CASE STUDY

How R Systems architected the AWS Cloud Services for Boardwalk Pipelines!

Geography

USA

Vertical

Oil and Gas

Tools & Technologies

- .Net
- AWS
  - DynamoDB, Aurora
  - App Sync
  - SNS, SQS
  - Kinesis, Firehouse, Athena
  - Cognito
  - Code Commit
  - IoT Core, Shadow, Rule Engine
  - S3, EFS
- VS Code
- Linux Machine
- NodeJs
- React Native
- Docker
- Web APIs

About Client

Boardwalk Pipelines deals with establishing access to key shale-gas supply, developing connections to a wide range of end-use markets, and diversifying into natural gas liquids transportation and storage services.

Problem Statement

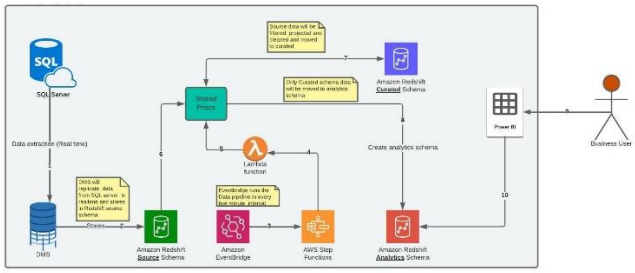
The client wanted to build out a reusable framework for data collection, data storage, data catalog, and data serving that increase speed to which information is curated, added, and secure access is provided.

Our Solution

We architected a reliable, scalable & cost-effective solution employing AWS cloud services. Developed a cloud platform for ingesting source data from SQL Server in real-time with a change data capture (CDC) using AWS Database Migration Service(DMS) into Amazon Redshift. Implemented existing SQL Server SSIS packages by converting existing stored procedures from SQL Server to Redshift and orchestrated using AWS Step Functions and Lambda.

Tools and technology used as a part of the solution

- AWS DMS – Database Migration Service is used to migrate data and database objects from SQL Server to Redshift.
- AWS Schema Conversion Tool(SCT) - To convert and migrate SQL Server schema to Redshift
- Stored Procedures – Converted SQL Server stored procedures to Redshift.
- Amazon Redshift – To load and transform data from SQL Server.
- Step Functions – Implemented existing SQL Server SSIS packages to transform Redshift raw data layer into a curated and final analytics layer.

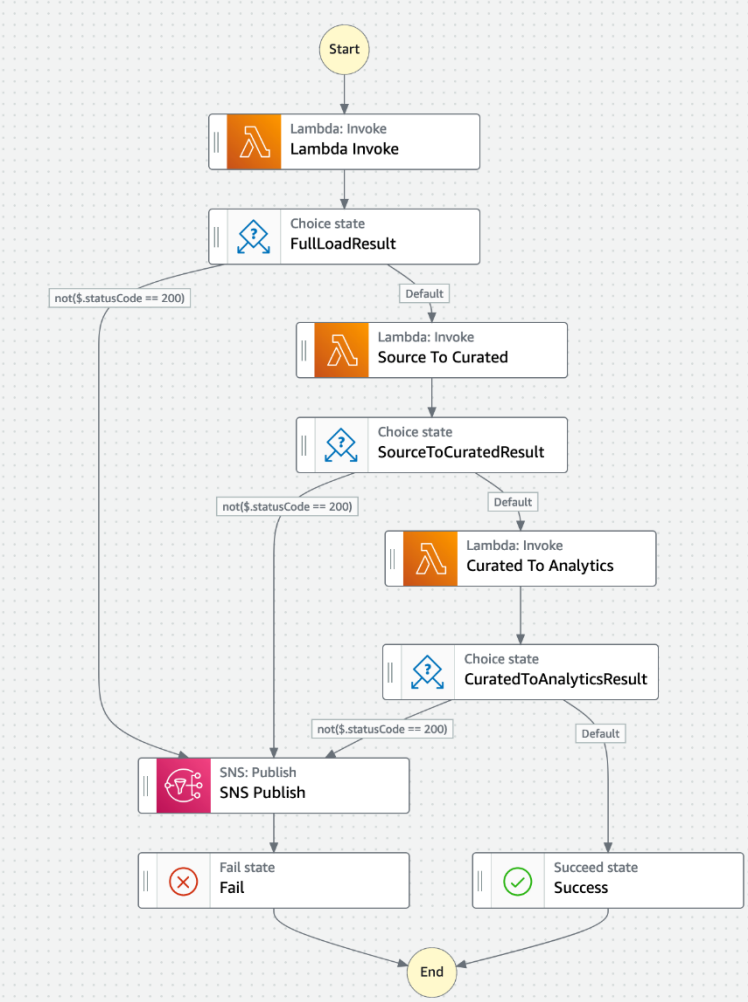


Architectural Diagram

- EventBridge(CloudWatch): Execution of Step Functions was scheduled via EventBridge events.
- Lambda: Used to call Redshift stored procedures.
- Cloud Formation Script: Automation script for creation of environment (Test, Dev, UAT etc.)
- Code Commit: Code repository
- CI-CD Pipeline: Automatic Build and deployment

Implementation and Orchestration

End to end transformation process in Redshift is managed by a state machine. At the completion of each step in the state machine, execution status is verified. In case of failure, the state machine changes its status from "running" to "failed" and sends an error email via AWS SNS (Simple Notification Service).

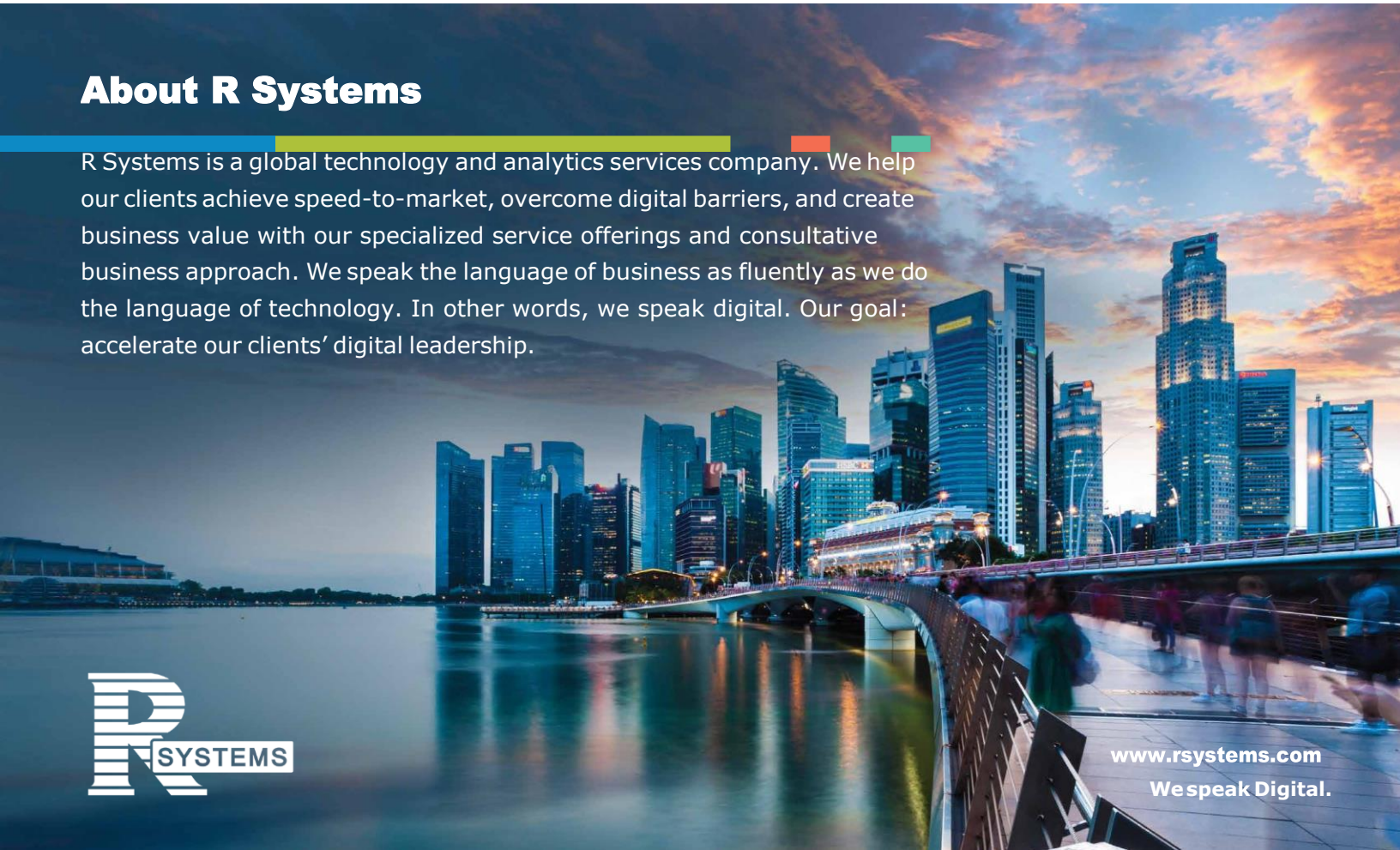


Implementation

Execution of the step function was scheduled via AWS EventBridge.

Outcomes of Project & Success Metrics

- Provided a cost-effective solution to ingest source data with CDC implementation
- Reduced operational costs and improved efficiency with the mix of scalable on-demand and Serverless architecture
- Improved availability and durability
- Enhanced flexibility with data storage with Redshift RA3 nodes which separate compute and storage
- Converted and optimized stored procedures for Redshift
- Configured Redshift Workload Management settings for optimal query performance for different user groups



About R Systems

R Systems is a global technology and analytics services company. We help our clients achieve speed-to-market, overcome digital barriers, and create business value with our specialized service offerings and consultative business approach. We speak the language of business as fluently as we do the language of technology. In other words, we speak digital. Our goal: accelerate our clients' digital leadership.