Migrating to Amazon RDS with Database Migration Service

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Amazon Aurora with PostgreSQL Compatibility

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What to expect from this talk

- Challenges of migrating databases and applications to the cloud
- Overview of the Database Migration Service (DMS)
- Overview of the Schema Conversion Tool (SCT)
- Why and When to use DMS
- Example Use Case: sharded database consolidation
- What do our customers say about us?
- Pricing and resources for customers
- Q&A

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How can I get to the cloud?

- How will my on-premises data migrate to the cloud?

- How can I make it transparent to my users?

- Afterwards, how will on-premises and cloud data interact?

- How can I integrate my data assets within AWS?

- Can I get help moving off of commercial databases?

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Migration used to be cost + complexity + time

- Commercial data migration and replication software

- Complex to set up and manage

- Application downtime

- Database-engine-specific application code

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What are DMS and SCT?

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

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

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DMS Trajectory

- We have migrated over 40,000 unique databases, & counting (most recent public announcement was 35,000 on Aug 22)

More than
35,000 databases
have been migrated using
AWS Database Migration
Service since September 2016
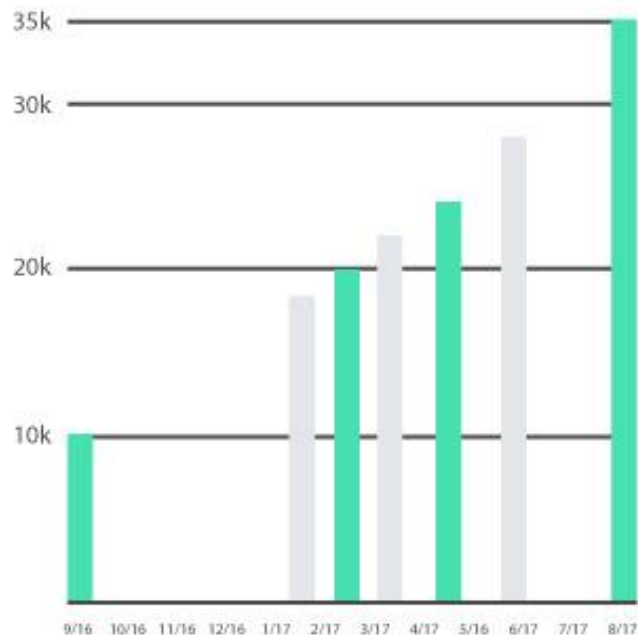
When to use DMS and SCT?

Modernize

Migrate

Replicate

When to use SCT?

Modernize

Modernize your database tier

ORACLE → Amazon Aurora
Microsoft® SQL Server → PostgreSQL
MySQL

Modernize and **Migrate** your Data Warehouse to Amazon Redshift

Hewlett Packard Enterprise VERTICA
Microsoft® SQL Server
TERADATA
NETEZZA
Greenplum
ORACLE → **Amazon Redshift**

SCT helps with converting tables, views, and code

Sequences
User-defined types
Synonyms
Packages
Stored procedures
Functions
Triggers
Schemas
Tables
Indexes
Views
Sort and distribution keys

SCT Migration Assessment Report
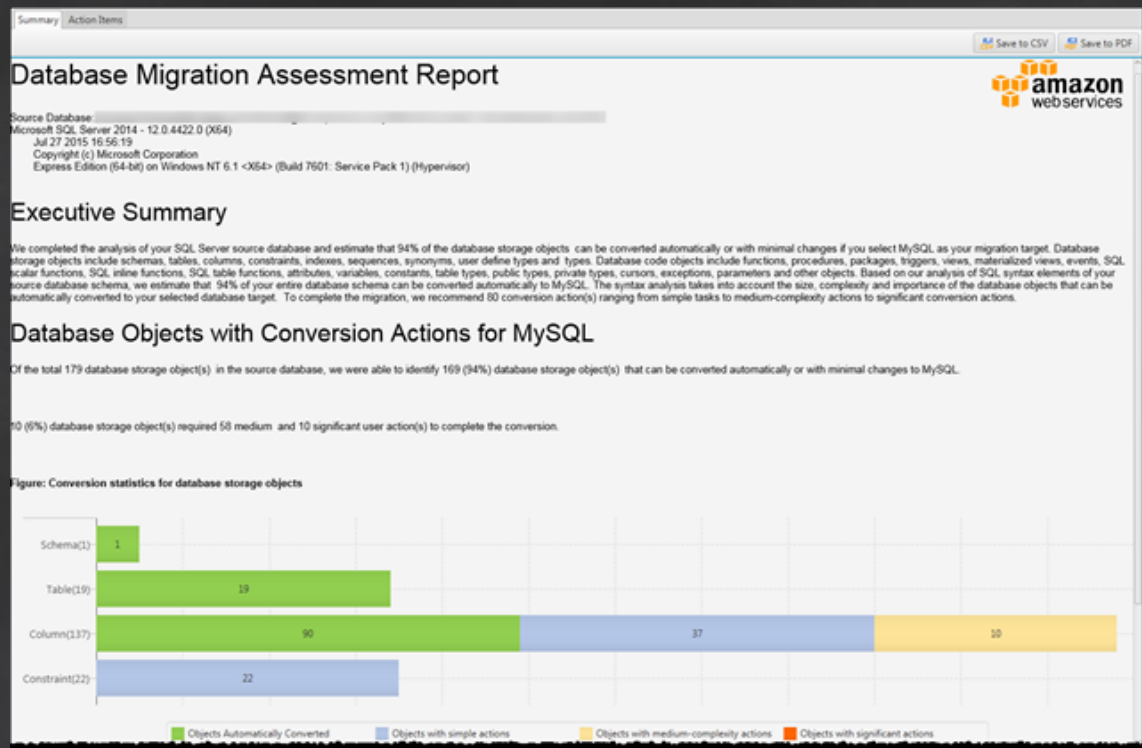
- Assessment of migration compatibility of source databases with open-source database engines – RDS MySQL, RDS PostgreSQL and Aurora
- Recommends best target engine
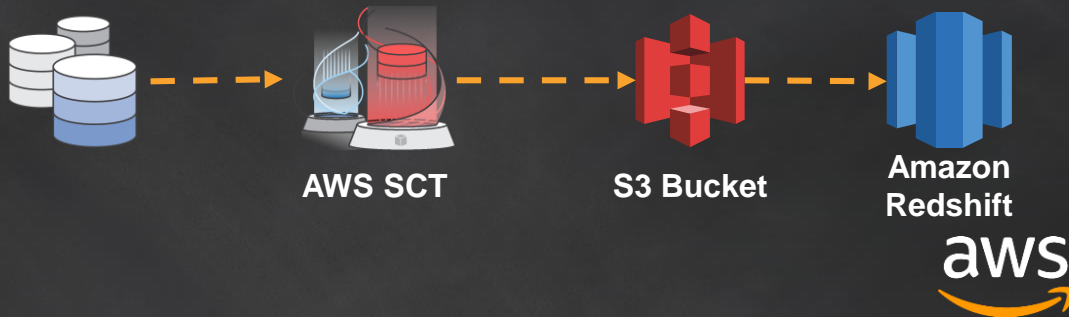- Provides details level of efforts to complete migration

New *SCT Data Extractors*

Extract Data from your data warehouse and migrate to Amazon Redshift

- **Extracts** data through local migration agents

- Data is **optimized** for Redshift and saved in local files

- Files are **loaded** to an Amazon S3 bucket (through network or Amazon Snowball) and

  then to Amazon Redshift

AWS SCT　　**S3 Bucket**　　**Amazon Redshift**

When to use DMS*?

ORACLE

MySQL

PostgreSQL

mongoDB

Microsoft SQL Server

MariaDB

- **Migrate** business-critical applications

- **Migrate** from Classic to VPC

- **Migrate** data warehouse to Redshift

- **Upgrade** to a minor version

- **Consolidate** shards into Aurora

- **Migrate** from NoSQL to SQL, SQL to NoSQL or NoSQL to NoSQL

Migrate

AWS

Targets:

Amazon S3

Amazon Redshift

Amazon Aurora

Amazon Dynamo DB

PostgreSQL

ORACLE

MariaDB

Microsoft SQL Server

MySQL

*DMS is a HIPAA certified service

When to use DMS?

Replicate

- **Create** cross-regions Read Replicas
- **Run** your analytics in the cloud
- **Keep** your dev/test and production environment sync
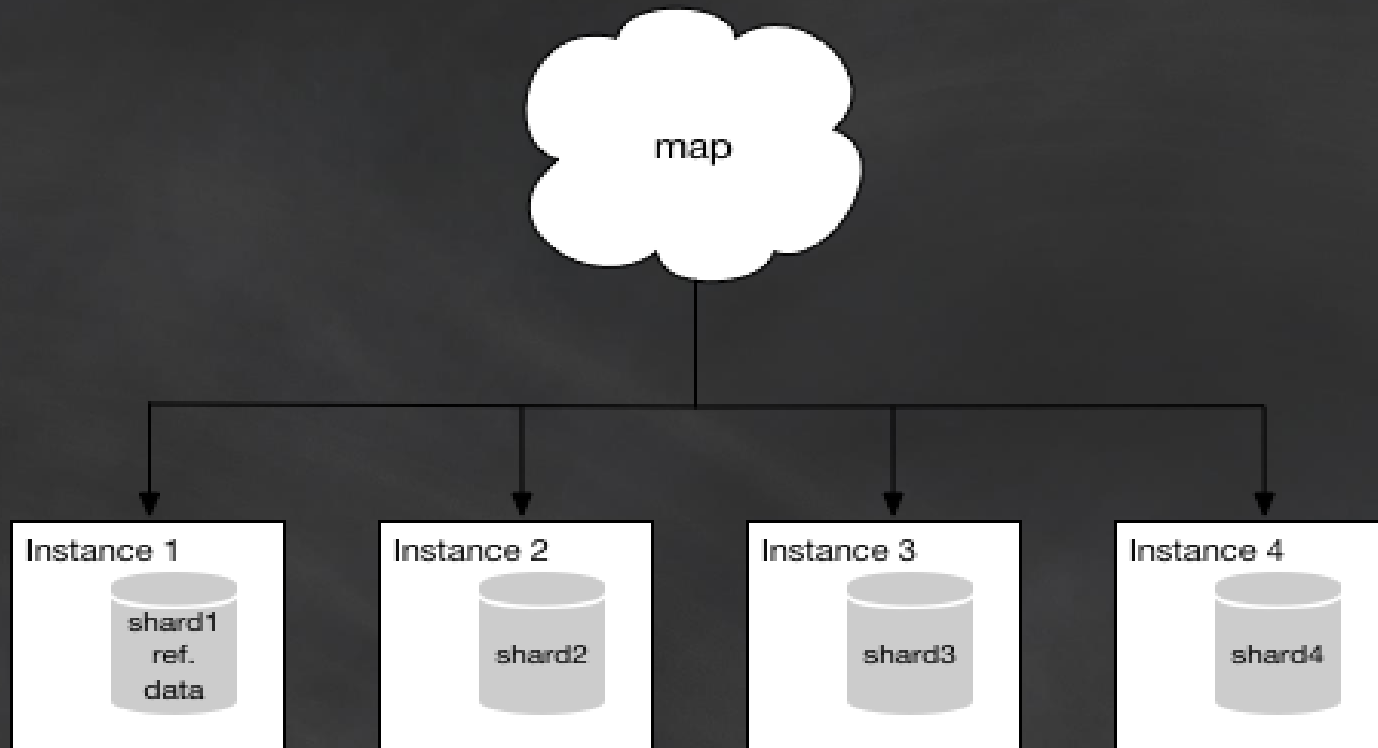
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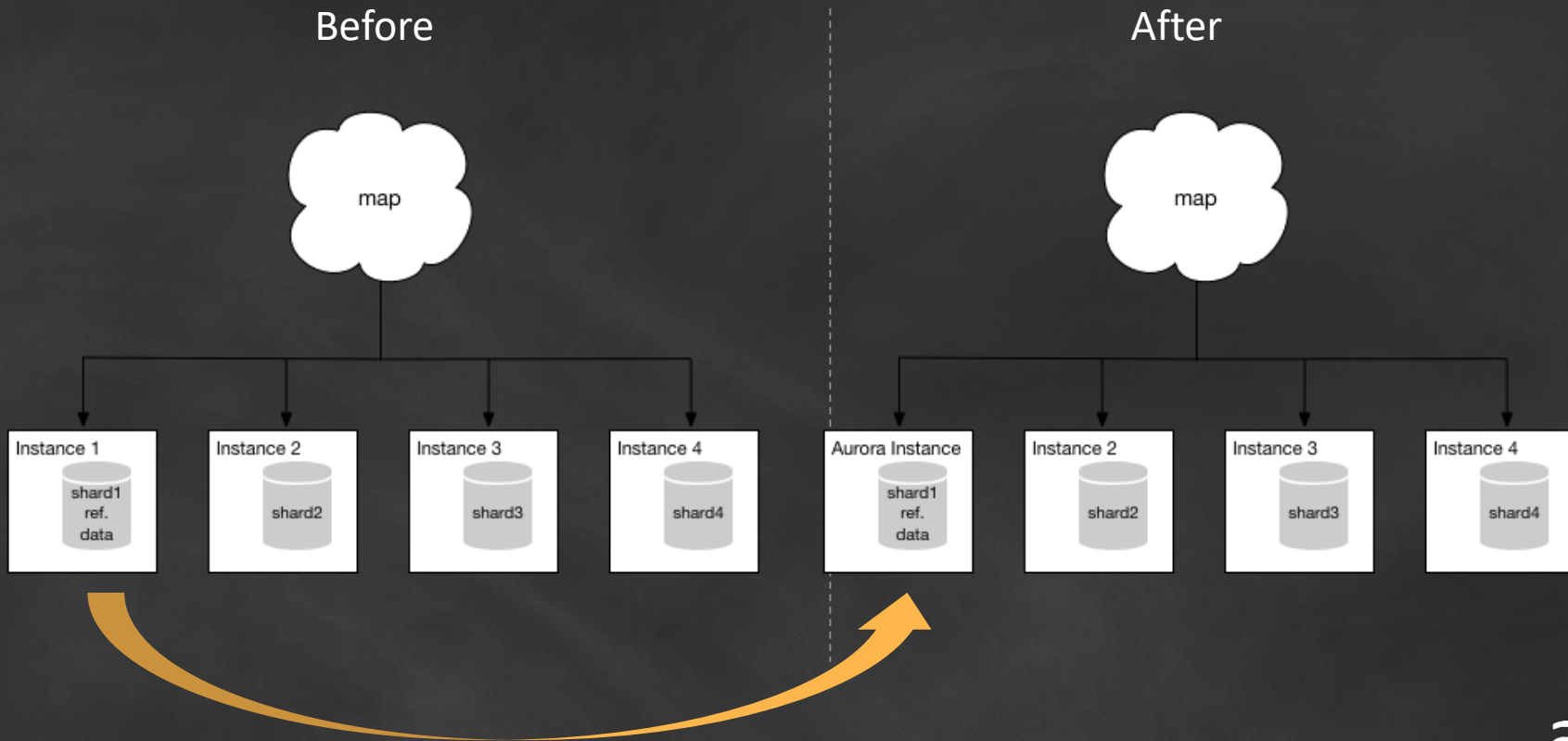
Shard consolidation use case

Things change

- In the beginning…

- - The system ran fine but then growth happened

- To solve the problem you could:
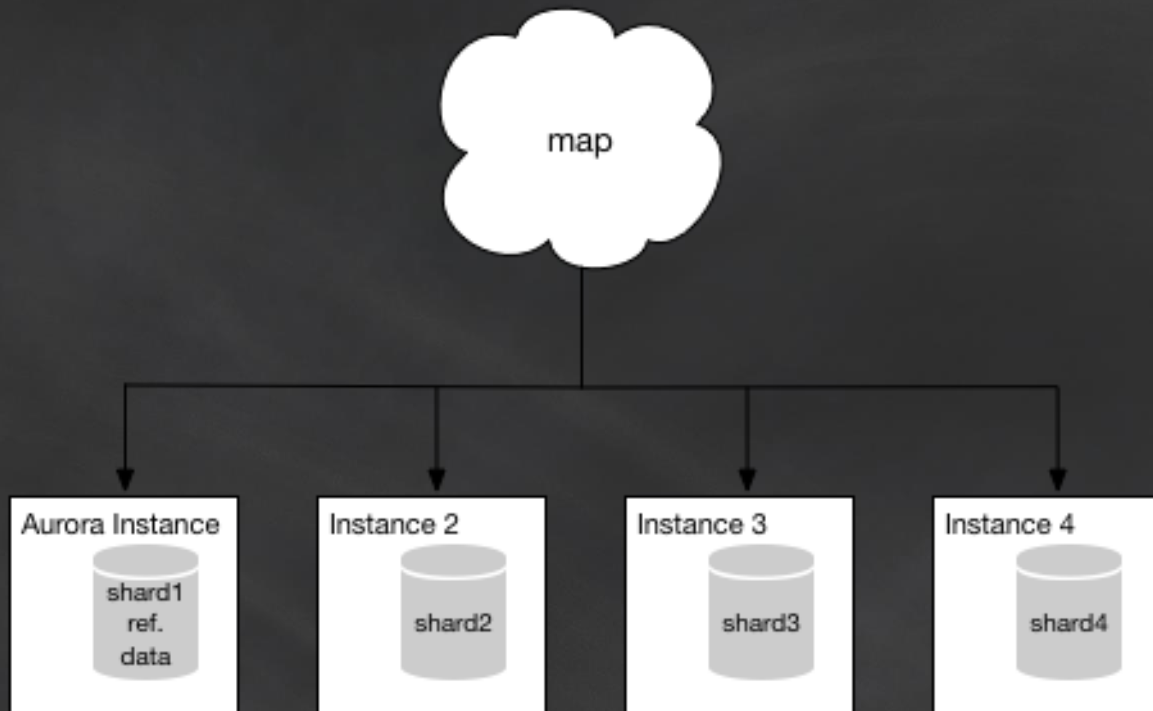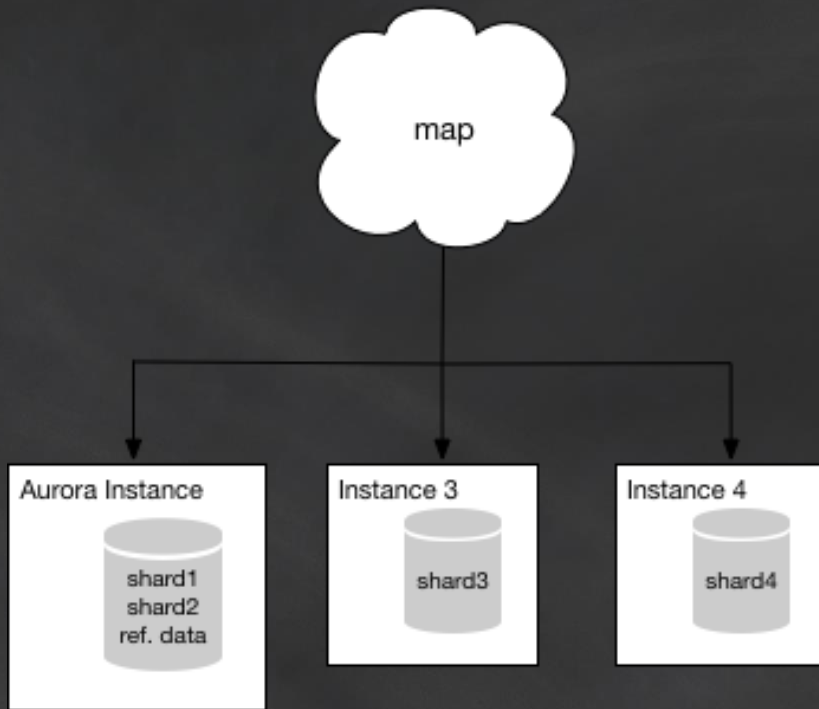- Scale up
- Scale out
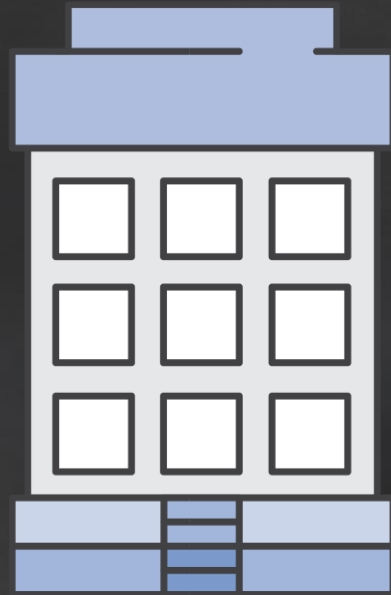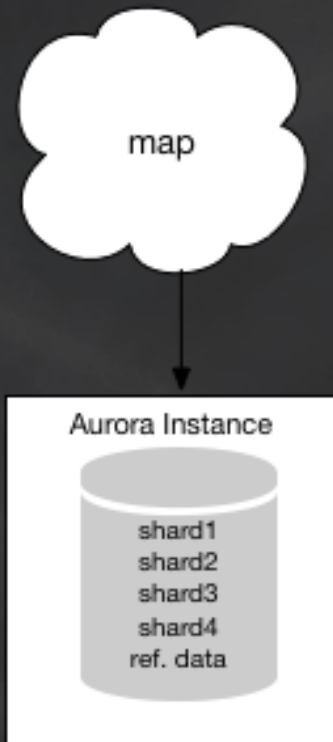
Sharding

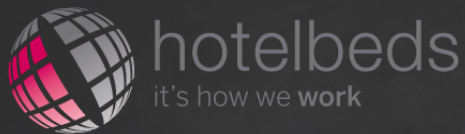# Establish a beach head

Validate

Partial Migration

The Result

map

Aurora Instance

shard1
shard2
shard3
shard4
ref. data

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What customers are saying about us?

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Our customers…

Who is saying *What* about DMS and SCT?

"The **SCT Assessment Report** was the key enabler to allow us to understand the scope of effort required to **complete an Oracle to PostgreSQL migration**. What was originally thought to be a largely manual task that no one was particularly excited about having to do became a **very straight-forward quick and easy process**."
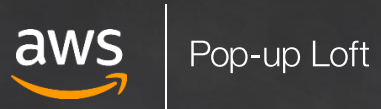
"We migrated hundreds of our clients from our in-house data-center to Amazon RDS Oracle 12c using the AWS Data Migration Service (DMS). Due to this service, we could live-replicate the databases between our data-center and RDS before the migration. That kept the migration **down-time to the very minimum**. We are very happy with DMS and are **planning to use it for Oracle to MySQL migration next**".

"We are in the process of migrating some databases to Amazon Aurora. **The ease by which we can do this using the AWS Database Migration Service has simplified this process for us and enabled us to accelerate our migration efforts**. The ability to closely monitor the process, the detailed logging feature, and the support we received from AWS have given us a great deal of confidence in a successful migration."
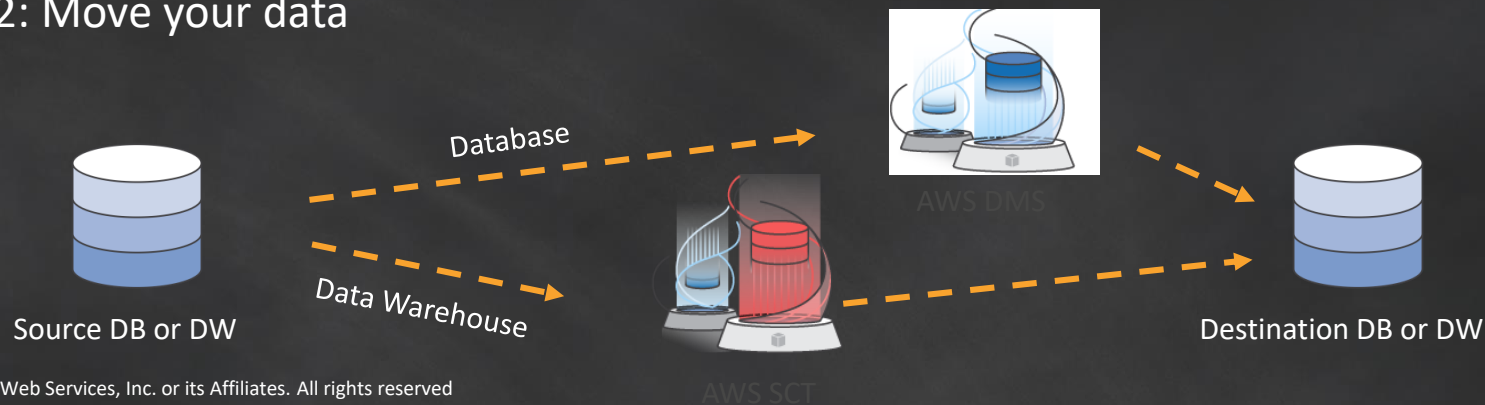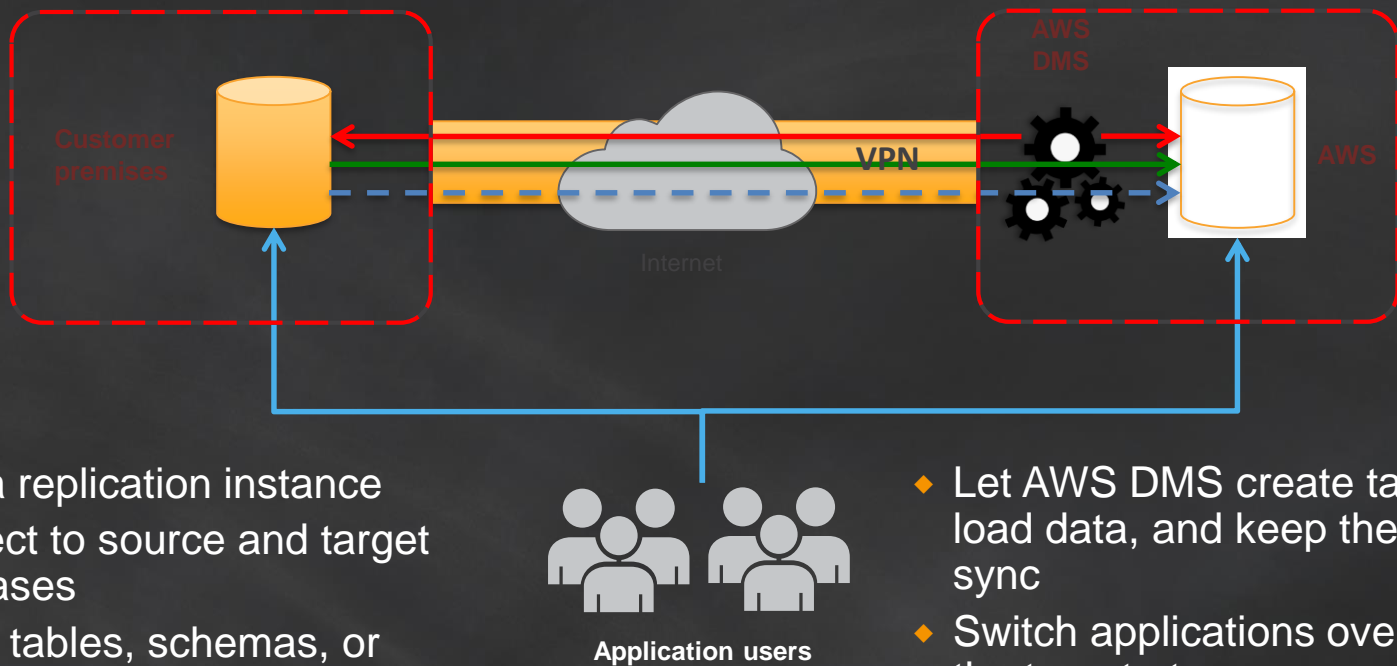
How does it work?

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Database migration process

Step 1: Convert or Copy your Schema

Copy or Convert

Copy

AWS SCT

Source DB or DW

Native Tool

Destination DB or DW

Step 2: Move your data

Database

Data Warehouse

AWS DMS

AWS SCT

Source DB or DW

Destination DB or DW

Keep your apps running during the migration

VPN

Internet

Application users

- Start a replication instance
- Connect to source and target databases
- Select tables, schemas, or databases

◆ Let AWS DMS create tables, load data, and keep them in sync
◆ Switch applications over to the target at your convenience

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Homogenous or heterogeneous

Oracle

Oracle

SQL Server

MySQL

Oracle

Aurora

The fine print

Sources for AWS Database Migration Service

Customers use the following databases as a source for data migration using AWS DMS:

On-premises and Amazon EC2 instance databases:

- Oracle Database 10g–12c
- Microsoft SQL Server 2005–2014
- MySQL 5.5–5.7
- MariaDB (MySQL-compatible data source)
- PostgreSQL 9.4–9.6
- SAP ASE 15.7+

RDS instance databases:

- Oracle Database 11g–12c
- Microsoft SQL Server 2008R2–2014. CDC operations are not supported yet.
- MySQL versions 5.5–5.7
- MariaDB (MySQL-compatible data source)
- PostgreSQL 9.4–9.6
- Amazon Aurora (MySQL-compatible data source)

Targets for AWS Database Migration Service

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- Amazon Aurora (MySQL-compatible data source)

Amazon Redshift

AWS Database Migration service pricing

US East (N. Virginia)

Instance Type	Price per hour (Single-AZ)	Price per hour (Multi-AZ)
t2.micro	$0.018	$0.036
t2.small	$0.036	$0.072
t2.medium	$0.073	$0.146
t2.large	$0.146	$0.292
c4.large	$0.154	$0.308
c4.xlarge	$0.308	$0.616
c4.2xlarge	$0.617	$1.234
c4.4xlarge	$1.235	$2.470

- T2 for developing and periodic data migration tasks
- C4 for large databases and minimizing time

- T2 pricing starts at $0.018 per hour for T2.micro
- C4 pricing starts at $0.154 per hour for C4.large

- 50 GB GP2 storage included with T2 instances
- 100 GB GP2 storage included with C4 instances
-
- Data transfer inbound and within AZ is free

- Data transfer across AZs starts at $0.01 per GB

Resources

New Content

- *Blogs*
- How to Migrate Your Oracle Database to PostgreSQL
- Migrating Oracle Database from On-Premises or Amazon EC2 Instances to Amazon Redshift
- Using the AWS Database Migration Service, Amazon S3, and AWS Lambda for Database Analytics
- How to Migrate Your Oracle Data Warehouse to Amazon Redshift Using AWS SCT and AWS DMS
- Reduce Resource Consumption by Consolidating Your Sharded System into Aurora
- Set Up AWS DMS for Cross-Account Migration

- *Webinars*
- "Consolidate MySQL Shards Into Amazon Aurora Using AWS Database Migration Service"
- "Migrate from SQL Server or Oracle into Amazon Aurora using AWS Database Migration Service"

- *Cookbook (Q4): step-by-step guide how to migrate Oracle to Aurora PostgreSQL*

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Resources available to customers—DMS

- **Getting Started Guide:** Review technical documentation.
- **Features and benefits:** Highlights DMS features.
- **Pricing:** Prices for replication instances, storage, and data transfer.
- **Support:** Post your questions to our Support forum.
- **Java SDK:** Java-based API for creating and managing data migration tasks.
- **AWS Command Line Interface:** Start and stop replication tasks with simple commands.
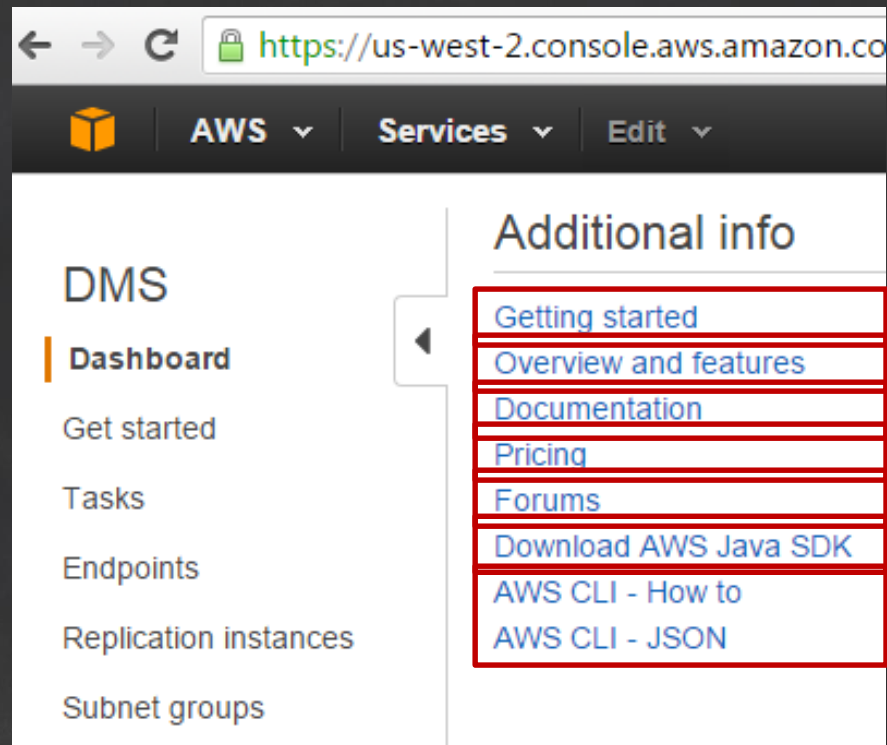
Resources available to customers—AWS Schema Conversion Tool

- **User Guide:** Review technical docs at
- aws.amazon.com/documentation/SchemaConversionTool/
- or choose the **Download** button.

- **Download area:** Get installation files for the Schema Conversion Tool.

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- **Support forums:** Ask questions and review how-to guides.
- https://forums.aws.amazon.com/forum.jspa?forumID=208.
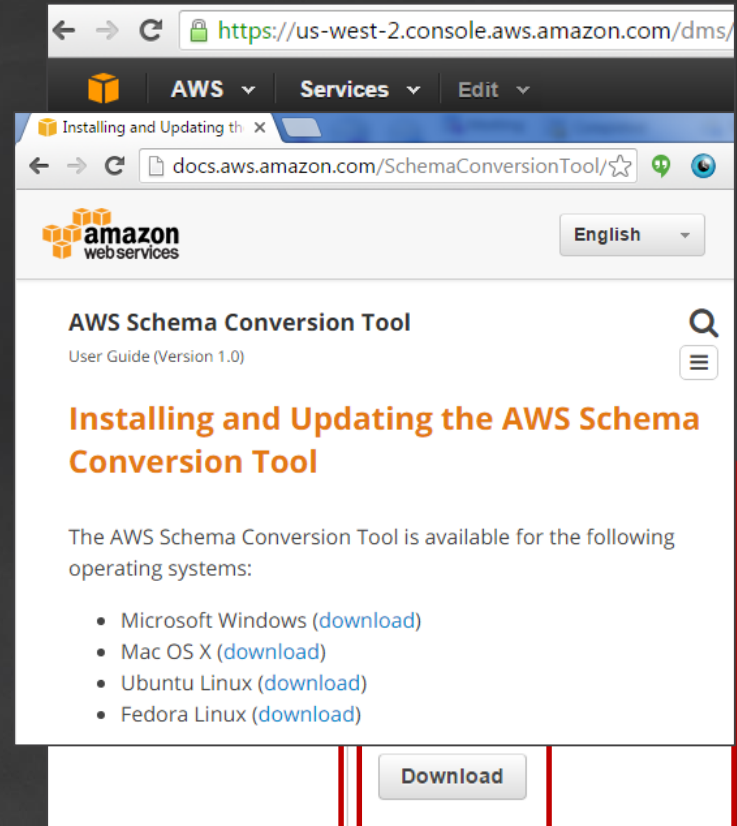
Partners

AWS database migration partners

Demo

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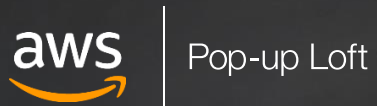
Learn more..

aws.amazon.com/dms

Thank you!