

Oracle Database 11g: Implement Streams Release 2

Duration: 5 Days

What you will learn

The Oracle Database 11g: Implement Streams course is a hands-on introduction for Streams Administrators, DBAs and others who need to know how to share data and messages between schemas, applications, and Oracle databases which can be continents apart.

This course begins with “Guided Configurations”, both in Oracle Enterprise Manager and via command line (using PL/SQL packages). The second unit addresses “Manual Configurations”, which is followed by “Customizing your Configurations” with transformations and apply handlers.

The unit on “Extending Streams” includes topics such as Configuring Downstream Capture, Synchronous Captures, XStream, and extending the Streams configuration automatically, with a single MAINTAIN procedure or wizard, or by adding components individually in multiple steps.

The last unit on “Managing and Monitoring Streams” includes the split-and-merge functionality, analyzing and avoiding data conflicts, comparing data, best practices and troubleshooting guidelines. The appendices can be used to address additional customer needs, such as Advanced Queueing (AQ).

This course is based on Oracle Database 11g Release 2.

Learn To:

- Setup and configure a Streams environment
- Administer and customize a Streams environment
- Manage data conflicts
- Monitor and troubleshoot a Streams environment

Audience

- Database Administrators
- Sales Consultants
- Support Engineer
- Technical Administrator
- Technical Consultant

Prerequisites

Suggested Prerequisites

Oracle Database 11g: Administration Workshop II Release 2

Course Objectives

- Perform basic troubleshooting of a Streams environment
- Alter the Streams environment to add, modify and drop 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
- Monitor the capture, propagation, and apply of events
- Quickly and easily configure an Oracle Streams environment

Course Topics

Oracle Streams: Overview

- What Is Oracle Streams?
- Streams: Overview
- Oracle Streams Database Configuration
- Configuring Communication Between Databases
- Identifying Streams Processes
- Example Streams configurations

Configuring Simple Streams Replication

- Overview of Replication Configuration Steps
- Ways to set up Oracle Streams
- MAINTAIN_* Procedures: Overview
- Configuration Decisions, Prerequisite Steps & Instantiation Options
- Configuring Replication using Enterprise Manager
- Replicating a Single Tablespace, a Set of Tablespaces, an Entire Database, Schemas & Tables
- Viewing the Configuration Progress & Troubleshooting the Configuration Procedures
- Removing Oracle Streams Components

Customizing Streams with Rules

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

Capture Process: Concepts and Manual Configuration

- Capture & Redo-Based Capture
- Capture Process: Components
- Identifying Changes to Capture & Data Types Captured
- Streams Support for Transparent Data Encryption
- Wallet Management
- Types of changes captured & not captured
- Limiting Captured Messages & Streams Tags
- Capture Process Architecture & Creating and managing the Capture Process

Instantiation

What Is Instantiation?

Performing Instantiation

Preparing for Instantiation

Instantiation SCN

Setting the Instantiation SCN

Instantiation Using Data Pump

Viewing Information About Instantiation & Verifying Instantiations at an Apply Site

Removing Instantiation Information

Propagation Concepts and Manual Configuration

What is Propagation?

Directed Networks, Queue Forwarding & Apply Forwarding

How Does Propagation Work?

Queue-to-Queue Propagation

Guaranteed Message Delivery

Queue-to-Queue Propagation and Real Application Clusters

Manually Creating a Propagation

Managing & Monitoring Propagations

Apply Concepts and Manual Configuration

What is Apply?

Processing Streams Messages

Applying DDL Messages

Applying Messages & Error Queue

Apply Process and Column Discrepancies

Creating, Modifying & Managing the Apply Process

Querying the Data Dictionary

Managing & Checking the Apply Process

Transformations

Rule-Based Transformations and Capture, Propagation & Apply

Declarative LCR Transformations

Custom Rule-Based Transformations

Modifying an LCR

Using LCR Extra Attributes

Creating a Custom Rule-Based Transformation

Viewing Rule-Based Transformations

Managing Custom Rule-Based Transformations

Apply Handlers

Message Processing

Apply Handlers for LCR Messages

Creating an Apply Handler Procedure

Implementing a DML Handler

Statement DML Handler Type

Recording Table Changes

Viewing Change Table Handler Information

Implementing LOB Assembly

Configuring Downstream Capture

Prerequisites for Downstream Capture

- Configuring Log Transport Services at the Source Database
- Configuring Downstream Initialization at the Destination Database
- Configuring Standby Logs at the Destination Database
- Creating a Downstream Capture Process with a Database Link & Without a Database Link and with the MAINTAIN Process
- Real-Time Downstream Capture
- Monitoring Downstream Capture Processes
- Monitoring Log File Availability

Configuring Synchronous Capture

- Synchronous Capture
- Captured Data Types & Captured Changes
- Configuring Synchronous Capture
- Configuring Oracle Streams for Synchronous Capture
- Configuring Synchronous Capture
- Managing and Monitoring Synchronous Capture

Extending the Streams Environment

- Automatic Extension of OracleStreams: Adding New Shared Objects
- Adding a Table to a Single or Multiple Source System
- Adding Objects to a Multiple-Source System
- Adding a New Destination to a Single-Source System
- Final Configuration for a Populated Database & an Import Database
- Using Streams API for Rolling Database Upgrades or Migrations
- Preinstantiation Steps for Rolling Upgrade
- Creating a New Streams Site by Using RMAN

Configuring and Using XStream

- Heterogeneous Data Sharing using Oracle Streams
- XStream Architecture
- XStream Out and XStream In
- Position Order in an LCR Stream
- Configuring an Outbound Server
- Configuring an Inbound Server
- XStream in Action – An Example
- Monitoring XStream

Splitting and Merging of Streams Destination

- When to Think about Split and Merge
- Splitting and Merging of Streams
- Automatic Split and Merge Functionality
- New Data Dictionary Views
- Manual Splitting and Merging of Streams

Avoiding Data Conflicts

- What Is a Replication Conflict?
- Error Queue
- Types of Data Conflicts
- Specifying Substitute Key Columns
- Data Consistency and Convergence
- Conflict Avoidance and Resolution Foundation
- Avoiding Conflicts by Assigning Data Ownership
- Suppressing Conflict Detection & Cascading Delete Operations

Conflict Resolution

Prebuilt Conflict Handlers

Resolution Columns

Configuring Supplemental Logging

Resolving Conflicts with Prebuilt Update Conflict Handlers & Custom Conflict Handlers

Viewing Apply Errors & Error Transaction Information

Printing Values from a SYS.AnyData Type

Using Procedures to Execute LCRs

Viewing Conflict Resolution Information

Comparing and Converging Data

Comparing Table Data

Creating & Performing Comparisons

Viewing the Differences in Data

Identifying the Rows That Differ

Converging Database Objects

Converging a Shared Database Object with a Session Tag Set

Rechecking the Results for a Comparison

Viewing & Purging Comparison Results

Best Practices and Operations Considerations

Best Practices for Streams Database Configuration

Sharing & Purging LogMiner Data Dictionaries

Altering FIRST_SCN for a Capture Process

Removing Unnecessary Archived Log Files

Best Practices for Streams Database Operation & Captured Messages

Source Queue Growth

Clock Synchronization

Best Practices for Performing Backups of Your Streams Environment

Monitoring Oracle Streams

Monitoring Tools

Using Oracle Enterprise Manager to Manage & Monitor Oracle Streams

Monitor Capture Statistics, Propagation Statistics & Apply Statistics

Message Tracking & Automated Alerts

Responding to Automated Alerts in Enterprise Manager

Checking the Trace Files and Alert Log

Streams Performance Advisor

Viewing Performance Statistics for Oracle Streams Components

Troubleshooting Oracle Streams

How to Troubleshoot

Troubleshooting Capture

Troubleshooting Propagation

Troubleshooting Apply