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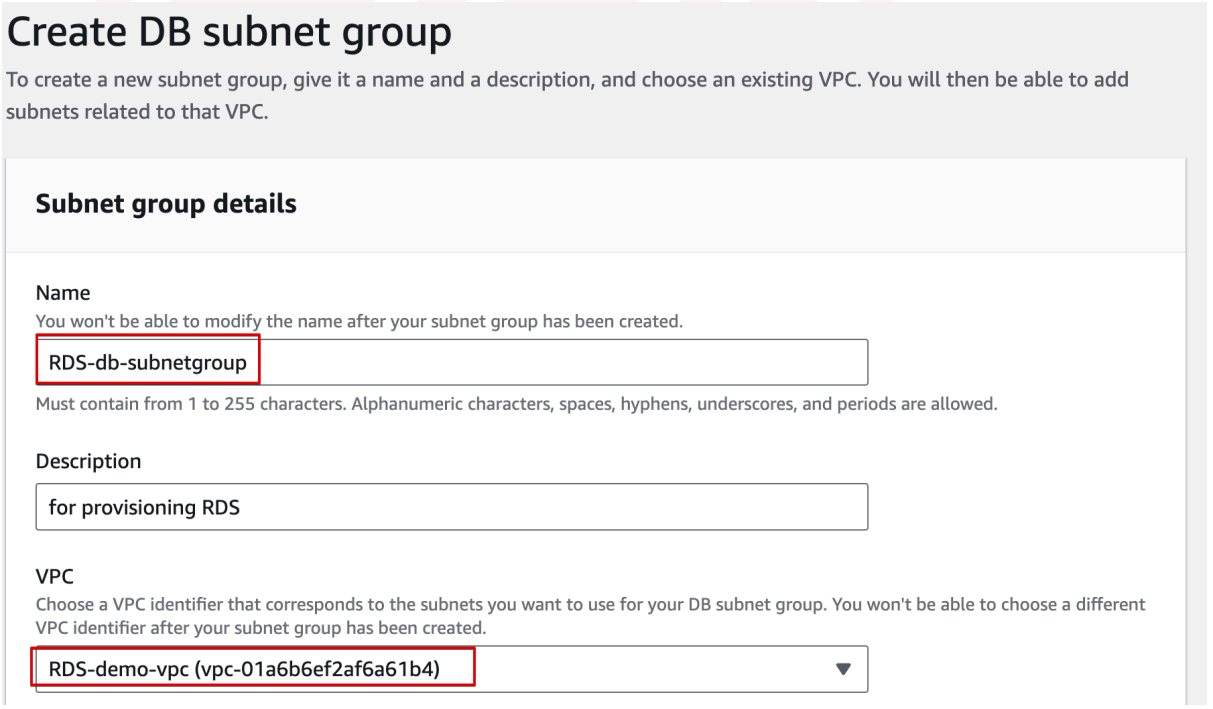
Working with MYSQL RDS

Use case: Create and Access and perform some CRUD in MYSQL RDS

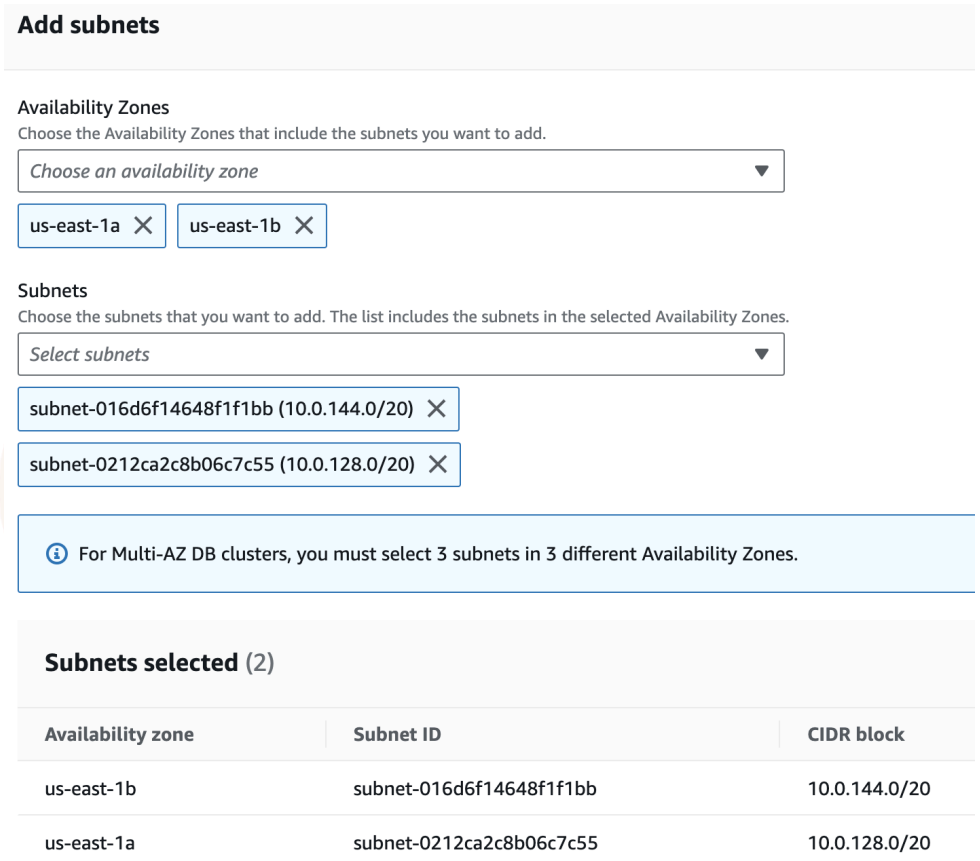
Prerequisites:

1. VPC: **use VPC-and_more**
2. Bastion Host (**check previous runbooks for bastion setting**.)
3. DB Subnet Group
4. Security Groups for DB and Instance communication (will be auto generated using RDS)

- Navigate to RDS Console
- Create a DB subnet group for RDS



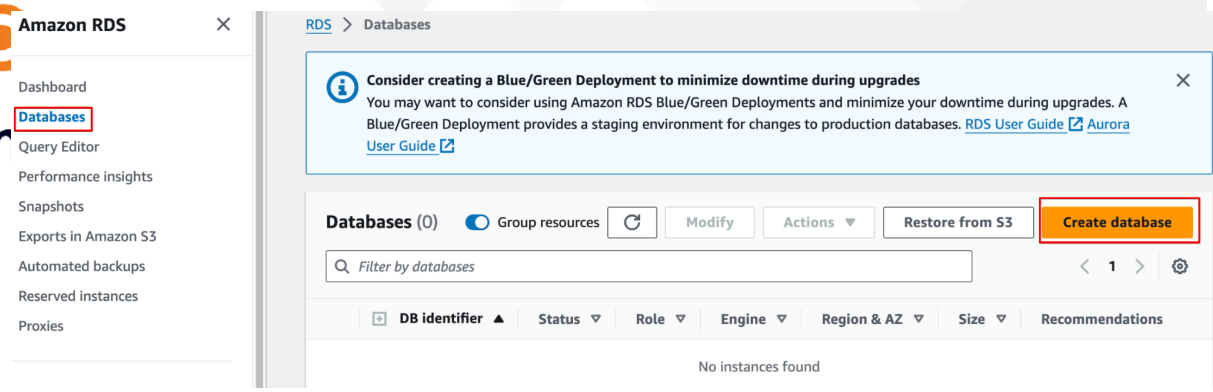
- While creating subnet group you have to choose a VPC and at least two private subnets in different Availability zones



- create the subnet

Creating MYSQL RDS Instance:

- Navigate to RDS console select database ancd click on create database.



Create database

Choose a database creation method Info

- (•) **Standard create**
  You set all of the configuration options, including ones for availability, security, backups, and maintenance.
- ( ) **Easy create**
  Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

Engine options

Engine type Info

- ( ) Aurora (MySQL Compatible)
- ( ) Aurora (PostgreSQL Compatible)
- (•) MySQL
- ( ) MariaDB
- ( ) PostgreSQL
- ( ) Oracle
- ( ) Microsoft SQL Server
- ( ) IBM Db2

Edition

(•) MySQL Community

Engine version Info

View the engine versions that support the following database features.

▼ Hide filters

- [ ] Show versions that support the Multi-AZ DB cluster Info
  Create a A Multi-AZ DB cluster with one primary DB instance and two readable standby DB instances. Multi-AZ DB clusters provide up to 2x faster transaction commit latency and automatic failover in typically under 35 seconds.
- [ ] Show versions that support the Amazon RDS Optimized Writes Info
  Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

Engine Version

MySQL 8.0.35 ▼

- [ ] Enable RDS Extended Support Info
  Amazon RDS Extended Support is a paid offering. By selecting this option, you consent to being charged for this offering if you are

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

Availability and durability

Deployment options Info

The deployment options below are limited to those supported by the engine you selected above.

- ○ Multi-AZ DB Cluster
  Creates a DB cluster with a primary DB instance and two readable standby DB instances, with each DB instance in a different Availability Zone (AZ). Provides high availability, data redundancy and increases capacity to serve read workloads.
- ○ Multi-AZ DB instance (not supported for Multi-AZ DB cluster snapshot)
  Creates a primary DB instance and a standby DB instance in a different AZ. Provides high availability and data redundancy, but the standby DB instance doesn't support connections for read workloads.
- ○ Single DB instance (not supported for Multi-AZ DB cluster snapshot)
  Creates a single DB instance with no standby DB instances.

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.

demoDB

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. The first character must be a letter.

Credentials management

You can use AWS Secrets Manager or manage your master user credentials.

- ○ **Managed in AWS Secrets Manager - *most secure***
  RDS generates a password for you and manages it throughout its lifecycle using AWS Secrets Manager.
- ◉ **Self managed**
  Create your own password or have RDS create a password that you manage.

☐ **Auto generate password**

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

Master password Info

••••••••••

Password strength Strong

Minimum constraints: At least 8 printable ASCII characters. Can't contain any of the following symbols: / ' " @

Safari

Instance configuration

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

DB instance class Info

▼ Hide filters

Show instance classes that support Amazon RDS Optimized Writes Info
Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

Include previous generation classes

Standard classes (includes m classes)

Memory optimized classes (includes r and x classes)

Burstable classes (includes t classes)

db.t3.micro
2 vCPUs 1 GiB RAM Network: 2,085 Mbps

Storage

Storage type Info
Provisioned IOPS SSD (io2) storage volumes are now available.

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

Allocated storage Info

20 GiB

The minimum value is 20 GiB and the maximum value is 6,144 GiB

After you modify the storage for a DB instance, the status of the DB instance will be in storage-optimization. Your instance will remain available as the storage-optimization operation completes. Learn more

▶ Storage autoscaling

Connectivity Info

Compute resource
Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

Don't connect to an EC2 compute resource
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

Connect to an EC2 compute resource
Set up a connection to an EC2 compute resource for this database.

EC2 instance Info
Choose the EC2 instance to add as the compute resource for this database. A VPC security group is added to this EC2 instance. A VPC security group is also added to the database with an inbound rule that allows the EC2 instance to access the database.

i-0bb82e19367c00a20
bastion

bastion host created earlier

Some VPC settings can't be changed when a compute resource is added
Adding an EC2 compute resource automatically selects the VPC, DB subnet group, and public access

Virtual private cloud (VPC) Info

Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

RDS-demo-vpc (vpc-01a6b6ef2af6a61b4)
4 Subnets, 2 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

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

DB subnet group Info

Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

- (•) **Choose existing**
  Choose existing DB subnet group
- ( ) **Automatic setup**
  RDS creates a new subnet group for you or reuses an existing subnet group

Existing DB subnet groups

rds-db-subnetgroup
2 Subnets, 2 Availability Zones

Public access Info

- ( ) Yes
  RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
- (•) **No**
  RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) Info

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

- (•) **Choose existing**
  Choose existing VPC security groups
- ( ) **Create new**
  Create new VPC security group

Additional VPC security group

Choose one or more options

Amazon RDS will add a new VPC security group *rds-ec2-1* to allow connectivity with your compute resource.

Availability Zone Info

us-east-1a

Certificate authority - *optional* Info

Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

rds-ca-rsa2048-g1 (default)
Expiry: May 26, 2061

If you don't select a certificate authority, RDS chooses one for you.

▶ **Additional configuration**

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Database authentication

Database authentication options Info

- (•) 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.

Monitoring

- [ ] Enable Enhanced Monitoring
  Enabling Enhanced Monitoring metrics are useful when you want to see how different processes or threads use the CPU.

▸ Additional configuration

Database options, encryption turned on, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

Estimated Monthly costs

DB instance	12.41 USD
Storage	2.30 USD
Total	**14.71 USD**

This billing estimate is based on on-demand usage as described in Amazon RDS Pricing. Estimate does not include costs for backup storage, IOs (if applicable), or data transfer.

Estimate your monthly costs for the DB Instance using the AWS Simple Monthly Calculator.

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.

Cancel **Create database**

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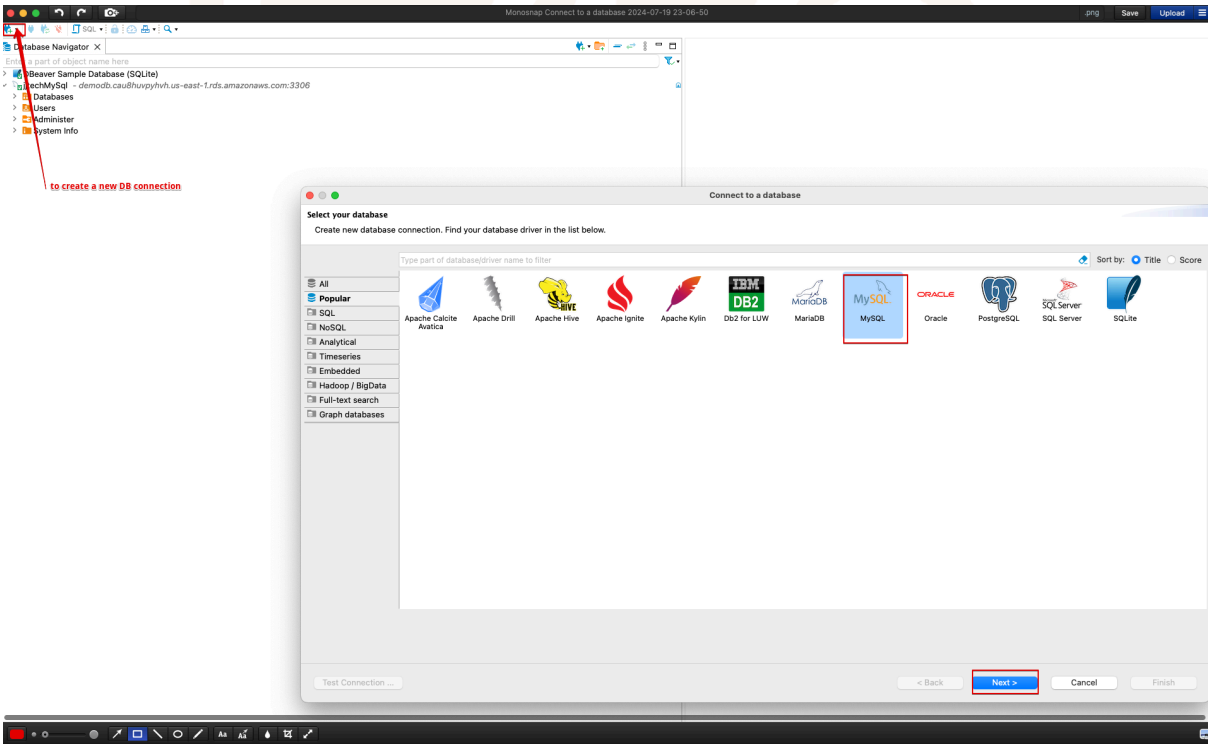
USING DBeaver:

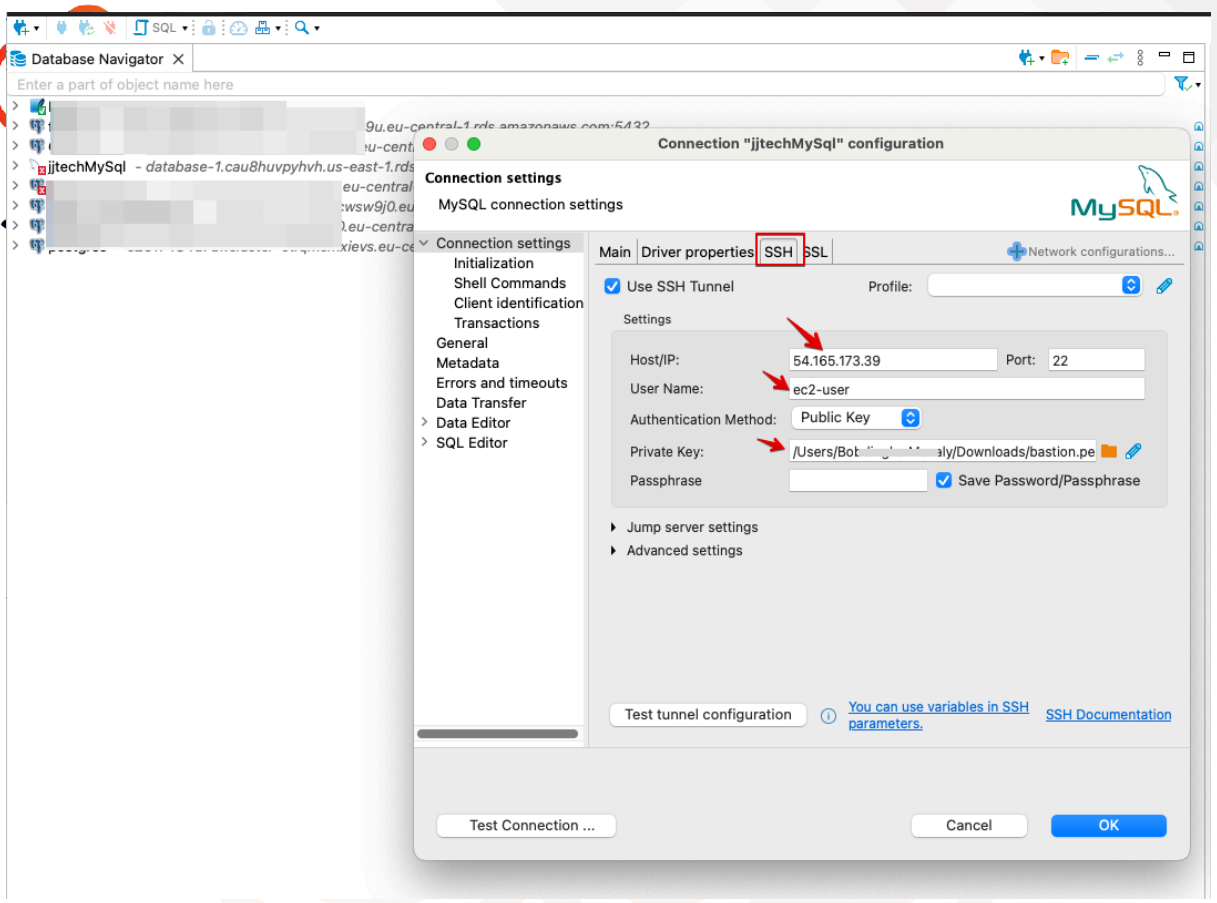
Download Dbeaver, an opensource tool for managing databases.

MacUsers: https://formulae.brew.sh/cask/dbeaver-community

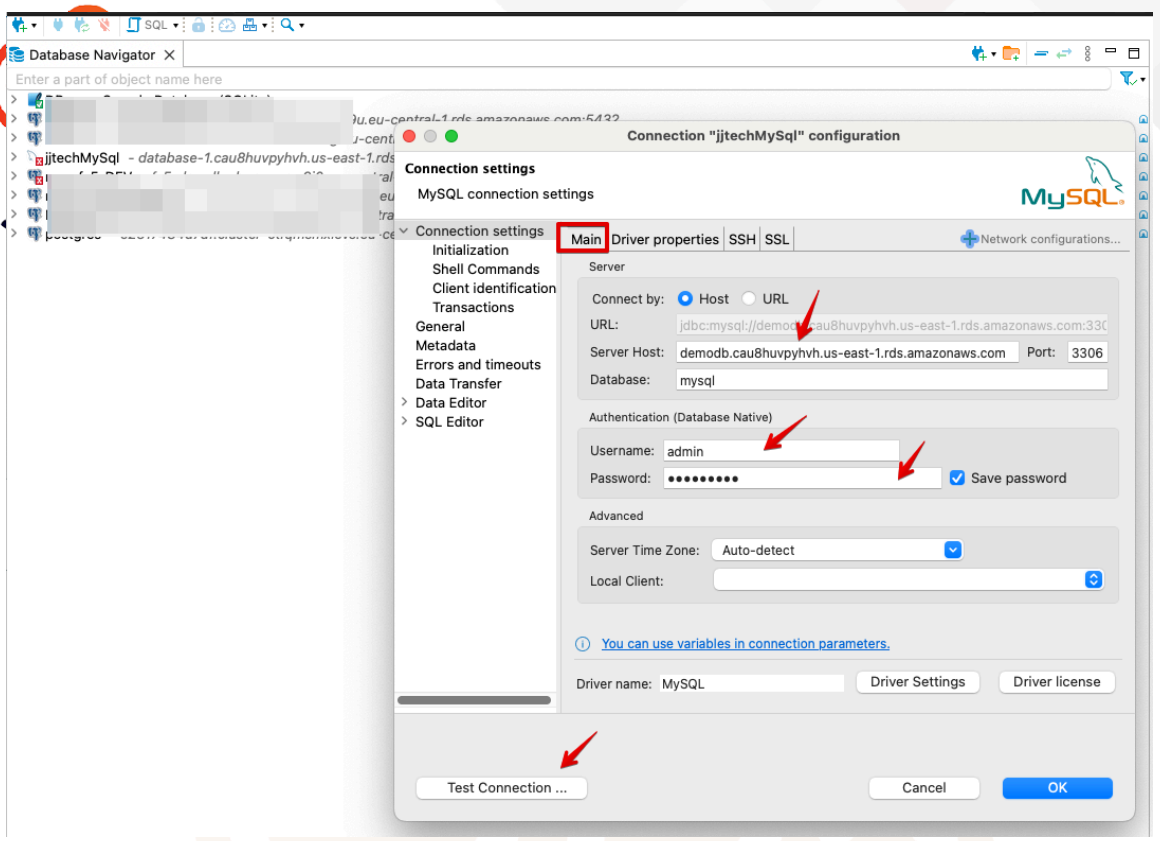
Users: Download installer https://dbeaver.io/download/

After installation, open the DB application.



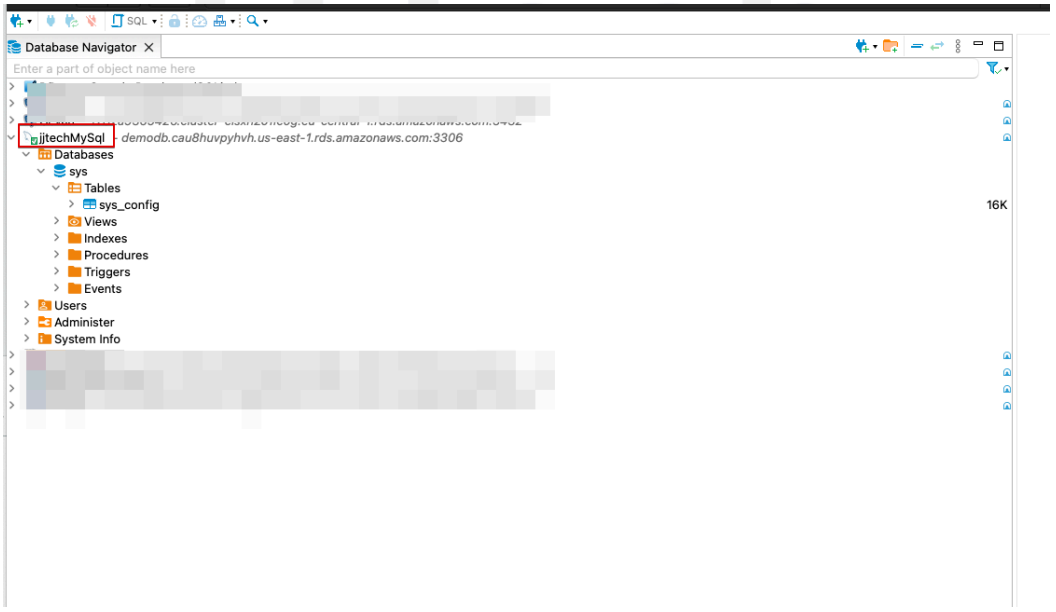


Click on **Test tunnel configuration** to ensure you can reach the bastion host . If connection is successful, then you should see **connected.**



If the connection is successful, then you will see **connected**. Thus you can reach the DB using the tool.

Connection to the DB will display the following defaults for the MYSQL DB.



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Create a Sample Database using the simple SQL script provided

simpleRDScript.sql

```sql
-- Create the new database
CREATE DATABASE jjtech_modelbatch_students;

-- Switch to the new database
USE jjtech_modelbatch_students;

-- Create the model_batch students info table
CREATE TABLE model_students_info (
    student_id INT AUTO_INCREMENT PRIMARY KEY,
    student_name VARCHAR(255) NOT NULL,
    student_city VARCHAR(255) NOT NULL,
    student_location_PLZ INT NOT NULL,
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP
);

-- Insert sample data into the information table
INSERT INTO model_students_info (student_name, student_city, student_location_PLZ)
VALUES
('francesca', 'texas', 7891),
('Adaobi', 'california', 7091),
('Mavuena', 'maryland', 7901),
('Pam K', 'Delaware', 5601);


-- Get data

SELECT * FROM model_students_info;
```

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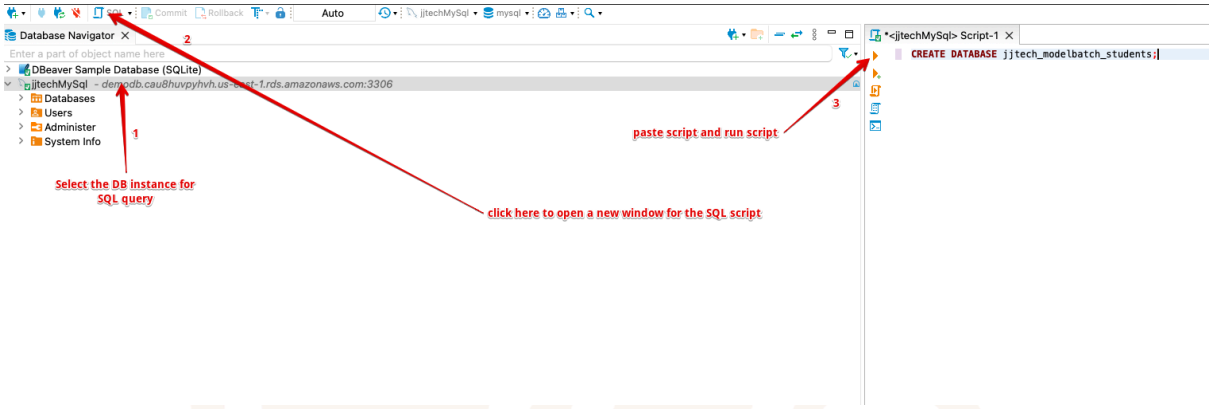
Sample for running the SQL script



You could also use the MySQL workbench to access the MYSQL DB.

Download MySQL workbench on your laptop

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

Based on your OS it will show you the package file to download

Reference for some most used commands
:https://www.javatpoint.com/mysql-commands-cheat-sheet