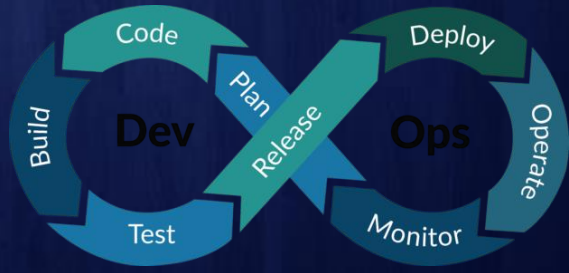
AWS SAA + SysOps + Developer + DevOps Course #Day-17

We will start at 8 AM,
Stay tuned



RAKESH TANINKI
LEARN TO UNLEARN

Recap:

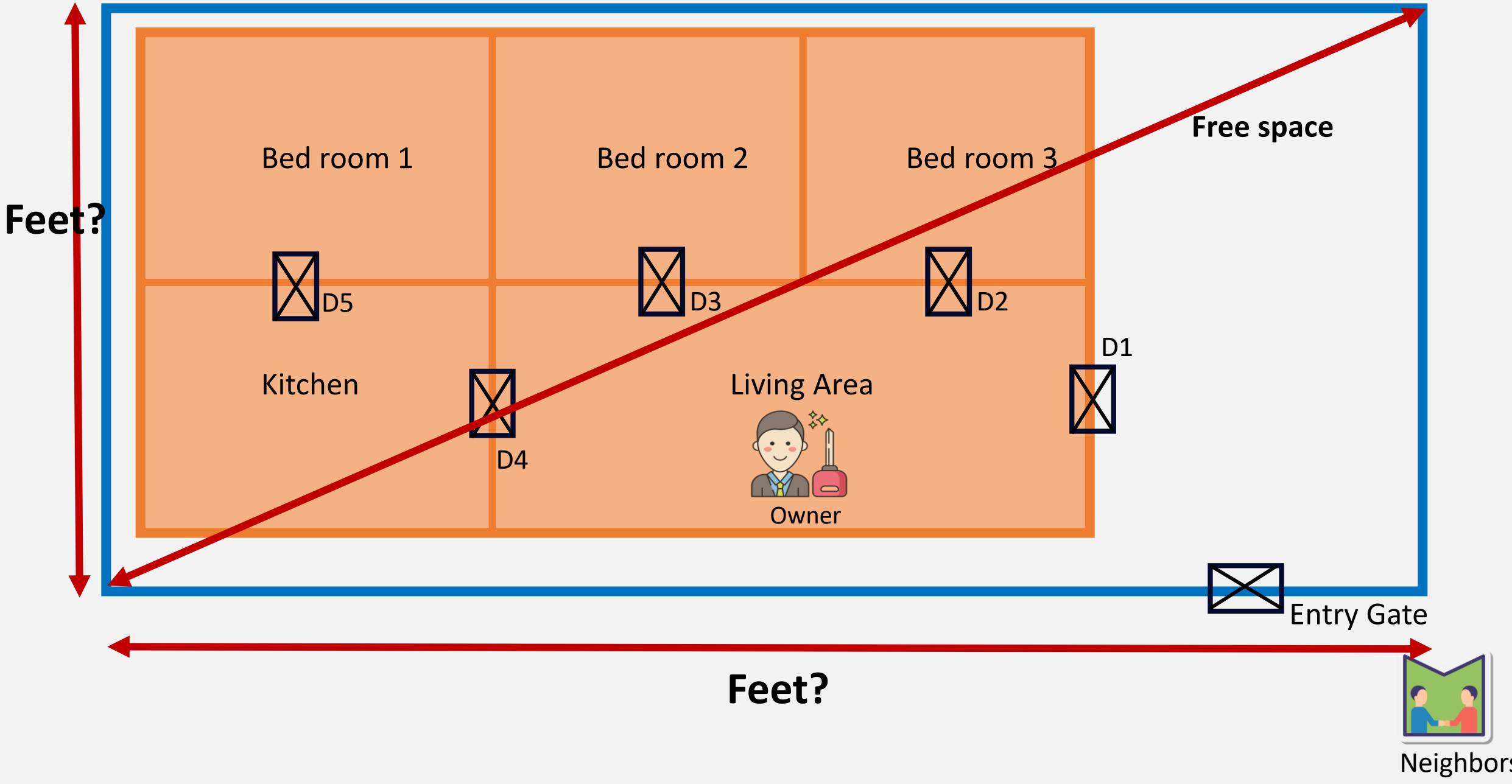
- S3 Storage Classes
- S3 Life Cycle Rules
  - Demo
- S3 Replication Rules
  - Demo
- S3 Select and Glacier Select
- S3 Event Notifications
- S3 Access Logs
- S3 Object Lock

Today's topics:

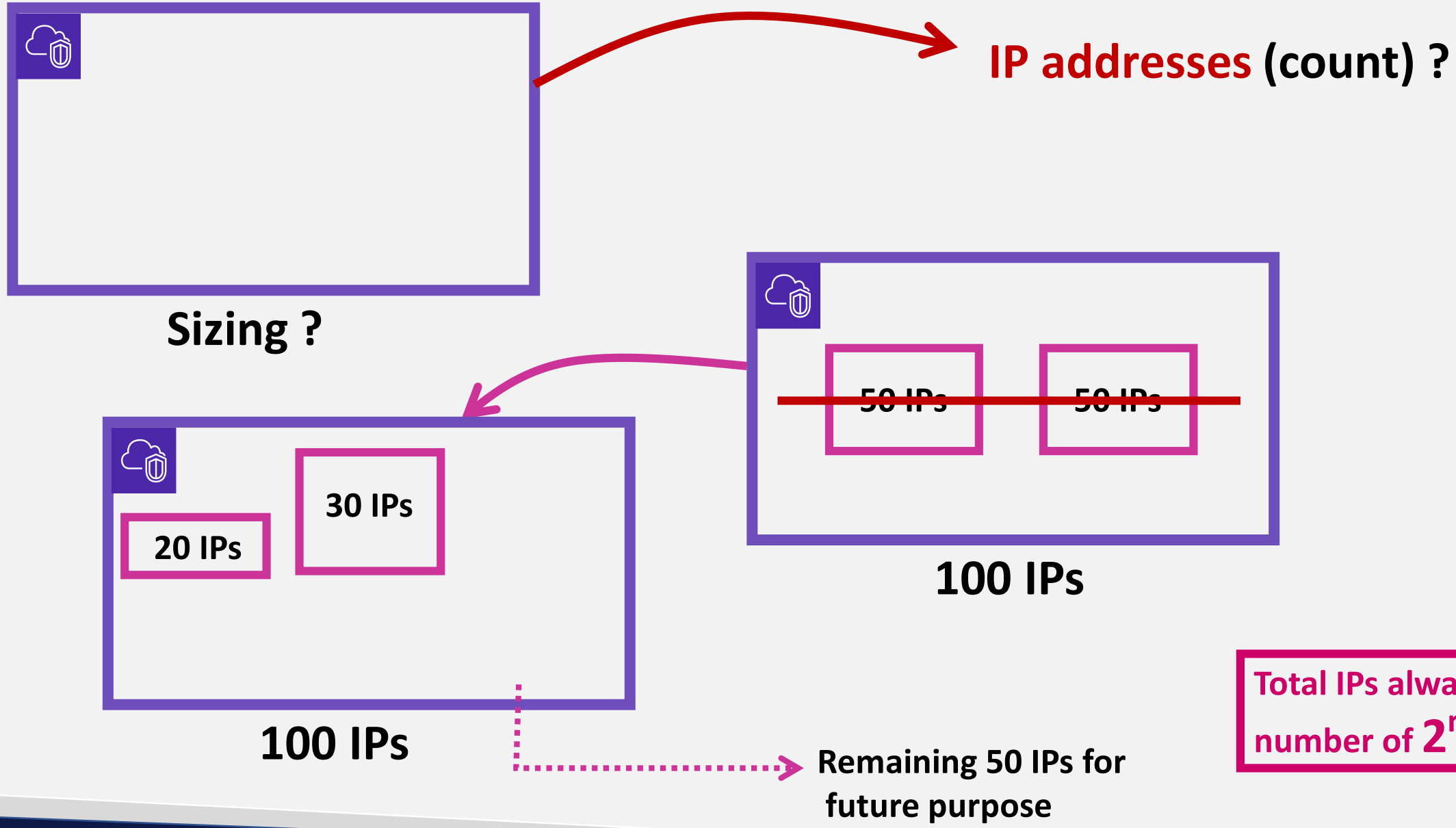
- VPC Advanced
  - VPC Sizing
  - Subnet Sizing
  - Internet Gateway
  - Route Tables
  - Custom VPC Demo

Virtual Private Cloud (VPC)

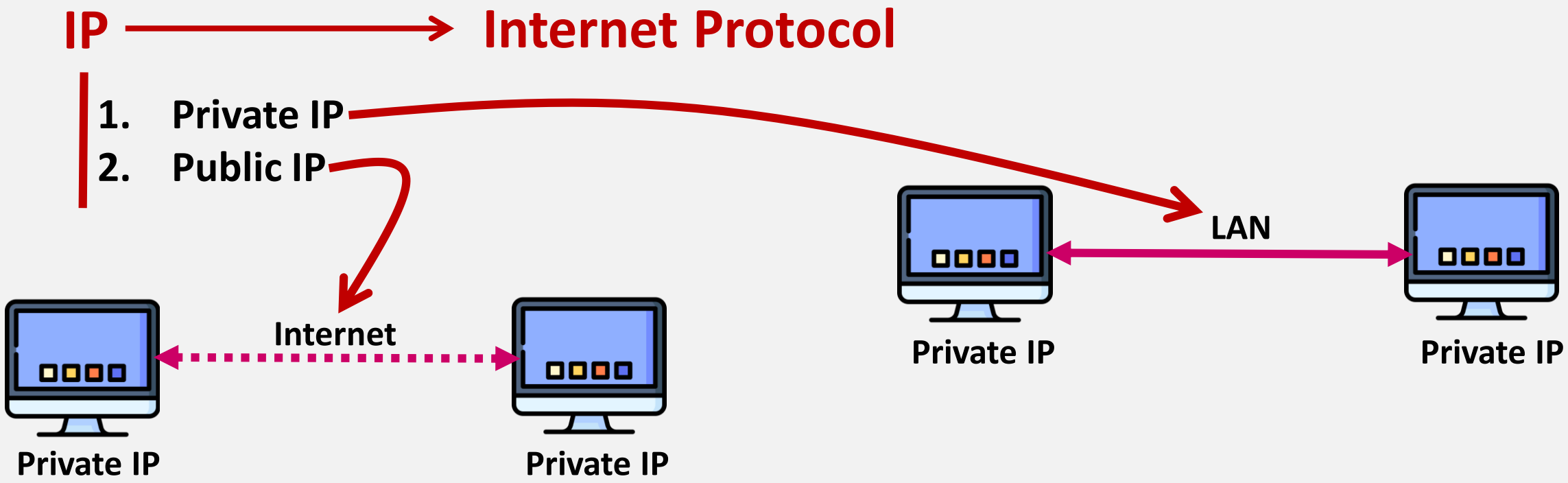
VPC (Housing Example)



VPC Sizing



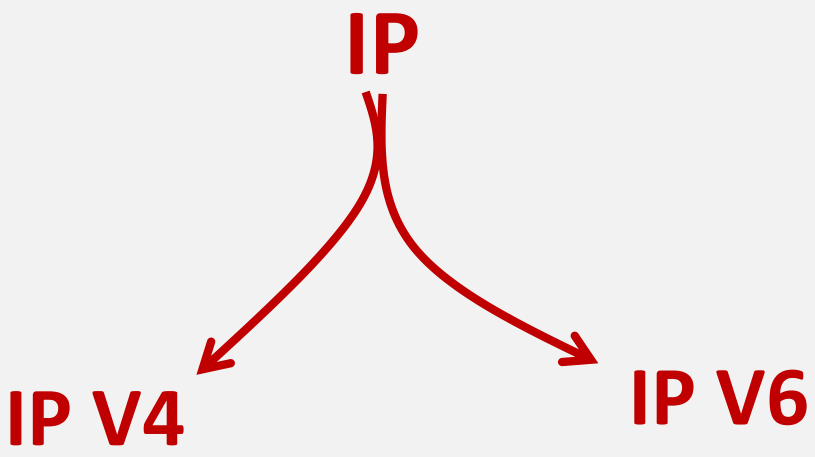
VPC Sizing (IP Address)



Public IP is only needed when you want to connect to **Internet**

Private IP is there by default to the machines

VPC Sizing (IP Address)



- 5 classes:
- Class A
- Class B
- Class C
- Class D
- Class E

CIDR

→ Classless Inter-Domain Routing

Ex: 10.0.0.0/16

- IPv4 - widely used IP version, this version has 4 billion* unique IP addresses
- Internet users are increasing day by day – so IPs are running out

- IPv6 is introduced
  - It has around 340 undecillion IPs – 340,282,366,920,938,463,463,374,607,431,768,211,456

VPC Sizing (IP Address)

IPv4

10.0.0.1

4 parts, separated by (.)

Each part is Octet

Each part is 8 bits of size

Total size is 8 x 4 = 32 bits

IPv6

2001:0db8:85a3:0000:0000:8a2e:0370:7334

8 parts, separated by (:)

Each part is Segment

Each part is 16 bits of size

Total size is 16 x 8 = 128 bits

VPC Sizing (IP Address - Ranges)

IPv4

10.0.0.1

10.0.0.0/16

Range

IPv6

2001:0db8:85a3:0000:0000:8a2e:0370:7334

Size Formula: 2^{32-n}

$= 2^{32-16}$

$= 2^{16}$ = 2 x 2 x 2 x …. 16 times

= 65,536

Example 2: 172.16.0.0/24

$= 2^{32-24}$

$= 2^{8}$

= 256

VPC Sizing (Sizing)

IPv4

For VPC
- Max range is 16 – 65,536
- Min range is 28 – 16

For Subnet
- Max range is 16
- Min range is 28

IPv6

For VPC
- Max range is 56

For VPC
- Max range is 64

Subnets Sizing

- Subnet size should be between /16 and /28
- … example for VPC => 10.0.0.0/16
- /24 is the standard subnet size

- Subnet 1 => 10.0.0.0/24

$= 2^{32-24} = 2^8 = 256$

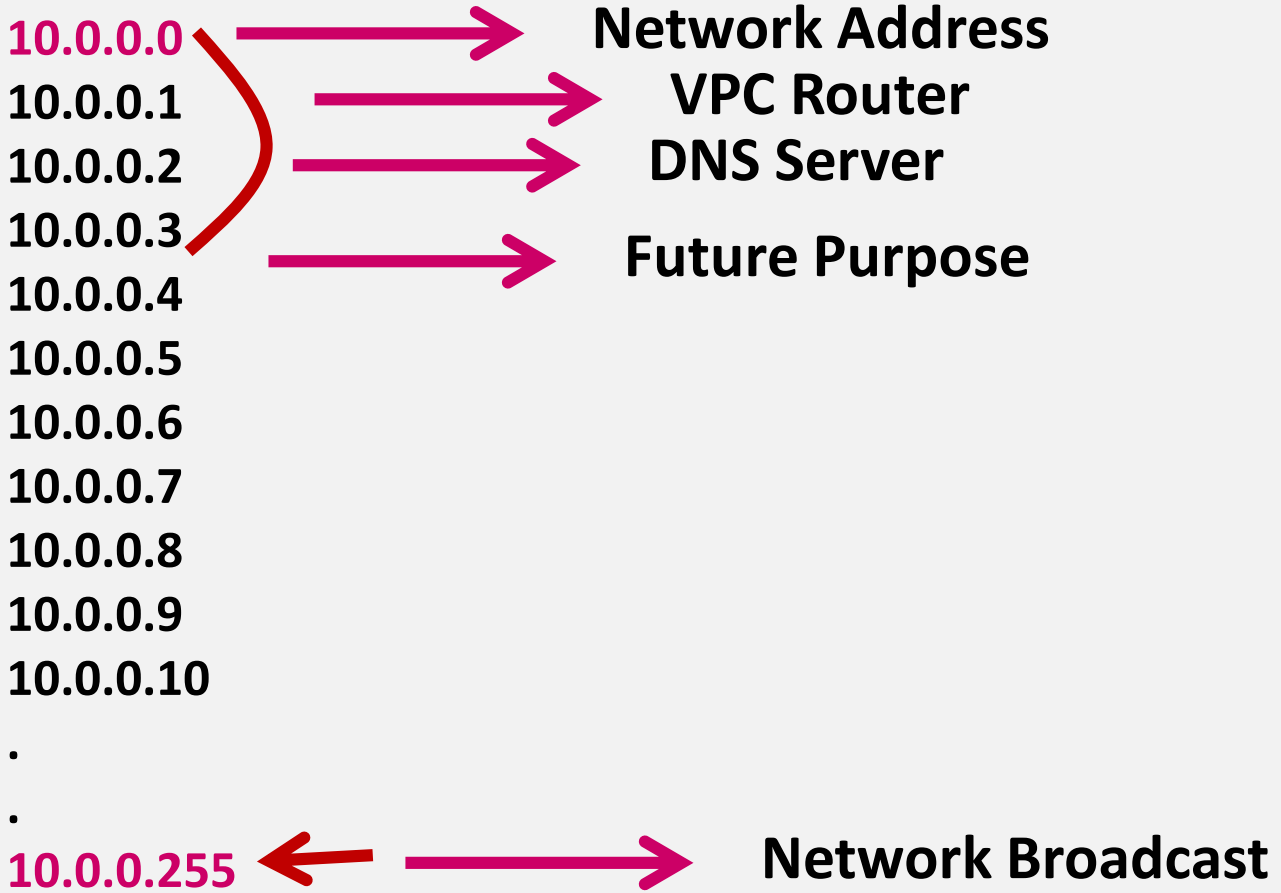
0 - 255

10.0.0.0	10.0.1.0
10.0.0.1	10.0.1.1
10.0.0.2	10.0.1.2
10.0.0.3	10.0.1.3
10.0.0.4	10.0.1.4
10.0.0.5	10.0.1.5
10.0.0.6	10.0.1.6
10.0.0.7	10.0.1.7
10.0.0.8	10.0.1.8
10.0.0.9	10.0.1.9
10.0.0.10	10.0.1.10
.	.
.	.
10.0.0.255	10.0.1.255

- Subnet 2 => ~~10.0.0.1/24~~
- Subnet 2 => 10.0.1.0/24
- Subnet 3 => 10.0.2.0/24
- Subnet 4 => 10.0.3.0/24

Subnet Sizing

- **5 IP addresses** are reserved for AWS from every subnet
- 1st 4 and last 1 IP are reserved



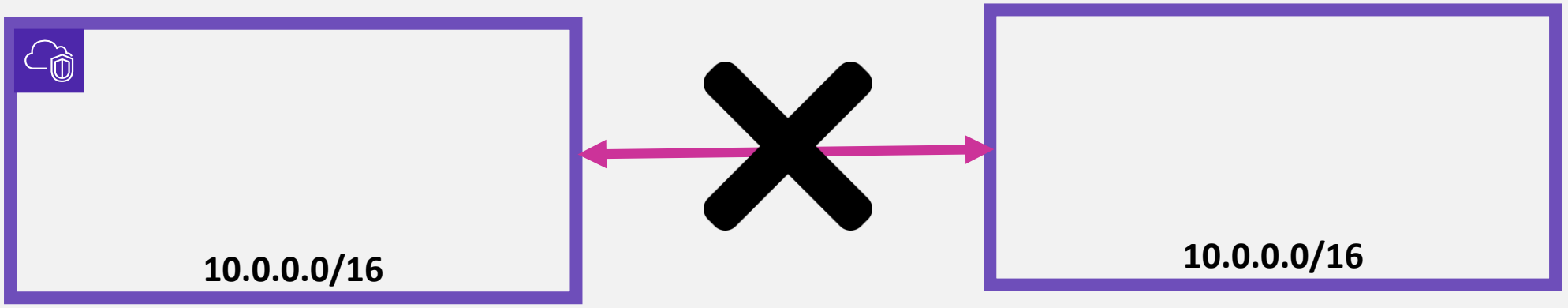
Subnet Sizing

- Why the minimum size is /28 ?
- IPv4 has 32 bits
  - /32 → $2^{32-32} = 2^0 = 1$ < 5
  - /31 → $2^{32-31} = 2^1 = 2$ < 5
  - /30 → $2^{32-30} = 2^2 = 4$ < 5
  - /29 → $2^{32-29} = 2^3 = 8$ > 5 but only 3 IPs
  - /28 → $2^{32-28} = 2^4 = 16$ > 5 → 16 – 5 = 11 IPs
  - .
  - .
  - /16 → $2^{32-16} = 2^{16} = 65,536$

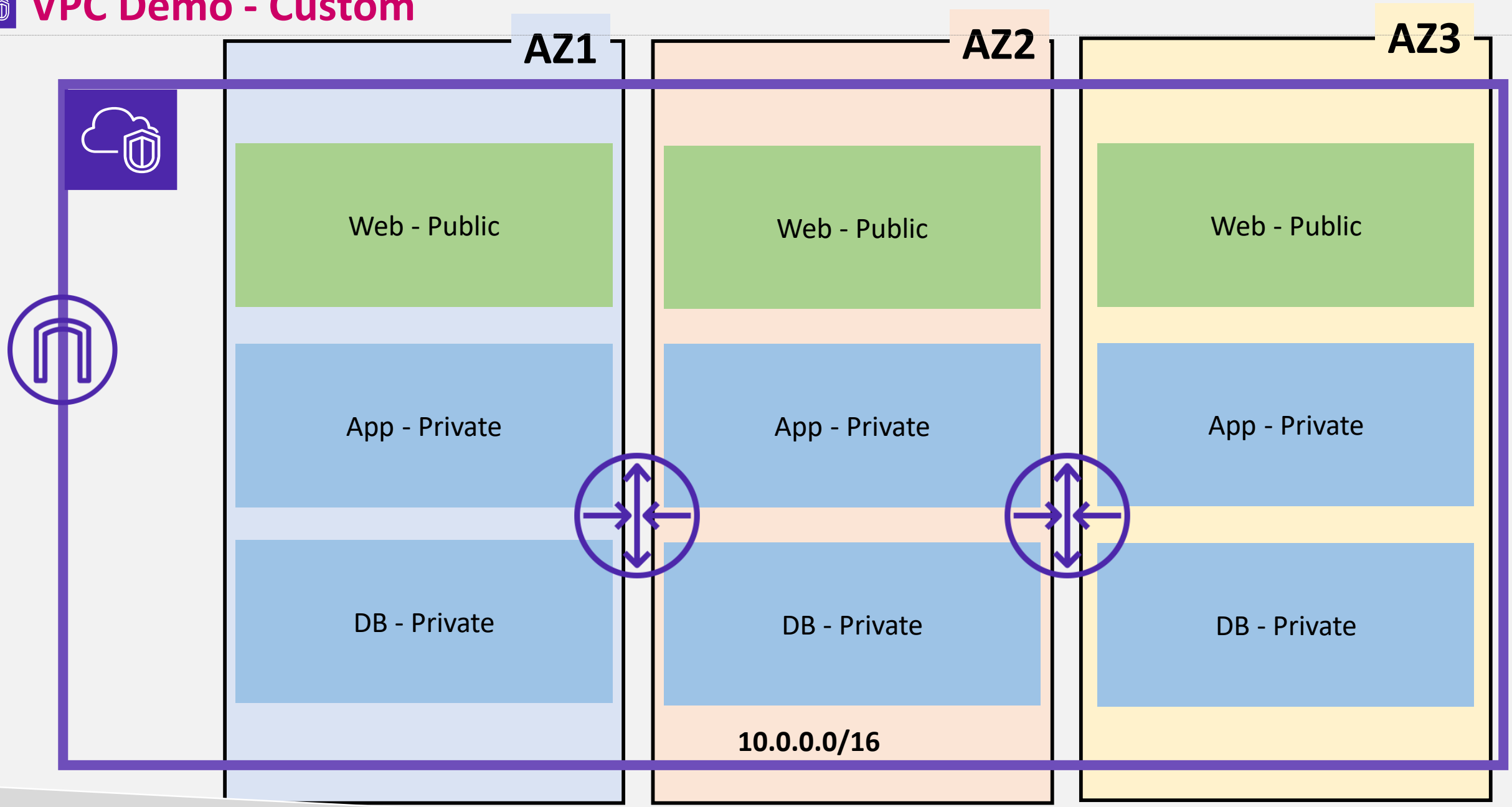
VPC IPs

- Which IP range we can choose for VPC?
- RFC 1918
    - 10.0.0.0 ➔ 10.255.255.255
    - 172.16.0.0 ➔ 172.31.255.255
    - 192.168.0.0 ➔ 192.168.255.255

- IPs ranges should be different when in hybrid networking



VPC Demo - Custom



Thank you, will meet in tomorrow's session