Case Study: A Fortune-1000 Education Technology Company

Oracle to PostgreSQL Migration using Cloud Data Migrator

Problem Statement

Our Client wanted to run a research project to build a multi-backend platform for their educational applications starting with their existing Oracle-based applications as they started cloud-based, online offerings. This meant two important constraints of their requirements

- Compatible database schemas and packages between different databas- es like Oracle and PostgreSQL, needed from current Oracle schemas and packages with:
  - Minimal application changes Minimal data
  - migrations from legacy / Oracle
- Minimal manual interventions for maintaining bidirectional compatibility while changes may originate from any of the supported databases

Customer Profile

Our Client is the world's leading provider of software and services higher education institutions need to help students succeed. We help more than 2,500 institutions and 18 million students worldwide with our technology designed specifically for higher education, cloud-based solutions, and professional services. Our Client provides student information systems (SIS), finance and HR, recruiting, retention, analytics and advancement software solutions. With more than 1,400 institutions subscribing to Our client's cloud services and SaaS offerings, we are one of the largest providers of cloud-based solutions.

Solution Approach

To find best solution approach for migration, Cloudly did an assessment on five different Oracle databases from Client. Table 01 is represent outcome of initial assessment phase. Based on the complexity of the databases below are the four major approaches selected for database migration:

1. Direct equivalent that will be automatically translated, e.g., Tables, Views, Synonyms, etc.
2. Direct equivalent that will be manually translated, e.g., Triggers, Functions / Procedures, etc.
3. Application level backend changes for object, e.g., ROWID, GOTO, etc.
4. Manually Data migration for object, e.g., BFILENAME, etc.

	Database 01	Database 02	Database 03	Database 04	Database 05
Tables	161	699	2369	835	196
Views	1460	2	0	0	0
Sequences	11	135	566	83	39
Triggers	299	162	699	74	44
Functions	624	0	0	0	0
Synonyms	7502	830	2923	919	237

Execution & Delivery

Cloudly team undertook the project over a period of fourteen weeks and delivered bi-direction- ally compatible PostgreSQL equivalents to Our Client's Oracle database features ranging from simple functions to complex data types and procedures:

Weeks 1-2	Weeks 3-6	Weeks 8-12	Weeks 13-14
• Complete Assessment of Oracle databases • Run SCT tool and review all reports • Tabulate and confirm solution approach for each failed case • Develop full blueprint and migration plan	• Pre-engineering of each failed case incl. prototyping and test data for approach and • Research into items with Client team • Review items with team and Client obtain test migration data	• Implementation of conversion scripts and source changes • for and Example implementation of items • Example implementation of items incl. migration of test data	• Re-run of SCT tool until all source-changed features convert successfully • Run conversion scripts on failed cases that are unsupported by SCT tool • Setup PostgreSQL test environment incl. test data load

Cloudly Profile

CloudlyIO was founded by a group of cloud experts of Silicon Valley, who started working on Amazon Web Services (AWS) platform when there were only two services available: EC2 and S3. They successfully migrated over 100 customers in North America, Europa, Asia and Australia over a period of five years. This experience showed them how migrating to cloud, esp. databases was one of the daunting challenges that almost all businesses who wanted to use public clouds for their workloads were facing. They decided to do something about it and built an automated database migration platform called: Cloud Database Migrator (CDM), which leverages AWS Database Migration Service (DMS) and automates various parts of the workflows, such as, provision- ing of resources, validation of migrations and reporting of migrated features.

Business Benefits

Cloudly successfully completed the research project of migrating Our Client's enormous and complex Oracle databases into PostgreSQL equivalent and proved a successful bi-directionally compatible database model. Customer was able to quickly validate:

- The hypothesis of using a multi-backend architecture for their business-critical applications
- The possibility of using an open-source database and avoid millions in licensing fees
- The capability of AWS RDS PostgreSQL for elastically scaling databases against demand
- The potential costs of maintaining two tracks: licensed on-premise and open-source cloud
- Reduce TTM for their cloud-based offerings by leveraging AWS RDS capabilities

Outcomes

At the end of project, customer had a completed PoC on their extremely complex databases and the set of deliverables from Cloudly:

- Complete migration blueprint incl. detailed instructions of all automated and manual
- steps All conversion scripts for source>source and source>target conversions of SCT
- failed cases Example code snippets where application changes are necessary
- Sample test data for testing post-migration compatibility
- All test scripts validating converted schema and data

Cloudly

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