

Oracle GoldenGate 12c: Fundamentals for Oracle Ed 2

Oracle Database

DURATION

4 Days

MODULES

16 Lectures

COURSE CODE

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Course Overview

This Oracle GoldenGate training provides presentations and hands-on practice of the commands, parameters, functions and features for installing and configuring Oracle GoldenGate for Oracle-to-Oracle database replication on a Linux or Windows platform.

What You Will Learn

Introduction

- Objectives
- Agenda
- Oracle GoldenGate
- Why Do You Need Oracle GoldenGate?
- Uses of Oracle GoldenGate
- Use Case Example: Oracle GoldenGate for Operational Reporting
- Use Case Example: Oracle GoldenGate for Real-Time Data Warehousing
- Oracle GoldenGate Use Cases for Oracle Database
- Oracle GoldenGate for Oracle Database Eliminate Down Time for Migrations and Application Upgrades
- Oracle GoldenGate for Oracle Database Eliminate Down Time During Oracle Database Upgrades
- Oracle GoldenGate for Oracle Database Eliminate Unplanned Down Time with Active Data Guard
- Oracle GoldenGate for Oracle Database Increase Return on Investment (ROI) on Existing Servers and Synchronize Global Data
- Oracle GoldenGate for Oracle Database Offload Redo Logs
- Oracle GoldenGate for Oracle Database Improve Production System Performance and Lower Costs
- Agenda
- Oracle GoldenGate Topologies

- Supported Databases
- Supported Operating Systems
- Agenda
- Oracle Middleware for Business Intelligence
- Oracle GoldenGate and Oracle Data Integrator
- Oracle GoldenGate Product Line
- Quiz
- Summary
- Practice 1 Overview: Verifying the Lab Environment

Oracle GoldenGate Architecture

- Objectives
- Agenda
- Oracle GoldenGate Architectures
- Classic Versus Microservices Architecture
- Agenda
- Oracle GoldenGate Classic Logical Architecture
- Components of Oracle GoldenGate
- Oracle GoldenGate Process Groups
- Process-Group Naming Conventions
- GGSCI
- Parameter Files
- Agenda
- Extract Flavors
- Capture and Delivery Work Flow
- Capture and Delivery Using a Data Pump
- Distributed Topologies for Integrated Extract: Same Machine
- Distributed Topologies for Integrated Extract: Different Machine, Real Time
- Distributed Topologies for Integrated Extract: Different Machine,
• Non-Real-Time
- Agenda
- Online Versus Batch Operation
- Running an Initial Load
- Initial Load Work Flow
- Agenda
- Checkpoints: Capture
- Checkpoints: Pump
- Checkpoints: Delivery
- Commit Sequence Number (CSN)
- Discussion Questions
- Quiz
- Summary
- Practice 2 Overview: Oracle GoldenGate Architecture

Installing Oracle GoldenGate

- Objectives
- Agenda
- Software System Requirements
- Operating System Requirements
- Downloading Oracle GoldenGate
- Setting Environment Variables
- Agenda
- Installation on UNIX, Linux, or z/OS Systems
- Oracle Universal Installer GUI
- Installation on Windows Systems
- Oracle GoldenGate Directories
- Agenda
- GGSCI Command Interface
- GGSCI Commands
- GGSCI Examples
- Obey Files
- Running Oracle GoldenGate from the OS Shell
- Discussion Questions
- Summary
- Practice 3 Overview: Installing Oracle GoldenGate

Preparing the Environment and Configuring Integrated Extract

- Objectives
- Agenda
- Configuring Oracle GoldenGate: Overview
- Configuring Oracle GoldenGate
- Agenda
- Step 1: Preparing the Environment Enabling Oracle GoldenGate in the Database
- Preparing the Environment Enabling Supplemental Logging
- Preparing the Environment Defining Roles and Permissions
- Preparing the Environment Starting the Manager
- Preparing the Environment: Sample Manager Parameter File
- Preparing the Environment Generating a Source Definitions File
- Quiz
- Agenda
- Step 2: Change Capture
- Extract: Overview
- Data Pump: Overview
- Data Pumps: One-to-Many Trails
- Data Pumps: One-to-Many Target Systems
- Configuring Extract
- Add Extract Command

- Add Extract: Examples
- Editing Extract Parameters
- User ID and Password Aliases (New with 12c)
- Passive Alias Extract
- Overview of Trails
- Adding a Local or Remote Trail
- Starting the Extract
- Primary Extract Configuration for Oracle
- Data Definition Language (DDL) Replication
- Data Pump Configuration for Oracle
- Automatic Storage Management (ASM)
- Ensuring ASM Connectivity
- ASM and DBLogReader
- Discussion Questions
- Summary
- Practice 4 Overview: Preparing the Environment and Configuring Classic
- Extract

Configuring Initial Load

- Objectives
- Agenda
- Step 3: Initial Load
- Initial Load: Advantages of Oracle GoldenGate Methods
- Initial Load: Resource Limitations
- Prerequisites for Initial Load
- Initial Load: Oracle GoldenGate Methods
- Agenda
- Initial Load: File to Replicat
- Initial Load: File to Database Utility
- Initial Load: Direct Load
- Initial Load: Direct Bulk Load (to Oracle)
- Discussion Questions
- Summary
- Practice 5 Overview: Configuring Initial Load

Configuring Replicat

- Objectives
- Agenda
- Step 4: Change Delivery (Replicat)
- Replicat: Overview
- Nonintegrated or “Classic” Replicat
- “Integrated” Replicat a.k.a. “Integrated Delivery”
- Coordinated Replicat
- Parallel Replicat
- Components of Parallel Replicat

- Parallel Replication Architecture
- Parallel Replicat Control Parameters
- Agenda
- Change Delivery Tasks
- CheckpointTable
- Sample Configuration
- Agenda
- Avoiding Collisions with Initial Load
- Handling Collisions with Initial Load
- Agenda
- Obtaining Process Information Through GGSCI
- Process Report Files
- Sample Extract Process Report
- Discard Files
- Using the ggserr.log Error Log
- Using the System Logs
- Discussion Questions
- Quiz
- Summary
- Practice 6 Overview: Configuring Change Delivery

Managing Extract Trails and Files

- Objectives
- Agenda
- Extract Trails and Files: Overview
- Extract Trails and Files Distribution
- Extract Trails and Files
- Extract Trails and Files Cleanup
- Trail Format
- Record Header Area
- Record Data Area
- Setting the Compatibility Level
- Agenda
- Alternative Trail Formats
- Logical Change Records (LCRs)
- OutputFormat Text
- OutputFormat Text Sample Output
- OutputFormat SQL
- OutputFormat SQL Sample Output
- OutputFormat XML
- OutputFormat XML Sample Output
- Agenda
- logdump Utility
- Opening a Trail
- Setting Up a View

- Viewing the Trail File Header
- Viewing Trail Records
- Viewing Canonical Trail Records
- Counting Records in the Trail
- Filtering by a File Name
- Locating a Hex Data Value
- Saving Records to a New Trail
- Keeping a Log of Your Session
- Agenda
- reverse Utility: Overview
- Discussion Questions
- Summary
- Practice 7 Overview: Using Extract Trails and Files

Oracle GoldenGate Parameters

- Objectives
- Agenda
- Oracle GoldenGate Parameter Files
- Using Parameter Files
- GLOBALS Versus Process Parameters
- GLOBALS Parameters
- Agenda
- Manager Parameters: Overview
- Sample Manager Parameter File
- Manager Parameter Categories
- Managing Trail Files
- Agenda
- Extract Parameter: Overview
- Extract Parameter Defaults
- Sample Extract Parameter File
- Extract Parameter Categories
- Extract Example: Table Parameter
- Extract Example: TranLogOptions Parameter
- Agenda
- Replicat Parameters: Overview
- Replicat Parameter Defaults
- Sample Replicat Parameter File
- Replicat Parameter Categories
- Replicat Example: Map Parameter
- DBOptions
- Discussion Questions
- Summary
- Practice 8 Overview: Modifying Parameters

Data Selection and Filtering

- Objectives
- Agenda
- Data Mapping and Manipulation: Overview
- Types of Definition Files
- Data Selection: Overview
- Agenda
- Data Selection: Where Clause
- Data Selection: Where Clause Examples
- Agenda
- Data Selection: Filter Clause
- Data Selection: Filter Clause Examples
- Agenda
- Column Mapping: Overview
- Column Mapping: Example
- Column Mapping: Building History
- Data Transformation Using Functions
- Functions: Performing Tests on Column Values
- @IF Function
- Functions: Working with Dates
- @Date Function
- Functions: Working with Strings and Numbers
- @StrCat Function
- @StrExt Function
- Other Functions
- Agenda
- SQLEXEC: Overview
- SQLEXEC: Basic Functionality
- SQLEXEC: DBMS and Data Type Support
- SQLEXEC: Usage with a LOOKUP Stored Procedure
- SQLEXEC: Usage with a SQL Query
- SQLEXEC: Usage in a Table or Map Statement
- SQLEXEC: Usage as a Stand-Alone Statement
- Quiz
- Summary
- Practice 9 Overview: Data Selection and Filtering

Additional Transformation and Configuration Options

- Objectives
- Agenda
- Macros: Overview
- Creating Macros
- Invoking a Macro
- Reusing Parameter Sets

- Creating Macro Libraries
- Tracing Macro Expansion
- Agenda
- User Tokens: Overview
- Environmental Values Available to @GETENV
- User Tokens Display
- Using User Tokens
- Viewing User Tokens in Logdump
- Agenda
- User Exits: Overview
- Uses for User Exits
- User Exits: High-Level Processing Logic
- Implementing User Exits
- User Exit Parameters
- Sample User Exits
- Calling User Exits
- Quiz
- Agenda
- Compression Options
- Example of Compression
- Compression and Exadata
- Agenda
- Encryption: Overview
- Message Encryption
- Options: Message Encryption
- Trail or Extract File Encryption
- Trail Encryption with Wallet
- Password Encryption: Method 1
- Password Encryption: Method 2
- Password Encryption: Method 3
- Summary of Password Encryption
- Agenda
- Event Marker System
- Uses for Event Actions
- Event Actions Flowchart
- EventActions Order
- Implementing Event Actions: Examples
- Event Actions: Automated Switchover Example
- Event Actions: Automated Synchronization Example
- Quiz
- Summary
- Practice 10 Overview: Data Transformation and Configuration Options

Installing Oracle GoldenGate Microservices Architecture

- Objectives

- Agenda
- The Oracle GoldenGate Microservices Architecture
- Microservices Architecture: Main Components
- Microservices Architecture: Additional Components
- Microservices Architecture: a Pictorial Representation
- Microservices Architecture: Service Manager
- MA Security, Authentication, and Authorization
- Microservices Architecture Authentication
- Types of Certificates Used for Authentication
- Secure and Unsecure Deployments
- Agenda
- OS Requirements: Memory
- OS Requirements: Disk
- OS Requirements: Network
- OS Requirements: Privileges
- Agenda
- Oracle GoldenGate 12.3 MA Software Bundle
- Configuring MA servers/services using oggca.
- oggca.sh: Step One
- oggca.sh: Step Two
- oggca.sh: Step Three
- oggca.sh: Step Four
- oggca.sh: Step Five
- oggca.sh: Step Six
- oggca.sh: Step Seven
- oggca.sh: Step Eight
- oggca.sh: Step Nine
- Verifying Deployment Configuration Using Your Browser
- Verifying Deployment Configuration Using adminclient
- Discussion Questions
- Summary
- Practice 11: Overview

Oracle GoldenGate Microservices Architecture—Administration Server

- Objectives
- MA Administration Server Overview
- Administration Server - Functionality
- The REST API
- Embedded Web Server
- Web Page Overview
- Add Extract
- Extract Options
- Add Replicat
- Replicat Options
- Extract/Replicat Process Overview

- Checkpoint Information
- Extract/Replicat Statistics
- Process Parameters
- Process Reports
- Quiz
- Summary
- Practice 12: Overview

Oracle GoldenGate Microservices Architecture - Distribution Server

- Objectives
- MA Distribution Server Overview
- Data Pump Replacement
- Multiple Protocols
- Distribution Server Functionality
- Embedded Web Server
- Web Page Overview
- Add Path
- Path Management
- Path Information Page
- Path Statistics
- Quiz
- Summary
- Practice 13: Overview

Oracle GoldenGate Microservices Architecture—Receiver Server and

- Performance Metrics Server
- Objectives
- Agenda
- The Receiver Server: Overview
- Receiver Server Functionality
- Receiver Server Interaction with a Distribution Server
- Receiver Server Web GUI
- Receiver Server: Path Information
- Agenda
- Performance Metrics Server: Overview
- Performance Metrics Server Functionality
- Metrics and Counters by MA Component: 1
- Metrics and Counters by MA Component: 2
- Metrics Server Overview Page
- Extract Group: Process Performance Analysis
- Extract Group: Thread Performance Analysis
- Extract Group: Trail File Analysis
- Extract Group: Database Statistics
- Extract Group: Cache Statistics
- Extract Group: Queue Statistics

- Replicat Group: Process Performance Analysis
- Replicat Group: Thread Performance Analysis
- Replicat Group: Trail File Analysis
- Replicat Group: Database Statistics
- Quiz
- Summary
- Practice 14: Overview

MA Admin Client

- Objectives
- MA Admin Client Overview
- Admin Client Common Use
- Admin Client and GGSCI: Similarities and Differences
- Admin Client: MA Specific Syntax
- Admin Client Environment Variables
- Admin Client: Syntax Help
- Admin Client Example
- Quiz
- Summary
- Practice 15: Overview

Database Sharding Support, Metadata Encapsulation, Replication Lag

- Management, Invisible Column Support
- Objectives
- Agenda
- Database Sharding Overview
- Unsharded Table vs. Sharded Table (Three Databases)
- Sharding in Details
- Oracle Sharding: Typical Deployment
- Oracle GoldenGate MA Support for Sharded Databases
- Oracle GoldenGate Sharding Advantages
- Oracle GoldenGate Shard Configuration
- Agenda
- Metadata Encapsulation: Overview
- Metadata in Trail Files
- Support for Metadata Encapsulation in logdump
- Agenda
- Replication Lag Analysis
- Heartbeat Mechanism
- Heartbeat Lag Management Setup—GGSCI
- Heartbeat Lag Management Setup: MA Deployment
- MA Deployment: Heartbeat Management
- Accessing Heartbeat Statistics
- Agenda
- Invisible Columns in the Oracle RDBMS

- Oracle GoldenGate Support for Invisible Columns
- Quiz
- Summary
- Practice 16: Overview