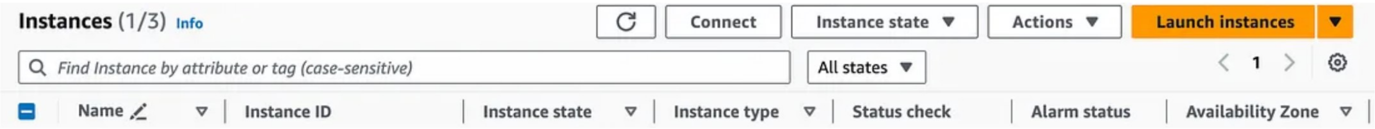
Step-by-step guide for deploying a Streamlit application on an AWS EC2 instance

Aiko Hassett · Follow
5 min read · Jul 13, 2024

Launch a new EC2 instance

From your AWS CLI, go into your **EC2 Dashboard** and select **Launch instances.**

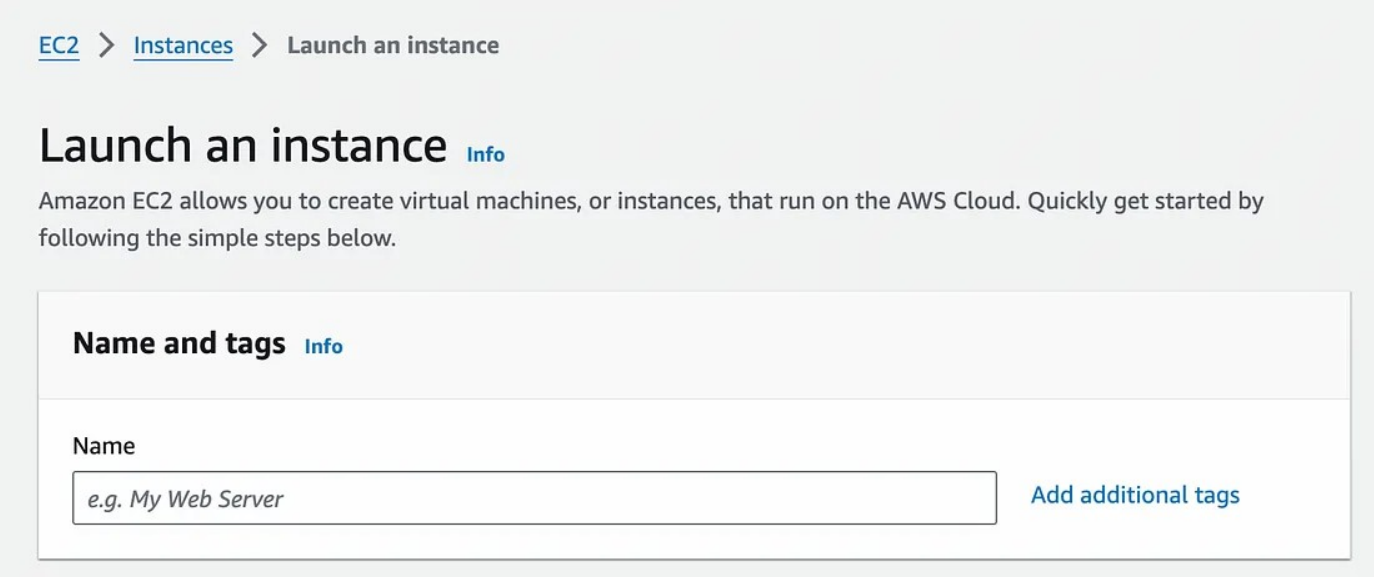


Snippet of the EC2 dashboard

· · ·

Configure your EC2 instance

When configuring your **instance type**, pay attention to how big your application is (including all the dependencies that come with running it). For example, a *t2.micro* might not be the best choice if you're looking to run compute-intensive workloads directly from your EC2 instance. For me, my web application ran on a handful of dependencies and API calls, so a *t2.micro* seemed like an adequate option.



EC2 > Instances > Launch an instance

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name

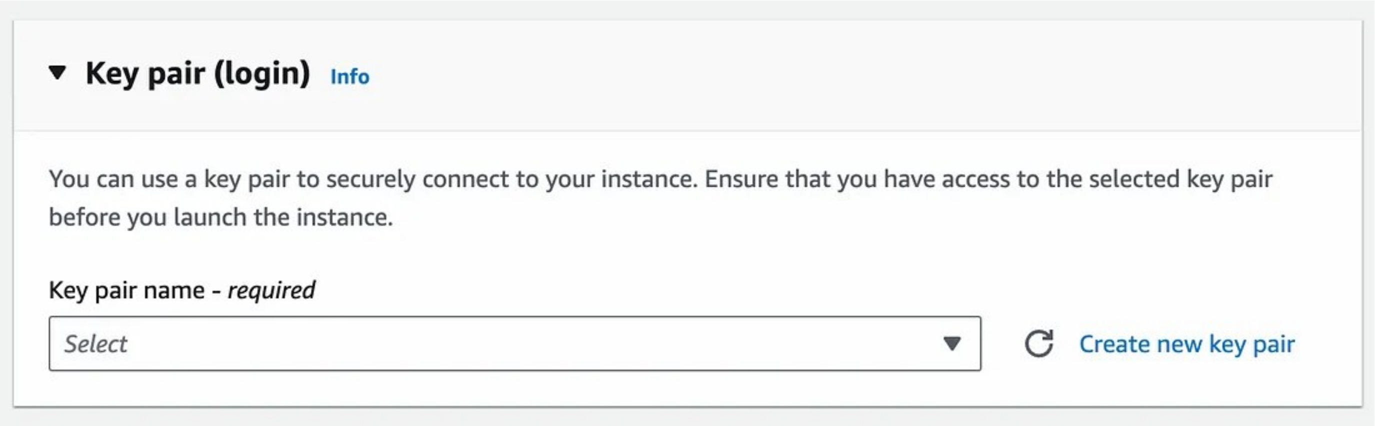
e.g. My Web Server

Snippet A — Configure your EC2 instance

Note: At the time of writing this article, t2.micro supports 1GB vCPU and 1GB of memory. Keep in mind, you won't be able to allocate the full 1GB of memory on the t2.micro instance to your web application because some of that will be reserved for use by the operating system. If you are unsure if a t2.micro fits your use case, there is no harm in trying it out and scaling up the instance if it runs out of compute.

Set up a key pair for your EC2 instance

You can use an existing one, or let AWS create a new one for you. There is also an option to proceed without one, but it is highly recommended you set one up to secure your connection to your instance.



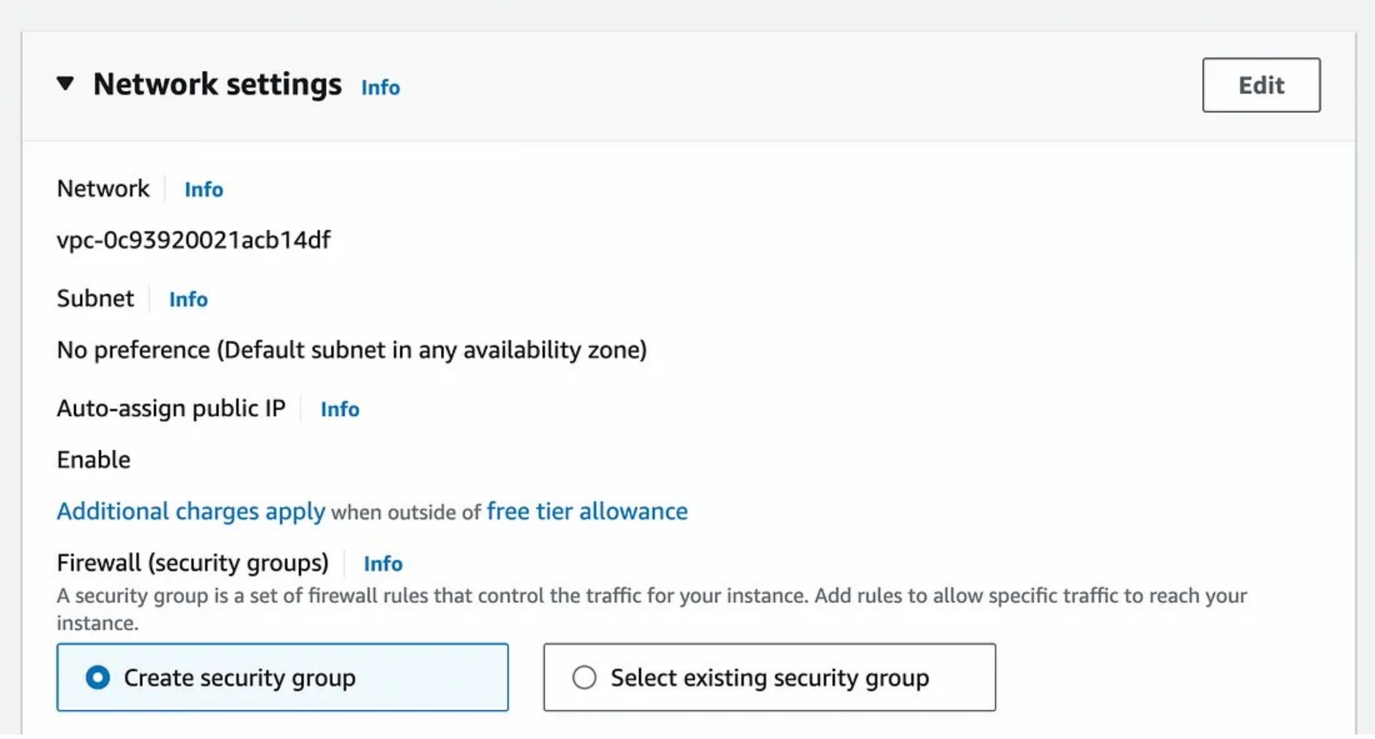
You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

Snippet B— Configure your EC2 instance

Configure your network settings

Make sure you check the appropriate options if you are looking to expose your web application over HTTP (port 80) and/or HTTPS (port 443).



Network | Info

vpc-0c93920021acb14df

Subnet | Info

No preference (Default subnet in any availability zone)

Auto-assign public IP | Info

Enable

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 specific traffic to reach your instance.

● Create security group

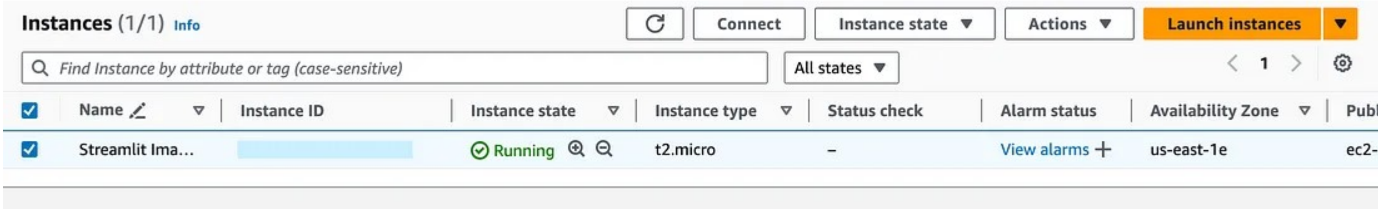
○ Select existing security group

Snippet C— Configure your EC2 instance

• • •

Connect to your EC2 instance

Once your are done configuring your instance details, finalize your changes via **launch instance.** This should be a fairly quick process that can take anywhere from 30 seconds to a few minutes. You should be redirected to your **Instances** dashboard where you can see the **instance state** update.

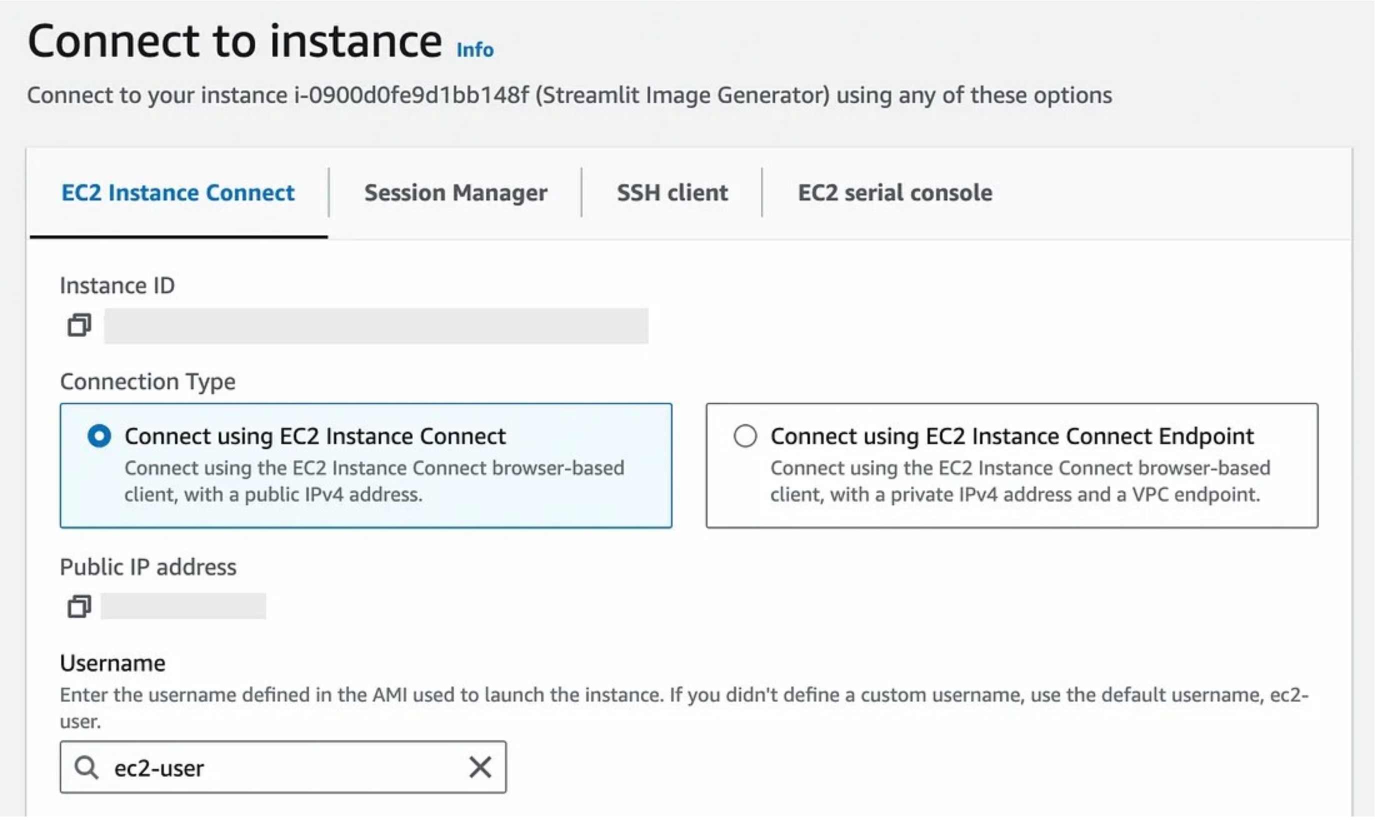


☑	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Publ
☑	Streamlit Ima...	[redacted]	✓ Running	t2.micro	–	View alarms +	us-east-1e	ec2-

Snapshot D — Connect your EC2 instance

Once the **instance state** shows as **running**, that is your sign to select the checkbox next to your instance and click on **connect.**

From **EC2 Instance Connect**, leave the configuration as is and click **connect.**



Connect to instance

Connect to your instance i-0900d0fe9d1bb148f (Streamlit Image Generator) using any of these options

Instance ID

[redacted]

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

[redacted]

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

Snapshot E — Connect your EC2 instance

. . .

Setting up your EC2 instance

Once the CLI loads, type in *sudo su* to invoke **root privileges.** This will allow you to install all your code and it's dependencies under root without any mistakes. This is important because we will need to configure our user data scripts later to run on these files, and user data runs as a root user.

Package installation

Remember, the VM comes as a blank slate, so you will need to reinstall all your dependencies from scratch. Pip and Git are your standard two, you may need to install Docker as well if you are contanerizing your application beforehand.

```
# install pip (package manager)
wget https://bootstrap.pypa.io/get-pip.py
python3 ./get-pip.py

# install git (for those using github/gitlab or similar)
sudo yum install git

# install and build docker (if you are looking to contanerize application)
sudo yum install docker -y
sudo service docker start
sudo docker build -t <my-username/my-image> .
sudo docker login
sudo docker push <my-username/my-image>

# pip install your packages individually
pip install <package-name>

# ...or via requirements.txt
pip install -r requirements.txt
```

Note: EC2 will not allow you to connect to your repository via username and password and will essentially require an SSH connection.

Set up an SSH connection between your EC2 instance and your code repository. The installation process for GitHub can be found here. Clone your repository via SSH and confirm that the operation was successful.

Optional: Create an IAM Role for your EC2 instance

If you are utilizing AWS resources in your code, create an **IAM Role** for your

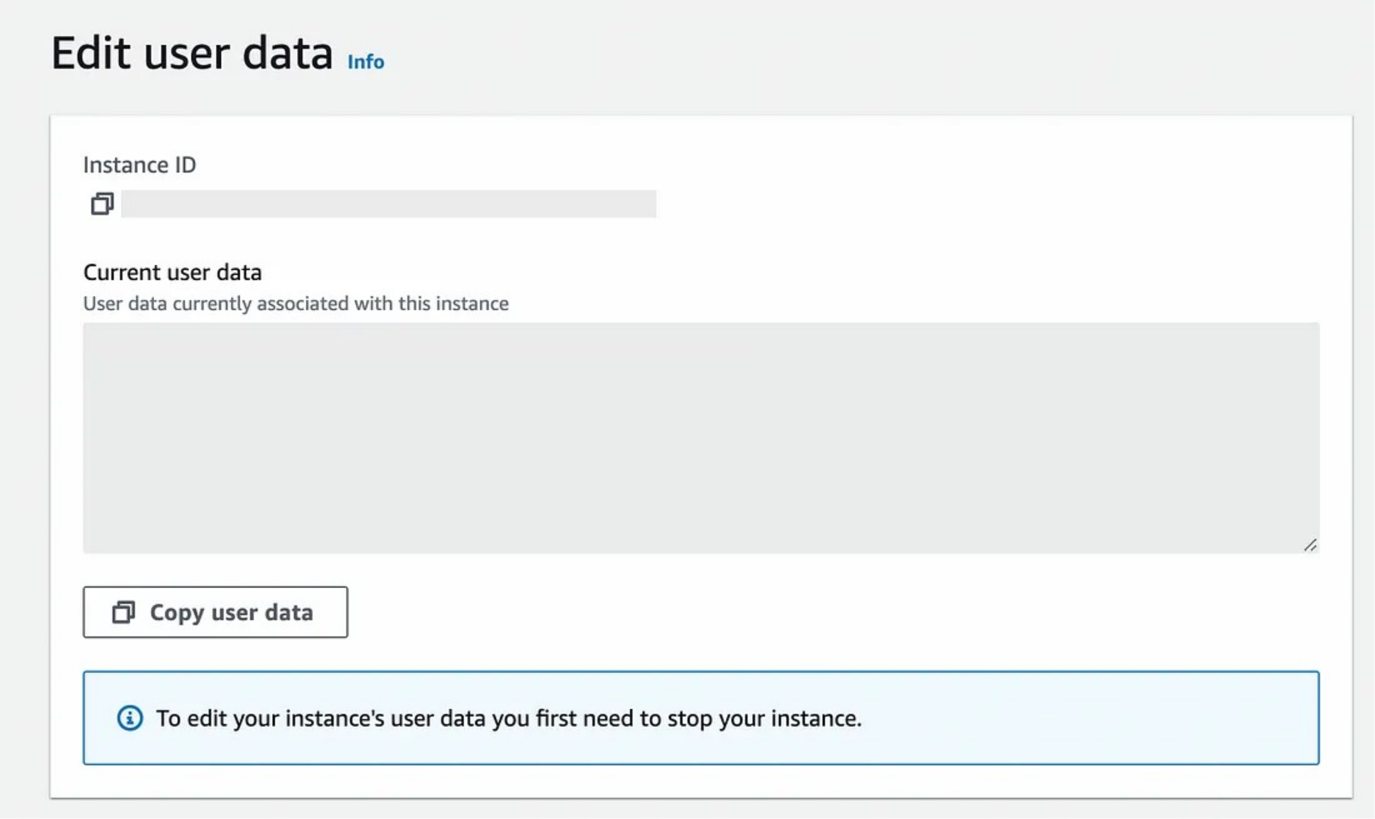
EC2 instance that gives it access permission to those resources.

Once completed, attach the IAM Role to the instance by going back to the **Instances** dashboard > select your instance and going into **Action > Security > Modify IAM Role** from the dropdown menu on the top right.

Optional: Add your run commands in EC2 User Data

If you are looking to save your instance as an AMI and start up additional instances that automatically run your script at initial launch, this is a section for you.

From your EC2 dashboard, go to **Actions** > **Instance Settings** > **Edit User Data.**



To edit your instance's user data you first need to stop your instance.

Snapshot F — Add your run commands in EC2 User Data

What you include in here can automate task flows at launch time. As an example, this is what I entered to launch my Streamlit application.

```
streamlit run <path/to/streamlit/><streamlit-app.py>
```

. . .

Confirm everything is working

Go to your EC2 dashboard and copy your **Public IPv4 DNS** address into a new tab. If the URL loads your application, you are good to go. If it stalls, check your network security group configurations, make sure you are mapping to the right port and try again.

Hope this tutorial is helpful to you and good luck on your AWS journey!

Streamlit AWS Ec2 Cloud Computing Walkthrough

Written by Aiko Hassett

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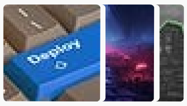

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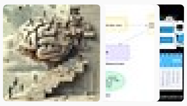

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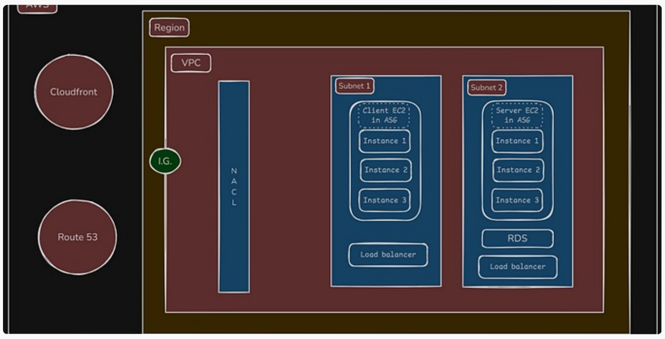

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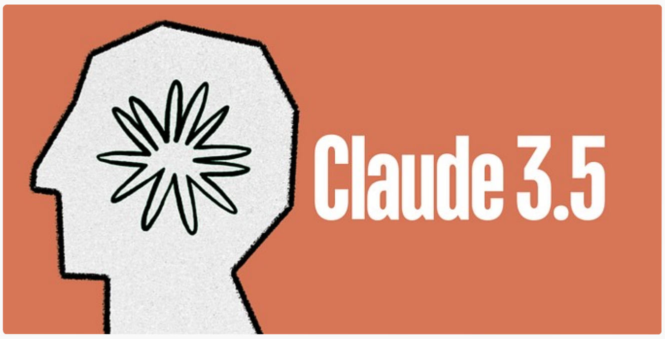

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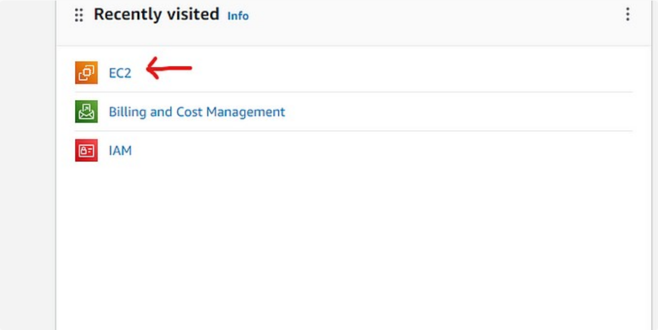

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