Amazon VPC-1

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1 Introduction to VPC

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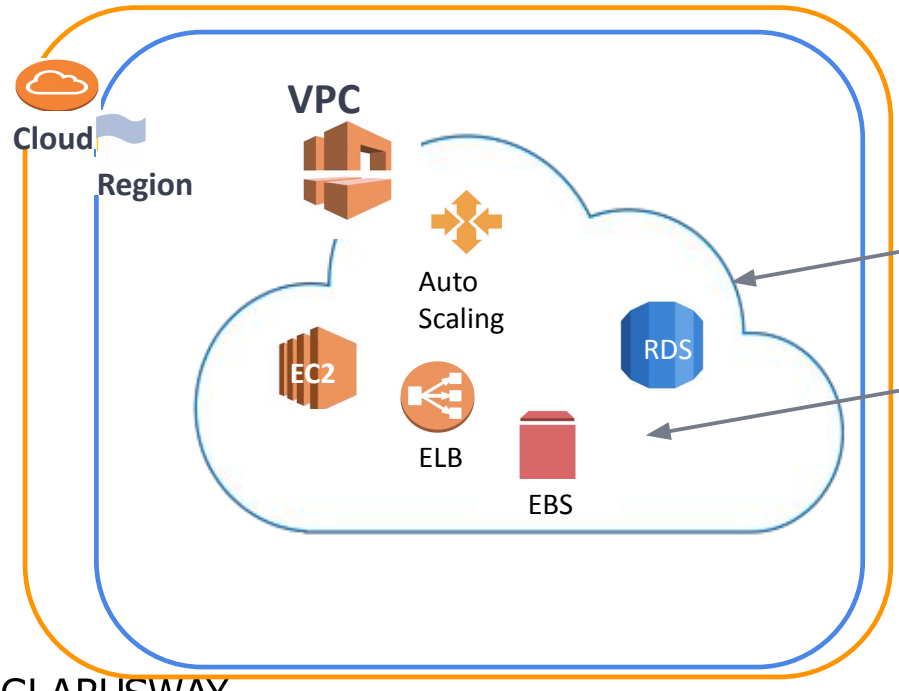
Introduction to VPC

What is VPC?



Amazon Virtual Private Cloud (Amazon VPC) is a logically isolated area of the AWS cloud where you can launch AWS resources in a virtual network that you define.

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2 VPC Basic Components

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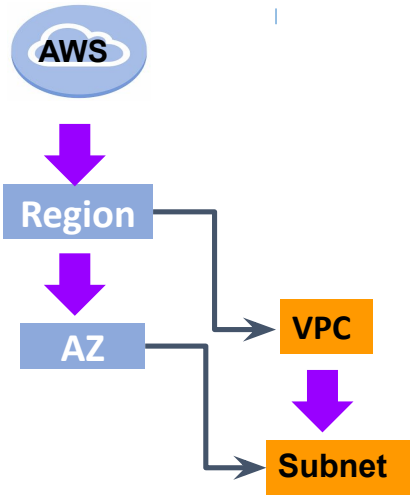
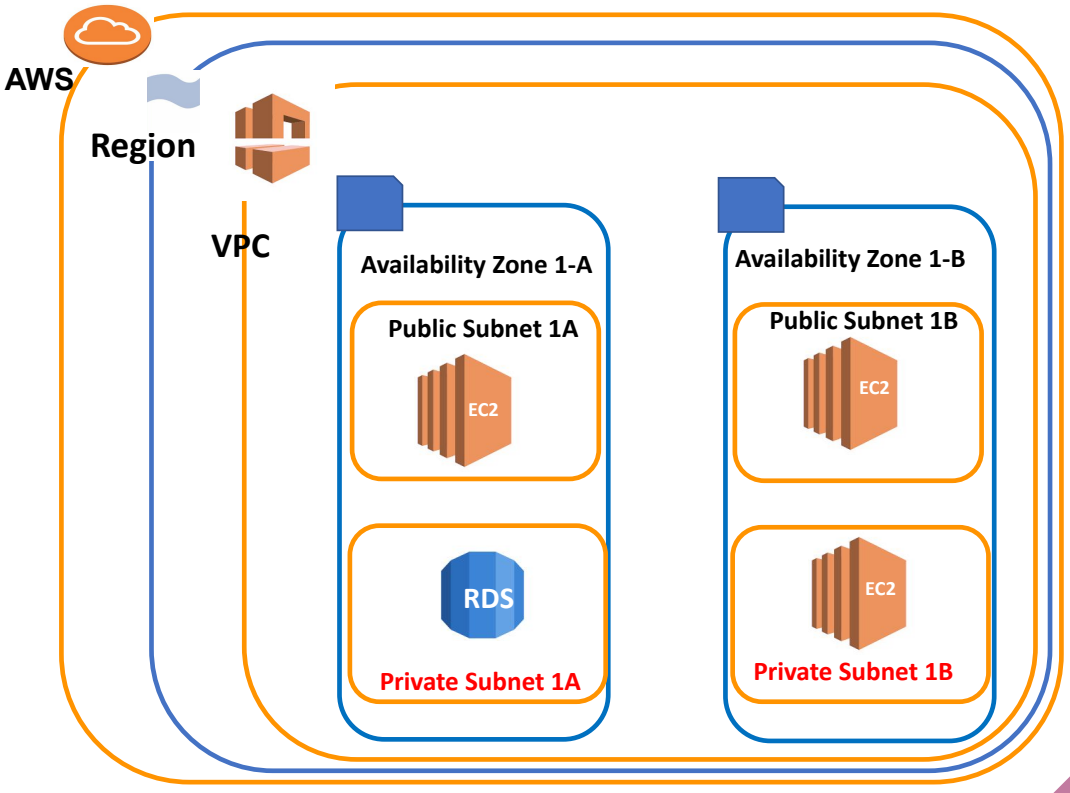
VPC Basic Components

- VPC Region (AZ)
- VPC Subnets
- VPC CIDR
- Elastic Network Interfaces
- Internet Gateway
- Route Table
- Security Group and Network ACL

Region,VPC, AZ and Subnets





VPC CIDR

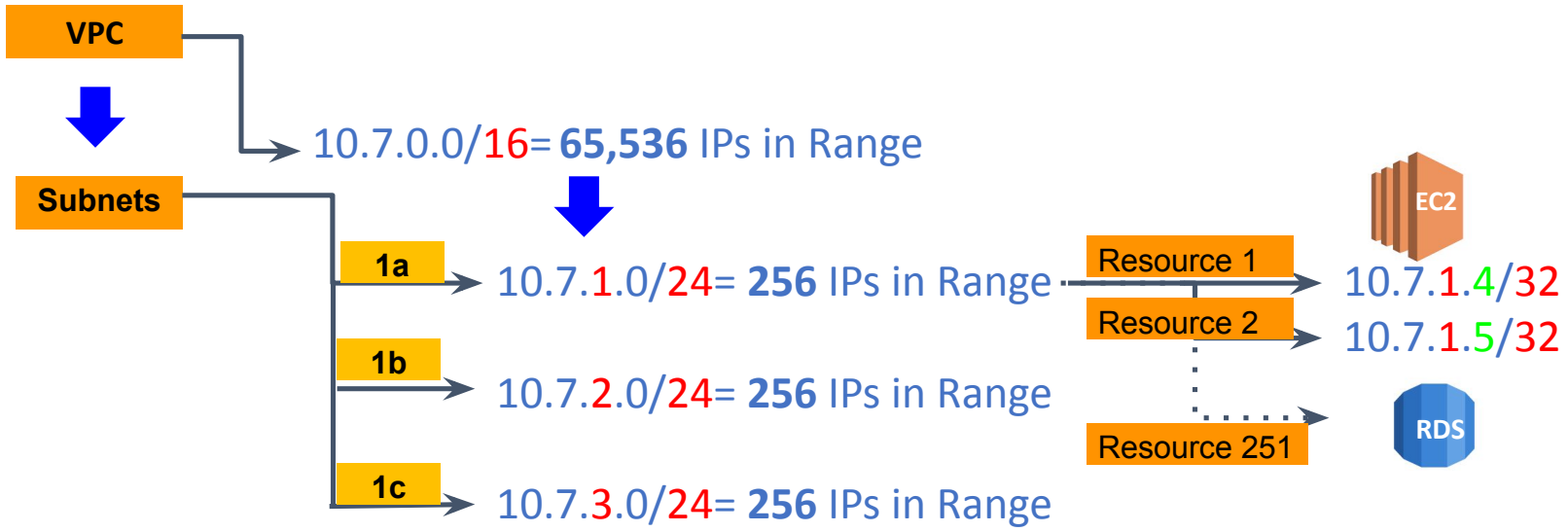
10.0.0.0/16= **65,536** IPs in Range
10.0.1.0/24= **256** IPs in Range
10.0.1.0/32= **1** IP in Range

10.0.0.0/16 Block Size

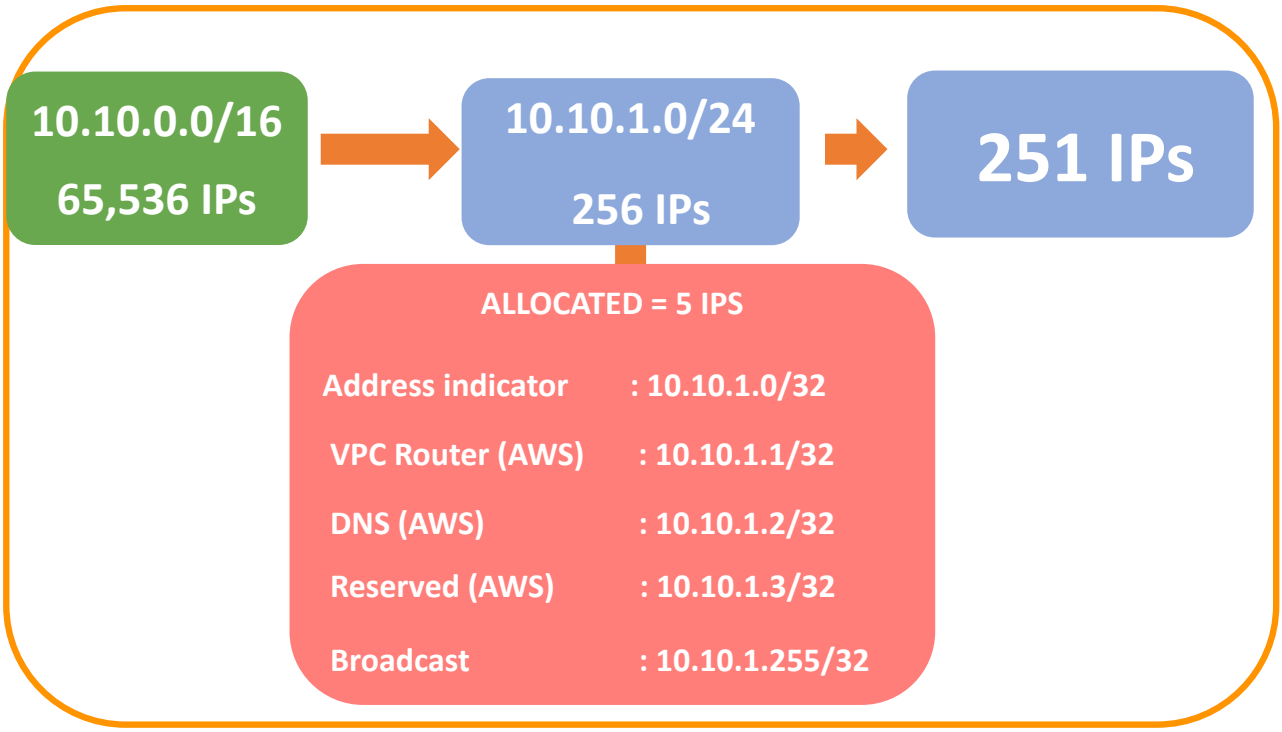
- CIDR refers to Classless Inter-Domain Routing.
- It is a set of Internet protocol (IP)
- standards that is used to create unique identifiers for networks.

- As the Size Block/Netmask (/16,24,32) increases, the number of IP located in CIDR Block decreases.

VPC CIDR



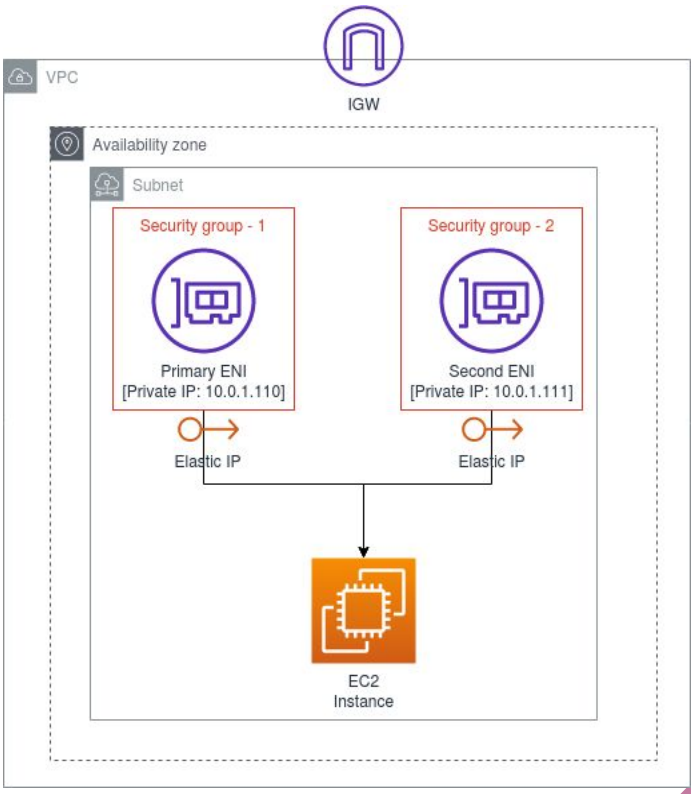
VPC CIDR



Elastic Network Interface

An *elastic network interface* is a logical networking component in a VPC that represents a virtual network card. It can include the following attributes:

- A primary private IPv4 address from the IPv4 address range of your VPC
- One or more secondary private IPv4 addresses from the IPv4 address range of your VPC
- One Elastic IP address (IPv4) per private IPv4 address
- One public IPv4 address
- One or more IPv6 addresses
- One or more security groups
- A MAC address
- A source/destination check flag
- A description

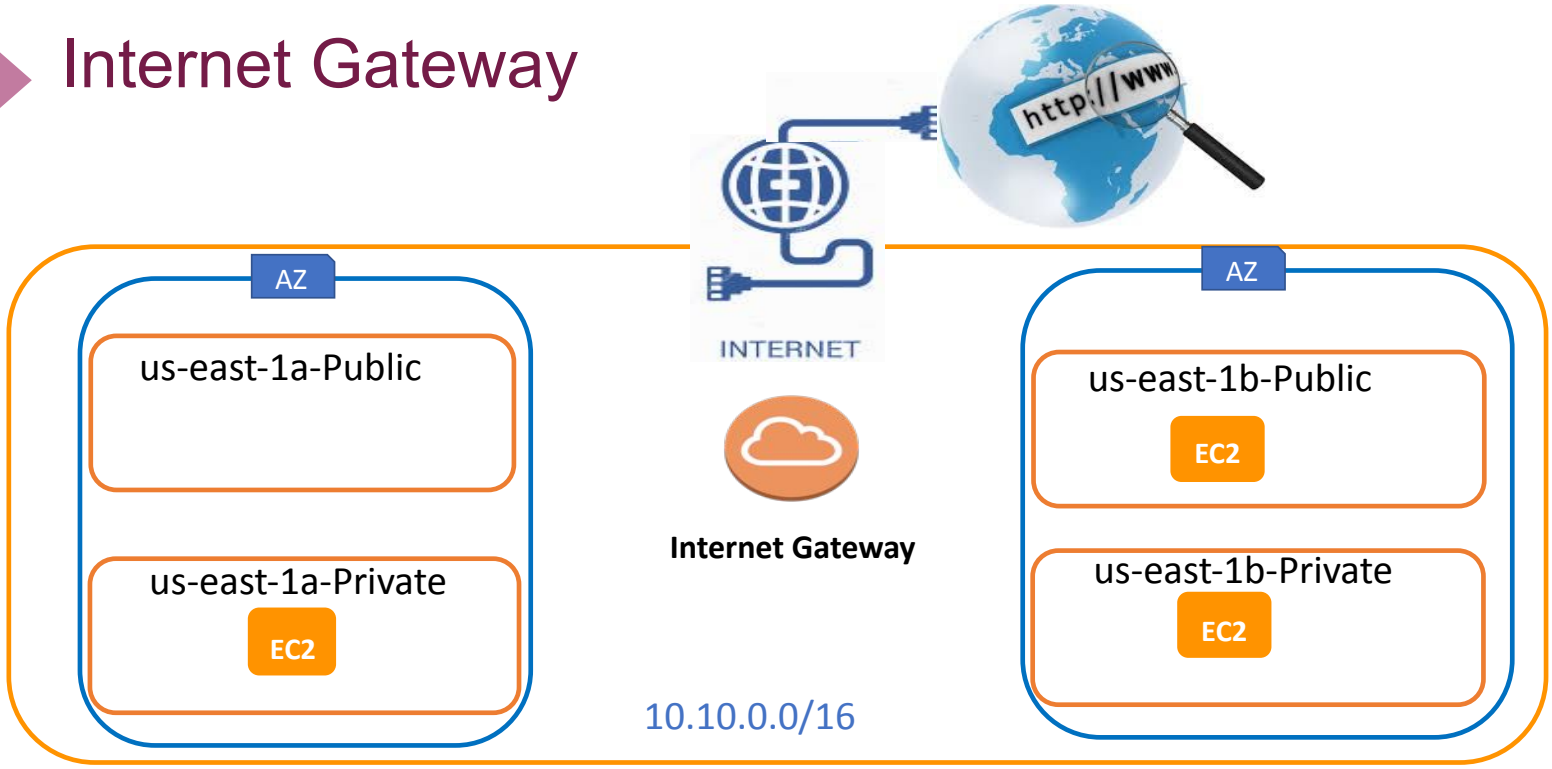


Elastic Network Interface

ENI → ENA → EFA

ENI	ENA	EFA
• Upto 10 GBPS • VMDq • TCP/IP • Multiple ENI/instance • Traffic can traverse across subnets • VPC Networking, General purpose • Default	• Upto 25 GBPS • SR-IOV • TCP/IP • Single setting/per instance • Traffic can traverses across subnets • Low latency apps • Optional on supported instance type	• Upto 100 GBPS • OS-Bypass • SRD • One EFA per instance • OS Bypass traffic is limited to single subnet and is not routable • HPC and ML Apps • Optional on supported instance type

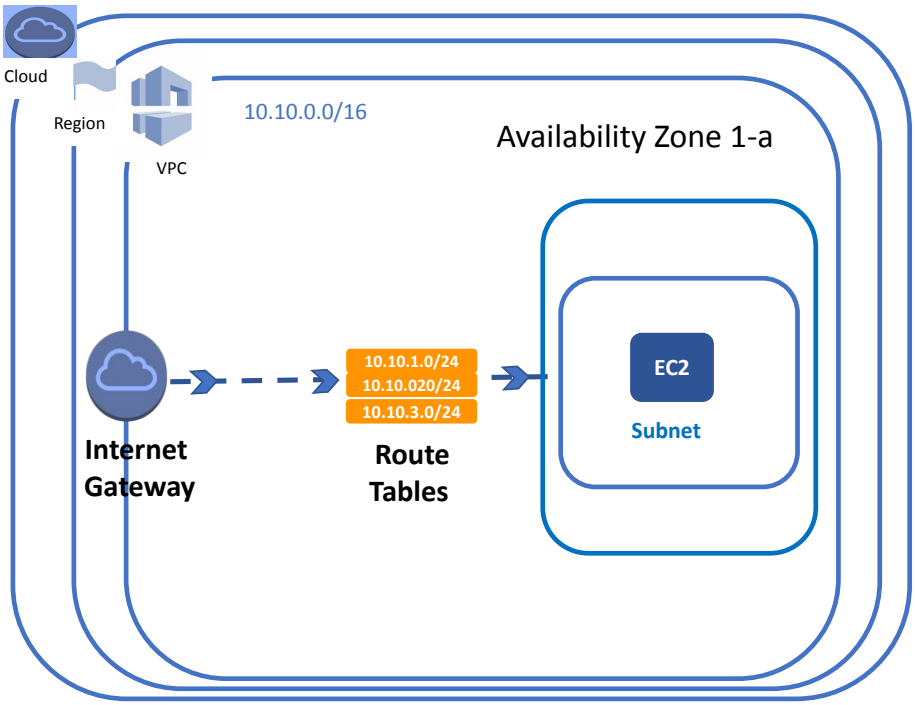
Internet Gateway



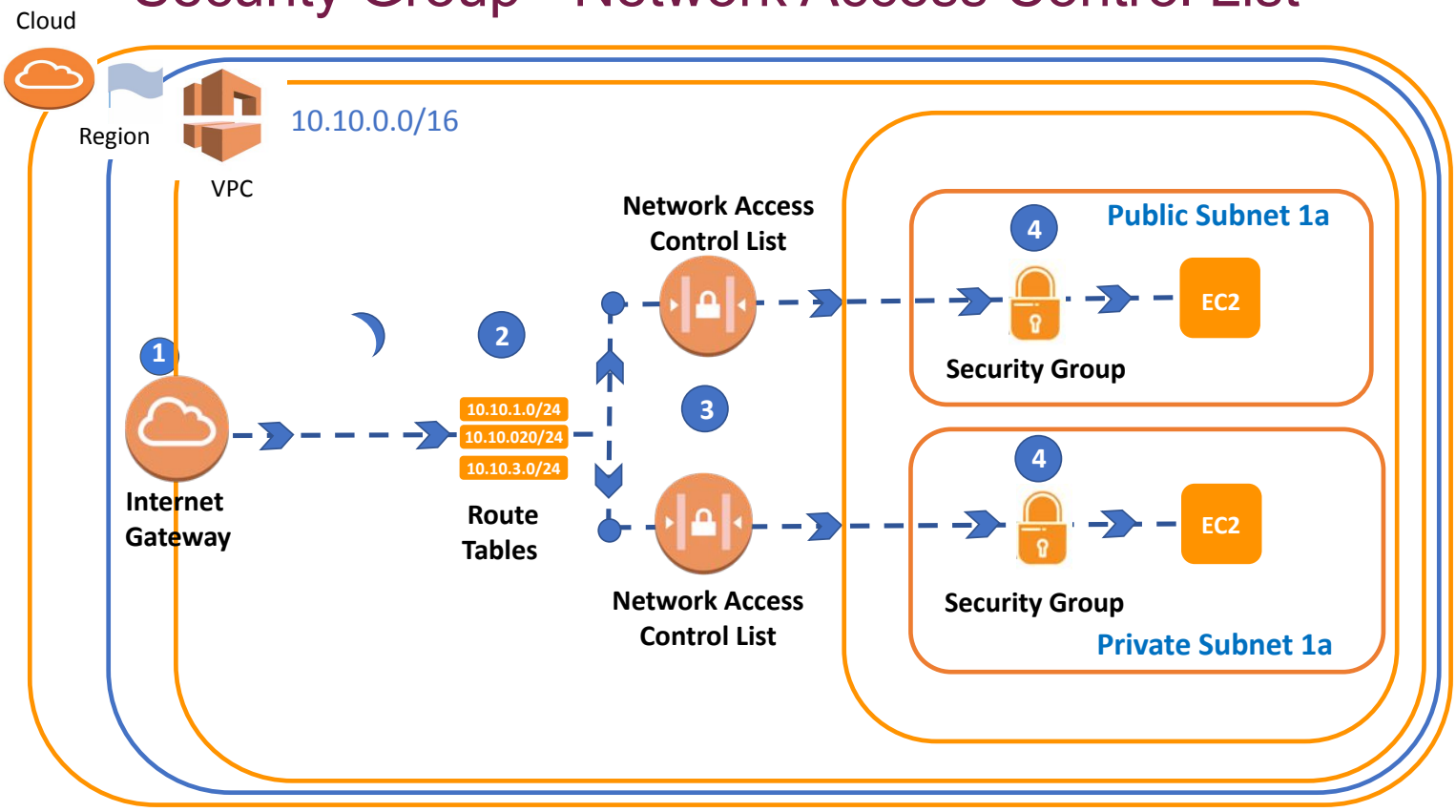
- **Internet Gateway** is a VPC component that provides communication between resources in your VPC and the internet.

Route Table

- Route Table is a set of rules, that is used to determine where VPC traffic is directed.



Security Group - Network Access Control List



Network ACLs & Security Groups

- Network ACLs are subnet-based security components.
- It controls the traffic in and out of subnets.

- Security Groups are instance-based security components,
- They are used for determining which traffic will access the instance.

- Instance in subnet is affected by rules of both Security Groups and Network ACLs

	Security Group	Network Access Control List
Rules	It supports only **Allow Rules**	It supports **both Allow and Deny** rules
Default by AWS	By default, **inbound** rules are **Denied, outbound** rules are **Allow**	By default, all the rules are **Allowed**
* **Newly Created by User**	By default, **inbound** rules are **Denied, outbound** rules are **Allow**	By default, all the rules are **Denied*** until you add rules.
Add Rule	You need to add the rule which you'll **Allow**	You need to add the rule which you can **either Allow or Deny it**.
Stateful/Stateless	It is a **Stateful** means that any changes made in the inbound rule will be automatically reflected in the outbound rule	It is a **Stateless** means that any changes made in the inbound rule will not reflect the outbound rule
Association	1. It is **instance-based** 2. Instances can associate with **more than one** Security Groups	1. It is **subnet-based** 2. Subnets can **associate with only one** Network ACL

THANKS!

Any questions?