

## Objectifs

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

## Participants

Responsables des ventes Ingénieurs support Consultant Technique Administrateurs de base de données

## Prérequis

Cours pré-requis obligatoire(s): Oracle Database 11g: Administration Workshop I Nouveau Oracle Database 11g: Administration Workshop II DBA Release 2

## Pédagogie

La pédagogie est basée sur le principe de la dynamique de groupe avec alternance d'apports théoriques, de phases de réflexion collectives et individuelles, d'exercices, d'études de cas et de mises en situations observées. Formation / Action participative et interactive : les participants sont acteurs de leur formation notamment lors des mises en situation car ils s'appuient sur leurs connaissances, les expériences et mettront en oeuvre les nouveaux outils présentés au cours de la session.

## Profil de l'intervenant

Consultant-formateur expert sur cette thématique. Suivi des compétences techniques et pédagogiques assurée par nos services.

## Moyens techniques

Encadrement complet des stagiaires durant la formation. Espace d'accueil, configuration technique des salles et matériel pédagogique dédié pour les formations en centre. Remise d'une documentation pédagogique papier ou numérique à échéance de la formation.

## Méthodes d'évaluation des acquis

Exercices individuels et collectifs durant la formation. Evaluation des acquis et attestation de fin de stage adressés avec la facture.

## Programme

# Oracle Database 11g - Implement Streams Release 2

5 jours - 35 heures

## Objectifs

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

## Participants

Responsables des ventes Ingénieurs support Consultant Technique Administrateurs de base de données

## Prérequis

# Oracle Database 11g - Implement Streams Release 2



5 jours - 35 heures

Code formation : log-

[www.adhara.fr](http://www.adhara.fr)

**Cours pré-requis obligatoire(s): Oracle Database 11g: Administration Workshop I Nouveau Oracle Database 11g: Administration Workshop II DBA Release 2**

## Pédagogie

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

## Profil de l'intervenant

Consultant-formateur expert sur cette thématique. Suivi des compétences techniques et pédagogiques assurée par nos services.

## Moyens techniques

Encadrement complet des stagiaires durant la formation. Espace d'accueil, configuration technique des salles et matériel pédagogique dédié pour les formations en centre. Remise d'une documentation pédagogique papier ou numérique à échéance de la formation.

## Méthodes d'évaluation des acquis

Exercices individuels et collectifs durant la formation. Evaluation des acquis et attestation de fin de stage adressés avec la facture.

## Programme

### Oracle Streams: Overview

What Is Oracle Streams?

Streams: Overview

Oracle Streams Database Configuration

Configuring Communication Between Databases

Identifying Streams Processes

Example Streams configurations

### 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 Procedure

## **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**

## **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**

## **Troubleshooting Oracle Streams**

### **How to Troubleshoot**

#### **Troubleshooting Capture**

#### **Troubleshooting Propagation**

#### **Troubleshooting Apply**

## **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

1220