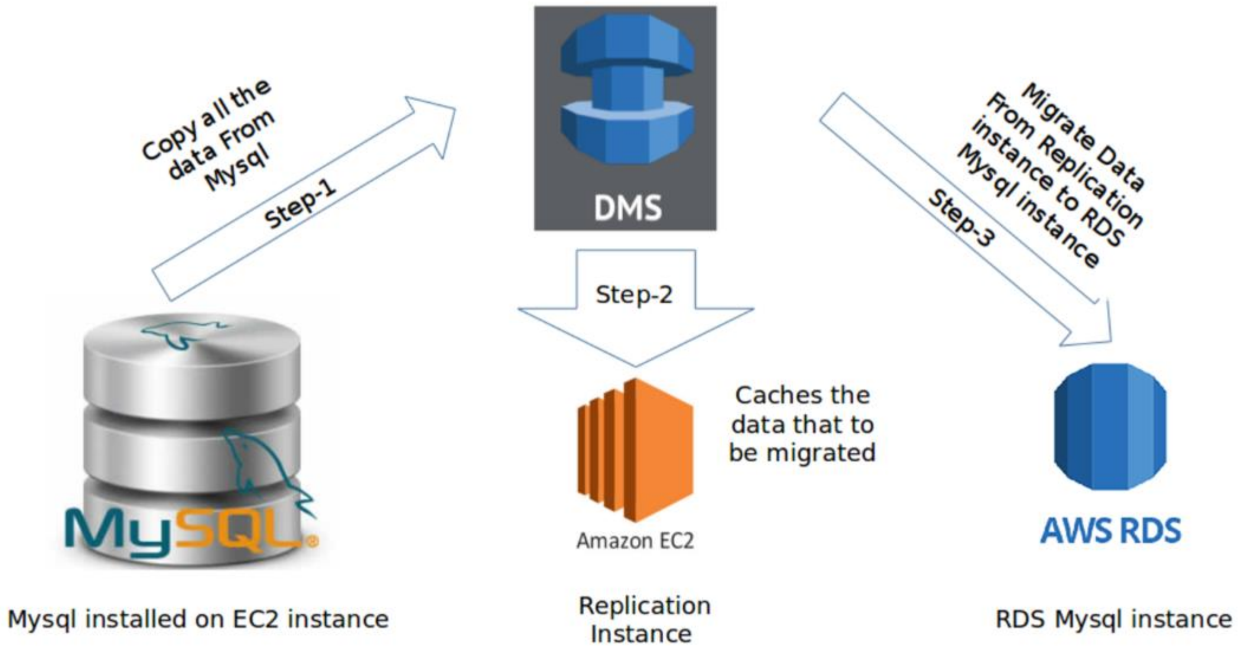
Migrate on-premises MySQL environment to Amazon RDS using Amazon DMS

This project will be executed in 4 different modules:

1. Create a MySQL database instance in Amazon RDS
2. Create a replication instance in AWS DMS
3. Create target and source endpoints in AWS DMS
4. Create a replication task in AWS DMS
5. Complete the migration and clean up the resources

Architectural Diagram


DMS
Copy all the data From Mysql
Step-1
Step-2
Migrate Data From Replication instance to RDS Mysql instance
Step-3
MySQL
Amazon EC2
Caches the data that to be migrated
AWS RDS
Mysql installed on EC2 instance
Replication Instance
RDS Mysql instance

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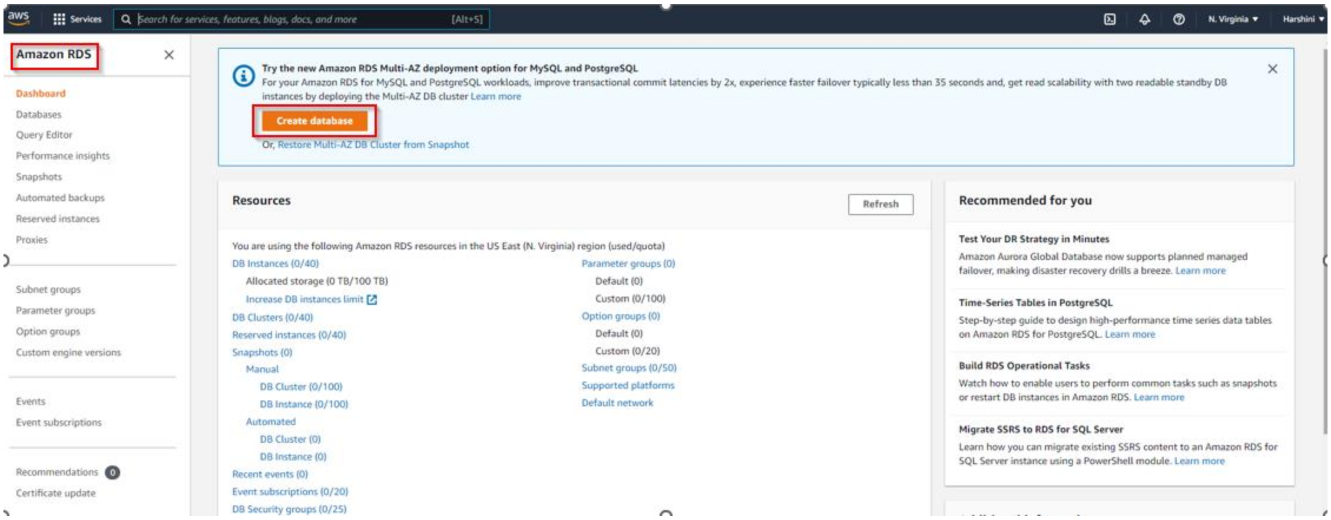
Module 1: Create a MySQL database instance in Amazon RDS

This RDs instance will be used as a primary database after copying existing data into it using AWS DMS.

Step 1: Create an Amazon RDS database instance.

1. Navigate to the **Amazon RDS** console. On the main page, choose **Create database** to create a new database.



Try the new Amazon RDS Multi-AZ deployment option for MySQL and PostgreSQL
For your Amazon RDS for MySQL and PostgreSQL workloads, improve transactional commit latencies by 2x, experience faster failover typically less than 35 seconds and, get read scalability with two readable standby DB instances by deploying the Multi-AZ DB cluster Learn more

Or, Restore Multi-AZ DB Cluster from Snapshot

Resources

You are using the following Amazon RDS resources in the US East (N. Virginia) region (used/quota)

DB Instances (0/40)
  Allocated storage (0 TB/100 TB)
  Increase DB instances limit
DB Clusters (0/40)
Reserved instances (0/40)
Snapshots (0)
  Manual
    DB Cluster (0/100)
    DB Instance (0/100)
  Automated
    DB Cluster (0)
    DB Instance (0)
Recent events (0)
Event subscriptions (0/20)
DB Security groups (0/25)

Parameter groups (0)
  Default (0)
  Custom (0/100)
Option groups (0)
  Default (0)
  Custom (0/20)
Subnet groups (0/50)
Supported platforms
Default network

Recommended for you

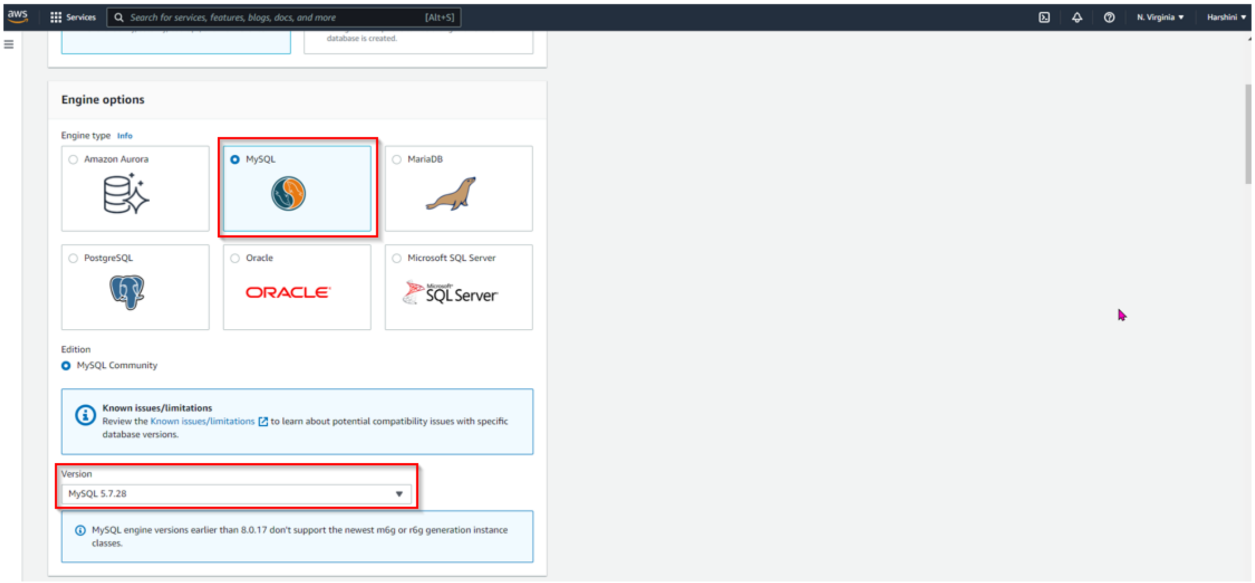
Test Your DR Strategy in Minutes
Amazon Aurora Global Database now supports planned managed failover, making disaster recovery drills a breeze. Learn more

Time-Series Tables in PostgreSQL
Step-by-step guide to design high-performance time series data tables on Amazon RDS for PostgreSQL. Learn more

Build RDS Operational Tasks
Watch how to enable users to perform common tasks such as snapshots or restart DB instances in Amazon RDS. Learn more

Migrate SSRS to RDS for SQL Server
Learn how you can migrate existing SSRS content to an Amazon RDS for SQL Server instance using a PowerShell module. Learn more

2. In the **Engine options** section, chose **MySQL** as the **Engine type**. Then, chose the version **MySQL 5.7.28** to use.



Engine options

Engine type Info

○ Amazon Aurora
● MySQL
○ MariaDB
○ PostgreSQL
○ Oracle
○ Microsoft SQL Server

Edition
● MySQL Community

Known issues/limitations
Review the Known issues/limitations to learn about potential compatibility issues with specific database versions.

Version
MySQL 5.7.28 ▾

MySQL engine versions earlier than 8.0.17 don't support the newest m6g or r6g generation instance classes.

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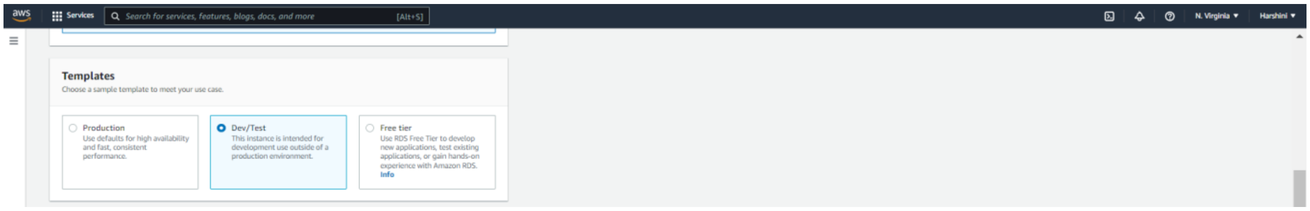
3. Choose Dev/Test template.


aws
Services
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Templates

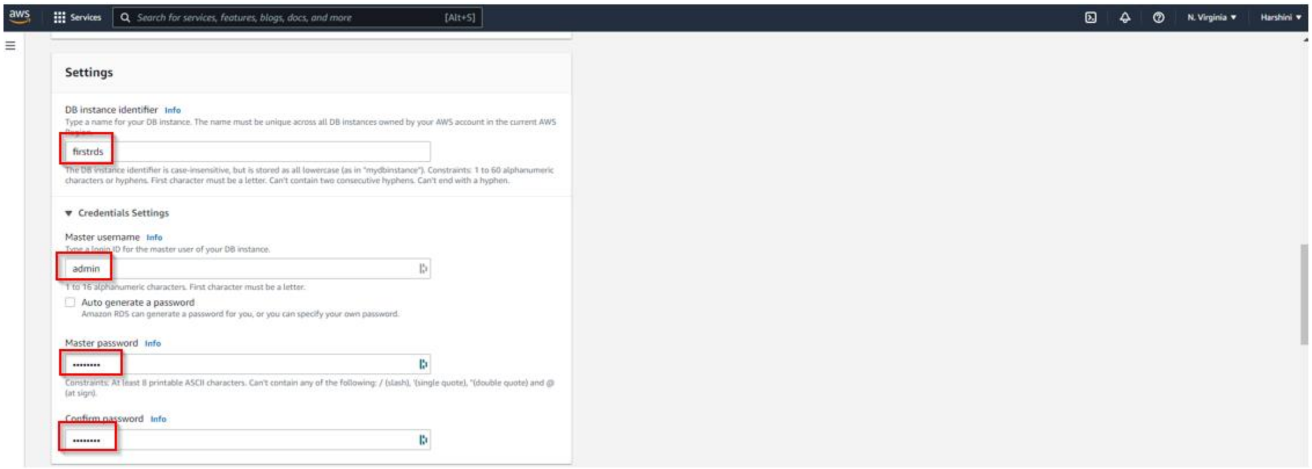
Choose a sample template to meet your use case.

○ Production
Use defaults for high availability and fast, consistent performance.

● Dev/Test
This instance is intended for development use outside of a production environment.

○ Free tier
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS. Info

4. In the **Settings** section, database name “**firstrds**” is given and master username “**admin**” and password is set. Saved the master password to connect to the database which can also help to create additional users.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Settings

DB instance identifier Info
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.

firstrds

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

Master username Info
Type a login ID for the master user of your DB instance.

admin

1 to 16 alphanumeric characters. First character must be a letter.

□ Auto generate a password
Amazon RDS can generate a password for you, or you can specify your own password.

Master password Info

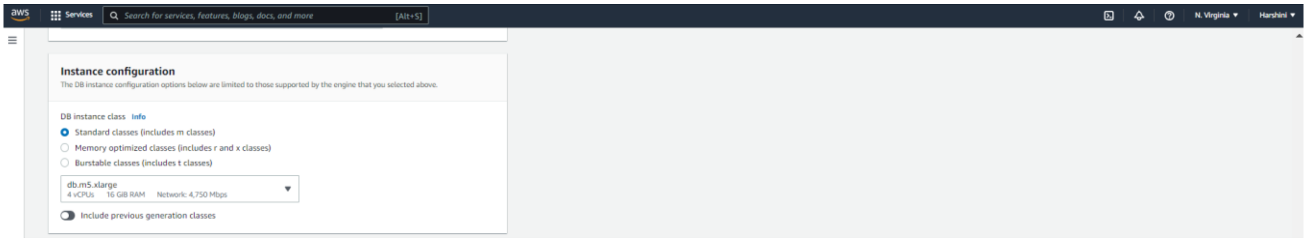
•••••••••

Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), '(single quote), "(double quote) and @ (at sign).

Confirm password Info

•••••••••

5. Next, database instance size is chosen based on the estimated capacity. Please note that it requires some downtime to change database size.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Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class Info

● Standard classes (includes m classes)
○ Memory optimized classes (includes r and x classes)
○ Burstable classes (includes t classes)

db.m5.xlarge
4 vCPUs 16 GiB RAM Network: 4,750 Mbps

Include previous generation classes

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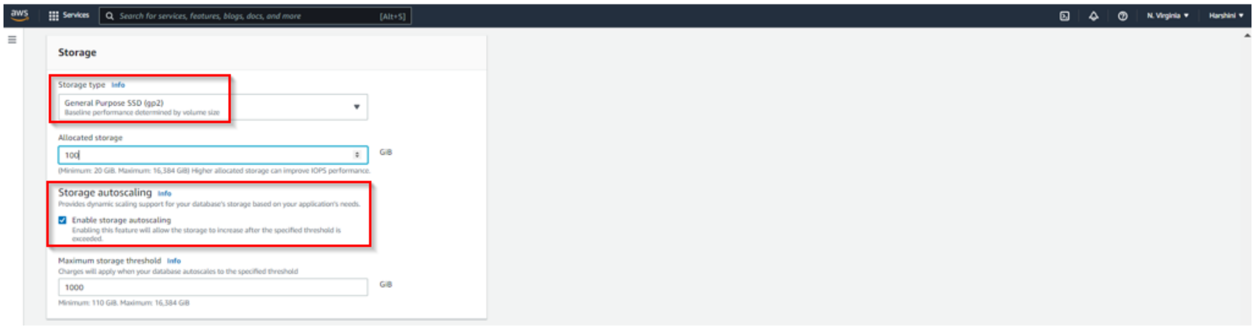
6. Next, configure the storage options for Amazon RDS database.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Storage

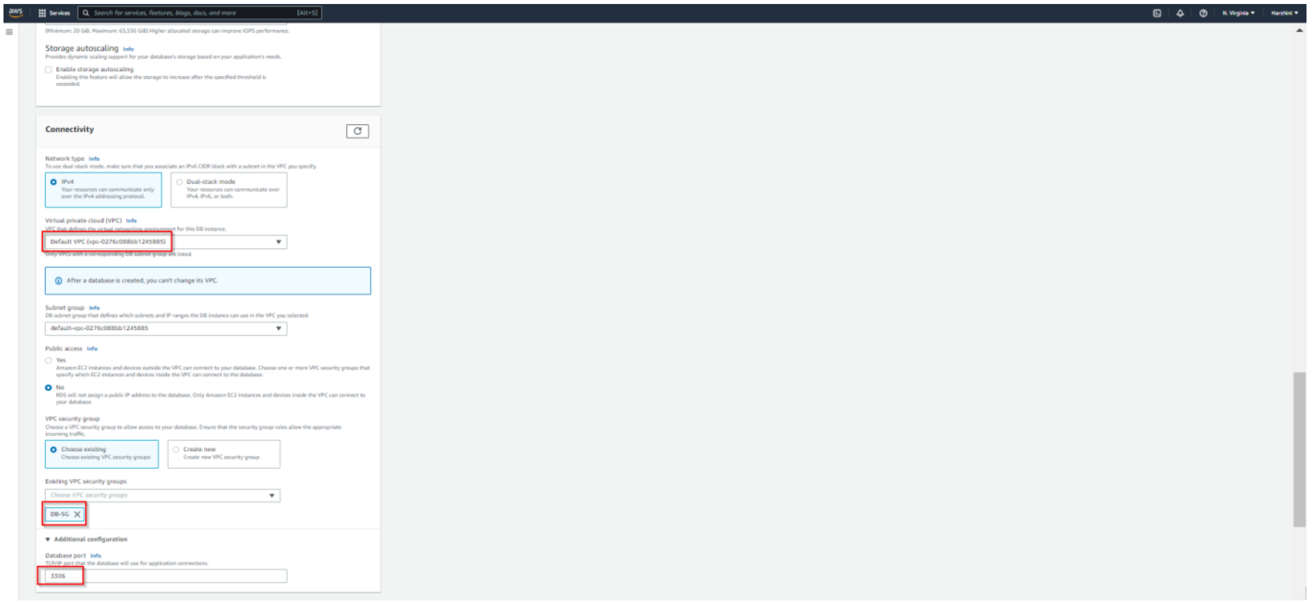
Storage type Info
General Purpose SSD (gp2)
Baseline performance determined by volume size

Allocated storage
100 GiB
(Minimum: 20 GiB. Maximum: 16,384 GiB) Higher allocated storage can improve IOPS performance.

Storage autoscaling Info
Provides dynamic scaling support for your database's storage based on your application's needs.
☑ Enable storage autoscaling
Enabling this feature will allow the storage to increase after the specified threshold is exceeded.

Maximum storage threshold Info
Charges will apply when your database autoscales to the specified threshold
1000 GiB
Minimum: 110 GiB. Maximum: 16,384 GiB

7. Configure **Connectivity** - Specify **Amazon Virtual Private Cloud** (Amazon VPC) in which database resides, as well as the network subnet and security groups for database instance.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(Minimum: 20 GiB. Maximum: 65,536 GiB) Higher allocated storage can improve IOPS performance.

Storage autoscaling Info
Provides dynamic scaling support for your database's storage based on your application's needs.
□ Enable storage autoscaling
Enabling this feature will allow the storage to increase after the specified threshold is exceeded.

Connectivity

Network type Info
To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.
● IPv4
Your resources can communicate only over the IPv4 addressing protocol.
○ Dual-stack mode
Your resources can communicate over IPv4, IPv6, or both.

Virtual private cloud (VPC) Info
VPC that defines the virtual networking environment for this DB instance.
Default VPC (vpc-0276c088bb1245885)
Only VPCs with a corresponding DB subnet group are listed.

After a database is created, you can't change its VPC.

Subnet group Info
DB subnet group that defines which subnets and IP ranges the DB instance can use in the VPC you selected.
default-vpc-0276c088bb1245885

Public access Info
○ Yes
Amazon EC2 instances and devices outside the VPC can connect to your database. Choose one or more VPC security groups that specify which EC2 instances and devices inside the VPC can connect to the database.
● No
RDS will not assign a public IP address to the database. Only Amazon EC2 instances and devices inside the VPC can connect to your database.

VPC security group
Choose a VPC security group to allow access to your database. Ensure that the security group rules allow the appropriate incoming traffic.
● Choose existing
Choose existing VPC security groups
○ Create new
Create new VPC security group

Existing VPC security groups
Choose VPC security groups
DB-SG

▾ Additional configuration

Database port Info
TCP/IP port that the database will use for application connections.
3306

8. Finally, choose the database authentication methods to allow in database as MySQL databases traditionally allow for username and password authentication. With MySQL on Amazon RDS, another option is to allow for authentication by using AWS Identity and Access Management (**IAM**). This integrates easily with your application compute and removes the need for credential rotation.

   It is recommended to allow both password and IAM database authentication. It will result in some downtime for Amazon RDS database instance to add IAM database authentication later.

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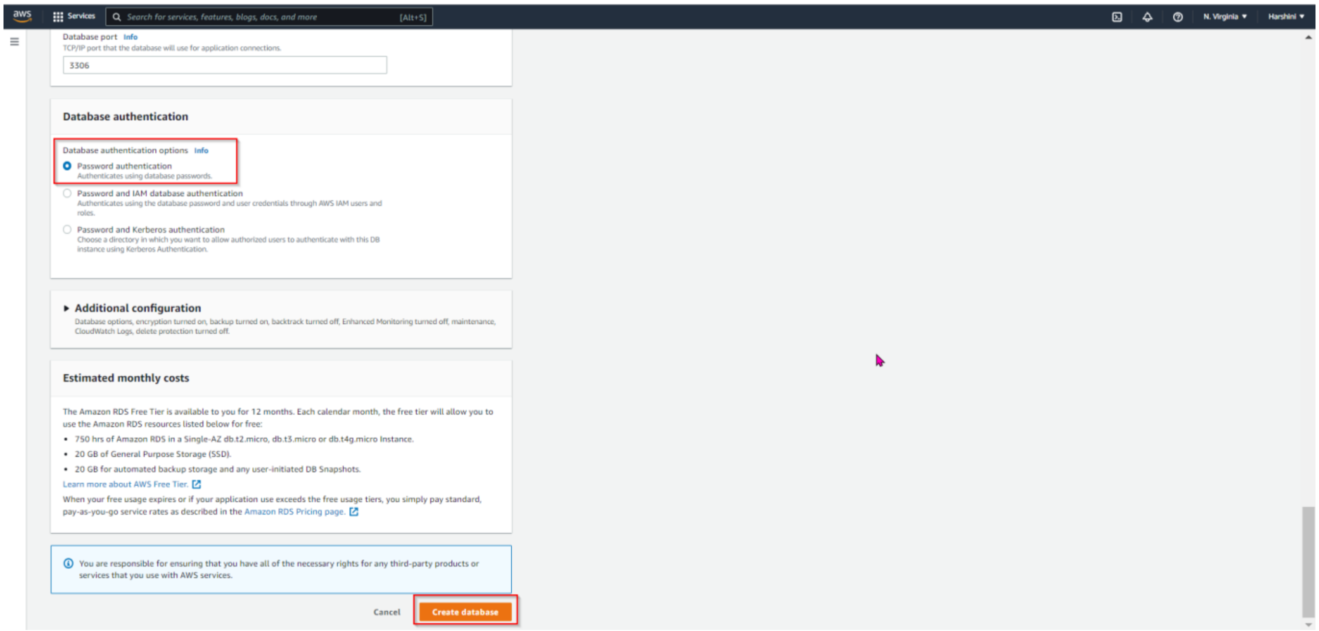
9. Finally, choose **Create database** to create your database instance.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Info
Cancel
Create database

Database port
TCP/IP port that the database will use for application connections.
3306

Database authentication

Database authentication options
● Password authentication
Authenticates using database passwords.
○ Password and IAM database authentication
Authenticates using the database password and user credentials through AWS IAM users and roles.
○ Password and Kerberos authentication
Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

Additional configuration
Database options, encryption turned on, backup turned on, backtrack turned off, Enhanced Monitoring turned off, maintenance, CloudWatch Logs, delete protection turned off.

Estimated monthly costs

The Amazon RDS Free Tier is available to you for 12 months. Each calendar month, the free tier will allow you to use the Amazon RDS resources listed below for free:

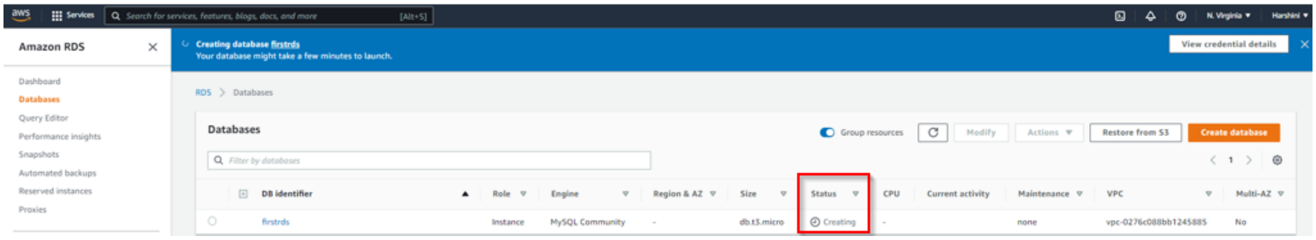
- 750 hrs of Amazon RDS in a Single-AZ db.t2.micro, db.t3.micro or db.t4g.micro Instance.
- 20 GB of General Purpose Storage (SSD).
- 20 GB for automated backup storage and any user-initiated DB Snapshots.

Learn more about AWS Free Tier.

When your free usage expires or if your application use exceeds the free usage tiers, you simply pay standard, pay-as-you-go service rates as described in the Amazon RDS Pricing page.

You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

10. As Amazon RDS is provisioning infrastructure and initializing database, the **Status** of database is **Creating**.

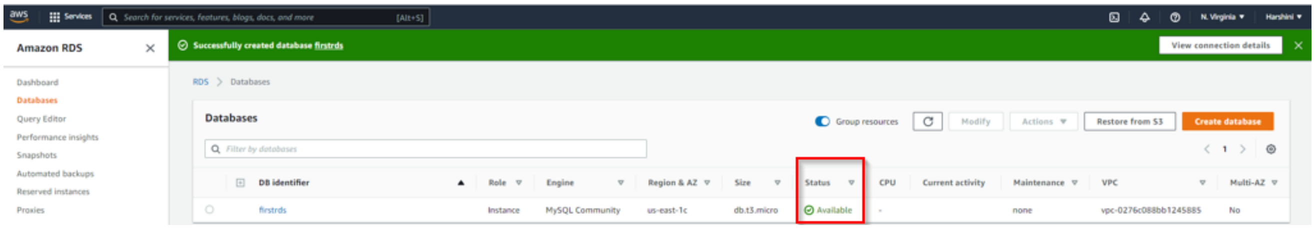


Creating database firstrds
Your database might take a few minutes to launch.

Databases

DB identifier	Role	Engine	Region & AZ	Size	Status	CPU	Current activity	Maintenance	VPC	Multi-AZ
firstrds	Instance	MySQL Community	-	db.t3.micro	Creating	-		none	vpc-0276c088bb1245885	No

11. When database is ready to use, its **Status** shows **Available** like below.



Successfully created database firstrds

Databases

DB identifier	Role	Engine	Region & AZ	Size	Status	CPU	Current activity	Maintenance	VPC	Multi-AZ
firstrds	Instance	MySQL Community	us-east-1c	db.t3.micro	Available	-		none	vpc-0276c088bb1245885	No

In this module, successfully created a fully managed MySQL database instance in Amazon RDS.

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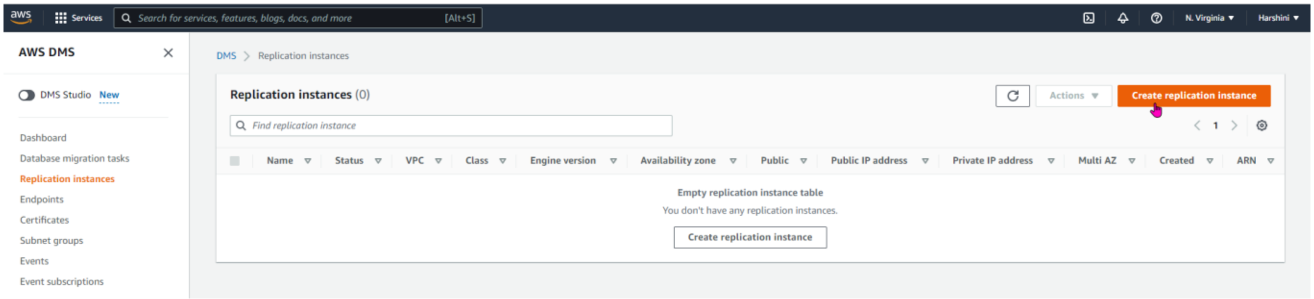
Module 2: Create a replication instance in AWS DMS

AWS DMS is a service that copies data from an existing database into a fully managed database on AWS. A replication instance is an Amazon EC2 instance that can host replication tasks within AWS DMS.

Step 1: Create a replication instance in AWS DMS.

1. Go to **Replication Instances** section of the AWS DMS console. Choose **Create replication instance** to begin the replication instance creation wizard.



Replication instances (0)

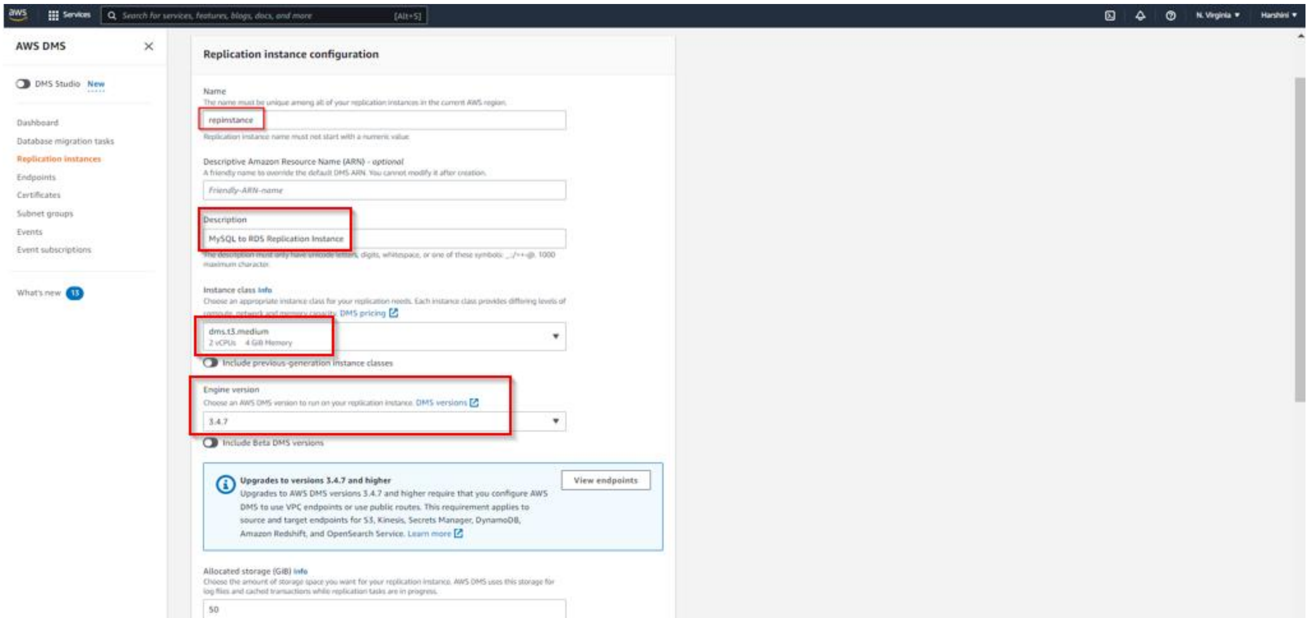
	Name	Status	VPC	Class	Engine version	Availability zone	Public	Public IP address	Private IP address	Multi AZ	Created	ARN

Empty replication instance table

You don't have any replication instances.

Create replication instance

2. In the **Replication instance configuration** section, replication instance name and description is provided. Then instance class is chosen based on the size of an existing database and the amount of data flowing through it. Then, an engine version for AWS DMS is chosen. Finally, the amount of allocated storage for replication instance is also chosen like below.



Replication instance configuration

Name
The name must be unique among all of your replication instances in the current AWS region.
repinstance
Replication instance name must not start with a numeric value

Descriptive Amazon Resource Name (ARN) - *optional*
A friendly name to override the default DMS ARN. You cannot modify it after creation.
Friendly-ARN-name

Description
MySQL to RDS Replication Instance
The description must only have unicode letters, digits, whitespace, or one of these symbols: _.:/=+-@. 1000 maximum character.

Instance class Info
Choose an appropriate instance class for your replication needs. Each instance class provides differing levels of compute, network and memory capacity. DMS pricing
dms.t3.medium
2 vCPUs 4 GiB Memory
Include previous-generation instance classes

Engine version
Choose an AWS DMS version to run on your replication instance. DMS versions
3.4.7
Include Beta DMS versions

Upgrades to versions 3.4.7 and higher
Upgrades to AWS DMS versions 3.4.7 and higher require that you configure AWS DMS to use VPC endpoints or use public routes. This requirement applies to source and target endpoints for S3, Kinesis, Secrets Manager, DynamoDB, Amazon Redshift, and OpenSearch Service. Learn more

Allocated storage (GiB) Info
Choose the amount of storage space you want for your replication instance. AWS DMS uses this storage for log files and cached transactions while replication tasks are in progress.
50

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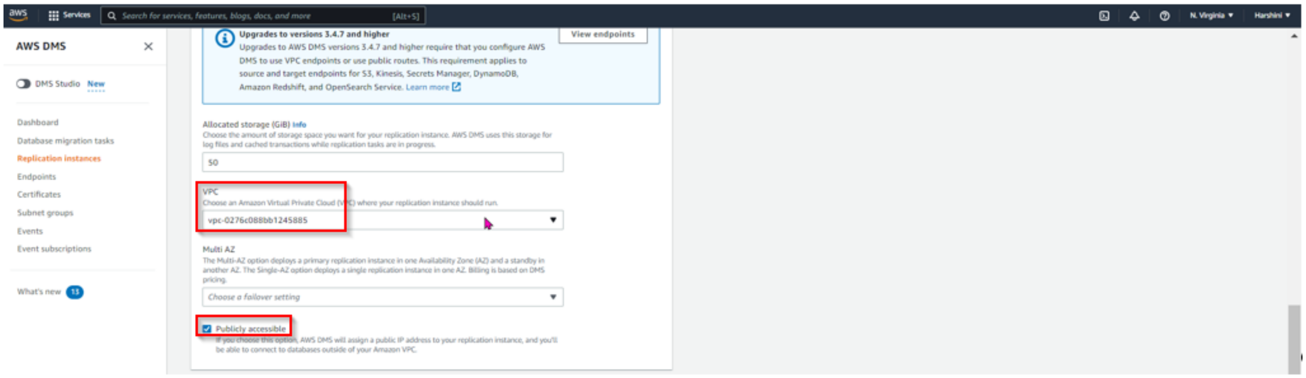
3. Choose the same VPC in which you provisioned your Amazon RDS database to ease network access for the replication instance.

   Please note that to use a Multi-AZ setup in AWS DMS to keep two databases in sync over a long period of time.

   Choose replication instance to be publicly accessible.



Upgrades to versions 3.4.7 and higher
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Allocated storage (GiB) Info
Choose the amount of storage space you want for your replication instance. AWS DMS uses this storage for log files and cached transactions while replication tasks are in progress.
50

VPC
Choose an Amazon Virtual Private Cloud (VPC) where your replication instance should run.
vpc-0276c088bb1245885

Multi AZ
The Multi-AZ option deploys a primary replication instance in one Availability Zone (AZ) and a standby in another AZ. The Single-AZ option deploys a single replication instance in one AZ. Billing is based on DMS pricing.
Choose a failover setting

☑ Publicly accessible
If you choose this option, AWS DMS will assign a public IP address to your replication instance, and you'll be able to connect to databases outside of your Amazon VPC.

4. Next, open **Advanced security and network configuration** section. For the **VPC security group(s)** configuration, choose the same security group that is attached to Amazon RDS database. This allows replication instance to access Amazon RDS database. Choose **Create** to create replication instance in AWS DMS.

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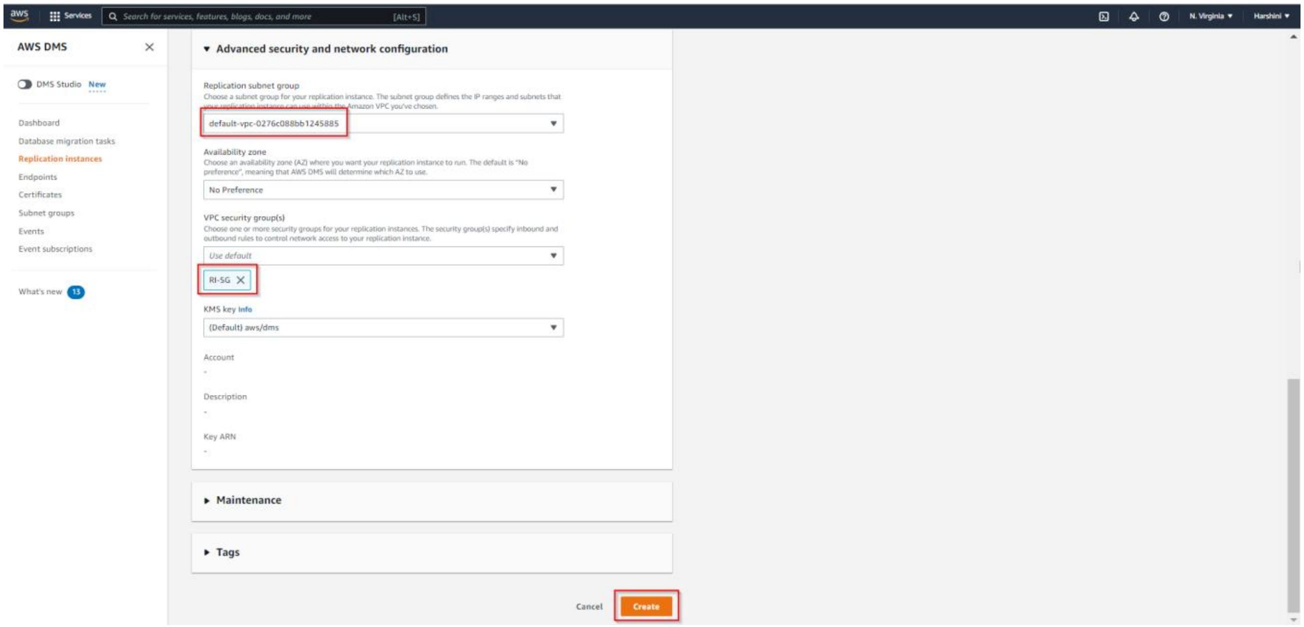


▼ Advanced security and network configuration

Replication subnet group
Choose a subnet group for your replication instance. The subnet group defines the IP ranges and subnets that your replication instance can use within the Amazon VPC you've chosen.
default-vpc-0276c088bb1245885

Availability zone
Choose an availability zone (AZ) where you want your replication instance to run. The default is "No preference", meaning that AWS DMS will determine which AZ to use.
No Preference

VPC security group(s)
Choose one or more security groups for your replication instances. The security group(s) specify inbound and outbound rules to control network access to your replication instance.
Use default
RI-SG ✕

KMS key Info
(Default) aws/dms

Account
-

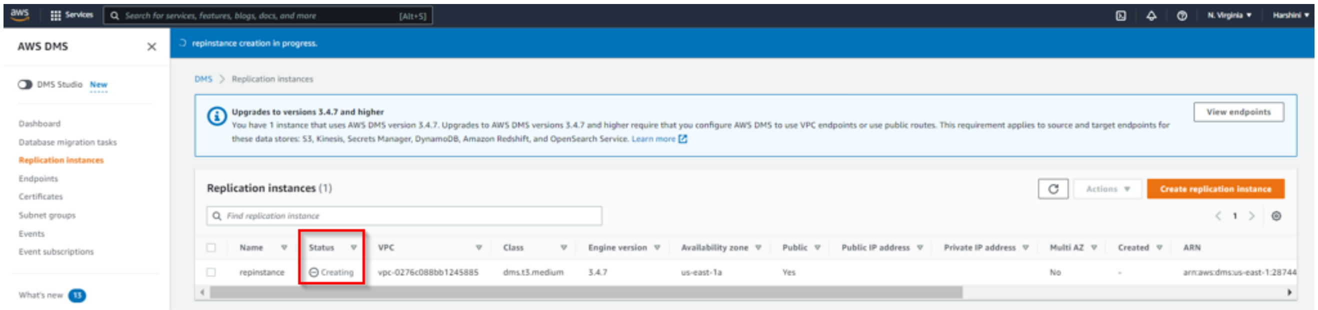
Description
-

Key ARN
-

▶ Maintenance

▶ Tags

5. It shows **Status** of the replication instance as **Creating** while AWS provisions and initializes replication instance.



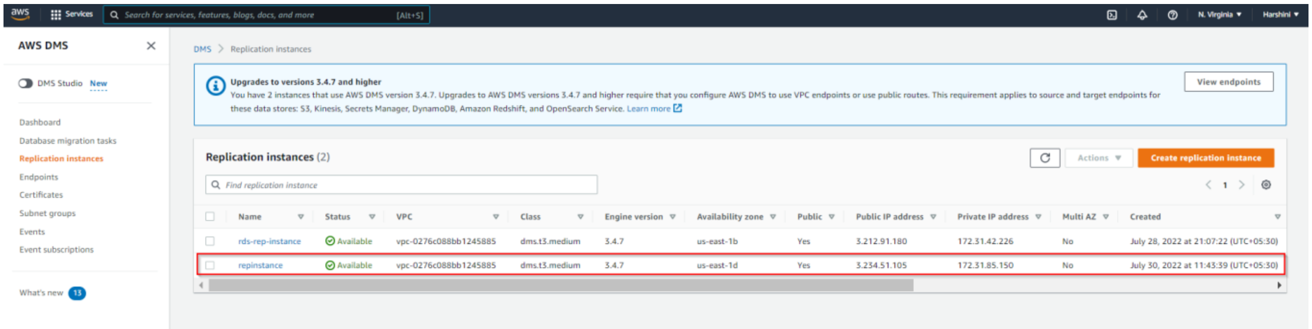
repinstance creation in progress.

Upgrades to versions 3.4.7 and higher
You have 1 instance that uses AWS DMS version 3.4.7. Upgrades to AWS DMS versions 3.4.7 and higher require that you configure AWS DMS to use VPC endpoints or use public routes. This requirement applies to source and target endpoints for these data stores: S3, Kinesis, Secrets Manager, DynamoDB, Amazon Redshift, and OpenSearch Service. Learn more

Replication instances (1)

Name	Status	VPC	Class	Engine version	Availability zone	Public	Public IP address	Private IP address	Multi AZ	Created	ARN
repinstance	Creating	vpc-0276c088bb1245885	dms.t3.medium	3.4.7	us-east-1a	Yes			No	-	arn:aws:dms:us-east-1:28744

6. When replication instance is ready to go, its **Status** shows **Available**.



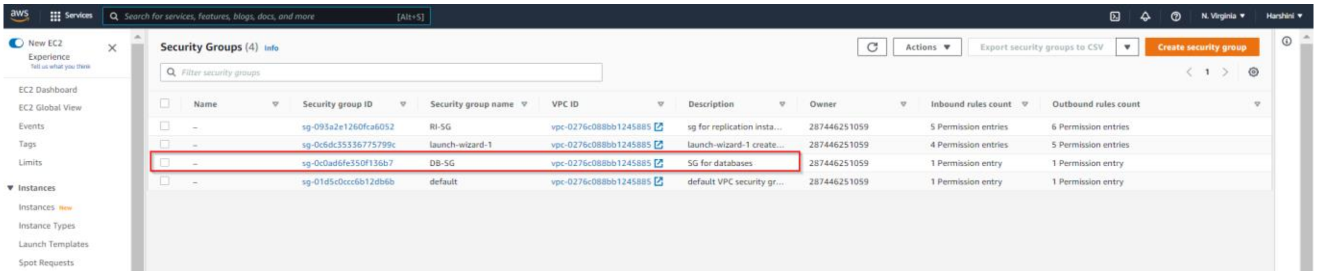
Upgrades to versions 3.4.7 and higher
You have 2 instances that use AWS DMS version 3.4.7. Upgrades to AWS DMS versions 3.4.7 and higher require that you configure AWS DMS to use VPC endpoints or use public routes. This requirement applies to source and target endpoints for these data stores: S3, Kinesis, Secrets Manager, DynamoDB, Amazon Redshift, and OpenSearch Service. Learn more

Replication instances (2)

Name	Status	VPC	Class	Engine version	Availability zone	Public	Public IP address	Private IP address	Multi AZ	Created
rds-rep-instance	Available	vpc-0276c088bb1245885	dms.t3.medium	3.4.7	us-east-1b	Yes	3.212.91.180	172.31.42.226	No	July 28, 2022 at 21:07:22 (UTC+05:30)
repinstance	Available	vpc-0276c088bb1245885	dms.t3.medium	3.4.7	us-east-1d	Yes	3.234.51.105	172.31.85.150	No	July 30, 2022 at 11:43:39 (UTC+05:30)

Step 2: Add a rule to security group to allow replication instance to access RDS database.

1. In the **Security Groups** section, find the security group which was attached to MySQL database instance, and choose it.



Security Groups (4)

Name	Security group ID	Security group name	VPC ID	Description	Owner	Inbound rules count	Outbound rules count
–	sg-093a2e1260fca6052	RI-SG	vpc-0276c088bb1245885	sg for replication insta...	287446251059	5 Permission entries	6 Permission entries
–	sg-0c6dc35336775799c	launch-wizard-1	vpc-0276c088bb1245885	launch-wizard-1 create...	287446251059	4 Permission entries	5 Permission entries
–	sg-0c0ad6fe350f136b7	DB-SG	vpc-0276c088bb1245885	SG for databases	287446251059	1 Permission entry	1 Permission entry
–	sg-01d5c0ccc6b12db6b	default	vpc-0276c088bb1245885	default VPC security gr...	287446251059	1 Permission entry	1 Permission entry

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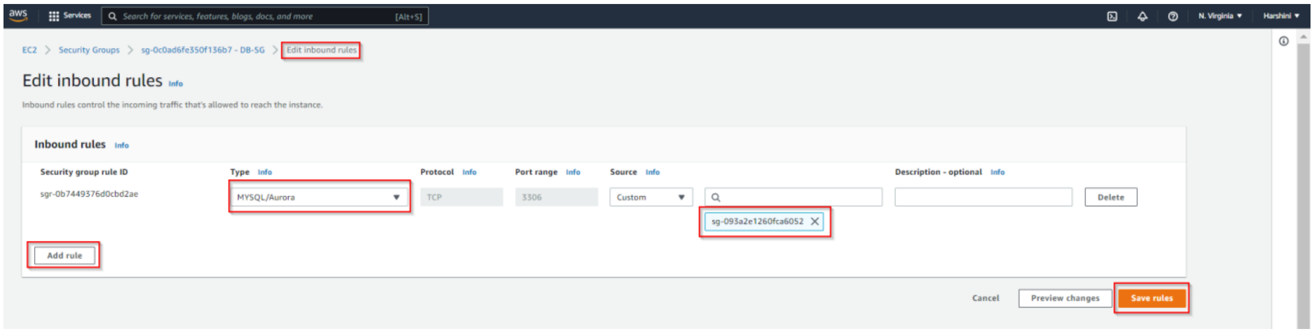
2. Edit inbound rules of RDS instance security groups and enter the name of the security group used for replication instance like below and choose **Save rules** to save the updated rules for security group.



EC2 > Security Groups > sg-0c0ad6fe350f136b7 - DB-SG > Edit inbound rules

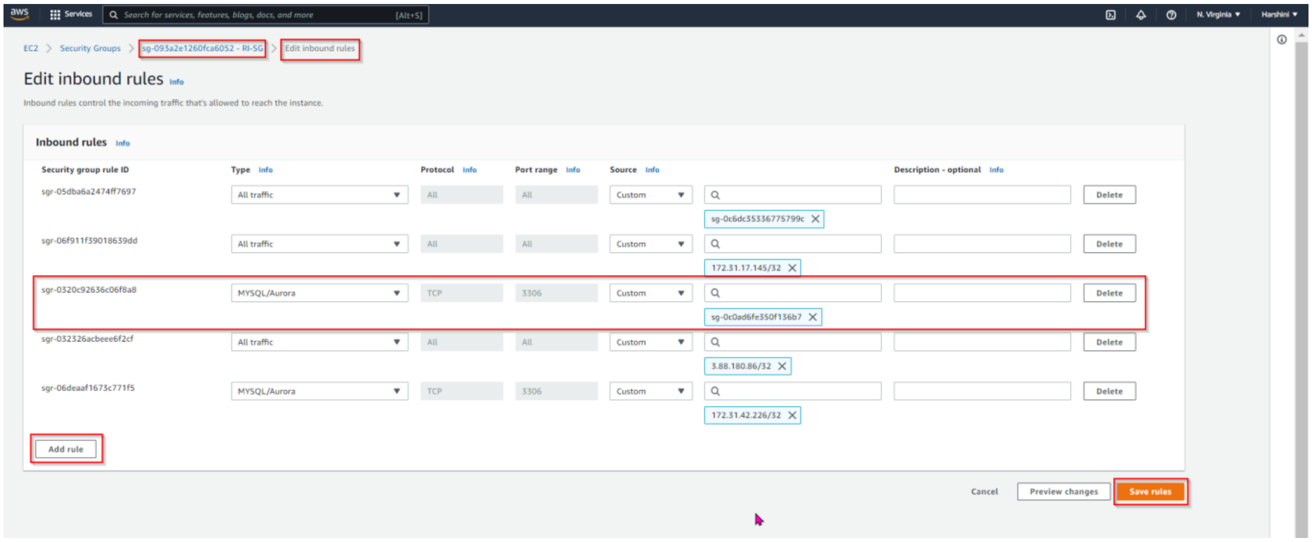
Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules Info

Security group rule ID	Type	Protocol	Port range	Source		Description - optional
sgr-0b7449376d0cbd2ae	MYSQL/Aurora	TCP	3306	Custom	sg-093a2e1260fca6052	

3. Add database instance security group to replication instance security group by executing same steps as above.



EC2 > Security Groups > sg-093a2e1260fca6052 - RI-SG > Edit inbound rules

Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules Info

Security group rule ID	Type	Protocol	Port range	Source		Description - optional
sgr-05dba6a2474ff7697	All traffic	All	All	Custom	sg-0c6dc35336775799c	
sgr-06f911f39018639dd	All traffic	All	All	Custom	172.31.17.145/32	
sgr-0320c92636c06f8a8	MYSQL/Aurora	TCP	3306	Custom	sg-0c0ad6fe350f136b7	
sgr-032326acbeee6f2cf	All traffic	All	All	Custom	3.88.180.86/32	
sgr-06deaaf1673c771f5	MYSQL/Aurora	TCP	3306	Custom	172.31.42.226/32	

In this module, replication instance is created and also updated the rules for security group.

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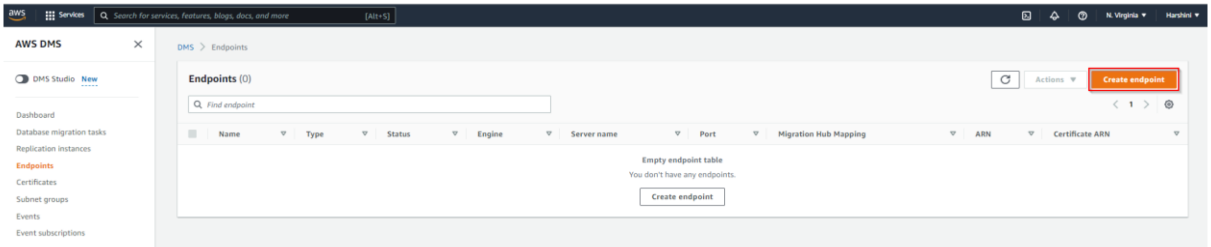
Module 3: Create endpoints in AWS DMS

A replication task is a job to migrate data from one database to another by using AWS DMS. Before creating a replication task, it is required to register endpoints for source and target databases. An endpoint describes the connection address, credentials, and other information required to connect to a database.

In this module, create source and target endpoints for a replication task in AWS DMS.

Step 1: Create an endpoint for target database (Amazon RDS).

1. Navigate to **Endpoints section** of the AWS DMS console. Choose **Create endpoint** to create a new endpoint.



Endpoints (0)

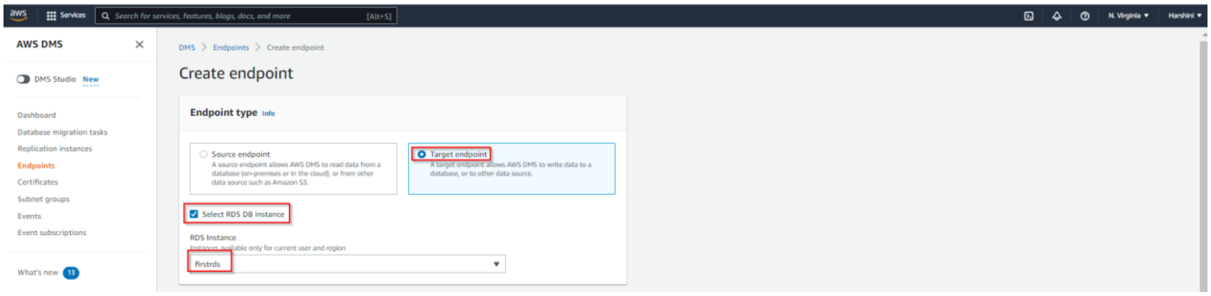
□	Name	Type	Status	Engine	Server name	Port	Migration Hub Mapping	ARN	Certificate ARN

Empty endpoint table

You don't have any endpoints.

Create endpoint

2. In the endpoint creation wizard, choose to create a **Target endpoint**. Choose the check box to **Select RDS DB instance**, and choose your newly created Amazon RDS database in the dropdown.



Create endpoint

Endpoint type Info

○ Source endpoint
A source endpoint allows AWS DMS to read data from a database (on-premises or in the cloud), or from other data source such as Amazon S3.

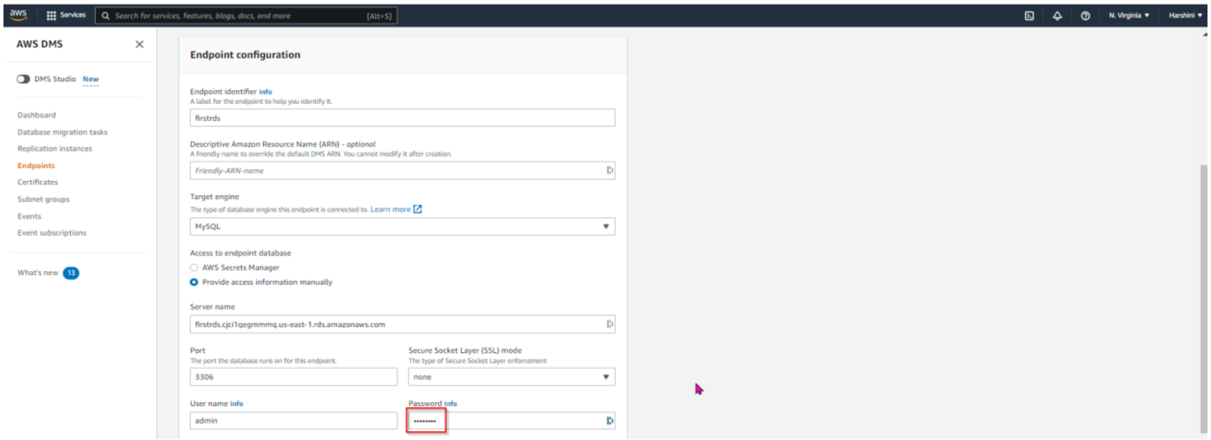
● Target endpoint
A target endpoint allows AWS DMS to write data to a database, or to other data source.

☑ Select RDS DB instance

RDS Instance
Instances available only for current user and region
firstrds ▾

Author: Harshini U
Sr DBA

3. This fills in most of the **Endpoint configuration** details. It is also required to enter password near the bottom of the section.



Endpoint configuration

Endpoint identifier Info
A label for the endpoint to help you identify it.
firstrds

Descriptive Amazon Resource Name (ARN) - *optional*
A friendly name to override the default DMS ARN. You cannot modify it after creation.
Friendly-ARN-name

Target engine
The type of database engine this endpoint is connected to. Learn more
MySQL

Access to endpoint database
○ AWS Secrets Manager
● Provide access information manually

Server name
firstrds.cjci1qegmmmq.us-east-1.rds.amazonaws.com

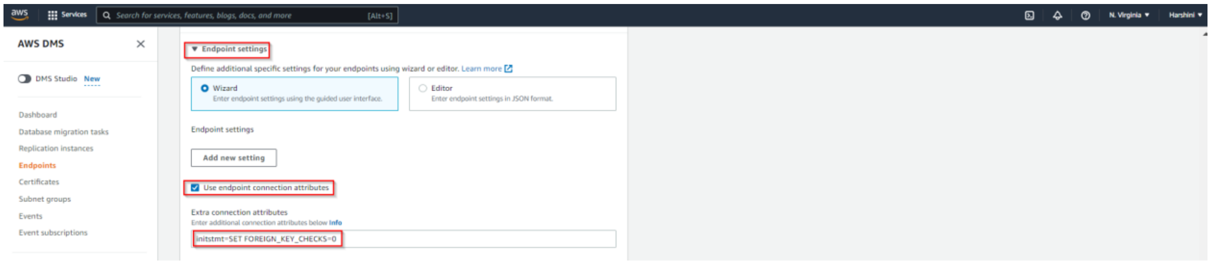
Port
The port the database runs on for this endpoint.
3306

Secure Socket Layer (SSL) mode
The type of Secure Socket Layer enforcement
none

User name Info
admin

Password Info
•••••••••

4. When loading data into a MySQL database by using AWS DMS, it is required to disable foreign key checks, so enter ***initstmt=SET FOREIGN_KEY_CHECKS=0*** in the **Extra connection attributes** box.



▼ Endpoint settings

Define additional specific settings for your endpoints using wizard or editor. Learn more

● Wizard
Enter endpoint settings using the guided user interface.

○ Editor
Enter endpoint settings in JSON format.

Endpoint settings

☑ Use endpoint connection attributes

Extra connection attributes
Enter additional connection attributes below Info
initstmt=SET FOREIGN_KEY_CHECKS=0

5. Before saving endpoint, connection is to be tested to ensure that it is configured correctly. To test it, open the **Test endpoint connection** section.

   Choose the replication instance in the dropdown list to use, and then select **Run test** and it should show **Status** like **successful**. This indicates that security group and target endpoint are configured correctly.

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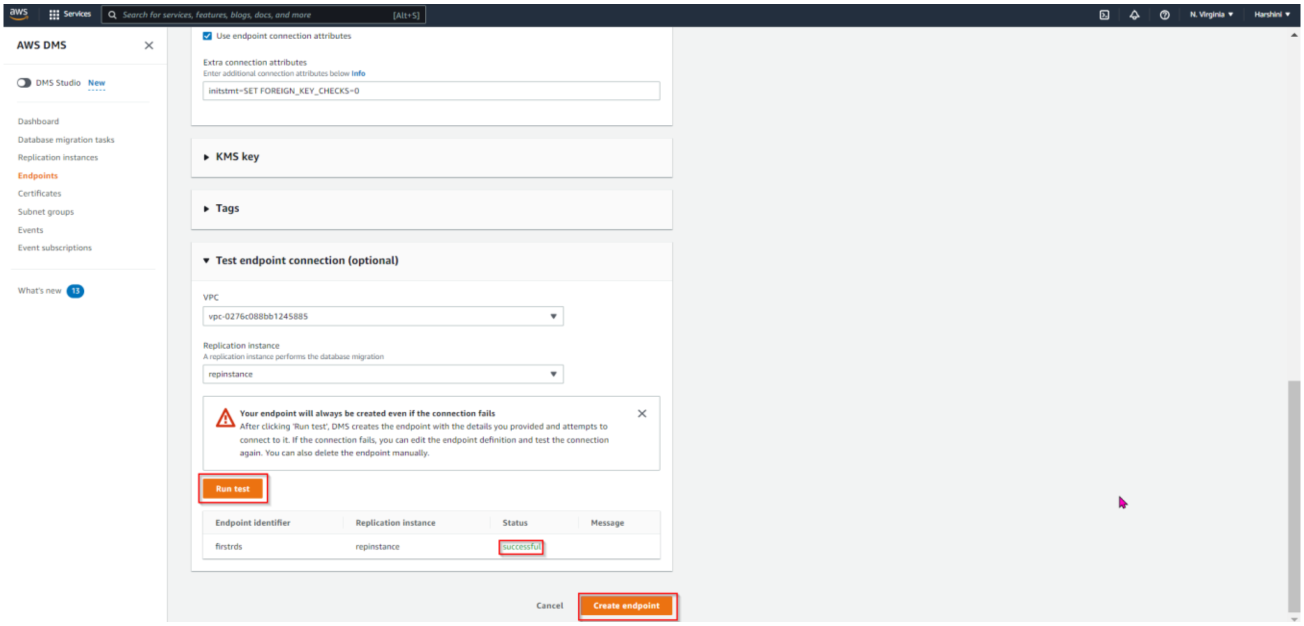


☑ Use endpoint connection attributes

Extra connection attributes
Enter additional connection attributes below Info
initstmt=SET FOREIGN_KEY_CHECKS=0

Test endpoint connection (optional)

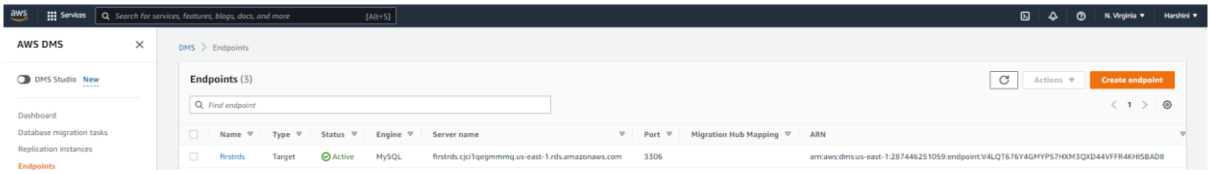
VPC
vpc-0276c088bb1245885

Replication instance
A replication instance performs the database migration
repinstance

Your endpoint will always be created even if the connection fails
After clicking 'Run test', DMS creates the endpoint with the details you provided and attempts to connect to it. If the connection fails, you can edit the endpoint definition and test the connection again. You can also delete the endpoint manually.

Endpoint identifier	Replication instance	Status	Message
firstrds	repinstance	successful	

6. To save endpoint, select **Create endpoint**.



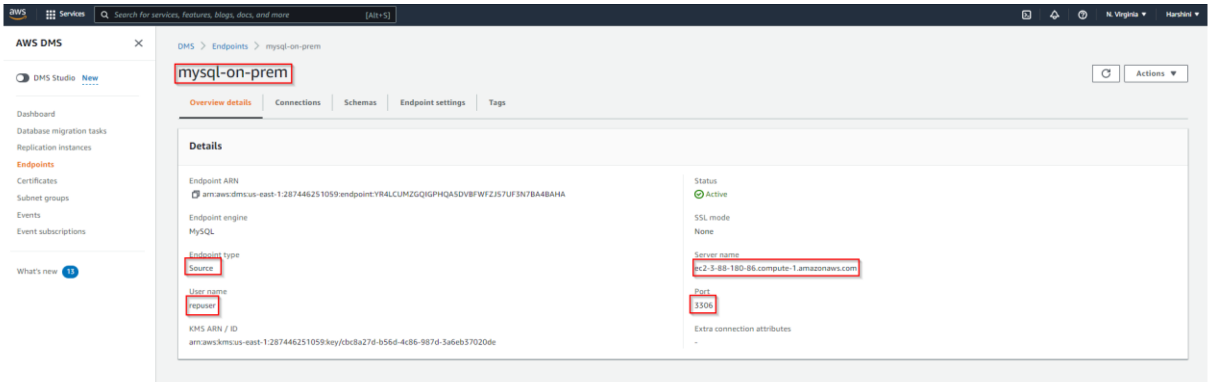
Endpoints (3)

☐	Name	Type	Status	Engine	Server name	Port	Migration Hub Mapping	ARN
☐	firstrds	Target	Active	MySQL	firstrds.cjci1qegmmmq.us-east-1.rds.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:V4LQT676Y4GMYPS7HXM3QXD44VFFR4KHISBADII

Step 2: Configure source endpoint.

It is required to follow the same steps again to create anendpoint for source database. Fill out the connection endpoint, port, and credentials. Provide source database network access to replication instance.

Followed the same steps and created an endpoint for source database and tested connection like below:



mysql-on-prem

Details

Endpoint ARN
arn:aws:dms:us-east-1:287446251059:endpoint:YR4LCUMZGQIGPHQASDVBFWFZJ57UF3N7BA4BAHA

Status
Active

Endpoint engine
MySQL

SSL mode
None

Endpoint type
Source

Server name
ec2-3-88-180-86.compute-1.amazonaws.com

User name
repuser

Port
3306

KMS ARN / ID
arn:aws:kms:us-east-1:287446251059:key/cbc8a27d-b56d-4c86-987d-3a6eb37020de

Extra connection attributes
-

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Sr DBA

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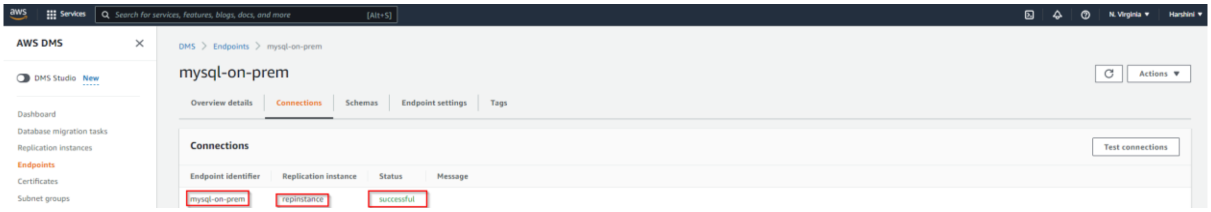
Sr DBA



mysql-on-prem

Connections

Endpoint identifier	Replication instance	Status	Message
mysql-on-prem	repinstance	successful	

In this module, two endpoints are configured, one for source database and one for target database. Tested both endpoints and successfully able to connect to both databases.

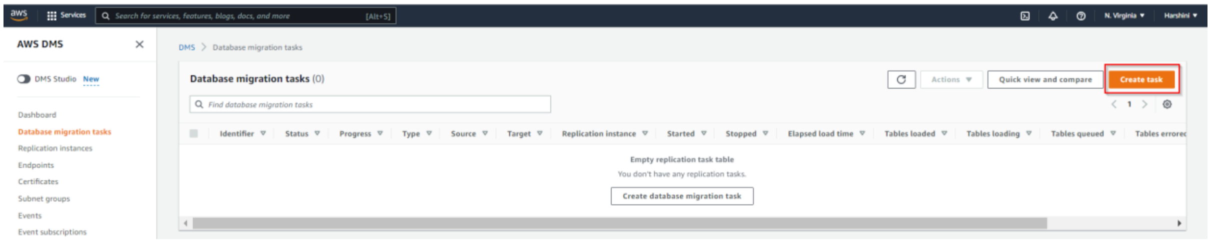
Additional information: For any connectivity issues, please follow this documentation: https://aws.amazon.com/premiumsupport/knowledge-center/dms-endpoint-connectivity-failures/

Module 4: Create and run a replication task in AWS DMS

A replication task is responsible for migrating data from a source database to a target database. In this case, I am moving data from an existing MySQL database to newly created database in Amazon RDS.

Step 1: Create a replication task and run it.

1. Navigate to **Database migration tasks** section of the AWS DMS console. Choose **Create task** to create a new replication task.



Database migration tasks (0)

□	Identifier	Status	Progress	Type	Source	Target	Replication instance	Started	Stopped	Elapsed load time	Tables loaded	Tables loading	Tables queued	Tables errored

Empty replication task table

You don't have any replication tasks.

2. In **Task configuration** section, set up the parameters of the replication task. A task name is given and selected the replication instance created in an earlier module. Then, chose the source endpoint for an existing MySQL database and target endpoint for the fully managed database in Amazon RDS. Chosen **Migrate existing data and replicate ongoing changes** as a migration type with which first type copies all data into RDS database and the second type ensures that all additional updates are replicated to RDS database until the application

switch over is executed to use the new RDS database as a primary database.

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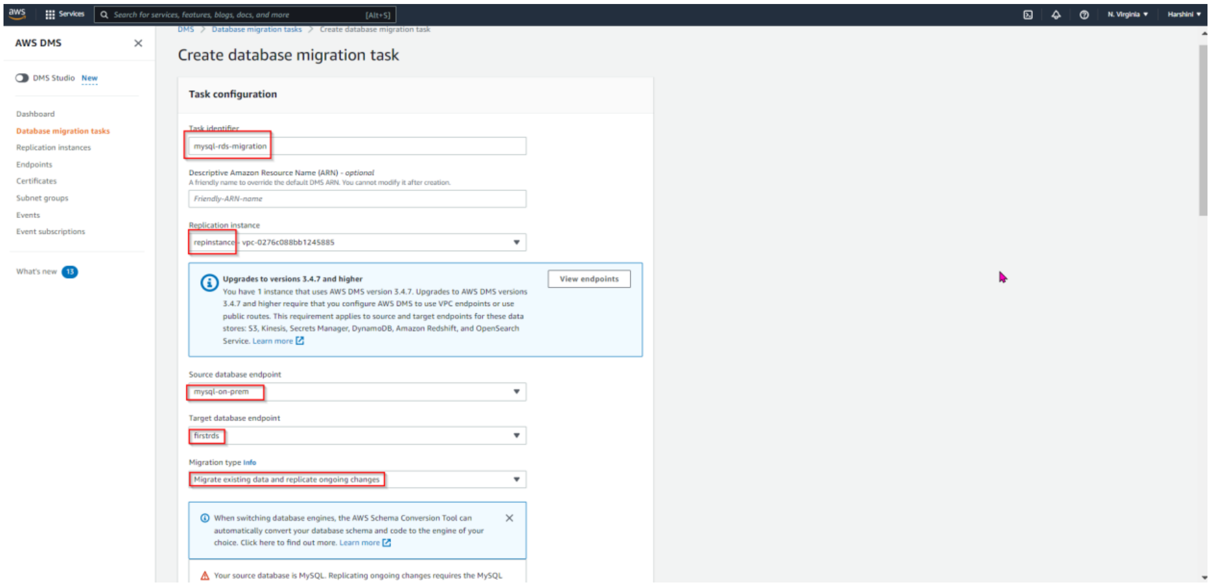

Create database migration task

Task configuration

Task identifier: mysql-rds-migration

Descriptive Amazon Resource Name (ARN) - *optional*
A friendly name to override the default DMS ARN. You cannot modify it after creation.
Friendly-ARN-name

Replication instance: repinstance - vpc-0276c088bb1245885

Upgrades to versions 3.4.7 and higher
You have 1 instance that uses AWS DMS version 3.4.7. Upgrades to AWS DMS versions 3.4.7 and higher require that you configure AWS DMS to use VPC endpoints or use public routes. This requirement applies to source and target endpoints for these data stores: S3, Kinesis, Secrets Manager, DynamoDB, Amazon Redshift, and OpenSearch Service. Learn more

Source database endpoint: mysql-on-prem

Target database endpoint: firstrds

Migration type Info: Migrate existing data and replicate ongoing changes

When switching database engines, the AWS Schema Conversion Tool can automatically convert your database schema and code to the engine of your choice. Click here to find out more. Learn more

Your source database is MySQL. Replicating ongoing changes requires the MySQL

3. In the **Table mappings** section, choose the tables to copy over. Enter the name of the schemas and tables to copy. Use **%** as a wildcard character to copy multiple tables or schemas.

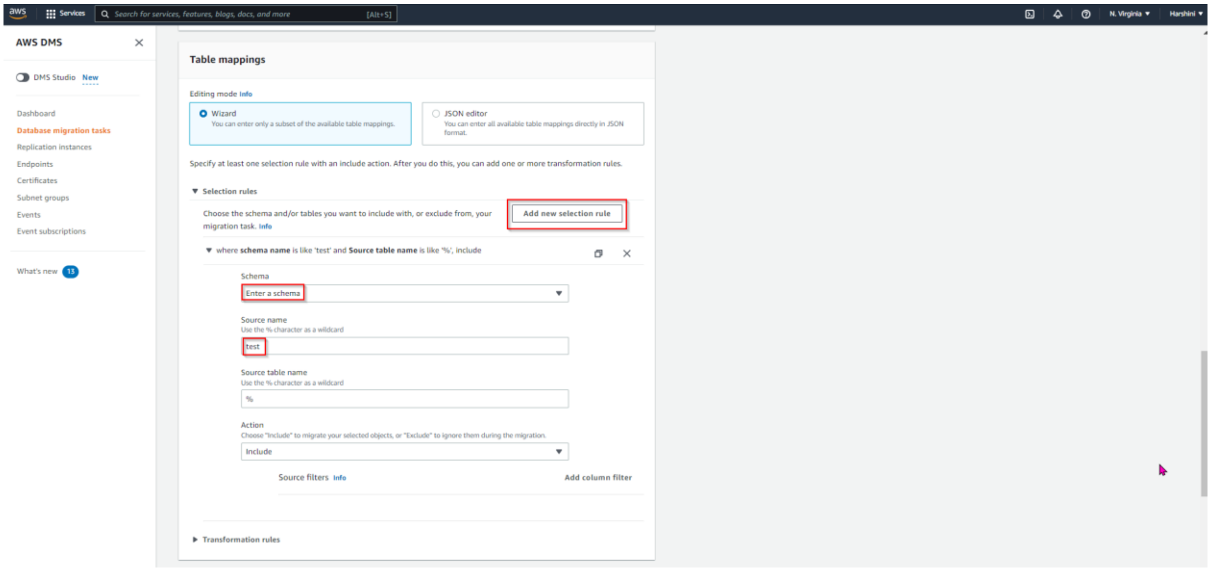

Table mappings

Editing mode Info

● Wizard
You can enter only a subset of the available table mappings.

○ JSON editor
You can enter all available table mappings directly in JSON format.

Specify at least one selection rule with an include action. After you do this, you can add one or more transformation rules.

▼ Selection rules

Choose the schema and/or tables you want to include with, or exclude from, your migration task. Info

▼ where **schema name** is like 'test' and **Source table name** is like '%', include

Schema: Enter a schema

Source name
Use the % character as a wildcard
test

Source table name
Use the % character as a wildcard
%

Action
Choose "Include" to migrate your selected objects, or "Exclude" to ignore them during the migration.
Include

Source filters Info

▶ Transformation rules

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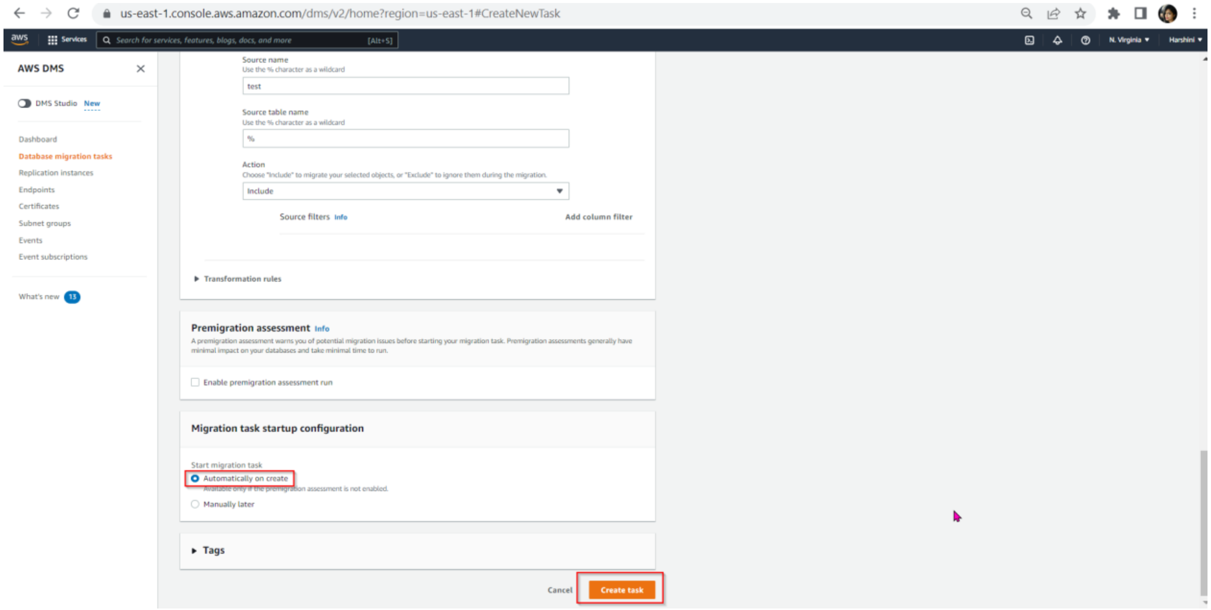
4. Choose **Create task** to start your replication task.



Source name
Use the % character as a wildcard
test

Source table name
Use the % character as a wildcard
%

Action
Choose "Include" to migrate your selected objects, or "Exclude" to ignore them during the migration.
Include

Source filters Info — Add column filter

▸ Transformation rules

Premigration assessment Info
A premigration assessment warns you of potential migration issues before starting your migration task. Premigration assessments generally have minimal impact on your databases and take minimal time to run.

□ Enable premigration assessment run

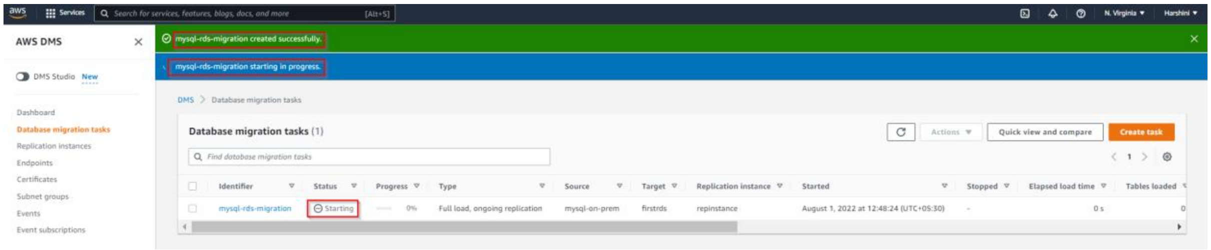
Migration task startup configuration

Start migration task
● Automatically on create
Available only if the premigration assessment is not enabled.
○ Manually later

▸ Tags

Cancel — Create task

5. After creating task, task is shown in the **Database migration tasks** section with a **Status** of **Creating**, **Starting** and then **Running**.

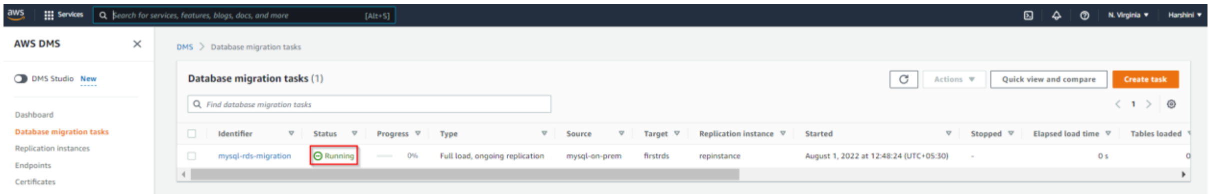


mysql-rds-migration created successfully.

mysql-rds-migration starting in progress.

Database migration tasks (1)

Identifier	Status	Progress	Type	Source	Target	Replication instance	Started	Stopped	Elapsed load time	Tables loaded
mysql-rds-migration	Starting	0%	Full load, ongoing replication	mysql-on-prem	firstrds	repinstance	August 1, 2022 at 12:48:24 (UTC+05:30)	-	0 s	0



Database migration tasks (1)

Identifier	Status	Progress	Type	Source	Target	Replication instance	Started	Stopped	Elapsed load time	Tables loaded
mysql-rds-migration	Running	0%	Full load, ongoing replication	mysql-on-prem	firstrds	repinstance	August 1, 2022 at 12:48:24 (UTC+05:30)	-	0 s	0

6. After the migration of existing data is completed, it shows **Status** as **Load complete, replication ongoing**. Any updates to source database at this point will be copied to target database.

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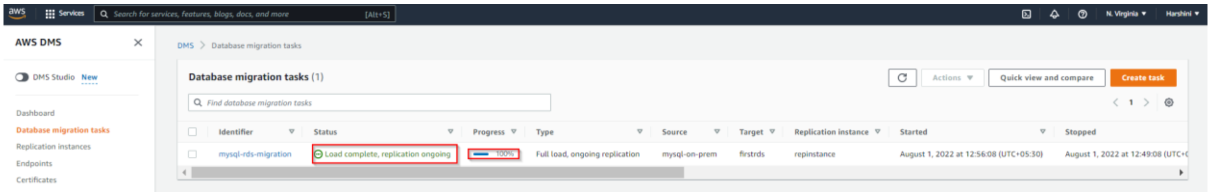
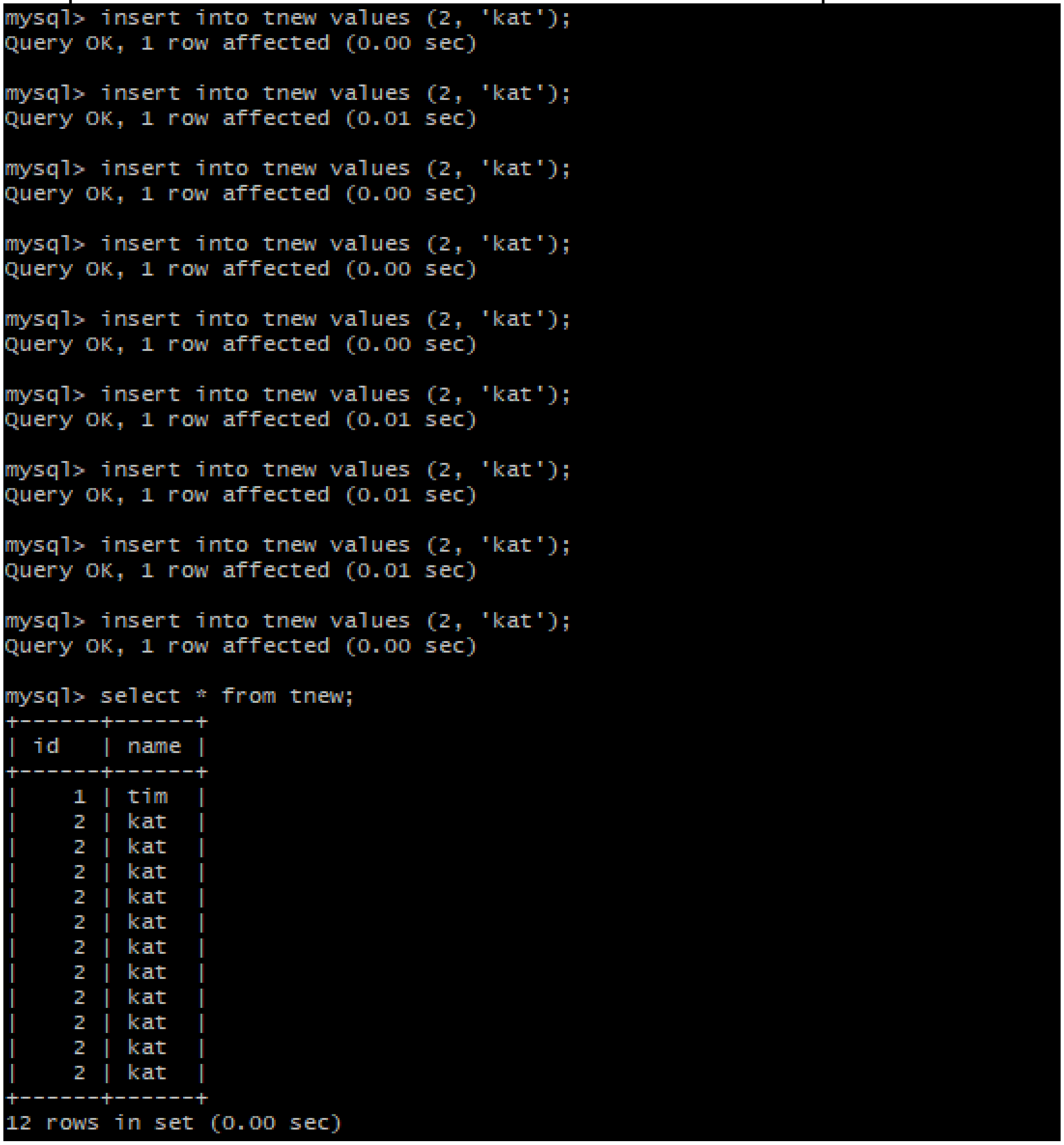


Database migration tasks (1)

	Identifier	Status	Progress	Type	Source	Target	Replication instance	Started	Stopped
□	mysql-rds-migration	Load complete, replication ongoing	100%	Full load, ongoing replication	mysql-on-prem	firstrds	repinstance	August 1, 2022 at 12:56:08 (UTC+05:30)	August 1, 2022 at 12:49:08 (UTC+(

Author: Harshini U
Sr DBA

7. Sample data inserted to source database after full load completed:



```
mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.00 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.01 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.00 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.00 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.00 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.01 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.01 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.01 sec)

mysql> insert into tnew values (2, 'kat');
Query OK, 1 row affected (0.00 sec)

mysql> select * from tnew;
+------+------+
| id   | name |
+------+------+
|    1 | tim  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
|    2 | kat  |
+------+------+
12 rows in set (0.00 sec)
```

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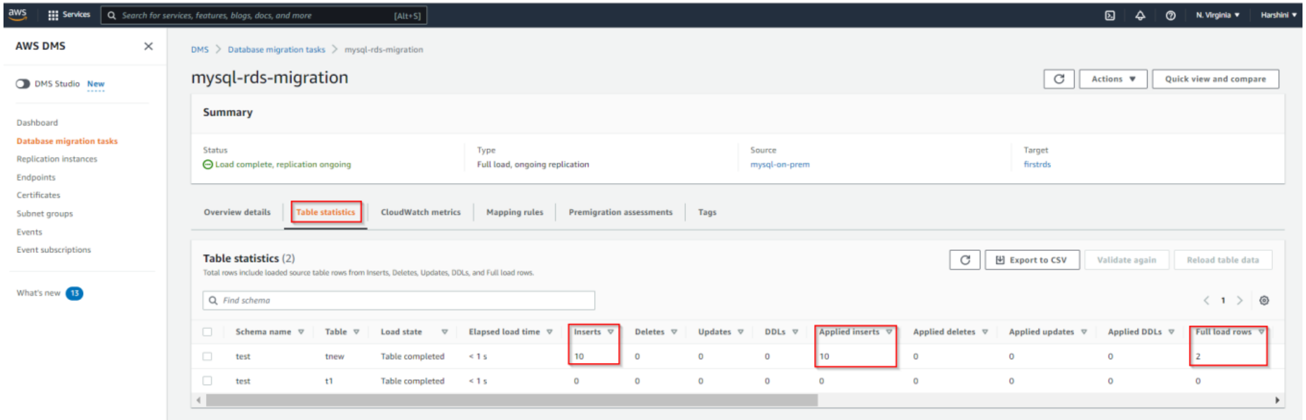
Sr DBA

8. Same insert data are also applied to RDS instance as well like below:



mysql-rds-migration

Summary

Status: Load complete, replication ongoing
Type: Full load, ongoing replication
Source: mysql-on-prem
Target: firstrds

Table statistics (2)

Total rows include loaded source table rows from Inserts, Deletes, Updates, DDLs, and Full load rows.

	Schema name	Table	Load state	Elapsed load time	Inserts	Deletes	Updates	DDLs	Applied inserts	Applied deletes	Applied updates	Applied DDLs	Full load rows
□	test	tnew	Table completed	< 1 s	10	0	0	0	10	0	0	0	2
□	test	t1	Table completed	< 1 s	0	0	0	0	0	0	0	0	0

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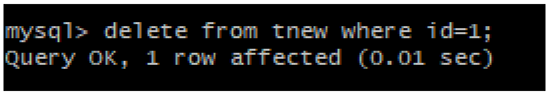
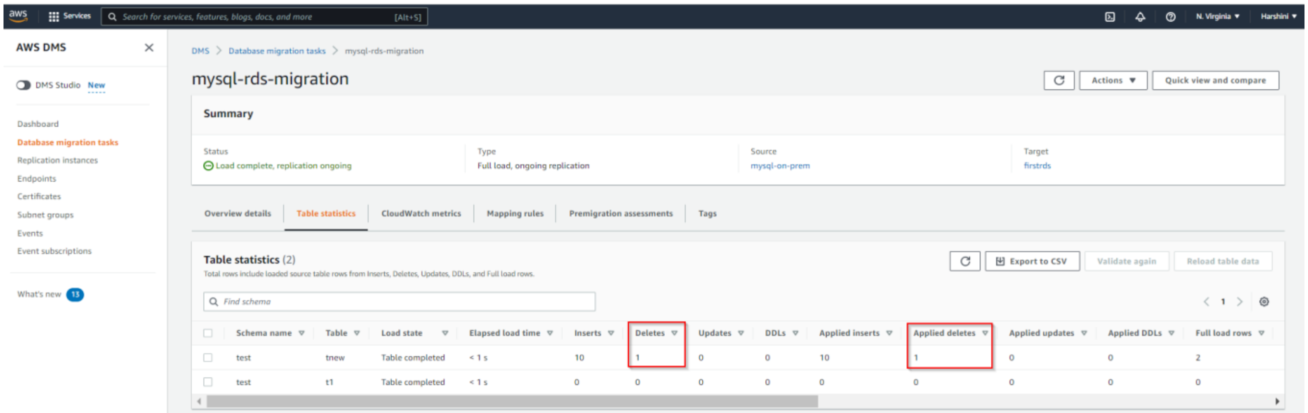
9. Deleted a row in the table in source database:



```
mysql> delete from tnew where id=1;
Query OK, 1 row affected (0.01 sec)
```

10. Same is reflected in the migration instance too:



mysql-rds-migration

Summary

Status: Load complete, replication ongoing
Type: Full load, ongoing replication
Source: mysql-on-prem
Target: firstrds

Table statistics (2)

Total rows include loaded source table rows from Inserts, Deletes, Updates, DDLs, and Full load rows.

	Schema name	Table	Load state	Elapsed load time	Inserts	Deletes	Updates	DDLs	Applied inserts	Applied deletes	Applied updates	Applied DDLs	Full load rows
□	test	tnew	Table completed	< 1 s	10	1	0	0	10	1	0	0	2
□	test	t1	Table completed	< 1 s	0	0	0	0	0	0	0	0	0

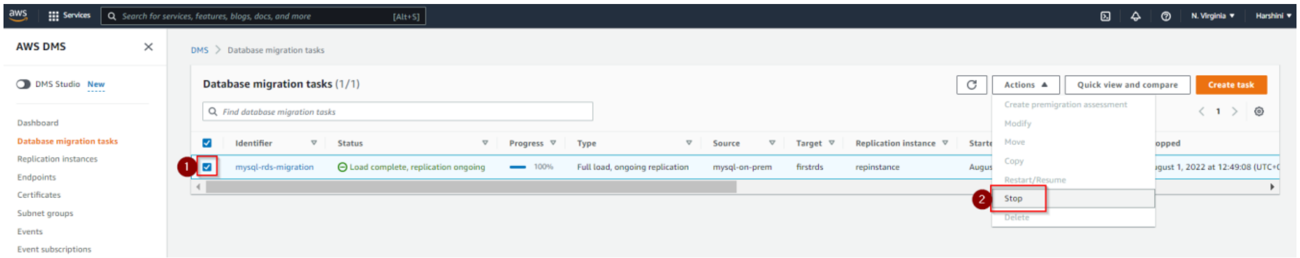
In this module, created a replication task in AWS DMS to migrate an existing data and sync ongoing changes from on-prem MySQL database to new database in Amazon RDS.

Module 5 – Clean up resources after completing migration

Now that initial migration and Change Data Capture are completed, data sync is validated in the new RDS database, RDS database is ready to use as a primary database. Also, executed a thorough test in the last module above.

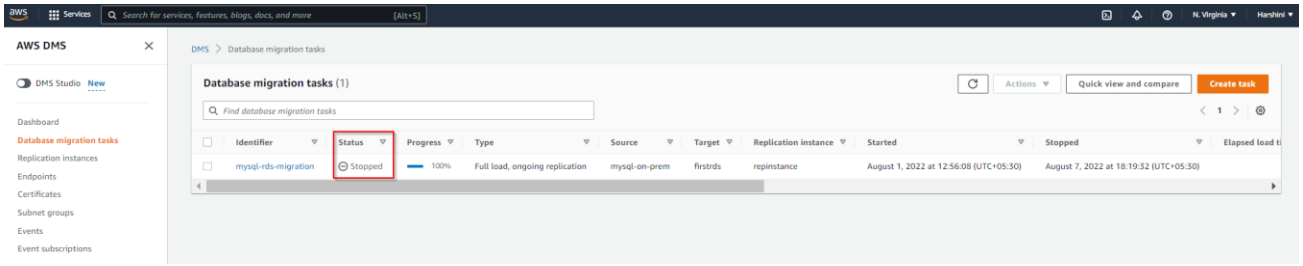
After switching to use RDS database as a primary database successfully, delete AWS DMS infrastructure.

1. Stop and delete migration task like below:



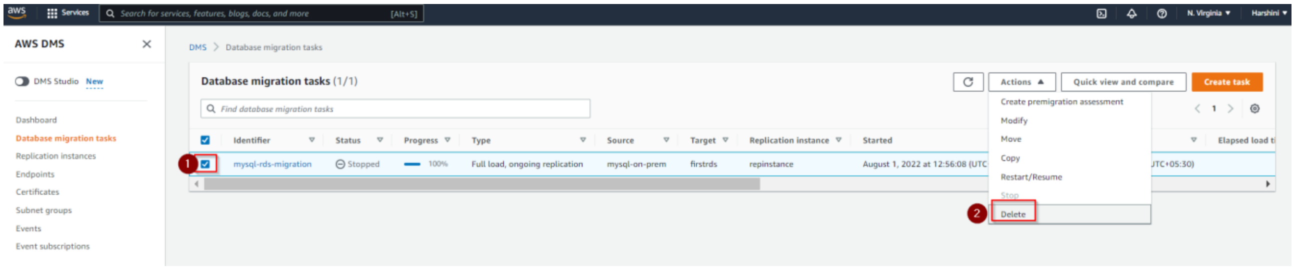
Database migration tasks (1/1)

☑	Identifier	Status	Progress	Type	Source	Target	Replication instance	Starte	opped
☑	mysql-rds-migration	Load complete, replication ongoing	100%	Full load, ongoing replication	mysql-on-prem	firstrds	repinstance	Augus	ugust 1, 2022 at 12:49:08 (UTC+(



Database migration tasks (1)

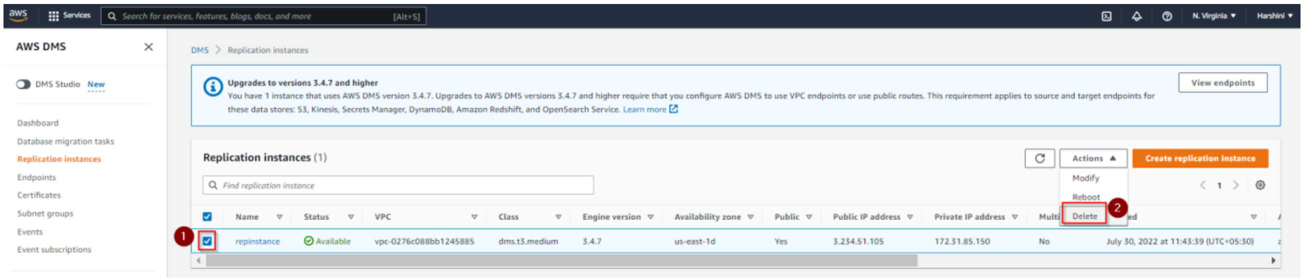
☐	Identifier	Status	Progress	Type	Source	Target	Replication instance	Started	Stopped	Elapsed load ti
☐	mysql-rds-migration	⊖ Stopped	100%	Full load, ongoing replication	mysql-on-prem	firstrds	repinstance	August 1, 2022 at 12:56:08 (UTC+05:30)	August 7, 2022 at 18:19:32 (UTC+05:30)	



Database migration tasks (1/1)

☑	Identifier	Status	Progress	Type	Source	Target	Replication instance	Started	Elapsed load ti
☑	mysql-rds-migration	⊖ Stopped	100%	Full load, ongoing replication	mysql-on-prem	firstrds	repinstance	August 1, 2022 at 12:56:08 (UTC	JTC+05:30)

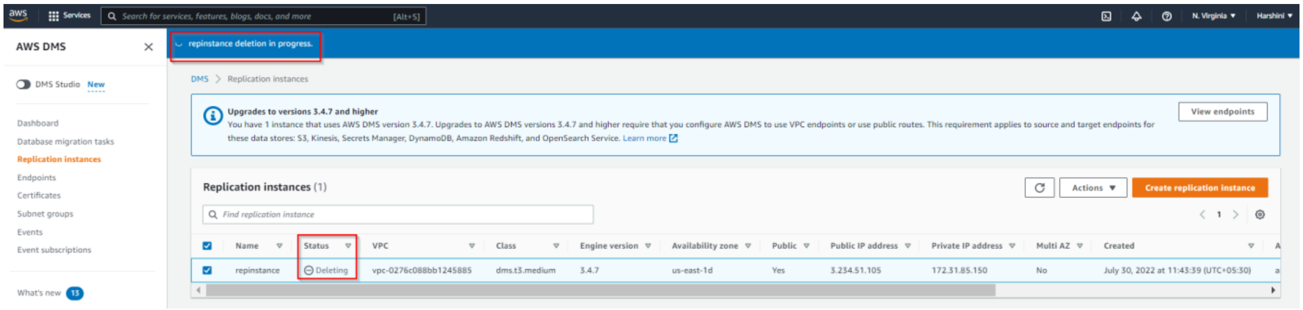
2. Select and delete replication instance:



Upgrades to versions 3.4.7 and higher
You have 1 instance that uses AWS DMS version 3.4.7. Upgrades to AWS DMS versions 3.4.7 and higher require that you configure AWS DMS to use VPC endpoints or use public routes. This requirement applies to source and target endpoints for these data stores: S3, Kinesis, Secrets Manager, DynamoDB, Amazon Redshift, and OpenSearch Service. Learn more

Replication instances (1)

☑	Name	Status	VPC	Class	Engine version	Availability zone	Public	Public IP address	Private IP address	Multi	ed
☑	repinstance	✓ Available	vpc-0276c088bb1245885	dms.t3.medium	3.4.7	us-east-1d	Yes	3.234.51.105	172.31.85.150	No	July 30, 2022 at 11:43:39 (UTC+05:30)



repinstance deletion in progress.

Upgrades to versions 3.4.7 and higher
You have 1 instance that uses AWS DMS version 3.4.7. Upgrades to AWS DMS versions 3.4.7 and higher require that you configure AWS DMS to use VPC endpoints or use public routes. This requirement applies to source and target endpoints for these data stores: S3, Kinesis, Secrets Manager, DynamoDB, Amazon Redshift, and OpenSearch Service. Learn more

Replication instances (1)

☑	Name	Status	VPC	Class	Engine version	Availability zone	Public	Public IP address	Private IP address	Multi AZ	Created
☑	repinstance	⊖ Deleting	vpc-0276c088bb1245885	dms.t3.medium	3.4.7	us-east-1d	Yes	3.234.51.105	172.31.85.150	No	July 30, 2022 at 11:43:39 (UTC+05:30)

3. Delete both the endpoints created under AWS DMS:

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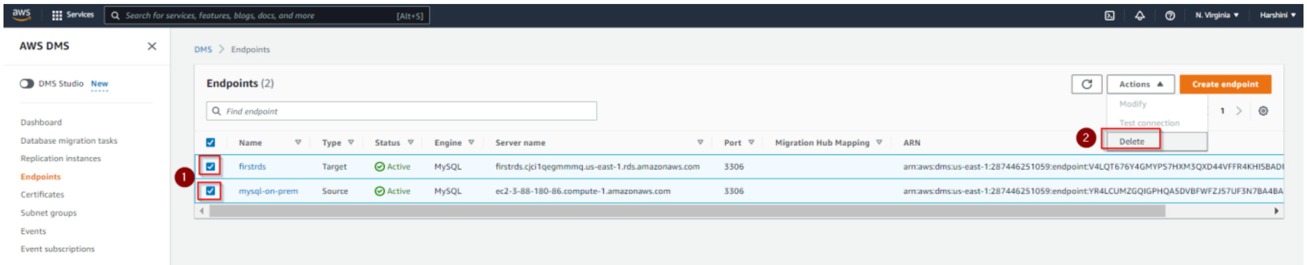
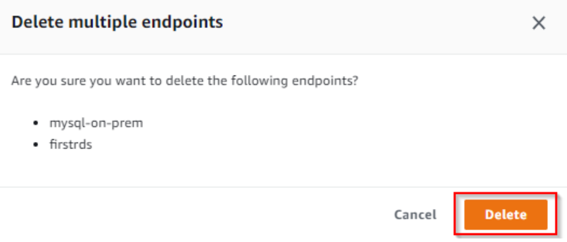


Endpoints (2)

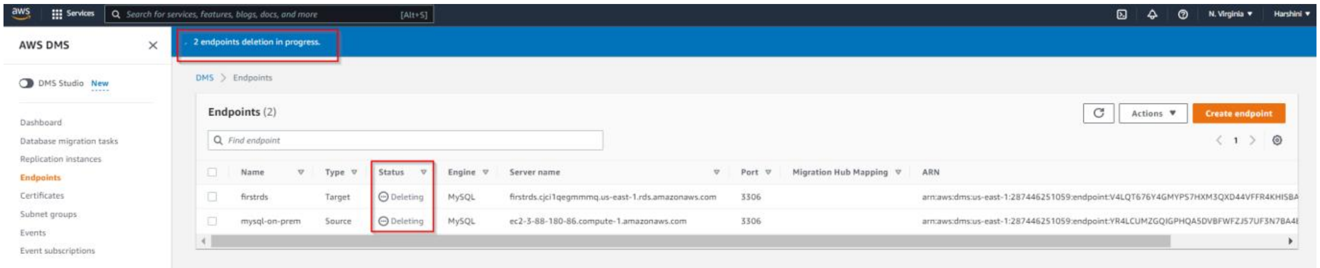
☑	Name	Type	Status	Engine	Server name	Port	Migration Hub Mapping	ARN
☑	firstrds	Target	Active	MySQL	firstrds.cjci1qegmmmq.us-east-1.rds.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:V4LQT676Y4GMYPS7HXM3QXD44VFFR4KHISBADI
☑	mysql-on-prem	Source	Active	MySQL	ec2-3-88-180-86.compute-1.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:YR4LCUMZGQIGPHQA5DVBFWFZJ57UF3N7BA4BA



Delete multiple endpoints

Are you sure you want to delete the following endpoints?

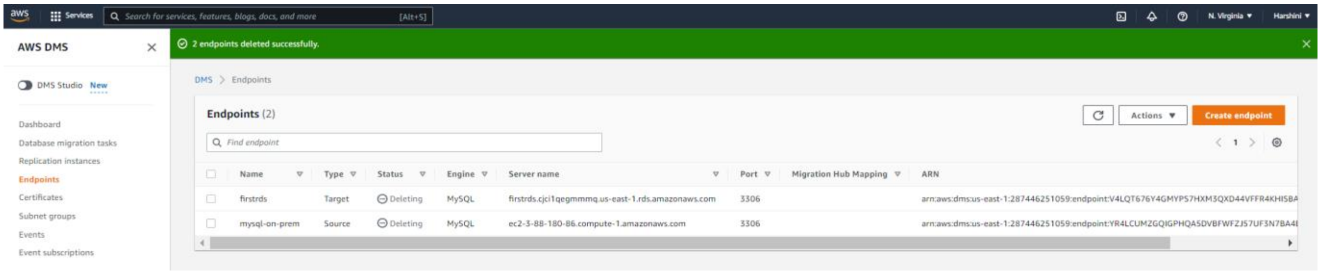
- mysql-on-prem
- firstrds



2 endpoints deletion in progress.

Endpoints (2)

□	Name	Type	Status	Engine	Server name	Port	Migration Hub Mapping	ARN
□	firstrds	Target	Deleting	MySQL	firstrds.cjci1qegmmmq.us-east-1.rds.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:V4LQT676Y4GMYPS7HXM3QXD44VFFR4KHISBA
□	mysql-on-prem	Source	Deleting	MySQL	ec2-3-88-180-86.compute-1.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:YR4LCUMZGQIGPHQA5DVBFWFZJ57UF3N7BA4E



2 endpoints deleted successfully.

Endpoints (2)

□	Name	Type	Status	Engine	Server name	Port	Migration Hub Mapping	ARN
□	firstrds	Target	Deleting	MySQL	firstrds.cjci1qegmmmq.us-east-1.rds.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:V4LQT676Y4GMYPS7HXM3QXD44VFFR4KHISBA
□	mysql-on-prem	Source	Deleting	MySQL	ec2-3-88-180-86.compute-1.amazonaws.com	3306		arn:aws:dms:us-east-1:287446251059:endpoint:YR4LCUMZGQIGPHQA5DVBFWFZJ57UF3N7BA4E

Cost Analysis

Region	Service	Upfront	Monthly	First 12 months total	Currency	Configuration Summary
US East (Ohio)	Amazon RDS for MySQL	0.00	267.00	3204.00	USD	Instance type: db.m4.xlarge Single AZ. Storage: General Purpose SSD (gp2) 100 GB

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US East (Ohio)	Amazon Database Migration Service	0.00	64.79	777.48	USD	Instance type: dms.t3.medium (vCPU 2, Memory 4 GB, Storage: EBS only)
Total			331.79	3981.48	USD	

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Lessons and Observations:

1. Learnt how to create Amazon RDS database instance for MySQL database.
2. Learnt to create replication instance and setup source and target endpoints in Amazon DMS.
3. Learnt how to migrate database (initial data load and change data capture) from on-prem MySQL database to RDS database instance and cutover the process after sync validation and application switchover to new RDS primary database.

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