changing Parameters
- Modification Of Physical Structures

DELETED FUNCTIONALITY IN EMDE
DATABASE ADMINISTRATION WITH OTHER TOOLS
EMDE ACCESS FOR NON-DBA USERS
EMDE ACCESS TO PLUGGABLE DATABASES
*LAB 4: ENTERPRISE MANAGER ENHANCEMENTS*

**CHAPTER 5 – SQL DEVELOPER / SQL\*PLUS**
SQL DEVELOPER
MULTITENANT CONNECTION CONSIDERATIONS
USING SQL DEVELOPER
SQL\*PLUS FOR ORACLE 12C
- Invisible Columns
- New SHOW Commands
- Last Login Time
- Support For The New Administrative Privileges
- Support For Pluggable Databases

*LAB 5: SQL DEVELOPER / SQL\*PLUS*

## CHAPTER 6 – MULTITENANT DATABASES

THE IMPACT OF MULTITENANT ARCHITECTURE
MAJOR BENEFITS OF MULTITENANT ARCHITECTURE
THE BIRD'S EYE VIEW
WALKING THE
DIRECTORIES OF A CONTAINER DATABASE
IMPACTS OF MULTITENANT ARCHITECTURE
TOOLS FOR USE WITH MULTITENANT ARCHITECTURE
- SQL*Plus
- DBCA
- Oracle Enterprise Manager Cloud Control
- SQL Developer
- Server Control (SRVCTL)

*LAB 6: MULTITENANT DATABASES*

## CHAPTER 7 – MULTITENANT BASICS

CREATING CDBS
FEATURES UNSUPPORTED FOR MULTITENANT ARCHITECTURE
THE CREATE DATABASE COMMAND
Seed Data Files
CONFIGURING ENTERPRISE MANAGER DATABASE EXPRESS FOR CDBS
USING SQL D
EVELOPER WITH CDBS AS A DBA
LAB 7: MULTITENANT BASICS

## CHAPTER 8 – INTERMEDIATE MULTITENANT

OPTIONS AVAILABLE
THE CREATE PLUGGABLE DATABASE STATEMENT
- The STORAGE Clause
- File Locations Clause
- Temp File Clause

PREPARING TO CREATE PDBS
CREATING PDBS USING THE CDB SEED
- Specifics Using SQL*Plus

CLONING AN EXISTING LOCAL PDB
CLONING AN EXISTING REMOTE PDB
- Effects Of Cloning A Remote PDB

UNPLUGGING A PDB
CREATING A PDB BY PLUGGING IN AN UNPLUGGED PDB
CREATING A PDB FROM A NON-CDB DATABASE
- Using DBMS_PDB

NEW TRIGGER TYPES FOR PDBS
- The BEFORE UNPLUG Trigger
- The AFTER CLONE Trigger

*LAB 8: INTERMEDIATE MULTITENANT*

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## CHAPTER 9 –AUTOMATIC DATA OPTIMIZATION
STORAGE AND COMPRESSION TIERING
THE HEAT MAP
AUTOMATIC DATA OPTIMIZATION
COMPRESSION LEVELS

## CHAPTER 10 –IN-DATABASE ARCHIVING
TO KEEP OR NOT TO KEEP
THE ROW ARCHIVAL CLAUSE
ORA_ARCHIVE_STATE
ROW ARCHIVAL VISIBILITY
*LAB 10: IN-DATABASE ARCHIVING*

## CHAPTER 11 –AUDITING ENHANCEMENTS
UNIFIED AUDITING
ENABLING UNIFIED AUDITING
DISABLING UNIFIED AUDITING
HANDLING EARLIER AUDIT RECORDS
CREATING A SEC_ADMIN ACCOUNT
CREATING A UNIFIED AUDIT POLICY
AUTOMATIC AUDITS WITH UNIFIED AUDITING
DISABLING / DROPPING AUDIT POLICIES
IMMEDIATE-WRITE VS. QUEUED-WRITE MODE
AUDIT DATA CLEANUP
*LAB 11: AUDITING ENHANCEMENTS*

## CHAPTER 12 –PRIVILEGE ENHANCEMENTS
CONSIDERATIONS REGARDING PASSWORD CASE SENSITIVITY
PROFILES AND PASSWORD POLICIES
ROLES IN ORACLE 12C
SEPARATION OF DUTY
INHERIT [ ANY ] PRIVILEGES
PERMISSION CONTROL WITHIN VIEWS
DATABASE PRIVILEGE ANALYSIS
- Restrictions On Privilege Analysis
- Potential Benefits Of Privilege Analysis
- Privilege Analysis In Container Databases
- Privilege Analysis Policies
- Disabling A Privilege Analysis Policy
- Generating A Privilege Analysis Report
- Dropping A Privilege Analysis Policy

SIGNIFICANT CHANGES TO ROLES AND PRIVILEGES
*LAB 12: PRIVILEGE ENHANCEMENTS*

## CHAPTER 13 – DATA REDACTION

OVERVIEW OF DATA REDACTION
EXEMPTION FROM REDACTION POLICIES
HOW AND WHEN REDACTION OCCURS
REDACTION EXAMPLES
FUNCTION_PARAMETERS
FOR PARTIAL REDACTION
USING REGULAR EXPRESSIONS
USING RANDOM VALUES IN REDACTION
THE EXPRESSION PARAMETER
ENABLE / DISABLE / DROP REDACTION POLICIES
USING RES FOR PARTIAL VARCHAR2 REDACTIONS
REDACTION_POLICIES / REDACTION_COLUMNS
*LAB 13: DATA REDACTION*

## CHAPTER 14 – RMAN / FDA ENHANCEMENTS

NEW BACKUP SUPER USER
RMAN CONNECTIONS
SELECT AND DESCRIBE FROM WITHIN RMAN
SIMPLER SQL COMMANDS
DUPLICATE WITH NOOPEN
CROSS-PLATFORM BACKUP AND RESTORE
RECOVERY OVER A NETWORK
STORAGE SNAPSHOT TECHNOLOGY
TABLE AND PARTITION RECOVERY
MULTISECTION BACKUPS ON VERY LARGE FILES
ACTIVE DATABASE DUPLICATION ENHANCEMENTS
TABLESPACE TRANSPORTS ACROSS PLATFORMS AND ENDIANNESS
- Convert At Source
- Restore From Converted At Source
- Convert At Target
- Restore From Converted At Target
STANDBY DATABASE UPDATING
DATA GUARD ENHANCEMENTS
ORACLE SCHEDULER SCRIPT JOBS
*LAB 14: RMAN / FDA ENHANCEMENTS LAB*

**CHAPTER 15 –DB OPERATIONS**
    DATABASE OPERATIONS
    DO MONITORING USE CASES
    ENABLING DATABASE OPERATIONS MONITORING
    DB OPERATIONS MONITORING ARCHITECTURE OVERVIEW
    DO ATTRIBUTES
    USING DBMS_SQL_MONITOR
- BEGIN_OPERATION Function
- END_OPERATION Procedure
- REPORT_SQL_MONITOR Function
- SIMPLE DATABASE OPERATIONS MONITORING EXAMPLE
- THE ACTIVE REPORT TYPE

    NEW OPTIMIZER HINTS
    *LAB 15: DB OPERATIONS*

**CHAPTER 16 – SCHEMA AND DATA CHANGES**
    DATABASE CHANGES
    CHANGE MANAGEMENT CAPABILITIES
    THE DBMS_COMPARISON PACKAGE
    THE CREATE COMPARISON PROCEDURE
    THE COMPARE FUNCTION
    DISCOVERING DIFFERENCES
    THE CONVERGE PROCEDURE
    THE RECHECK FUNCTION
    THE DBA_COMPARISON_COLUMNS VIEW
    *LAB 16: SCHEMA AND DATA CHANGES*

**CHAPTER 17 – SQL TUNING**
    ADAPTIVE EXECUTION PLANS
    DBMS_XPLAN AND ADAPTIVE EXECUTION PLANS
    SQL PLAN DIRECTIVES / EXTENDED STATISTICS
    ENHANCED STATISTICS GATHERING
    HISTOGRAM ENHANCEMENTS
    *LAB 17: SQL TUNING*

**CHAPTER 18 – REAL-TIME ADDM / PERFORMANCE**
    THE AUTOMATIC DATABASE DIAGNOSTIC MONITOR
    REAL-TIME ADDM
    EMERGENCY MONITORING / CURRENT ADDM FINDINGS
    MONITORING THE DATABASE WITH EMDE
    USING THE PERFORMANCE HUB
- The Summary Tab
- The RAC Tab
- The Activity Tab
- The Workload Tab

**CHAPTER 22 – DATA LOADING ENHANCEMENTS**

DATA PUMP ENHANCEMENTS
- Data Pump VIEWS_AS_TABLES
- Transform Clause Enhancements
- New Parameters

LOG MINER ENHANCEMENTS
FULL TRANSPORTABLE EXPORT / IMPORT
SQL*LOADER ENHANCEMENTS
- SQL*Loader Express Mode
- SQL*Loader Enhancements
- SQL*Loader / External Table Common Enhancements

**CHAPTER 23 – PARTITIONING ENHANCEMENTS**

MOVING PARTITIONS ONLINE
INTERVAL-REFERENCE PARTITIONING
ENHANCED CASCADE FUNCTIONALITY
OPERATING ON MULTIPLE PARTITIONS
PARTIAL INDEXES
GLOBAL INDEX MAINTENANCE
CONTROLLING STATISTICS GATHERING FOR PARTITIONS

**CHAPTER 24 – NEW FEATURES IN 12.1.0.2 – Time Permitting**

ABOUT 12.1.0.2
ADVANCED INDEX COMPRESSION
APPROX_COUNT_DISTINCT
ATTRIBUTE CLUSTERING
BIG TABLE CACHING
FLASHBACK DATA ARCHIVE SUPPORT FOR CDBS
FULL DATABASE CACHING
IN-MEMORY AGGREGATION
IN-MEMORY COLUMN STORE
- Working With Tables
- Working With Columns
- Working With Tablespaces
- Working With Materialized Views
- Data Pump And INMEMORY

SUPPORT FOR JSON
FIPS 140 ENCRYPTION PARAMETER
PDB CONTAINERS CLAUSE IN QUERIES
OMF FILE REPLACEMENT FOR PDBS
THE PDB LOGGING CLAUSE
PDB METADATA CLONES
PDB REMOTE CLONES