# EC2 Instance Setup and Apache Web Server Deployment Project

**Project Description**

This project involves deploying a simple HTML web page on an AWS EC2 instance using the Apache Web Server. The main goal is to understand cloud infrastructure setup, Linux server management, and web server deployment.

**The project includes the following steps:**

1. Launching an EC2 instance on AWS and configuring its network and security settings.

2. Connecting to the instance via SSH to perform server-side operations.

3. Installing and configuring the Apache Web Server on the EC2 instance.

4. Deploying a custom HTML page in the web server's root directory.

5. Configuring firewall and security group rules to allow HTTP access from the internet.

6. Testing the web page by accessing the EC2 public IP in a browser.

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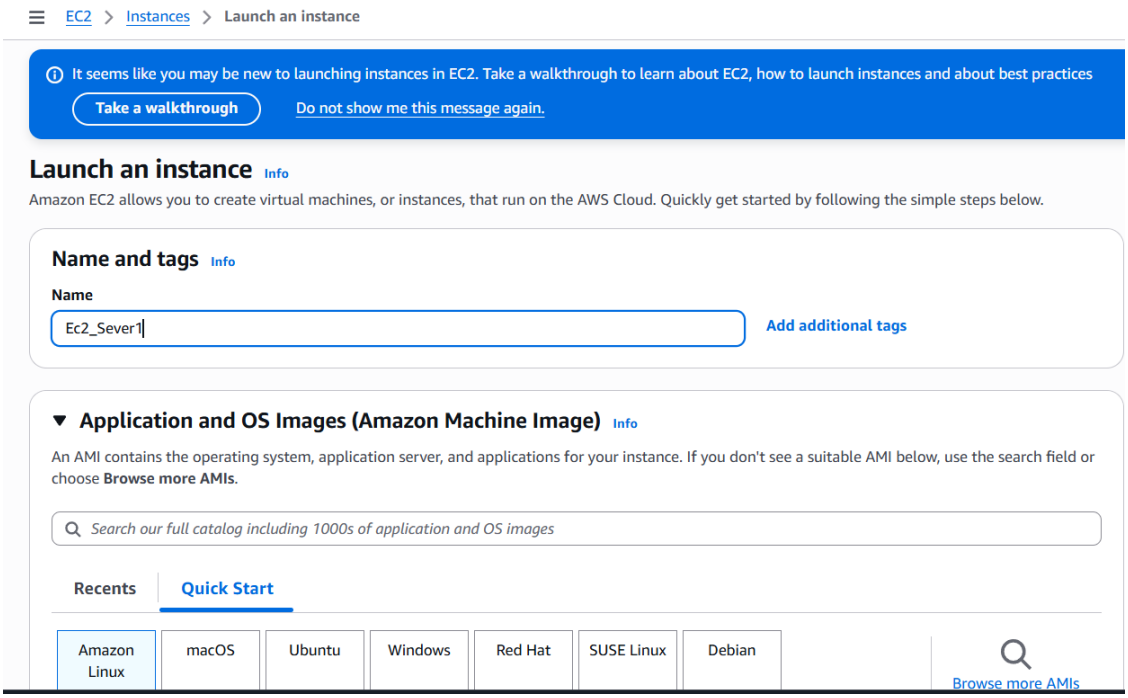
6. Testing the web page by accessing the EC2 public IP in a browser.

**Step 1:**

**1. Launch an EC2 Instance**

1. Login to AWS Console → Navigate to EC2 → Click Launch Instance.

2. Choose an Amazon Machine Image (AMI): Select Amazon Linux / CentOS 9 / Ubuntu depending on your preference.



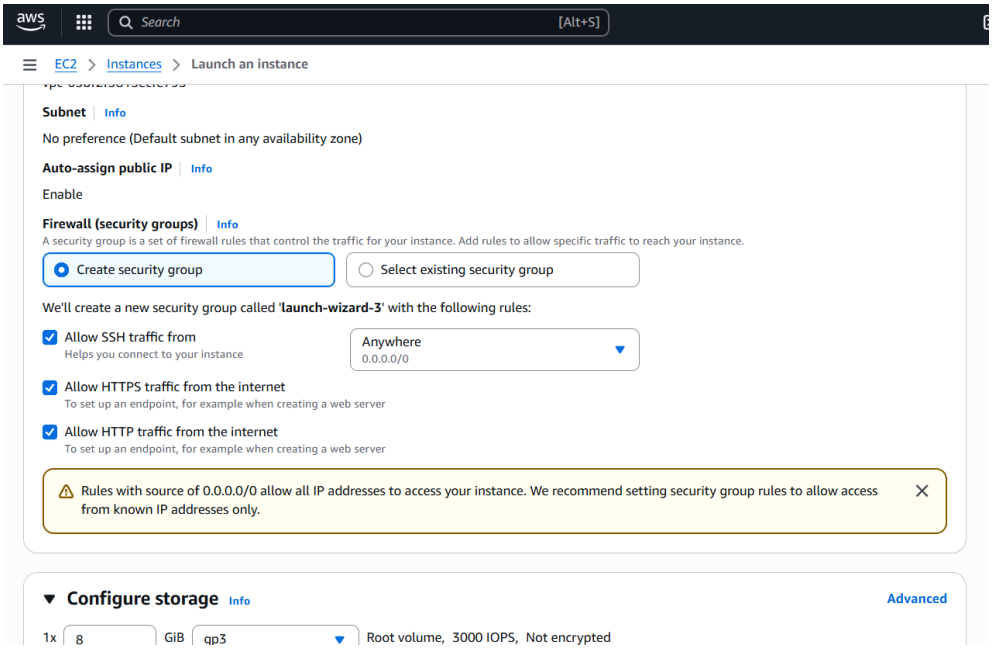

3. Select Instance Type: For testing, t2.micro (free tier) is enough.

4. Configure Instance: Keep default network settings or customize if needed.

5. Add Storage: Default 8 GB is sufficient.

6. Configure Security Group:

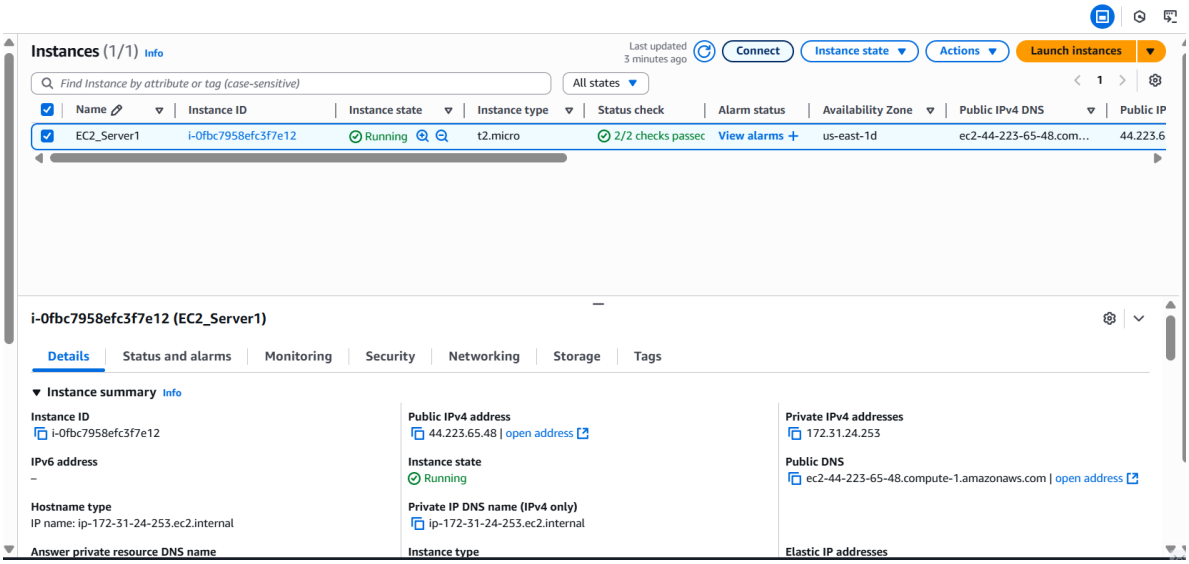
o Allow SSH (port 22) for your IP.
o Allow HTTP (port 80) for public access.
o Optionally, allow HTTPS (port 443) if planning SSL.




7. Review and Launch → Select key pair (create new or use existing) → Launch Instance.

**Step 2:** Connect to EC2 via SSH

1. Open terminal (Linux/macOS) or use PuTTY (Windows).




2. Run command:

Install Apache (ex. Httpd Service)

sudo yum install httpd -y

```
[ec2-user@ip-172-31-24-253 ~]$ sudo -i
[root@ip-172-31-24-253 ~]# sudo yum install httpd -y
Amazon Linux 2023 Kernel Livepatch repository            234 kB/s |  26 kB     00:00
Dependencies resolved.
================================================================================
 Package                 Arch        Version                     Repository        Size
================================================================================
Installing:
 httpd                   x86_64      2.4.65-1.amzn2023.0.1       amazonlinux       47 k
Installing dependencies:
 apr                     x86_64      1.7.5-1.amzn2023.0.4        amazonlinux      129 k
 apr-util                x86_64      1.6.3-1.amzn2023.0.1        amazonlinux       98 k
 generic-logos-httpd     noarch      18.0.0-12.amzn2023.0.3      amazonlinux       19 k
 httpd-core              x86_64      2.4.65-1.amzn2023.0.1       amazonlinux      1.4 M
 httpd-filesystem        noarch      2.4.65-1.amzn2023.0.1       amazonlinux       13 k
 httpd-tools             x86_64      2.4.65-1.amzn2023.0.1       amazonlinux       81 k
 libbrotli               x86_64      1.0.9-4.amzn2023.0.2        amazonlinux      315 k
 mailcap                 noarch      2.1.49-3.amzn2023.0.3       amazonlinux       33 k
Installing weak dependencies:
 apr-util-openssl        x86_64      1.6.3-1.amzn2023.0.1        amazonlinux       17 k
 mod_http2               x86_64      2.0.27-1.amzn2023.0.3       amazonlinux      166 k
 mod_lua                 x86_64      2.4.65-1.amzn2023.0.1       amazonlinux       60 k

Transaction Summary
================================================================================
Install  12 Packages

Total download size: 2.3 M
Installed size: 6.9 M
Downloading Packages:
(1/12): apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64.rpm  462 kB/s |  17 kB     00:00
(2/12): apr-1.7.5-1.amzn2023.0.4.x86_64.rpm               2.9 MB/s | 129 kB     00:00
(3/12): apr-util-1.6.3-1.amzn2023.0.1.x86_64.rpm          2.0 MB/s |  98 kB     00:00
(4/12): generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch 807 kB/s |  19 kB     00:00
(5/12): httpd-2.4.65-1.amzn2023.0.1.x86_64.rpm            1.7 MB/s |  47 kB     00:00
```

Start the Service

sudo systemctl start httpd # Start Apache

sudo systemctl enable httpd # Enable at boot

sudo systemctl status httpd # Check status

```
[root@ip-172-31-24-253 ~]# sudo systemctl start httpd
[root@ip-172-31-24-253 ~]# sudo systemctl enable httpd
[root@ip-172-31-24-253 ~]# sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
     Active: active (running) since Mon 2025-10-13 05:10:47 UTC; 2min 44s ago
       Docs: man:httpd.service(8)
   Main PID: 26653 (httpd)
     Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec:   0 B/sec"
      Tasks: 177 (limit: 1106)
     Memory: 13.0M
        CPU: 156ms
     CGroup: /system.slice/httpd.service
             ├─26653 /usr/sbin/httpd -DFOREGROUND
             ├─26654 /usr/sbin/httpd -DFOREGROUND
             ├─26655 /usr/sbin/httpd -DFOREGROUND
             ├─26656 /usr/sbin/httpd -DFOREGROUND
             └─26657 /usr/sbin/httpd -DFOREGROUND

Oct 13 05:10:47 ip-172-31-24-253.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Oct 13 05:10:47 ip-172-31-24-253.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Oct 13 05:10:47 ip-172-31-24-253.ec2.internal httpd[26653]: Server configured, listening on: port 80
[root@ip-172-31-24-253 ~]#
```

Test:

echo "<h1>Welcome to My Apache Web Server on EC2</h1>" | sudo tee /var/www/html/index.html

```
Oct 13 05:10:47 ip-172-31-24-253.ec2.internal httpd[26653]: Server configured, listening on: port 80
[root@ip-172-31-24-253 ~]# echo "<h1>Welcome to My Apache Web Server on EC2</h1>" | sudo tee /var/www/html/index.html
<h1>Welcome to My Apache Web Server on EC2</h1>
[root@ip-172-31-24-253 ~]#
```

**Step 3:** Install Firewall

sudo yum install firwalld -y

```
[root@ip-172-31-24-253 ~]# sudo yum install firewalld -y
Last metadata expiration check: 0:07:02 ago on Mon Oct 13 05:10:06 2025.
Dependencies resolved.
================================================================================
 Package                    Architecture          Version
================================================================================
Installing:
 firewalld                  noarch                1.2.3-1.amzn2023
Installing dependencies:
 firewalld-filesystem       noarch                1.2.3-1.amzn2023
 gobject-introspection      x86_64                1.82.0-1.amzn2023
 ipset                      x86_64                7.11-1.amzn2023.0.3
 ipset-libs                 x86_64                7.11-1.amzn2023.0.3
 iptables-libs              x86_64                1.8.8-3.amzn2023.0.2
 iptables-nft               x86_64                1.8.8-3.amzn2023.0.2
 libnetfilter_conntrack     x86_64                1.0.8-2.amzn2023.0.2
 libnfnetlink               x86_64                1.0.1-19.amzn2023.0.2
 libnftnl                   x86_64                1.2.2-2.amzn2023.0.2
 nftables                   x86_64                1:1.0.4-3.amzn2023.0.2
 python3-firewall           noarch                1.2.3-1.amzn2023
 python3-gobject-base       x86_64                3.48.2-3.amzn2023.0.2
 python3-nftables           x86_64                1:1.0.4-3.amzn2023.0.2
Installing weak dependencies:
 libcap-ng-python3          x86_64                0.8.2-4.amzn2023.0.2

Transaction Summary
================================================================================
Install  15 Packages

Total download size: 2.5 M
Installed size: 11 M
Downloading Packages:
(1/15): firewalld-filesystem-1.2.3-1.amzn2023.noarch.rpm
(2/15): gobject-introspection-1.82.0-1.amzn2023.x86_64.rpm
```

sudo systemctl start firewalld

sudo firewall-cmd --permanent --add-service=http

sudo firewall-cmd --reload

```
[root@ip-172-31-24-253 ~]# sudo systemctl start firewalld
[root@ip-172-31-24-253 ~]# sudo firewall-cmd --permanent --add-service=http
success
[root@ip-172-31-24-253 ~]# sudo firewall-cmd --reload
success
[root@ip-172-31-24-253 ~]#
```

**Step 4:**

Use curl <your Public IP> to check webpage

```
  services: dhcpv6-client http mdns ssh
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@ip-172-31-24-253 ~]# ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=117 time=0.956 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=117 time=1.01 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=117 time=1.24 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=117 time=0.993 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=117 time=1.72 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=117 time=1.28 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=117 time=1.33 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=117 time=1.25 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=117 time=1.00 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=117 time=1.20 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=117 time=1.46 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=117 time=1.01 ms
64 bytes from 8.8.8.8: icmp_seq=13 ttl=117 time=1.24 ms
64 bytes from 8.8.8.8: icmp_seq=14 ttl=117 time=0.999 ms
64 bytes from 8.8.8.8: icmp_seq=15 ttl=117 time=1.02 ms
64 bytes from 8.8.8.8: icmp_seq=16 ttl=117 time=1.19 ms
64 bytes from 8.8.8.8: icmp_seq=17 ttl=117 time=1.38 ms
64 bytes from 8.8.8.8: icmp_seq=18 ttl=117 time=0.993 ms
^C
--- 8.8.8.8 ping statistics ---
18 packets transmitted, 18 received, 0% packet loss, time 17024ms
rtt min/avg/max/mdev = 0.956/1.181/1.723/0.200 ms
[root@ip-172-31-24-253 ~]# curl 44.223.65.48
<h1>Welcome to My Apache Web Server on EC2</h1>
[root@ip-172-31-24-253 ~]#
```

Open public IP in New window you will get your webpage here.


**Skills Learned**

- Launching and configuring EC2 instances
- Accessing EC2 using SSH
- Installing Apache Web Server on Linux
- Configuring firewall and security groups
- Deploying a basic HTML web page
- Using Linux commands for server management

**Project Summary**

Deployed a simple HTML web page on an AWS EC2 instance using Apache Web Server. The project involved launching and configuring an EC2 instance, connecting via SSH, installing Apache, deploying a web page, and configuring firewall and security settings. Gained hands-on experience in cloud infrastructure, Linux server management, web server deployment, and network security.

**Conclusion**

This project successfully demonstrated the deployment of a web server on an AWS EC2 instance. It provided practical experience in cloud computing, Linux server management, and web service hosting. By completing this project, skills in configuring EC2 instances, installing Apache, managing security settings, and deploying web content were effectively enhanced, preparing for real-world cloud and server administration tasks.

**Project Member**

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