



lab



lab title

AWS Relational Database Service (RDS) V1.02



Course title

BackSpace Academy
AWS Certified Associate



Table of Contents

Contents

Table of Contents.....	1
About the Lab	3
Deploying & Connecting to a MySQL Database Server	4
Connecting to your RDS Instance using the MySQL WorkBench	8
Troubleshooting Connection Issues	11
Connecting to your RDS Instance using the Command Line	12
Clean Up.....	13
Deploying & Connecting to a PostgreSQL Database Server.....	15
Connect to the Server using pgAdmin	18
Clean Up.....	20
Deploying & Connecting to an Oracle Database Server	21
Connecting to the Oracle RDS Instance	24
Clean Up.....	25
Deploying & Connecting to a Microsoft SQL Server Database	27
Connecting to the Database Using the Windows Command Line.....	29
Connecting to the Database Using SQL Management Studio	30
Clean up	30
Migrating from Oracle to Aurora Using AWS Database Migration Service.....	32
Create a Security Group.....	32
Create Source MySQL database	34
Create Target Database	38
Connecting to the Source Database	38
Creating an AWS Database Migration Service Job	40
Create Replication Instance.....	40
Create Source and Target Database Endpoints.....	41
Create a Migration Task.....	44
Clean Up.....	47

About the Lab

Please note that not all AWS services are supported in all regions. Please use the US-East-1 (North Virginia) region for this lab.

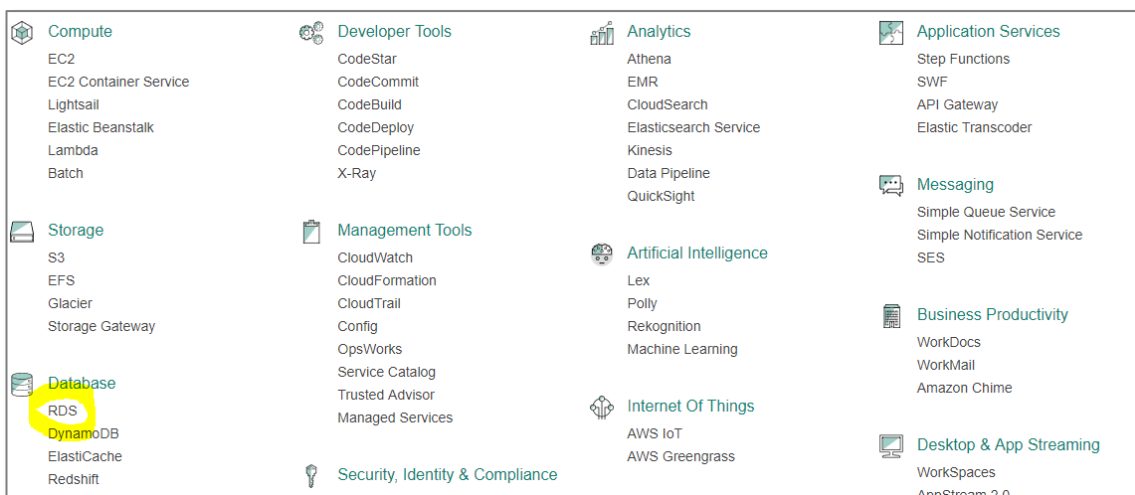
These lab notes are to support the hands on instructional videos of the AWS Relational Database Service (RDS) section of the AWS Certified Associate Course.

Please note that AWS services change on a weekly basis and it is extremely important you check the version number on this document to ensure you have the latest version with any updates or corrections.

▶ Deploying & Connecting to a MySQL Database Server

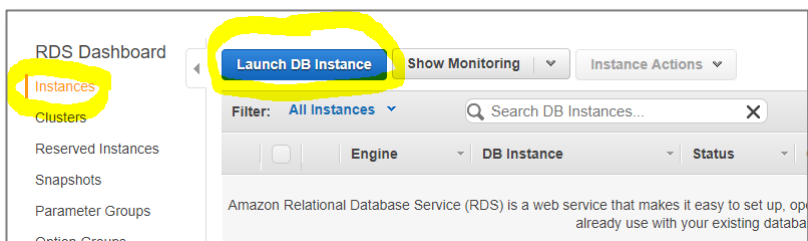
In this section, we will use the Relational Database Service to create a database. We will also connect in to the database.

From the AWS console select “RDS” from the Database services.



Select “instances”

Select “Launch DB Instance”



Select “Free tier eligible only”

Step 1: Select Engine

☒ Free tier eligible only ⓘ

Select Engine

To get started, choose a DB Engine below and click Select.

Amazon Aurora

Amazon Aurora is a MySQL- and PostgreSQL-compatible enterprise-class database, starting at <\$1/day.

- Up to 5 times the throughput of MySQL and 3 times the throughput of PostgreSQL.
- Up to 64TB of auto-scaling SSD storage.

Select the MySQL Community Edition

Step 1: Select Engine

☐ Free tier eligible only ⓘ

Select Engine

To get started, choose a DB Engine below and click Select.

MySQL

MySQL Community Edition

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 6 TB.
- Instances offer up to 32 vCPUs and 244 GiB Memory.
- Supports automated backup and point-in-time recovery.
- Supports cross-region read replicas.
- Free tier eligible

Select

Make sure “Only show options that are eligible for RDS Free Tier” is selected

Specify DB Details

Free Tier

The Amazon RDS Free Tier provides a single db.t2.micro instance as well as up to 20 GB of storage, allowing new AWS customers to gain hands-on experience with Amazon RDS. Learn more about the RDS Free Tier and the instance restrictions [here](#).

☒ Only show options that are eligible for RDS Free Tier

Select db.t2.micro instance class

Instance Specifications

DB Engine: mysql

License Model: general-public-license

DB Engine Version: MySQL 5.6.35

Review the [Known Issues/Limitations](#) to learn about potential compatibility issues with specific database versions.

DB Instance Class: **db.t2.micro — 1 vCPU, 1 GiB RAM**

Multi-AZ Deployment: No

Storage Type: General Purpose (SSD)

Allocated Storage*: 5 GB

Give your instance a name/identifier.

Fill in a master username and password

Click “Next Step”

Settings

DB Instance Identifier*

Master Username*

Master Password*

Confirm Password*

* Required

[Cancel](#) [Previous](#) [Next Step](#)

your AWS account in the current region. DB instance identifier is case insensitive, but stored as all lower-case, as in "mydbinstance". [Learn More](#).

Leave settings for Network and Security as below.

Configure Advanced Settings

Network & Security

VPC*

Subnet Group

Publicly Accessible

Availability Zone

VPC Security Group(s)

HTTP (VPC)

WordPress powered by Bitnami-4-8-0

default (VPC)

Enter a database name.

Leave other options default as below.

Database Options

Database Name

Note: If no database name is specified then no initial MySQL database will be created on the DB Instance.

Database Port

DB Parameter Group

Option Group

Copy Tags To Snapshots ☐

Enable IAM DB Authentication

Enable Encryption

Change "Backup Retention Period" to disable automated backups.

Click "Launch DB Instance"

Backup

Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail [here](#).

Backup Retention Period 0 days

A backup retention period of zero days will disable automated backups for this DB Instance.

Backup Window No Preference

Monitoring

Enable Enhanced Monitoring No

Maintenance

Auto Minor Version Upgrade Yes

Maintenance Window No Preference

* Required

Cancel Previous **Launch DB Instance**

The number of days for which automated backups are retained. Setting this parameter to a positive number enables backups. Setting this parameter to 0 disables automated backups.

Click "View your DB Instances"

Step 1: [Select Engine](#)

Step 2: [Production?](#)

Step 3: [Specify DB Details](#)

Step 4: [Configure Advanced Settings](#)

✓ Your DB Instance is being created.

Note: Your instance may take a few minutes to launch.

Connecting to your DB Instance

Once Amazon RDS finishes provisioning your DB instance, you can use a SQL client application or utility to connect to the instance.

[Learn about connecting to your DB instance](#)

View Your DB Instances

Your instance will show status "creating".

Filter: All Instances

Search DB Instances...

	Engine	DB Instance	Status	CPU	Current Activity	Maintenance	Class	VPC
	MySQL	backspace-intro-aws	creating			None	db.t2.micro	vpc-

Endpoint: Not available yet

Alarms and Recent Events

TIME (UTC+10)

EVENT

No Recent Events

Monitoring

	CURRENT VALUE	THRESHOLD	LAST HOUR		CURRENT VALUE	LAST HOUR
CPU	No Data	<div></div>	<div></div>		Read IOPS	No Data
Memory	No Data	<div></div>	<div></div>		Write IOPS	No Data
Storage	No Data	<div></div>	<div></div>		Swap Usage	No Data

Instance Actions

Tags

Logs

When you instance status changes to "available" you can view your configuration details which should look similar to below:

Endpoint: backspace-intro-aws.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com:3306 (authorized) ⓘ

Configuration Details		Security and Network	
ARN	arn:aws:rds:us-east-1:950302654420:db:backspace-intro-aws	Availability Zone	us-east-1e
Engine	MySQL 5.6.35	VPC	vpc-72d25a0b
License Model	General Public License	Subnet Group	default (Complete)
Created Time	September 14, 2017 at 11:05:21 AM UTC+10	Subnets	subnet-227d386a subnet-c0a2279a subnet-4770eb4b subnet-d6455ab3 subnet-a7b38b9b subnet-a9e06d85
DB Name	test	Security Groups	rds-launch-wizard-12 (sg-4b5c9f38) (active)
Username	admin	Publicly Accessible	Yes
Option Group	default:mysql-5-6 (in-sync)	Endpoint	backspace-intro-aws.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com
Parameter Group	default:mysql5.6 (in-sync)	Port	3306
Copy Tags To Snapshots	No	Certificate Authority	rds-ca-2015 (Mar 5, 2020)
Resource ID	db-LFEUQPMTOKOWINOI63CWPQRO	Instance and IOPS	
IAM DB Authentication Enabled	No	Instance Class	db.t2.micro ⓘ
		Storage Type	General Purpose (SSD)
		IOPS	disabled
		Storage	5 GB
		Monitoring Details	
		Enhanced Monitoring Enabled	No

Encryption Details		Availability and Durability		Maintenance Details	
Encryption Enabled	No	DB Instance Status	available	Auto Minor Version Upgrade	Yes
		Multi AZ	No	Maintenance Window	fri:03:26-fri:03:56
		Automated Backups	Disabled	Backup Window	Disabled
		Latest Restore Time	N/A	Pending Maintenance	None

Connecting to your RDS Instance using the MySQL WorkBench

To connect to your MySQL Database you will need to download and install the MySQL Workbench from

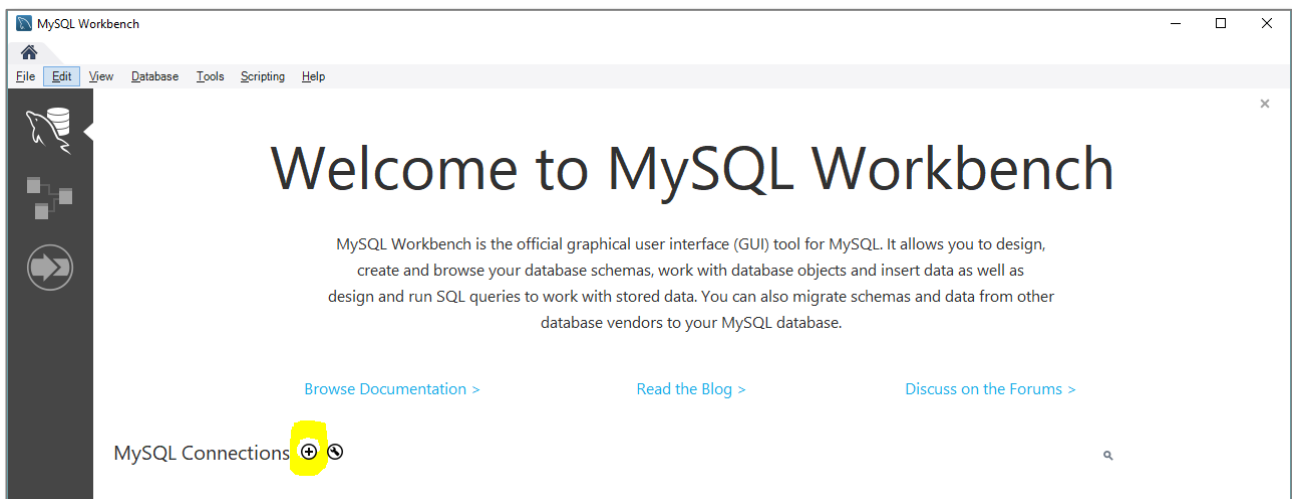
<https://dev.mysql.com/downloads/workbench/>

When your instance status is “available”, copy the database server endpoint

Endpoint: backspace-intro-aws.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com:3306 (authorized) ⓘ

Alarms and Recent Events		Monitoring	
TIME (UTC+10)	EVENT	CURRENT VALUE	THRESHOLD
Aug 14 6:32 PM	DB instance created	CPU	0.99%
Aug 14 6:32 PM	DB instance restarted	Memory	542 MB
		Storage	4,530 MB
		Read IOPS	0.55/sec
		Write IOPS	0.158/sec
		Swap Usage	0 MB

Open the MySQL Workbench application click to add a new connection



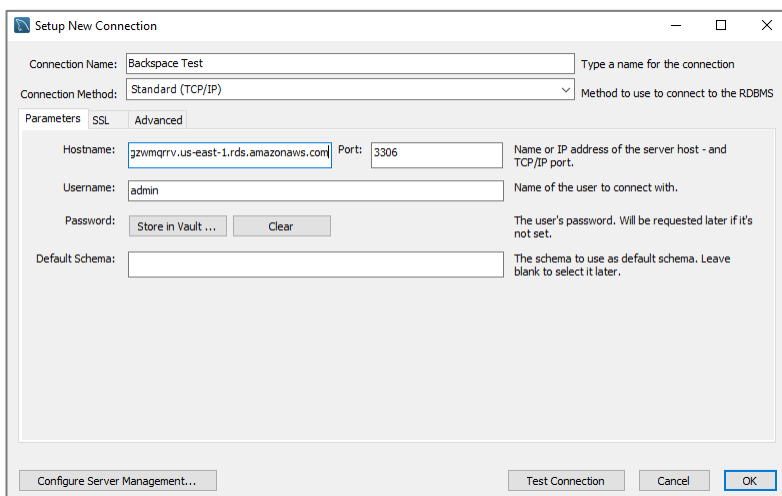
Give the connection a name.

The Hostname will be the RDS server endpoint with the “:3306” removed from the end.

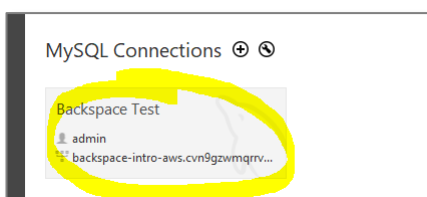
The port will be 3306.

The Username will be the master username we created in RDS (i.e. admin)

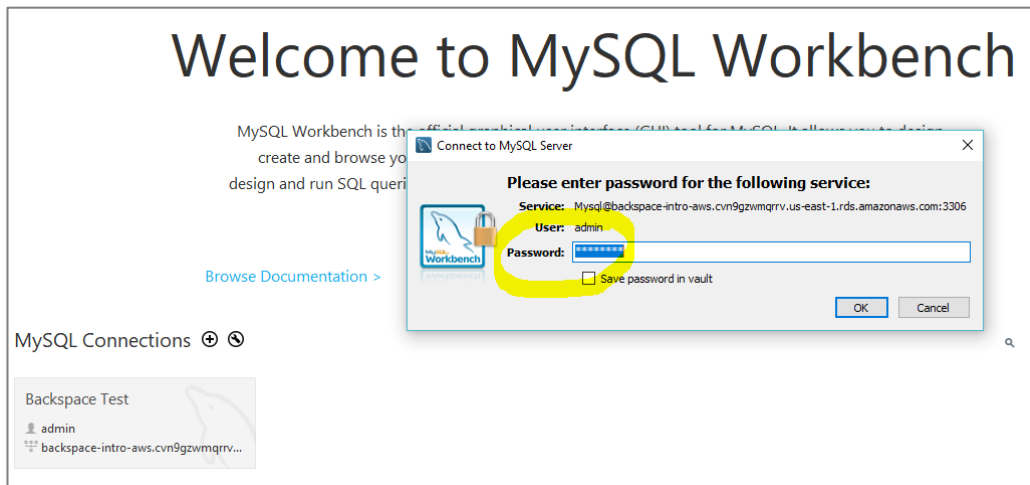
Click OK



Click on the Connection

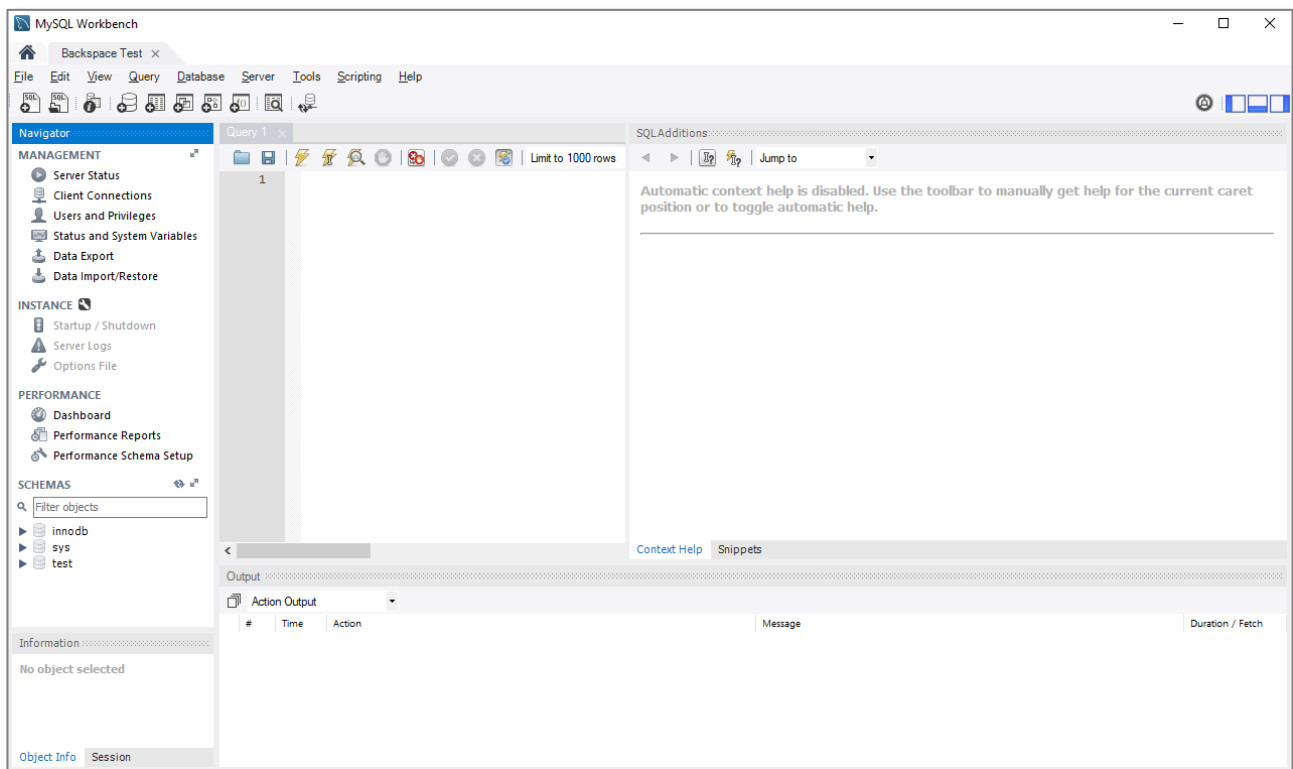


Enter the password you created in RDS for your master username

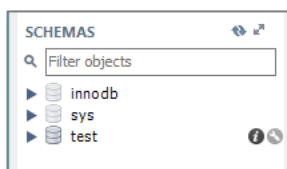


You will soon be connected to your database server

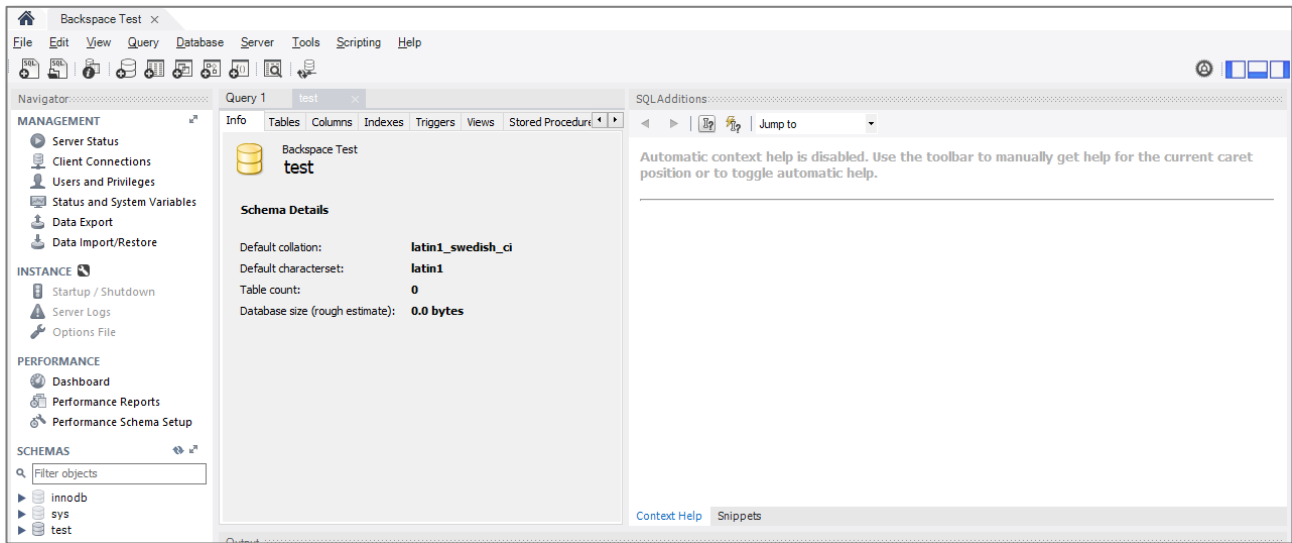
If have any problems connecting go to [Troubleshooting Connection Issues](#)



Hover over the “test” database under “SCHEMAS” and click the information icon to get information about the database that was created by us in RDS.



You then get an information screen for the database.

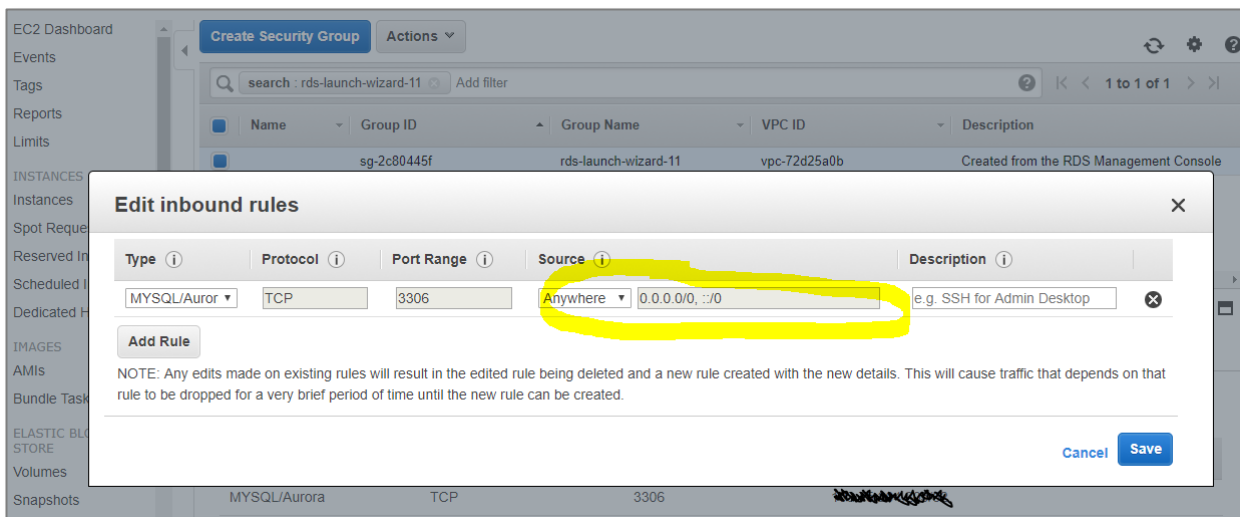


Troubleshooting Connection Issues

If you are getting connection errors then check the following:

Security Group Inbound Rules

The security group should have an inbound rule for your IP address. If you are using a dynamic IP address or you are connecting from different networks then this will need to be changed to “anywhere” for the lab.



Database Username and Password

The username and password must be the one created when the RDS instance was created.

Settings

DB Instance Identifier* backspace-intro-aws

Master Username* admin

Master Password*

Confirm Password*

* Required

Cancel Previous Next Step

your AWS account in the current region. DB instance identifier is case insensitive, but stored as all lower-case, as in "mydbinstance". [Learn More](#).

Hostname

The hostname will be the RDS Instance Connection Endpoint without :3306 on the end.

Connecting to your RDS Instance using the Command Line

To connect to your MySQL Database using the command line you will need to download and install the MySQL Shell from

<https://dev.mysql.com/downloads/shell/>

Download and Unzip the file.

Go to the bin folder and run mysqlsh.exe

This will open the MySQL Shell

```

F:\Backspace Technology\Backspace Academy\Courses\2017\AWS Associate\09 - RDS\mysql-shell-1.0.10-...
MySQL Shell 1.0.10
Copyright (c) 2016, 2017, Oracle and/or its affiliates. All rights reserved.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type '\help' or '? for help; '\quit' to exit.
Currently in JavaScript mode. Use \sql to switch to SQL mode and execute queries.
mysql-js>

```

Connect your database using the following command (if the username is admin):

```
\connect admin@your-connection-hostname-goes-here
```

Enter your password when requested.

After a while you will be connected to your RDS instance.

```

F:\Backspace Technology\Backspace Academy\Courses\2017\AWS Associate\09 - RDS\mysql-shell-1.0.10-...
MySQL Shell 1.0.10
Copyright (c) 2016, 2017, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type '\help' or '? for help; '\quit' to exit.

Currently in JavaScript mode. Use \sql to switch to SQL mode and execute queries.
mysql-js> \connect admin@backspace-intro-aws.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com
Creating a Session to 'admin@backspace-intro-aws.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com'
Enter password: *****
Your MySQL connection id is 47
Server version: 5.6.35 MySQL Community Server (GPL)
No default schema selected; type \use <schema> to set one.
mysql-js>

```

Enter SQL mode with the following command:

```
\sql
```

Enter the SQL command to list databases (don't forget the ';' on the end):

```
show databases;
```

```

mysql-js> \sql
Switching to SQL mode... Commands end with ;
mysql-sql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| innodb      |
| mysql      |
| performance_schema |
| sys        |
| test_database |
+-----+
6 rows in set (0.22 sec)
mysql-sql>

```

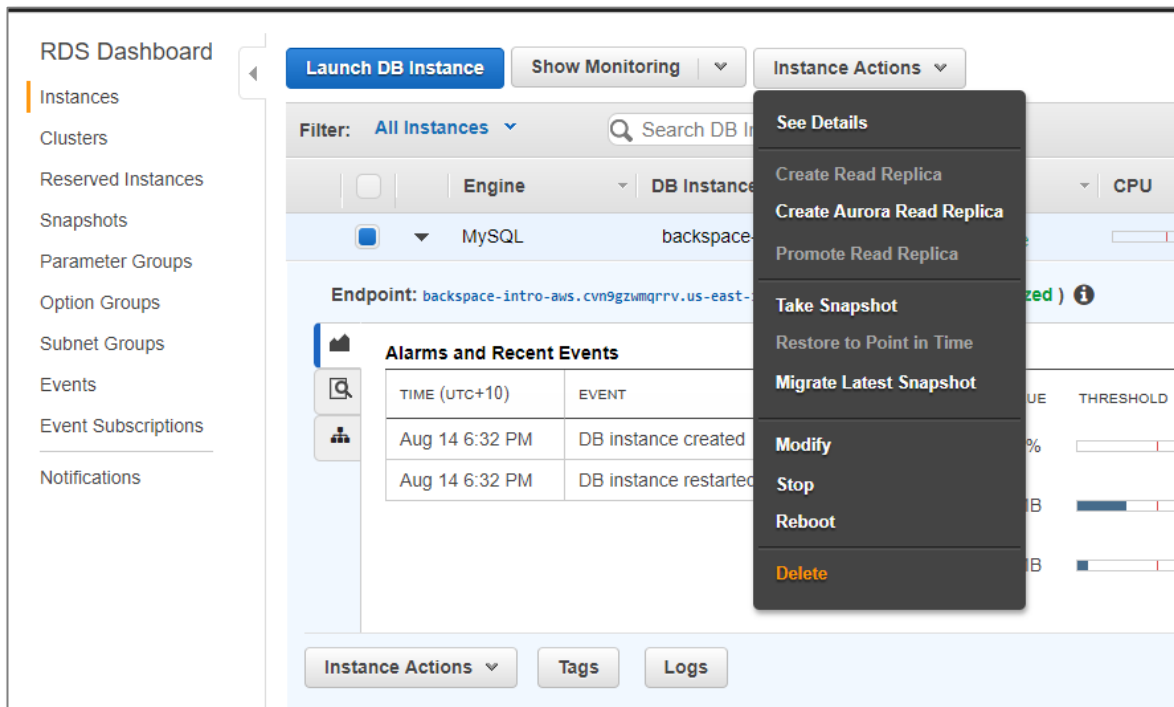
Type \quit to leave the command line

Clean Up

To avoid incurring charges from AWS we will terminate the instance.

Go back to the RDS console.

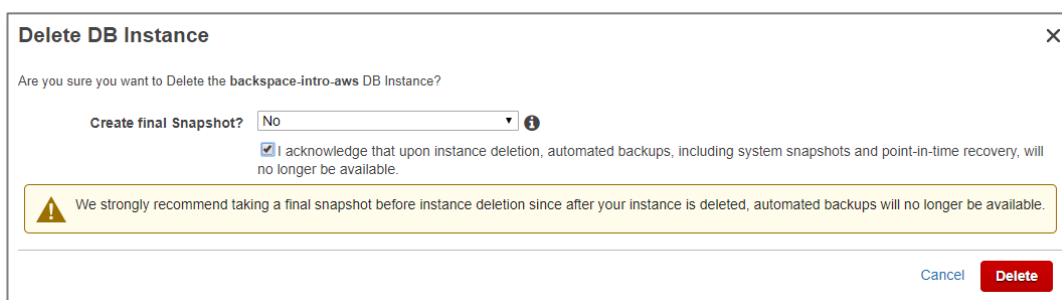
Click "Instance Actions", "Delete" to terminate the instance



Select "No" for "Create final snapshot"

Check "I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available."

Click "Delete"



▶ Deploying & Connecting to a PostgreSQL Database Server

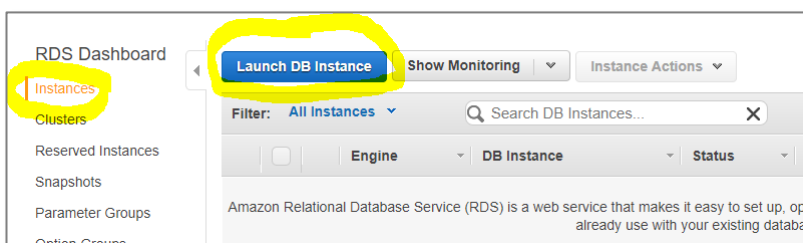
In this section, we will learn how to deploy and connect to a PostgreSQL RDS instance.

From the AWS console select “RDS” from the Database services.



Select “instances”

Select “Launch DB Instance”




Select “Free tier eligible only”

Step 1: Select Engine

☒ Free tier eligible only ⓘ

Select Engine

To get started, choose a DB Engine below and click Select.



Amazon Aurora

Amazon Aurora is a MySQL- and PostgreSQL-compatible enterprise-class database, starting at <\$1/day.

- Up to 5 times the throughput of MySQL and 3 times the throughput of PostgreSQL.
- Up to 64TB of auto-scaling SSD storage.


Select the PostgreSQL engine

Step 1: Select Engine

☒ Free tier eligible only ⓘ

Select Engine

To get started, choose a DB Engine below and click Select.



Amazon Aurora

PostgreSQL

PostgreSQL is a powerful, open-source object-relational database system with a strong reputation of reliability, stability, and correctness.

- High reliability and stability in a variety of workloads.
- Advanced features to perform in high-volume environments.
- Vibrant open-source community that releases new features multiple times per year.
- Supports multiple extensions that add even more functionality to the database.
- The most Oracle-compatible open-source database.
- Free tier eligible

Select

Make sure “Only show options that are eligible for RDS Free Tier” is selected

Select db.t2.micro instance class

Give your instance a name/identifier “testPostgreSQL”.

Fill in a master username administrator (username “admin” can’t be used with PostgreSQL) and password

Click “Next Step”

Settings

DB Instance Identifier* testPostgreSQL

Master Username* administrator

Master Password*

Confirm Password*

Retype the value you specified for Master Password.

* Required

Next Step

Select “create new security group”

Network & Security

VPC* Default VPC (vpc-72d25a0b)

Subnet Group default

Publicly Accessible Yes

Availability Zone No Preference

VPC Security Group(s)

- Create new Security Group
- HTTP (VPC)
- default (VPC)
- efs-sg (VPC)

Call the database sampledb

Database Options

Database Name sampledb

Database Port 5432

DB Parameter Group default:postgres9.6

Option Group default:postgres-9-6

Copy Tags To Snapshots ☐

Enable Encryption No

Set backup retention period to zero.

Click "Launch DB Instance"

Backup

Backup Retention Period 0 days

A backup retention period of zero days will disable automated backups for this DB Instance.

Backup Window No Preference

Monitoring

Enable Enhanced Monitoring No

Maintenance

Auto Minor Version Upgrade Yes

Maintenance Window No Preference

* Required

Cancel Previous Launch DB Instance

automated backups are retained. Setting this parameter to a positive number enables automated backups. Setting this parameter to 0 disables automated backups.

Click the refresh icon.

Wait for your instance state to change to available.

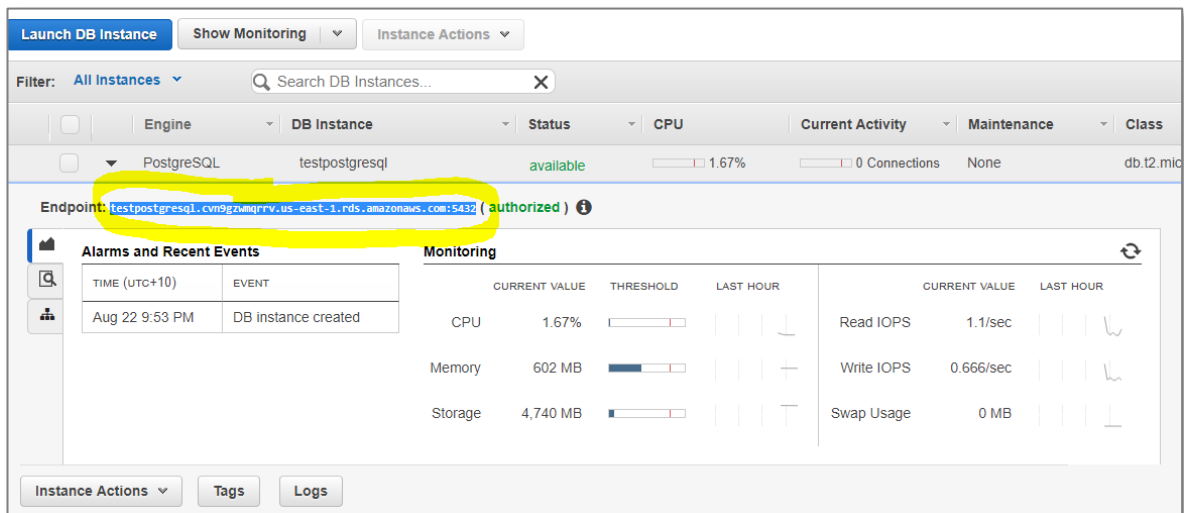
Launch DB Instance Show Monitoring Instance Actions

Filter: All Instances Search DB Instances... Viewing 1 of 1 DB Instances

	Engine	DB Instance	Status	CPU	Current Activity	Maintenance	Class	VPC	Multi-AZ	Read Replicas
<input type="checkbox"/>	PostgreSQL	testpostgresql	available	0 Connections	None	db.t2.micro	vpc-72d25a0b	No		

Connect to the Server using pgAdmin

Copy the server endpoint

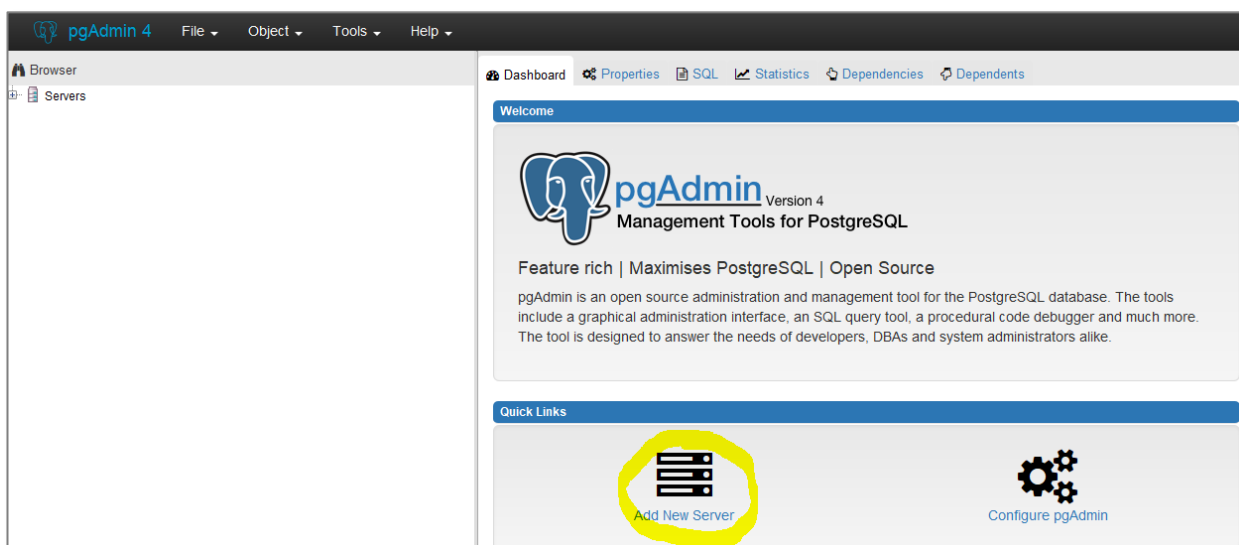


Download and install pgAdmin from:

<https://www.pgadmin.org/download/>

Open pgAdmin

Select "Add new server"



Enter connection name "testpostgresql"

Create - Server

General Connection Advanced

Name **testpostgres**

Server group Servers

Connect now? ☒

Comments

Either Host name or Host address must be specified.

Save Cancel Reset

Click on the "Connection" tab

Enter the RDS instance endpoint without :5432 on the end

Enter Port 5432

Enter the username "administrator" and password

Click "Save"

Create - Server

General Connection Advanced

Host name/address testpostgres.cvn9gzwmqrrv.us-east-1.rds.amazonaws

Port 5432

Maintenance database postgres

Username administrator

Password

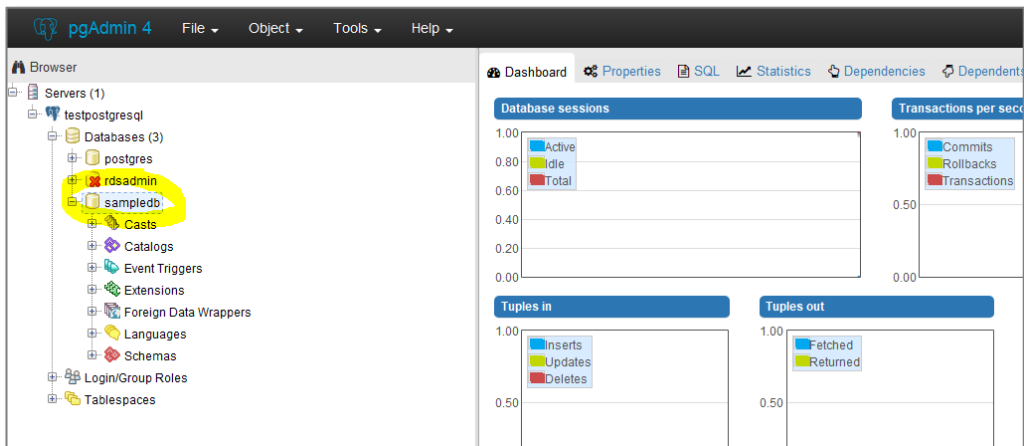
Save password? ☐

Role

SSL mode Prefer

Save Cancel Reset

You will now be connected to your database and will be able to navigate to see the sampled database



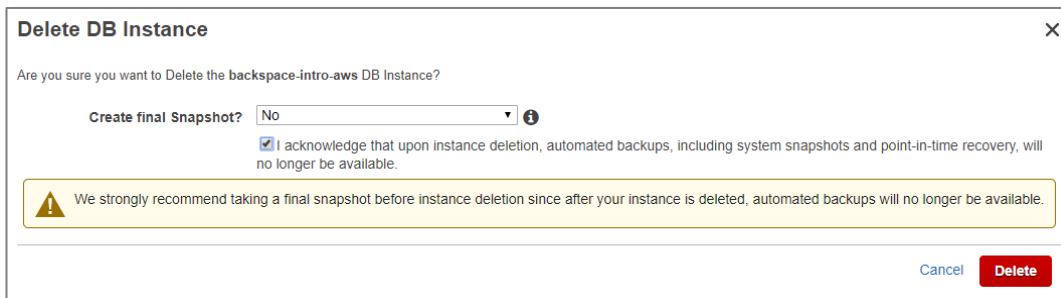
Clean Up

Go back to the RDS console and delete the instance

Select “No” for “Create final snapshot”

Check “I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available.”

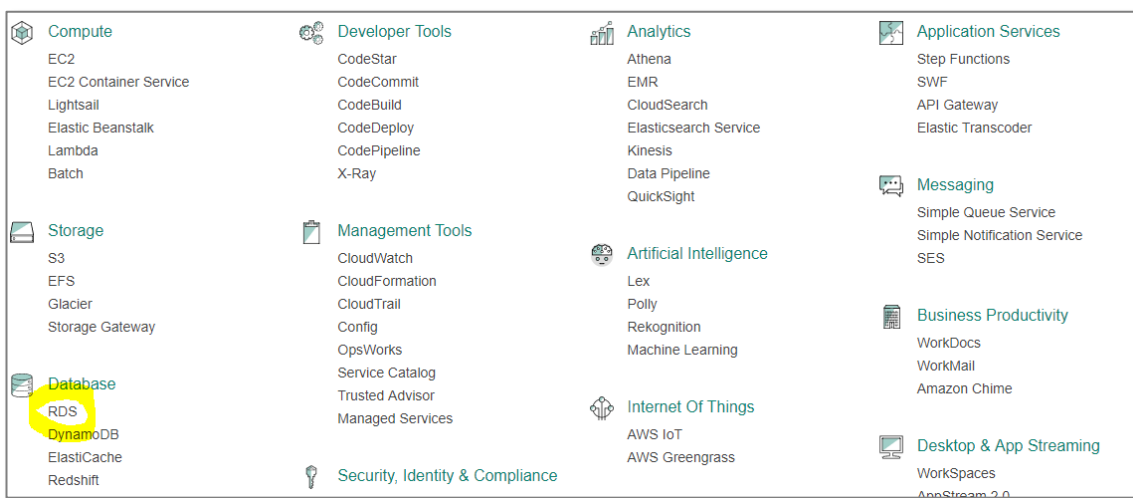
Click “Delete”



Deploying & Connecting to an Oracle Database Server

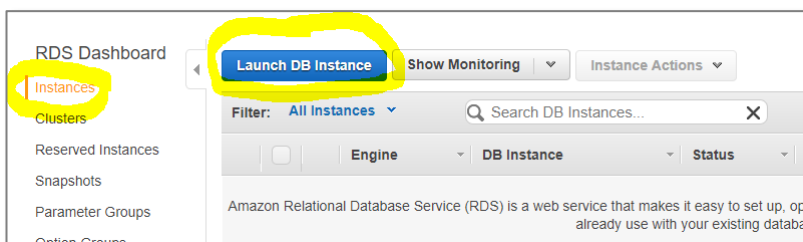
In this section, we will learn how to deploy and connect to an Oracle RDS instance.

From the AWS console select “RDS” from the Database services.

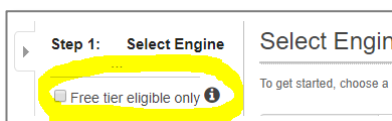


Select “instances”

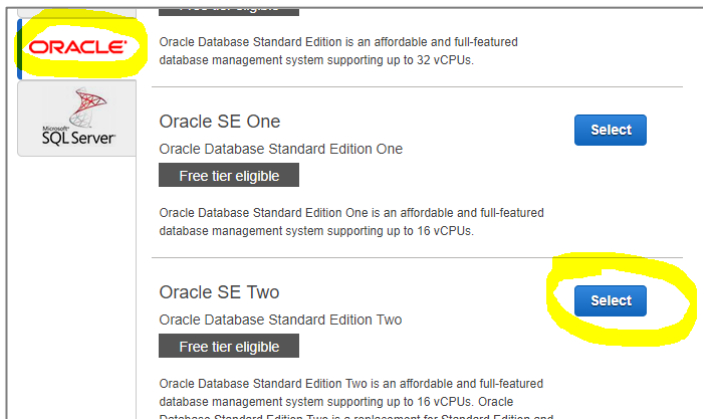
Select “Launch DB Instance”



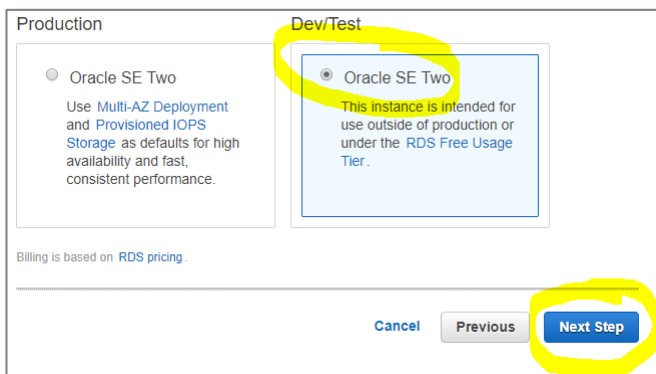
Licensed Oracle is not available on the free tier so uncheck “Free tier eligible only”



Select “Oracle SE Two”



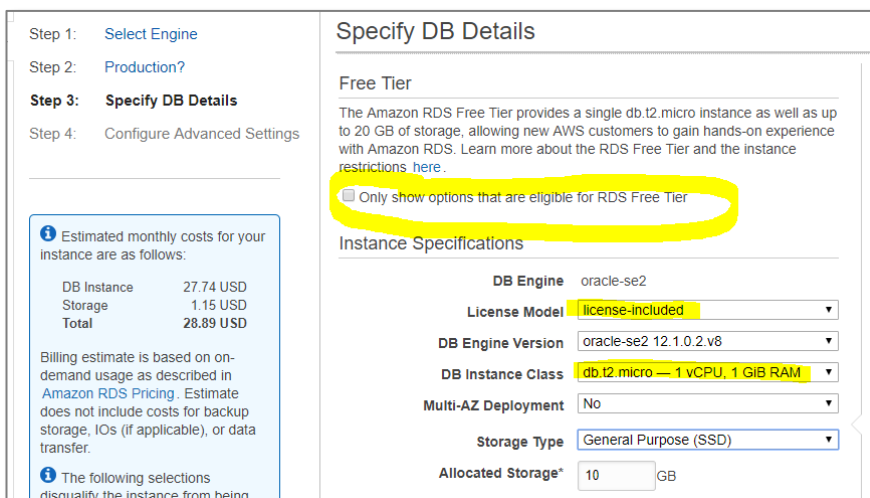
Select Dev/Test



Make sure Free tier is unchecked

Select "license-included" for License Model

Select db.t2.micro instance type



Give the server a name

Enter a username "admin" and create a password. Be sure to remember this.

Settings

DB Instance Identifier* backspace-rs-oracle

Master Username* admin

Master Password*

Confirm Password*

* Required

Cancel Previous **Next Step**

Select "Create new security group"

Network & Security

VPC* Default VPC (vpc-72d25a0b)

Subnet Group default

Publicly Accessible Yes

Availability Zone No Preference

VPC Security Group(s) **Create new Security Group**

HTTP (VPC)

default (VPC)

efs-sg (VPC)

Leave Database Options as is

Database Options

Database Name ORCL

Database Port 1521

DB Parameter Group default:oracle-se2-12.1

Option Group default:oracle-se2-12-1

Copy Tags To Snapshots ☐

Character Set Name AL32UTF8

Enable Encryption No

Disable automated backups

Click "Launch DB instance"

Backup

Backup Retention Period **0** days

A backup retention period of zero days will disable automated backups for this DB Instance.

Backup Window No Preference

Monitoring

Enable Enhanced Monitoring No

Maintenance

Auto Minor Version Upgrade Yes

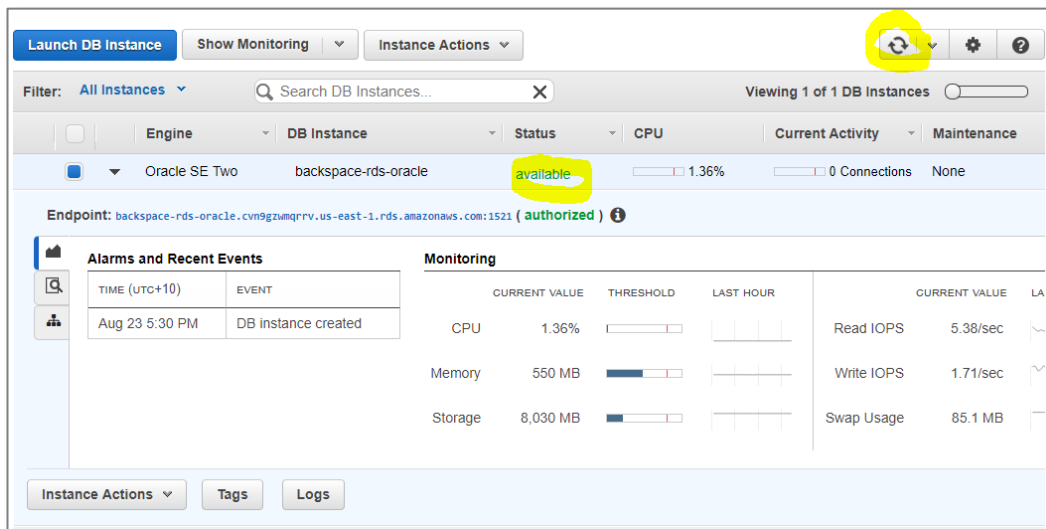
Maintenance Window No Preference

* Required

Cancel Previous **Launch DB Instance**

retained. Setting this p. to a positive number er backups. Setting this p to 0 disables automate backups.

Refresh screen and wait for status to be “available”



Connecting to the Oracle RDS Instance

Download and install Oracle SQL Developer from:

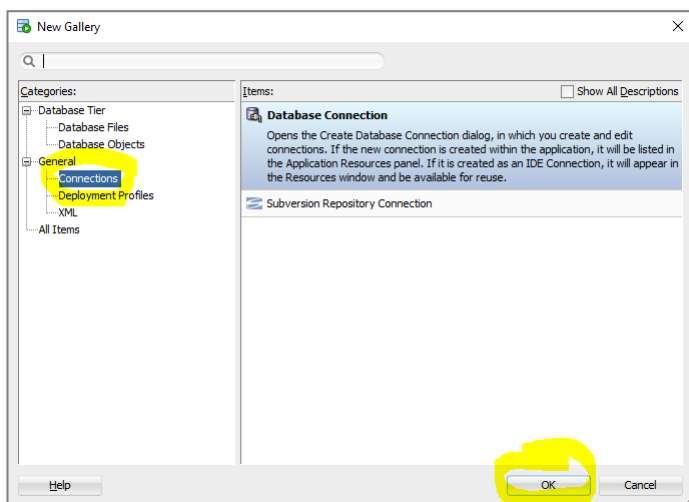
<http://www.oracle.com/technetwork/developer-tools/sql-developer/downloads/index.html>

Open SQL Developer

Select “File” – “New”

Select “Connections”

Click OK



Give the connection a name

Enter the database username and password

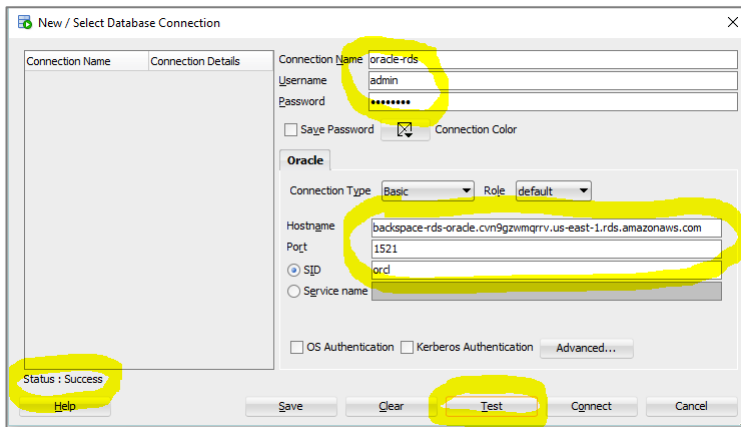
Enter the RDS Endpoint without :1521 on the end

Enter port as 1521

Enter SID as ORCL

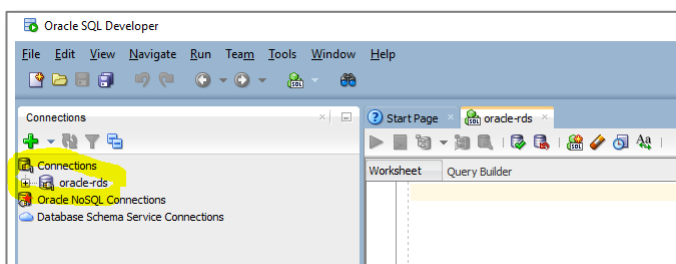
Click “Test”

Status should eventually be “success”



Click “Connect”

You will now see the new connection to the ORCL database in the treeview



Clean Up

Go back to the RDS console and delete the instance

Select “No” for “Create final snapshot”

Check “I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available.”

Click “Delete”

Delete DB Instance

×

Are you sure you want to Delete the `backspace-intro-aws` DB Instance?

Create final Snapshot? No ⓘ

☒ I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available.

⚠

We strongly recommend taking a final snapshot before instance deletion since after your instance is deleted, automated backups will no longer be available.

Cancel Delete

Deploying & Connecting to a Microsoft SQL Server Database

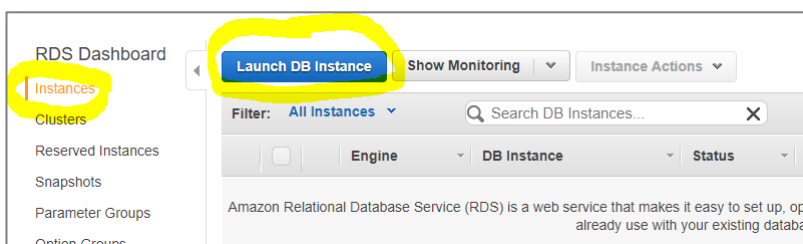
In this section, we will learn how to deploy and connect to an Microsoft SQL Server RDS instance.

From the AWS console select “RDS” from the Database services.



Select “instances”

Select “Launch DB Instance”




Select “Free tier eligible only”

Step 1: Select Engine


☒ Free tier eligible only ⓘ

Select Engine


To get started, choose a DB Engine below and click Select.


Amazon Aurora

Amazon Aurora is a MySQL- and PostgreSQL-compatible enterprise-class database, starting at <\$1/day.


MySQL

Up to 5 times the throughput of MySQL and 3 times the throughput of PostgreSQL.


PostgreSQL

Up to 64TB of auto-scaling SSD storage.


Select SQL Server Express

Step 1: Select Engine


☒ Free tier eligible only ⓘ

Select Engine


To get started, choose a DB Engine below and click Select.


Amazon Aurora


SQL Server Express
Microsoft SQL Server Express Edition
Free tier eligible


MySQL


Microsoft SQL Server Express Edition is an affordable database management system that supports database sizes up to 10 GB. Refer to [Microsoft's web site](#) for more details.


MariaDB


SQL Server Web
Microsoft SQL Server Web Edition


PostgreSQL

Microsoft SQL Server Web Edition is an efficient and affordable database management system. In accordance with Microsoft's licensing policies, it can only be used to support public and Internet-accessible webpages, websites, web applications, and web services. Refer to the [AWS Service Terms](#) for more details.


ORACLE

SQL Server SE


SQL Server

SQL Server SE

SQL Server Web is not eligible for free tier

Give your DB Instance a name

Create a username and password for the database

Settings

Free Tier Eligible Yes

DB Instance Identifier* backspace-rds-ms-sql-server

Master Username* admin

Master Password*

Confirm Password*

* Required

Cancel Previous **Next Step**

Select create "new security group"

Configure Advanced Settings

Network & Security

VPC* Default VPC (vpc-72d25a0b)

Subnet Group default

Publicly Accessible Yes

Availability Zone No Preference

VPC Security Group(s) Create new Security Group

Change Backup retention period to zero.

Click "Launch DB Instance"

Backup

Backup Retention Period 0 days

A backup retention period of zero days will disable automated backups for this DB Instance.

Backup Window No Preference

Monitoring

Enable Enhanced Monitoring No

Maintenance

Auto Minor Version Upgrade Yes

Maintenance Window No Preference

* Required

Cancel Previous Launch DB Instance

Refresh and wait for the instance state to change from "creating" to "available"

Launch DB Instance Show Monitoring Instance Actions

Filter: All Instances Search DB Instances... Viewing 1 of 1 DB Instances

Engine	DB Instance	Status	CPU	Current Activity	Maintenance
SQL Server Express	backspace-rds-ms-sql-server	available	39.00%	0 Connections	None

Endpoint: backspace-rds-ms-sql-server.cv9gzwmqrrv.us-east-1.rds.amazonaws.com:1433 (authorized)

Connecting to the Database Using the Windows Command Line

Use sqlcmd from the Windows command line to connect to your database with the following command:

sqlcmd -S *rds_endpoint_goes_here*\SQLEXPRESS,1433 -U*username_goes_here* -P*password_goes_here*

```
sqlcmd -S backspace-rds-ms-sql-server.cv9gzwmqrrv.us-east-1.rds.amazonaws.com\SQLEXPRESS,1433 -Uadmin -P12345678
```

Connecting to the Database Using SQL Management Studio

Download and install SQL Server Management Studio from:

<https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms>

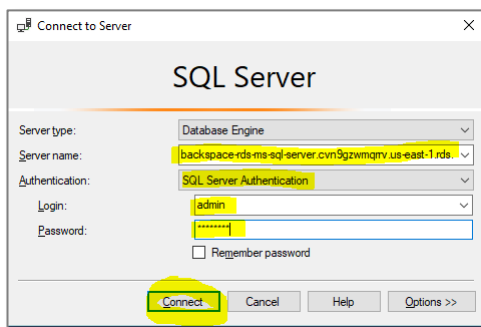
Open the app after installing

Enter in "Server name" the RDS endpoint without the :1433

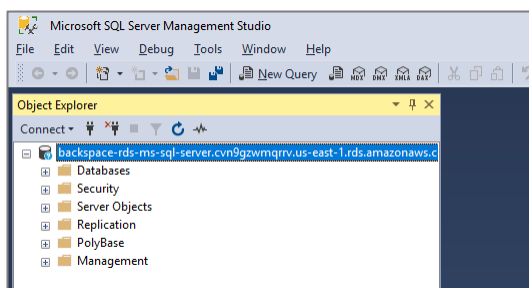
Select "SQLServer Authentication"

Enter the username and password

Click "Connect"



You will eventually be connected to your RDS database server



Clean up

To avoid incurring charges from AWS we will terminate the instance.

Go back to the RDS console.

Select the instance and delete.

Select "No" for "Create final snapshot"

Check "I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available."


Click “Delete”

Delete DB Instance ✕

Are you sure you want to Delete the `backspace-intro-aws` DB Instance?

Create final Snapshot? No ⓘ

☒ I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available.

 We strongly recommend taking a final snapshot before instance deletion since after your instance is deleted, automated backups will no longer be available.

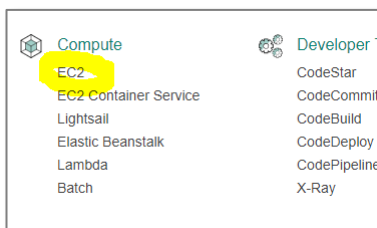
Cancel Delete

▶ Migrating from Oracle to Aurora Using AWS Database Migration Service

In this section, we will learn how to migrate an Oracle database to AWS Aurora using the AWS Database Migration Service.

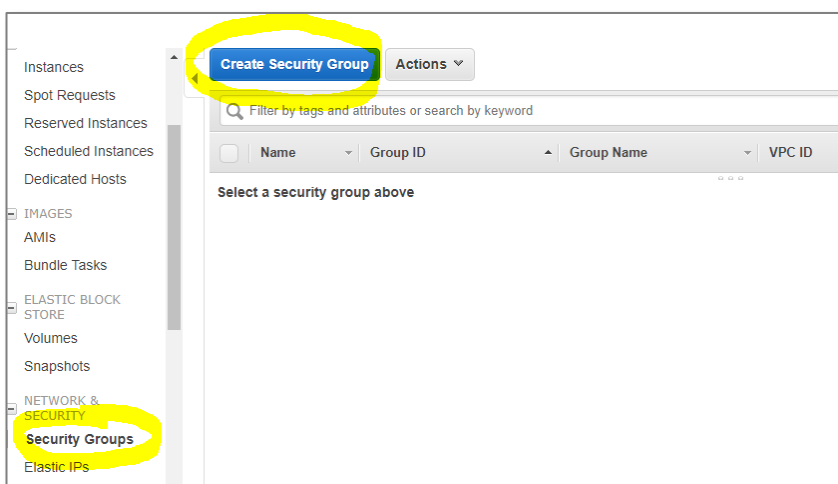
Create a Security Group

From the AWS console select “EC2” from the Compute services.



Select “Security Groups” from the side menu

Click “Create Security Group”



Give the Security the name “oracle-aurora-migration” and a description

Add an inbound rule for MySQL access. You can use “anywhere” for source although in a production environment you should select “My IP”

Click “Create”

Create Security Group

Security group name: mysql-migration

Description: Migration of MySQL databases

VPC: vpc-72d25a0b (default)

Security group rules:

Inbound | Outbound

Type	Protocol	Port Range	Source
MYSQL/Aurora	TCP	3306	Anywhere

Add Rule

Cancel Create

Click the refresh icon to see your security group

Create Security Group Actions

Filter by tags and attributes or search by keyword

Name	Group ID	Group Name	VPC ID	Description
ssh	sg-1d343e6c	ssh	vpc-72d25a0b	SSH only access
mysql-migration	sg-4caa293c	mysql-migration	vpc-72d25a0b	Migration of MySQL databases
rds-launch-wizard	sg-557c3624	rds-launch-wizard	vpc-72d25a0b	Created from the RDS Management Co...
efs-sg	sg-72245303	efs-sg	vpc-72d25a0b	EFS security group
default	sg-78fc6409	default	vpc-72d25a0b	default VPC security group
HTTP	sg-ffcd38e	HTTP	vpc-72d25a0b	launch-wizard-6 created 2017-08-01T2...

Select a security group above

Copy the Security Group ID

Select “Actions” – “Edit inbound rules”

Create Security Group Actions

Filter by tags and attributes or search by keyword

Name	Group ID	Group Name	VPC ID	Description
ssh	sg-1d343e6c	ssh	vpc-72d25a0b	SSH only access
mysql-migration	sg-4caa293c	mysql-migration	vpc-72d25a0b	Migration of MySQL databases
rds-launch-wizard	sg-557c3624	rds-launch-wizard	vpc-72d25a0b	Created from the RDS Management Co...

Create an inbound rule for type “All traffic” and source the Security group ID (type “sg” for a list)

Edit inbound rules

Type	Protocol	Port Range	Source
MySQL/Aurora	TCP	3306	Custom 0.0.0.0/0
MySQL/Aurora	TCP	3306	Custom ::/0
All traffic	All	0 - 65535	Custom sg-

Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created depends on that rule to be dropped for a very brief period of time until the new rule can be created.

- sg-1d343e6c - ssh
- sg-4caa293c - mysql-migration
- sg-557c3624 - rds-launch-wizard
- sg-72245303 - efs-sg
- sg-78fc6409 - default
- sg-ffcfd38e - HTTP

Click Save

Edit inbound rules

Type	Protocol	Port Range	Source
MySQL/Aurora	TCP	3306	Custom 0.0.0.0/0
MySQL/Aurora	TCP	3306	Custom ::/0
All traffic	All	0 - 65535	Custom sg-4caa293c

Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

Cancel Save

Create Source MySQL database

Select "Launch DB Instance"

RDS Dashboard

Instances

Launch DB Instance

Show Monitoring Instance Actions

Filter: All Instances Search DB Instances...

Engine	DB Instance	Status
Amazon Relational Database Service (RDS) is a web service that makes it easy to set up, operate, and scale a relational database in the cloud. It is designed to make it easy to use existing relational database engines and is compatible with a wide range of applications and tools. You can use RDS to launch instances of the MySQL, PostgreSQL, Oracle, and Microsoft SQL Server database engines. You can also use RDS to launch instances of the Amazon Aurora database engine. For more information, see Amazon Relational Database Service (RDS) in the Amazon Web Services (AWS) User Guide.		

Select "Free tier eligible only"

Step 1: Select Engine

☒ Free tier eligible only ⓘ

Select Engine

To get started, choose a DB Engine below and click Select.

Amazon Aurora

Amazon Aurora

Amazon Aurora is a MySQL- and PostgreSQL-compatible enterprise-class database, starting at <\$1/day.

- Up to 5 times the throughput of MySQL and 3 times the throughput of PostgreSQL.
- Up to 64TB of auto-scaling SSD storage.

MySQL

MariaDB

Select the MySQL Community Edition

Step 1: Select Engine

☐ Free tier eligible only ⓘ

Select Engine

To get started, choose a DB Engine below and click Select.

Amazon Aurora

MySQL

MySQL Community Edition

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 6 TB.
- Instances offer up to 32 vCPUs and 244 GiB Memory.
- Supports automated backup and point-in-time recovery.
- Supports cross-region read replicas.
- Free tier eligible

MySQL

MariaDB

Make sure “Only show options that are eligible for RDS Free Tier” is selected

Specify DB Details

Free Tier

The Amazon RDS Free Tier provides a single db.t2.micro instance as well as up to 20 GB of storage, allowing new AWS customers to gain hands-on experience with Amazon RDS. Learn more about the RDS Free Tier and the instance restrictions [here](#).

☒ Only show options that are eligible for RDS Free Tier

Select db.t2.micro instance class

Instance Specifications

DB Engine mysql

License Model general-public-license ▼

DB Engine Version MySQL 5.6.35 ▼

Review the [Known Issues/Limitations](#) to learn about potential compatibility issues with specific database versions.

DB Instance Class db.t2.micro — 1 vCPU, 1 GiB RAM ▼

Multi-AZ Deployment No ▼

Storage Type General Purpose (SSD) ▼

Allocated Storage* 5 GB

Give your instance a name/identifier.

Fill in a master username and password

Click “Next Step”

Settings

DB Instance Identifier* sourcedb

Master Username* admin

Master Password*

Confirm Password*

Retype the value you specified for Master Password.

* Required

Cancel Previous **Next Step**

Select the security group

Configure Advanced Settings

Network & Security

VPC* Default VPC (vpc-72d25a0b)

Subnet Group default

Publicly Accessible Yes

Availability Zone No Preference

VPC Security Group(s)

- default (VPC)
- efs-sg (VPC)
- mysql-migration (VPC)**
- rds-launch-wizard (VPC)

Enter database name "testdb"

Leave other options default as below.

Database Options

Database Name testdb

Note: if no database name is specified then no initial MySQL database will be created on the DB Instance.

Database Port 3306

DB Parameter Group default.mysql5.6

Option Group default.mysql-5-6

Copy Tags To Snapshots ☐

Enable IAM DB Authentication No Preference

Enable Encryption No

Change "Backup Retention Period" to disable automated backups.

Click "Launch DB Instance"

Backup

Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail [here](#).

Backup Retention Period 0 days

A backup retention period of zero days will disable automated backups for this DB Instance.

Backup Window No Preference

Monitoring

Enable Enhanced Monitoring No

Maintenance

Auto Minor Version Upgrade Yes

Maintenance Window No Preference

* Required

Cancel Previous **Launch DB Instance**

The number of days for which automated backups are retained. Setting this parameter to a positive number enables backups. Setting this parameter to 0 disables automated backups.

Click "View your DB Instances"

Step 1: [Select Engine](#)

Step 2: [Production?](#)

Step 3: [Specify DB Details](#)

Step 4: [Configure Advanced Settings](#)

✓ Your DB Instance is being created.

Note: Your instance may take a few minutes to launch.

Connecting to your DB Instance

Once Amazon RDS finishes provisioning your DB instance, you can use a SQL client application or utility to connect to the instance.

[Learn about connecting to your DB instance](#)

View Your DB Instances

Your instance will show status "creating".

Engine: MySQL DB Instance: sourcedb Status: **creating** CPU: None Current Activity: None Maintenance: None Class: db.t2.micro

Endpoint: not available yet

Alarms and Recent Events

TIME (UTC+10)	EVENT
Aug 22 3:01 PM	DB instance deleted
Aug 22 2:58 PM	DB instance shutdown
Aug 22 1:21 PM	DB instance created
Aug 22 11:34 AM	DB instance deleted
Aug 22 11:31 AM	DB instance shutdown
Aug 22 7:56 AM	DB instance created
Aug 21 11:53 PM	DB instance deleted
Aug 21 11:50 PM	DB instance shutdown
Aug 21 9:55 PM	DB instance created

Monitoring

	CURRENT VALUE	THRESHOLD	LAST HOUR
CPU	1.19%		
Memory	539 MB		
Storage	8,030 MB		

	CURRENT VALUE	LAST HOUR
Read IOPS	4.51/sec	
Write IOPS	1.5/sec	
Swap Usage	101 MB	

Instance Actions Tags Logs

Create Target Database

Create another RDS instance with exactly the same settings as before but with a DB Instance Identifier “targetdb”

Settings

DB Instance Identifier* targetdb

Master Username* admin

Master Password*

Confirm Password*

Retype the value you specified for Master Password.

* Required

Cancel Previous Next Step

Use the same settings as before for security group, Database Name and Backup retention period:

Network & Security

VPC* Default VPC (vpc-72d25a0b)

Subnet Group default

Publicly Accessible Yes

Availability Zone No Preference

VPC Security Group(s) **mysql-migration (VPC)**

Database Options

Database Name **testdb**

Note: if no database name is specified then no initial MySQL database will be created on the DB Instance.

Database Port 3306

DB Parameter Group default.mysql5.6

Option Group default.mysql-5-6

Copy Tags To Snapshots

Enable IAM DB Authentication No Preference

Enable Encryption No

Backup

Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail [here](#).

Backup Retention Period 0 days

Connecting to the Source Database

Connect to the source database using the MySQL Shell:

```
\connect admin@your-connection-hostname-goes-here
```

```

λ mysqlsh.exe
MySQL Shell 1.0.10

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affiliates. Other names may be trademarks of their respective
owners.

Type '\help' or '\?' for help; '\quit' to exit.

Currently in JavaScript mode. Use \sql to switch to SQL mode and execute queries.
mysql-js> \connect admin@sourcedb.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com:3306
Creating a Session to 'admin@sourcedb.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com:3306'
Enter password: *****
Your MySQL connection id is 26
Server version: 5.6.35 MySQL Community Server (GPL)
No default schema selected; type \use <schema> to set one.
mysql-js>

```

Set active database as testdb:

```
\use testdb
```

```

mysql-js> \use testdb
Schema set to 'testdb'.
mysql-js>

```

Change to SQL mode

```
\sql
```

```

mysql-js> \sql
Switching to SQL mode... Commands end with ;
mysql-sql>

```

Create a table called migrate (don't forget the ";" at the end):

```
create table sample (name varchar(20));
```

```

mysql-sql> create table sample (name varchar(20));
Query OK, 0 rows affected (0.27 sec)
mysql-sql>

```

Check it is there:

```
show tables;
```

```

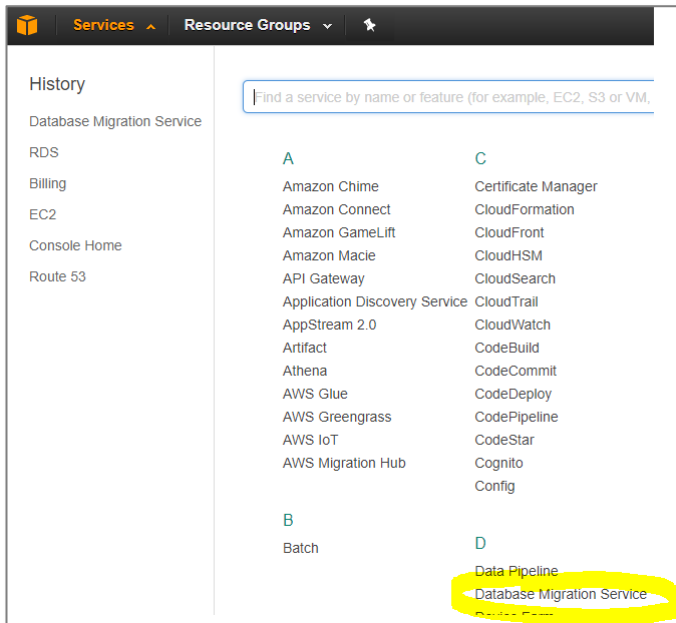
mysql-sql> show tables;
+-----+
| Tables_in_testdb |
+-----+
| sample           |
+-----+
1 row in set (0.25 sec)
mysql-sql>

```

DO NOT change the target database as this table will be migrated across with the AWS Database Migration Service

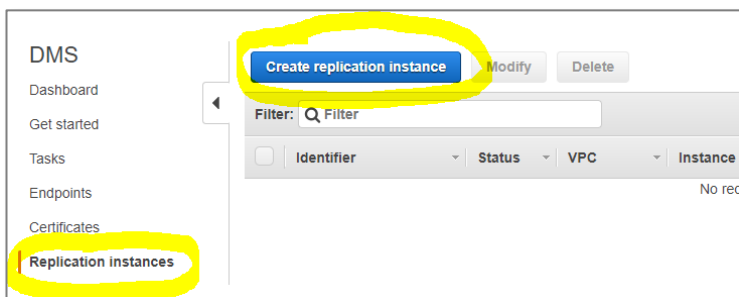
Creating an AWS Database Migration Service Job

Select “AWS Database Migration Service” from the services menu.



Create Replication Instance

Select “Replication Instances” from the side menu
Click “Create Replication Instance”



Give it a name and description
Set the instance class to t2.micro

Create replication instance

A replication instance initiates the connection between the source and target databases, transfers the data, and caches any changes that occur on the source database during the initial data load. Use the fields below to configure the parameters of your new replication instance including network and security information, encryption details, and performance characteristics. We suggest you shut down the replication instance once your migration is complete to prevent further usage charges.

Name* ⓘ

Description* ⓘ

Instance class* ⓘ

VPC* ⓘ

Multi-AZ ⓘ

Publicly accessible ☒ ⓘ

Select “Advanced”

Select your security group

▼ Advanced

Allocated storage (GB)*

Replication Subnet Group* ⓘ

Availability zone* ⓘ

VPC Security Group(s) ⓘ

- Use default -
- ssh
- mysql-migration
- rds-launch-wizard

Click “Create replication instance”

Create replication instance

Modify

Delete







Filter:

<input type="checkbox"/>	Identifier	Status	VPC	Instance class	Availability zone	IP address	Public	M
<input type="checkbox"/>	mysql-replication	creating	vpc-72d25a0b	dms.t2.micro			Yes	No

Create Source and Target Database Endpoints

Wait until the replication instance status is available.

Create replication instance					
Modify					
Delete					
Filter: Q Filter					
Identifier	Status	VPC	Instance class	Availability zone	IP address
mysql-replication	available	vpc-72d25a0b	dms.t2.micro	us-east-1d	34.233.30.30

Select "Endpoints" from the side menu
Click "Create endpoint"

DMS
Dashboard
Get started
Tasks
Endpoints

Create endpoint

Modify

Test connection

Refresh schemas

Delete

Filter: Q Filter

Identifier	Type	Status	Engine	Server name
No records found.				

Enter the following:

Endpoint type – source

Endpoint identifier – sourcedb

Source engine – mysql

Server name – RDS source database endpoint without :3306 on the end

Port – 3306

SSL mode - None

Create database endpoint

A database endpoint is used by the replication server to connect to a database. The database specified in the endpoint can be on-premise, on RDS, in EC2 or in the cloud. Details should be specified in the form below. It is recommended that you test your endpoint connections here to avoid errors during processing.

Endpoint type*

Source

Target

Endpoint identifier*

sourcedb

Source engine*

mysql

Server name*

sourcedb.cvn9gzwmqrnv.us-east-1.rds.amazonaws.com

Port*

3306

SSL mode*

none

Enter the username and password for the instance

User name*

admin

Password*

Now test the endpoint connection to the replication instance

▼ Test endpoint connection (optional)

Test your endpoint connection by selecting a replication instance within your desired VPC. After clicking "Run test", an endpoint will be created with the details provided and attempt to connect to the instance. If the connection fails, you can edit and test it again. Endpoints that aren't saved will be deleted.

VPC* vpc-72d25a0b

Replication instance* mysql-replication - vpc-72d25a0b ⓘ

☒ Refresh schemas after successful connection test ⓘ

Run test

Testing endpoint connection...

If connection test is successful click save:

(If not successful check your RDS security groups)

Run test

✓ Connection tested successfully

Cancel Save

Select "Create endpoint and do the same process for the target database:

Create database endpoint

A database endpoint is used by the replication server to connect to a database. The database specified in the endpoint can be on-premise, on RDS, in EC2 or in the cloud. Details should be specified in the form below. It is recommended that you test your endpoint connections here to avoid errors during processing.

Endpoint type* ☐ Source ☒ Target ⓘ

Endpoint identifier* targetdb ⓘ

Target engine* mysql ⓘ
We recommend Aurora. Amazon Aurora is a high-performance, MySQL-compatible, enterprise-class database at a tenth the cost of commercial databases. [Learn more](#)

Server name* targetdb.cv9gzwmqrrv.us-east-1.rds.amazonaws.com ⓘ

Port* 3306 ⓘ

SSL mode* none ⓘ

Test the target connection and if successful click save:

▼ Test endpoint connection (optional)

Test your endpoint connection by selecting a replication instance within your desired VPC. After clicking "Run test", an endpoint will be created with the details provided and attempt to connect to the instance. If the connection fails, you can edit and test it again. Endpoints that aren't saved will be deleted.

VPC* vpc-72d25a0b

Replication instance* mysql-replication - vpc-72d25a0b ⓘ

☒ Refresh schemas after successful connection test ⓘ

Run test

✓ Connection tested successfully

Cancel Save

Both your endpoints should now be active

Create endpoint Modify Test connection Refresh schemas Delete									
Filter: Q Filter									
<input type="checkbox"/>	Identifier	Type	Status	Engine	Server name	Port	Migration Hub Mapping	ARN	
<input type="checkbox"/>	sourcedb	source	active	mysql	sourcedb.cvn9gzwmqrrv.us-e	3306		arn:	
<input type="checkbox"/>	targetdb	target	active	mysql	targetdb.cvn9gzwmqrrv.us-e	3306		arn:	

Create a Migration Task

Select "tasks" from the side menu and click "create task"

DMS

Dashboard

Get started

Tasks

Create task Modify Start/Resume Stop Delete

Filter: Q Filter

<input type="checkbox"/>	ID	Status	Source	Target
--------------------------	----	--------	--------	--------

Give the task a name

When finished status will be “Load complete”

45

When finished status will be “Load complete”

45

When finished status will be “Load complete”

When finished status will be “Load complete”

45

ID	Status	Source	Target	Type	Complete %	Elapsed time	Tables
migrate-tables	Load complete	sourcedb	targetdb	Full Load	100	0m	1

Now connect to the target database using the MySQL Shell to see if the table was migrated.

Connect to the source database using the MySQL Shell:

`\connect admin@your-connection-hostname-goes-here`

```
mysql-sql> \connect admin@targetdb.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com:3306
Creating a Session to 'admin@targetdb.cvn9gzwmqrrv.us-east-1.rds.amazonaws.com:3306'
Enter password: *****
Closing old connection...
Your MySQL connection id is 54
Server version: 5.6.35 MySQL Community Server (GPL)
No default schema selected; type \use <schema> to set one.
mysql-sql>
```

Set active database as testdb:

`\use testdb`

```
mysql-js> \use testdb
Schema set to `testdb`.
mysql-js>
```

Change to SQL mode

`\sql`

```
mysql-js> \sql
Switching to SQL mode... Commands end with ;
mysql-sql>
```

Check the sample table is there:

`show tables;`

```
mysql-sql> show tables;
+-----+
| Tables_in_testdb |
+-----+
| sample           |
+-----+
1 row in set (0.25 sec)
mysql-sql>
```

`\quit` to end connection

Clean Up

Go back to the AWS Database Migration Service console delete the task, terminate the replication instance and delete the endpoints.

Go back to the RDS console and delete the RDS instances.