Database Migration: Simple, Cross-Engine and Cross-Platform Migrations with Minimal Downtime

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Solutions Architect

Pop-up Loft

Agenda

- How does the cloud help?
- How do I get there?
- How does it work?
- What have others done?
- Are there any tricks? Where is the magic?
- Show me!

Amazon RDS

Relational databases

Fully managed

Simple and fast to scale

Fast, predictable performance

Low cost, pay for what you use

MySQL

Microsoft SQL Server

ORACLE

PostgreSQL

MariaDB

Amazon Aurora

How does the cloud help?

- Provision a database in 6 minutes
- Provision an MAZ database with a few mouse clicks
- Scale a database up/down with 60–90 seconds of downtime
- Apply patches with 60–90 seconds of downtime
- Add Read Replicas with a few mouse clicks
- Protect your backups and logs with 11 9s of durability
- Recover to any point in time from nightly backups + logs
- Detailed metrics, down to 1-second intervals
- Secure your data with single-click encryption at rest

Amazon RDS

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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?

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

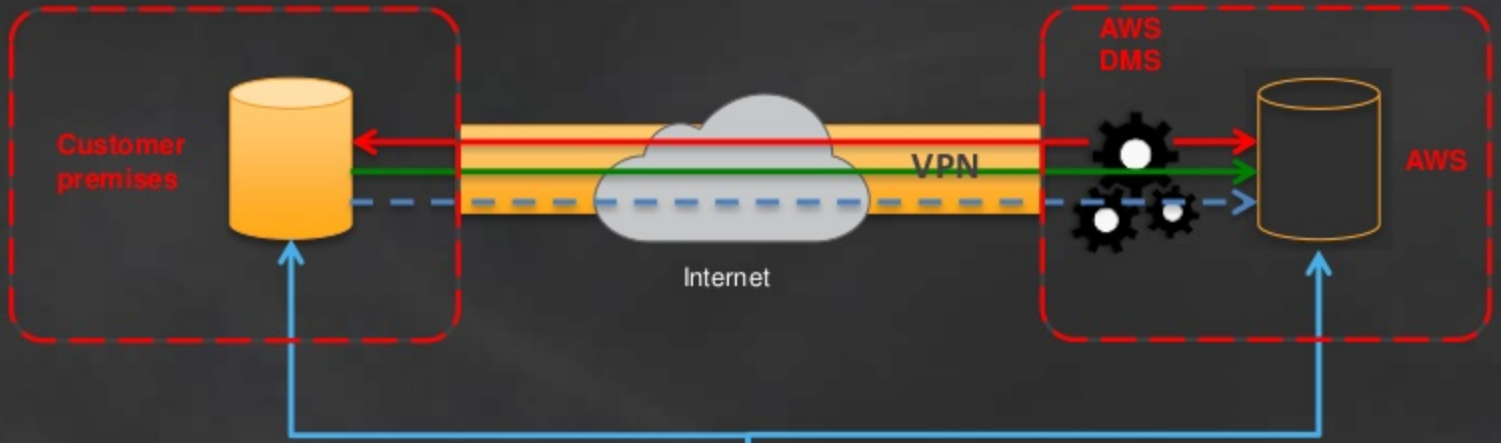
AWS Database Migration Service (AWS DMS)

PostgreSQL ORACLE Amazon Aurora MariaDB

AMAZON REDSHIFT MySQL Microsoft SQL Server SAP ASE

- Start your first migration in 10 minutes or less
- Keep your apps running during the migration
- Replicate within, to, or from Amazon EC2 or RDS
- Move data to the same or a different database engine

Keep your apps running during the migration



- 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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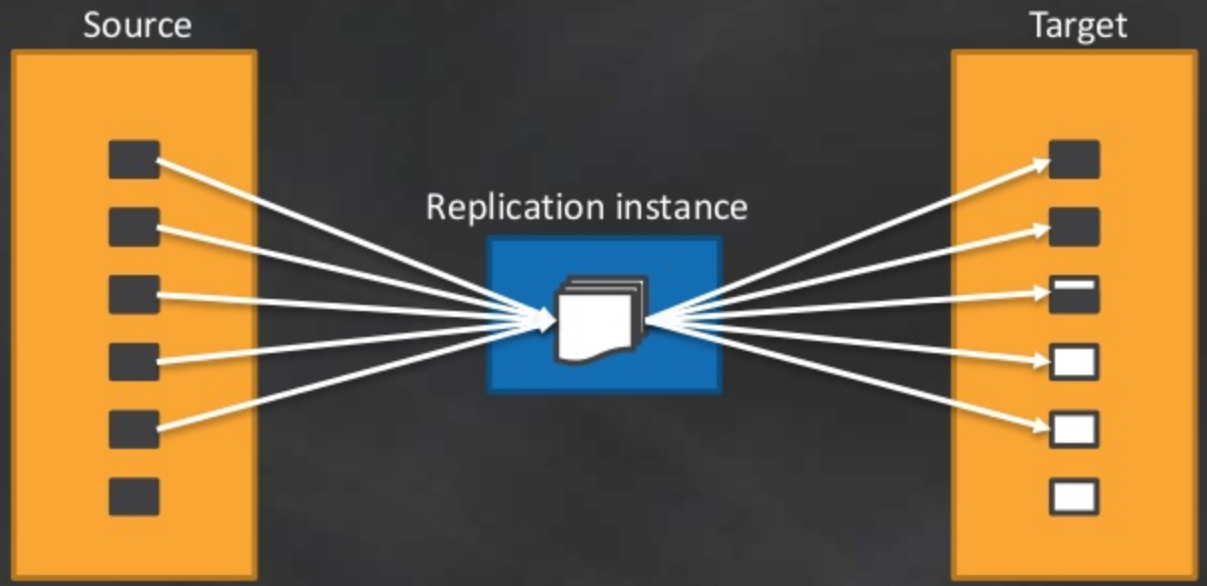
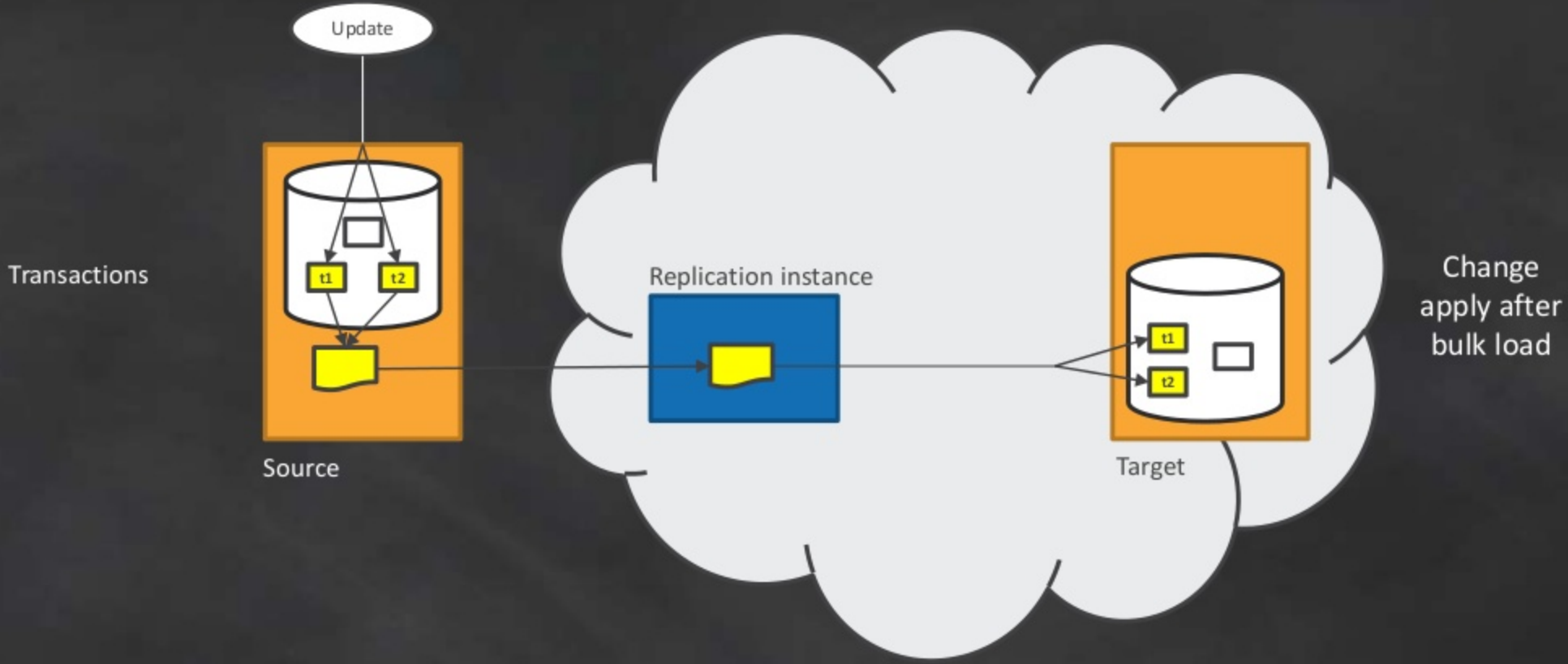
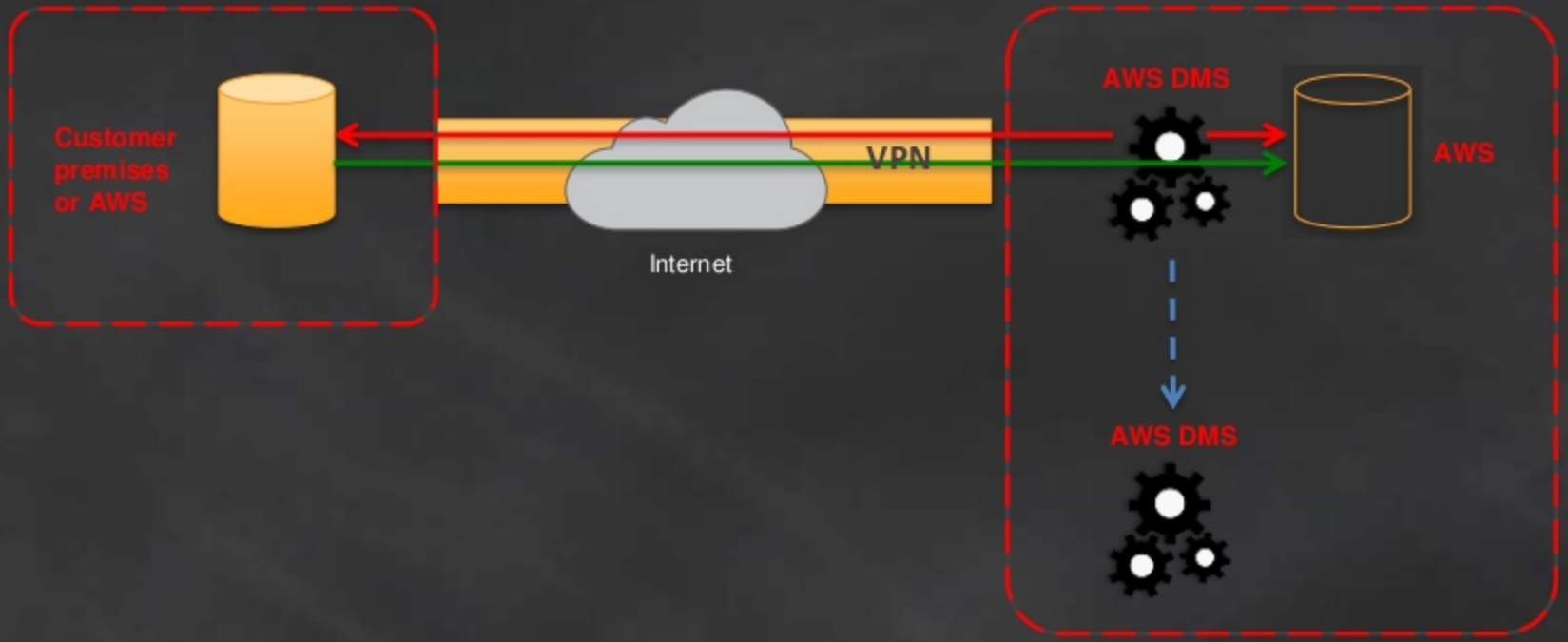
Load is table by table



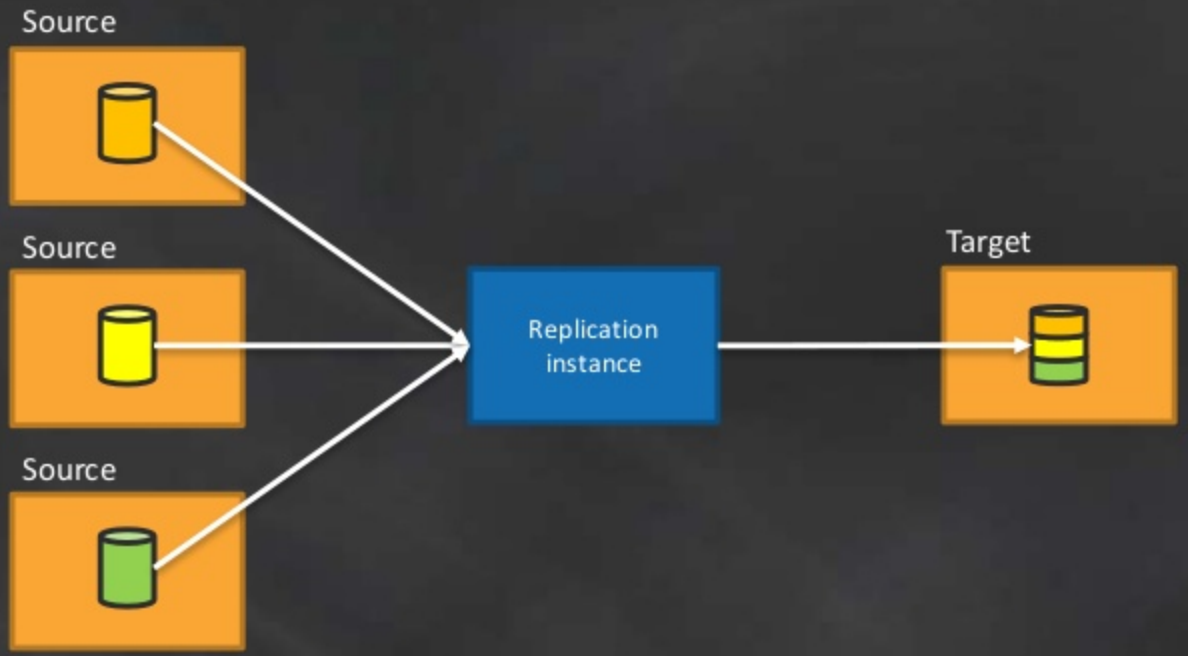
Change data capture (CDC) and apply



Multi-AZ option for high availability



What else can I do?



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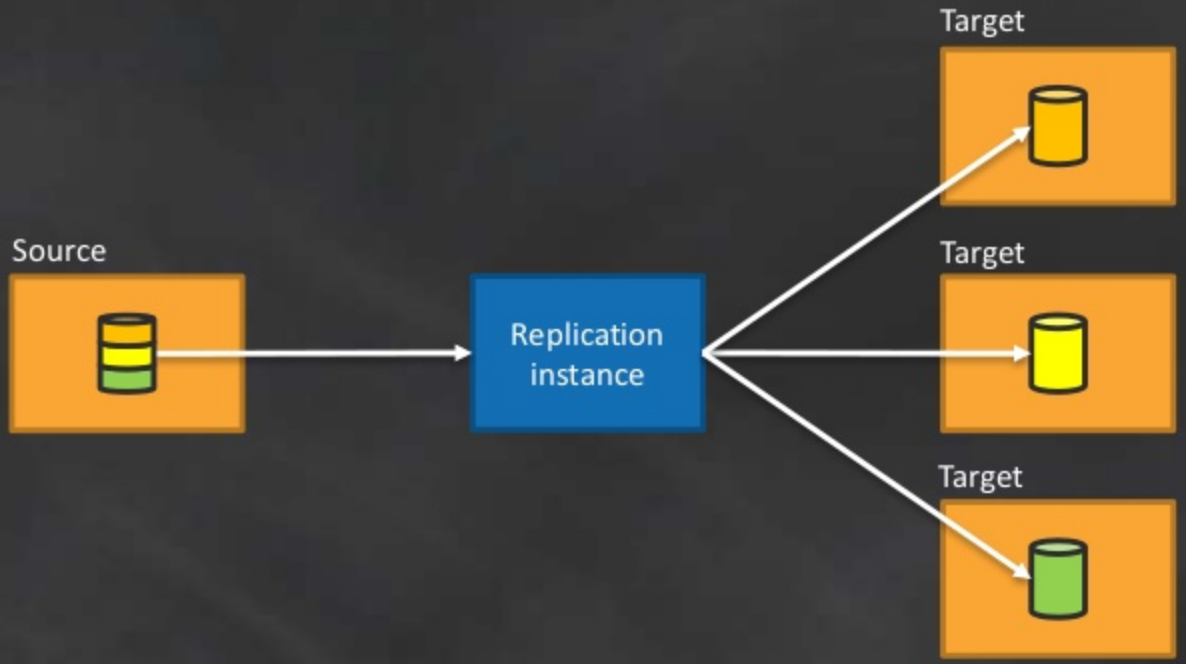
Consolidation demo

What else can I do?



AWS Schema Conversion Tool

The AWS Schema Conversion Tool helps automate many database schema and code conversion tasks when migrating between database engines or data warehouse engines

Features

- Oracle and Microsoft SQL Server schema conversion to MySQL, Amazon Aurora, MariaDB, and PostgreSQL
- Or convert your schema between PostgreSQL and any MySQL engine
- Database Migration Assessment report for choosing the best target engine
- Code browser that highlights places where manual edits are required
- Secure connections to your databases with SSL
- Cloud native code optimization

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AWS Schema Conversion Tool

- Converts relational databases

- Converts warehouses

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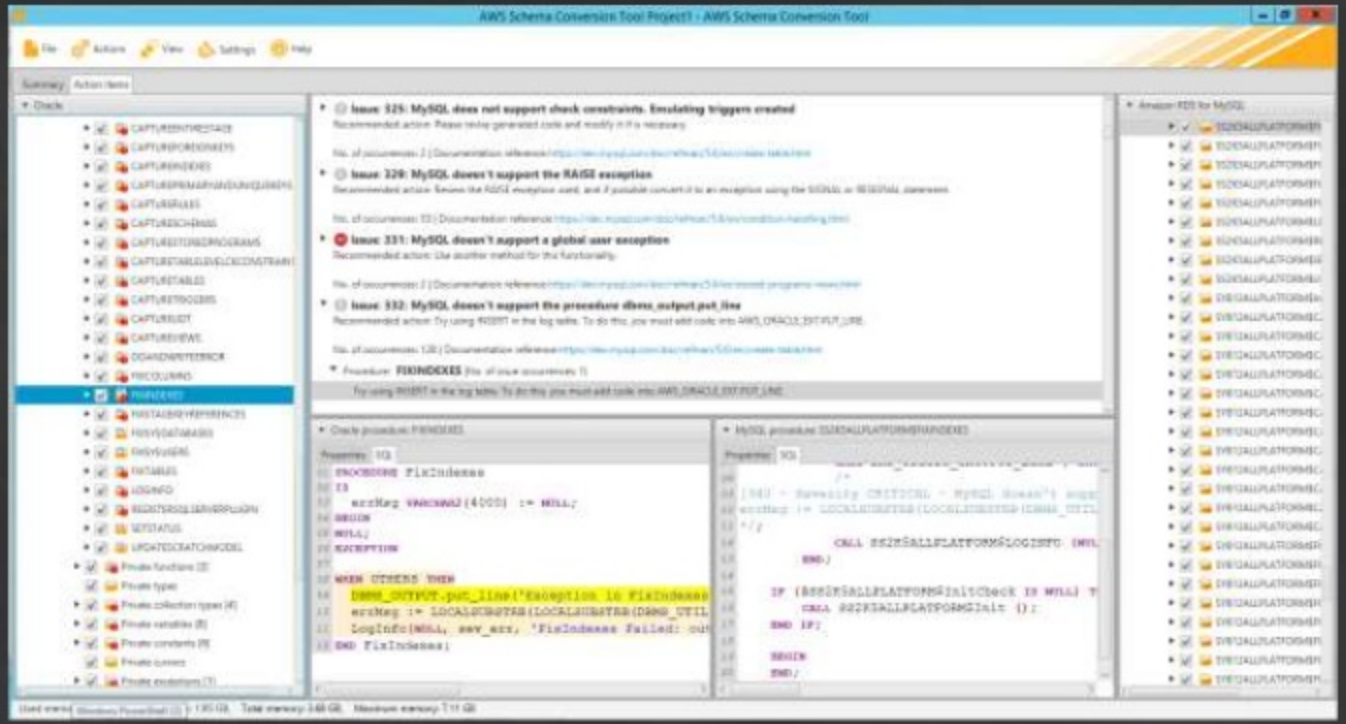
SCT helps with converting tables, views, and code



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

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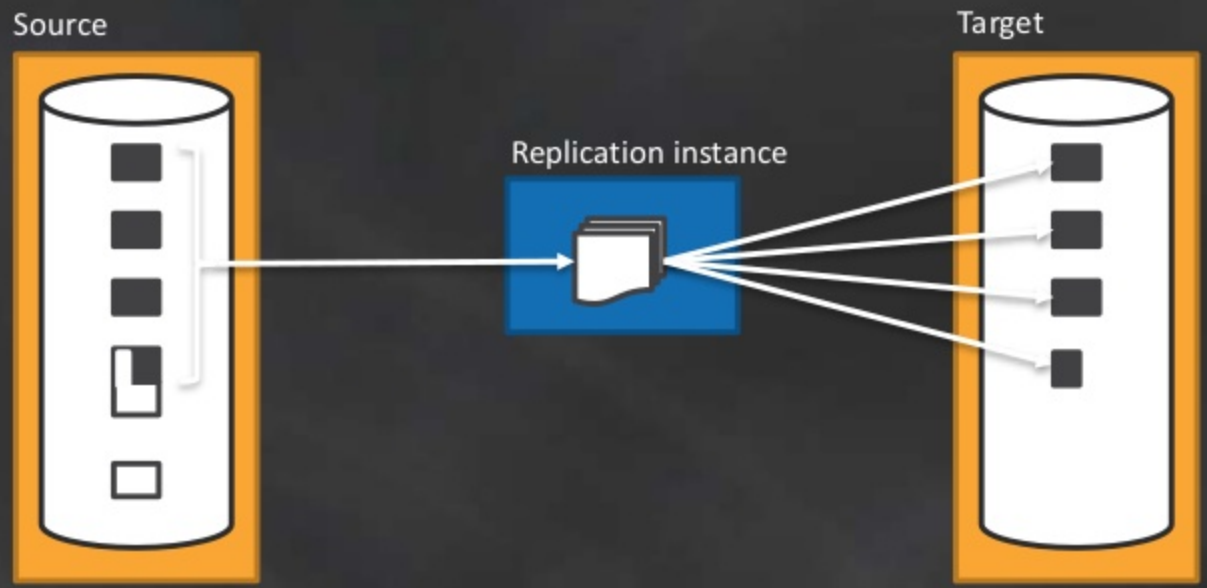
Split out demo with AWS Schema Conversion Tool

Take it all—or not



Homogenous or heterogeneous

Other database migration use cases

Migration of business-critical applications

Migration from Classic to VPC

Cheap Read Replicas for Oracle

Read Replicas for other engines

Cross-region Read Replicas for Oracle and SQL Server

Analytics in the cloud

Dev/test and production environment sync

Ongoing replication for BI

Sources for AWS Database Migration Service

Customers can 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 9.4–9.5
- 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 9.4–9.5. CDC operations are not supported yet.
- Amazon Aurora (MySQL-compatible data source)

Targets for AWS Database Migration Service

Customers can use the following databases as a target for data replication using AWS DMS:

On-premises and EC2 instance databases:

- Oracle Database 10g–12c
- Microsoft SQL Server 2005–2016
- MySQL 5.5–5.7
- MariaDB (MySQL-compatible data source)
- PostgreSQL 9.3–9.5
- SAP ASE 15.7+

RDS instance databases:

- Oracle Database 11g–12c
- Microsoft SQL Server 2008 R2 - 2014
- MySQL 5.5–5.7
- MariaDB (MySQL-compatible data source)
- PostgreSQL 9.3–9.5
- Amazon Aurora (MySQL-compatible data source)

Amazon Redshift

AWS Database Migration service pricing

Northern California

Instance Type	Price per hour (Single-AZ)	Price per hour (Multi-AZ)
t2.micro	$0.024	$0.048
t2.small	$0.048	$0.096
t2.medium	$0.095	$0.190
t2.large	$0.190	$0.380
c4.large	$0.193	$0.386
c4.xlarge	$0.386	$0.772
c4.2xlarge	$0.773	$1.546
c4.4xlarge	$1.546	$3.092

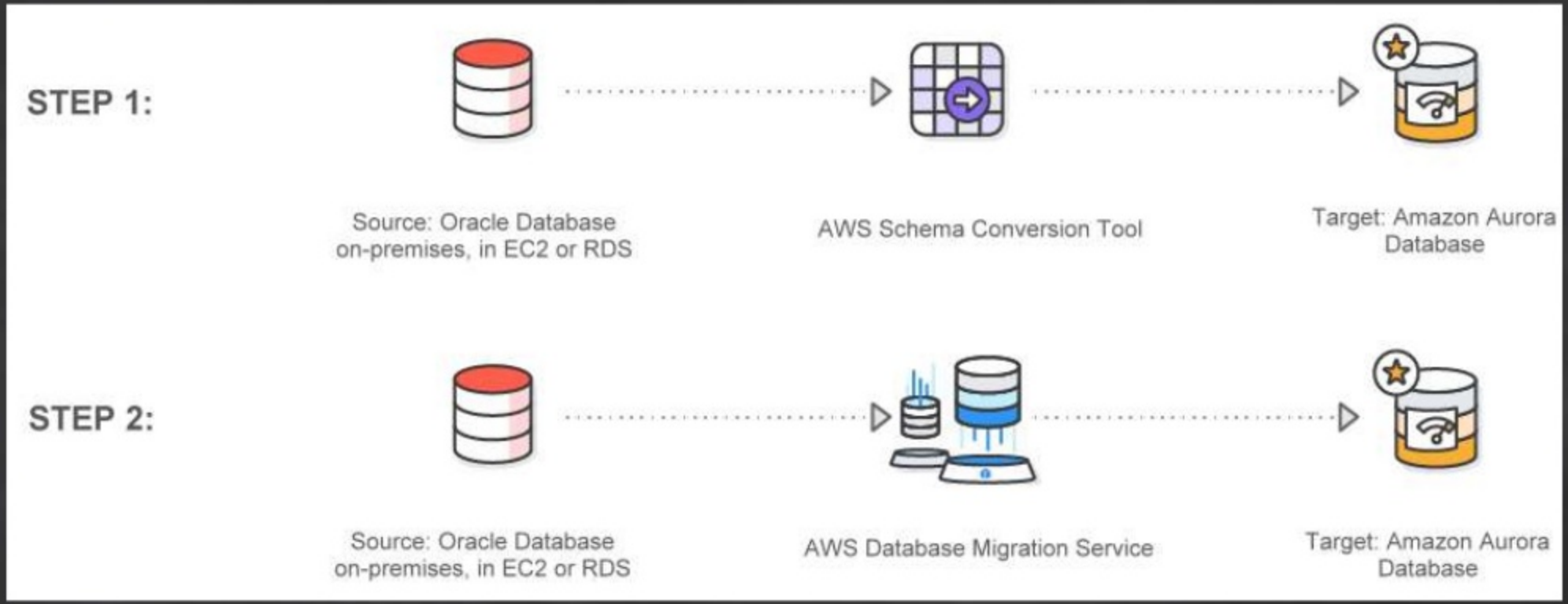
- T2 for developing and periodic data migration tasks
- C4 for large databases and minimizing time

- 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

Database migration process



Expedia: Online travel marketplace

World's leading online travel company, with a portfolio that includes 150+ travel sites in 70 countries.

- Migrating some databases to Amazon Aurora
- Kuldeep Chowhan, Principal Engineer, Expedia, Inc.:

"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."

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Thomas Publishing: Digital-friendly business

Connecting buyers and suppliers across all industrial sectors, evolving from an industrial trade print publisher into industry's most respected group of digital-friendly businesses.

- Needed to grow database footprint but using Oracle would require significant up front investment in both infrastructure and license expense
- Wanted to migrate to Amazon Aurora
- AWS DMS automated most of the work and dramatically reduced the manual effort involved in the code migration
- Hans Wald, Chief Technology Officer, Thomas Publishing:
  - "The AWS Database Migration Service will be a key enabler for our plans to migrate more databases to Amazon Aurora in 2016."

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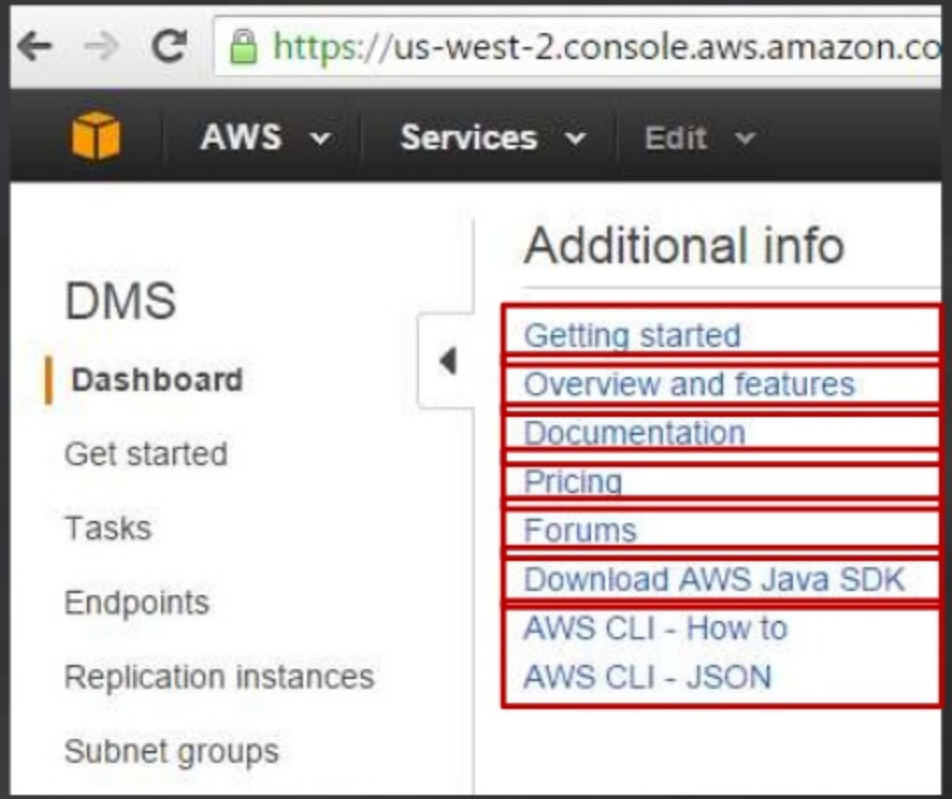
Resources available to customers—DMS

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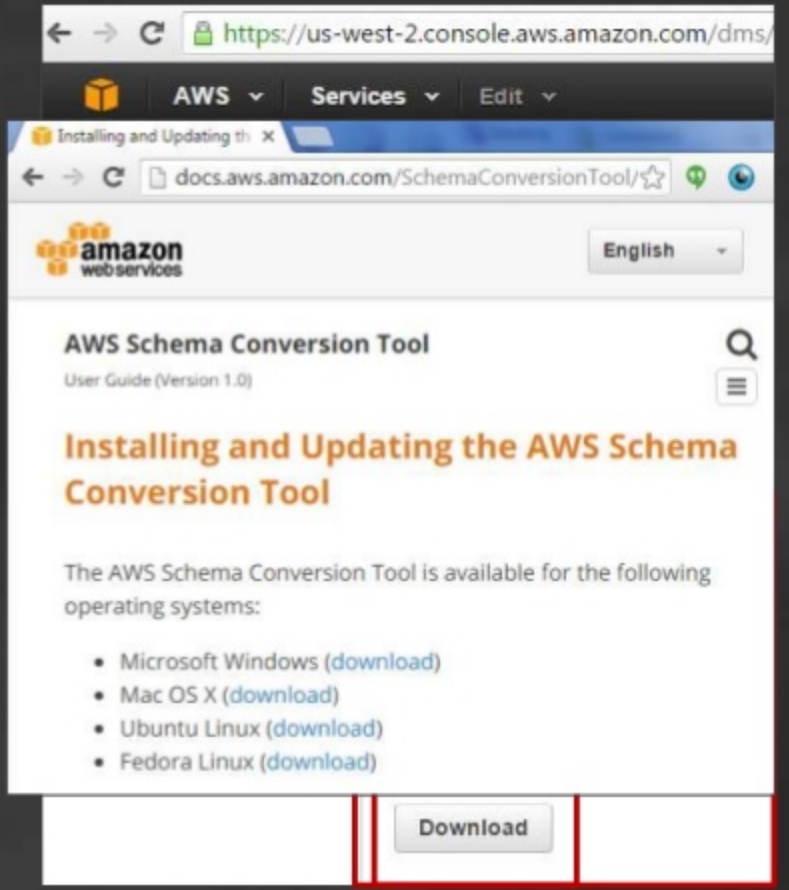
- **Support forums:** Ask questions and review how-to guides.
- https://forums.aws.amazon.com/forum.jspa?forumID=208.



AWS database migration partners

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Everything and Anything Startups Need to Get Started on AWS

aws.amazon.com/activate