

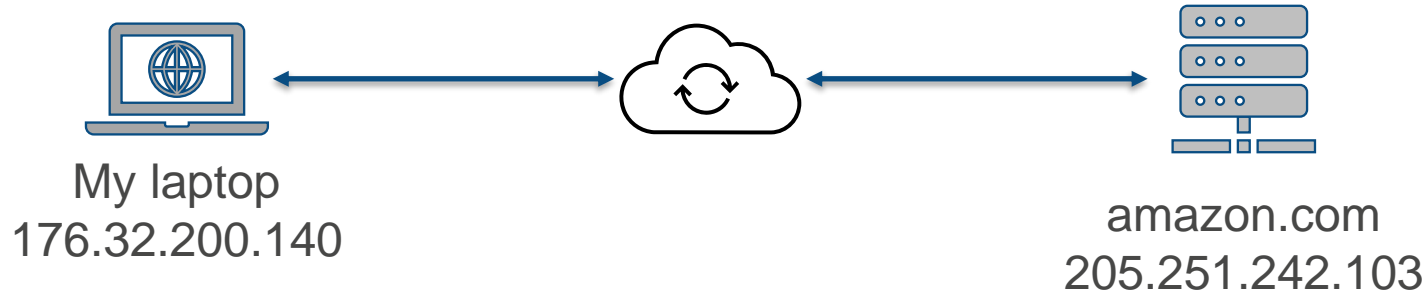
Network Addressing Primer

Public IP, Private IP, CIDR

Chandra Lingam

Cloud Wave LLC

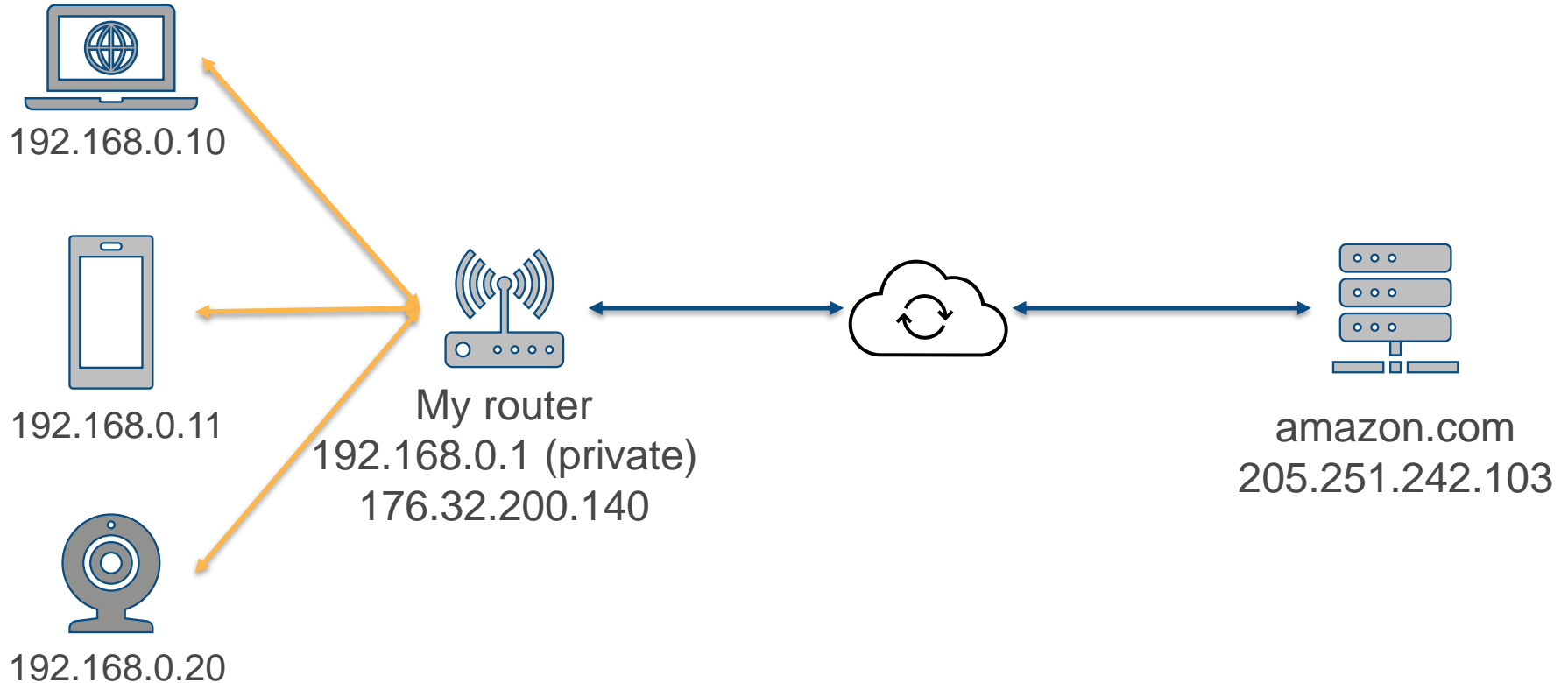
Communication



Public IP address uniquely identifies a device in the internet

To communicate over internet, devices require public IP address

Private IP



Private Network

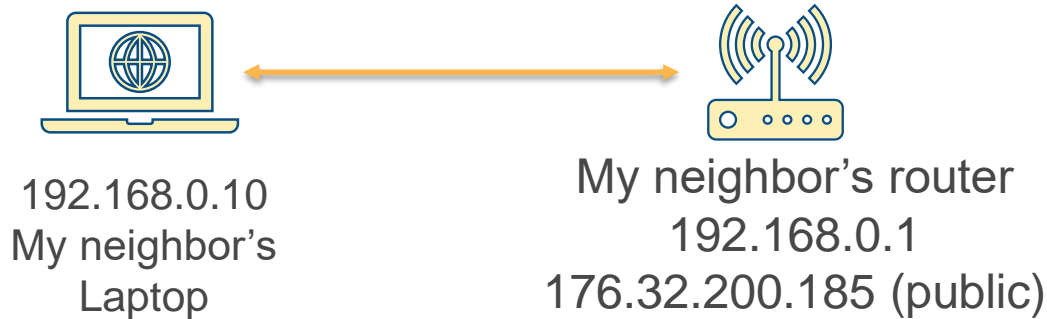
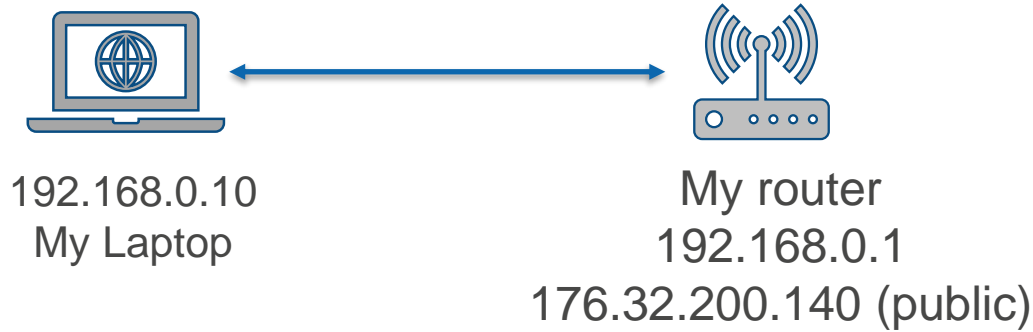
Devices that communicate directly over the internet require a Public IP

Private IP is used for all other devices

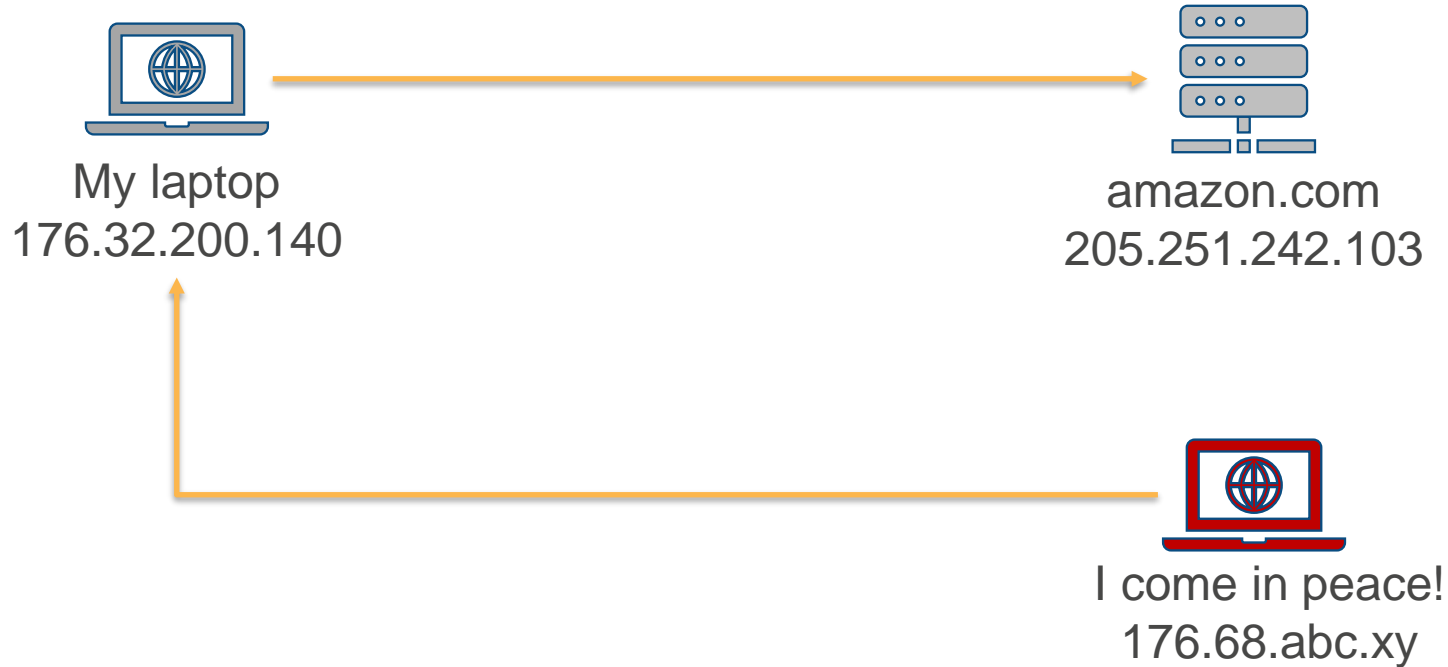
Router talks to both internet and private network – so has two IP addresses

Private IP is reusable – unique only within the private network

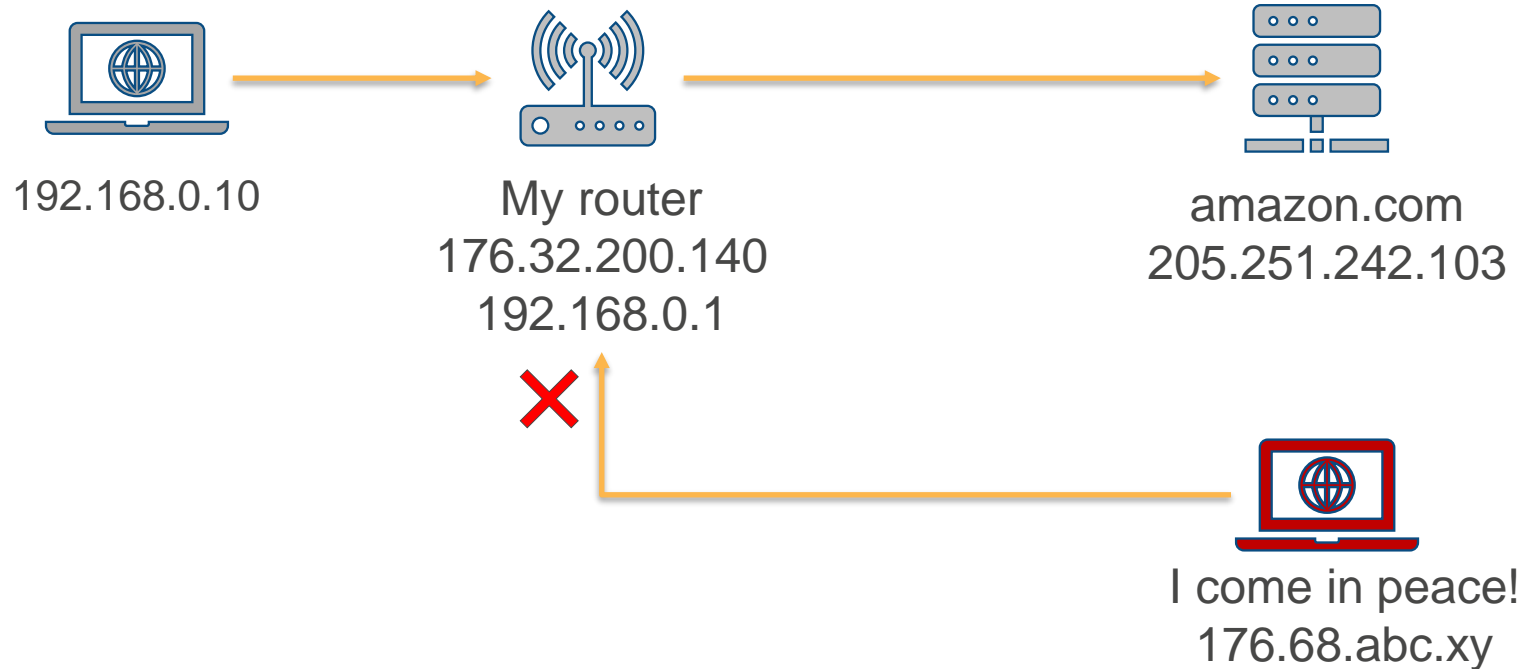
Private Networks



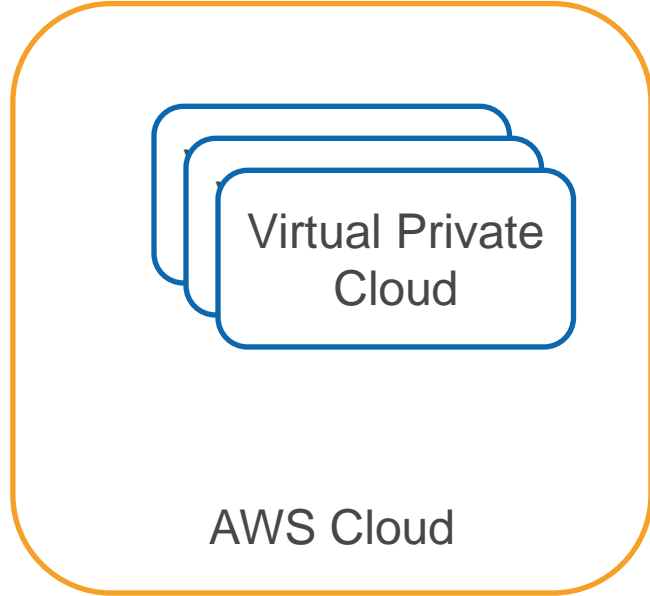
Request – Public IP



Request – Private IP

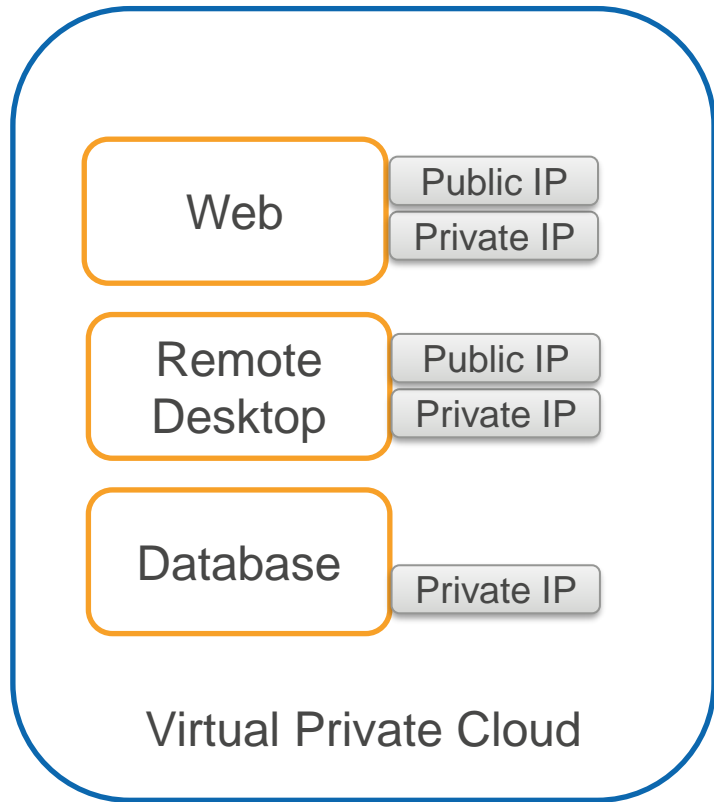


Cloud



AWS Virtual Private Cloud uses
Private IP address

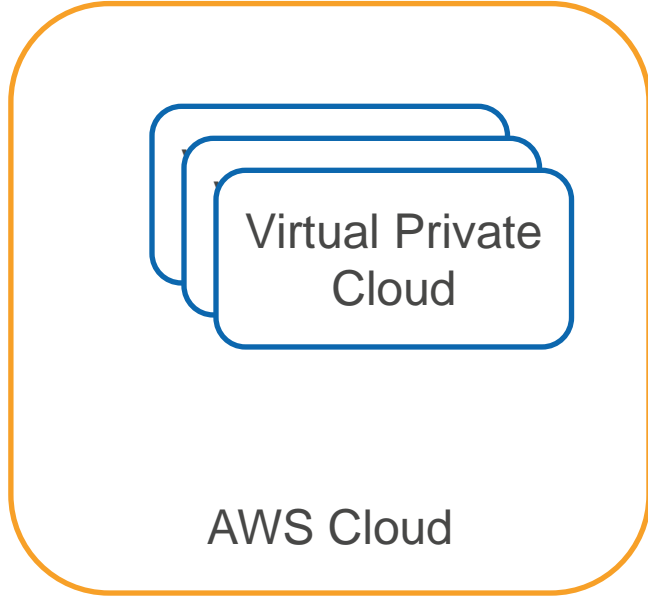
Virtual Private Cloud



Web and Remote Desktop connected to the internet

Database is accessible only in the private network

Cloud



AWS Virtual Private Cloud uses Private IP address

Public IP address is assigned to servers that need to communicate over internet

Optional – you can bring your organization Public IP address

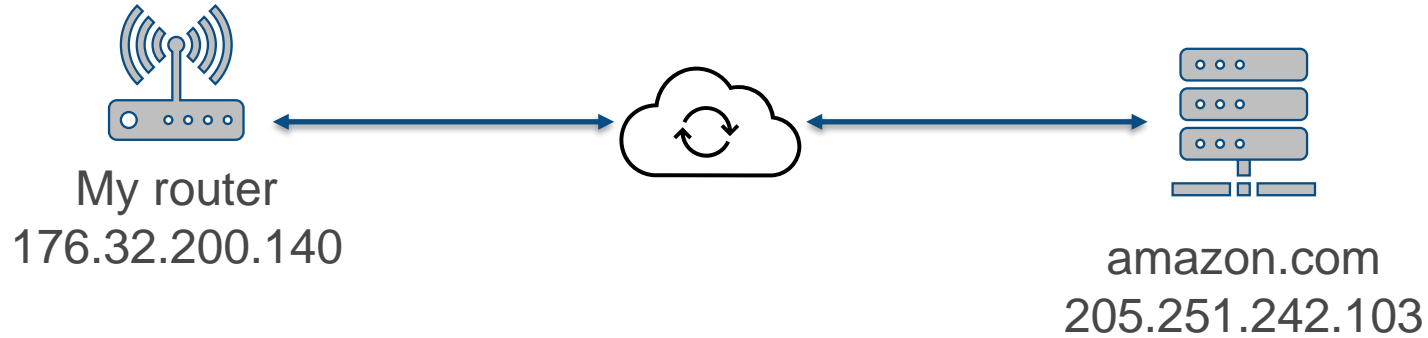
Private Address Space

10.0.0.0 - 10.255.255.255 (10.0.0.0/8 prefix)

172.16.0.0 - 172.31.255.255 (172.16.0.0/12 prefix)

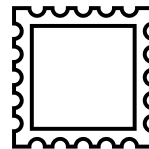
192.168.0.0 - 192.168.255.255 (192.168.0.0/16 prefix)

Routing



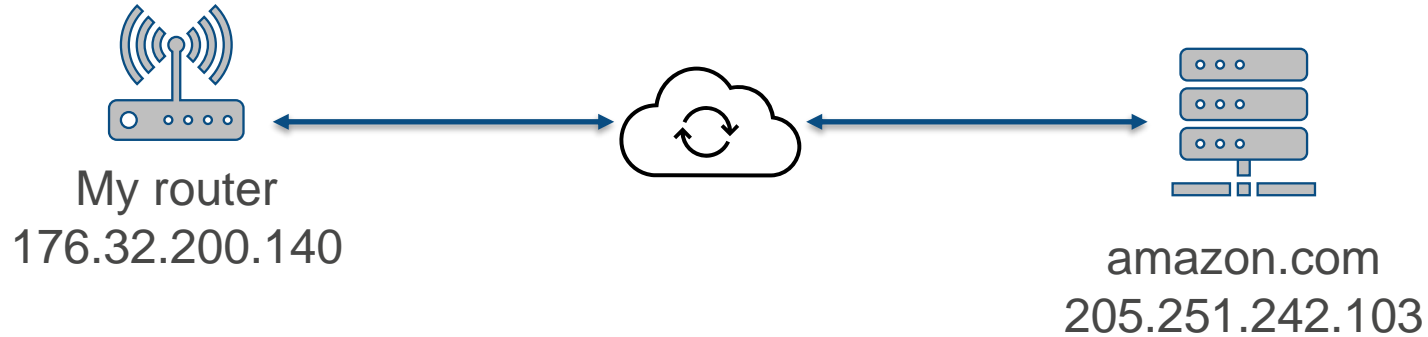
Mail

From
The Florida Aquarium
701 Channelside Dr,
Tampa, FL 33602 USA



To
SEA LIFE Sydney Aquarium
1-5 Wheat Rd,
Sydney NSW 2000,
Australia

Routing



IP address identifies the country, organization and device

IP Country, Location and Organization Lookup

IP ADDRESS DETAILS

205.251.242.103

Virginia Beach, Virginia, United States

Location



Connection

Hostname	s3-console-us-standard.console.aws.amazon.com
Address type	IPv4
ASN	AS16509 Amazon.com, Inc.
Organization	Amazon.com, Inc. (amazon.com)
Route	205.251.240.0/22

Source <https://ipinfo.io/205.251.242.103>

205.251.240.0/22 - AMAZON-05

ID

AMAZON-05

DESCRIPTION

Amazon.com, Inc.

ASN

[AS16509](#) Amazon.com, Inc.

COUNTRY

 [United States](#)

REGISTRY

arin

Source <https://ipinfo.io/AS16509/205.251.240.0/22>

Classless Inter Domain Routing (CIDR)

Identify the network

IP address 205.251.242.103 is part of the **205.251.240.0/22**

CIDR Example

CIDR Block 205.251.240.0/22 was assigned to Amazon

11001101.11111011.11110000.00000000

IP 205.251.242.103 belongs to Amazon

11001101.11111011.111100**10.01100111**

Classless Inter Domain Routing (CIDR)

Identify the network

IP address 205.251.242.103 is part of the **205.251.240.0/22**

/22 first 22 bits of IPv4 is used as the network identifier

IPv4 = 32-bit addressing scheme

IPv6 = 128-bit addressing scheme

Subnet

Network can be sub-divided into subnets inside an organization

Aides in manageability, security, isolation and so forth

Divide a network into four subnets

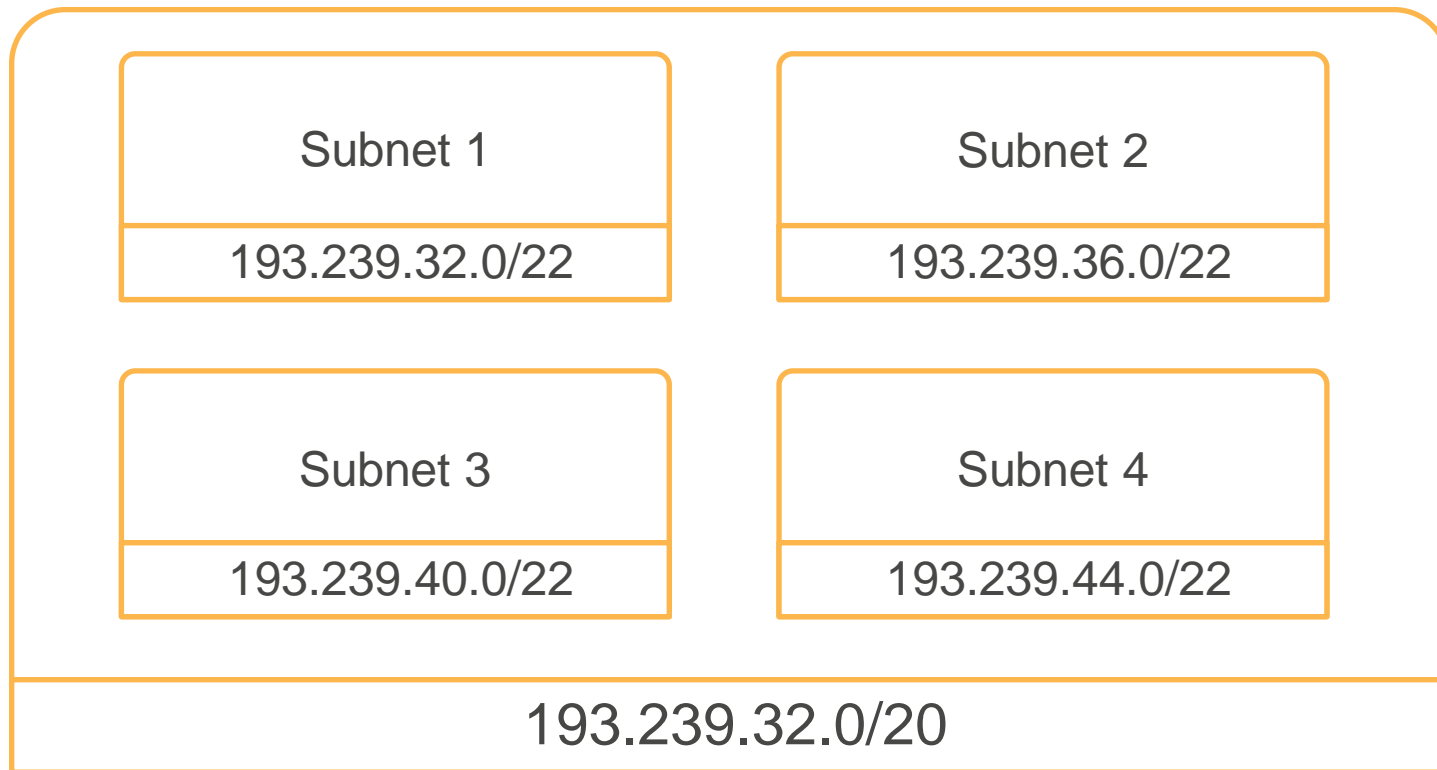
Network CIDR: 193.239.32.0/20

Additional two-bits are needed to indicate the subnets.

Subnet CIDR: 193.239.32.0/22

193.239.32.0/22	<u>11000001.11101111.0010</u> 00 00.00000000
193.239.36.0/22	<u>11000001.11101111.0010</u> 01 00.00000000
193.239.40.0/22	<u>11000001.11101111.0010</u> 10 00.00000000
193.239.44.0/22	<u>11000001.11101111.0010</u> 11 00.00000000

Subnet Example



1,019 hosts in each subnet ($1024 - 5$)



Chandra Lingam

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