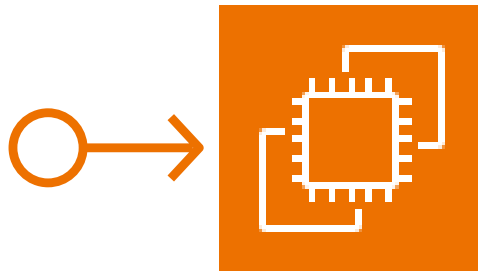


## **AWS Solution Architect Training with AWS Cloud Practitioner Global Certification Training**

**Trainer: Aravindraaj.G- N minds Academy**

# **Configure Elastic IP Address to Windows Web Server in AWS**



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## Objective

An Elastic IP (EIP) in AWS is a static, public IP address designed for dynamic cloud computing. It is associated with your AWS account and can be quickly associated or disassociated with any EC2 instance in your account. This feature is particularly useful when you need to maintain a consistent IP address for your resources, even when you stop and start EC2 instances.

### Common Use Cases for Elastic IP:

#### 1. Highly Available Applications:

- If you're running a service that requires high availability, you can use Elastic IPs to quickly reassign a static IP to a new instance if your primary instance fails, ensuring minimal downtime.

#### 2. Web Servers:

- If you host a website and need to ensure the IP address remains the same even if the underlying EC2 instance is restarted, an Elastic IP helps maintain this consistency.

#### 3. Disaster Recovery:

- Elastic IPs are useful for disaster recovery scenarios. If one instance goes down, you can quickly associate the EIP with a backup instance to ensure services are still accessible.

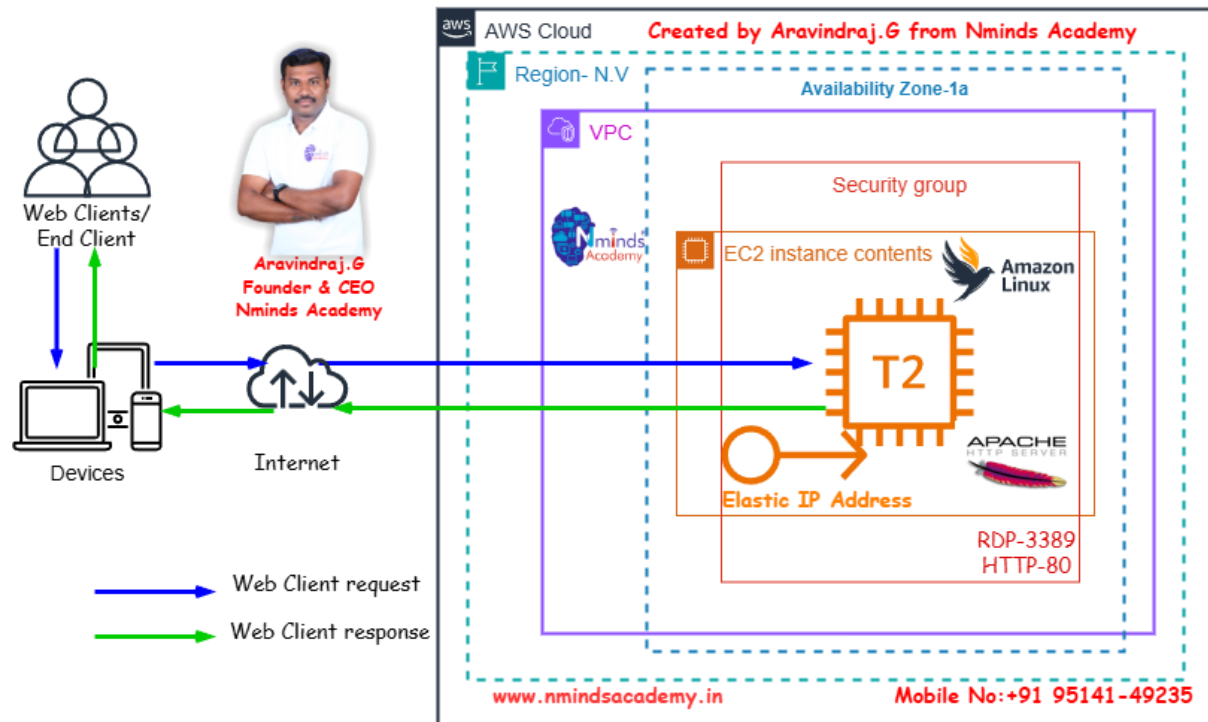
### Best Practices:

- Use Elastic IPs only when necessary: Since they come with associated costs when unused, it's a good practice to release EIPs that are no longer required.
- Move IPs during instance failure: Instead of keeping an EIP permanently attached, use it as a failover method, reassociating it to a new instance when needed.
- Monitor EIP Usage: Periodically review your usage to ensure you're not paying for unnecessary Elastic IP addresses.



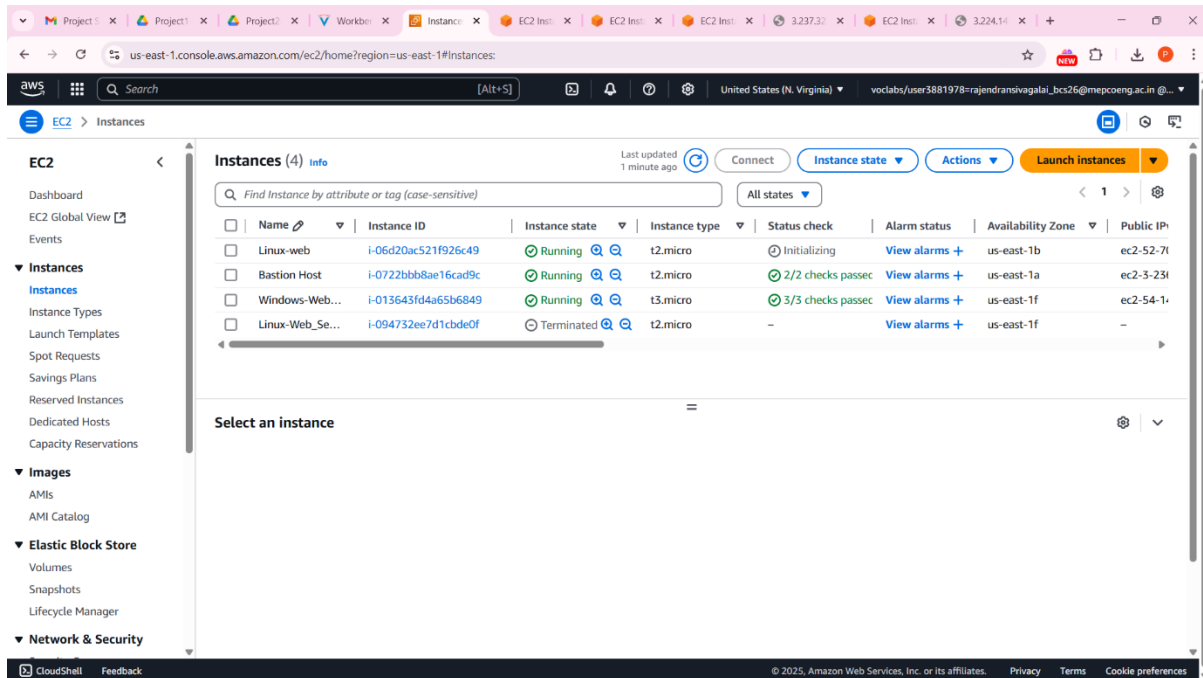
# Topology

How to Configure the Elastic IP Address to Linux Web Server with AWS EC2



## Execution Tasks:

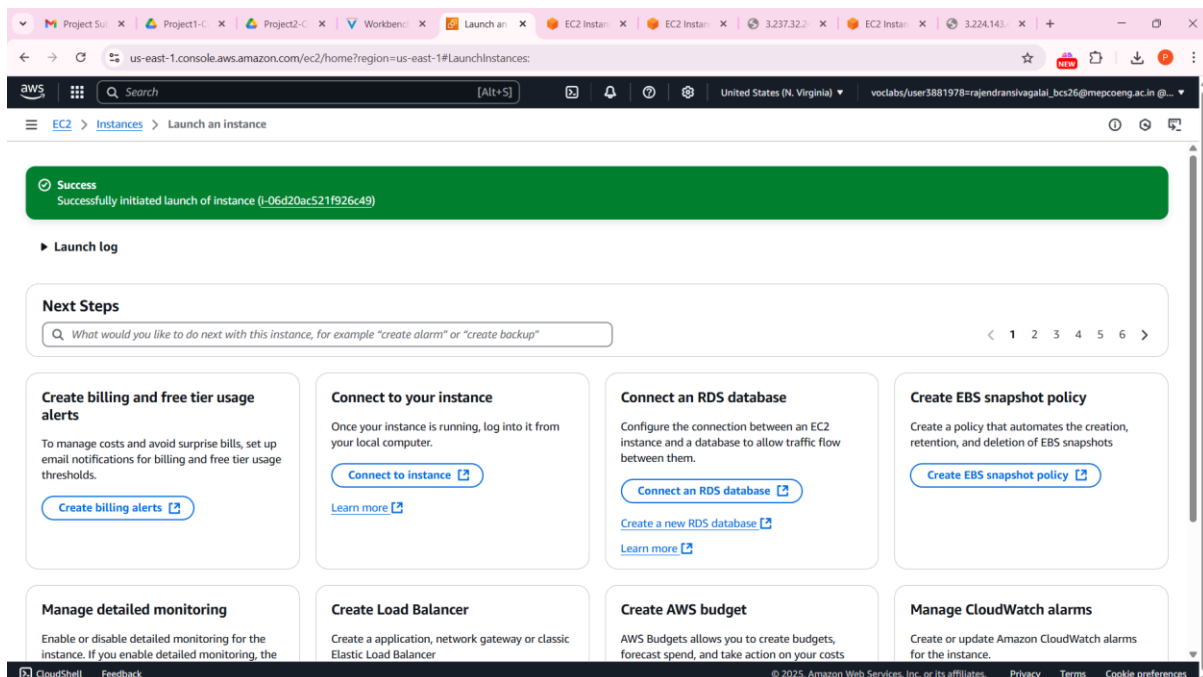
### Step 1: Launch a Linux EC2 Instance



The screenshot shows the AWS Management Console for the 'us-east-1' region. The left sidebar contains navigation links for EC2, including Dashboard, EC2 Global View, Events, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Volumes, Snapshots, Lifecycle Manager, and Network & Security. The main content area displays the 'Instances (4)' page. A table lists the instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
Linux-web	i-06d20ac521f926c49	Running	t2.micro	Initializing	View alarms +	us-east-1b	ec2-52-71
Bastion Host	i-0722bbb8ae16cad9c	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-3-231
Windows-Web...	i-013643fd4a6b6849	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1f	ec2-54-1
Linux-Web_Se...	i-094732ee7d1cbde0f	Terminated	t2.micro	-	View alarms +	us-east-1f	-

Below the table, there is a 'Select an instance' section with a search bar and a dropdown menu.



The screenshot shows the 'Launch an instance' page in the AWS Management Console. A green success banner at the top states: 'Successfully initiated launch of instance (i-06d20ac521f926c49)'. Below the banner, there is a 'Launch log' section. The 'Next Steps' section contains several cards with links to various AWS services:

- Create billing and free tier usage alerts**: To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds. [Create billing alerts](#)
- Connect to your instance**: Once your instance is running, log into it from your local computer. [Connect to instance](#) [Learn more](#)
- Connect an RDS database**: Configure the connection between an EC2 instance and a database to allow traffic flow between them. [Connect an RDS database](#) [Create a new RDS database](#) [Learn more](#)
- Create EBS snapshot policy**: Create a policy that automates the creation, retention, and deletion of EBS snapshots. [Create EBS snapshot policy](#)
- Manage detailed monitoring**: Enable or disable detailed monitoring for the instance. If you enable detailed monitoring, the instance is billed at a higher rate. [Manage detailed monitoring](#)
- Create Load Balancer**: Create an application, network gateway or classic Elastic Load Balancer. [Create Load Balancer](#)
- Create AWS budget**: AWS Budgets allows you to create budgets, forecast spend, and take action on your costs. [Create AWS budget](#)
- Manage CloudWatch alarms**: Create or update Amazon CloudWatch alarms for the instance. [Manage CloudWatch alarms](#)



## Step 2: Install Apache (Web Server) on the Linux Instance


```
ec2-user@ip-172-31-92-161:~$ ssh -i linux-key-pair.pem ec2-user@3.237.32.247
ssh: connect to host 3.237.32.247 port 22: Connection timed out

C:\Users\donpr\Downloads>ssh -i linux-key-pair.pem ec2-user@3.237.32.247
ssh: connect to host 3.237.32.247 port 22: Connection timed out

C:\Users\donpr\Downloads>chmod 400 my-key-pair.pem
'chmod' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\donpr\Downloads>ssh -i linux-key-pair.pem ec2-user@3.237.32.247
ssh: connect to host 3.237.32.247 port 22: Connection timed out

C:\Users\donpr\Downloads>ssh -i linux-key-pair.pem ec2-user@52.70.167.16
The authenticity of host '52.70.167.16 (52.70.167.16)' can't be established.
ED25519 key fingerprint is SHA256:0JvyqUmrCMNN30ip5f84Wf6hcFB1gW9/u4tvaFH9cJQ.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '52.70.167.16' (ED25519) to the list of known hosts.
```



```
#
Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023
```

```
Last login: Wed Apr 16 18:46:32 2025 from 18.206.107.29
[ec2-user@ip-172-31-92-161 ~]$
```

```
ec2-user@ip-172-31-92-161: ~  
Microsoft Windows [Version 10.0.22631.4974]  
(c) Microsoft Corporation. All rights reserved.  
  
C:\Users\donpr>Downloads>ssh -i linux-key-pair.pem ec2-user@3.237.32.247  
ssh: connect to host 3.237.32.247 port 22: Connection timed out  
  
C:\Users\donpr>Downloads>ssh -i linux-key-pair.pem ec2-user@3.237.32.247  
ssh: connect to host 3.237.32.247 port 22: Connection timed out  
  
C:\Users\donpr>Downloads>chmod 400 my-key-pair.pem  
'chmod' is not recognized as an internal or external command,  
operable program or batch file.  
  
C:\Users\donpr>Downloads>ssh -i linux-key-pair.pem ec2-user@3.237.32.247  
ssh: connect to host 3.237.32.247 port 22: Connection timed out  
  
C:\Users\donpr>Downloads>ssh -i linux-key-pair.pem ec2-user@52.70.167.16  
The authenticity of host '52.70.167.16 (52.70.167.16)' can't be established.  
ED25519 key fingerprint is SHA256:0JvyqUarcMMN30ip5f84MfhcFBlgW9/u4tvaFH9cJQ.  
This key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '52.70.167.16' (ED25519) to the list of known hosts.  
  
##### Amazon Linux 2023  
#####  
##### https://aws.amazon.com/linux/amazon-linux-2023  
#####  
#####  
#####  
Last login: Wed Apr 16 18:46:32 2025 from 18.206.107.29  
[ec2-user@ip-172-31-92-161 ~]$ sudo yum update -y  
Amazon Linux 2023 Kernel Livepatch repository  
Dependencies resolved.  
Nothing to do.  
Complete!  
[ec2-user@ip-172-31-92-161 ~]$ sudo yum install httpd -y  
Last metadata expiration check: 0:00:08 ago on Wed Apr 16 18:49:27 2025.  
Dependencies resolved.  
  
===== Package Architecture Version Repository Size =====
```



```
ec2-user@ip-172-31-92-161: ~
Last login: Wed Apr 16 18:46:32 2025 from 18.206.107.29
[ec2-user@ip-172-31-92-161 ~]$ sudo yum update -y
Amazon Linux 2023 Kernel Livepatch repository
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-92-161 ~]$ sudo yum install httpd -y
Last metadata expiration check: 0:00:08 ago on Wed Apr 16 18:49:27 2025.
Dependencies resolved.

=====
Package                               Architecture      Version            Repository          Size
=====
Installing:
httpd                                 x86_64            2.4.62-1.amzn2023  amazonlinux         48 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            2.4.62-1.amzn2023    amazonlinux        1.4 M
httpd-filesystem                     noarch            2.4.62-1.amzn2023    amazonlinux         14 k
httpd-tools                          x86_64            2.4.62-1.amzn2023    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            2.4.62-1.amzn2023    amazonlinux         61 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                579 kB/s | 17 kB  00:00
(2/12): apr-1.7.5-1.amzn2023.0.4.x86_64.rpm                          3.1 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.rpm         855 kB/s | 19 kB  00:00
(5/12): httpd-2.4.62-1.amzn2023.x86_64.rpm                          1.7 MB/s | 48 kB  00:00
(6/12): httpd-filesystem-2.4.62-1.amzn2023.noarch.rpm                 567 kB/s | 14 kB  00:00
(7/12): httpd-core-2.4.62-1.amzn2023.x86_64.rpm                      15 MB/s | 1.4 MB 00:00
```

```
ec2-user@ip-172-31-92-161: ~
(12/12): mod_lua-2.4.62-1.amzn2023.x86_64.rpm                        2.4 MB/s | 61 kB  00:00
Total                                                                11 MB/s | 2.3 MB  00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing : 1/1
  Installing : apr-1.7.5-1.amzn2023.0.4.x86_64 2/12
  Installing : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64 3/12
  Installing : apr-util-1.6.3-1.amzn2023.0.1.x86_64 4/12
  Installing : mailcap-2.1.49-3.amzn2023.0.3.noarch 5/12
  Installing : httpd-tools-2.4.62-1.amzn2023.x86_64 6/12
  Installing : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 7/12
  Running scriptlet: httpd-filesystem-2.4.62-1.amzn2023.noarch 7/12
  Installing : httpd-filesystem-2.4.62-1.amzn2023.noarch 8/12
  Installing : httpd-core-2.4.62-1.amzn2023.x86_64 9/12
  Installing : mod_http2-2.0.27-1.amzn2023.0.3.x86_64 10/12
  Installing : mod_lua-2.4.62-1.amzn2023.x86_64 11/12
  Installing : generic-logos-httpd-18.0-0-12.amzn2023.0.3.noarch 12/12
  Running scriptlet: httpd-2.4.62-1.amzn2023.x86_64 12/12
  Verifying : apr-1.7.5-1.amzn2023.0.4.x86_64 1/12
  Verifying : apr-util-1.6.3-1.amzn2023.0.1.x86_64 2/12
  Verifying : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64 3/12
  Verifying : generic-logos-httpd-18.0-0-12.amzn2023.0.3.noarch 4/12
  Verifying : httpd-2.4.62-1.amzn2023.x86_64 5/12
  Verifying : httpd-core-2.4.62-1.amzn2023.x86_64 6/12
  Verifying : httpd-filesystem-2.4.62-1.amzn2023.noarch 7/12
  Verifying : httpd-tools-2.4.62-1.amzn2023.x86_64 8/12
  Verifying : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 9/12
  Verifying : mailcap-2.1.49-3.amzn2023.0.3.noarch 10/12
  Verifying : mod_http2-2.0.27-1.amzn2023.0.3.x86_64 11/12
  Verifying : mod_lua-2.4.62-1.amzn2023.x86_64 12/12

Installed:
apr-1.7.5-1.amzn2023.0.4.x86_64      apr-util-1.6.3-1.amzn2023.0.1.x86_64      apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64
generic-logos-httpd-18.0-0-12.amzn2023.0.3.noarch  httpd-2.4.62-1.amzn2023.x86_64      httpd-core-2.4.62-1.amzn2023.x86_64
httpd-filesystem-2.4.62-1.amzn2023.noarch      httpd-tools-2.4.62-1.amzn2023.x86_64      libbrotli-1.0.9-4.amzn2023.0.2.x86_64
mailcap-2.1.49-3.amzn2023.0.3.noarch      mod_http2-2.0.27-1.amzn2023.0.3.x86_64      mod_lua-2.4.62-1.amzn2023.x86_64

Complete!
[ec2-user@ip-172-31-92-161 ~]$
```



```
ec2-user@ip-172-31-92-161:~$ sudo systemctl start httpd
[ec2-user@ip-172-31-92-161 ~]$ systemctl status httpd
Unit httpd.service could not be found.
Unit status.service could not be found.
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
   Active: active (running) since Wed 2025-04-16 18:50:26 UTC; 8s ago
     Docs: man:httpd.service(8)
   Main PID: 26452 (httpd)
   Status: "Started, listening on: port 80"
   Tasks: 177 (limit: 1111)
  Memory: 13.0M
    CPU: 55ms
   CGroup: /system.slice/httpd.service
           └─26452 /usr/sbin/httpd -DFOREGROUND
             └─26453 /usr/sbin/httpd -DFOREGROUND
               └─26454 /usr/sbin/httpd -DFOREGROUND
                 └─26455 /usr/sbin/httpd -DFOREGROUND
                   └─26456 /usr/sbin/httpd -DFOREGROUND

Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal httpd[26452]: Server configured, listening on: port 80
[ec2-user@ip-172-31-92-161 ~]$ systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
   Active: active (running) since Wed 2025-04-16 18:50:26 UTC; 14s ago
     Docs: man:httpd.service(8)
   Main PID: 26452 (httpd)
   Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec: 0 B/sec"
   Tasks: 177 (limit: 1111)
  Memory: 13.0M
    CPU: 58ms
   CGroup: /system.slice/httpd.service
           └─26452 /usr/sbin/httpd -DFOREGROUND
             └─26453 /usr/sbin/httpd -DFOREGROUND
               └─26454 /usr/sbin/httpd -DFOREGROUND
                 └─26455 /usr/sbin/httpd -DFOREGROUND
                   └─26456 /usr/sbin/httpd -DFOREGROUND

Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal httpd[26452]: Server configured, listening on: port 80
[ec2-user@ip-172-31-92-161 ~]$
```

```
ec2-user@ip-172-31-92-161:~$ sudo systemctl start httpd
[ec2-user@ip-172-31-92-161 ~]$ systemctl status httpd
Unit httpd.service could not be found.
Unit status.service could not be found.
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
   Active: active (running) since Wed 2025-04-16 18:50:26 UTC; 8s ago
     Docs: man:httpd.service(8)
   Main PID: 26452 (httpd)
   Status: "Started, listening on: port 80"
   Tasks: 177 (limit: 1111)
  Memory: 13.0M
    CPU: 55ms
   CGroup: /system.slice/httpd.service
           └─26452 /usr/sbin/httpd -DFOREGROUND
             └─26453 /usr/sbin/httpd -DFOREGROUND
               └─26454 /usr/sbin/httpd -DFOREGROUND
                 └─26455 /usr/sbin/httpd -DFOREGROUND
                   └─26456 /usr/sbin/httpd -DFOREGROUND

Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal httpd[26452]: Server configured, listening on: port 80
[ec2-user@ip-172-31-92-161 ~]$ systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
   Active: active (running) since Wed 2025-04-16 18:50:26 UTC; 14s ago
     Docs: man:httpd.service(8)
   Main PID: 26452 (httpd)
   Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec: 0 B/sec"
   Tasks: 177 (limit: 1111)
  Memory: 13.0M
    CPU: 58ms
   CGroup: /system.slice/httpd.service
           └─26452 /usr/sbin/httpd -DFOREGROUND
             └─26453 /usr/sbin/httpd -DFOREGROUND
               └─26454 /usr/sbin/httpd -DFOREGROUND
                 └─26455 /usr/sbin/httpd -DFOREGROUND
                   └─26456 /usr/sbin/httpd -DFOREGROUND

Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Apr 16 18:50:26 ip-172-31-92-161.ec2.internal httpd[26452]: Server configured, listening on: port 80
[ec2-user@ip-172-31-92-161 ~]$
```

## Step 3: Allocate an Elastic IP Address



us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Addresses:PublicIp=50.17.201.90

**EC2**

Dashboard  
EC2 Global View  
Events

▼ **Instances**  
Instances  
Instance Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances  
Dedicated Hosts  
Capacity Reservations

▼ **Images**  
AMIs  
AMI Catalog

▼ **Elastic Block Store**  
Volumes  
Snapshots  
Lifecycle Manager

▼ **Network & Security**

**Elastic IP address allocated successfully.**  
Elastic IP address 50.17.201.90

[Associate this Elastic IP address](#)

**Elastic IP addresses (1)**

[Public IPv4 address : 50.17.201.90](#) [Clear filters](#)

<input type="checkbox"/>	Name	Allocated IPv4 address	Type	Allocation ID	Reverse DNS record
<input type="checkbox"/>	-	50.17.201.90	Public IP	eipalloc-06cd074a89823fb73	-

[View IP address usage and recommendations to release unused IPs with Public IP Insights](#)

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Addresses:PublicIp=50.17.201.90

**EC2**

Dashboard  
EC2 Global View  
Events

▼ **Instances**  
Instances  
Instance Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances  
Dedicated Hosts  
Capacity Reservations

▼ **Images**  
AMIs  
AMI Catalog

▼ **Elastic Block Store**  
Volumes  
Snapshots  
Lifecycle Manager

▼ **Network & Security**

**Elastic IP address associated successfully.**  
Elastic IP address 50.17.201.90 has been associated with instance i-06d20ac521f926c49

**Elastic IP addresses (1)**

[Public IPv4 address : 50.17.201.90](#) [Clear filters](#)

<input type="checkbox"/>	Name	Allocated IPv4 address	Type	Allocation ID	Reverse DNS record
<input type="checkbox"/>	-	50.17.201.90	Public IP	eipalloc-06cd074a89823fb73	-

[View IP address usage and recommendations to release unused IPs with Public IP Insights](#)

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