

Oracle Database 11g: Implement Streams

Duration: 5 Days

What you will learn

Oracle Streams allows students to share data, messages, and events between schemas, applications, and databases. This course includes lessons on the fundamental components of Oracle Streams and how to administer each of these components. The lessons are designed to give students practical experience in configuring and managing a Streams environment. The course covers enqueue and dequeue messages using Oracle Streams. Also included are best practice guidelines and troubleshooting practices.

This course counts towards the Hands-on course requirement for the Oracle Database 11g Administrator Certification. Only instructor-led inclass or instructor-led online formats of this course will meet the Certification Hands-on Requirement. Self Study CD-Rom and Knowledge Center courses DO NOT meet the Hands-on Requirement.

Learn To:Administering a Streams EnvironmentManage Data ConflictsTroubleshoot the Streams EnvironmentConfigure Streams Environment

Audience

Business Intelligence Developer
Database Administrators
Sales Consultants
Support Engineer
Technical Consultant

Prerequisites

Required Prerequisites

Oracle Database 11g: Administration Workshop II

Oracle Database 11g: Administration Workshop I

Suggested Prerequisites

Oracle Database 11g: Administration Workshop I

Oracle Database 11g: Administration Workshop II

Course Objectives

Quickly and easily configure an Oracle Streams environment
Monitor the capture, propagation, and apply of events
Alter the Streams environment to add new sites or objects
Configure conflict handling for data replication
Transform the data being replicated between two sites
Enqueue and dequeue messages using Oracle Streams
Perform basic troubleshooting of a Streams environment

Course Topics

Introduction and Overview

Oracle Streams: Basic Elements

- Capture and Event Staging
- Staging Area Propagation
- Rules Engine
- Oracle Streams with Single-Source and Multiple-Source Database
- Oracle Streams Usage: Scenarios
- Using Oracle Streams for Upgrades and Migrations
- Interfaces to Oracle Streams

Database Configuration

- Configuring Database Parameters
- Configuring Archive Logging
- Supplemental Logging
- Database Configuration with Enterprise Manager
- Configuring Communication Between Databases
- Configuring Multiple Streams Sites
- Additional Preparation for File Propagation

Basic Objects of Oracle Streams

- Object Types
- Streams Events
- Logical Change Records (LCRs)
- Creating and Managing a Streams Administrator User
- Staging Area Architecture
- SYS.AnyData Queues
- Creating a Staging Queue
- View Interface to Queue Buffers

System-Created Rules

- Using Rules in Oracle Streams
- Generating System-Created Rules
- Using Subset Rules with Oracle Streams
- Row Subsetting
- Customizing System-Created Rules
- Negative Rule Sets
- Rule Evaluation with Negative Rule Sets
- Monitoring Rules

Enterprise Manager Interface to Oracle Streams

- Oracle Streams Manageability Features
- Configuring Oracle Streams
- Streams Setup Page
- Streams Tablespace Replication Wizard
- Capture Management
- Apply Management
- Propagation Management
- Managing Message Transformations

Simplified Streams Configuration

- Simplified Configuration Procedures
- Replicating a Single Tablespace (MAINTAIN_SIMPLE_TTS) and a Set of Tablespaces (MAINTAIN_TTS)
- Instantiating Database Objects
- Replicating Tables, Schemas, and Entire Database

- Improved Diagnostics for Streams
- Removing a Streams Queue
- Removing All Streams Components

Capture Process Concepts

- Capture
 - Implicit Event Capture
 - Capture Process Components
 - Identifying Changes to Capture
 - Logical Change Records (LCRs)
 - Data Types, DDL and DML Types Captured
 - Commands and DDLs Not Captured
 - Streams Tags and Downstream Capture

Configuring a Capture Process

- Creating the Capture Process
- Downstream Capture
- Capture Process Parameters
- Starting and Managing the Capture Process
- Monitoring Log File Availability
- Capture Process Statistics
- Troubleshooting Capture

Instantiation

- Performing Instantiation
- Preparing for Instantiation
- Setting the Instantiation SCN
- Import Instantiation and Creation
- Instantiation Using Data Pump
- Setting the Instantiation SCN Manually
- Instantiating a Database Using RMAN
- Verifying Instantiations at an Apply Site

Propagation Concepts and Configuration

- Directed Networks
- Queue and Forwarding
 - Apply Forwarding
 - Queue-to-Queue Propagation
- Propagation Job, Rules, and Scheduling
- Creating, Managing, and Monitoring Propagation
- Troubleshooting Propagation Configuration

Apply Concepts and Configuration

- Processing Streams Events
- Applying DDL Events
- Error Queue
- Required Apply User Privileges
- Apply Process Components and Rules
- Enqueue Destination and Execution Directives During Apply
- Virtual Dependency Definition
- Apply Process and Parameters

Transformations

- Rule-Based Transformations
- Declarative LCR Transformations
- Customized Rule-Based Transformations
- Modifying an LCR
- Using LCR Extra Attributes
- Creating a Rule-Based Transformation
- One-to-many Transformations
- Viewing and Managing Rule-Based Transformations

Apply Handlers

- Creating an Apply Handler Procedure
- Implementing a DML Handler
- Creating an Error Handler
- Implementing a DDL and a Precommit Handler
- Restrictions for Apply Handler Procedures
- Managing Apply Handlers
- Customizing Apply Handler Actions
- Viewing Apply Handler Information

Administering a Streams Environment

- Managing the Capture Process
- Managing Propagations
- Managing Apply Processes
- Starting and Stopping Streams Processes
- Managing Streams Process Rule Sets
- Troubleshooting Apply Failures

Reconfiguring the Streams Environment

- Types of Streams Environments
- Extending a Single-Source System
- Extending a Multiple-Source System
- Using Streams for Upgrades or Migrations
- Removing Sites and Objects

Data Conflicts

- What Is a Replication Conflict?
- Error Queue
- Types of Data Conflicts
- Primary and Substitute Key Columns
- Detecting Conflicts
- Data Consistency and Convergence
- Conflict Avoidance and Resolution Foundation
- Site Ownership

Conflict resolution

- Prebuilt Conflict Handlers
- Resolution Columns
- Column Lists
- Configuring Supplemental Logging
- Resolving Conflicts with Prebuilt and Custom Update Conflict Handlers
- Common Data Conflict Errors

Message Queuing Concepts

- Enqueuing Events
- Subscriptions and Recipient List
- Creating a Messaging Client
- Streams Messages with Object Types
- Dequeuing Messages in Streams
- Message Handlers
- Configuring Message Notification and Monitoring Streams Messaging
- Queue Management Page

Enqueuing and Dequeuing Events

- Enqueuing a Message in Streams
- Creating User Messages with LCRs
- Enqueuing a User-Created LCR
- Configuring Propagation of Non-LCR Events
- Dequeuing LCRs and Messages
- Applying User-Created LCR Events
- Configuring Rule-Based Apply of Messages
- Purging the Staging Queue

Best Practices and Operational Considerations

- Best Practices for Configuring Streams
- Archive Logging
- Capture Process SCN Values and Checkpoints
- Modifying FIRST_SCN and START_SCN
- Source Queue Growth
- NOLOGGING Operations
- Clock Synchronization
- Integrating Triggers with Streams

Troubleshooting Oracle Streams

- Troubleshooting Capture
- Troubleshooting Propagation
- Troubleshooting Apply
- Common Apply Errors
- Troubleshooting Secure Queue Access