3 Tier Application Deployment on AWS

PREPARED FOR

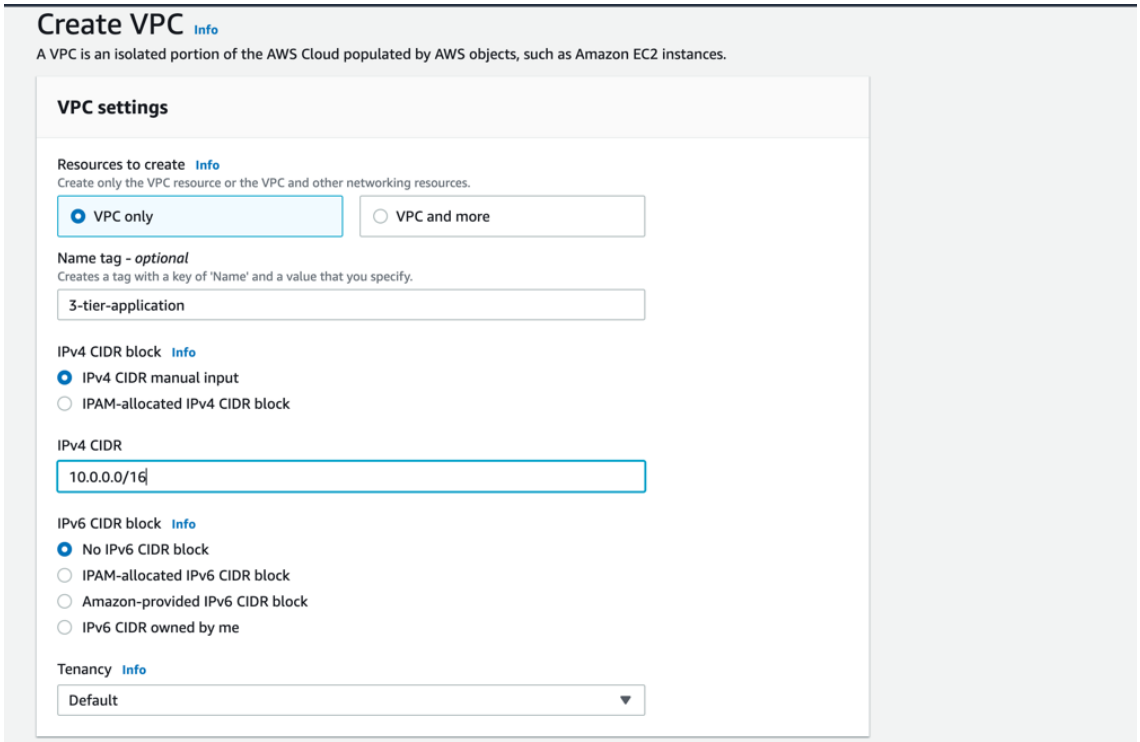
Usama Musharaf

PREPARED BY

Umair Maratab

P180045

Create VPC



Create Subnets

Subnet 1

Subnet settings

Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 6

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

web-tier-subnet-1

The name can be up to 256 characters long.

Availability Zone Info

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

Asia Pacific (Tokyo) / ap-northeast-1a

IPv4 CIDR block Info

10.0.1.0/24

Tags - *optional*

Key	Value - *optional*	
Name	web-tier-subnet-1	Remove

Add new tag

You can add 49 more tags.

Remove

Subnet 2

Subnet 2 of 6

Subnet name
Create a tag with a key of 'Name' and a value that you specify.

web-tier-subnet-2

The name can be up to 256 characters long.

Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.

Asia Pacific (Tokyo) / ap-northeast-1c

IPv4 CIDR block Info

10.0.2.0/24

▼ Tags - *optional*

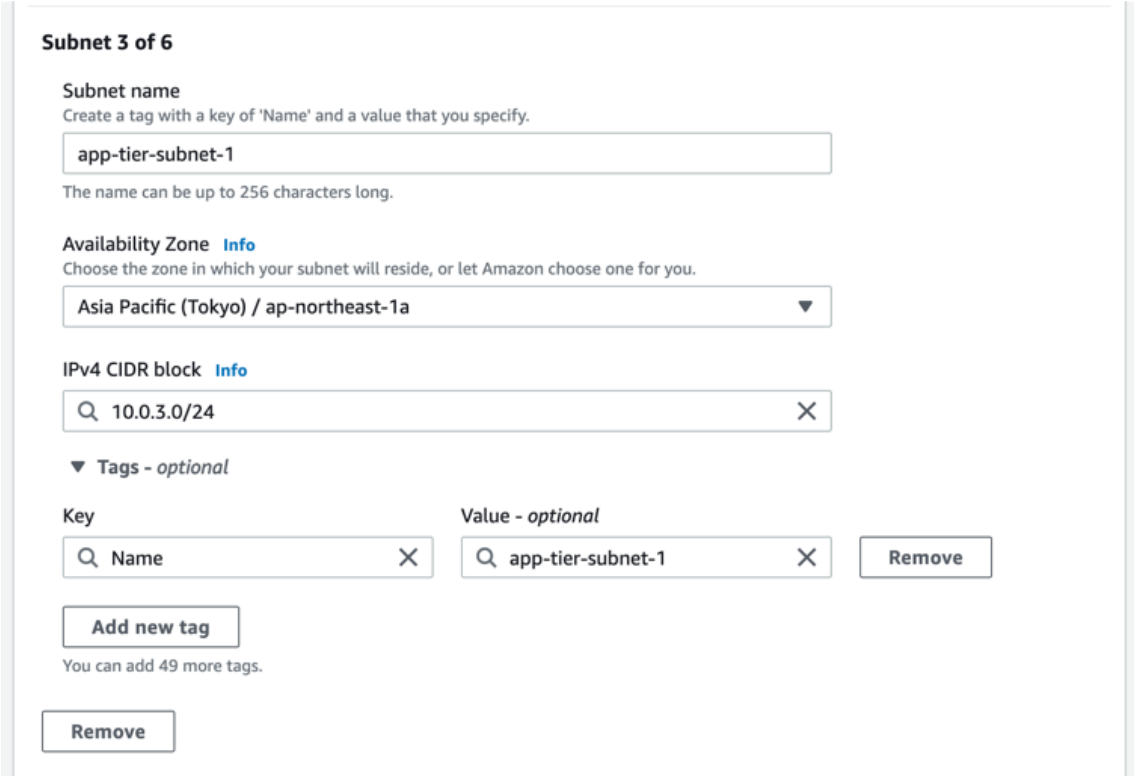
Key	Value - *optional*	
Name	web-tier-subnet-2	Remove

Add new tag

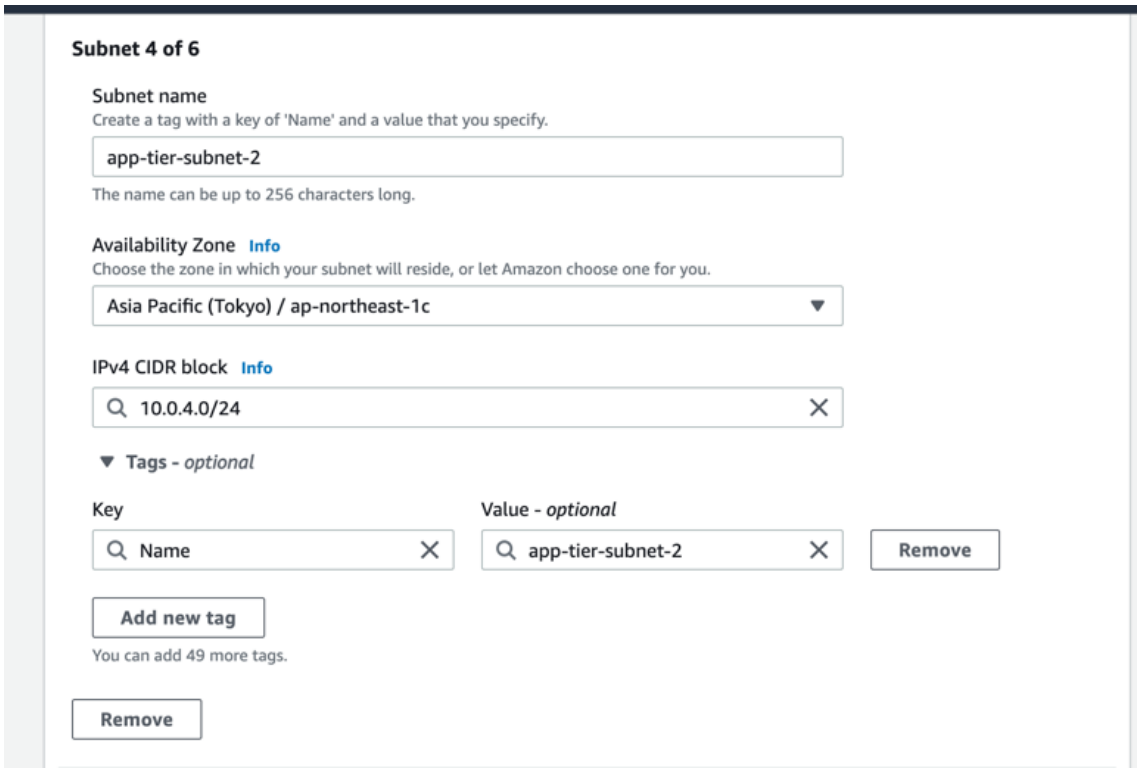
You can add 49 more tags.

Remove

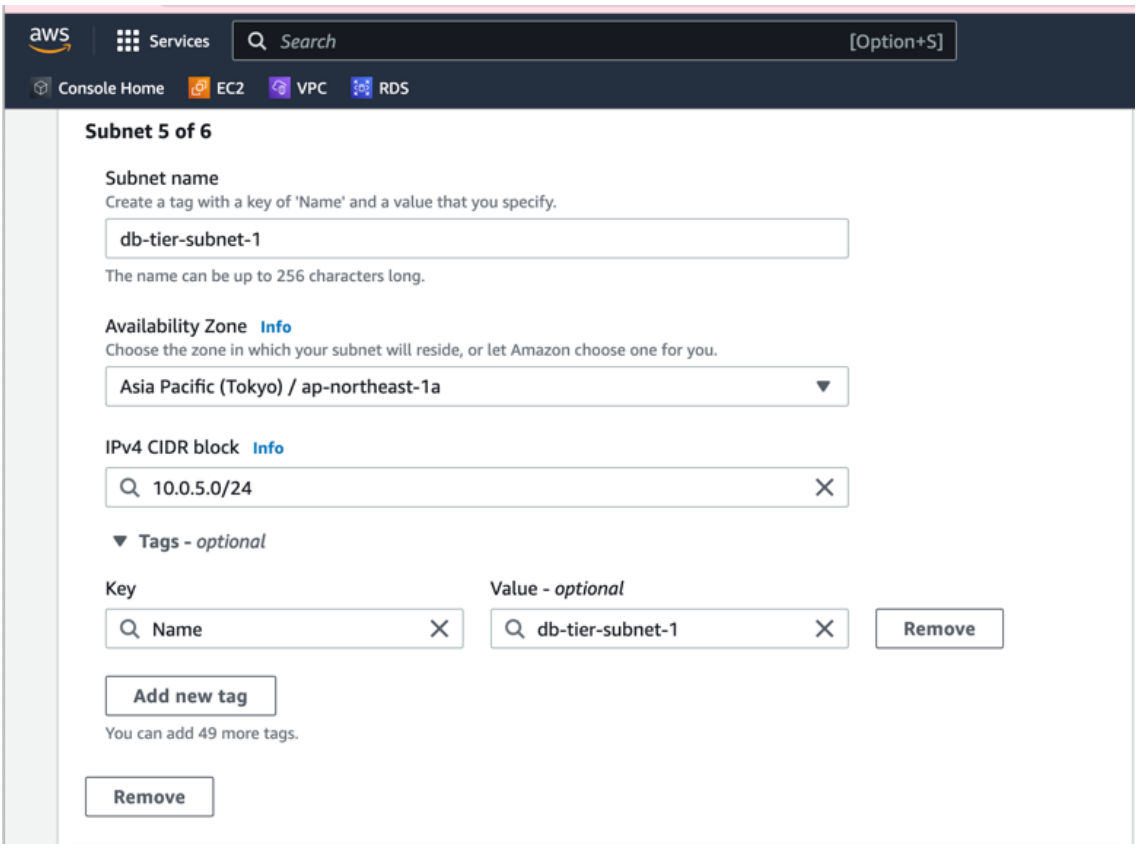
Subnet 3


Subnet 3 of 6
Subnet name
Create a tag with a key of 'Name' and a value that you specify.
app-tier-subnet-1
The name can be up to 256 characters long.
Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
Asia Pacific (Tokyo) / ap-northeast-1a
IPv4 CIDR block Info
10.0.3.0/24
Tags - optional
Key
Value - optional
Name
app-tier-subnet-1
Remove
Add new tag
You can add 49 more tags.
Remove

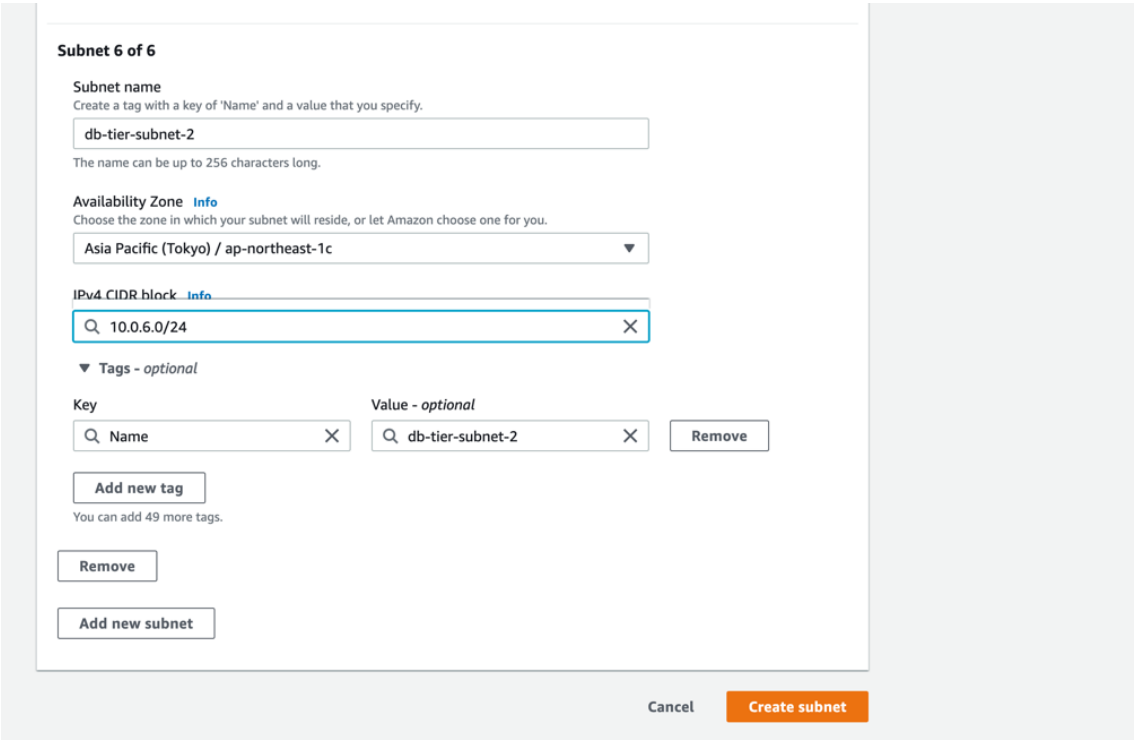
Subnet 4


Subnet 4 of 6
Subnet name
Create a tag with a key of 'Name' and a value that you specify.
app-tier-subnet-2
The name can be up to 256 characters long.
Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
Asia Pacific (Tokyo) / ap-northeast-1c
IPv4 CIDR block Info
10.0.4.0/24
Tags - optional
Key
Value - optional
Name
app-tier-subnet-2
Remove
Add new tag
You can add 49 more tags.
Remove

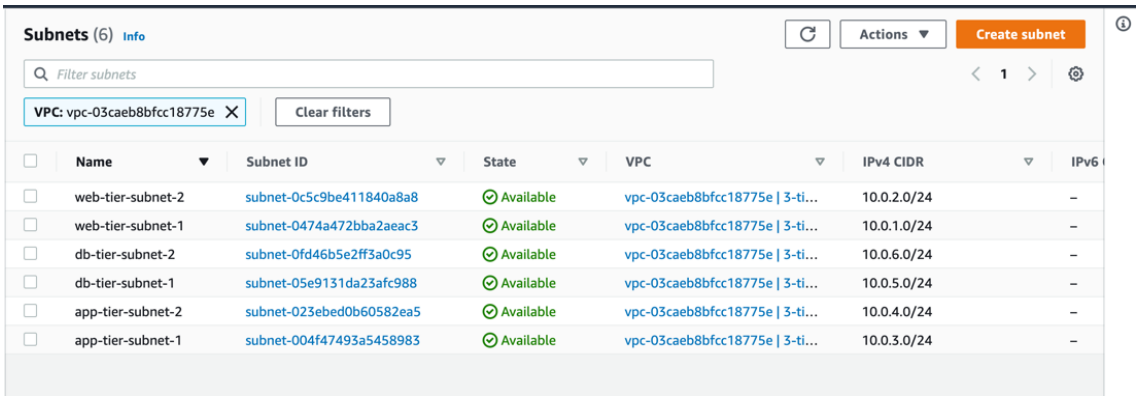
Subnet 5


aws
Services
Search
[Option+S]
Console Home
EC2
VPC
RDS
Subnet 5 of 6
Subnet name
Create a tag with a key of 'Name' and a value that you specify.
db-tier-subnet-1
The name can be up to 256 characters long.
Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
Asia Pacific (Tokyo) / ap-northeast-1a
IPv4 CIDR block Info
10.0.5.0/24
Tags - optional
Key
Value - optional
Name
db-tier-subnet-1
Remove
Add new tag
You can add 49 more tags.
Remove

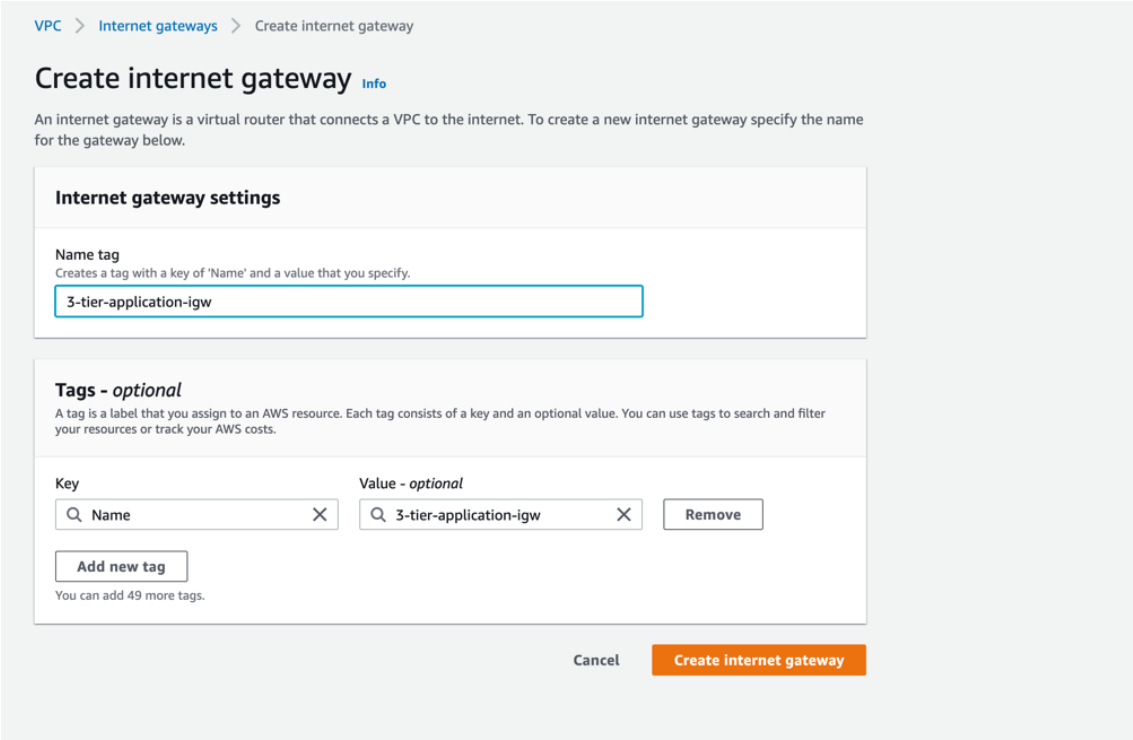
Subnet 6



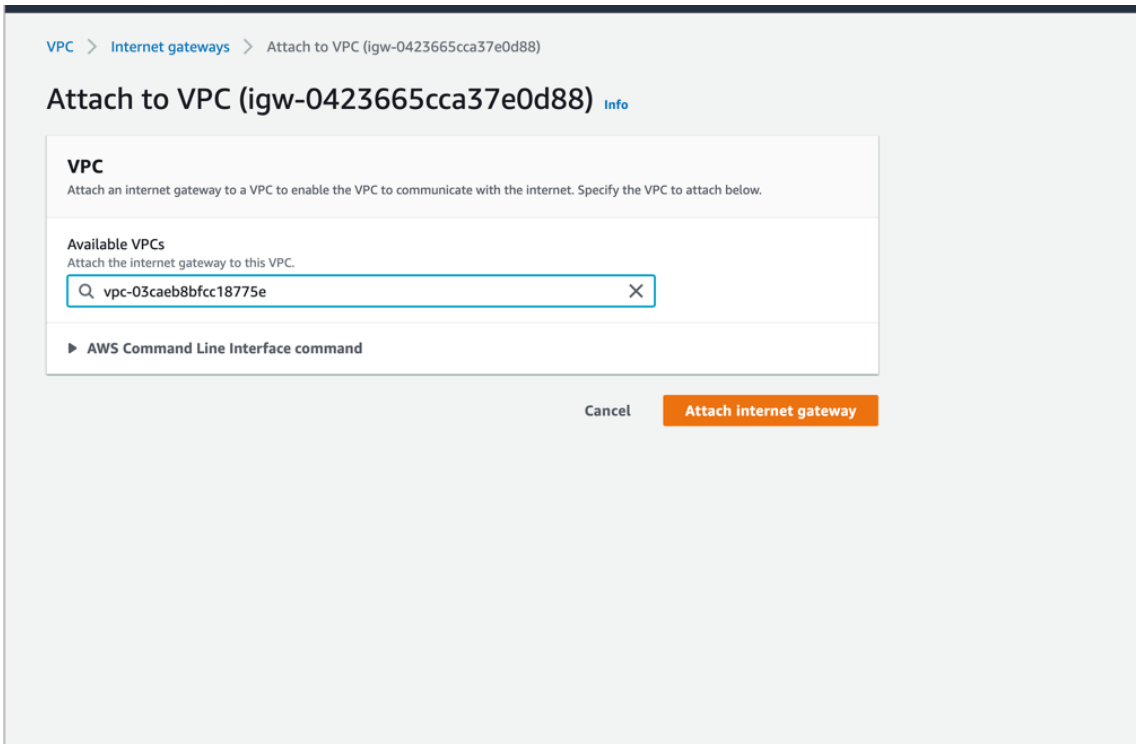
Interface



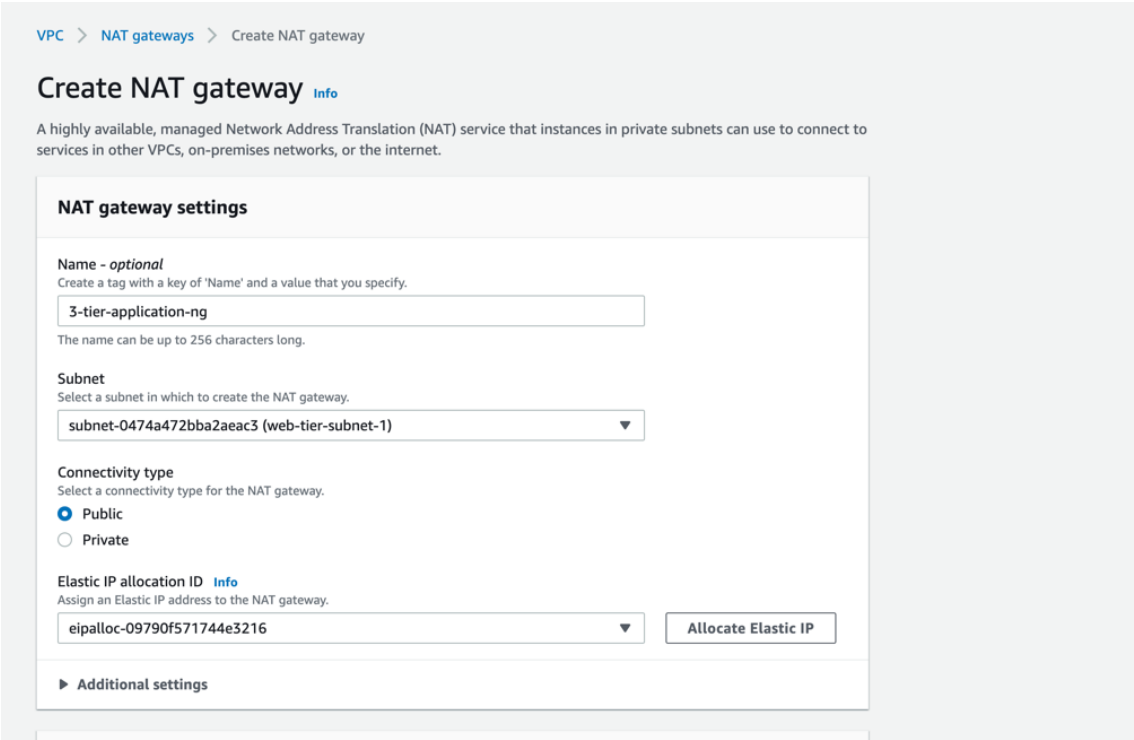
Create Internet Gateway



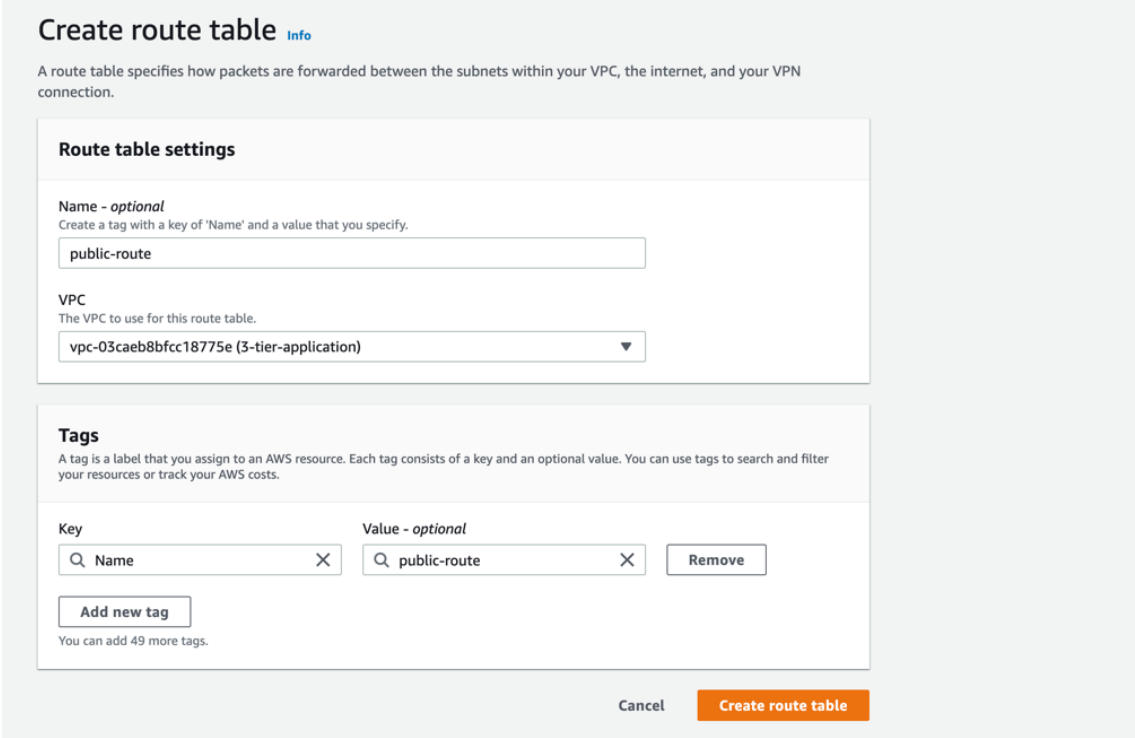
Attach it to VPC

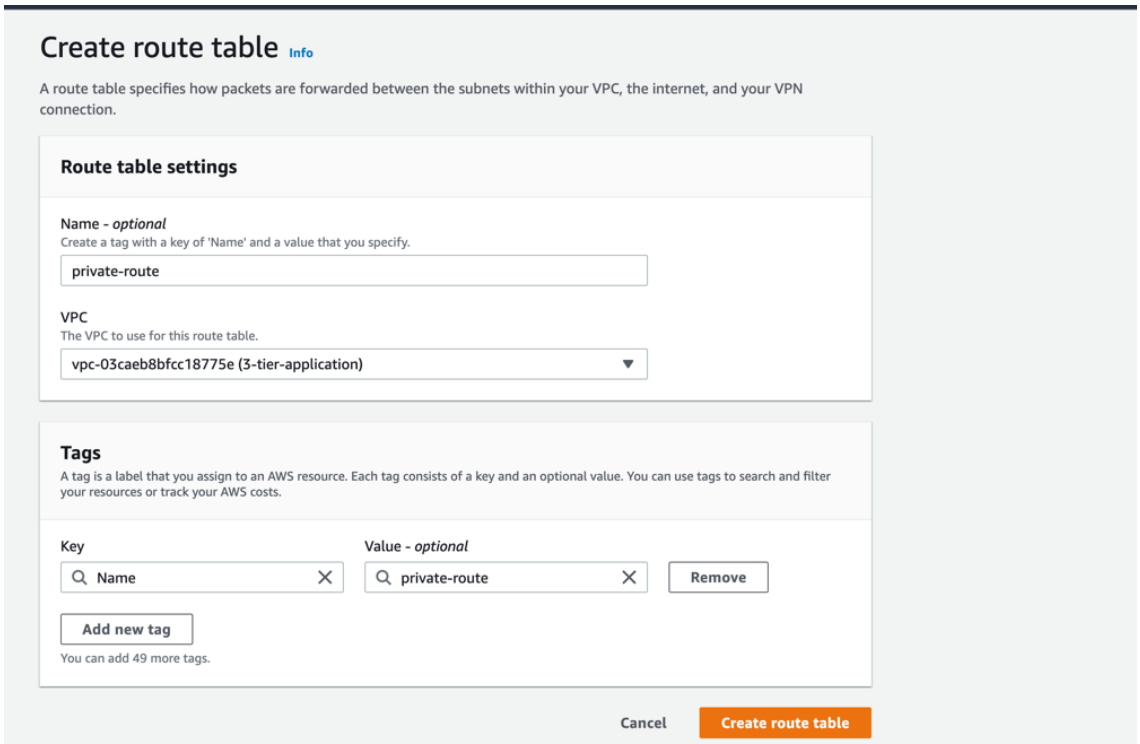


Create NAT Gateway

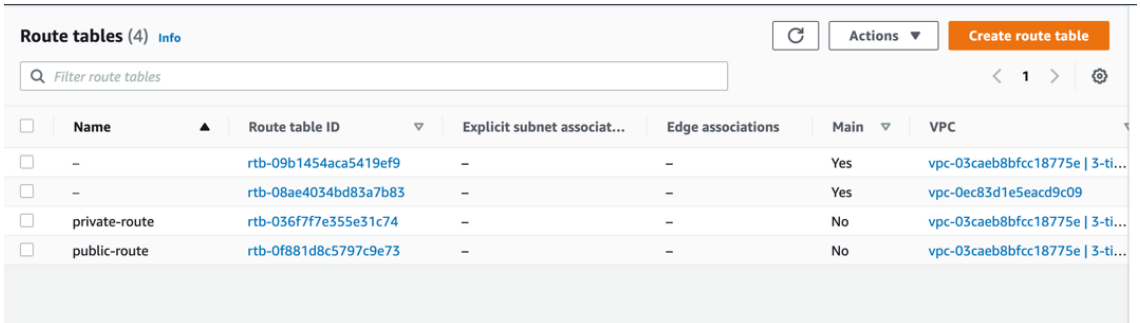


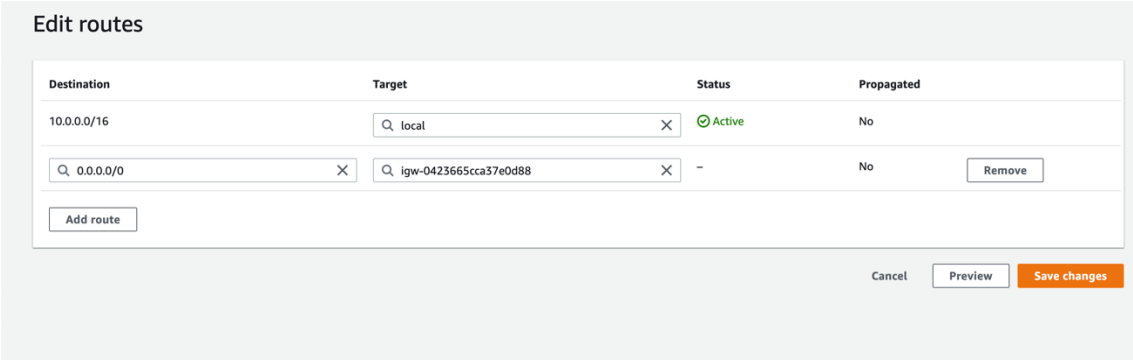
Create Routing Tables

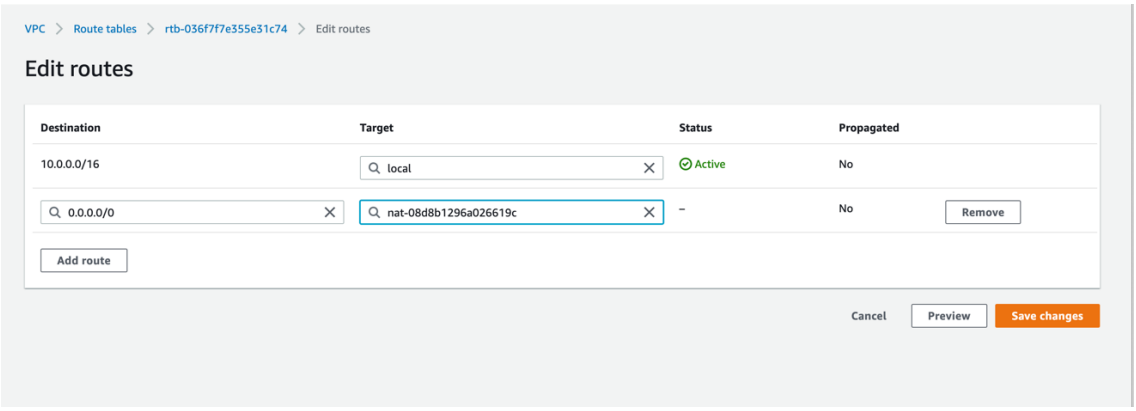



Create route table Info
A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.
Route table settings
Name - optional
Create a tag with a key of 'Name' and a value that you specify.
private-route
VPC
The VPC to use for this route table.
vpc-03caeb8bfcc18775e (3-tier-application)
Tags
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.
Key
Name
Value - optional
private-route
Remove
Add new tag
You can add 49 more tags.
Cancel
Create route table

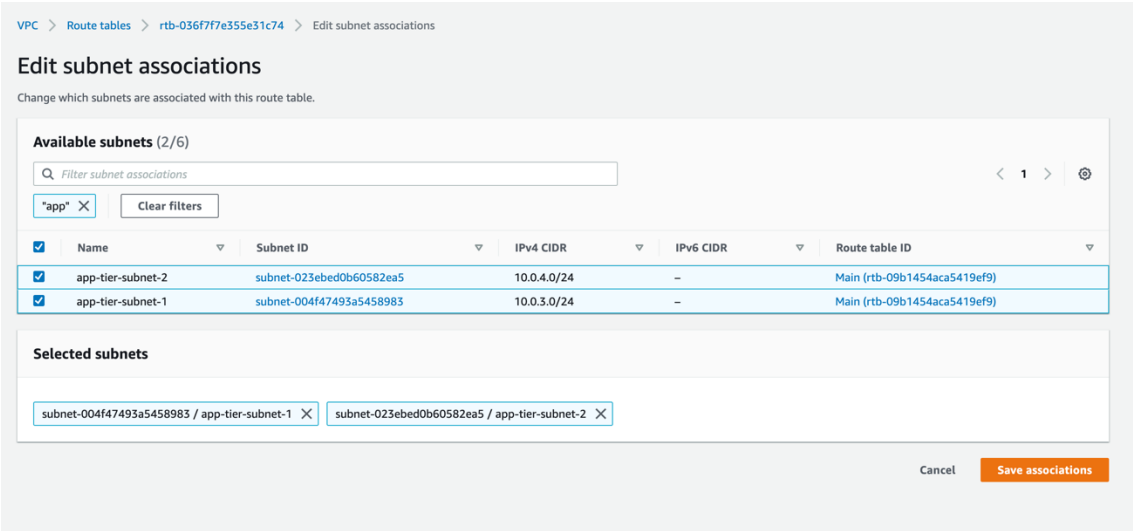
Edit Routes


Route tables (4) Info
Actions
Create route table
Filter route tables
1
Name
Route table ID
Explicit subnet associat...
Edge associations
Main
VPC
– rtb-09b1454aca5419ef9 – – Yes vpc-03caeb8bfcc18775e | 3-ti...
– rtb-08ae4034bd83a7b83 – – Yes vpc-0ec83d1e5eacd9c09
private-route rtb-036f7f7e355e31c74 – – No vpc-03caeb8bfcc18775e | 3-ti...
public-route rtb-0f881d8c5797c9e73 – – No vpc-03caeb8bfcc18775e | 3-ti...

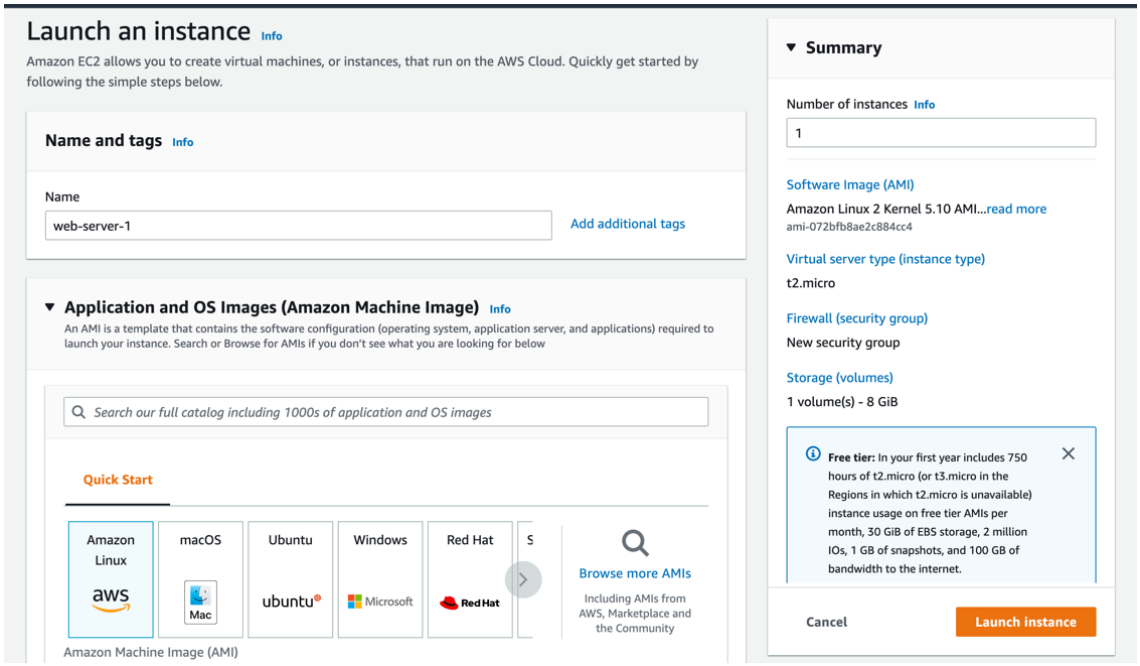




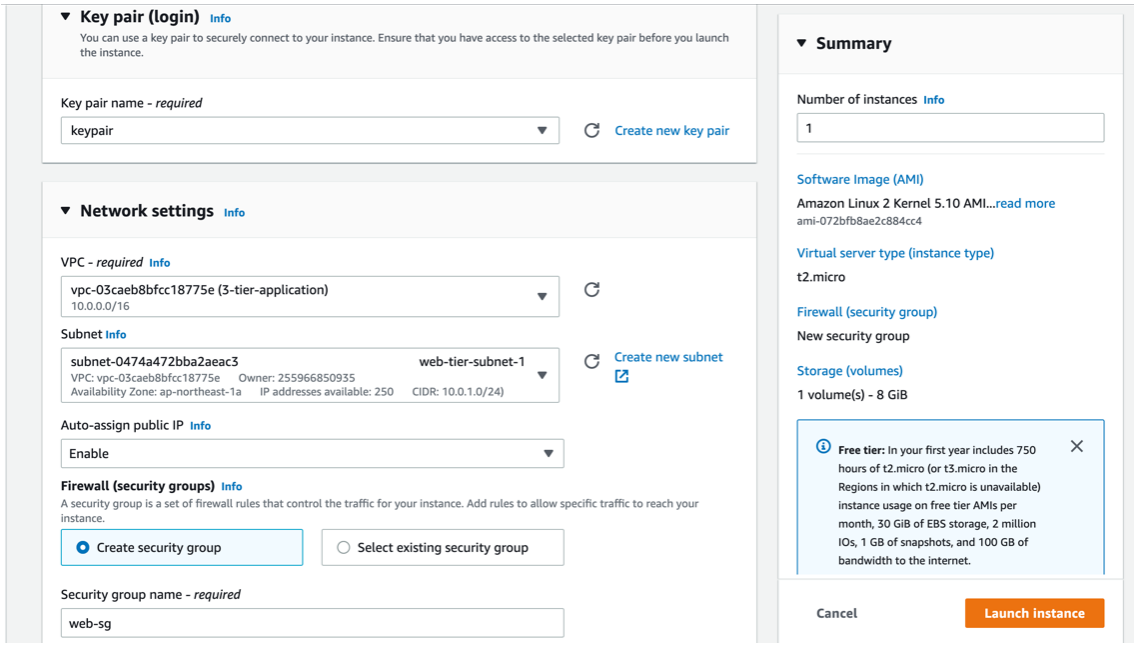
Edit Subnets Associations

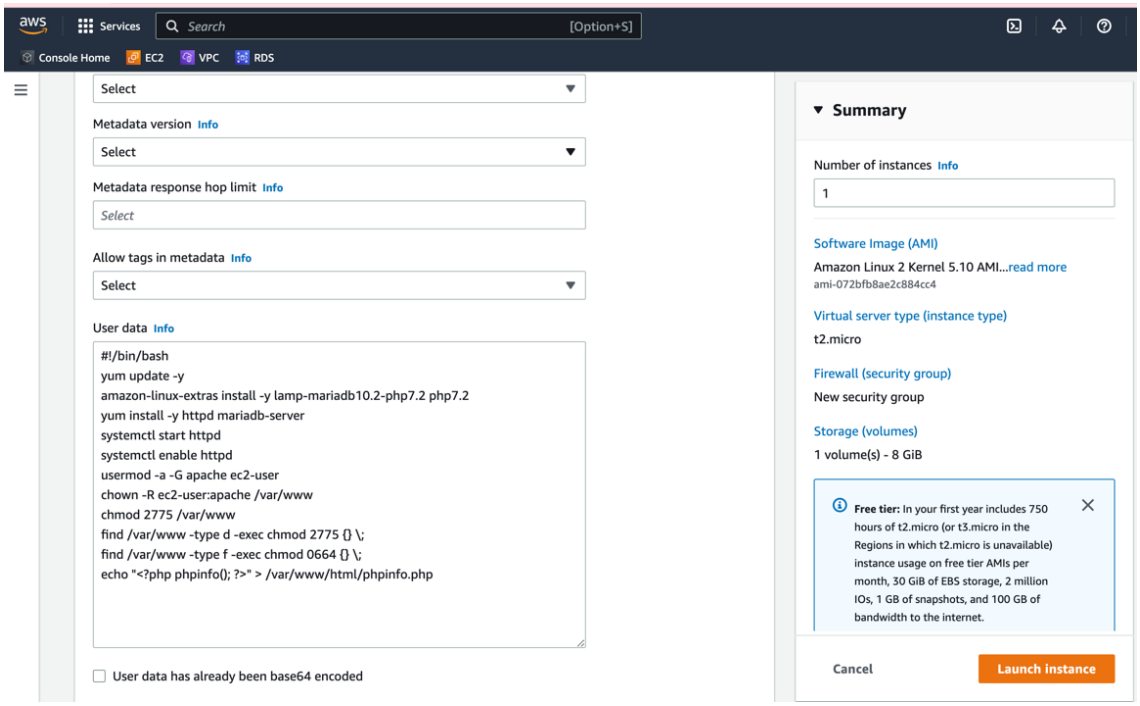


Launch Instance

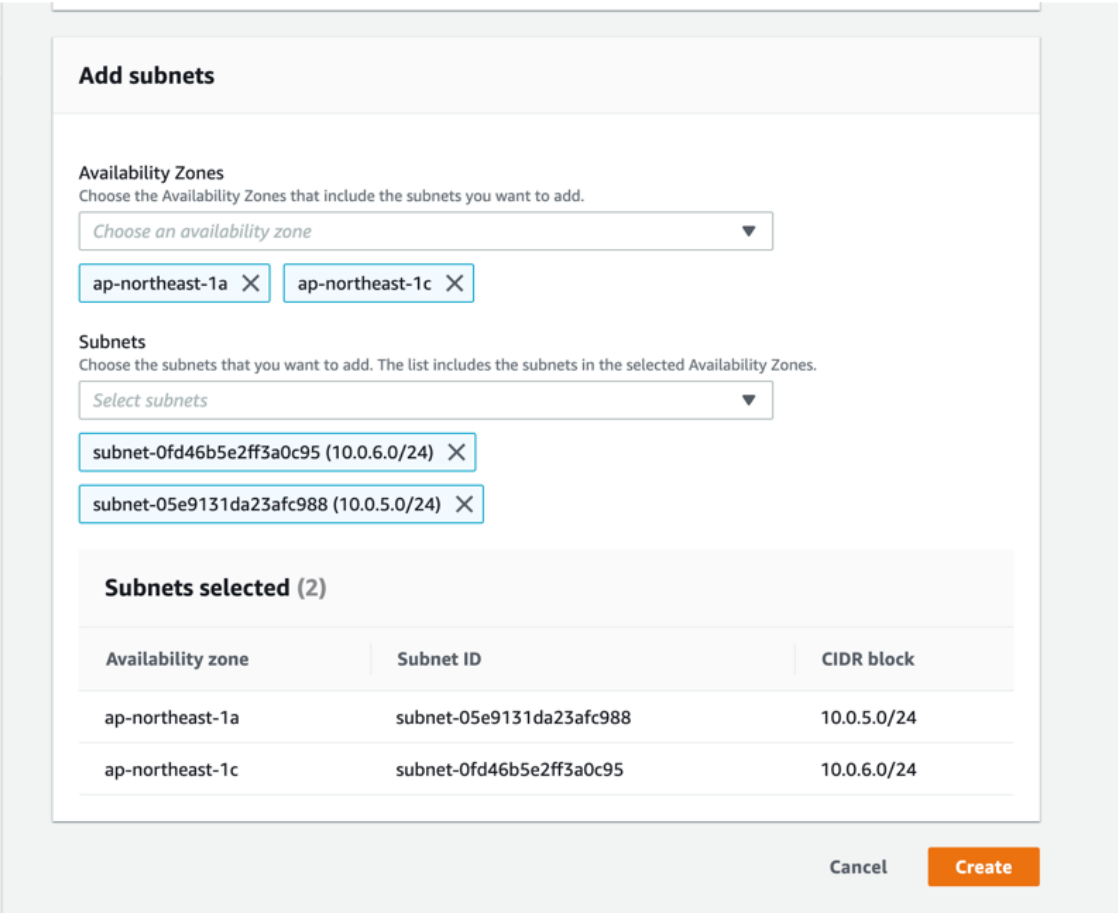


Network Settings

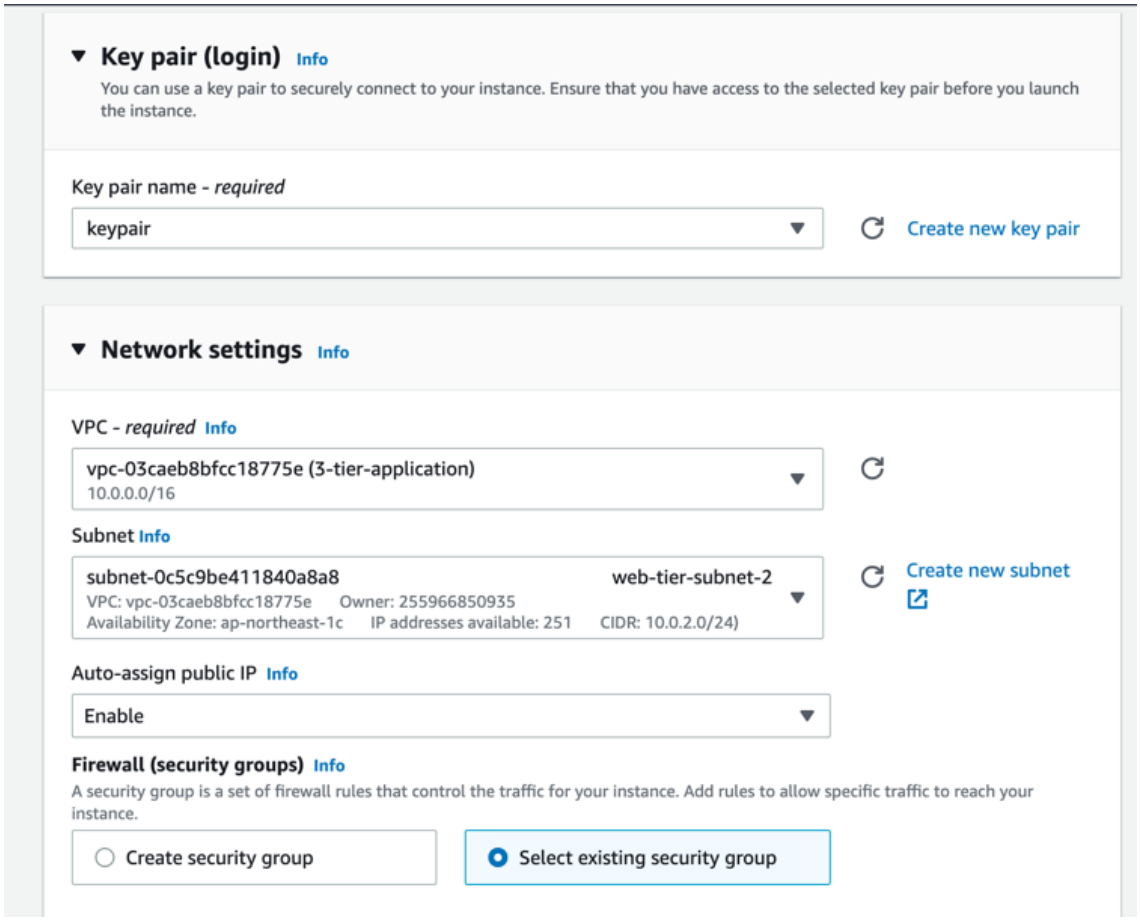



aws
Services
Search
[Option+S]
Console Home
EC2
VPC
RDS
Select
Metadata version Info
Select
Metadata response hop limit Info
Select
Allow tags in metadata Info
Select
User data Info
#!/bin/bash
yum update -y
amazon-linux-extras install -y lamp-mariadb10.2-php7.2 php7.2
yum install -y httpd mariadb-server
systemctl start httpd
systemctl enable httpd
usermod -a -G apache ec2-user
chown -R ec2-user:apache /var/www
chmod 2775 /var/www
find /var/www -type d -exec chmod 2775 {} \;
find /var/www -type f -exec chmod 0664 {} \;
echo "<?php phpinfo(); ?>" > /var/www/html/phpinfo.php
User data has already been base64 encoded
Summary
Number of instances Info
1
Software Image (AMI)
Amazon Linux 2 Kernel 5.10 AMI...read more
ami-072bfb8ae2c884cc4
Virtual server type (instance type)
t2.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 8 GiB
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.
Cancel
Launch instance

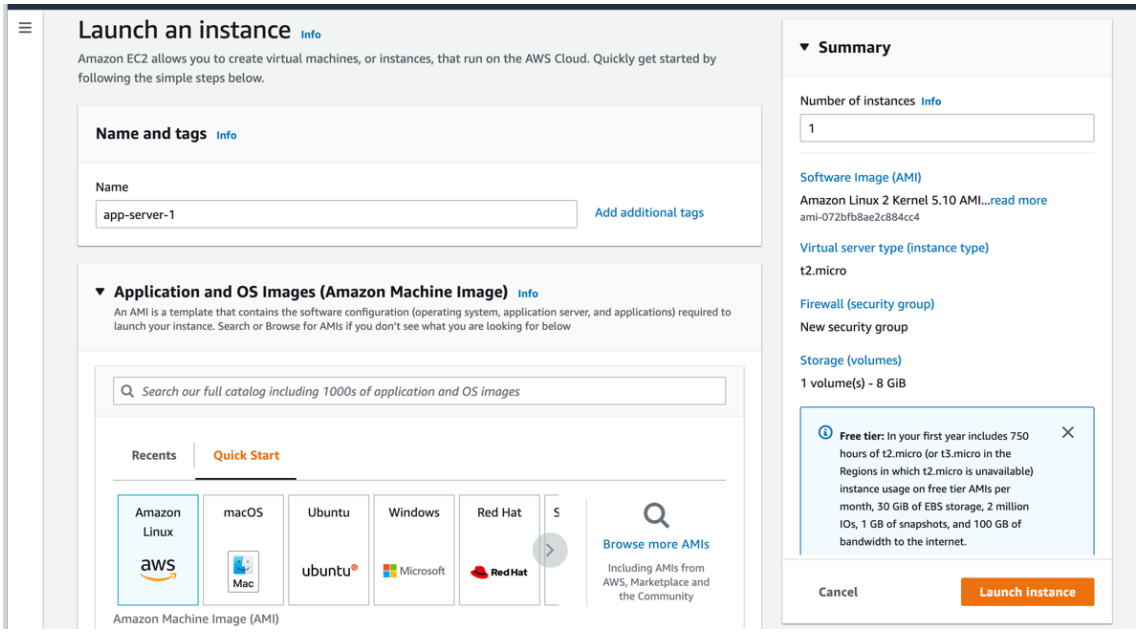
Add Subnets


Add subnets
Availability Zones
Choose the Availability Zones that include the subnets you want to add.
Choose an availability zone
ap-northeast-1a
ap-northeast-1c
Subnets
Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.
Select subnets
subnet-0fd46b5e2ff3a0c95 (10.0.6.0/24)
subnet-05e9131da23afc988 (10.0.5.0/24)
Subnets selected (2)
Availability zone
Subnet ID
CIDR block
ap-northeast-1a
subnet-05e9131da23afc988
10.0.5.0/24
ap-northeast-1c
subnet-0fd46b5e2ff3a0c95
10.0.6.0/24
Cancel
Create

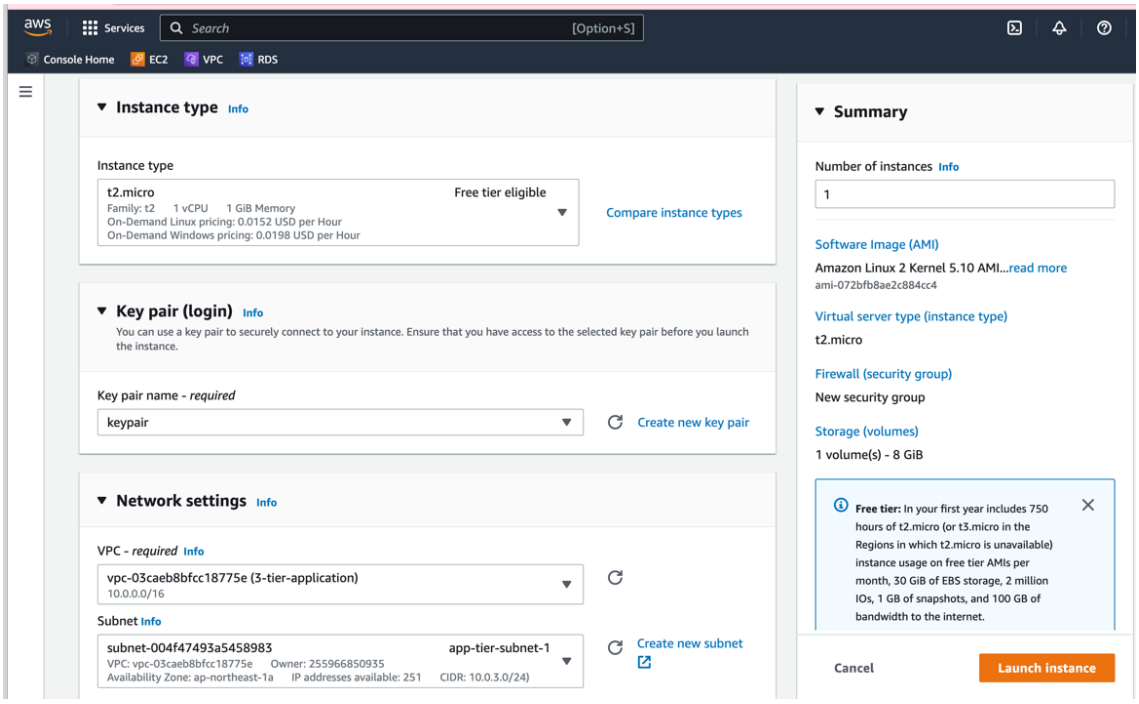
Network Settings



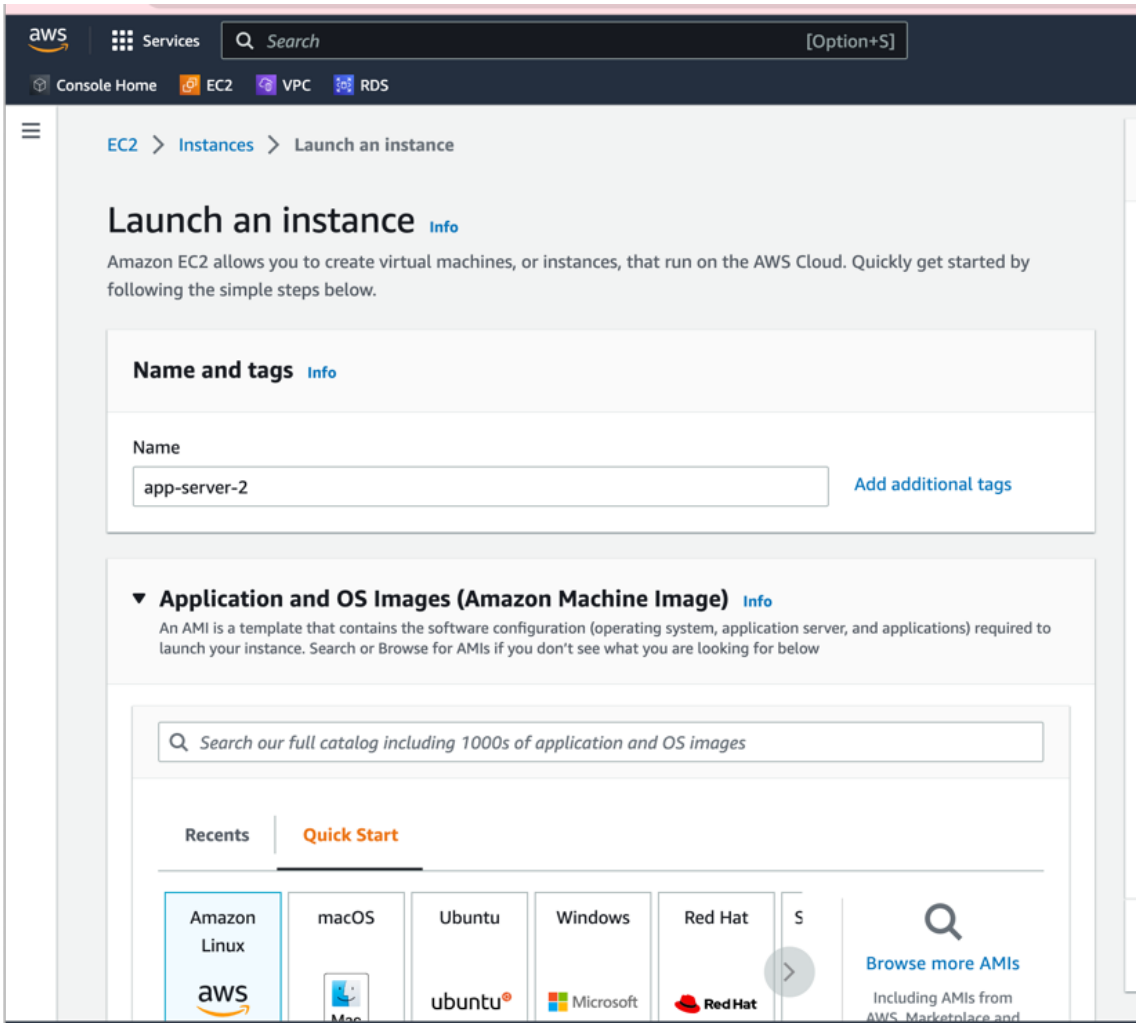
Launch 3rd Instance App-server-1



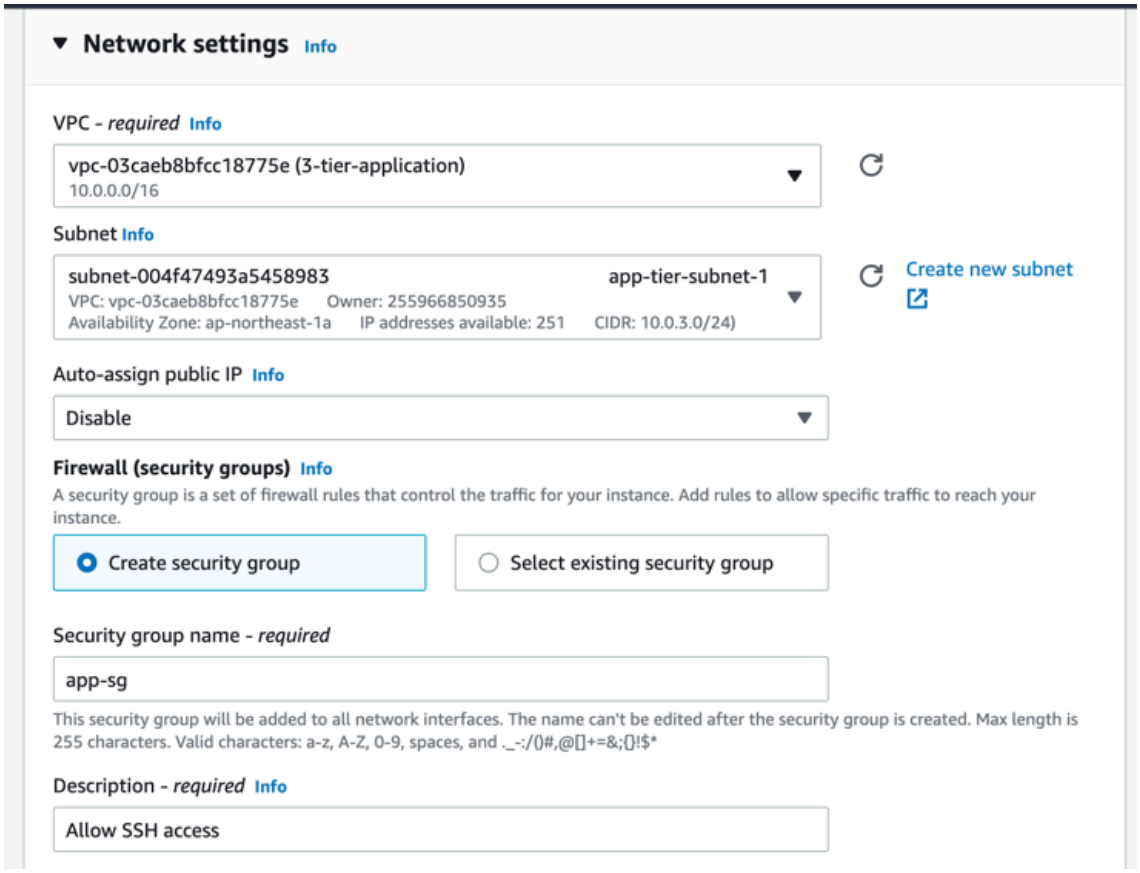
Network Settings

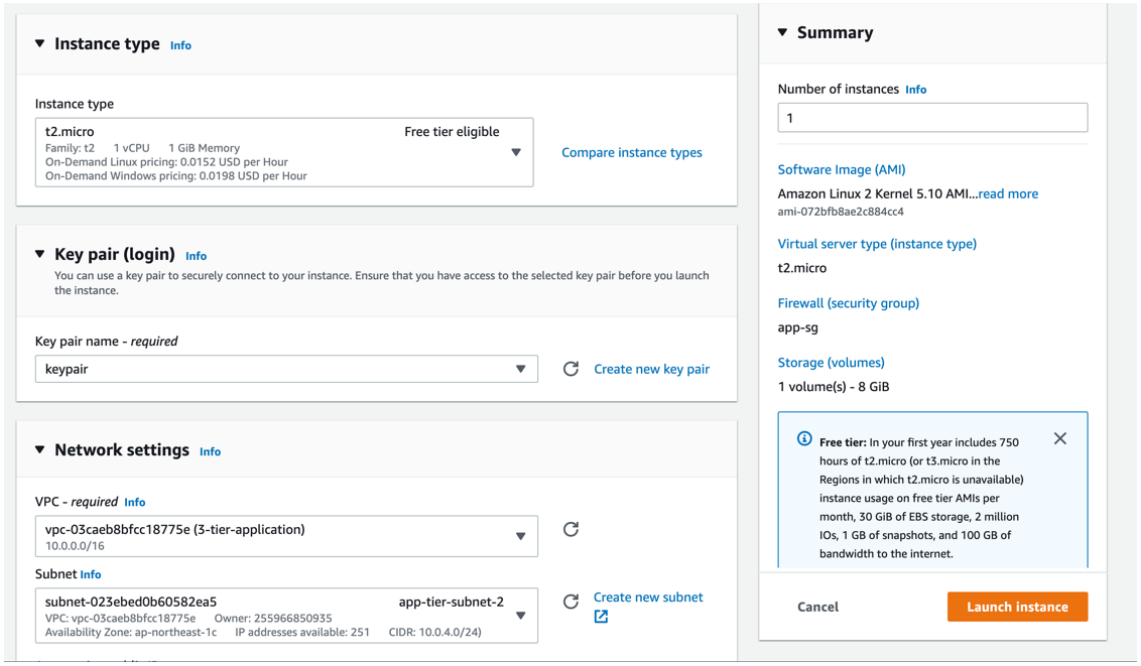


Launch App-server-2

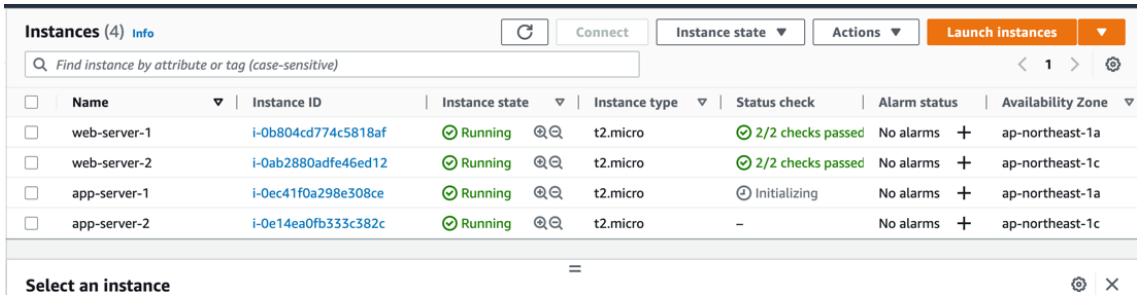


Network Settings





Listing instances



Create to Web-server-1 instance (front-end) through terminal

Download keypair.

Command:

```
ssh -i "keypair.com" ec2-user@ip
```

Execute it:

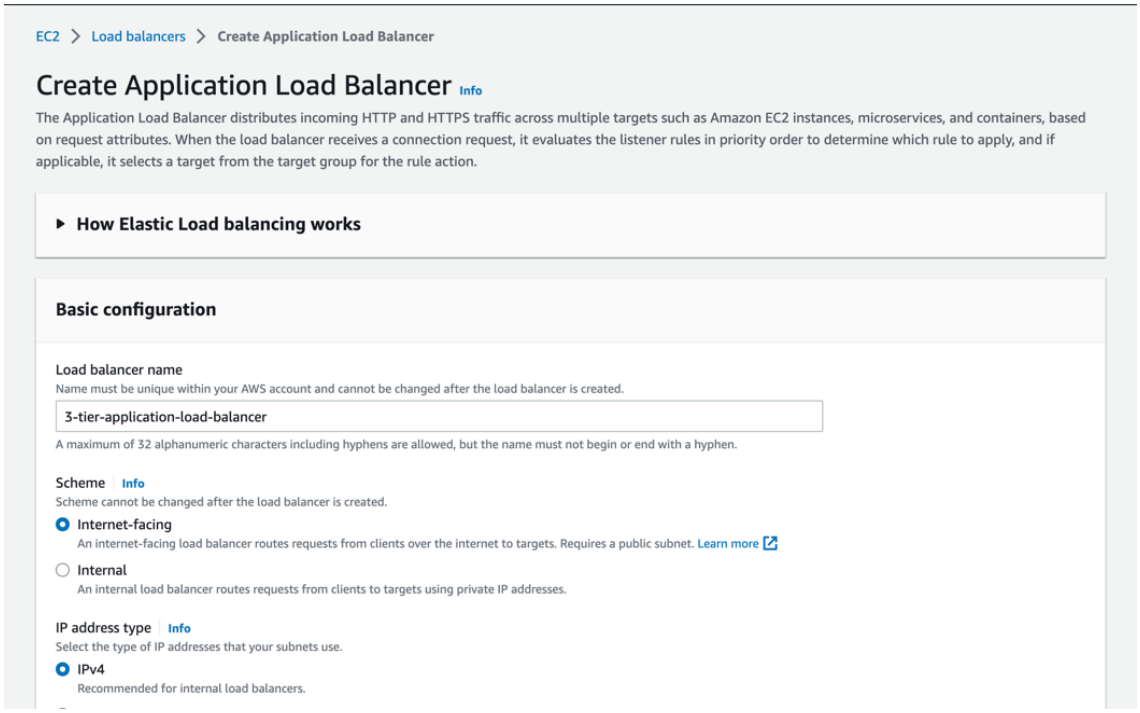
```
ssh -i "keypair.pem" ec2-user@54.208.114.96
```

Output:

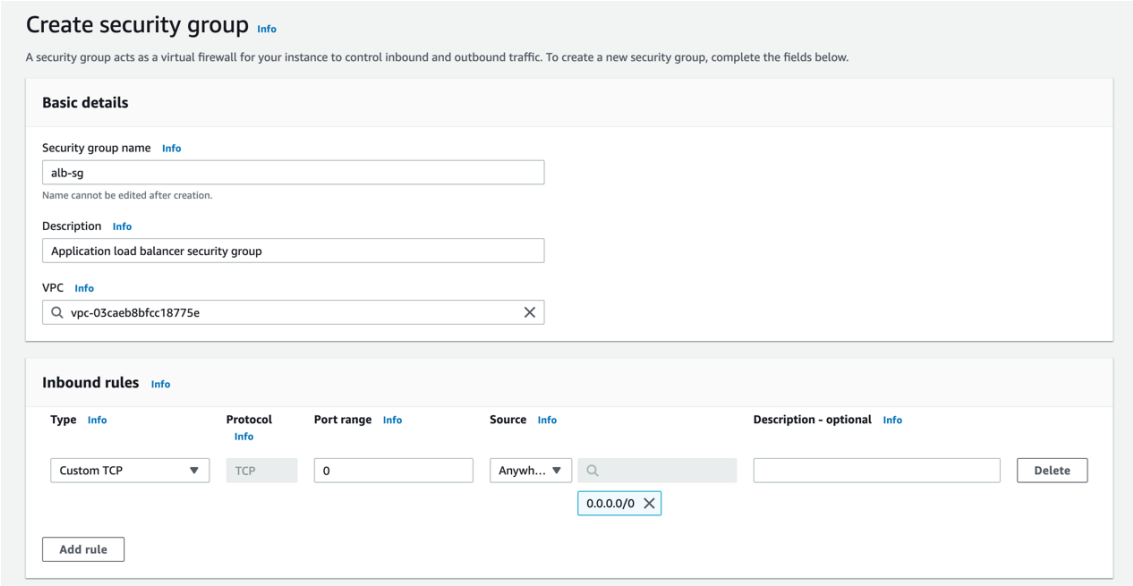
```
The authenticity of host '54.208.114.96 (54.208.114.96)' can't be established.
RSA key fingerprint is 0e:3e:00:c4:69:78:28:60:78:bc:ac:71:4a:1d:f0:44.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '54.208.114.96' (RSA) to the list of known hosts.

       __|  __|_  )
       _|  (     /   Amazon Linux AMI
      ___|\___|___|
https://aws.amazon.com/amazon-linux-ami/2013.03-release-notes/
There are 6 security update(s) out of 13 total update(s) available
Run "sudo yum update" to apply all updates.
```

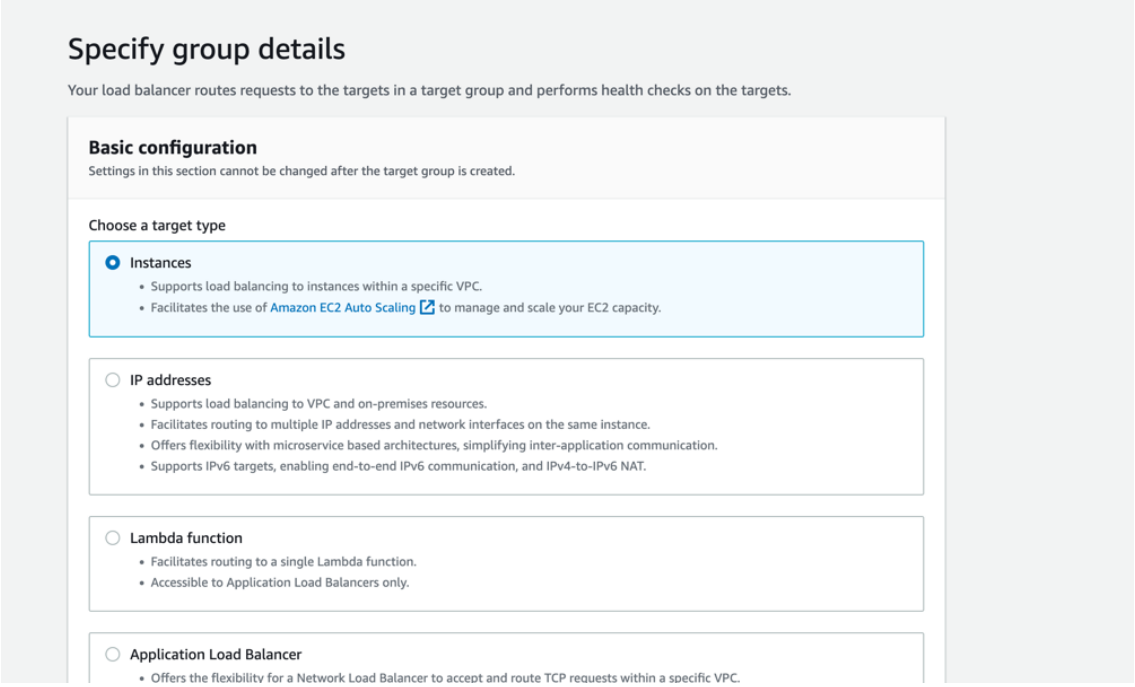
Create Application Load BALANCER

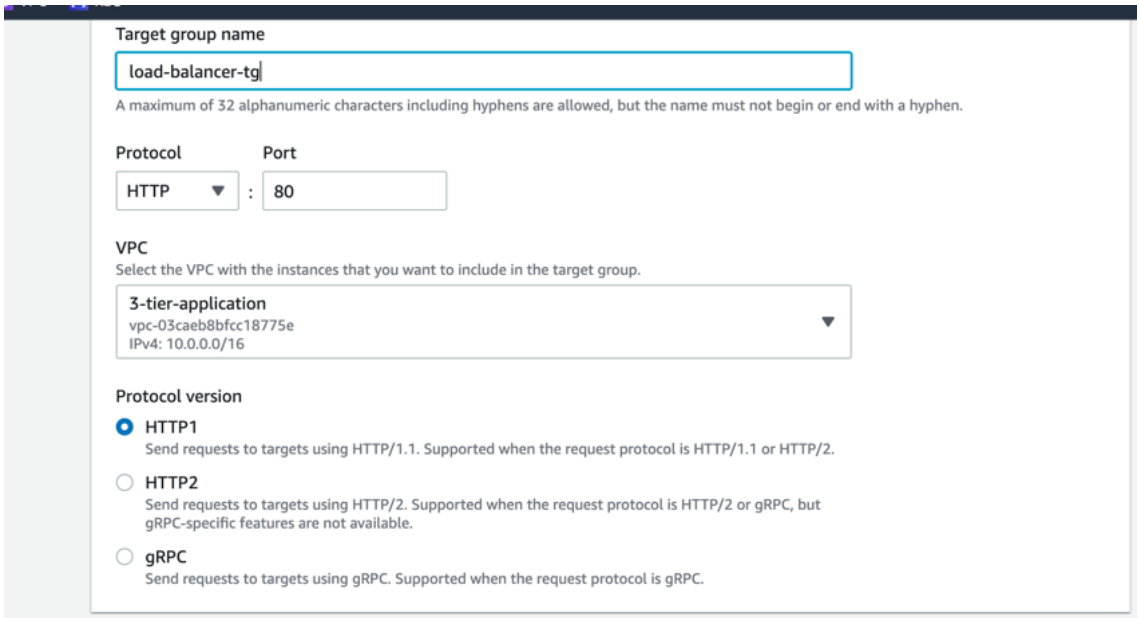


Create Security Group



Group Details





EC2 > Target groups > Create target group

Step 1
Specify group details

Step 2
Register targets

Register targets

This is an optional step to create a target group. However, to ensure that your load balancer routes traffic to this target group you must register your targets.

Available instances (2/4)

Filter resources by property or value

1

Instance ID	Name	State	Security groups	Zone	Subnet ID
i-0e14ea0fb333c382c	app-server-2	running	app-sg	ap-northeast-1c	subnet-023ebed0b60582ea5
i-0ab2880adfe46ed12	web-server-2	running	web-sg	ap-northeast-1c	subnet-0c5c9be411840a8a8
i-0ec41f0a298e308ce	app-server-1	running	app-sg	ap-northeast-1a	subnet-004f47493a5458983
i-0b804cd774c5818af	web-server-1	running	web-sg	ap-northeast-1a	subnet-0474a472bba2aeac3

2 selected

Ports for the selected instances
Ports for routing traffic to the selected instances.

80

Security groups Info

A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups

Select up to 5 security groups

Create new security group

alb-sg sg-045de549df4252fa2
VPC: vpc-03caeb8bfcc18775e

Listeners and routing Info

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

Listener **HTTP:80**

Remove

Protocol	Port	Default action Info
HTTP	80 (1-65535)	Forward to: load-balancer-tg, Target type: Instance, IPv4 — HTTP

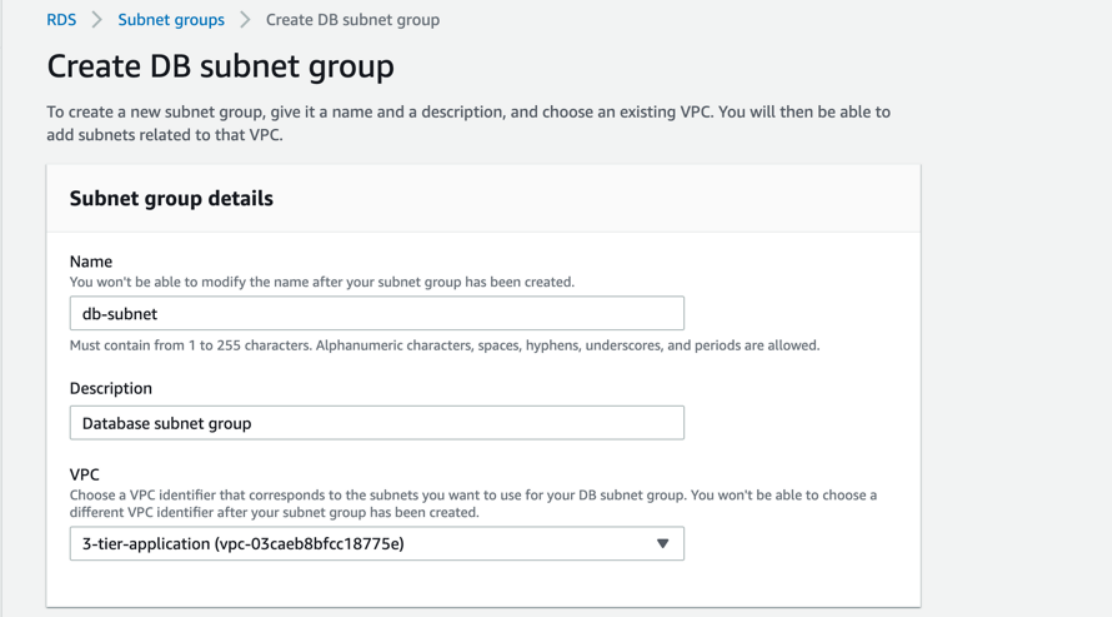
Create target group

Listener tags - *optional*

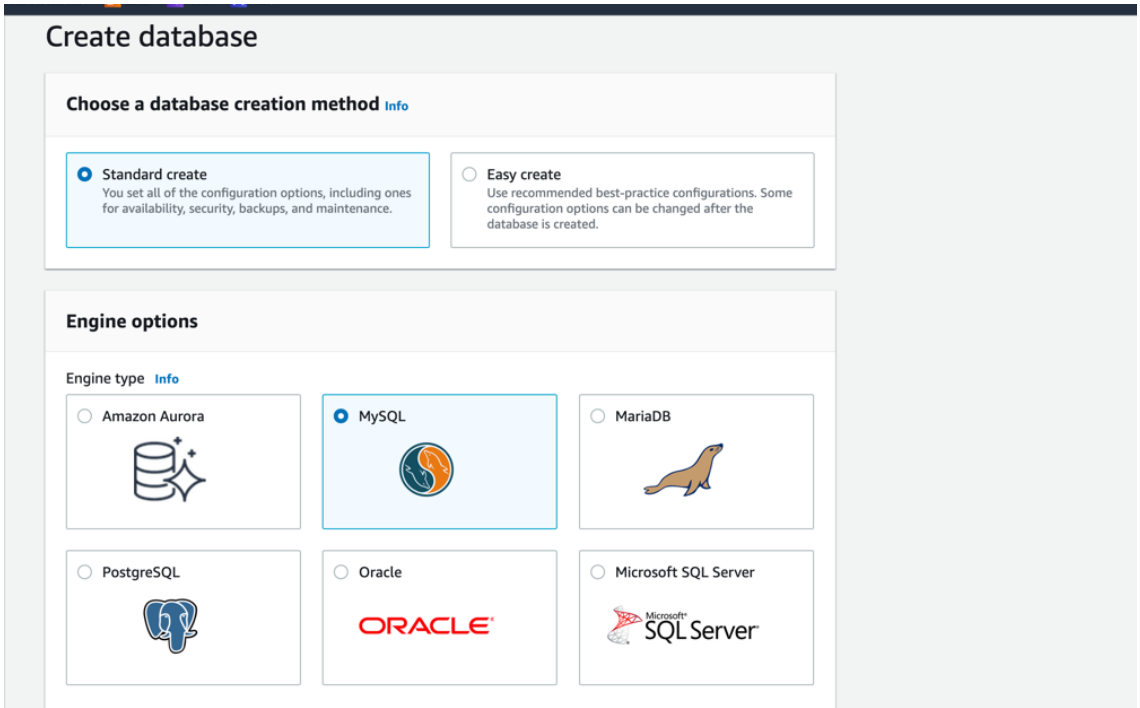
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

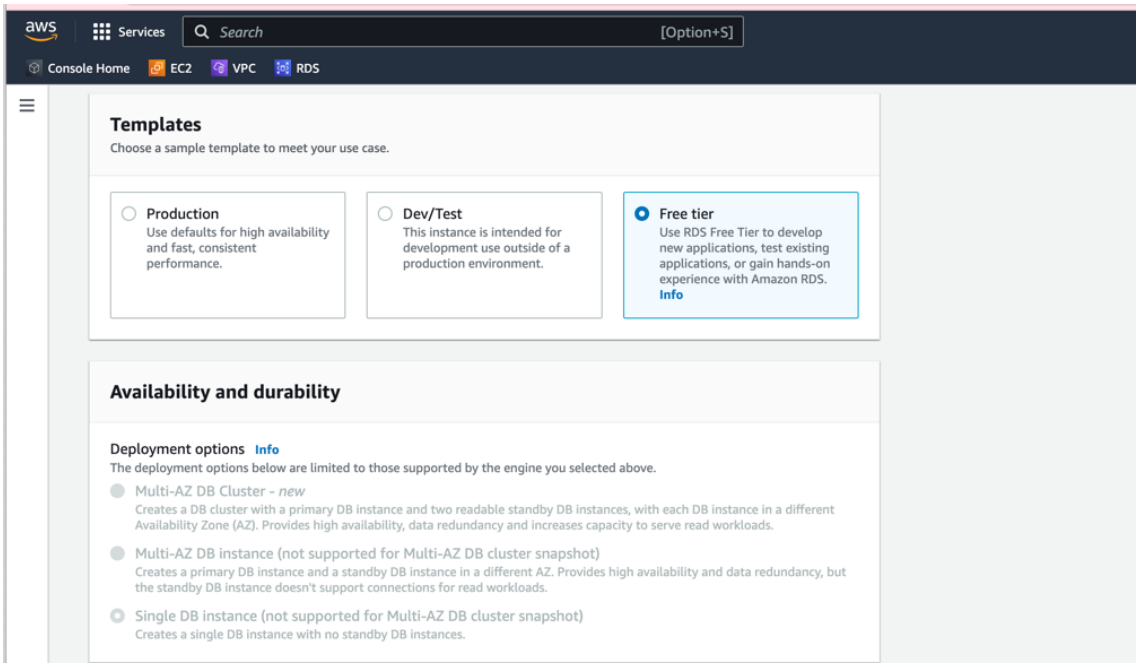
Add listener tag

Launch RDS Instance



Create Database





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.

db-1

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 master password Info

••••••••

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

◯ Include previous generation classes

Storage

Storage type Info

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

Allocated storage

200 GiB

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

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.

aws Services Search [Option+S]

Console Home EC2 VPC RDS

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.

- (selected) **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.

Virtual private cloud (VPC) Info

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

3-tier-application (vpc-03caeb8bfcc18775e)

Only VPCs with a corresponding DB subnet group are listed.

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

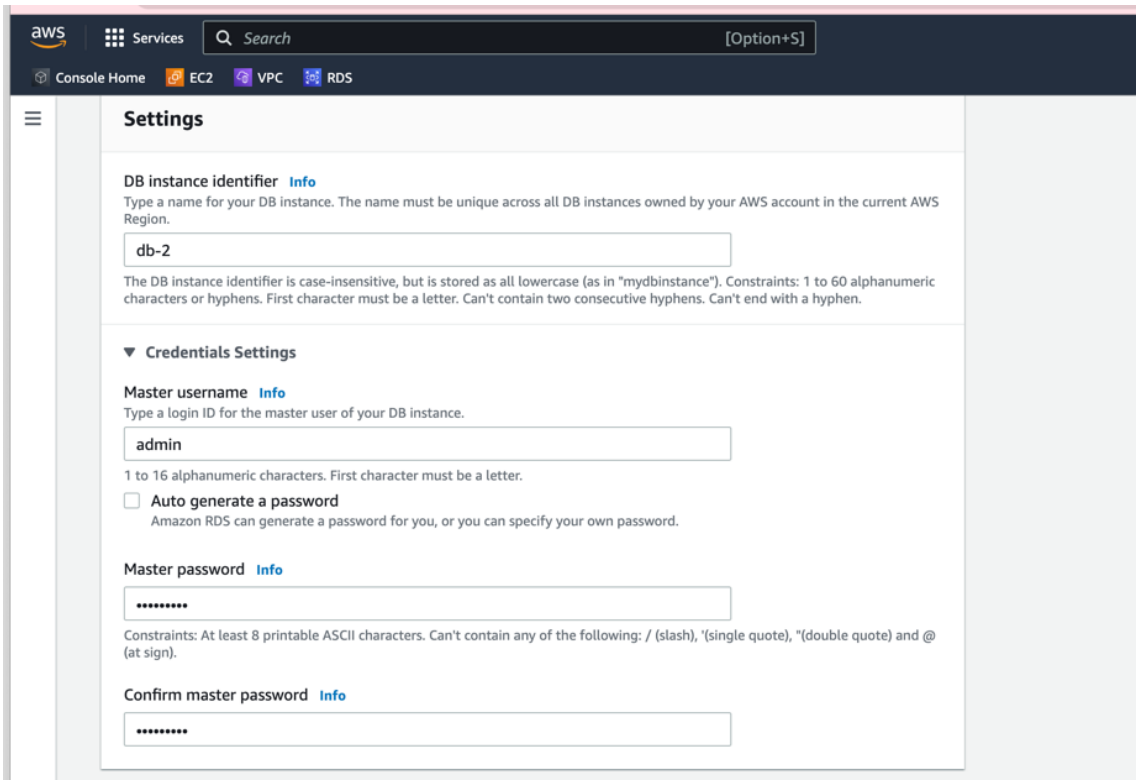
DB Subnet group Info

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.

db-subnet

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.
- (selected) **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.


aws
Services
Search
[Option+S]
Console Home
EC2
VPC
RDS
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.
db-2
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 master password Info

aws | Services | Search [Option+S]

Console Home | EC2 | VPC | RDS

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.

- (selected) **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.
- (not selected) **Connect to an EC2 compute resource**
  Set up a connection to an EC2 compute resource for this database.

Virtual private cloud (VPC) Info

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

3-tier-application (vpc-03caeb8bfcc18775e)

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.

db-subnet

Public access Info

- (not selected) **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.
- (selected) **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.

db-subnet

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

Existing VPC security groups

Choose one or more options

db-sg

Availability Zone Info

ap-northeast-1c

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

Create an RDS Proxy Info
RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see Amazon RDS Proxy pricing.