Fr. Conceicao Rodrigues college of Engineering
Department of Computer Engineering

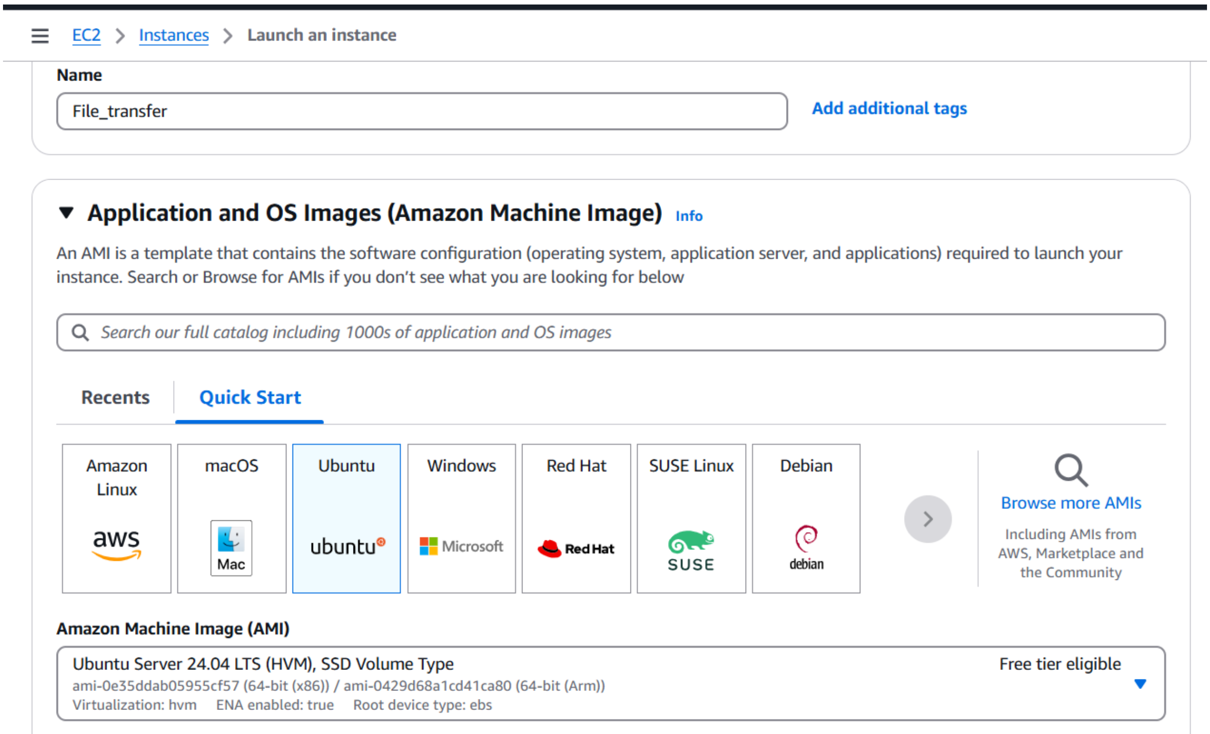
Experiment 3

Title:	**Introduction to AWS and deployment of EC2**		**LO2**
Student Name	Mork lopes	**Roll no.**	9913
Sign here to indicate that you have read all relevant material provided/ available on Moodle/ Classroom while performing and writing this experiment			

Rubrics:

Criteria	Excellent	Good	Satisfactory	Poor	Total Marks
Understanding of AWS Basics (R1)	Demonstrates a comprehensive understanding of AWS and its role in cloud computing. Clearly articulates its significance with examples. (2)	Shows a good understanding of AWS, with minor inaccuracies. Provides relevant examples. (1.5)	Basic understanding is evident, but lacks depth or has some inaccuracies. Few examples provided.(1)	Limited or incorrect understanding of AWS basics. No relevant examples. (0)	2 02
Management of AWS EC2 Instances (R2)	Expertly creates and manages EC2 instances. Demonstrates advanced configurations and optimizations. (6)	Effectively creates and manages EC2 instances with minor errors or inefficiencies. (5)	Able to create and manage EC2 instances, but with noticeable errors or lack of optimization. (4)	Struggles to create or manage EC2 instances effectively. Significant errors present. (3)	6 05
Utilization of AWS EBS and AMIs (R3)	Excellent understanding and application of EBS and AMIs. Uses these resources efficiently and effectively in different scenarios. (4)	Good use of EBS and AMIs, with minor misunderstandings or inefficiencies in application. (3)	Basic utilization of EBS and AMIs, but lacks full understanding or efficiency. (2)	Poor understanding and application of EBS and AMIs. Incorrect or ineffective usage. (1)	4 04
Deployment of Application using AWS Free Tier (R4)	Successfully deploys a well-functioning application using AWS Free Tier services, demonstrating a high skill level. (6)	Deploys a functional application with minor issues or inefficiencies. Good use of AWS Free Tier services. (5)	Deploys a basic application with some functional issues. Limited use of AWS Free Tier services. (4)	Unable to deploy a functional application or makes poor use of AWS Free Tier services. (3)	6 05
Timeliness of Submission (R5)	On time (2)	1-week late (1)	2-weeks late (0)	More than 2 weeks late (Deduct up to 5 marks)	2 02
Total Marks					18

Date of Performance	Date of Submission	Signature of the Teacher



Name

File_transfer

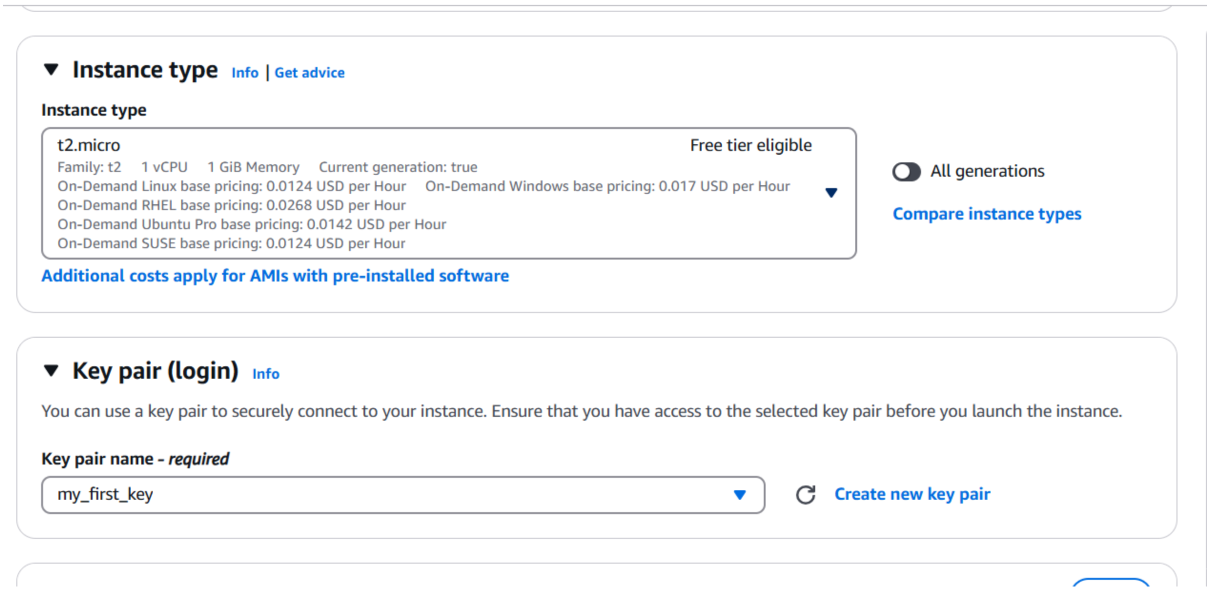
▼ Application and OS Images (Amazon Machine Image) Info

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images

Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type — Free tier eligible
ami-0e35ddab05955cf57 (64-bit (x86)) / ami-0429d68a1cd41ca80 (64-bit (Arm))
Virtualization: hvm ENA enabled: true Root device type: ebs



▼ **Instance type** Info | Get advice

Instance type

t2.micro Free tier eligible
Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Linux base pricing: 0.0124 USD per Hour On-Demand Windows base pricing: 0.017 USD per Hour
On-Demand RHEL base pricing: 0.0268 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0142 USD per Hour
On-Demand SUSE base pricing: 0.0124 USD per Hour

Additional costs apply for AMIs with pre-installed software

All generations

Compare instance types

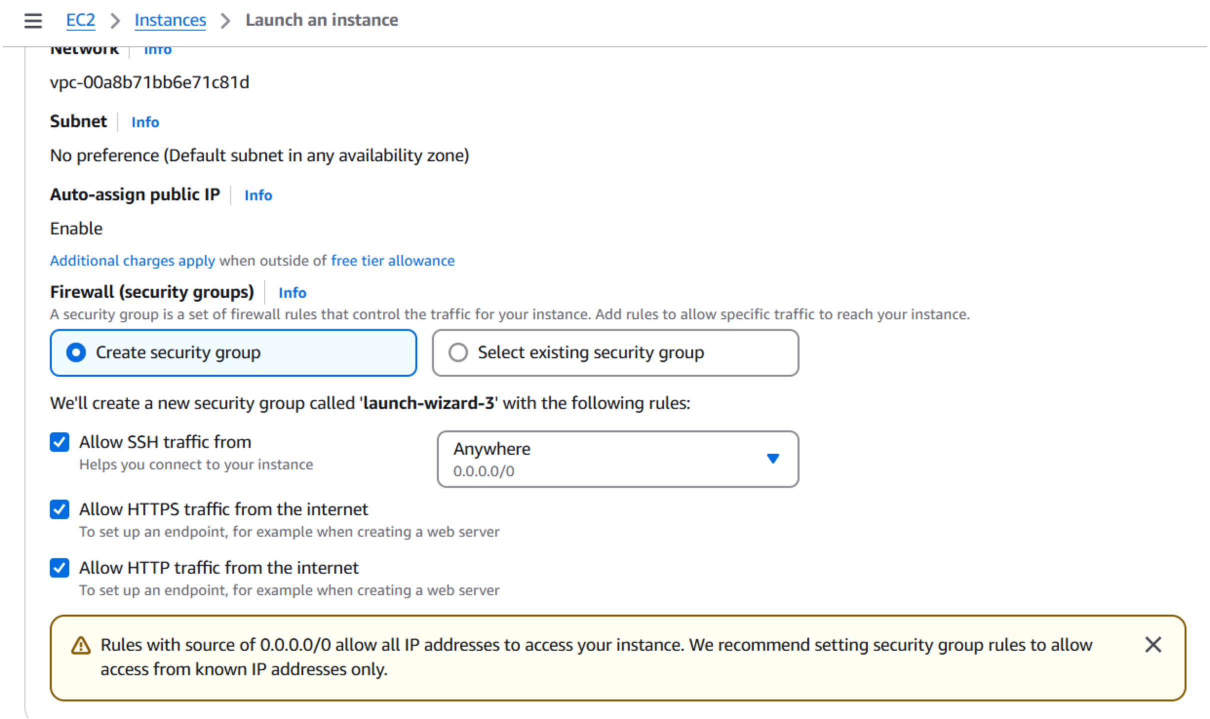
▼ **Key pair (login)** Info

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*

my_first_key ▼

Create new key pair



EC2 > Instances > Launch an instance

Network Info

vpc-00a8b71bb6e71c81d

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

We'll create a new security group called '**launch-wizard-3**' with the following rules:

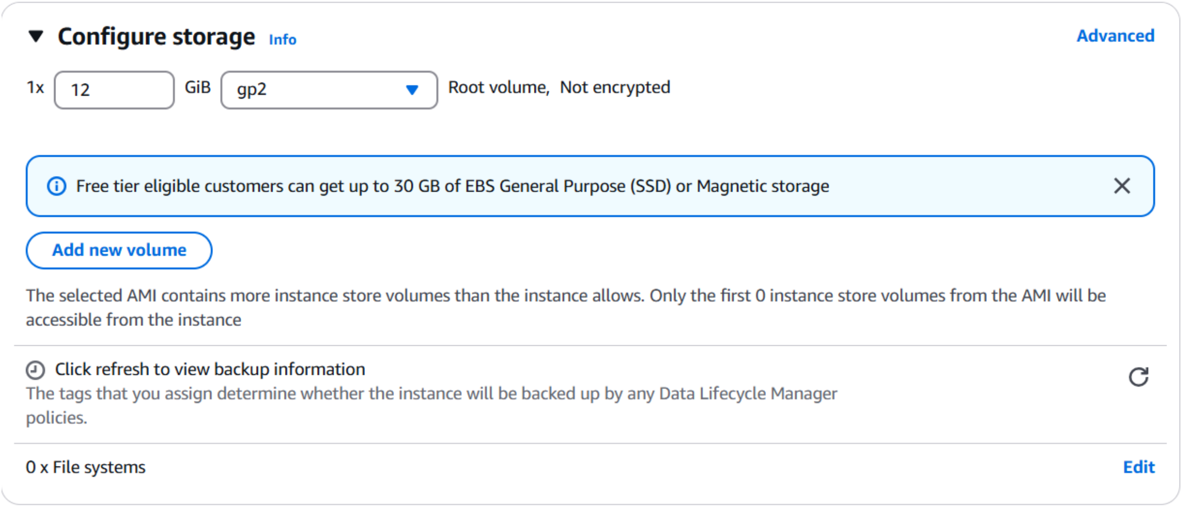
☑ Allow SSH traffic from
Helps you connect to your instance

Anywhere
0.0.0.0/0 ▼

☑ Allow HTTPS traffic from the internet
To set up an endpoint, for example when creating a web server

☑ Allow HTTP traffic from the internet
To set up an endpoint, for example when creating a web server

⚠ Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only. ✕



1x 12 GiB gp2 Root volume, Not encrypted

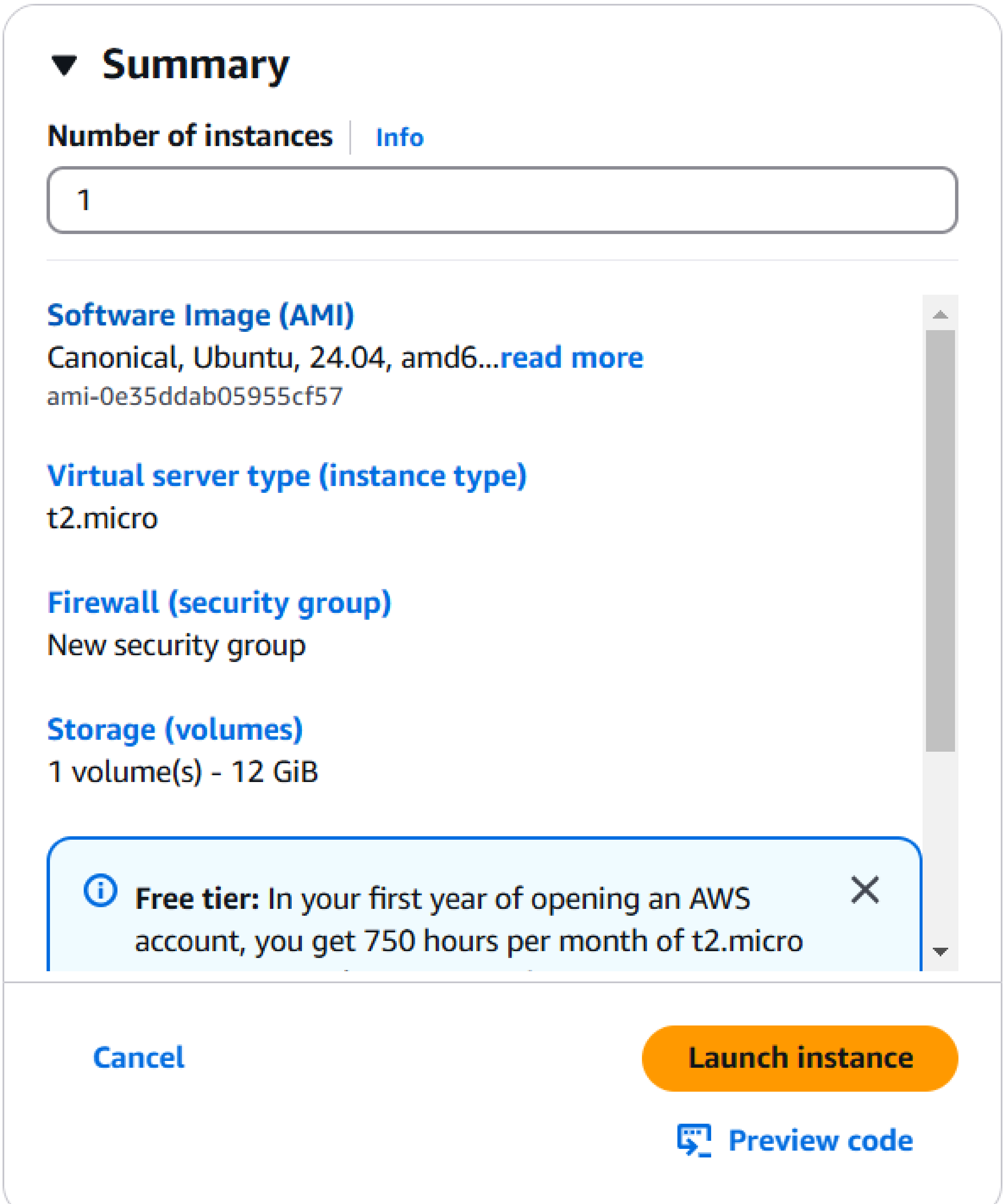
ⓘ Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage ✕

The selected AMI contains more instance store volumes than the instance allows. Only the first 0 instance store volumes from the AMI will be accessible from the instance

Click refresh to view backup information

The tags that you assign determine whether the instance will be backed up by any Data Lifecycle Manager policies.

0 x File systems



Number of instances | Info

1

Software Image (AMI)

Canonical, Ubuntu, 24.04, amd6...read more

ami-0e35ddab05955cf57

Virtual server type (instance type)

t2.micro

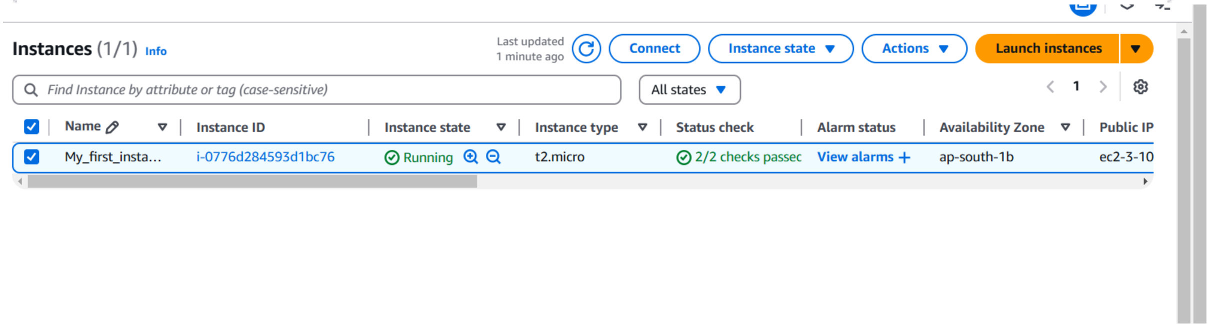
Firewall (security group)

New security group

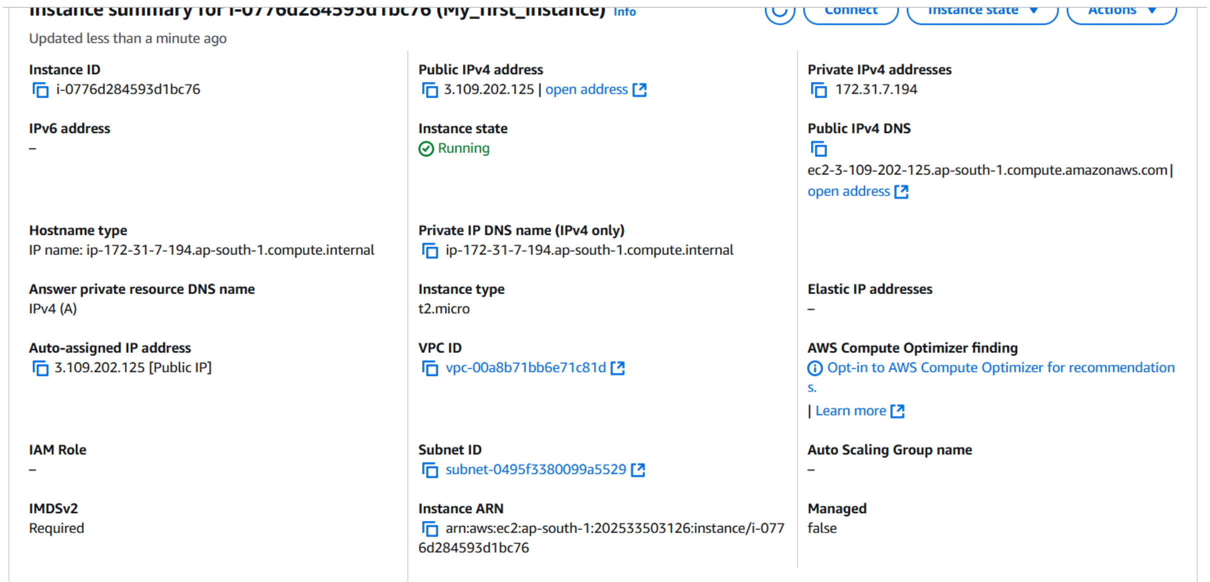
Storage (volumes)

1 volume(s) - 12 GiB

Free tier: In your first year of opening an AWS account, you get 750 hours per month of t2.micro



☑	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
☑	My_first_insta...	i-0776d284593d1bc76	✓ Running	t2.micro	✓ 2/2 checks passec	View alarms +	ap-south-1b	ec2-3-10



Instance summary for i-0776d284593d1bc76 (My_first_instance)

Updated less than a minute ago

Instance ID
i-0776d284593d1bc76

IPv6 address
–

Hostname type
IP name: ip-172-31-7-194.ap-south-1.compute.internal

Answer private resource DNS name
IPv4 (A)

Auto-assigned IP address
3.109.202.125 [Public IP]

IAM Role
–

IMDSv2
Required

Public IPv4 address
3.109.202.125 | open address

Instance state
Running

Private IP DNS name (IPv4 only)
ip-172-31-7-194.ap-south-1.compute.internal

Instance type
t2.micro

VPC ID
vpc-00a8b71bb6e71c81d

Subnet ID
subnet-0495f3380099a5529

Instance ARN
arn:aws:ec2:ap-south-1:202533503126:instance/i-0776d284593d1bc76

Private IPv4 addresses
172.31.7.194

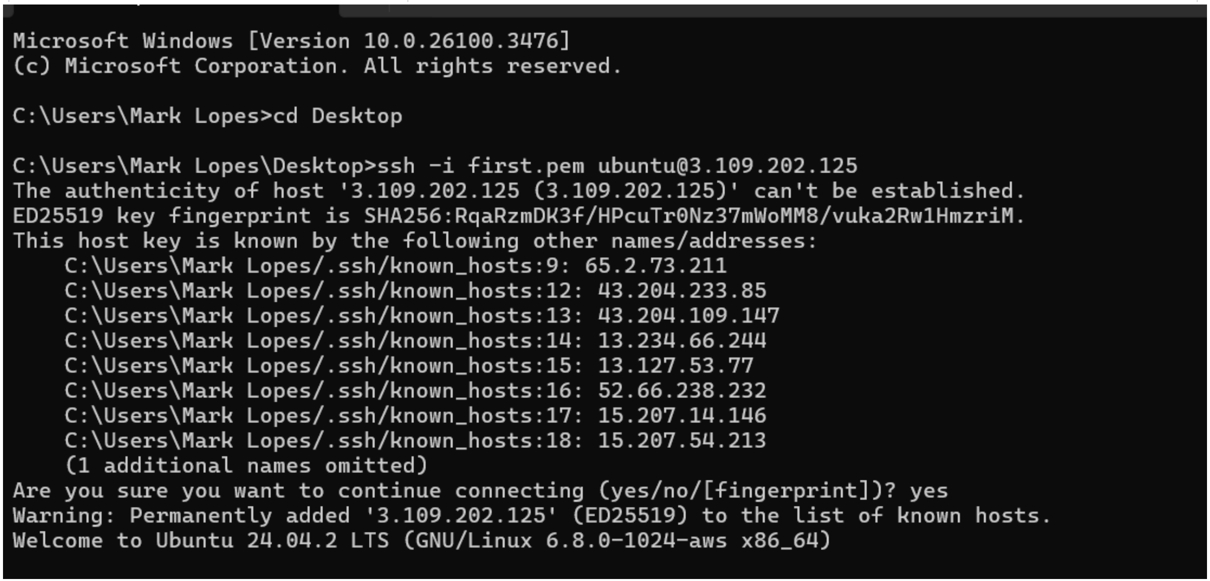
Public IPv4 DNS
ec2-3-109-202-125.ap-south-1.compute.amazonaws.com | open address

Elastic IP addresses
–

AWS Compute Optimizer finding
Opt-in to AWS Compute Optimizer for recommendations. | Learn more

Auto Scaling Group name
–

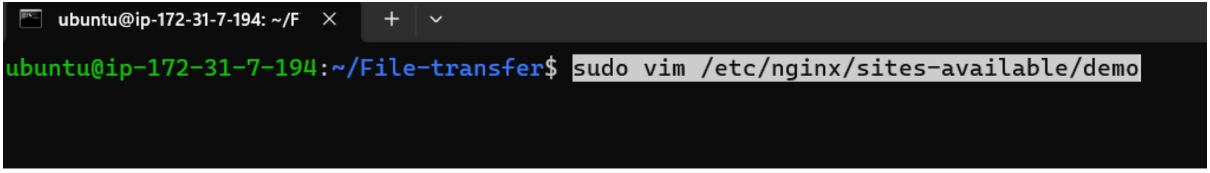
Managed
false



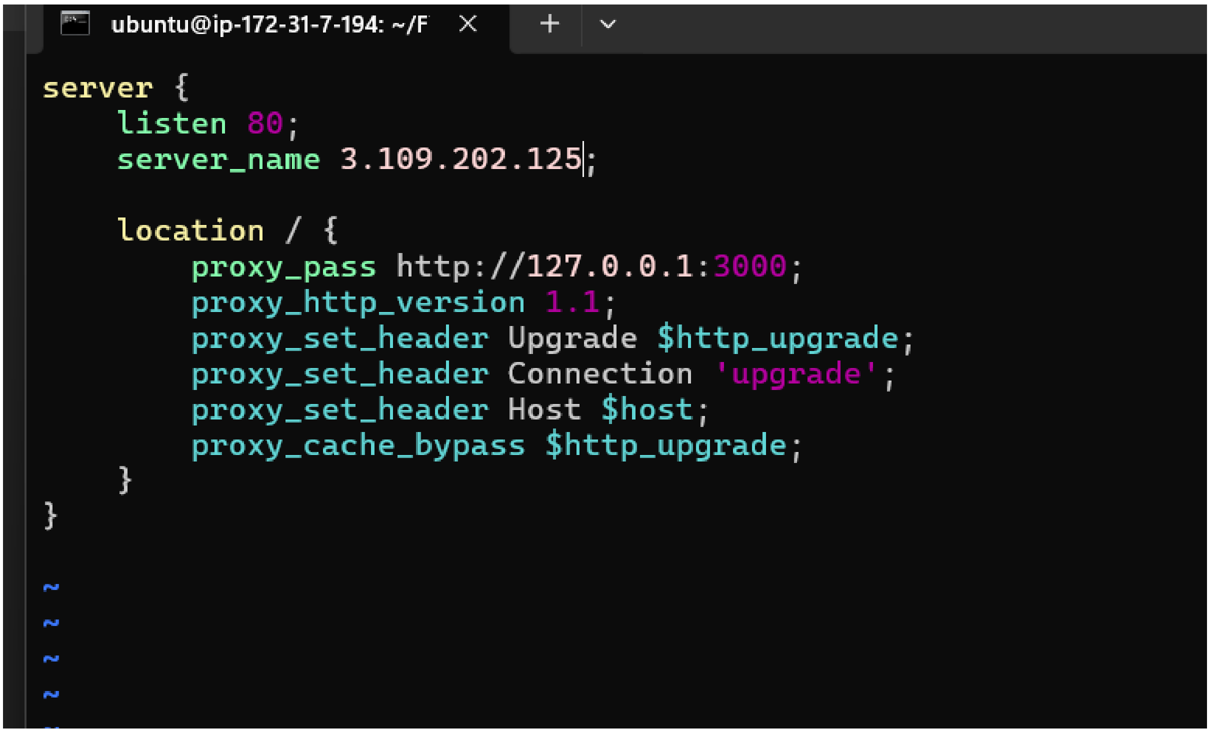
```
Microsoft Windows [Version 10.0.26100.3476]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Mark Lopes>cd Desktop

C:\Users\Mark Lopes\Desktop>ssh -i first.pem ubuntu@3.109.202.125
The authenticity of host '3.109.202.125 (3.109.202.125)' can't be established.
ED25519 key fingerprint is SHA256:RqaRzmDK3f/HPcuTr0Nz37mWoMM8/vuka2Rw1HmzriM.
This host key is known by the following other names/addresses:
    C:\Users\Mark Lopes/.ssh/known_hosts:9: 65.2.73.211
    C:\Users\Mark Lopes/.ssh/known_hosts:12: 43.204.233.85
    C:\Users\Mark Lopes/.ssh/known_hosts:13: 43.204.109.147
    C:\Users\Mark Lopes/.ssh/known_hosts:14: 13.234.66.244
    C:\Users\Mark Lopes/.ssh/known_hosts:15: 13.127.53.77
    C:\Users\Mark Lopes/.ssh/known_hosts:16: 52.66.238.232
    C:\Users\Mark Lopes/.ssh/known_hosts:17: 15.207.14.146
    C:\Users\Mark Lopes/.ssh/known_hosts:18: 15.207.54.213
    (1 additional names omitted)
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '3.109.202.125' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.8.0-1024-aws x86_64)
```



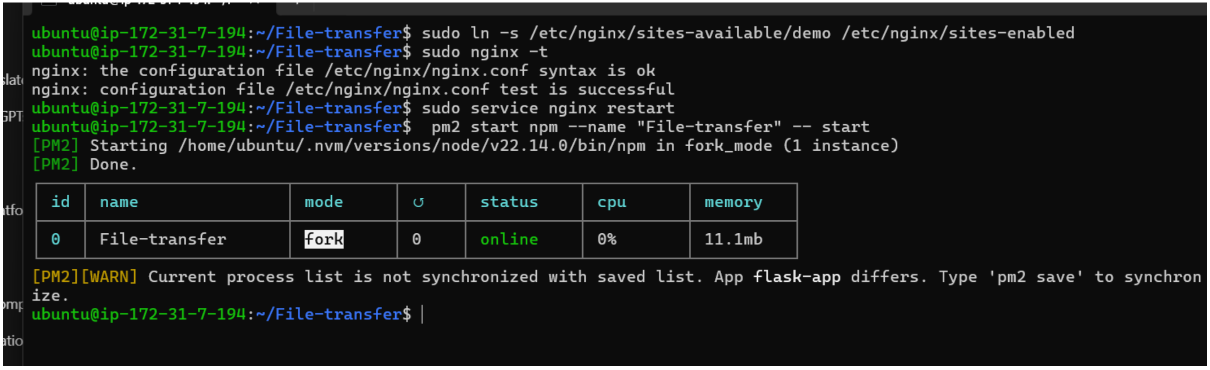
```
ubuntu@ip-172-31-7-194:~/File-transfer$ sudo vim /etc/nginx/sites-available/demo
```



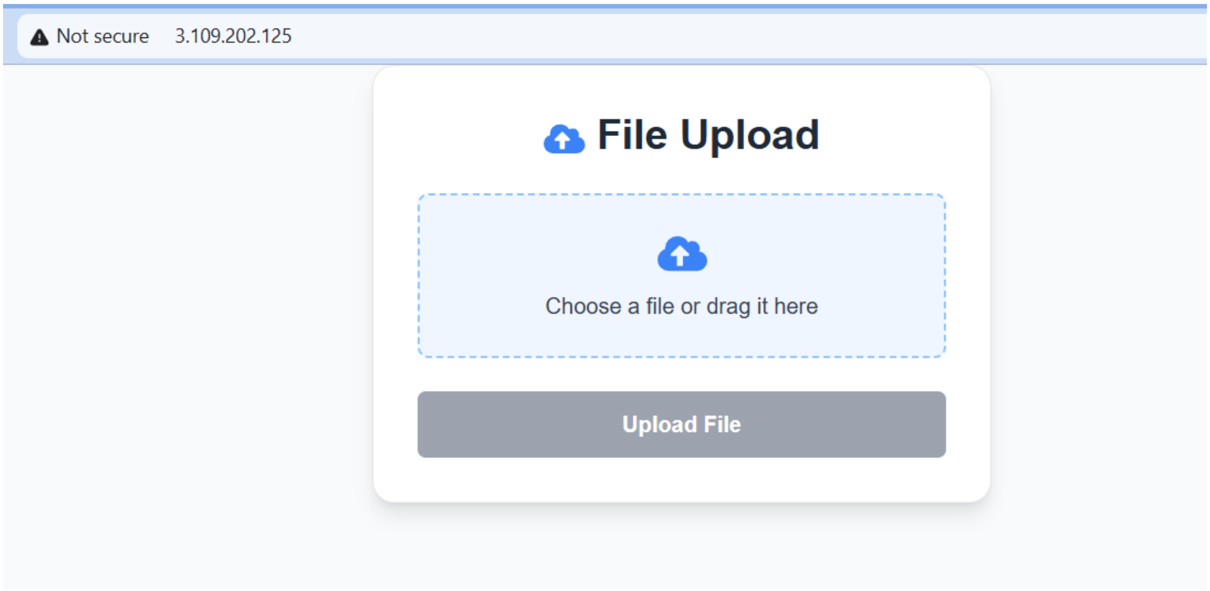
```
server {
    listen 80;
    server_name 3.109.202.125;

    location / {
        proxy_pass http://127.0.0.1:3000;
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }
}

~
~
~
~
```

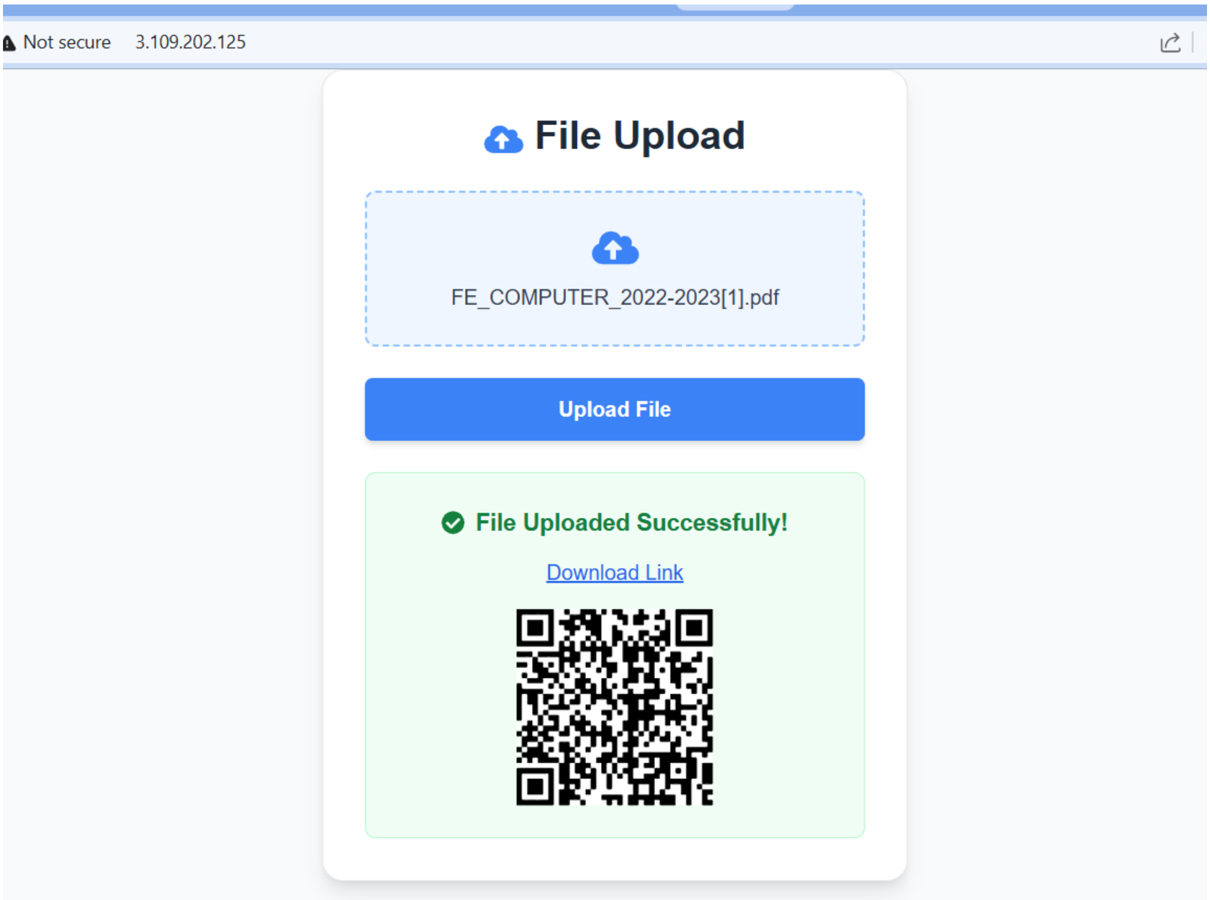


```
ubuntu@ip-172-31-7-194:~/File-transfer$ sudo ln -s /etc/nginx/sites-available/demo /etc/nginx/sites-enabled
ubuntu@ip-172-31-7-194:~/File-transfer$ sudo nginx -t
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
nginx: configuration file /etc/nginx/nginx.conf test is successful
ubuntu@ip-172-31-7-194:~/File-transfer$ sudo service nginx restart
ubuntu@ip-172-31-7-194:~/File-transfer$  pm2 start npm --name "File-transfer" -- start
[PM2] Starting /home/ubuntu/.nvm/versions/node/v22.14.0/bin/npm in fork_mode (1 instance)
[PM2] Done.
┌────┬────────────────────┬──────────┬──────┬───────────┬──────────┬──────────┐
│ id │ name               │ mode     │ ↺    │ status    │ cpu      │ memory   │
├────┼────────────────────┼──────────┼──────┼───────────┼──────────┼──────────┤
│ 0  │ File-transfer      │ fork     │ 0    │ online    │ 0%       │ 11.1mb   │
└────┴────────────────────┴──────────┴──────┴───────────┴──────────┴──────────┘
[PM2][WARN] Current process list is not synchronized with saved list. App flask-app differs. Type 'pm2 save' to synchron
ize.
ubuntu@ip-172-31-7-194:~/File-transfer$ |
```



File Upload

Choose a file or drag it here



File Upload

FE_COMPUTER_2022-2023[1].pdf

✓ File Uploaded Successfully!

Mark Lopes
TE-comps A Batch-C
9913

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

Lab 3- Postlab.

Q.1 Differentiate between various EC2 instance type and their typical use cases.

→ i) General purpose (T, M series) - Balanced compute, memory and networking.

- T-series (T3, T4g): cost-efficient, burstable performance for web apps, small domains.
- M-series (M6g, M5, M7i): Ideal for application servers, gaming and enterprise apps.

ii) Compute optimized (C-series) - High CPU performance for intensive tasks.

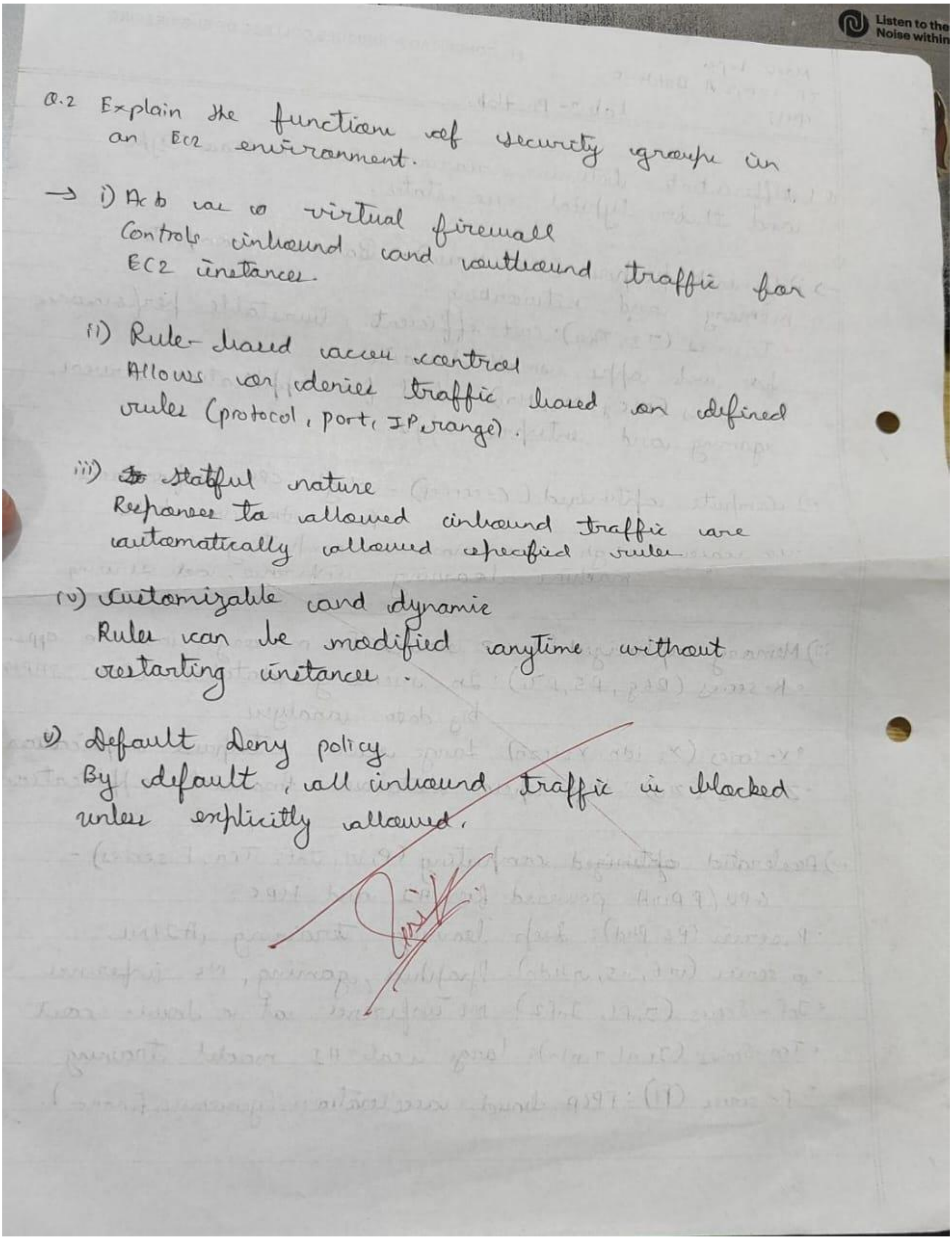
- Use cases: High performance computing (HPC), machine learning inference, ad serving.

iii) Memory optimized (R, X, Z series) - For memory intensive apps.

- R-series (R6g, R5, R7i): In memory databases (Redis, SAP HANA) big data analysis.
- X-series (X2idn, X2iezn): Large scale enterprise application, SA
- Z-series (Z1d): High speed database, financial applications.

iv) Accelerated ~~optimized~~ computing (P, G, Inf, Trn, F series) - GPU/FPGA powered for AI and HPC.

- P series (P5, P4d): deep learning training, AI/ML.
- G series (G6, G5, G4dn): Graphics, gaming, ML inference
- Inf - Series (Inf1, Inf2): ML inference at a lower cost.
- Trn-Series (Trn1, Trn1n): large scale AI model training.
- F-series (F1): FPGA based acceleration (genomics, finance).



Q.2 Explain the function of security groups in an EC2 environment.

→ i) Acts as a virtual firewall
Controls inbound and outbound traffic for EC2 instances.

ii) Rule-based access control
Allows or denies traffic based on defined rules (protocol, port, IP, range).

iii) Stateful nature
Responses to allowed inbound traffic are automatically allowed specified rules

iv) Customizable and dynamic
Rules can be modified anytime without restarting instances.

v) Default Deny policy
By default, all inbound traffic is blocked unless explicitly allowed.