

Q1) List out the types of instance base on the pricing model and write a brief about your understanding about it.

Ans. Types of instances:

1. **General Purpose:** Balanced compute, memory, and networking for scale-out workloads. Types: A1, T-family (T2, T3, T3a). Pricing: On-Demand, Reserved, Spot, Savings Plans.
2. **Compute Optimized:** High compute-to-memory ratio for CPU-bound tasks. Types: C-family (C5). Pricing: On-Demand, Reserved, Spot.
3. **Memory Optimized:** Designed for memory-intensive tasks like in-memory databases. Types: R-family (R5). Pricing: On-Demand, Reserved, Spot.
4. **Storage Optimized:** Ideal for high storage and sequential read/write workloads. Types: H1, D2. Pricing: On-Demand, Reserved, Spot.

Here is the list of instances:

☰ [EC2](#) > [Instances](#) > Launch an instance

▼ Instance type [Info](#) | [Get advice](#)

Instance type

t2.micro

Family: t2 1 vCPU 1 GiB Memory Current generation: true

On-Demand Windows base pricing: 0.0162 USD per Hour On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour

On-Demand SUSE base pricing: 0.0116 USD per Hour On-Demand RHEL base pricing: 0.026 USD per Hour

On-Demand Linux base pricing: 0.0116 USD per Hour

Free tier eligible

Q |

On-Demand Windows base pricing: 0.2266 USD per Hour On-Demand SUSE base pricing: 0.2856 USD per Hour

t2.2xlarge

Family: t2 8 vCPU 32 GiB Memory Current generation: true

On-Demand Windows base pricing: 0.4332 USD per Hour

On-Demand Linux base pricing: 0.3712 USD per Hour On-Demand RHEL base pricing: 0.4864 USD per Hour

On-Demand Ubuntu Pro base pricing: 0.3852 USD per Hour On-Demand SUSE base pricing: 0.4712 USD per Hour

t3.nano

Family: t3 2 vCPU 0.5 GiB Memory Current generation: true

On-Demand Linux base pricing: 0.0052 USD per Hour

On-Demand Windows base pricing: 0.0098 USD per Hour On-Demand Ubuntu Pro base pricing: 0.0087 USD per Hour

On-Demand SUSE base pricing: 0.0052 USD per Hour

t3.micro

Family: t3 2 vCPU 1 GiB Memory Current generation: true

On-Demand Ubuntu Pro base pricing: 0.0139 USD per Hour

On-Demand SUSE base pricing: 0.0104 USD per Hour On-Demand Linux base pricing: 0.0104 USD per Hour

On-Demand RHEL base pricing: 0.0392 USD per Hour On-Demand Windows base pricing: 0.0196 USD per Hour

t3.small

Family: t3 2 vCPU 2 GiB Memory Current generation: true

On-Demand SUSE base pricing: 0.0518 USD per Hour

On-Demand Linux base pricing: 0.0208 USD per Hour On-Demand RHEL base pricing: 0.0496 USD per Hour

On-Demand Ubuntu Pro base pricing: 0.0243 USD per Hour On-Demand Windows base pricing: 0.0392 USD per Hour

t3.medium

Family: t3 2 vCPU 4 GiB Memory Current generation: true

On-Demand SUSE base pricing: 0.0979 USD per Hour

On-Demand Windows base pricing: 0.06 USD per Hour On-Demand Linux base pricing: 0.0416 USD per Hour

On-Demand Ubuntu Pro base pricing: 0.0451 USD per Hour On-Demand RHEL base pricing: 0.0704 USD per Hour

t3.large

Family: t3 2 vCPU 8 GiB Memory Current generation: true

On-Demand Linux base pricing: 0.0832 USD per Hour

On-Demand Windows base pricing: 0.1108 USD per Hour On-Demand RHEL base pricing: 0.112 USD per Hour

On-Demand SUSE base pricing: 0.0704 USD per Hour On-Demand Ubuntu Pro base pricing: 0.0663 USD per Hour

Firewall (security groups) [Info](#)

☐ All generations

[Compare instance types](#)

You launch the instance.

[Create new key pair](#)

[Edit](#)

EC2

>

Instances

>

Launch an Instance

>

Compare instance types

Currently selected: t2.micro (1 vCPUs, 1024 memory, EB5 only)

Instance types (1/864)

Get advice

Q Find resources by attribute or tag

<

1

2

3

4

5

6

7

...

18

>

Instance type	vCPUs	Architecture	Memory (GiB)	Storage (GB)	Storage type	Network performance
<input type="radio"/> t1.micro	1	i386, x86_64	0.612	-	-	Very Low
<input type="radio"/> t2.nano	1	i386, x86_64	0.5	-	-	Low to Moderate
<input checked="" type="radio"/> t2.micro	1	i386, x86_64	1	-	-	Low to Moderate
<input type="radio"/> t2.small	1	i386, x86_64	2	-	-	Low to Moderate
<input type="radio"/> t2.medium	2	i386, x86_64	4	-	-	Low to Moderate
<input type="radio"/> t2.large	2	x86_64	8	-	-	Low to Moderate
<input type="radio"/> t2.xlarge	4	x86_64	16	-	-	Moderate
<input type="radio"/> t2.2xlarge	8	x86_64	32	-	-	Moderate
<input type="radio"/> t3.nano	2	x86_64	0.5	-	-	Up to 5 Gigabit
<input type="radio"/> t3.micro	2	x86_64	1	-	-	Up to 5 Gigabit
<input type="radio"/> t3.small	2	x86_64	2	-	-	Up to 5 Gigabit
<input type="radio"/> t3.medium	2	x86_64	4	-	-	Up to 5 Gigabit
<input type="radio"/> t3.large	2	x86_64	8	-	-	Up to 5 Gigabit
<input type="radio"/> t3.xlarge	4	x86_64	16	-	-	Up to 5 Gigabit
<input type="radio"/> t3.2xlarge	8	x86_64	32	-	-	Up to 5 Gigabit
<input type="radio"/> a1.medium	1	arm64	2	-	-	Up to 10 Gigabit
<input type="radio"/> a1.large	2	arm64	4	-	-	Up to 10 Gigabit
<input type="radio"/> a1.xlarge	4	arm64	8	-	-	Up to 10 Gigabit

Q2)Host a static website in S3.

Ans. Steps to host a static website in S3 is :

1. Create a bucket - bucket name should be unique globally. Unchecking the "Block all public access"

Amazon S3

>

Buckets

>

Create bucket

Create bucket info

Buckets are containers for data stored in S3.

General configuration

AWS Region

US East (N. Virginia) us-east-1

Bucket type info

☒ General purpose
 

Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.

☐ Directory
 

Recommended for low-latency use cases. These buckets use only the S3 Express One Zone storage class, which provides faster processing of data within a single Availability Zone.

Bucket name info

ttneexercisestaticwebsite

Bucket name must be unique within the global namespace and follow the bucket naming rules. [See rules for bucket naming](#)

Copy settings from existing bucket - optional

Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

☒ ACLs disabled (recommended)
 

All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using only policies.

☐ ACLs enabled
 

Objects in this bucket can be owned by other AWS accounts. Access to this bucket and its objects can be specified using ACLs.

Object Ownership

Bucket owner enforced

## 2. Inside the bucket upload files such as HTML, CSS, JS and then enable the static website hosting -

Amazon S3 > Buckets > ttnexercisestaticwebsite > Edit static website hosting

### Edit static website hosting

**Static website hosting**  
Use this bucket to host a website or redirect requests. [Learn more](#)

**Static website hosting**  
☐ Disable  
☒ Enable

**Hosting type**  
☒ Host a static website  
Use the bucket endpoint as the web address. [Learn more](#)  
☐ Redirect requests for an object  
Redirect requests to another bucket or domain. [Learn more](#)

For your customers to access content at the website endpoint, you must make all your content publicly readable. To do so, you can edit the S3 Block Public Access settings for the bucket. For more information, see [Using Amazon S3 Block Public Access](#)

**Index document**  
Specify the home or default page of the website.

**Error document - optional**  
This is returned when an error occurs.

**Redirection rules - optional**  
Redirection rules, written in JSON, automatically redirect webpage requests for specific content. [Learn more](#)

here for demo purpose I am uploading a HTML file with name index.html:

ttnexercisestaticwebsite

Objects | Metadata | Properties | Permissions | Metrics | Management | Access Points

**Objects (1)**  
Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 Inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

Find objects by prefix

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	<a href="#">index.html</a>	html	January 28, 2025, 15:33:07 (UTC+05:30)	402.0 B	Standard

Amazon S3 > Buckets > ttnexercisestaticwebsite > index.html

Copy S3 URI | Download | Open | Object actions

**index.html**

Properties | Permissions | Versions

**Object overview**

**Owner**  
netikkohli9

**AWS Region**  
US East (N. Virginia) us-east-1

**Last modified**  
January 28, 2025, 15:33:07 (UTC+05:30)

**Size**  
402.0 B

**Type**  
html

**Key**  
[index.html](#)

**S3 URI**  
<s3://ttnexercisestaticwebsite/index.html>

**Amazon Resource Name (ARN)**  
<arn:aws:s3::ttnexercisestaticwebsite/index.html>

**Entity tag (Etag)**  
[5cccb8b97264cc2ee386eb3c9adc80b](#)

**Object URL**  
<https://ttnexercisestaticwebsite.s3.us-east-1.amazonaws.com/index.html>

On clicking the object url as shown in above image our static website will open.



### Static Website TTN AWS Overview Exercise

- Website by - Netik Kohli
- Hosted in - S3

Q3) Launch an Ubuntu EC2 instance on AWS, with 10GB root volume, and SSH from your local machine using the private key.

Ans.

### Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Auto Scaling Groups	0	Capacity Reservations	0
Dedicated Hosts	0	Elastic IPs	0	Instances	0
Key pairs	0	Load balancers	0	Placement groups	0
Security groups	1	Snapshots	0	Volumes	0

### Launch instance

To get started, launch an Amazon EC2 Instance, which is a virtual server in the cloud.

[Launch instance](#) [Migrate a server](#)

Note: Your Instances will launch in the US East (N. Virginia) Region

### Service health

[AWS Health Dashboard](#)

**Region**  
US East (N. Virginia)

**Status**  
✔ This service is operating normally.

### Zones

EC2 > Instances > Launch an instance

### Launch an instance

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

Name:  [Add additional tags](#)

#### Application and OS Images (Amazon Machine Image)

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

#### Quick Start

[Browse more AMIs](#)  
Including AMIs from AWS, Marketplace and the Community

**Amazon Machine Image (AMI)**

Ubuntu Server 24.04 LTS (HVM), 55D Volume Type  
ami-04b4f1a8cf54c11d0 (64-bit (x86)) / ami-0a7a4e87939439934 (64-bit (ARM))  
Virtualization: hvm    ENA enabled: true    Root device type: ebs

Free tier eligible

**Description**  
Ubuntu Server 24.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

#### Summary

**Number of instances**  
1

**Software Image (AMI)**  
Canonical, Ubuntu, 24.04, amd64...[read more](#)  
ami-04b4f1a8cf54c11d0

**Virtual server type (instance type)**  
t2.micro

**Firewall (security group)**  
New security group

**Storage (volumes)**  
1 volume(s) - 10 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, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million I/Os, 1 GiB of snapshots, and 100 GiB of bandwidth to the internet.

[Cancel](#) [Launch instance](#) [Preview code](#)

## Create key pair



### Key pair name

Key pairs allow you to connect to your instance securely.

key pair exercise

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

### Key pair type

☒ RSA

RSA encrypted private and public key pair

☐ ED25519

ED25519 encrypted private and public key pair

### Private key file format

☒ .pem

For use with OpenSSH

☐ .ppk

For use with PuTTY

## Instances (1) [Info](#)

Last updated less than a minute ago

[Connect](#)

All states ▾

Instance ID = i-02633772b7fb30205



[Clear filters](#)

<input type="checkbox"/>	Name <a href="#">↗</a> ▾	Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status	Availability Zone ▾
<input type="checkbox"/>	Ubuntu Instance	i-02633772b7fb30205	Running	t2.micro	Initializing	<a href="#">View alarms +</a>	us-east-1b

```
netik@TTNPL-netikkohli:~$ sudo ssh -i '/home/netik/Downloads/key pair exercise.pem' ubuntu@54.166.81.181
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1021-aws x86_64)
```

```
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:        https://ubuntu.com/pro
```

System information as of Tue Jan 28 15:32:39 UTC 2025

```
System load:  0.0      Processes:            106
Usage of /:   19.5% of 8.65GB   Users logged in:      0
Memory usage: 20%      IPv4 address for enX0: 172.31.85.103
Swap usage:   0%
```

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.  
See <https://ubuntu.com/esm> or run: `sudo pro status`

The list of available updates is more than a week old.  
To check for new updates run: `sudo apt update`

Last login: Tue Jan 28 15:31:30 2025 from 152.58.119.99  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo\_root" for details.

```
ubuntu@ip-172-31-85-103:~$
```

Q4) Install nginx package in the above server and access this page from your local browser using a domain name instead of IP address of the server.

Ans.

SSH from local machine with key pair :

```
netik@TTNPL-netikkohli:~$ sudo ssh -i '/home/netik/Downloads/key pair exercise.pem' ubuntu@54.166.81.181
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1021-aws x86_64)
```

```
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:        https://ubuntu.com/pro
```

```
ubuntu@ip-172-31-85-103:~$ sudo apt install nginx -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  nginx-common
Suggested packages:
  fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  nginx nginx-common
0 upgraded, 2 newly installed, 0 to remove and 49 not upgraded.
Need to get 552 kB of archives.
After this operation, 1596 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx-common all 1.24.0-2ubuntu7.1 [31.2 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx amd64 1.24.0-2ubuntu7.1 [521 kB]
Fetched 552 kB in 0s (23.2 MB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 70610 files and directories currently installed.)
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7.1_all.deb ...
```

4. Inbound rules are set by : first go to the ec2 in the AWS console. In the left sidebar, click on Security Groups. Select the Security Group associated with your EC2 instance.

Click on the Inbound rules tab and then click Edit inbound rules.

Add a rule to allow HTTP (port 80): Type: HTTP, port: 80 and Source: anywhere (0.0.0.0/0) or specify your IP for restricted access, then click on save rules.

EC2 > Security Groups > sg-05c93409eaafd8170 - launch-wizard-3 > Edit inbound rules

**Edit inbound rules** [Info](#)

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

Security group rule ID	Type	Protocol	Port range	Source	Description - optional	
sg-060c4785557fba92d	SSH	TCP	22	Custom	<input type="text" value="Q"/>	<input type="button" value="Delete"/>
					<input type="text" value="152.58.119.99/32"/>	<input type="button" value="X"/>
sg-01c739a48c345558d	HTTP	TCP	80	Custom	<input type="text" value="Q"/>	<input type="button" value="Delete"/>
					<input type="text" value="0.0.0.0/0"/>	<input type="button" value="X"/>

```

ubuntu@ip-172-31-85-103:~$ sudo systemctl enable nginx
Synchronizing state of nginx.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable nginx
ubuntu@ip-172-31-85-103:~$ systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
   Active: active (running) since Tue 2025-01-28 15:35:00 UTC; 44min ago
     Docs: man:nginx(8)
  Main PID: 2018 (nginx)
    Tasks: 2 (limit: 1130)
   Memory: 1.7M (peak: 1.9M)
      CPU: 9ms
   CGroup: /system.slice/nginx.service
           └─2018 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─2019 "nginx: worker process"

Jan 28 15:35:00 ip-172-31-85-103 systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
Jan 28 15:35:00 ip-172-31-85-103 systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.

```

Purchase or get a free domain name and in ip address add ec2 instance public ip :

Free Domains Sign UP

Domain name:	netik.publicvm.com
Registration Term:	1 Year
Expiration Date:	2026-01-29 (Free renew after 2025-12-29)
Total:	\$ 0.00

**Note:** The domain is free forever with the limitation that you can only renew within 30 days of the expiration and max renew 1 year.

**Setup the DNS for the domain:**

**Note:** You can setup Records such as CName, MX, SRV, NS, A, AAAA later.

IP for the domain:	18.234.142.126
Is Dynamic IP? Check it if you intend to use our <a href="#">Dynamic DNS Clients</a>	<input checked="" type="checkbox"/>

SUBMIT »

Now edit the /etc/nginx/site-available/default:

```

ubuntu@ip-172-31-80-181:~$ sudo nano /etc/nginx/sites-available/default

```

Add domain name in the serer\_name section:

```
#
server {
    listen 80 default_server;
    listen [::]:80 default_server;

    root /var/www/html;

    # Add index.php to the list if you are using PHP
    index index.html index.htm index.nginx-debian.html;

    server_name exercise-aws-ttn.run.place;

    location / {
        # First attempt to serve request as file, then
        # as directory, then fall back to displaying a 404.
        try_files $uri $uri/ =404;
    }
}
```

Restart nginx and paste the domain on web browser:

```
ubuntu@ip-172-31-80-181:~$ sudo systemctl restart nginx
ubuntu@ip-172-31-80-181:~$ systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-01-29 06:37:40 UTC; 6s ago
     Docs: man:nginx(8)
  Process: 1793 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
  Process: 1798 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
 Main PID: 1799 (nginx)
    Tasks: 2 (limit: 1130)
   Memory: 1.7M (peak: 1.9M)
      CPU: 9ms
   CGroup: /system.slice/nginx.service
           └─1799 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─1800 "nginx: worker process"
```

