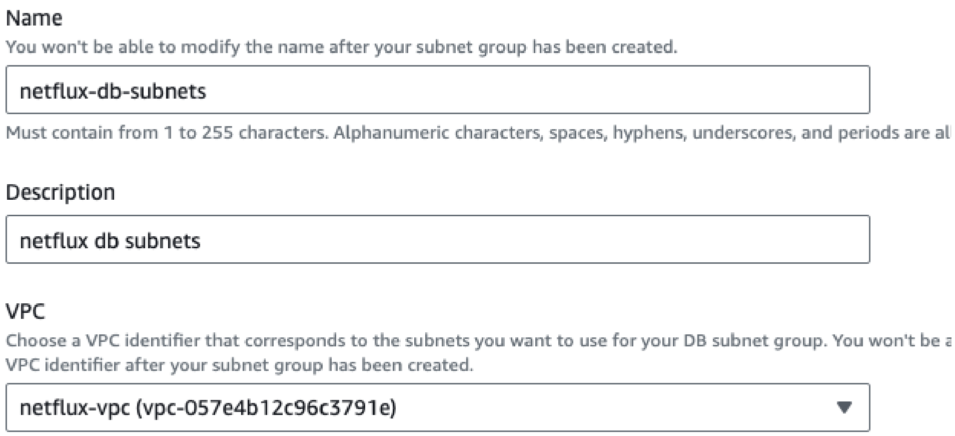
RDS & Secrets Manager

Create DB Subnet Group

- First let's create a DB subnet group.
  - Give some name and select the VPC

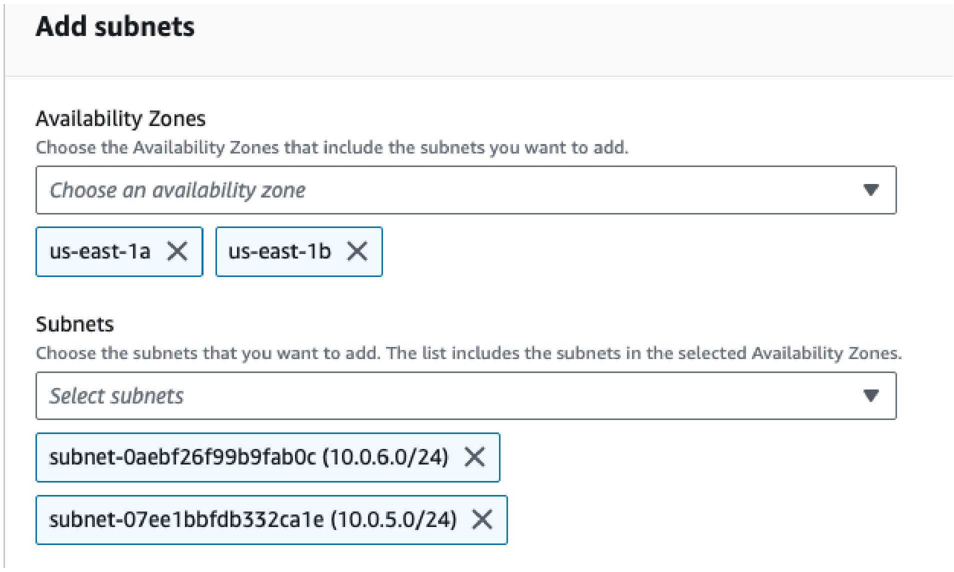


Name
You won't be able to modify the name after your subnet group has been created.
netflux-db-subnets
Must contain from 1 to 255 characters. Alphanumeric characters, spaces, hyphens, underscores, and periods are al

Description
netflux db subnets

VPC
Choose a VPC identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be a
VPC identifier after your subnet group has been created.
netflux-vpc (vpc-057e4b12c96c3791e) ▼

- Select the subnets. In our case **10.0.5.0/24** and **10.0.6.0/24** were created for db.



Add subnets

Availability Zones

Choose the Availability Zones that include the subnets you want to add.

Choose an availability zone ▼

us-east-1a ✕ us-east-1b ✕

Subnets

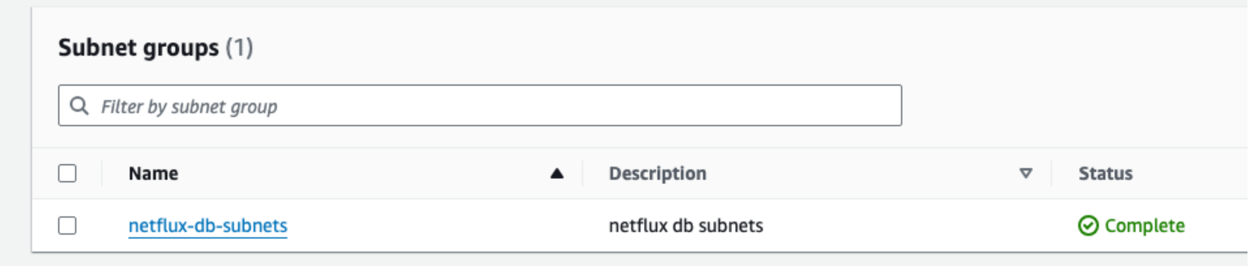
Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.

Select subnets ▼

subnet-0aebf26f99b9fab0c (10.0.6.0/24) ✕

subnet-07ee1bbfdb332ca1e (10.0.5.0/24) ✕

- Create

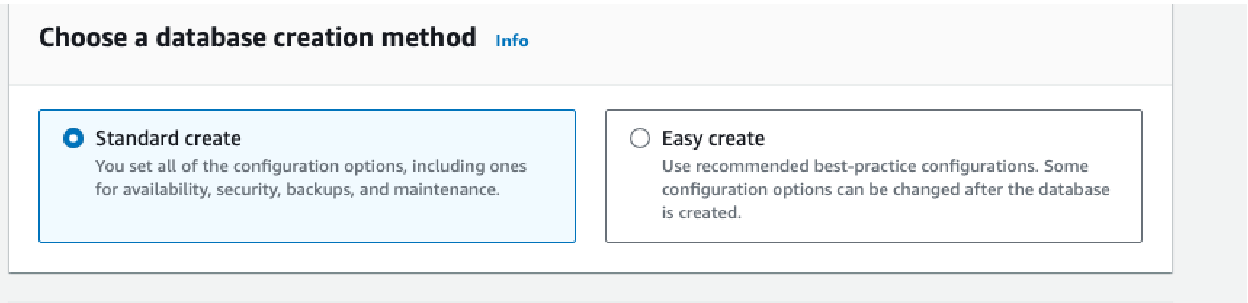


Subnet groups (1)

Filter by subnet group

□	Name ▲	Description ▽	Status
□	netflux-db-subnets	netflux db subnets	✓ Complete

Create Database Instance

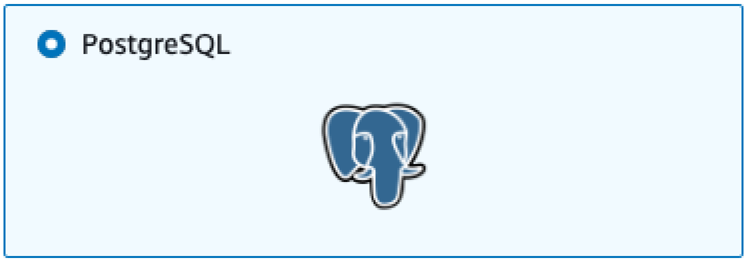


Choose a database creation method Info

● Standard create
You set all of the configuration options, including ones for availability, security, backups, and maintenance.

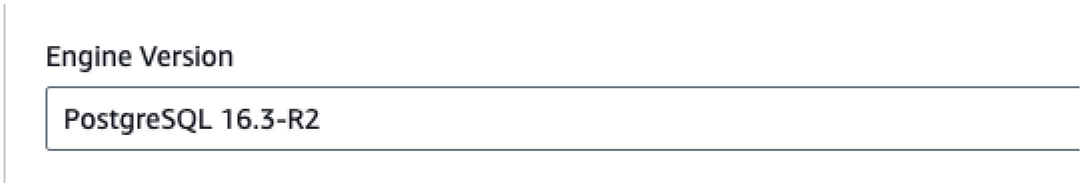
○ Easy create
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

- Select postgres



● PostgreSQL

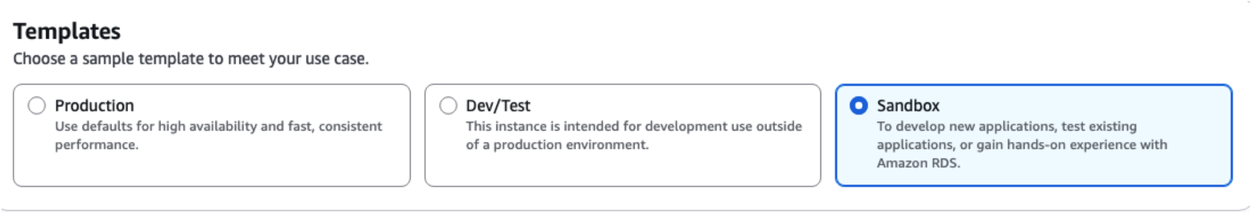
- Engine version can be latest



Engine Version

PostgreSQL 16.3-R2

- For our learning purposes, let's use the **sandbox** for this demo. But for production application, choose Production with multi AZ



Templates

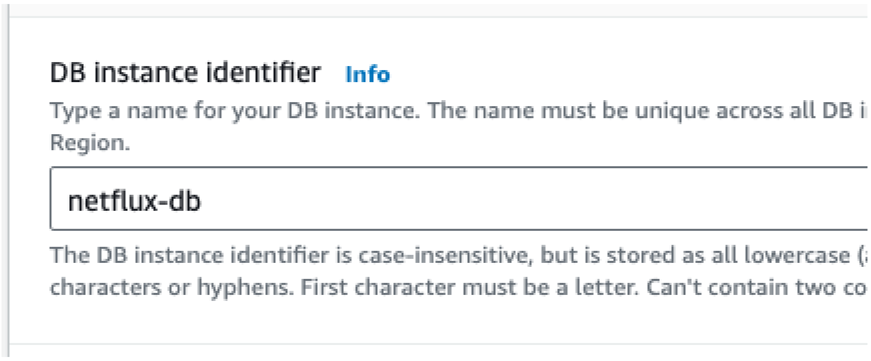
Choose a sample template to meet your use case.

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

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

● Sandbox
To develop new applications, test existing applications, or gain hands-on experience with Amazon RDS.

- Give a name for the DB Instance



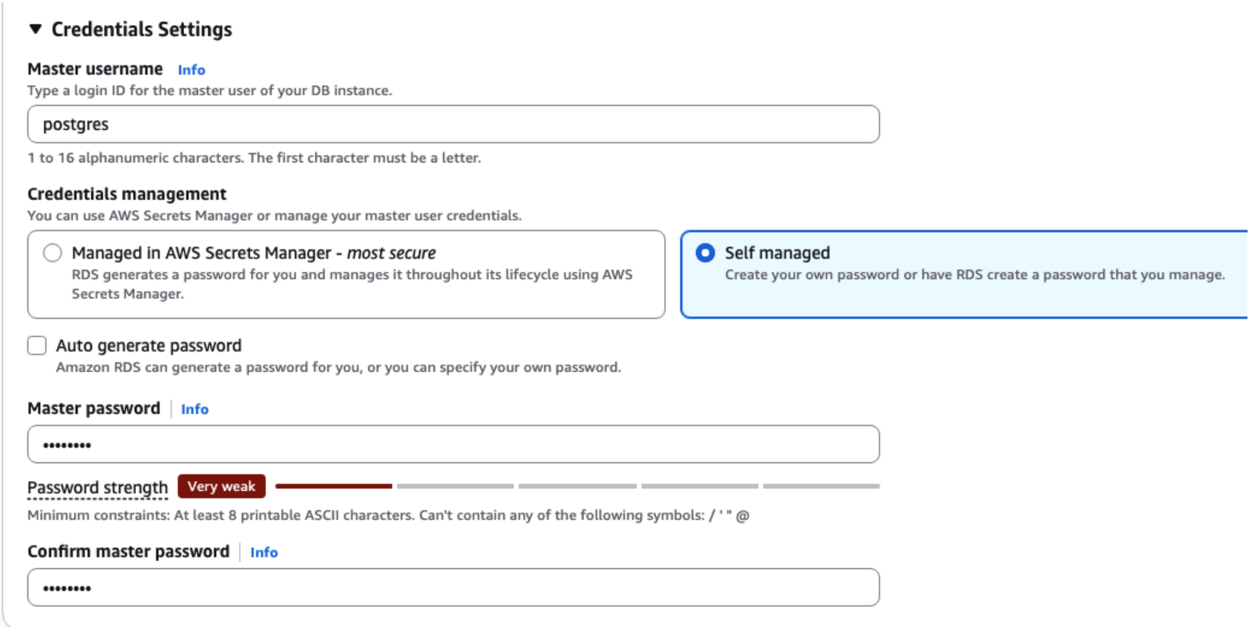
DB instance identifier

Type a name for your DB instance. The name must be unique across all DB i
Region.

netflux-db

The DB instance identifier is case-insensitive, but is stored as all lowercase (
characters or hyphens. First character must be a letter. Can't contain two co

- I give the credentials (for learning purposes) **postgres / admin123**



▼ Credentials Settings

Master username Info

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

postgres

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

••••••••

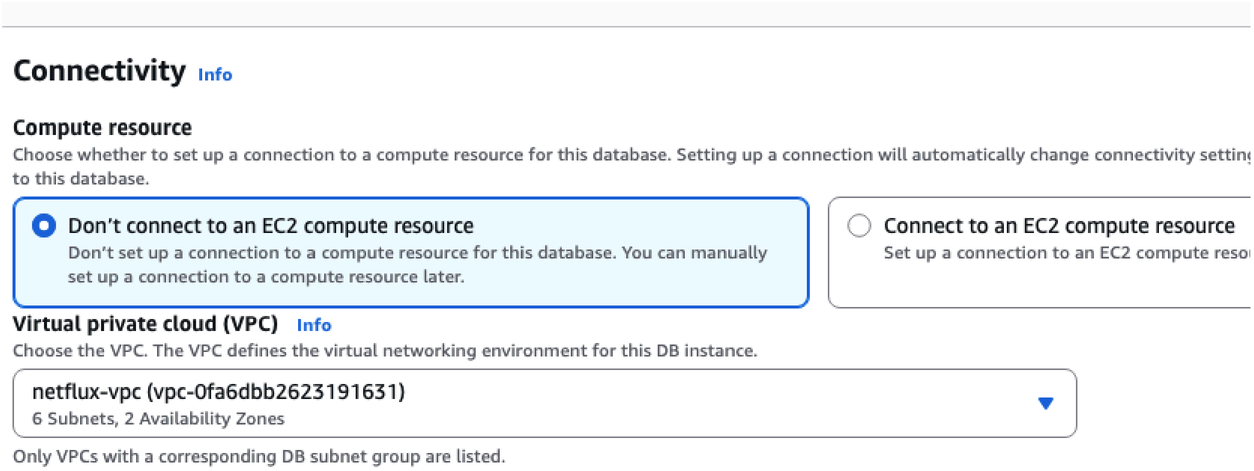
Password strength Very weak

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

Confirm master password Info

••••••••

- Select VPC



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 settin 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 reso

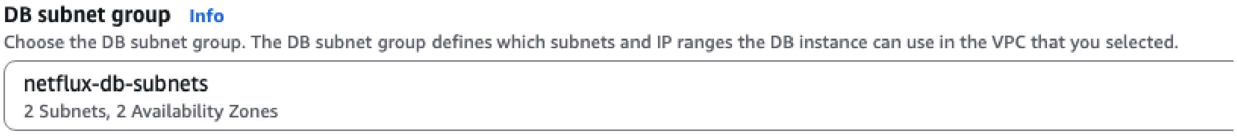
Virtual private cloud (VPC) Info

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

netflux-vpc (vpc-0fa6dbb2623191631)
6 Subnets, 2 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

- Select the subnet group

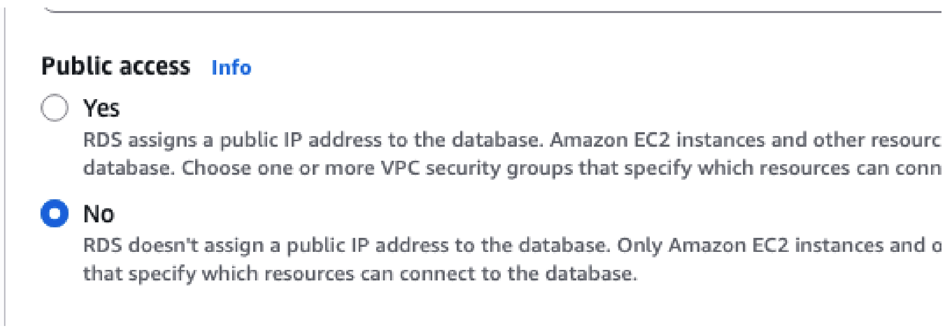


DB subnet group Info

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.

netflux-db-subnets
2 Subnets, 2 Availability Zones

- Public access - **NO**



Public access Info

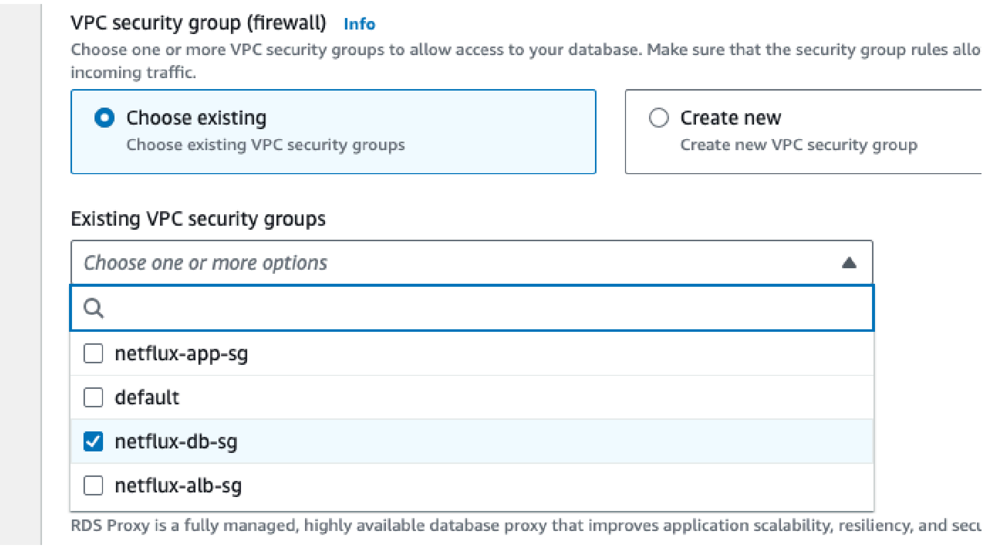
○ Yes

RDS assigns a public IP address to the database. Amazon EC2 instances and other resourc database. Choose one or more VPC security groups that specify which resources can conn

● No

RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and o that specify which resources can connect to the database.

- Security Group - We will choose the DB security group and attach it to the DB



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 allo incoming traffic.

● Choose existing
Choose existing VPC security groups

○ Create new
Create new VPC security group

Existing VPC security groups

Choose one or more options

□ netflux-app-sg

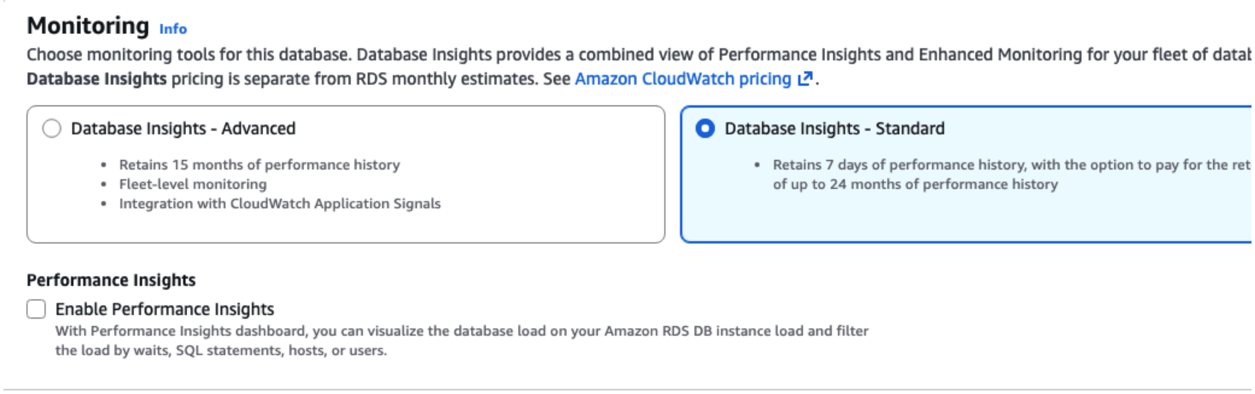
□ default

☑ netflux-db-sg

□ netflux-alb-sg

RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and secu

- We can disable the performance insights.



Monitoring Info

Choose monitoring tools for this database. Database Insights provides a combined view of Performance Insights and Enhanced Monitoring for your fleet of datat **Database Insights** pricing is separate from RDS monthly estimates. See Amazon CloudWatch pricing.

○ Database Insights - Advanced
- Retains 15 months of performance history
- Fleet-level monitoring
- Integration with CloudWatch Application Signals

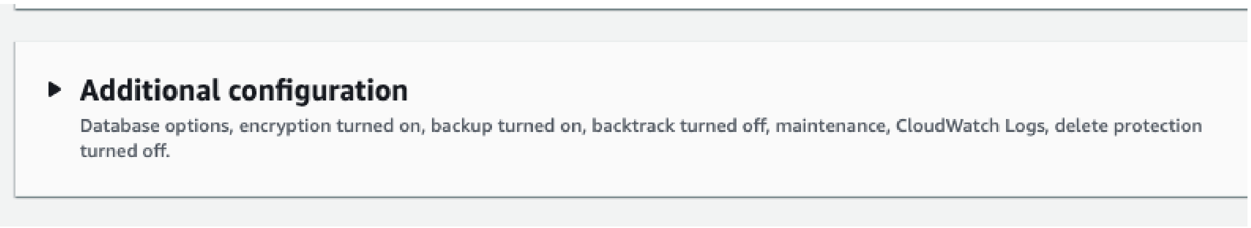
● Database Insights - Standard
- Retains 7 days of performance history, with the option to pay for the ret of up to 24 months of performance history

Performance Insights

□ Enable Performance Insights

With Performance Insights dashboard, you can visualize the database load on your Amazon RDS DB instance load and filter the load by waits, SQL statements, hosts, or users.

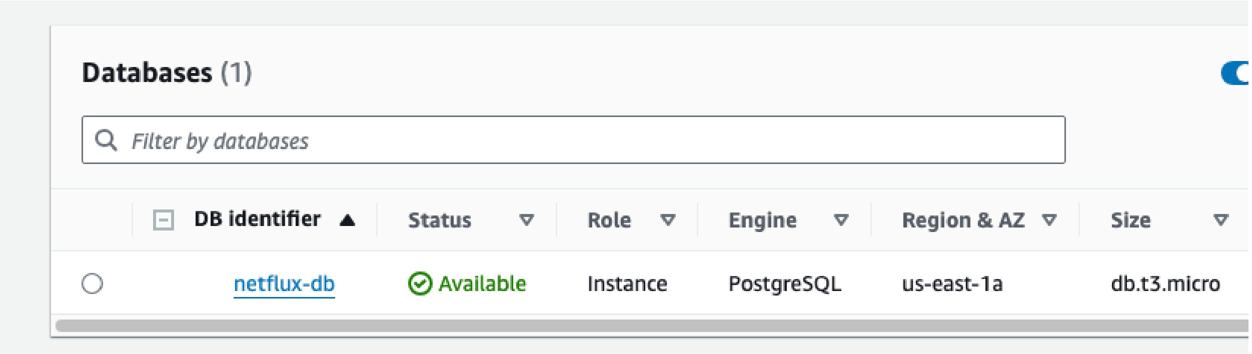
- No additional configuration is required



▶ **Additional configuration**

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

- Click on “Create database”. It might take 10+ minutes. Wait for the status to be “Available”

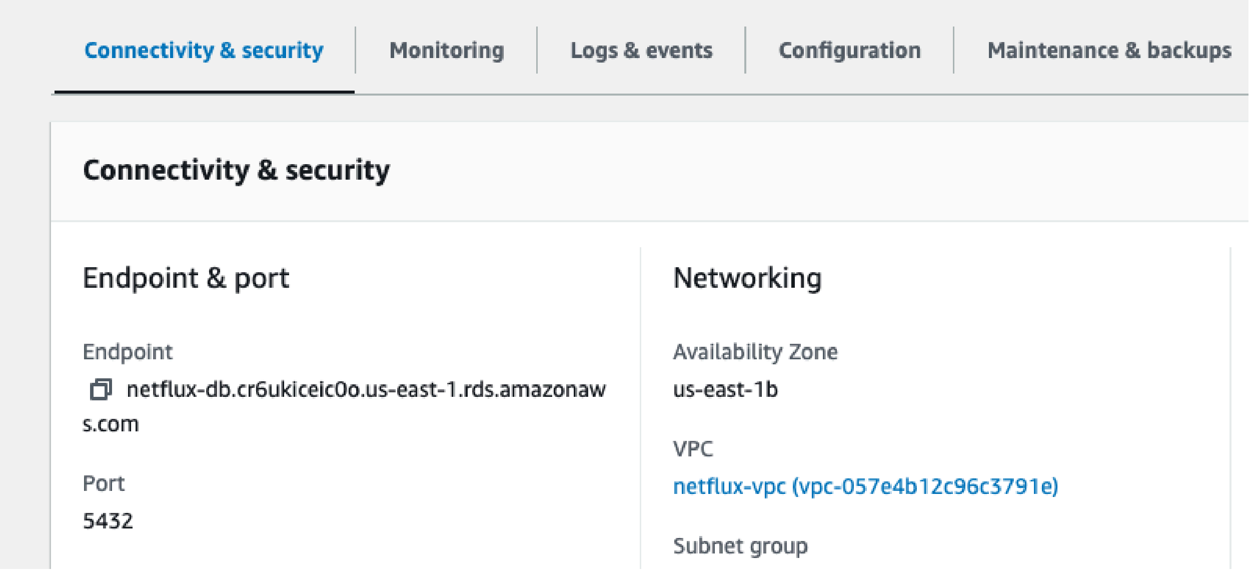


Databases (1)

Filter by databases

	DB identifier ▲	Status	Role	Engine	Region & AZ	Size
○	netflux-db	✓ Available	Instance	PostgreSQL	us-east-1a	db.t3.micro

- What we created is the DB Instance!
- Click on the DB Instance to get DB connectivity details



Connectivity & security

Endpoint & port

Endpoint
netflux-db.cr6ukiceic0o.us-east-1.rds.amazonaws.com

Port
5432

Networking

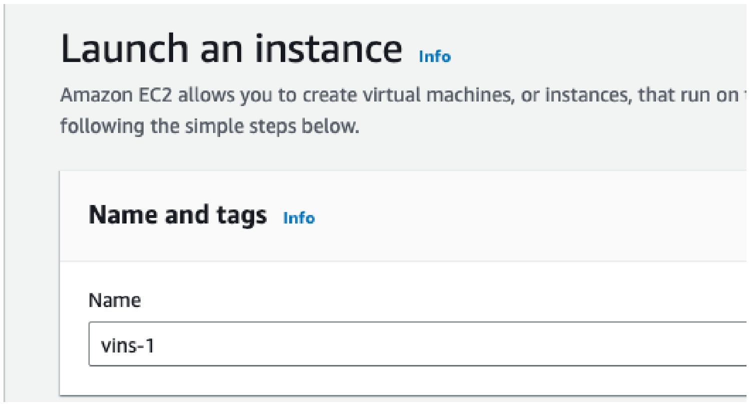
Availability Zone
us-east-1b

VPC
netflux-vpc (vpc-057e4b12c96c3791e)

Subnet group

Initializing Database

- Once the DB Instance is up and running, we need to create databases with our tables, data etc.
    - Go to EC2 to create an instance.



Launch an instance

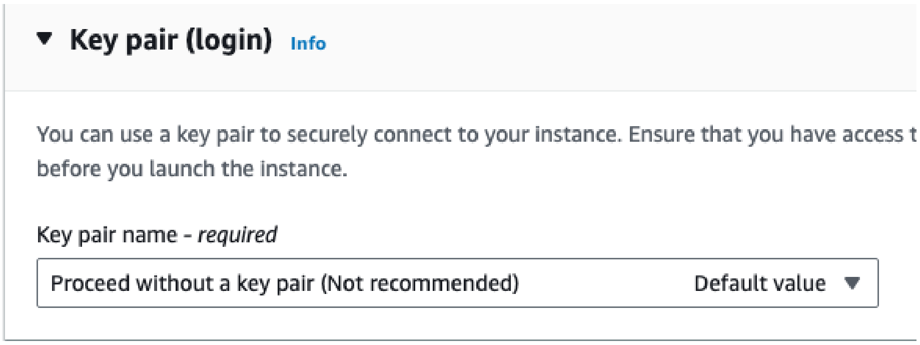
Amazon EC2 allows you to create virtual machines, or instances, that run on
following the simple steps below.

Name and tags

Name

vins-1

- Choose our AMI which has the ***psql*** installed
- No Key pair is required. We will destroy this instance immediately.



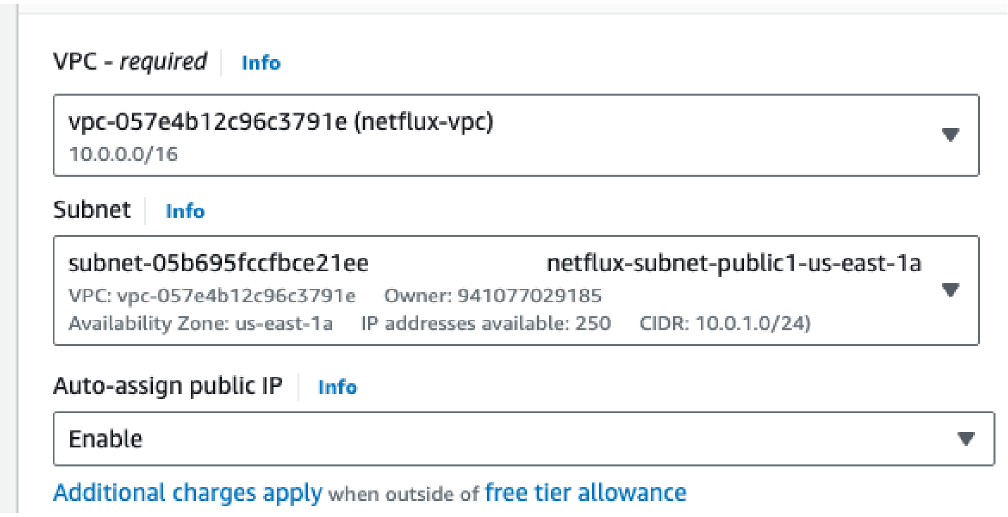
Key pair (login)

You can use a key pair to securely connect to your instance. Ensure that you have access t
before you launch the instance.

Key pair name - *required*

Proceed without a key pair (Not recommended) Default value

- Network Settings
  - Keep this in the public subnet
  - We need to assign public IP



VPC - *required*

vpc-057e4b12c96c3791e (netflux-vpc)
10.0.0.0/16

Subnet

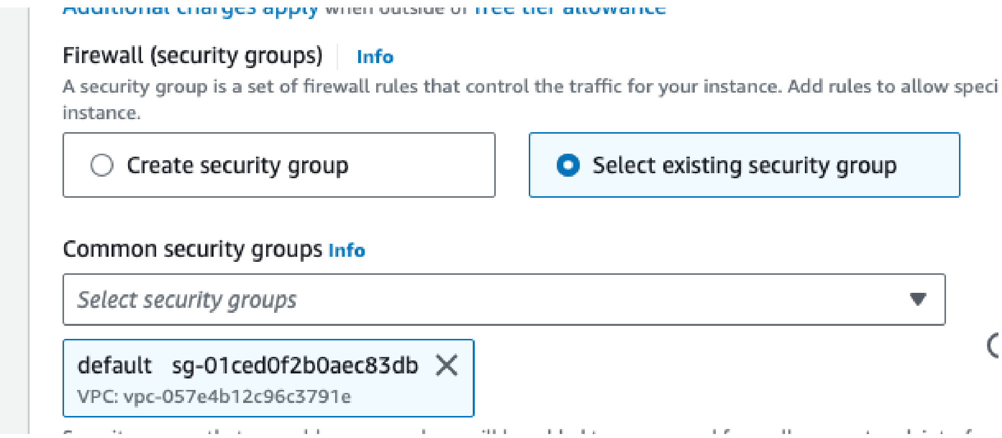
subnet-05b695fccfbce21ee netflux-subnet-public1-us-east-1a
VPC: vpc-057e4b12c96c3791e Owner: 941077029185
Availability Zone: us-east-1a IP addresses available: 250 CIDR: 10.0.1.0/24)

Auto-assign public IP

Enable

Additional charges apply when outside of free tier allowance

- Let’s attach default Security Group



Additional charges apply when outside of free tier allowance

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow speci
instance.

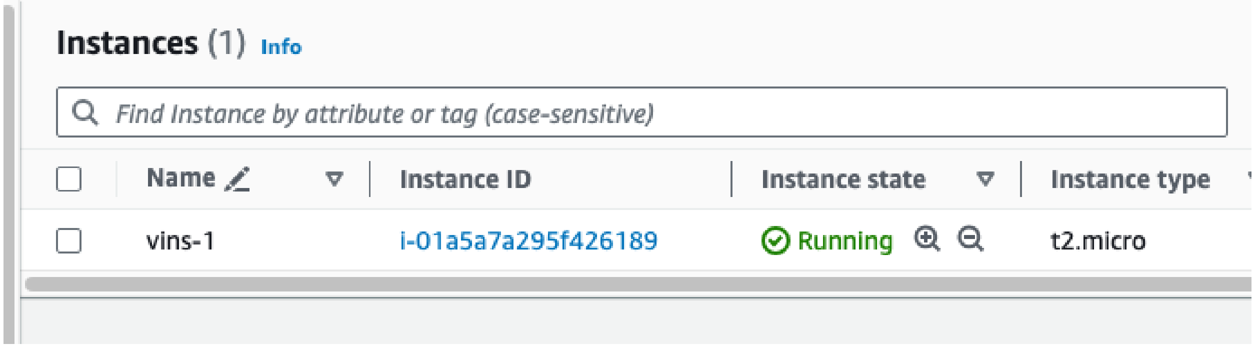
○ Create security group ● Select existing security group

Common security groups Info

Select security groups

default sg-01ced0f2b0aec83db
VPC: vpc-057e4b12c96c3791e

- Everything else is optional
- Create the instance

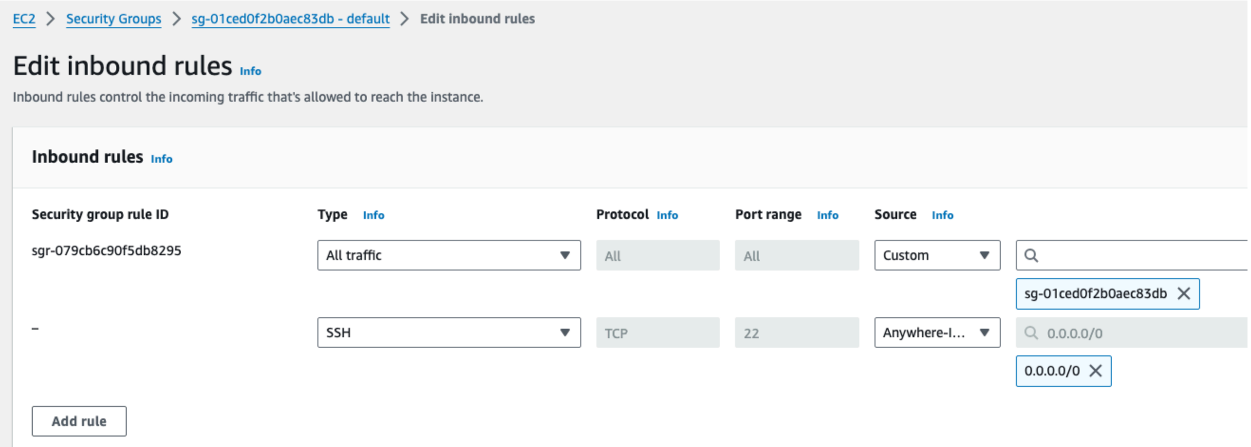


Instances (1) Info

Find Instance by attribute or tag (case-sensitive)

□	Name	Instance ID	Instance state	Instance type
□	vins-1	i-01a5a7a295f426189	Running	t2.micro

- Let’s open the “default” security group. allow port 22 for SSH access



EC2 > Security Groups > sg-01ced0f2b0aec83db - default > Edit inbound rules

Edit inbound rules Info

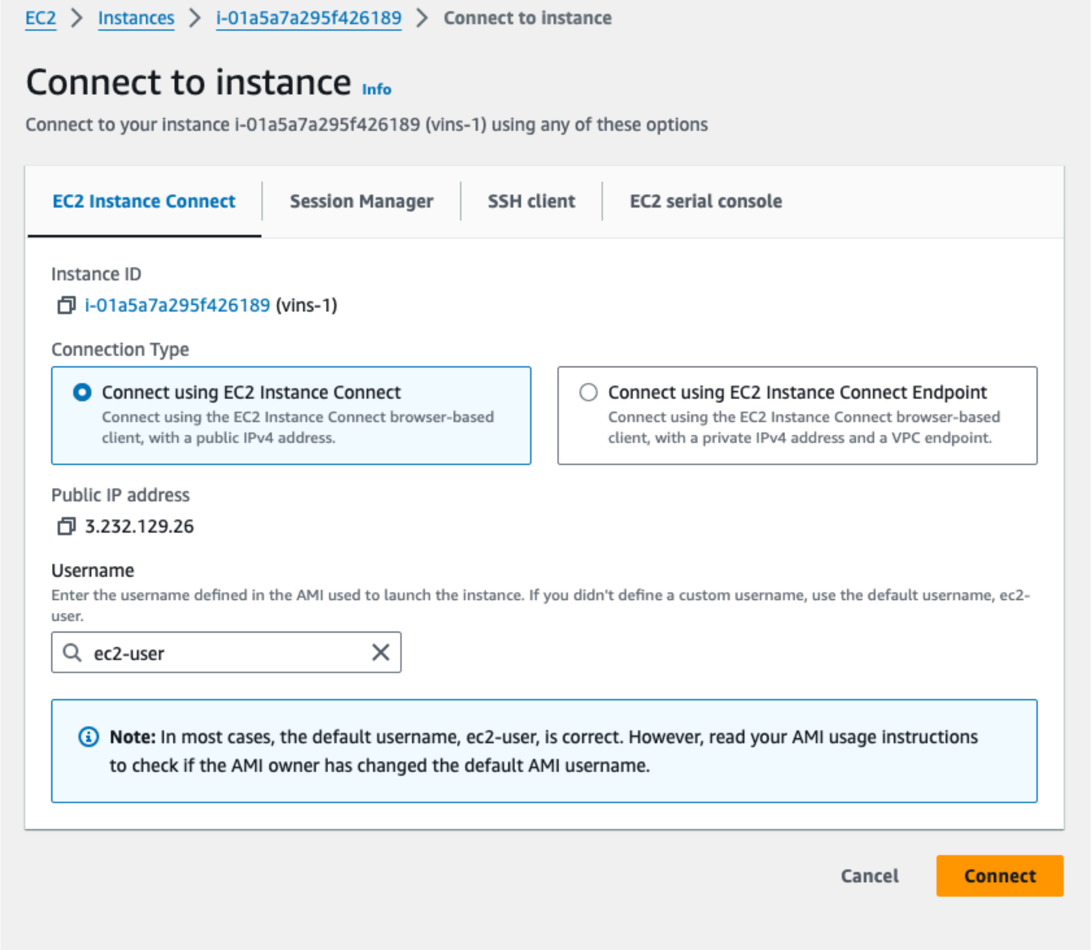
Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules Info

Security group rule ID	Type	Protocol	Port range	Source	
sgr-079cb6c90f5db8295	All traffic	All	All	Custom	sg-01ced0f2b0aec83db
–	SSH	TCP	22	Anywhere-I...	0.0.0.0/0

Add rule

- Important: Also temporarily allow the default security group to access the postgres
    - **netflux-db-sg**
- Go back to EC2, connect to this EC2 instance



EC2 > Instances > i-01a5a7a295f426189 > Connect to instance

Connect to instance Info

Connect to your instance i-01a5a7a295f426189 (vins-1) using any of these options

Instance ID

i-01a5a7a295f426189 (vins-1)

Connection Type

● Connect using EC2 Instance Connect
Connect using the EC2 Instance Connect browser-based client, with a public IPv4 address.

○ Connect using EC2 Instance Connect Endpoint
Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.

Public IP address

3.232.129.26

Username

Enter the username defined in the AMI used to launch the instance. If you didn't define a custom username, use the default username, ec2-user.

ec2-user

Note: In most cases, the default username, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

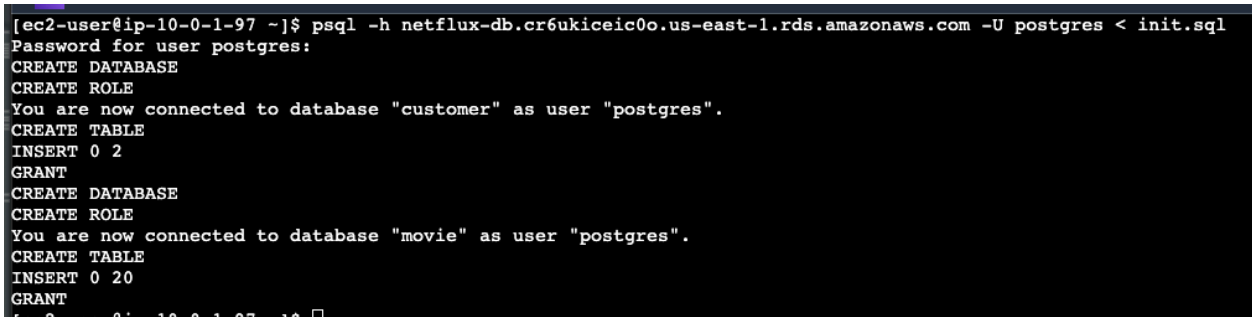
- Create a file **init.sql** and use the data I have provided.

```
cat > init.sql
```

- Then connect to the DB and run the init sql - Update the DB endpoint.

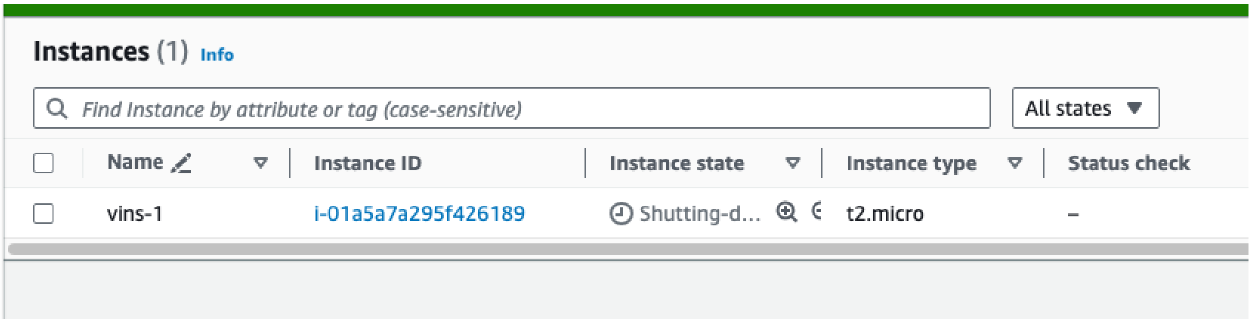
```
psql -U postgres -h netflux-db.cr6ukiceic0o.us-east-1.rds.amazonaws.com < init.sql
```

- It will ask for the password. It is **admin123**
  - At this point, it will create 2 different databases for our application with 2 users for individual applications to access.



```
[ec2-user@ip-10-0-1-97 ~]$ psql -h netflux-db.cr6ukiceic0o.us-east-1.rds.amazonaws.com -U postgres < init.sql
Password for user postgres:
CREATE DATABASE
CREATE ROLE
You are now connected to database "customer" as user "postgres".
CREATE TABLE
INSERT 0 2
GRANT
CREATE DATABASE
CREATE ROLE
You are now connected to database "movie" as user "postgres".
CREATE TABLE
INSERT 0 20
GRANT
[ec2-user@ip-10-0-1-97 ~]$
```

- We no longer need the EC2 instance. We can terminate.



Instances (1) Info

Find Instance by attribute or tag (case-sensitive) | All states ▼

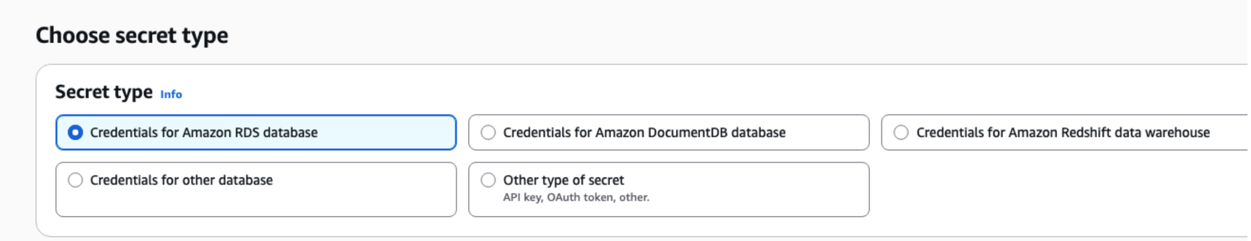
□	Name	Instance ID	Instance state	Instance type	Status check
□	vins-1	i-01a5a7a295f426189	Shutting-d...	t2.micro	–

- We can also remove
  - ***default*** security group - allow port 22 for ssh entry.
  - ***db*** security group - allow inbound from default security group

At this point, you can temporarily stop the DB instance and resume later.

Secrets Manager

- Go to Secrets Manager to store these credentials

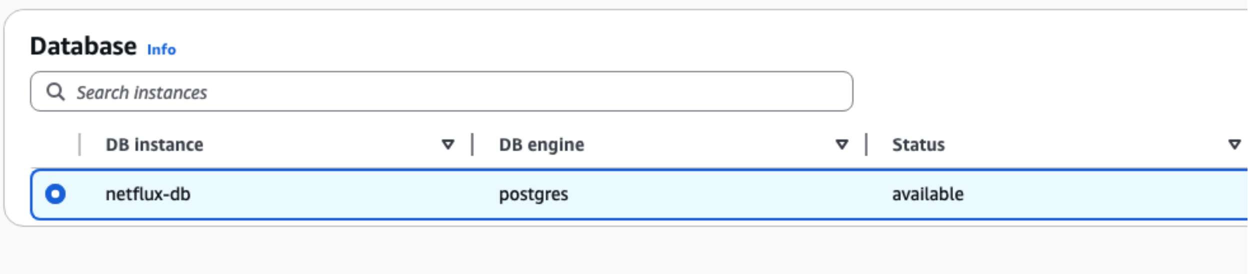


Choose secret type

Secret type Info

● Credentials for Amazon RDS database
○ Credentials for Amazon DocumentDB database
○ Credentials for Amazon Redshift data warehouse
○ Credentials for other database
○ Other type of secret
API key, OAuth token, other.

- select the DB Instance

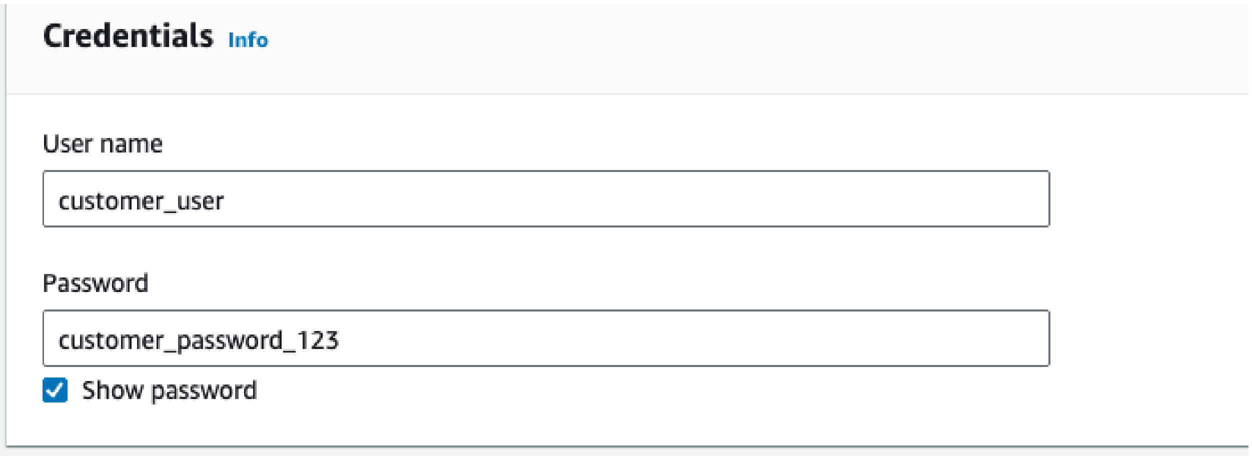


Database Info

Search instances

	DB instance	DB engine	Status
●	netflux-db	postgres	available

- Store the credentials for the database “customer”



Credentials Info

User name

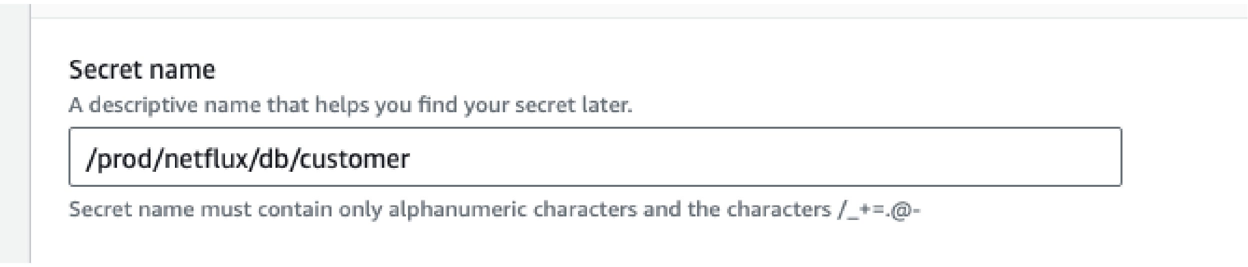
customer_user

Password

customer_password_123

☑ Show password

- Click Next
- Provide a name for the secret. You can follow any meaningful naming convention.



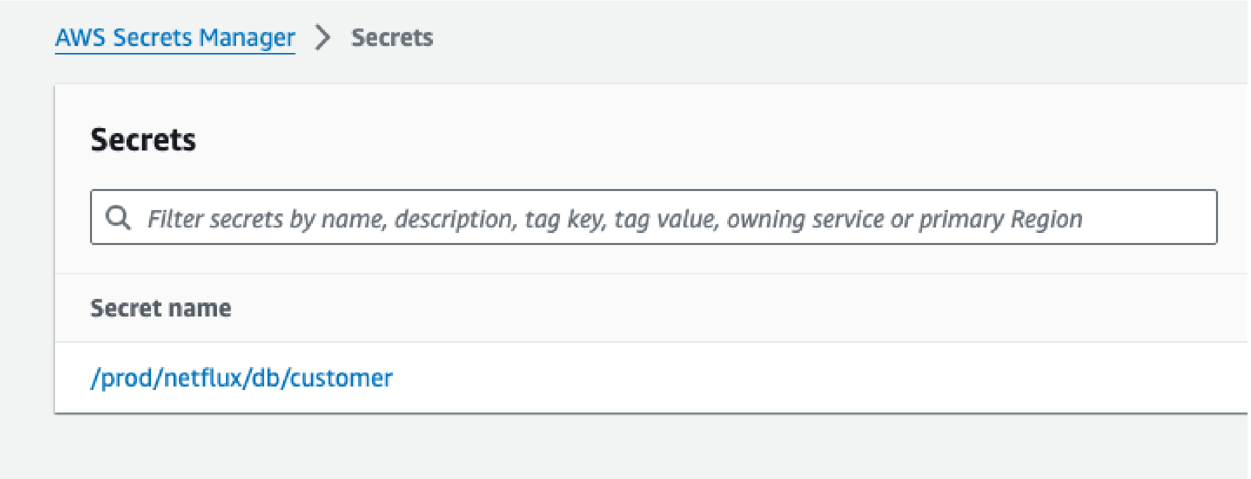
Secret name

A descriptive name that helps you find your secret later.

/prod/netflux/db/customer

Secret name must contain only alphanumeric characters and the characters /_+=.@-

- Click “Next” … finally “Create”



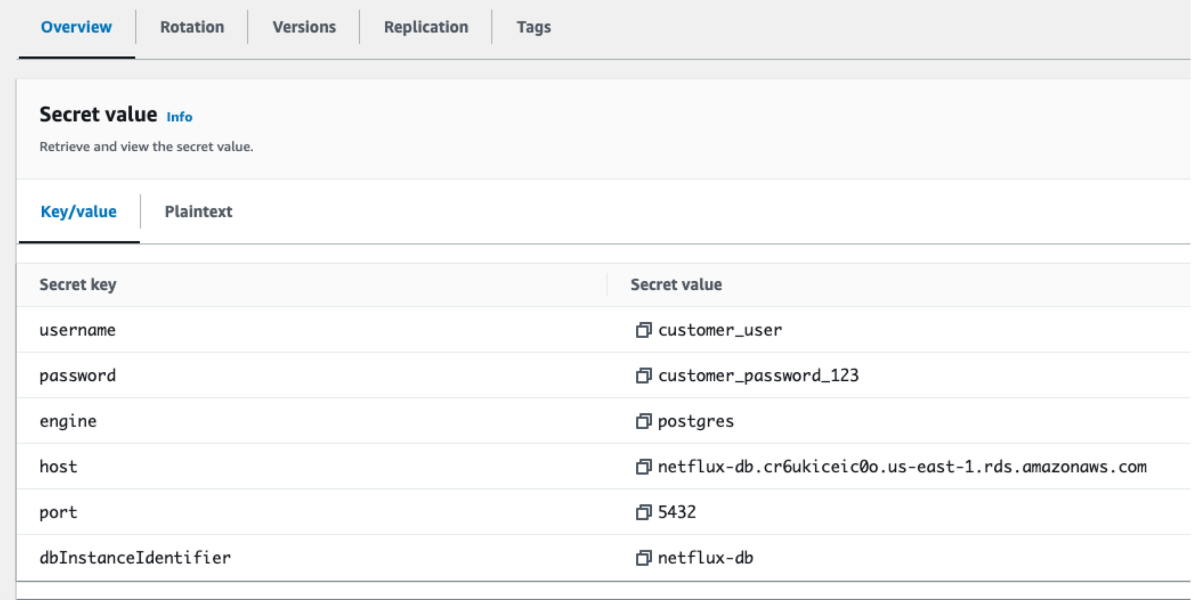
AWS Secrets Manager > Secrets

Secrets

Filter secrets by name, description, tag key, tag value, owning service or primary Region

Secret name
/prod/netflux/db/customer

- We can view what it stores

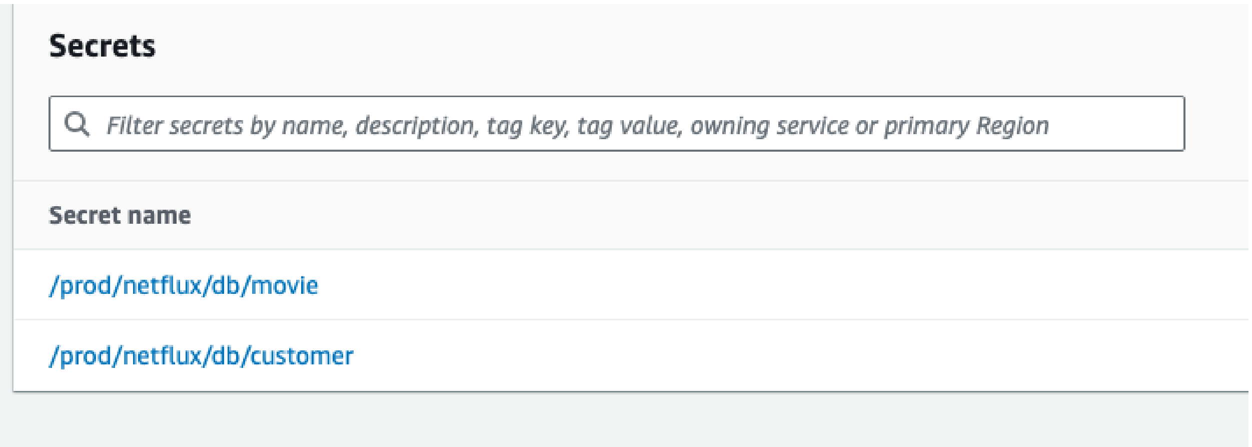


Secret value

Retrieve and view the secret value.

Secret key	Secret value
username	customer_user
password	customer_password_123
engine	postgres
host	netflux-db.cr6ukiceic0o.us-east-1.rds.amazonaws.com
port	5432
dbInstanceIdentifier	netflux-db

- repeat the above steps for “movie” db


Filter secrets by name, description, tag key, tag value, owning service or primary Region

Secrets

Secret name
/prod/netflux/db/movie
/prod/netflux/db/customer