Best Practices for Migrating from SQL Server to Amazon Aurora

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Agenda – Part 2

- AWS SCT – Best Practices
- SQL Server as Source
  - Multi Server Assessment
  - Demo
- DMS Best Practices - Tasks
  - Validation
  - Extra Connection Attributes,
  - Logging & Troubleshooting
- AWS DMS – Overview
  - Demo
- Best Practices and Lessoned Learned by Datavail
- Q&A

AWS
SCT – Schema Conversion Tool
DMS – Database Migration Service

AWS migration tooling

- **Our goal:** Allow customers the freedom to choose the best data platform for their needs #DBFreedom

AWS Schema Conversion Tool (AWS SCT) converts your commercial database and data warehouse schemas to open-source engines or AWS-native services, such as Amazon Aurora and Amazon Redshift

AWS Database Migration Service (AWS DMS) easily and securely migrates and / or replicates your databases **and** data warehouses to AWS

AWS Schema Conversion Tool (AWS SCT)

Aws SCT helps automate many database schema and code conversion tasks when migrating from source to target database engines

Features

Create assessment reports for homogeneous/heterogeneous migrations

Convert database schema

Convert data warehouse schema

Convert embedded application code

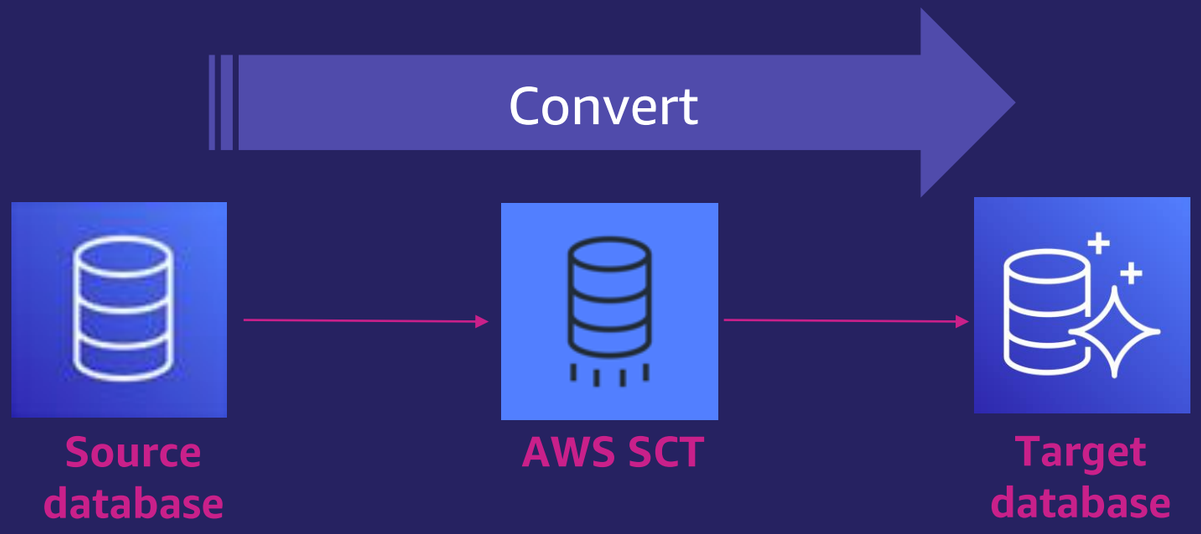
Code browser that highlights places where manual edits are required

Secure connections to your databases with SSL

Service substitutions / ETL modernization to AWS Glue

Migrate data to data warehouses using AWS SCT data extractors

Optimize schemas in Amazon Redshift



AWS SCT – Schema Conversion Tool

Assessment Reports

- Generate for single or multiple sources
- Storage Objects
- Code Objects
- Playbooks

Learn more ›

Conversion Actions

- High occurrence, Simple Actions
- Breakdown Code Objects to their essence

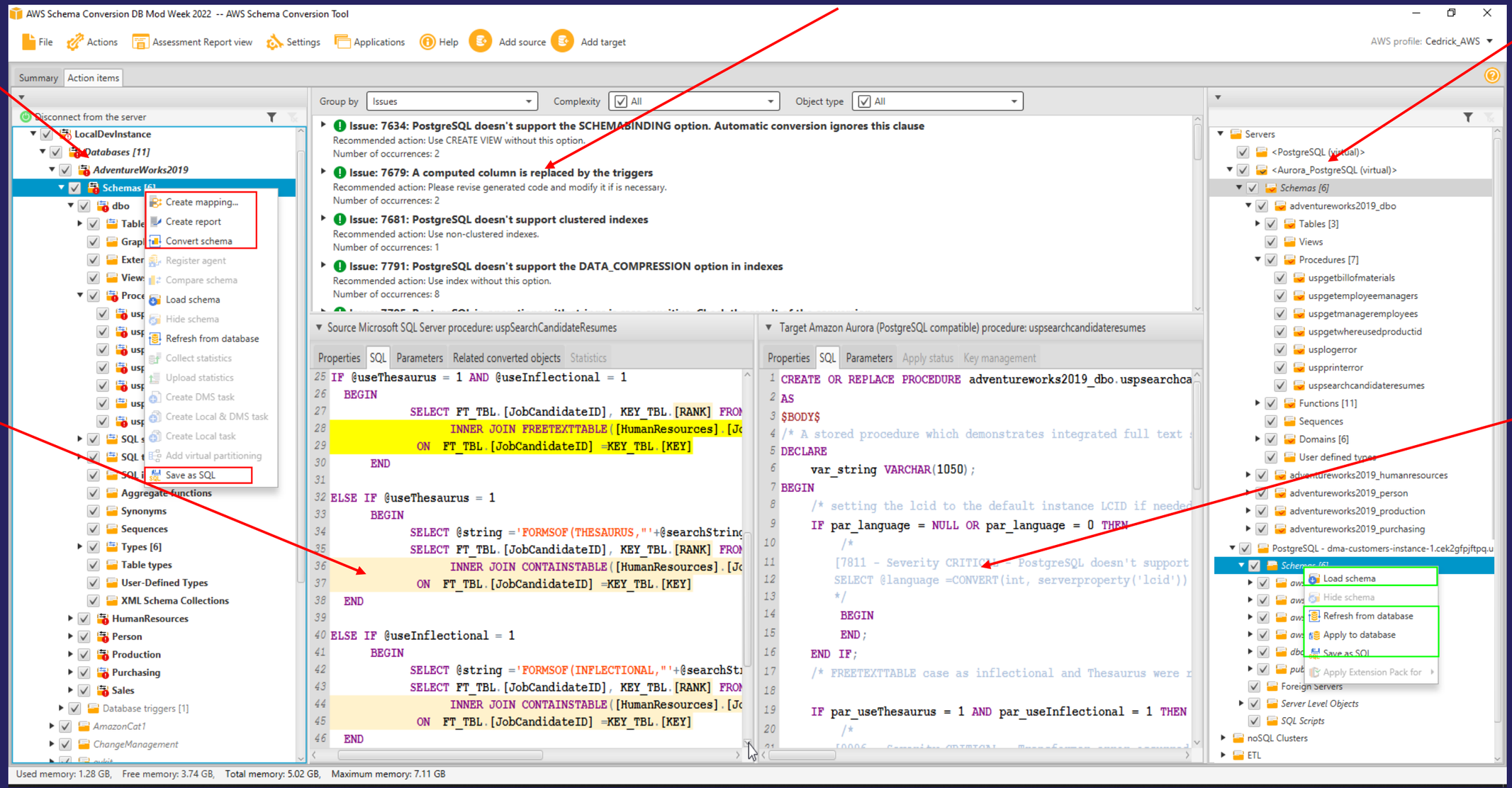
Learn more ›

Apply to Database

- Apply directly using the UI.
- Save DDL Scripts and execute directly on the target database

Learn more ›

AWS Schema Conversion Tool



1

2

3

4

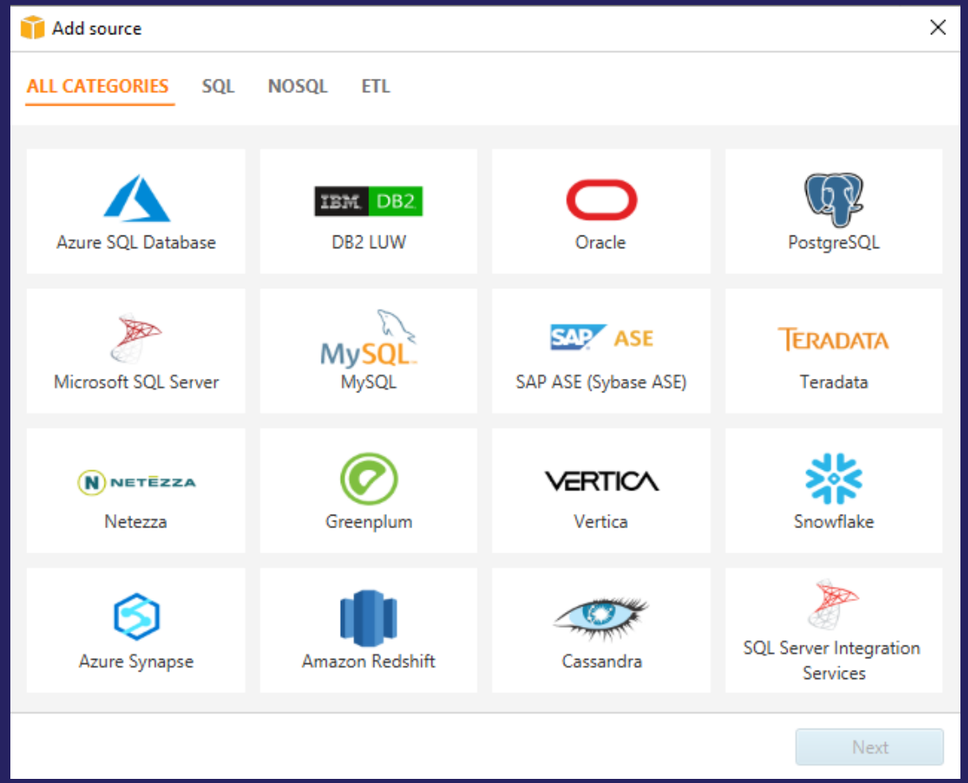
5

AWS SCT – Advanced Demo

- SCT Multi server navigation
- Mapping Rule and View
- Virtual Targets

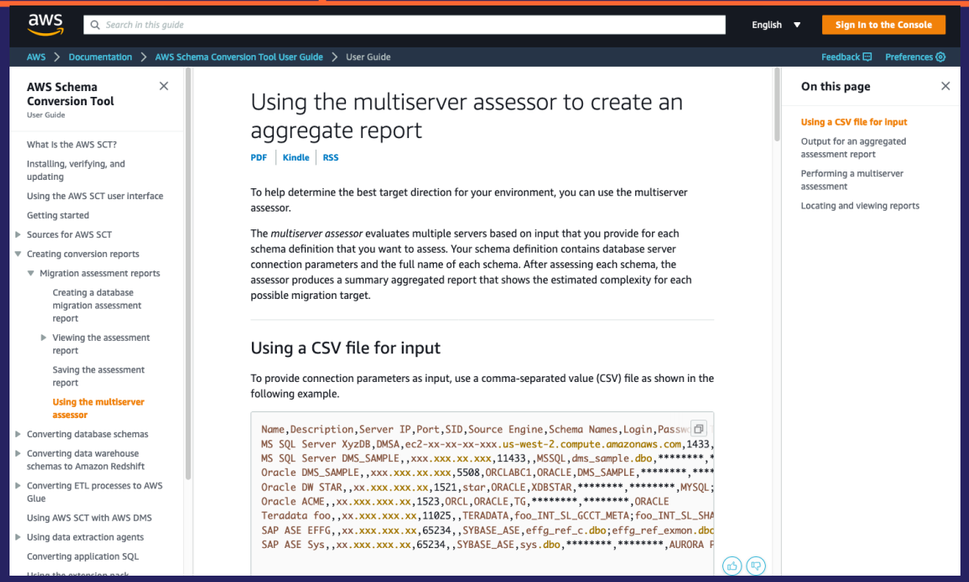
New in 6.57

- Assessment Report
  - Minor Issues , Major Problems: 9996, 9997
- Object Conversions
  - Application Code Module
  - SQL File - Trigger



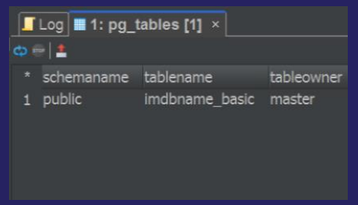
SCT Best Practices - Assessment

- Use the new SCT Multi-server Assessment feature
- This makes it easier to run assessments against multiple databases and schemas on multiple servers.
- https://docs.aws.amazon.com/SchemaConversionTool/latest/userguide/CHAP_AssessmentReport.Multiserver.html



SCT Best Practices – Conversion

- Don’t treat the target like the source. Understand your differences.
- Some Basic Examples:

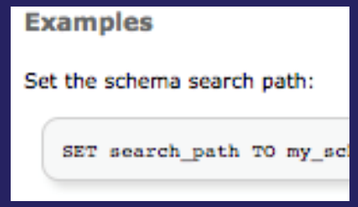


PostgreSQL is a lowercase data dictionary & is case sensitive

Select FirstName from Person

!=

Select firstname from person

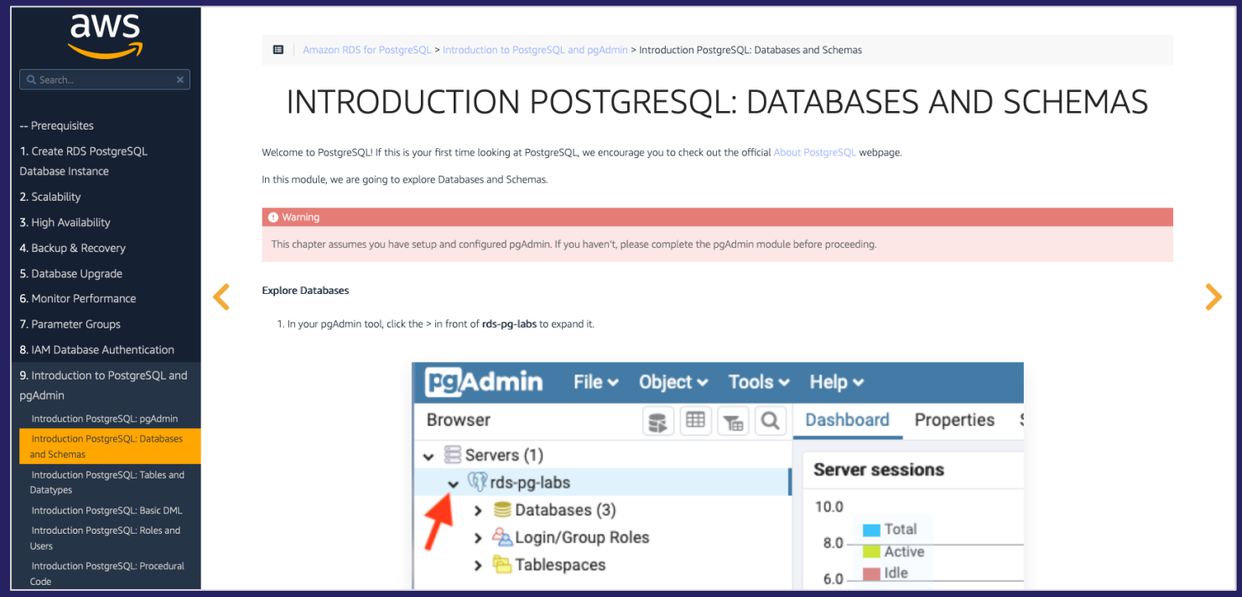


search_path replaces fully qualified object names and synonyms

PostGreSQL doesn’t support hints on inline SQL statements.

Remove hints such as with NOLOCK or with OPTION RECOMPILE

Hint: Just getting started with PostgreSQL? Check out the “Introduction to PostgreSQL” chapter in the AWS PostgreSQL Immersion Day: https://rdspg.workshop.aws/



AWS DMS
Database Migration Service

DMS – Database Migration Service

Replication Instance

- DMS Replication Instances are ec2 hosts with migration software preinstalled.
- Choose the right Instance Type
- Accessible through the AWS Console or the AWS CLI and APIs

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Endpoints

Endpoints can be:

- Relational
- NoSQL
- File Based(s3)

Source Types

Target Types

Learn more ›

Tasks

- Migration type
- Target Preparation
- Include LOBs
- Extra Connection Attributes Logging & Troubleshooting
- Validation

Learn more ›

DMS – Database Migration Service

Task

- Name your task
  - No spaces or underscores
- Connect to endpoints
  - Source
  - Target
- Choose migration type
  - Existing data
  - Existing data and replicate changes
  - Replicate changes only
- Target preparation
  - Do nothing
  - Drop tables on target
  - Truncate
- Include LOBs
  - Don't include LOBs
  - Full LOB mode
  - Limited LOB mode

AWS DMS – SQL Server as a Source

- Start Here: Limitations and Prerequisites
- Working With Always On Availability Groups
  - Server and Database Maintenance
- Extra Connection Attributes
  - MultiSubnetFailover=Yes
  - alwaysOnSharedSynchedBackupIsEnabled
  - MultiSubnetFailover=Yes
- Data Types
  - LOBS, CLOBS, NCLOBS = VARCHAR, NVARCHAR, XML
  - Full LOB vs Inline LOB Mode
- DEMO
- https://docs.aws.amazon.com/dms/latest/userguide/CHAP_Source.SQLServer.html

Thank you!

Cedrick Hoodye
Database Migration Accelerator Team

Datavail's TechBoost Modernization Journey from SQL Server to Amazon Aurora PostgreSQL

Trevor Banks, Datavail

AWS Advanced Tier Consulting Partner

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- AWS Certifications
  - Cloud Practitioner
  - Technical Certifications
  - AWS Solution Architects Associate and Professional
  - AWS SysOps Associate Admin
  - AWS Developer Associate
  - AWS Database Specialty
- Competencies
  - Windows Workloads Competency
  - Migration*

- Service Delivery Partner
  - Amazon RDS
  - Amazon EC2
  - AWS Database Migration Service*
- Programs
  - Aurora Optimization Program
  - Babelfish Program
  - Database Freedom Program
  - Windows Rapid Migration Program
  - Windows Modernization Program
  - Well Architected Review Program

*competency and SD in process

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Consulting Partner

Microsoft Workloads

AWS Public Sector Partner

Amazon EC2 for Windows Server

Amazon RDS

Immersion Day Program

Examples of Datavail Modernization Customers

What is TechBoost?

Overview:

Datavail's TechBoost is our multi-tenant cloud-based SaaS platform that collects and analyzes database metrics in near real-time, assists database administrators through useful insights, performs auto-remediation and assists with root-cause analysis .

Broad Database Support:

Datavail TechBoost is currently helping more than 400 customers monitor 400,000 databases and resolve 2 million incidents.

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Business Drivers for Modernization

Cost, Scalability, and Reliability

- No RDBMS license fees
- Autoscaling with demand
- Multi-AZ reliability and durability

Integration of Aurora PostgreSQL

- IAM authentication
- CloudWatch monitoring
- S3 backups

Tools and Technology

- AWS SCT
- AWS DMS
- Some manual code conversion based on SCT output

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Our Response

1

Inventory Expected Changes

We determined the changes we would likely need to make.

2

Build Target Database

Using AWS SCT's output, build the target database schema in AWS Aurora PostgreSQL.

3

Change Application Code

Convert SQL Server code to PostgreSQL

4

Migrate Data

Rigorous testing first, then the migration.

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Outcomes/Lessons Learned:

- Performance has improved.
- Case sensitivity differences should be tested.
- Table constraint consistency.
- Migration with minimal production downtime can be challenging, but is doable.
- AWS DMS and SCT are invaluable tools, but do benefit from manual testing alongside them.

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Thank you!