Amazon VPC-1

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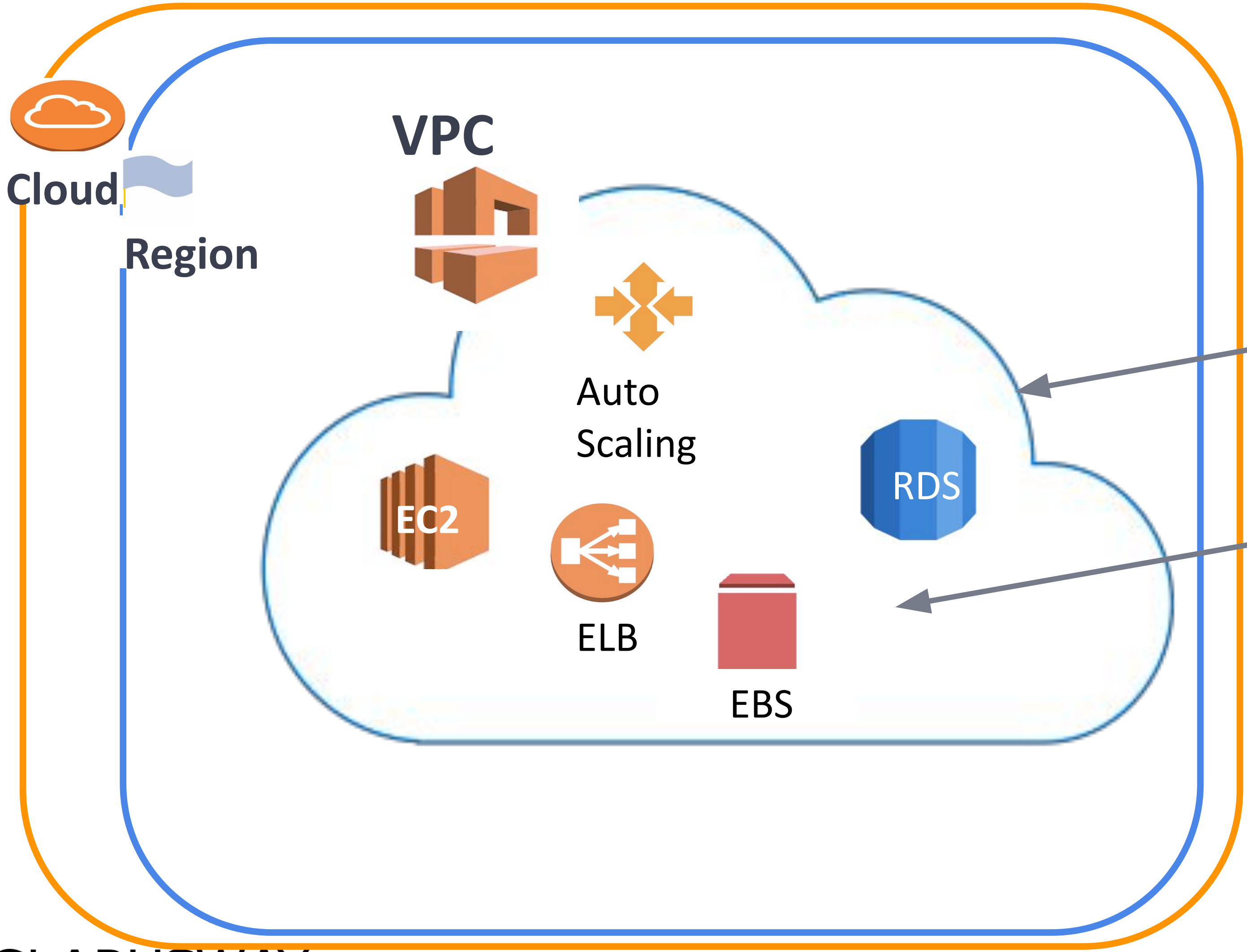
1 Introduction to VPC

Introduction to VPC

What is VPC?



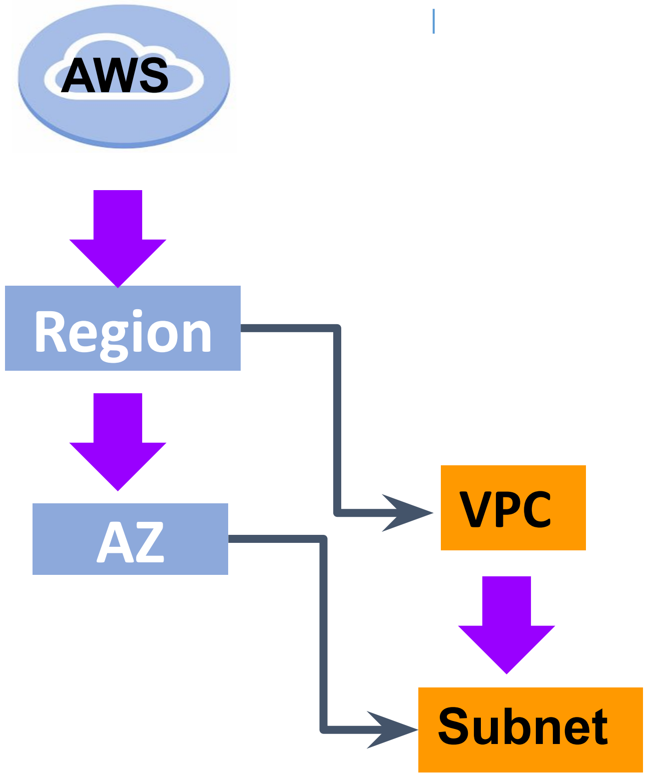
Amazon Virtual Private Cloud (Amazon VPC) is a logically isolated area of the AWS cloud where you can launch AWS resources in a virtual network that you define.

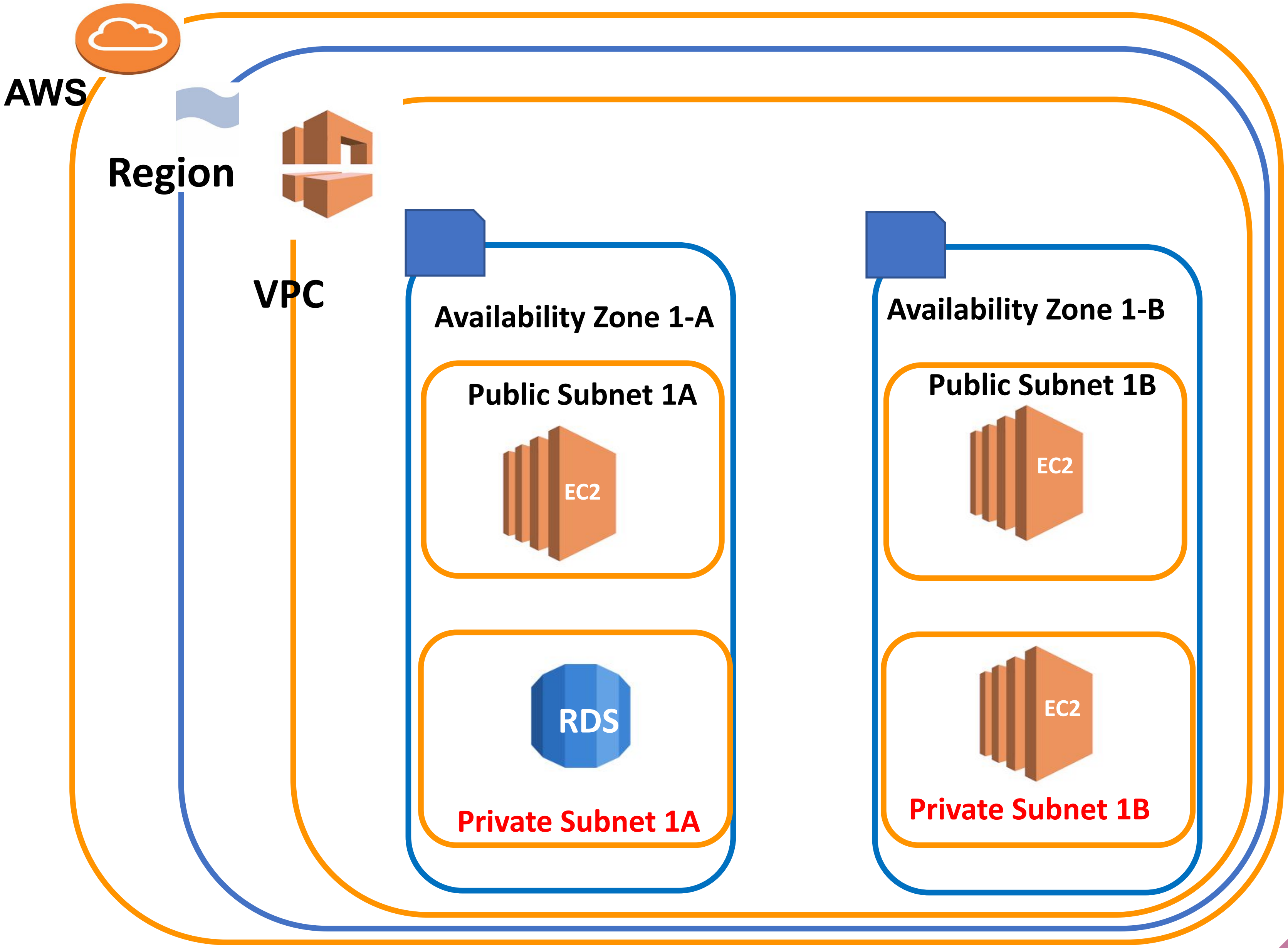
2 VPC Basic Components

VPC Basic Components

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

Region,VPC, AZ and Subnets





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VPC CIDR

10.0.0.0/16= **65,536** IPs in Range

10.0.1.0/24= **256** IPs in Range

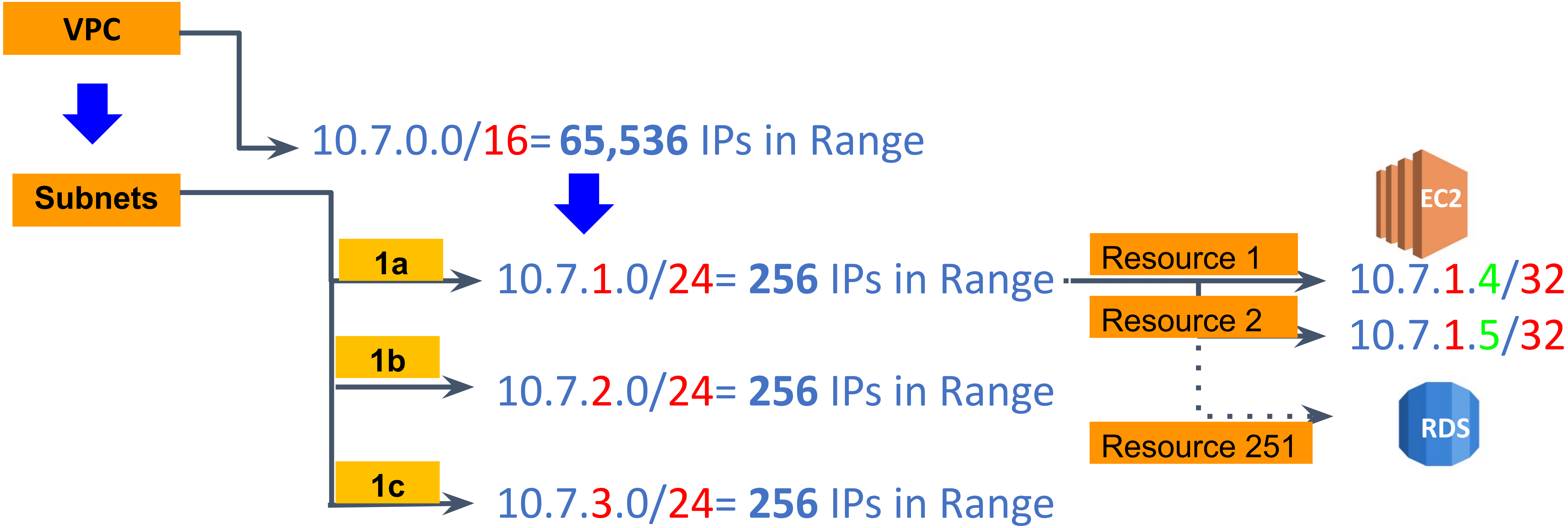
10.0.1.0/32= **1** IP in Range

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

Subnets

10.7.0.0/16= **65,536** IPs in Range

1a

10.7.1.0/24= **256** IPs in Range

1b

10.7.2.0/24= **256** IPs in Range

1c

10.7.3.0/24= **256** IPs in Range

Resource 1

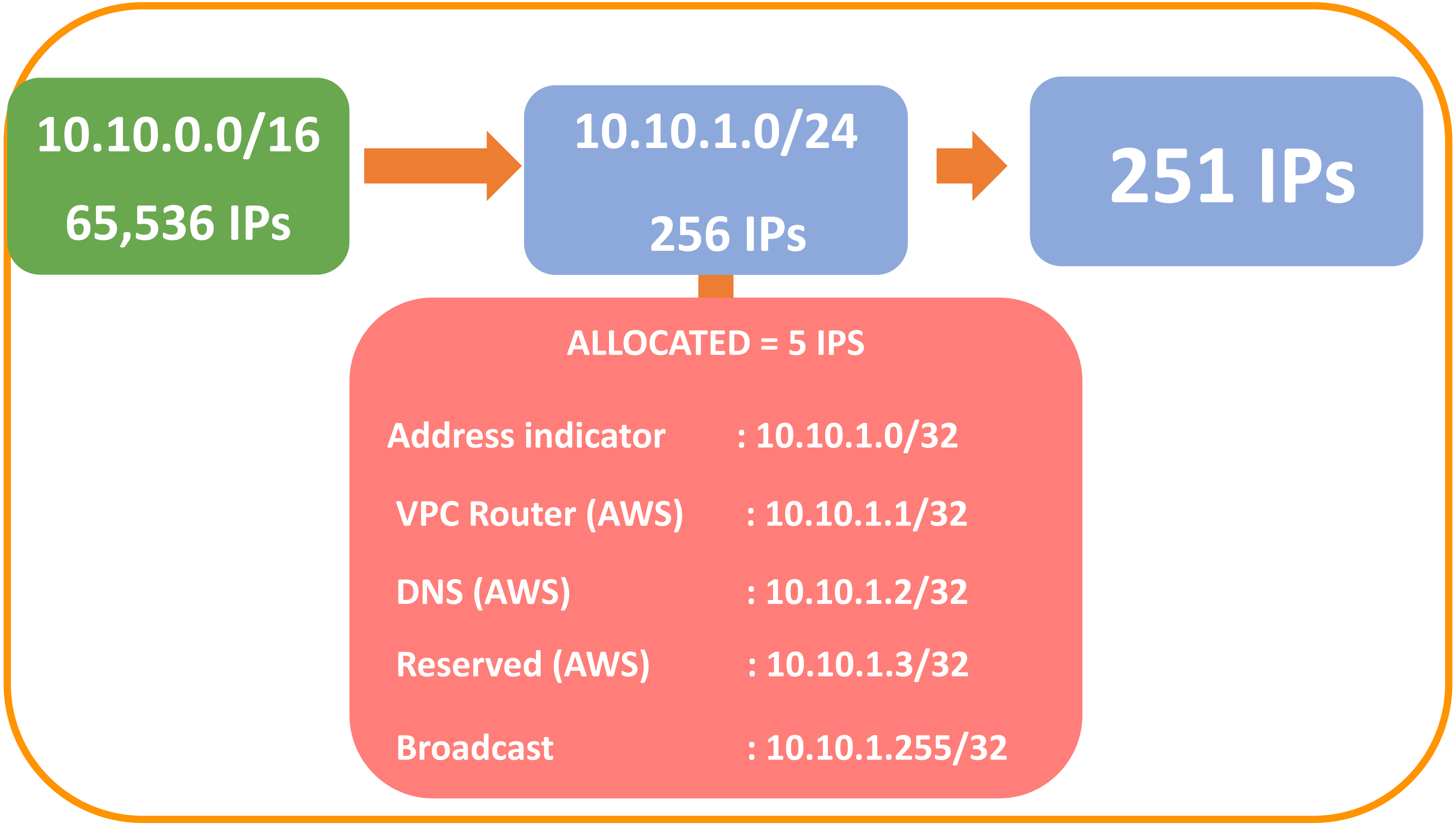
Resource 2

Resource 251

10.7.1.4/32

10.7.1.5/32

VPC CIDR



10.10.0.0/16

65,536 IPs

10.10.1.0/24

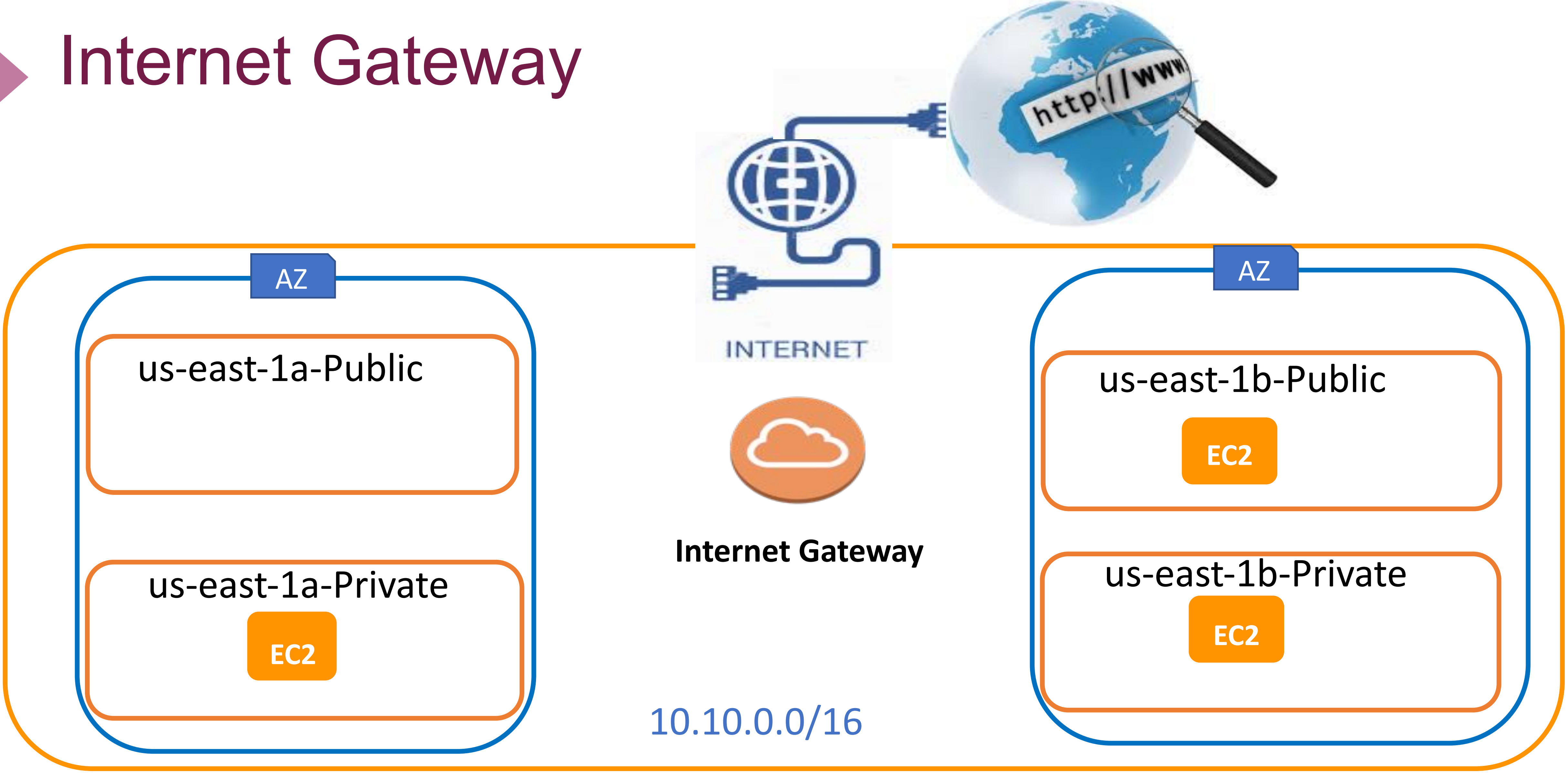
256 IPs

251 IPs

ALLOCATED = 5 IPS

Address indicator	: 10.10.1.0/32
VPC Router (AWS)	: 10.10.1.1/32
DNS (AWS)	: 10.10.1.2/32
Reserved (AWS)	: 10.10.1.3/32
Broadcast	: 10.10.1.255/32

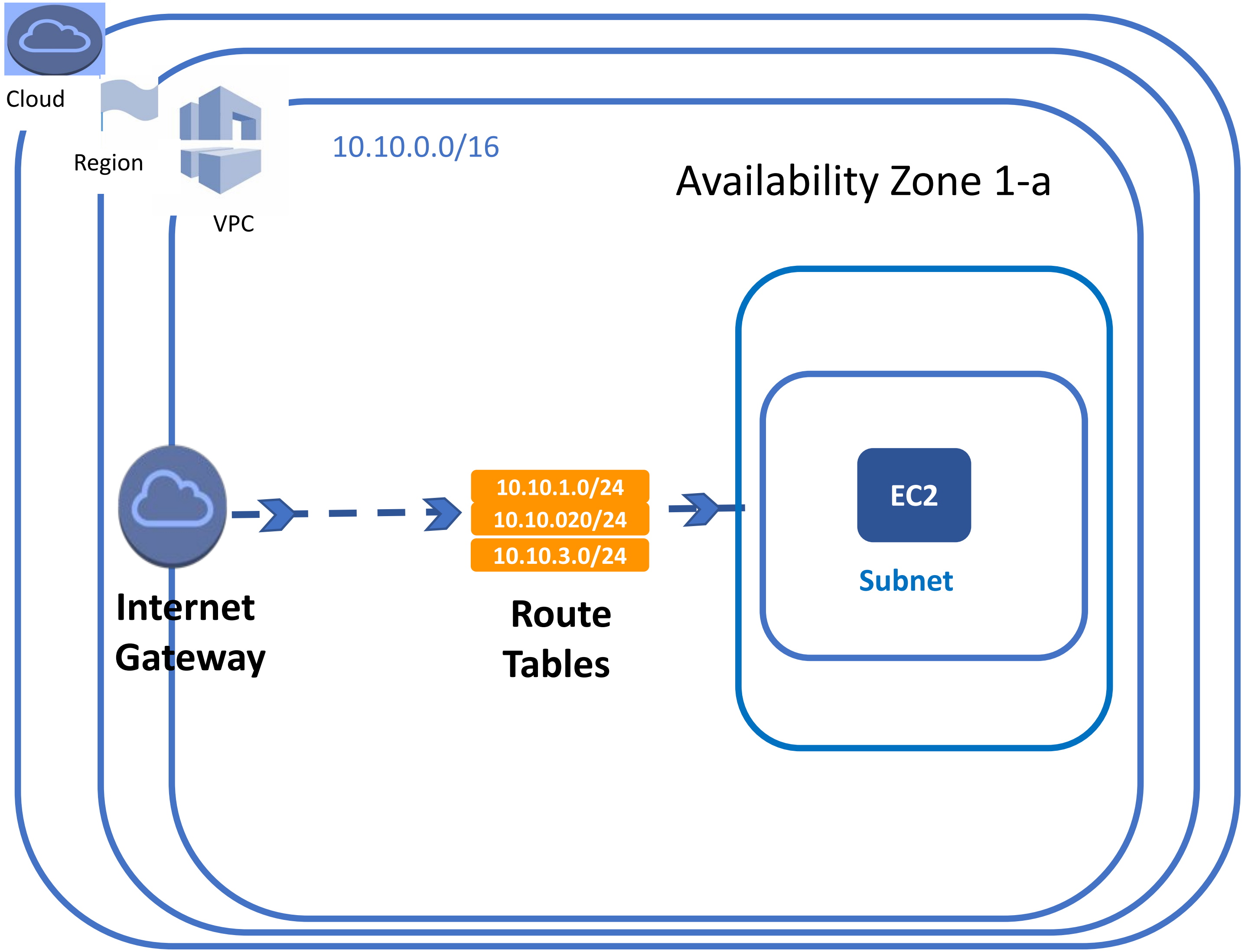
Internet Gateway



- **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.



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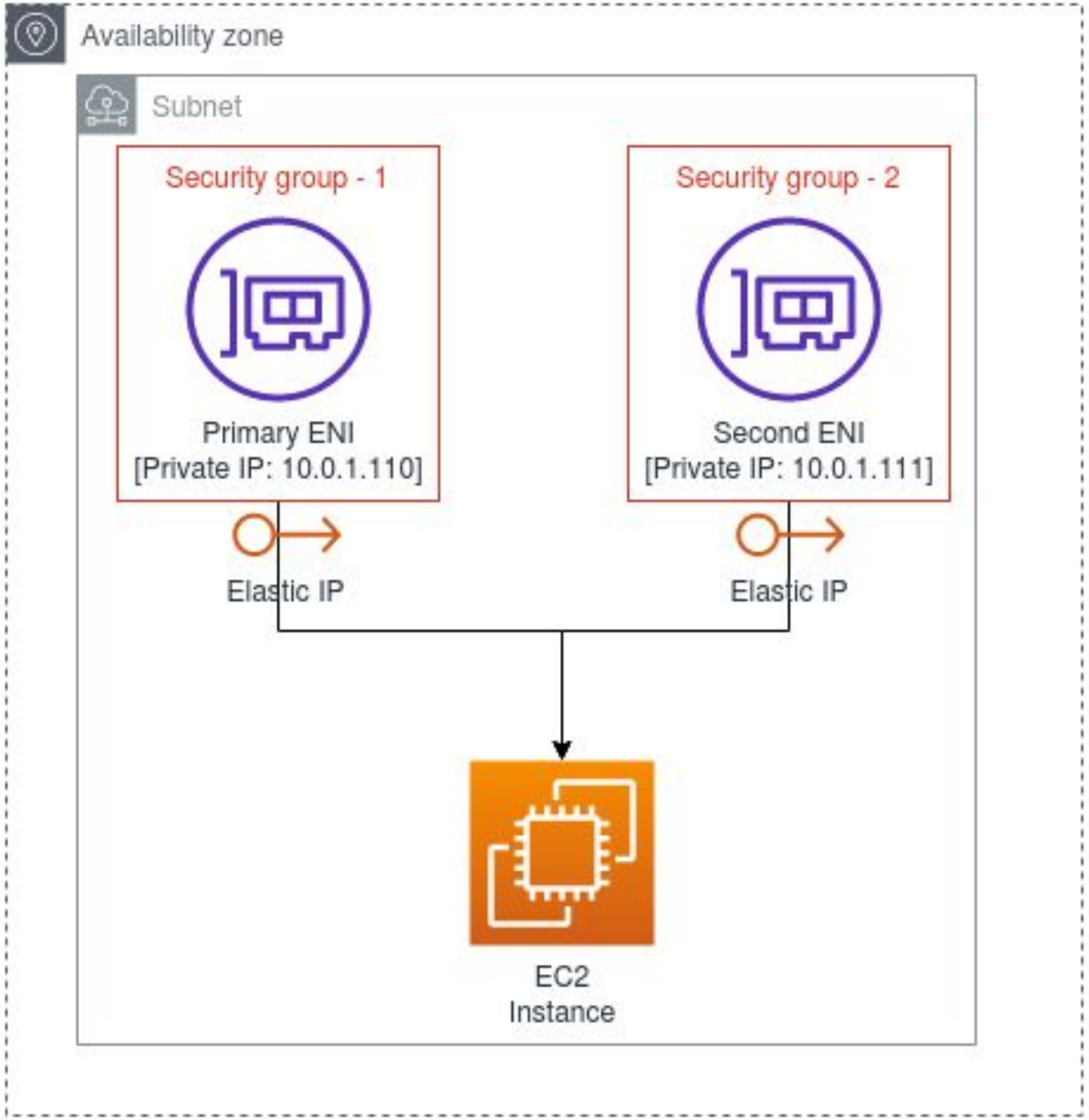
Elastic Network Interface

- An elastic network interface is a **logical networking component** in a VPC that represents a **virtual network card.** It is correspond to **ethernet card** in conventional computer.

- It **provides to direct internet traffic to EC2 instance**. Each EC2 instance has default Elastic Network Interface (ENI). But you can add more ENI's to instance depends on the instance type.



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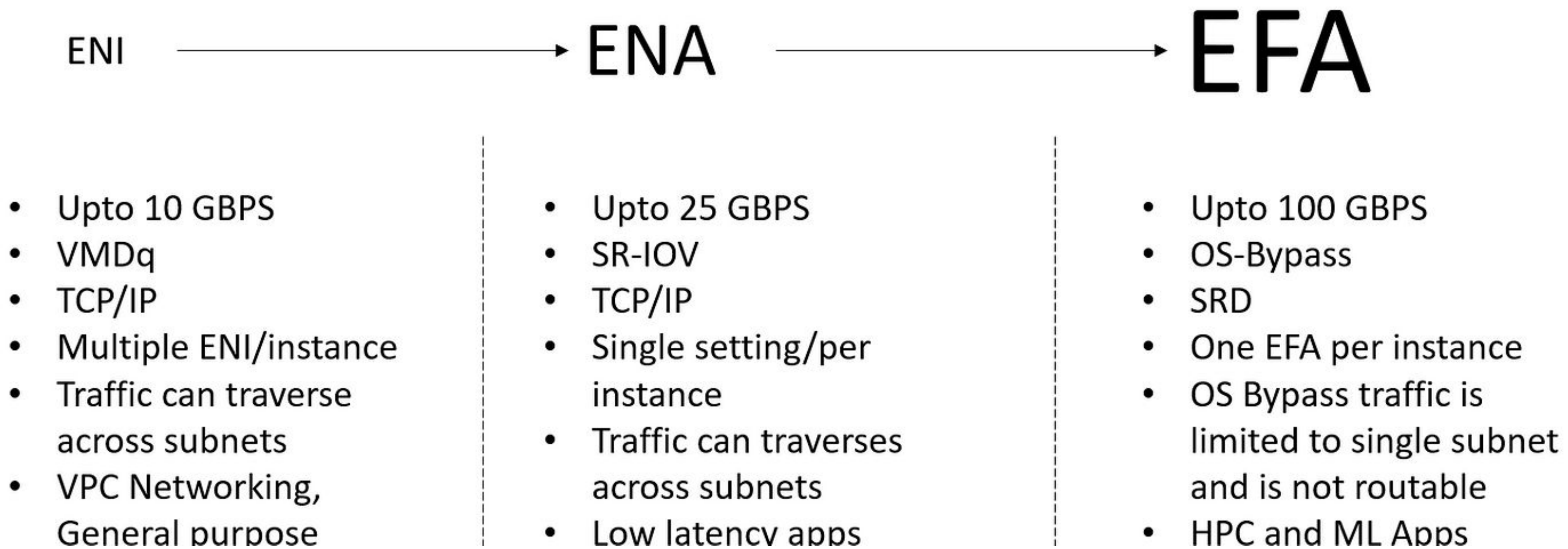
Elastic Network Interface



ENI → ENA → EFA

ENI

- Upto 10 GBPS
- VMDq
- TCP/IP
- Multiple ENI/instance
- Traffic can traverse across subnets
- VPC Networking, General purpose

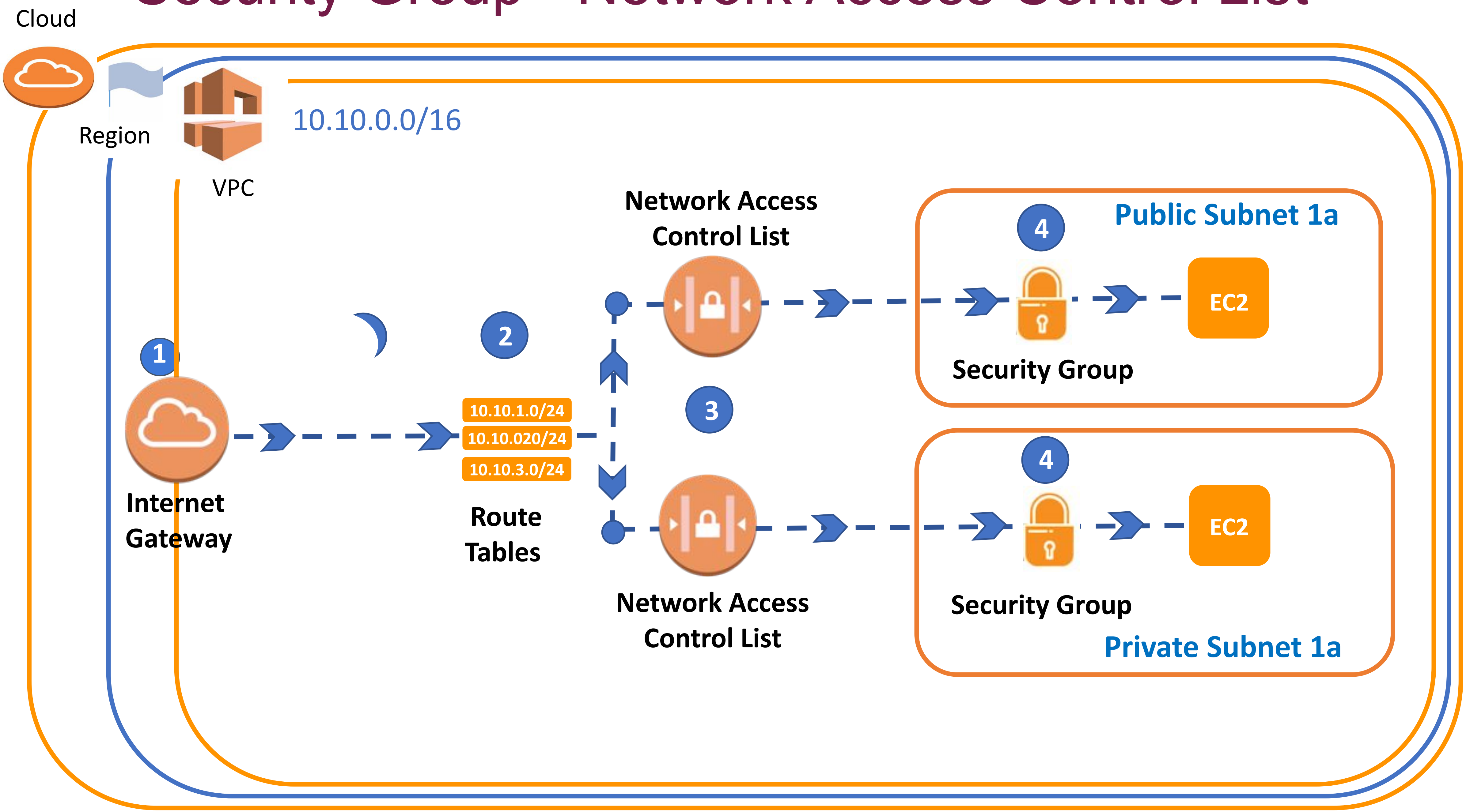
ENA

- Upto 25 GBPS
- SR-IOV
- TCP/IP
- Single setting/per instance
- Traffic can traverses across subnets
- Low latency apps

EFA

- 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

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 allowed, **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?