

## ELASTIC IP

*Elastic IP addresses are static IPv4 addresses designed for dynamic cloud computing. They allow you to allocate a persistent public IP address to your AWS resources such as EC2 instances, NAT gateways, and Network Load Balancers.*

**Static Public IP Address:** EIPs provide a static IPv4 address that remains constant even if associated instances are stopped or terminated.

**Flexible Assignment:** You can allocate an EIP and associate it with any eligible AWS resource within the same region, such as EC2 instances, NAT gateways, or Network Load Balancers.

**Avoid IP Address Changes:** Using EIPs ensures that your applications and services maintain a stable endpoint for communication, which is crucial for scenarios requiring fixed IP addresses.

**Resilience and Failover:** EIPs can be quickly remapped to different instances or resources in case of failures or system upgrades, aiding in implementing failover strategies and maintaining application availability.

**Cost Considerations:** While EIPs are free to use as long as they are associated with running instances, there may be charges if the EIP is not attached to an instance or used with certain AWS services like NAT gateways. Understanding the cost implications is essential for efficient resource utilization.

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## PLACEMENT GROUPS

*Placement groups in AWS offer a way to control the placement of EC2 instances within a single Availability Zone to meet specific performance, latency, and fault tolerance requirements for your applications. Choosing the appropriate type of placement group depends on your application's architecture and performance needs.*

**Types of Placement Groups:**

**Cluster Placement Group:** Instances in a cluster placement group are placed in close proximity to each other within a single Availability Zone. This placement type is ideal for applications that require low network latency and high throughput.

**Partition Placement Group:** Instances in a partition placement group are spread across partitions within an Availability Zone. This allows you to deploy large-scale distributed and fault-tolerant applications by grouping instances into logical partitions.

**Spread Placement Group:** Instances in a spread placement group are placed on distinct underlying hardware within an Availability Zone to reduce the risk of simultaneous failures. This placement type is suitable for applications that require high availability.

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## NETWORK INTERFACE

*A network interface in AWS is essentially a virtual network card that allows an EC2 instance to communicate with the internet, other instances, or other AWS services.*

### Functions

**Connectivity:** It enables your EC2 instance to connect to the internet or other instances within the same VPC.

**Traffic Control:** You can assign security groups and network ACLs (Access Control Lists) to control the traffic flowing in and out of the network interface.

**Elastic IP Assignment:** You can attach Elastic IP addresses to network interfaces, providing a static IP address to your EC2 instance.

**Load Balancer Integration:** Network interfaces can be attached to Elastic Load Balancers, facilitating traffic distribution across multiple instances.

**Flexibility:** EC2 instances can have multiple network interfaces, allowing for various networking configurations. For example, you might have one interface for public internet access and another for communication within a private network.

**Lifecycle Management:** Network interfaces are associated with EC2 instances and follow their lifecycle. When you terminate an instance, its associated network interfaces are also removed.

### Usage Scenarios

**High Availability:** Multiple network interfaces can be used for redundancy and high availability.

**Security Segmentation:** Different network interfaces can be used to segregate traffic, such as separating public-facing services from internal resources.

**Specialized Networking:** Network interfaces can be used for specific networking requirements, such as configuring VPN connections or integrating with AWS Direct Connect.

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### Windows Instance launch and connect steps

- Step 1)** Select Windows AMI
- Step 2)** Create a security group, ensure have port 3389 for RDP
- Step 3)** Create a new key pair and download it
- Step 4)** Launch Instance
- Step 5)** Wait min 4 min to initialize the Instance
- Step 6)** Click on Connect, select RDP Client
- Step 7)** Download the Remote Desktop File
- Step 8)** Click on Get password
- Step 9)** Upload Private Key file
- Step 10)** Decrypt the password, and copy it.
- Step 11)** Open the Downloaded Remote Desktop file paste the copied password and log in.



