HOW TO LAUNCH EC2 INSTANCE WITH APACHE IN UBUNTU

Prepared By:-Hitesh Chauhan

Introduction Of Apache

Apache is widely used in cloud computing for a variety of purposes, primarily because of its suite of open-source software projects that address different aspects of cloud infrastructure, data processing, and web services. Here’s a breakdown of what Apache is used for in the cloud:

1. Web Hosting and HTTP Services

Apache HTTP Server (httpd):

- It is one of the most popular web servers used to host websites and web applications in the cloud.
- Provides HTTP and HTTPS protocols support.
- Used for deploying static and dynamic web content, with compatibility for PHP, Python, Perl, and other web technologies.
- Powers many virtual machines and containers in cloud environments

2. Big Data and Analytics

Apache Hadoop:

A framework for distributed storage and processing of large datasets across clusters of computers.

Widely used for building data lakes, performing batch processing, and supporting machine learning workloads in the cloud.

Apache Spark:

An in-memory data processing engine for large-scale data analytics.

Used in cloud platforms for real-time and batch data processing.

Apache Kafka:

A distributed event-streaming platform.

Used in cloud environments for building data pipelines and streaming applications.

---

3. Cloud Native Development

Apache Tomcat:

A lightweight Java application server used for deploying Java-based cloud applications.

Often integrated with cloud platforms for microservices and enterprise application development.

Apache Camel:

A framework for integrating cloud applications via message routing and mediation.

Supports cloud-native integration patterns and multiple communication protocols.

---

4. Distributed Systems

Apache Cassandra:

A highly scalable, distributed NoSQL database.

Used in cloud setups for managing large amounts of data with high availability and fault tolerance.

Apache Zookeeper:

A service for coordinating distributed applications.

Used in cloud systems to manage configuration, synchronization, and leader election.

---

5. Cloud Orchestration and Management

Apache Mesos:

A cluster manager that provides resource abstraction for distributed systems.

Often used as a building block for cloud orchestration systems, like DC/OS.

Apache CloudStack:

An Infrastructure-as-a-Service (IaaS) platform for deploying and managing cloud environments.

Offers a complete solution for building public or private clouds.

---

6. Data Streaming and Processing

Apache Flink:

A stream-processing framework for real-time data analytics.

Useful in cloud computing for event-driven applications and Internet of Things (IoT) workloads.

---

7. Machine Learning and AI

Apache Mahout:

A library for scalable machine learning.

Used in cloud environments to build recommendation systems, clustering models, and classification tools.

---

8. Open-Source Flexibility

Apache projects are open source, making them ideal for custom cloud solutions.

Many cloud service providers integrate Apache tools as part of their managed services (e.g., AWS EMR for Apache Spark, Google Cloud Dataflow for Apache Beam).

In Summary:

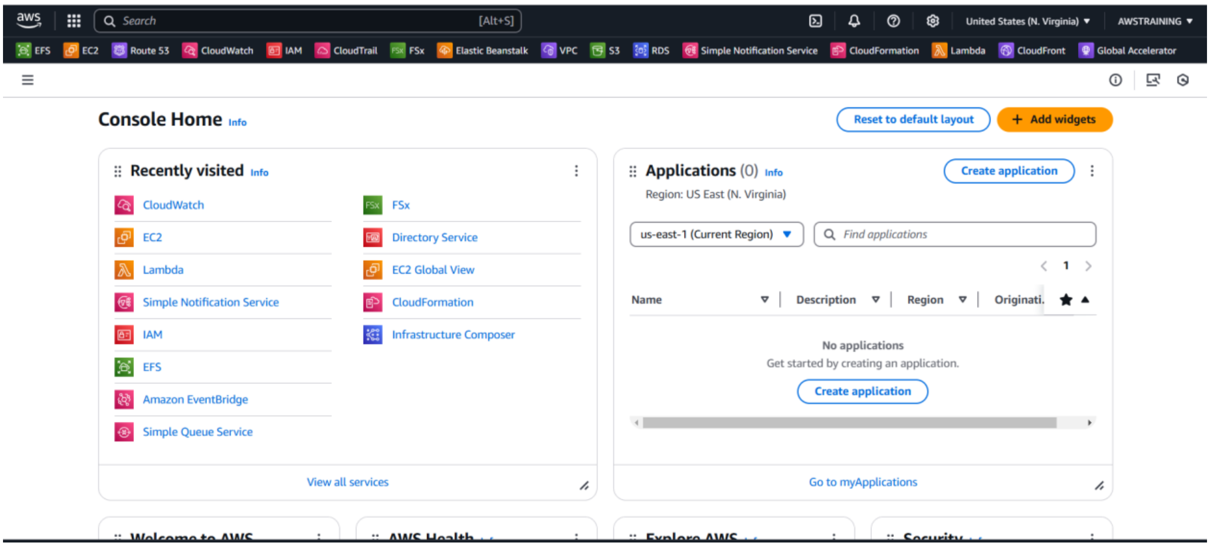
Apache technologies are foundational in cloud computing, enabling efficient data processing, scalable storage, robust web services, and real-time analytics. Their open-source nature and compatibility with distributed environments make them indispensable for building modern cloud-native applications and services.

Mastering Apache: A Step-by-Step Guide to Installing on EC2 Ubuntu

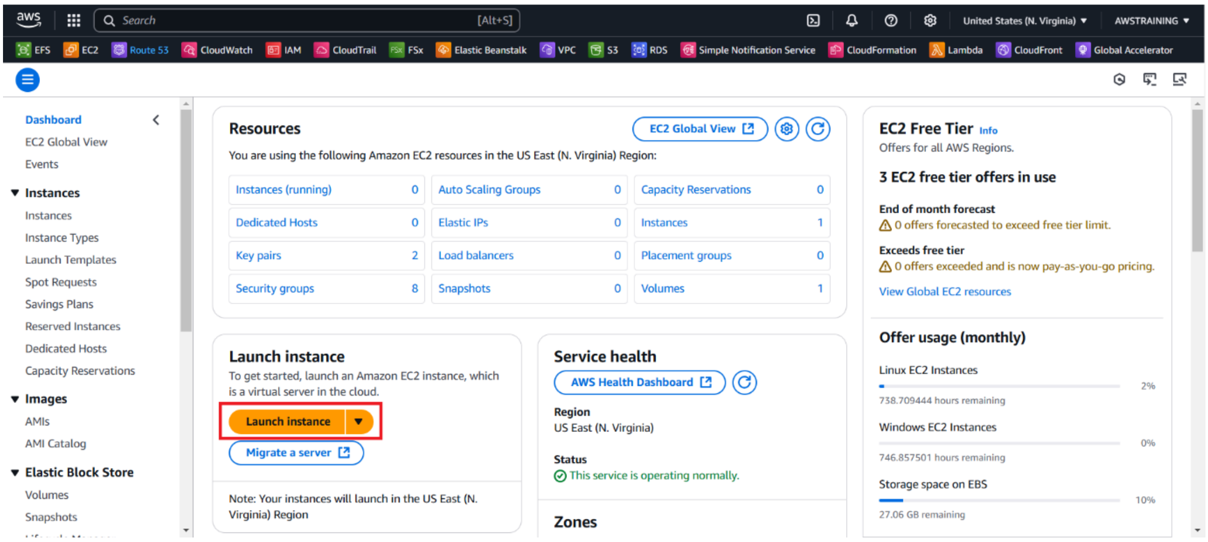
Here's a step-by-step guide for installing and configuring Apache on an EC2 instance running Ubuntu.

1. Launch an EC2 Instance

- Sign in to your AWS Management Console.



- Go to the **EC2 Dashboard**.



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	1
Key pairs	2	Load balancers	0	Placement groups	0
Security groups	8	Snapshots	0	Volumes	1

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

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

Region
US East (N. Virginia)

Status
This service is operating normally.

Offers for all AWS Regions.

3 EC2 free tier offers in use

End of month forecast
⚠ 0 offers forecasted to exceed free tier limit.

Exceeds free tier
⚠ 0 offers exceeded and is now pay-as-you-go pricing.

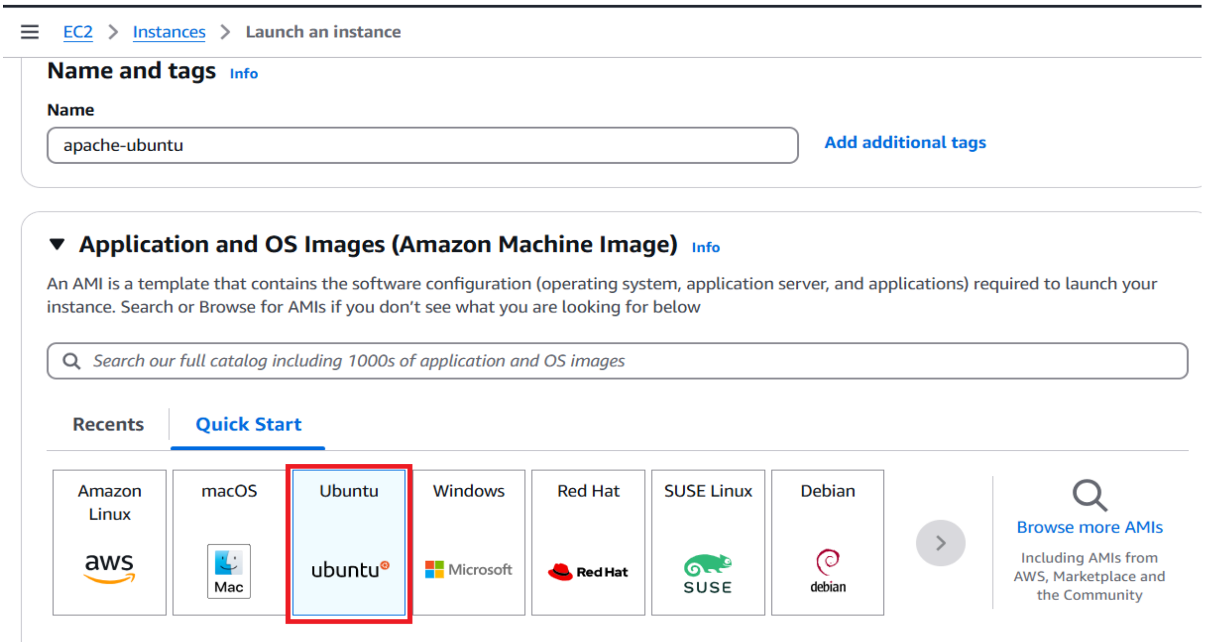
View Global EC2 resources

Linux EC2 Instances 2%
738.709444 hours remaining

Windows EC2 Instances 0%
746.857501 hours remaining

Storage space on EBS 10%
27.06 GB remaining

- Click on **Launch Instance** to create a new EC2 instance.



EC2 > Instances > Launch an instance

Name and tags Info

Name

apache-ubuntu

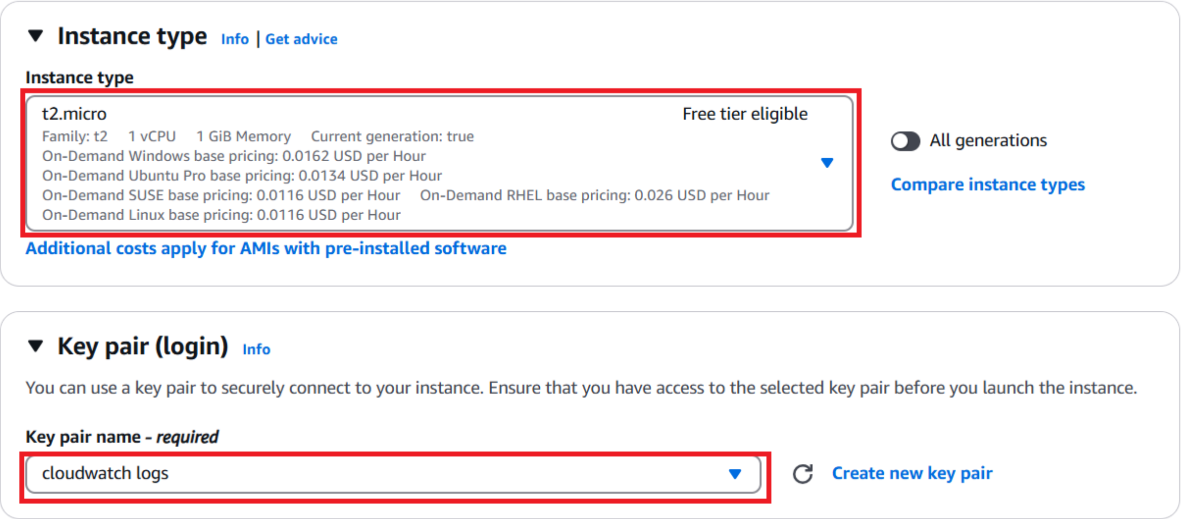
Add additional tags

▼ 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

- Choose an **Ubuntu AMI** (e.g., Ubuntu 22.04 LTS).
- Select an appropriate **Instance Type** (e.g., t2.micro for low-cost, basic usage).



▼ Instance type Info | Get advice

Instance type

t2.micro Free tier eligible
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

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

▼ 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.

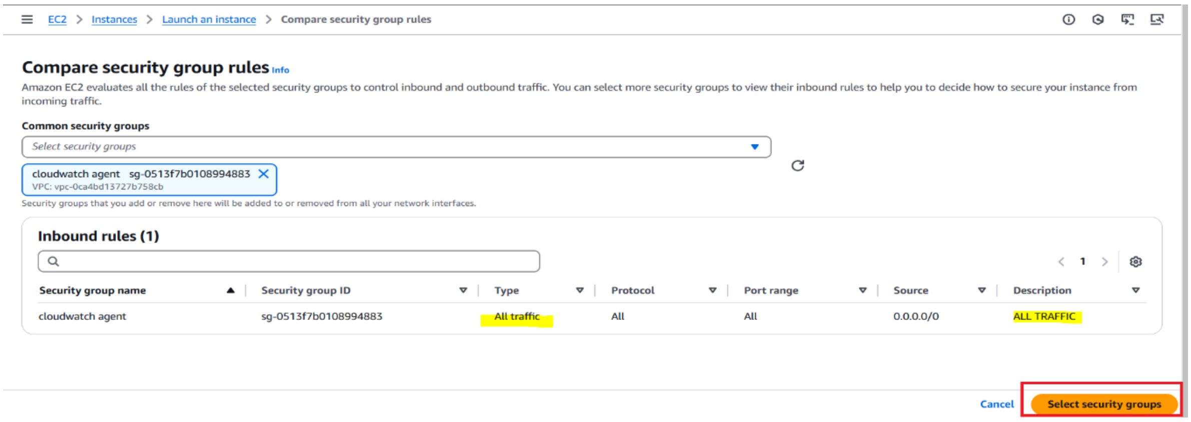
Key pair name - *required*

cloudwatch logs

Create new key pair

- Configure instance details, add storage if needed, and configure a security group.
    - Make sure to allow HTTP (port 80) and SSH (port 22) access in the security group but we use all traffic for all inbound rules.

NOTE:-This Security Group is Allowed all traffic but this is not a good practice while working in production environment.



EC2 > Instances > Launch an instance > Compare security group rules

Compare security group rules Info

Amazon EC2 evaluates all the rules of the selected security groups to control inbound and outbound traffic. You can select more security groups to view their inbound rules to help you to decide how to secure your instance from incoming traffic.

Common security groups

Select security groups

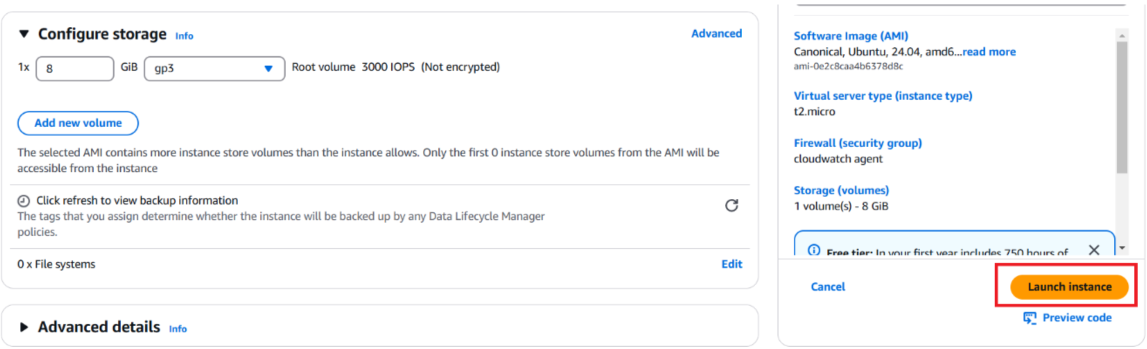
cloudwatch agent sg-0513f7b0108994883
VPC: vpc-0ca4bd13727b758cb

Security groups that you add or remove here will be added to or removed from all your network interfaces.

Inbound rules (1)

Security group name	Security group ID	Type	Protocol	Port range	Source	Description
cloudwatch agent	sg-0513f7b0108994883	All traffic	All	All	0.0.0.0/0	ALL TRAFFIC

Choose Configure Storage we use by default.



Configure storage Info

1x 8 GiB gp3 Root volume 3000 IOPS (Not encrypted)

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

Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-0e2c8caa4b6378d8c

Virtual server type (instance type)
t2.micro

Firewall (security group)
cloudwatch agent

Storage (volumes)
1 volume(s) - 8 GiB

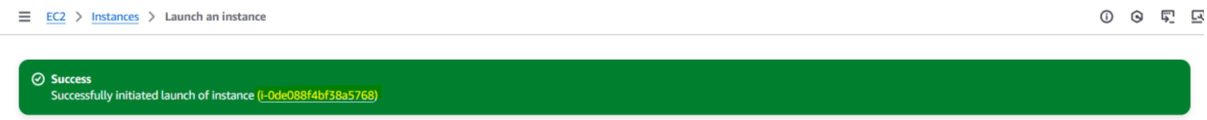
Free tier: In your first year includes 750 hours of

We can Launch ec2 either two way means you can direct use user data to create the apache and use and other way in after launch the instance when you install the apache2.

So I used After connect the instance with moba-x-term third party application.

How To Download Moba-x-term

NOTE:I am suggest you use third party application for ec2 instance connect.when you are using moba-x-term and use private key(.ppk) file format.

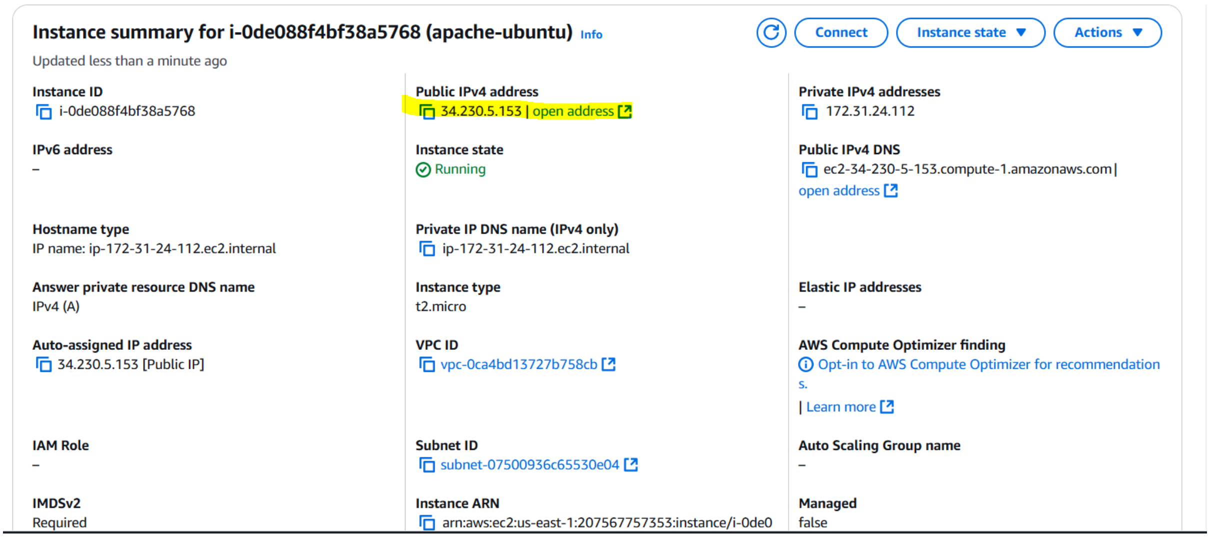


EC2 > Instances > Launch an instance

Success
Successfully initiated launch of instance (i-0de088f4bf38a5768)

After Launch the instance you will see this all instance information

Instance ID,Public ip,private ip,host name.



Instance summary for i-0de088f4bf38a5768 (apache-ubuntu) Info

Updated less than a minute ago

Instance ID
i-0de088f4bf38a5768

Public IPv4 address
34.230.5.153 | open address

Private IPv4 addresses
172.31.24.112

IPv6 address
–

Instance state
Running

Public IPv4 DNS
ec2-34-230-5-153.compute-1.amazonaws.com | open address

Hostname type
IP name: ip-172-31-24-112.ec2.internal

Private IP DNS name (IPv4 only)
ip-172-31-24-112.ec2.internal

Answer private resource DNS name
IPv4 (A)

Instance type
t2.micro

Elastic IP addresses
–

Auto-assigned IP address
34.230.5.153 [Public IP]

VPC ID
vpc-0ca4bd13727b758cb

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

IAM Role
–

Subnet ID
subnet-07500936c65530e04

Auto Scaling Group name
–

IMDSv2
Required

Instance ARN
arn:aws:ec2:us-east-1:207567757353:instance/i-0de0

Managed
false

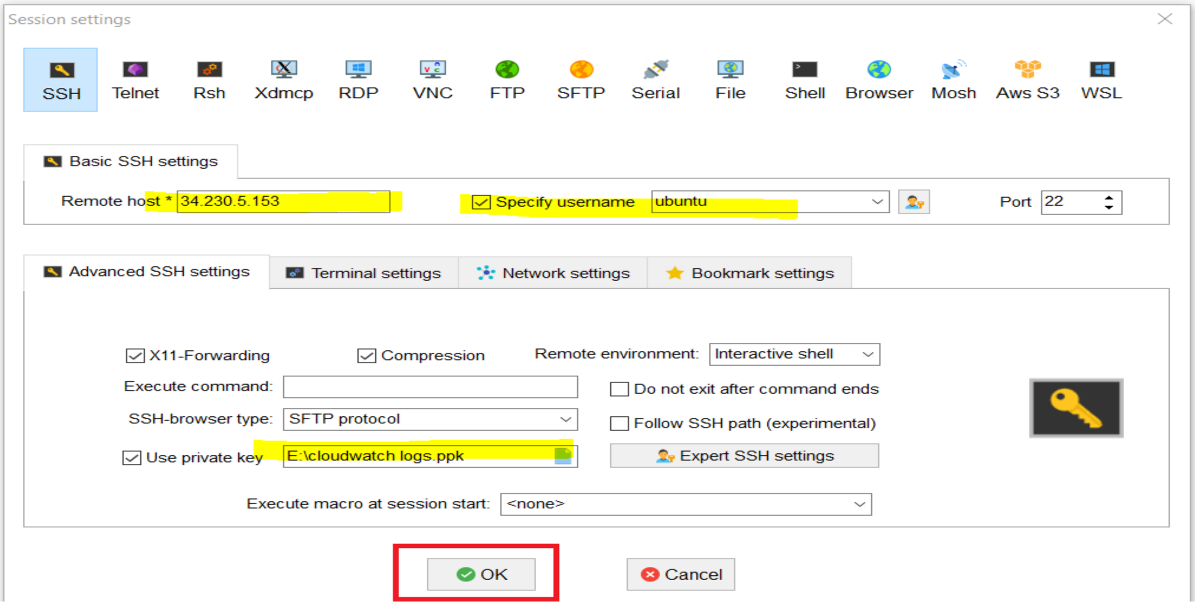
Now We use Public ip assigned by aws and connect to ec2 instance in our moba-x-term application.this application helps to interaction between ec2 instance.

In Moba X term

Remote Host:-In this we use public ip

Specify Username:-ubuntu

NOTE:-We use Private Key.(.ppk)Format for third party.when we launch the instance you will see the key pair >create new key pair.in this key pair you will see two file format 1).pem and 2).ppk so you need to choose the 2 option and download the .ppk file format



Basic SSH settings

Remote host * 34.230.5.153 ☑ Specify username ubuntu Port 22

Advanced SSH settings

☑ X11-Forwarding ☑ Compression Remote environment: Interactive shell

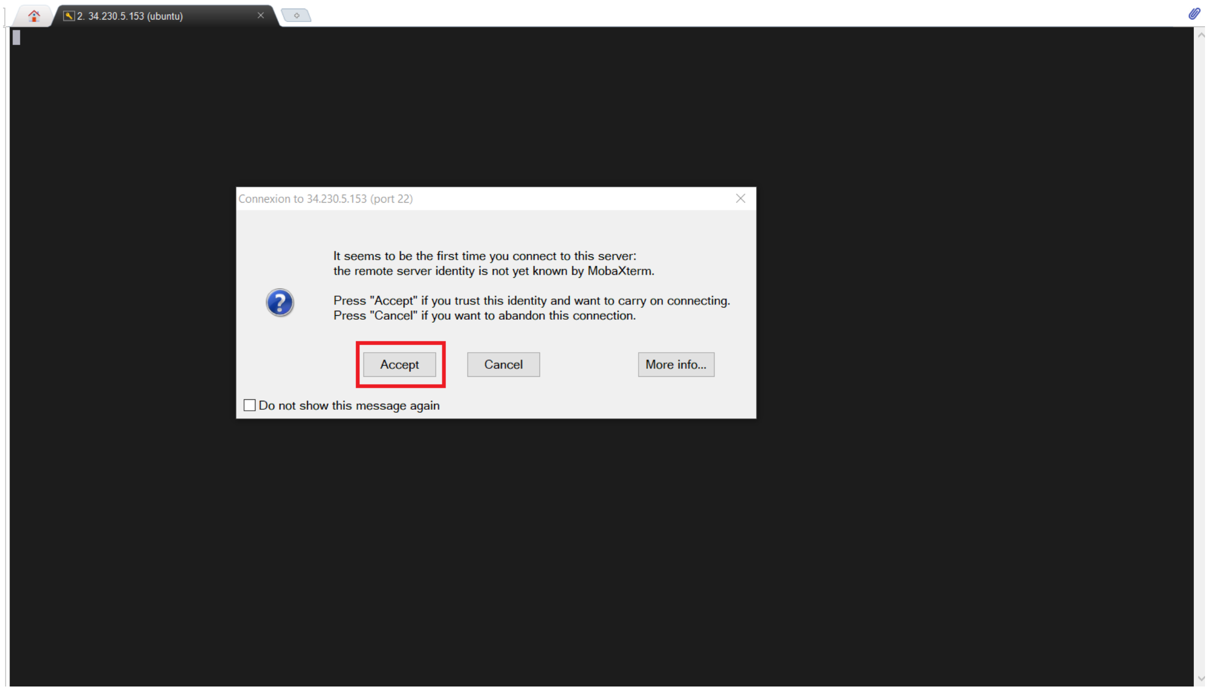
Execute command: □ Do not exit after command ends

SSH-browser type: SFTP protocol □ Follow SSH path (experimental)

☑ Use private key E:\cloudwatch logs.ppk

Execute macro at session start: <none>

Then Click OK

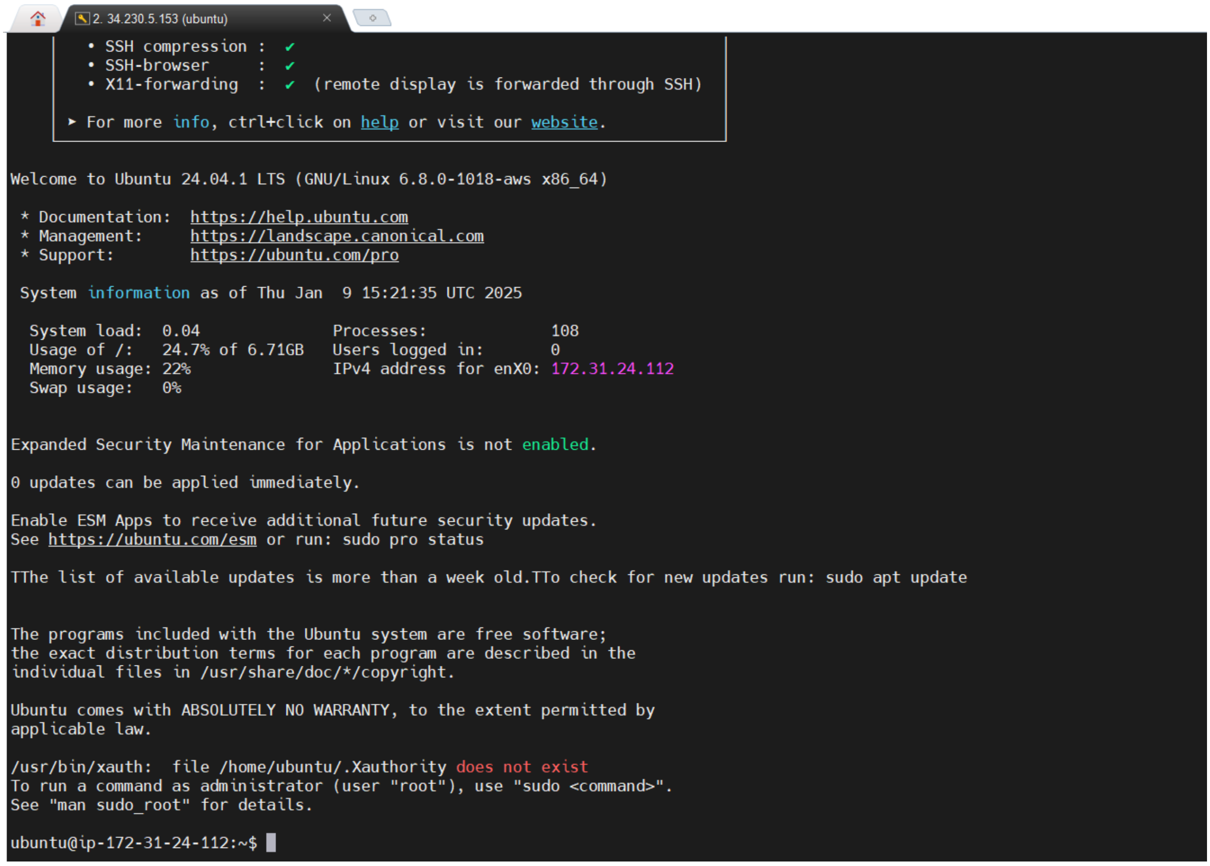


It seems to be the first time you connect to this server:
the remote server identity is not yet known by MobaXterm.

Press "Accept" if you trust this identity and want to carry on connecting.
Press "Cancel" if you want to abandon this connection.

□ Do not show this message again

Accept

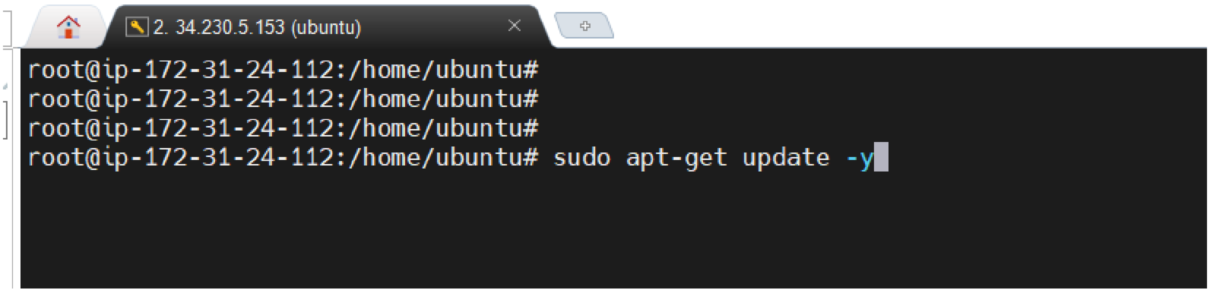


```
    • SSH compression : ✔
    • SSH-browser     : ✔
    • X11-forwarding  : ✔  (remote display is forwarded through SSH)

  ➤ For more info, ctrl+click on help or visit our website.

Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1018-aws x86_64)

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

 System information as of Thu Jan  9 15:21:35 UTC 2025

  System load:  0.04               Processes:             108
  Usage of /:   24.7% of 6.71GB    Users logged in:       0
  Memory usage: 22%                IPv4 address for enX0: 172.31.24.112
  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

TThe list of available updates is more than a week old.TTo check for new updates run: sudo apt update


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

/usr/bin/xauth:  file /home/ubuntu/.Xauthority does not exist
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-24-112:~$ 
```

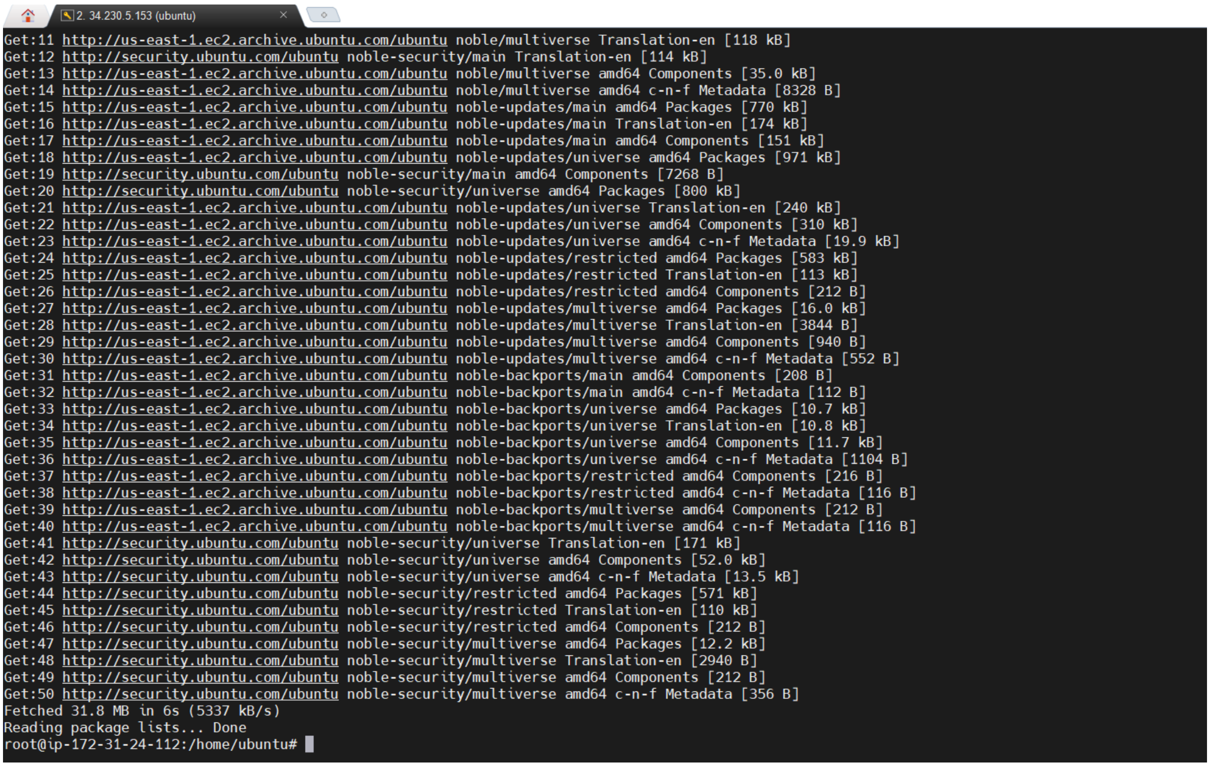
Now Your EC2 Instance has been connected to mobaxterm

Now First we need to update the ubuntu so this is command for update the ec2 ubuntu

sudo apt-get update -y



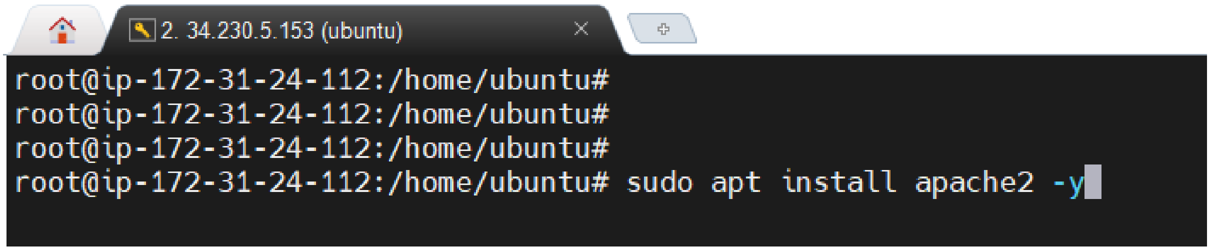
```
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu# sudo apt-get update -y
```



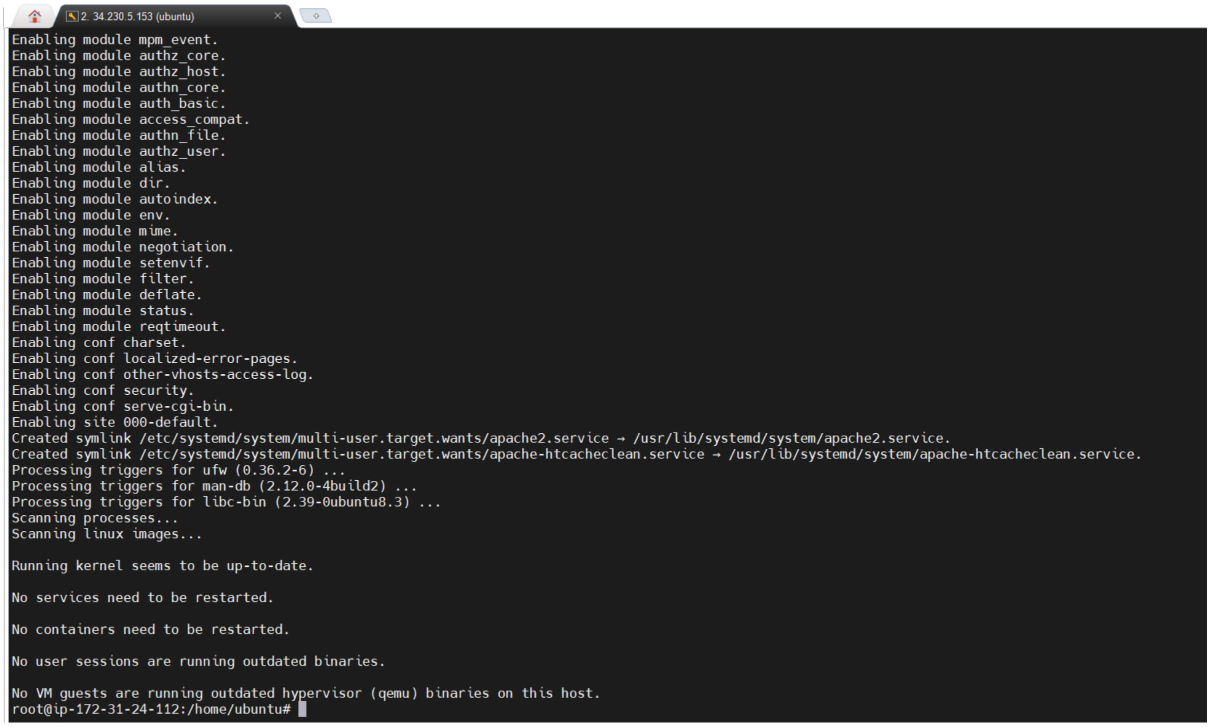
```
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:12 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [114 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [770 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [174 kB]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [151 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [971 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7268 B]
Get:20 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [800 kB]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [240 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [310 kB]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.9 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [583 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [113 kB]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [16.0 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3844 B]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [552 B]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.7 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.8 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.7 kB]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1104 B]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:40 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:41 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [171 kB]
Get:42 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.0 kB]
Get:43 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [13.5 kB]
Get:44 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [571 kB]
Get:45 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [110 kB]
Get:46 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:47 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [12.2 kB]
Get:48 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2940 B]
Get:49 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:50 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [356 B]
Fetched 31.8 MB in 6s (5337 kB/s)
Reading package lists... Done
root@ip-172-31-24-112:/home/ubuntu#
```

After Update the ec2 instance We need to install apache package so this is command for install the apache2

Sudo apt install apache2



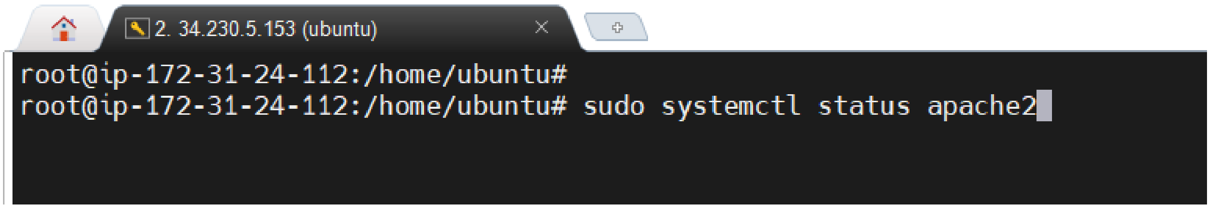
```
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu# sudo apt install apache2 -y
```



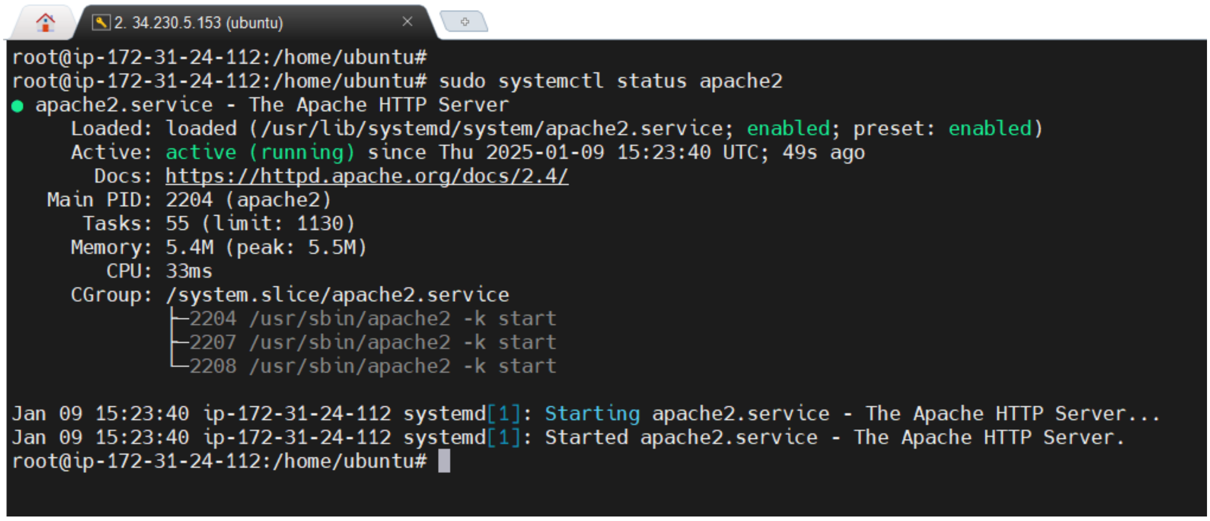
```
Enabling module mpm_event.
Enabling module authz_core.
Enabling module authz_host.
Enabling module authn_core.
Enabling module auth_basic.
Enabling module access_compat.
Enabling module authn_file.
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-24-112:/home/ubuntu#
```

After Install the apache2 we need to check the apache2 services so this is the command

sudo systemctl status apache2

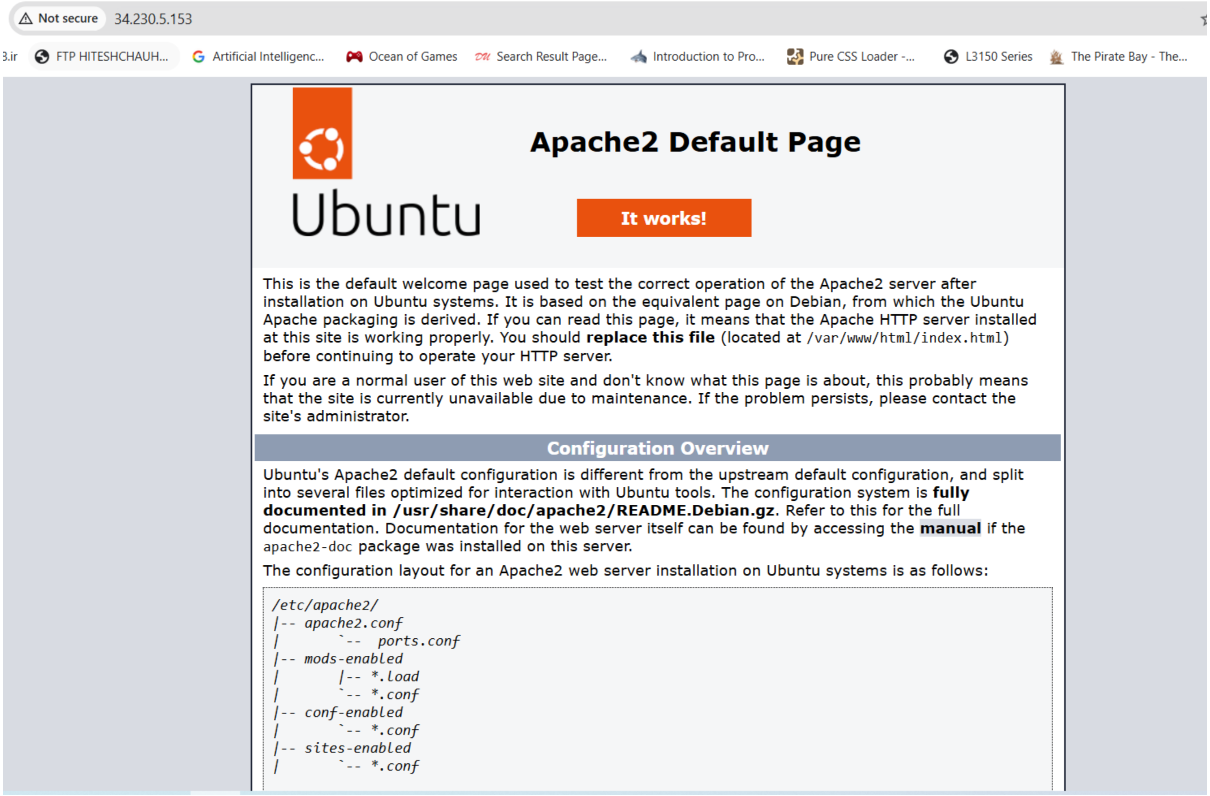


```
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu# sudo systemctl status apache2
```



```
root@ip-172-31-24-112:/home/ubuntu#
root@ip-172-31-24-112:/home/ubuntu# sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Thu 2025-01-09 15:23:40 UTC; 49s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2204 (apache2)
      Tasks: 55 (limit: 1130)
     Memory: 5.4M (peak: 5.5M)
        CPU: 33ms
     CGroup: /system.slice/apache2.service
             ├─2204 /usr/sbin/apache2 -k start
             ├─2207 /usr/sbin/apache2 -k start
             └─2208 /usr/sbin/apache2 -k start

Jan 09 15:23:40 ip-172-31-24-112 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Jan 09 15:23:40 ip-172-31-24-112 systemd[1]: Started apache2.service - The Apache HTTP Server.
root@ip-172-31-24-112:/home/ubuntu#
```

Now We can see the apache2 default page in ec2 instance.



Apache2 Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|       `--  ports.conf
|-- mods-enabled
|       |-- *.load
|       `-- *.conf
|-- conf-enabled
|       `-- *.conf
|-- sites-enabled
|       `-- *.conf
```

Now We can transfer the website data in **/var/www/html** location through filezilla.

When transfer the data require permission for this path use this

chmod -R 0777 /var/www/html

In this I am suggest you to use file zilla for website data transfer.