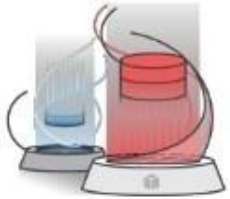
Migrating Databases to the Cloud with AWS Database Migration Service

What are DMS and SCT?

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



AWS Schema Conversion Tool 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 easily and securely migrates and/or replicate your databases *and* data warehouses to AWS

When to use DMS and SCT?

Modernize

Migrate

Replicate

AWS Schema Conversion Tool

Modernize

- **Modernize your database**

  Convert your Oracle, SQL Server, or Db2 LUW to PostgreSQL, MySQL, or Amazon Aurora

MySQL

Amazon Aurora

PostgreSQL

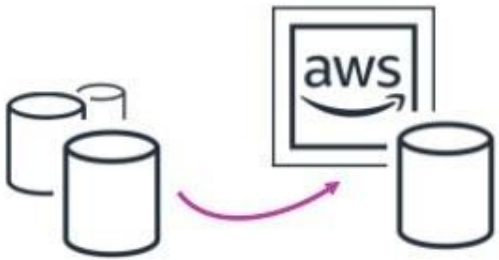
- **Modernize your data warehouse**

  Convert your Oracle, SQL Server, Netezza, Greenplum, Vertica or Teradata to Amazon Redshift

Amazon Redshift

AWS Database Migration Service

Migrate



- **Migrate** business-critical applications
- **Migrate** data warehouse to Amazon Redshift
- **Upgrade** to a minor version
- **Consolidate** shards into Aurora
- **Archive** old data
- **Migrate** from NoSQL to SQL, SQL to NoSQL or NoSQL to NoSQL


Amazon Redshift


Amazon RDS


Amazon S3

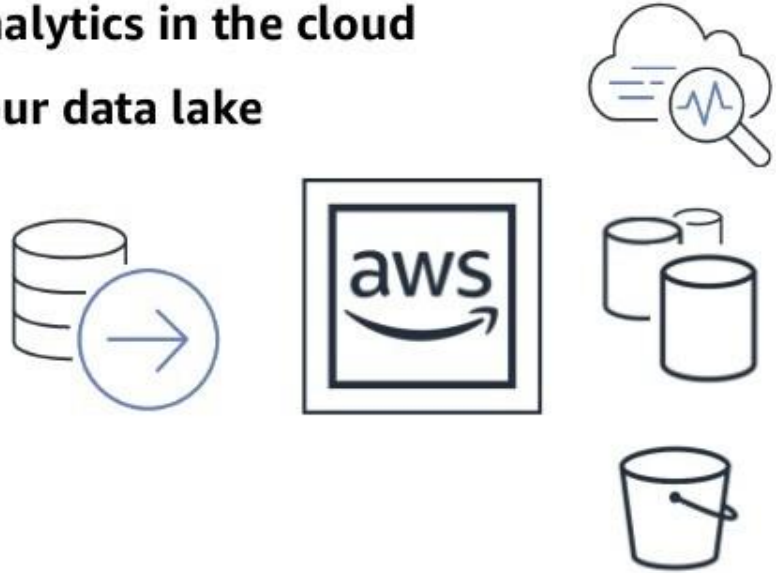

Amazon DynamoDB


Amazon Aurora

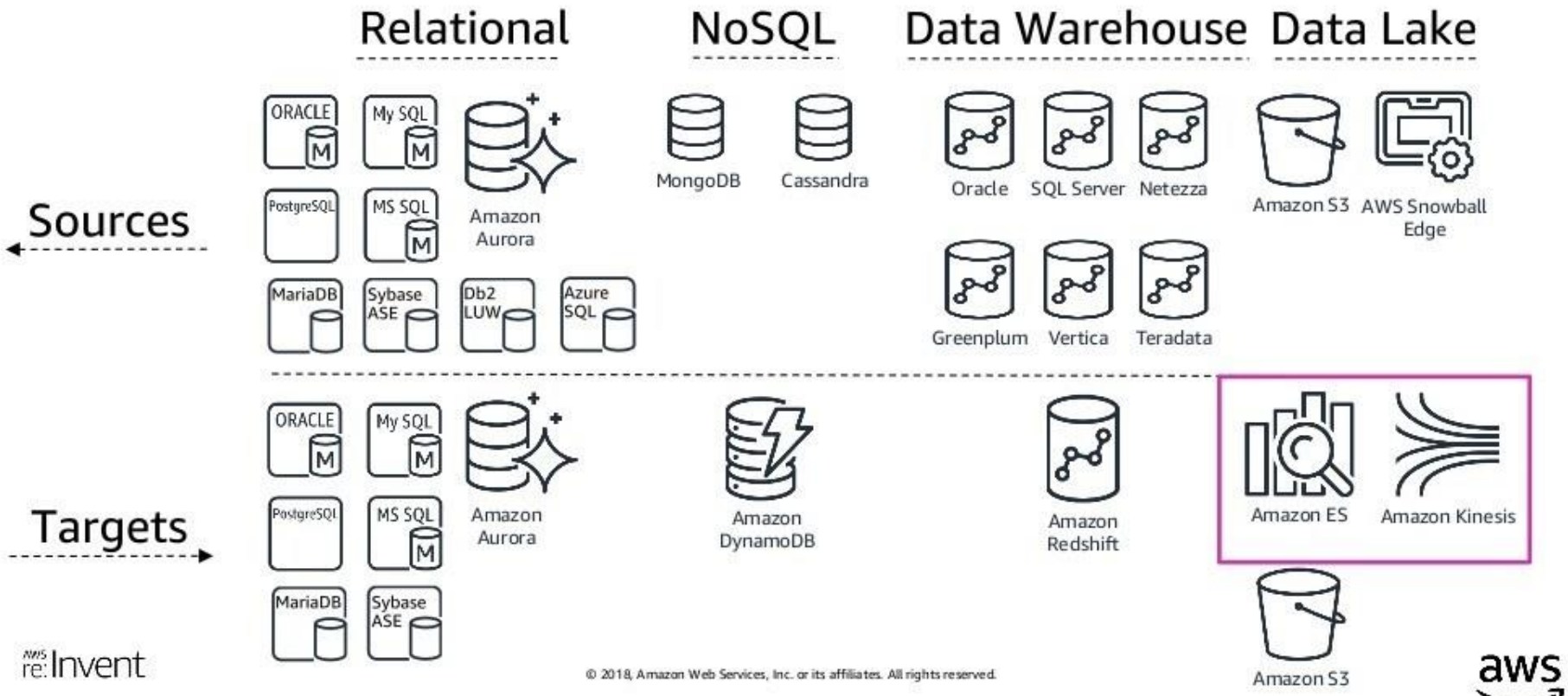
AWS Database Migration Service

Replicate

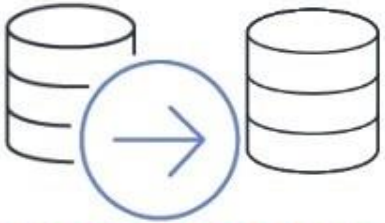
- **Create** cross region Read Replicas
- **Run** your analytics in the cloud
- **Populate** your data lake



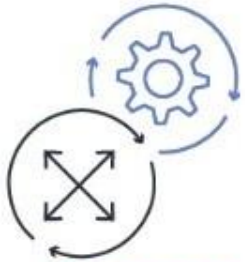
AWS DMS – Endpoint Support Expansion



AWS DMS/SCT Product Highlights



Homogeneous & Heterogeneous



Assess

Convert Schema & Code

Verify

Secure

Validate

Tools for Migration

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

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

Lessons Learned/Challenges

SCT

- 80% conversion rate from Oracle → PostgreSQL for most of the apps
- Not all procedures can be converted automatically, generates report with recommendations

Issues

- Partition table conversion
- Data type issues (Number to Double precision)
- Default date conversions

Lessons Learned/Challenges

DMS

- Continuous replication post data copy
- Can use standby on source to reduce impact
- For large tables – create subtasks
- Dry runs needed before production migration

Issues

- Data migration for large databases
- No option to specify parallel table copy more than 8 threads

Key Takeaways

Migrating to Cloud

- One size ***does not*** fit all
- Choose the ***right tools***
- Conduct ***dry runs***
- Measure through ***performance testing***

Future Enterprise Requirements

- Cross Region Replication
- Hybrid & Multi-Master Replication
- Conversion of Packages
- Conversion of Shell scripts

DMS/SCT Product Highlights

Old World to Aurora Migration Playbooks

- Topic-by-topic overview of how to migrate databases and data warehouses to AWS services
- Covers all proprietary features and the different database objects
- Migration best practices
  - Oracle to Aurora PostgreSQL
  - SQL Server to Aurora MySQL
  - SQL Server to Aurora PostgreSQL

	Oracle Feature	PostgreSQL Feature	Compatibility
Link	Index Organized Tables (IOTs)	PostgreSQL "Cluster" Tables	Yes*
Link	Common Data Types	Common Data Types	Yes
Link	Table Constraints	Table Constraints	Yes
Link	Table Partitioning including: RANGE, LIST, HASH, COMPOSITE, Automatic LIST	Table Partitioning including: RANGE, LIST	Yes*
Link	Exchange & Split Partitions	N/A	None
Link	Temporary Tables	Temporary Tables	Yes*
Link	Unused Columns	ALTER TABLE DROP COLUMN	Yes
Link	Virtual Columns	Views and/or Function as a Column	Yes*
Link	User Defined Types (UDTs)	User Defined Types (UDTs)	Yes
Link	Read Only Tables & Table Partitions	Read Only Roles and/or Triggers	Yes*
Link	Recovery Manager (RMAN)	AWS Aurora Snapshots	Yes
Link	Flashback Database	AWS Aurora Snapshots	Yes
Link	12c Multi-tenant architecture: PDBs and CDB	Databases	Yes*
Link	Tablespaces & DataFiles	Tablespaces	Yes*
Link	Data Pump	pg_dump & pg_restore	Yes
Link	Resource Manager	Separate AWS Aurora Clusters	Yes
Link	Database Users	Database Roles	Yes
Link	Database Roles	Database Roles	Yes
Link	SGA & PGA Memory	Memory Buffers	Yes
Link	V$ Views & Data Dictionary	System Catalog Tables, Statistics Collector, AWS Aurora Performance Insights	Yes*
Link	Log Miner	Logging Options	Yes
Link	Instance & Database Parameters (SPFILE)	AWS Aurora Parameter Groups	Yes
Link	Session Parameters	Session Parameters	Yes
Link	Alert.log (error log)	Error Log via AWS Console	Yes
Link	Automatic and Manual Statistics Collection	Automatic and Manual Statistics Collection	Yes
Link	Viewing Execution Plans	Viewing Execution Plans	Yes

To download the playbooks, please visit:

https://aws.amazon.com/dms/resources/

AWS SCT Product Highlights

Assessment Report	Converts Schema and Code	Extracts and Migrates DW to Amazon Redshift
• Assessment of migration compatibility of source databases with open-source database engines – Amazon RDS for MySQL, Amazon RDS for PostgreSQL, and Amazon Aurora • Recommends best target engine • Provides details level of efforts to complete migration	• Attempts to convert all schema and code objects to the target engine, including stored procedures and functions • Scans and converts embedded SQL statements in app code • Generates a report with recommendations	• Extracts data through local migration agents • Files are loaded to an Amazon Simple Storage Service (Amazon S3) bucket and to Amazon Redshift • Netezza • Vertica • Greenplum • Teradata • Oracle • SQL Server

AWS DMS Product Highlights

Pre-migration Assessment	Data Validation	Snowball Integration
• Checks migration task settings prior to launch • Alerts for potential issues, such as unsupported data types • Prevent unnecessary, time consuming runtime migration failures	• Validates that all data selected for migration migrated properly • Includes both stages of full load and CDC • Applies for both homogeneous and heterogeneous migrations	Use AWS Snowball & AWS DMS to migrate data to AWS • Migrate large databases (over 5TB) • Migrate many databases at once • Migrate over slow network • Push vs. Pull

AWS Database Migration Service

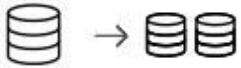
MIGRATING DATABASES TO AWS

100,000+
DATABASE INSTANCES MIGRATED

MIGRATE BETWEEN ON PREMISES AND AWS

MIGRATE BETWEEN DATABASES

AUTOMATED SCHEMA CONVERSION



DATA REPLICATION FOR ZERO DOWNTIME MIGRATION

Please visit our blog at:
https://aws.amazon.com/blogs/database
Category: database migration service