
✓ Public IP Address

- **Definition:** An IP address that is accessible over the internet.
- **Used by:** Routers, servers, or any device that needs to communicate directly with the internet.
- **Assigned by:** Internet Service Providers (ISPs).
- **Example:** 203.0.113.5

Key Points:

- Unique across the entire internet.
- Can be dynamic (changes over time) or static (permanently assigned).
- Used to identify your device/network to the outside world.

✓ Private IP Address

- **Definition:** An IP address used within a private network, not accessible directly from the internet.
- **Used by:** Devices within a home, office, or cloud network.
- **Assigned by:** Local routers or internal DHCP servers.
- **Examples:**
 - 192.168.0.1
 - 10.0.0.5
 - 172.16.0.2

Key Points:

- Not routable on the internet.
 - Must be translated to a public IP via **NAT** (Network Address Translation) for internet access.
 - Helps conserve global IP address space.
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✓ Elastic IP (EIP) (specific to AWS and some cloud platforms)

- **Definition:** A **static public IP address** in AWS that you can associate with your EC2 instances.
- **Used by:** AWS customers to maintain a consistent public IP even if the underlying instance changes.
- **Assigned by:** Amazon Web Services (AWS), under your account.

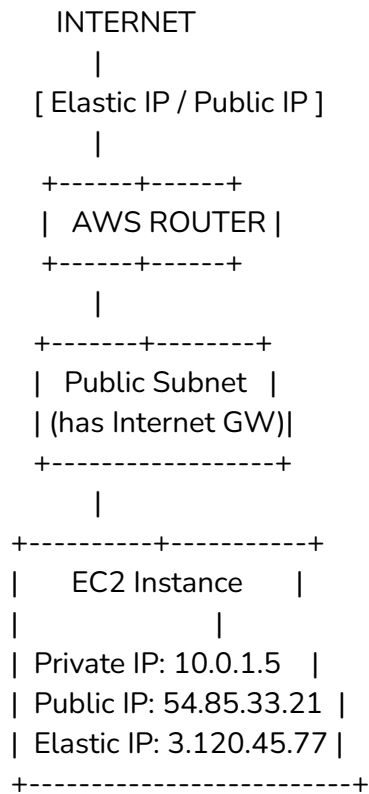
Key Points:

- You can remap it to different instances without changing the IP.
 - It's still a public IP but gives you flexibility and control.
 - **You get charged** if it's not associated with a running instance (to discourage waste).
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Summary Table:

Type	Routable on Internet	Assigned By	Example IP	Used In
Public IP	✓ Yes	ISP / Cloud Provider	203.0.113.5	Internet-facing systems
Private IP	✗ No	Local Router/DHCP	192.168.1.1	Internal networks
Elastic IP	✓ Yes	AWS (Cloud)	13.58.120.1	AWS EC2, cloud infrastructure

Network Setup Example (AWS EC2)



How Each IP is Used in AWS

IP Type	Scope	Where You Use It	Purpose
Private IP	Inside AWS VPC	Communication between EC2s	Secure, internal traffic only
Public IP	Assigned by AWS	Internet access (temporary)	Lost if instance stops
Elastic IP	Your AWS Account	Static internet IP for EC2	Retained even if instance stops; remappable

Real-World Use Case Example

Let's say you run a website on an EC2 instance:

- Your EC2 has a **private IP** (10.0.1.5) for internal use.
- AWS gives it a **public IP** (54.85.33.21) when launched.
- You want a consistent IP for DNS and never want it to change.
- So you **allocate an Elastic IP** (3.120.45.77) and associate it with the instance.

This way, your **domain name** (e.g., [example.com](#)) can always point to the **Elastic IP**, even if your EC2 instance stops and you replace it.
