Networking for the Cloud DBA

Arup Nanda
Longtime Oracle DBA
And
Explorer of New Things

Most Important Skill for a Cloud DBA

Netmask

Broadcast Address

Network ID ≠ IP Address

Most Important Skill for a Cloud DBA is *Networking*

Why Networking?

What's Different in Cloud

How are IP Addresses Used

What is Subnetting?

What is NetMask

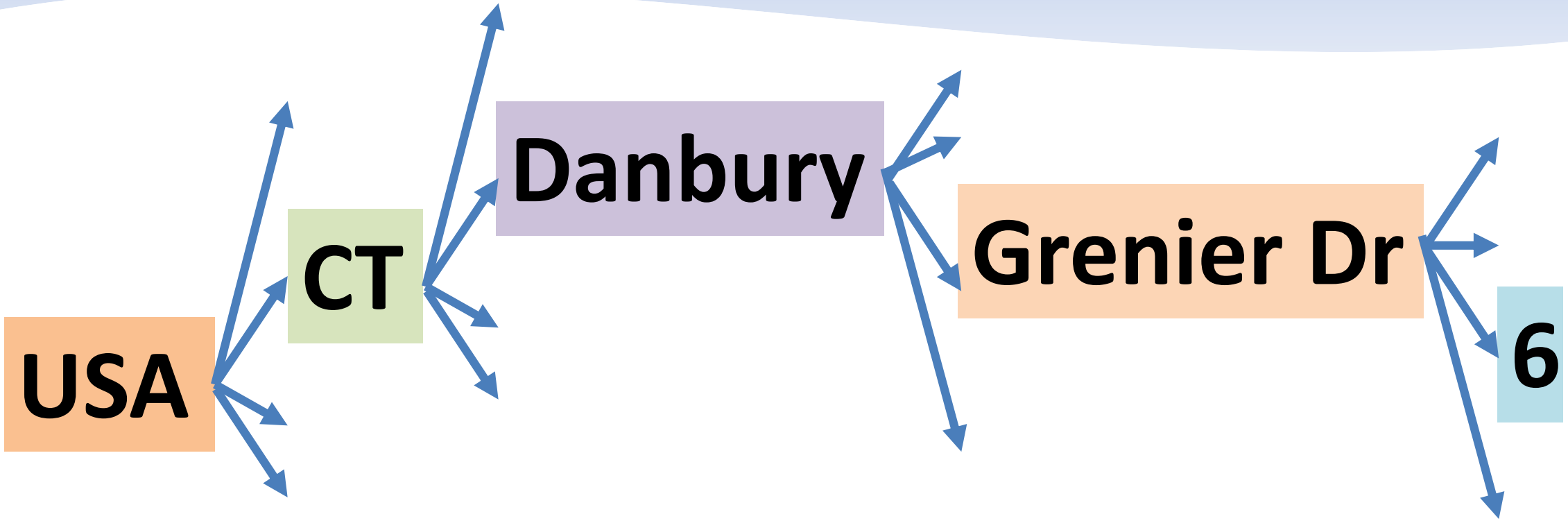
How to apply Network Concepts in the Cloud.

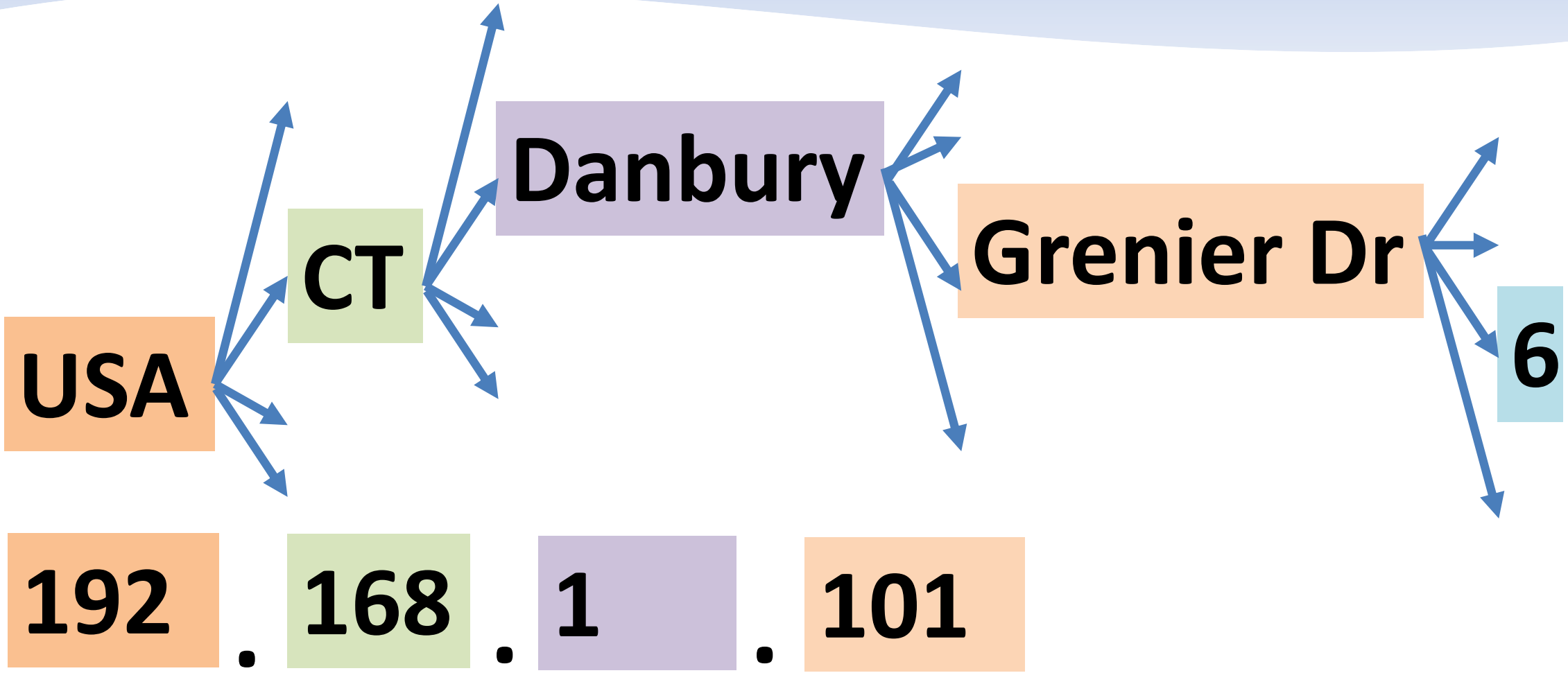
What is a Network?

- IP Address
- Network address
- How many IP

6 Grenier Dr Danbury CT USA

6 Grenier Dr Danbury CT USA

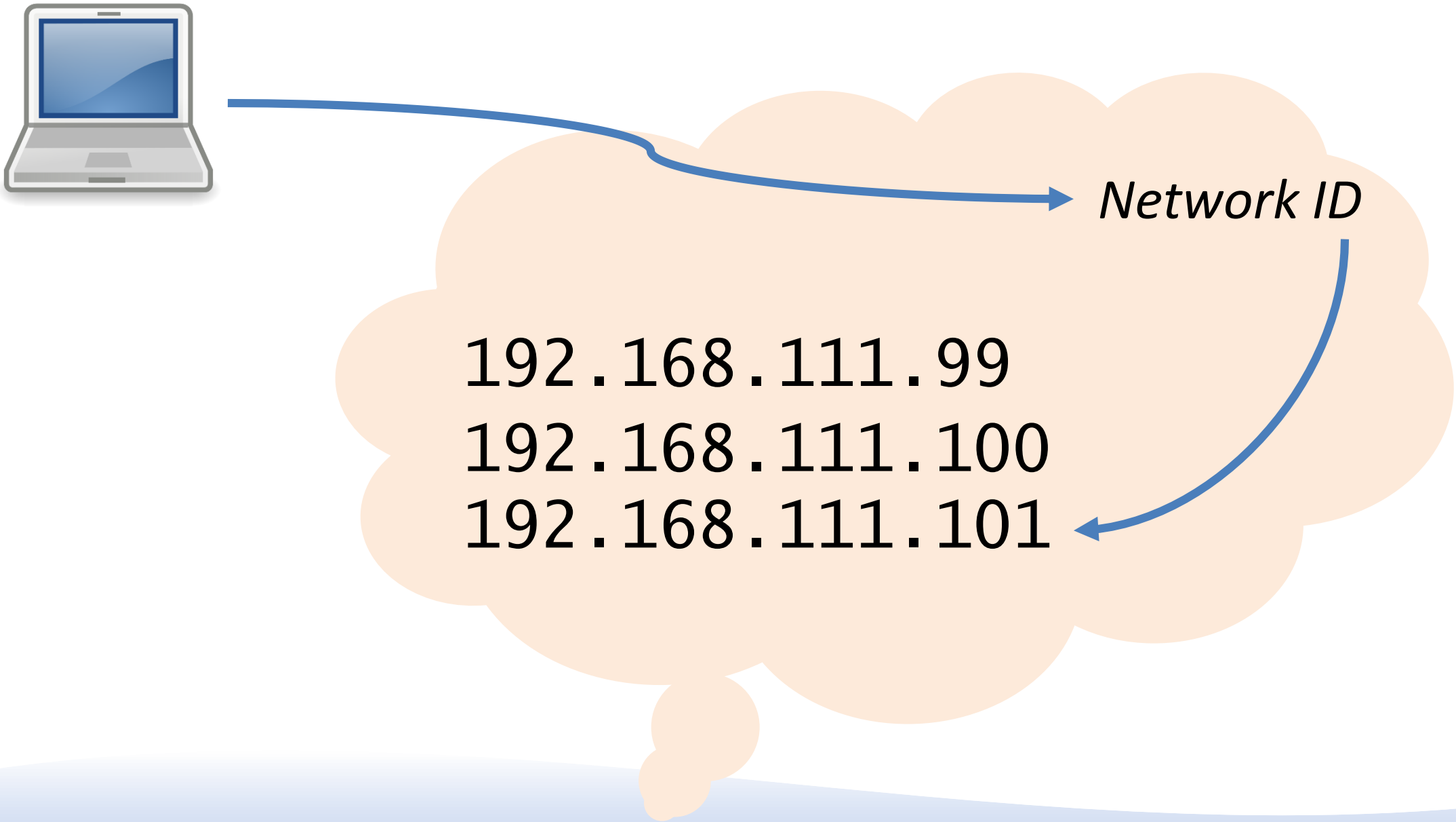

USA
CT
Danbury
Grenier Dr
6

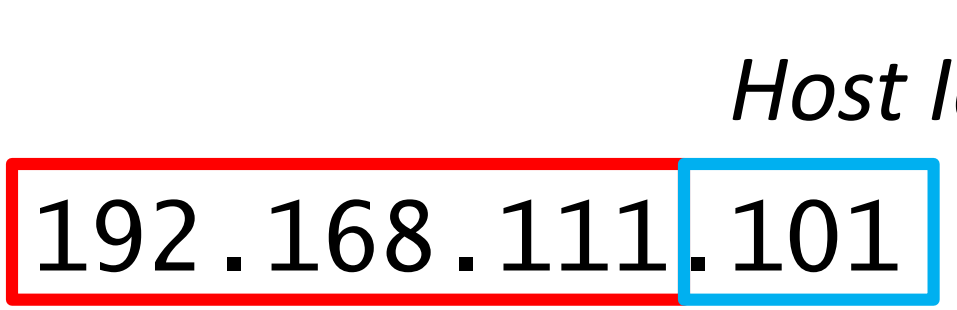

USA
CT
Danbury
Grenier Dr
6
192
168
1
101

192.168.111.101

192.168.111.101

192.168.111.101

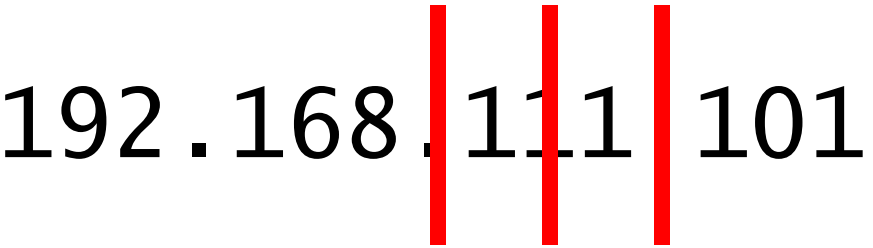

Network ID
192.168.111.99
192.168.111.100
192.168.111.101



Network Address

192.168.111. 0

192.168. 0. 0



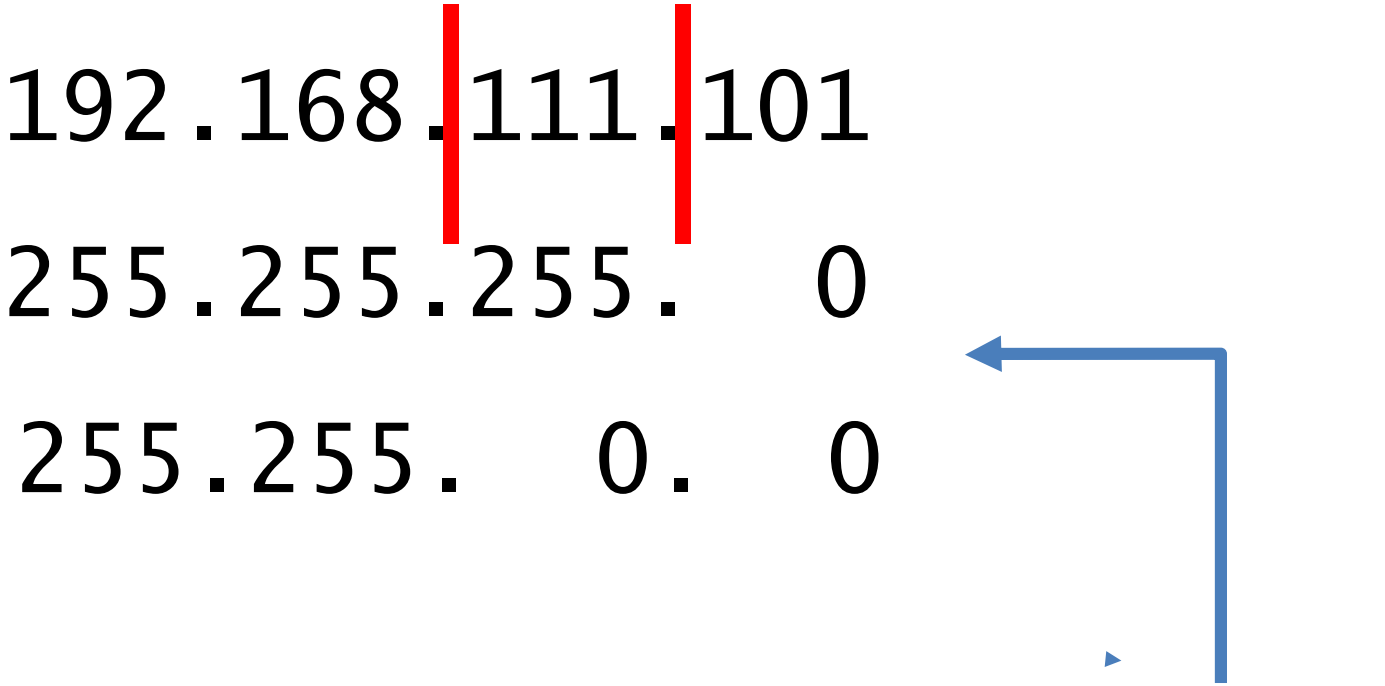
Does not tell you the network address

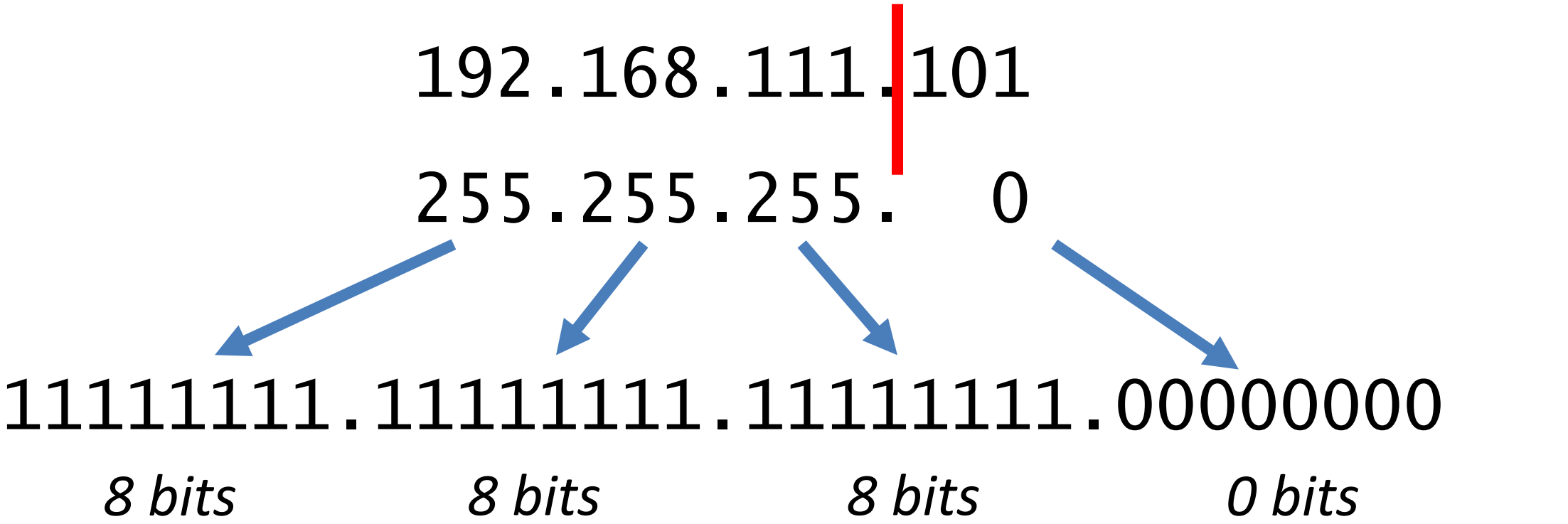
How do you know where to “cut”?

11111111.11111111.11111111.00000000

	1	1	1	1	1	1	1	1
2	*64*	*32*	*16*	*8*	*4*	*2*	*1*	*0*
	128	64	32	16	8	4	2	1

= 256


192.168.111.101
255.255.255. 0
255.255. 0. 0
Subnet Mask
Or Netmask



= 24 bits

192.168.111.101/24

Class of Networks

Class A	1.0.0.1 – 126.255.255.254	16 million hosts
Class B	128.1.0.1 – 126.255.255.254	16,000 networks 65,000 hosts each
Class C	192.0.1.1 – 223.255.254.254	2 million networks 254 hosts each
Class D	224.0.0.0 – 239.255.255.255	Reserved for multicast
Class E	240.0.0.0 – 254.255.255.254	Reserved for research

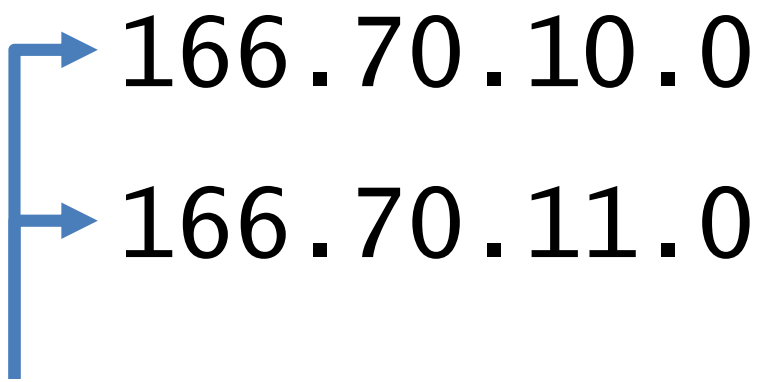
What about 127.x.x.x?

127.x.x.x is loopback

254.254.254.254 is general broadcast

Typical Routing

Network Address
166.70.10.0



We need two networks

192.168.111.101/**24**

Classless Inter-Domain Routing

CIDR

192.168.111.101

Mask: 255.255.255.0

255.255.255.0

255.255.255.128

1	0	0	0	0	0	0	0	
128	64	32	16	8	4	2	1	= **128**

8 + 8 + 8 + 1 = 25 bits

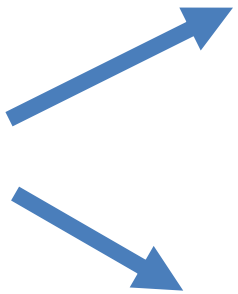
166.70.10.101 166.70.10.101/25

CIDR Splitting

Network Address

166.70.10.0

We need two networks



Subnet 1

Network Address 166.70.10.0

Subnet Mask 255.255.255.128

Or in CIDR 166.70.10.0/25

Subnet 2

Network Address 166.70.10.128

Subnet Mask 255.255.255.128

Or in CIDR 166.70.10.128/25

IP 166.70.10.23/27

Binary 10100110.01000110.00001010.00010111

IP 166.70.10.12/27

Binary 10100110.01000110.00001010.00001200

IP 166.70.10.84/27

Binary 10100110.01000110.00001010.01010100

Our assigned network address is 166.70.10.0

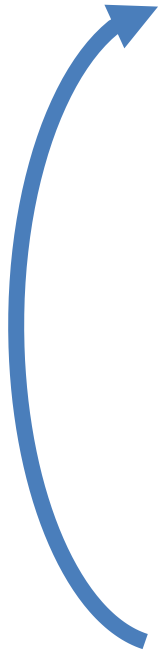
Objective

3 Subnets

1st Subnet = 50 hosts

2nd Subnet = 15 hosts

3rd Subnet = 15 hosts.



Class C Network will give 254 hosts; but not 3 subnets.

We have to carve this up into 3 subnets. **CIDR**

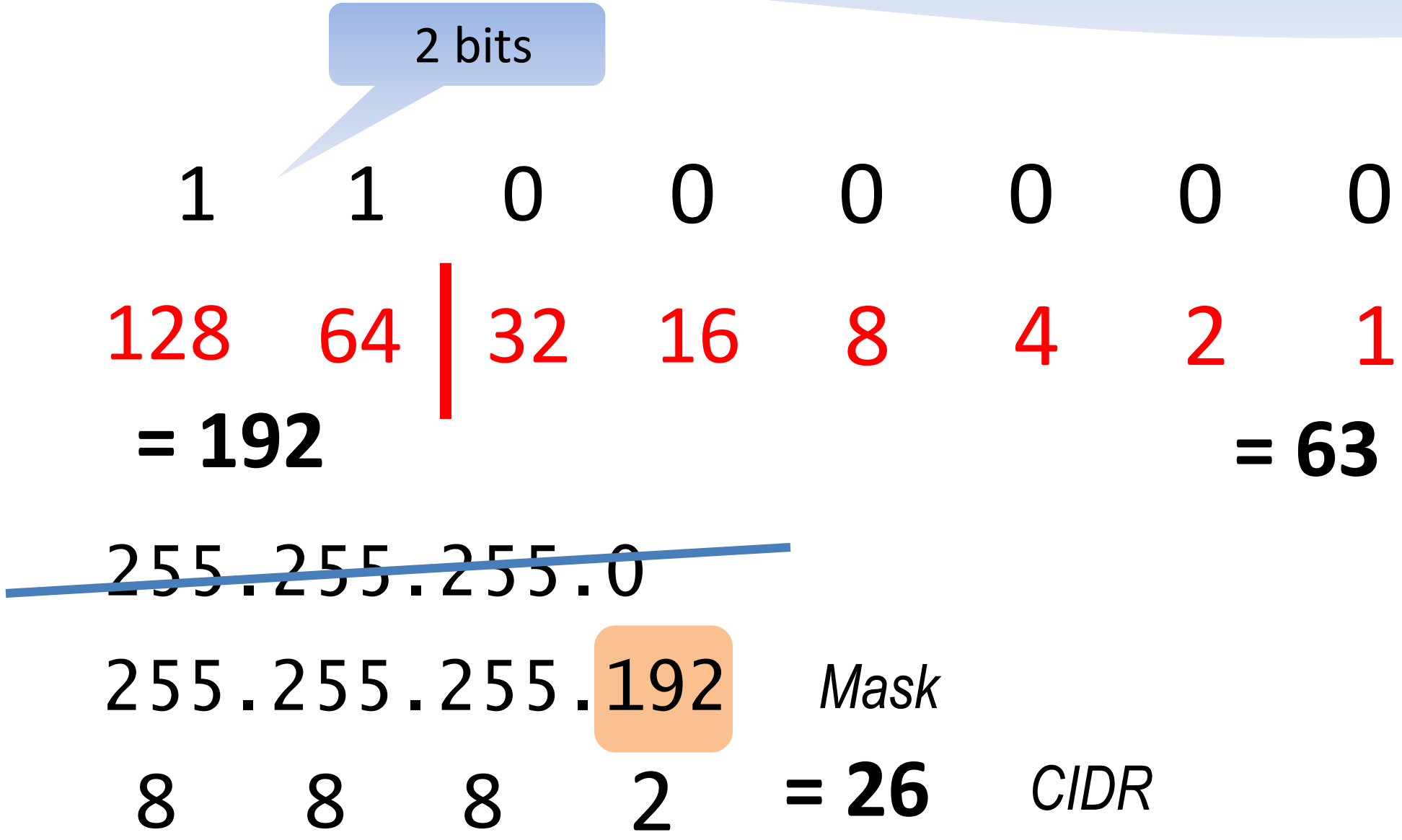
1st Subnet with 50 hosts 166.70.10.0

3 Subnets

1st Subnet = 50 hosts

2nd Subnet = 15 hosts

3rd Subnet = 15 hosts


2 bits
1 1 0 0 0 0 0 0
128 64 32 16 8 4 2 1
= 192
= 63
255.255.255.0
255.255.255.192
Mask
8 8 8 2
= 26
CIDR

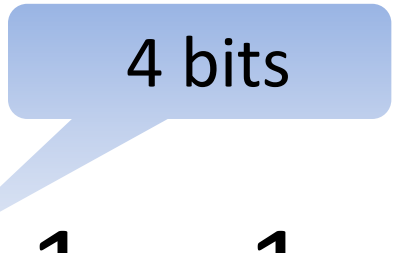
3 Subnets

1st Subnet = 50 hosts

2nd Subnet = 15 hosts

3rd Subnet = 15 hosts

1st Subnet with 50 hosts	166.70.10.0/26
Mask	255.255.255.192
Broadcast	166.70.10.63
2nd Subnet with 15 hosts	166.70.10.64



1	1	1	1	0	0	0	0
128	64	32	16	8	4	2	1
= 240						**= 15**	

255.255.255.240 *Mask*

8 8 8 4 **= 28** *CIDR*

3 Subnets

1st Subnet = 50 hosts

2nd Subnet = 15 hosts

3rd Subnet = 15 hosts

1st Subnet with 50 hosts 166.70.10.0/26

Mask 255.255.255.192

Broadcast 166.70.10.63

2nd Subnet with 15 hosts 166.70.10.64/28

Mask 255.255.255.240

Broadcast 166.70.10.79

3 Subnets

1st Subnet = 50 hosts

2nd Subnet = 15 hosts

3rd Subnet = 15 hosts

1st Subnet with 50 hosts 166.70.10.0/26

Mas 255.255.255.192

Broadcast 166.70.10.63

2nd Subnet with 15 hosts 166.70.10.64/28

Mask 255.255.255.240

Broadcast 166.70.10.79

3rd Subnet with 15 hosts 166.70.10.80/28

Mask 255.255.255.240

Broadcast 166.70.10.95

Our assigned network address is 166.70.10.0

1st Subnet with 50 hosts 166.70.10.0/26
Mask 255.255.255.192
Broadcast 166.70.10.63

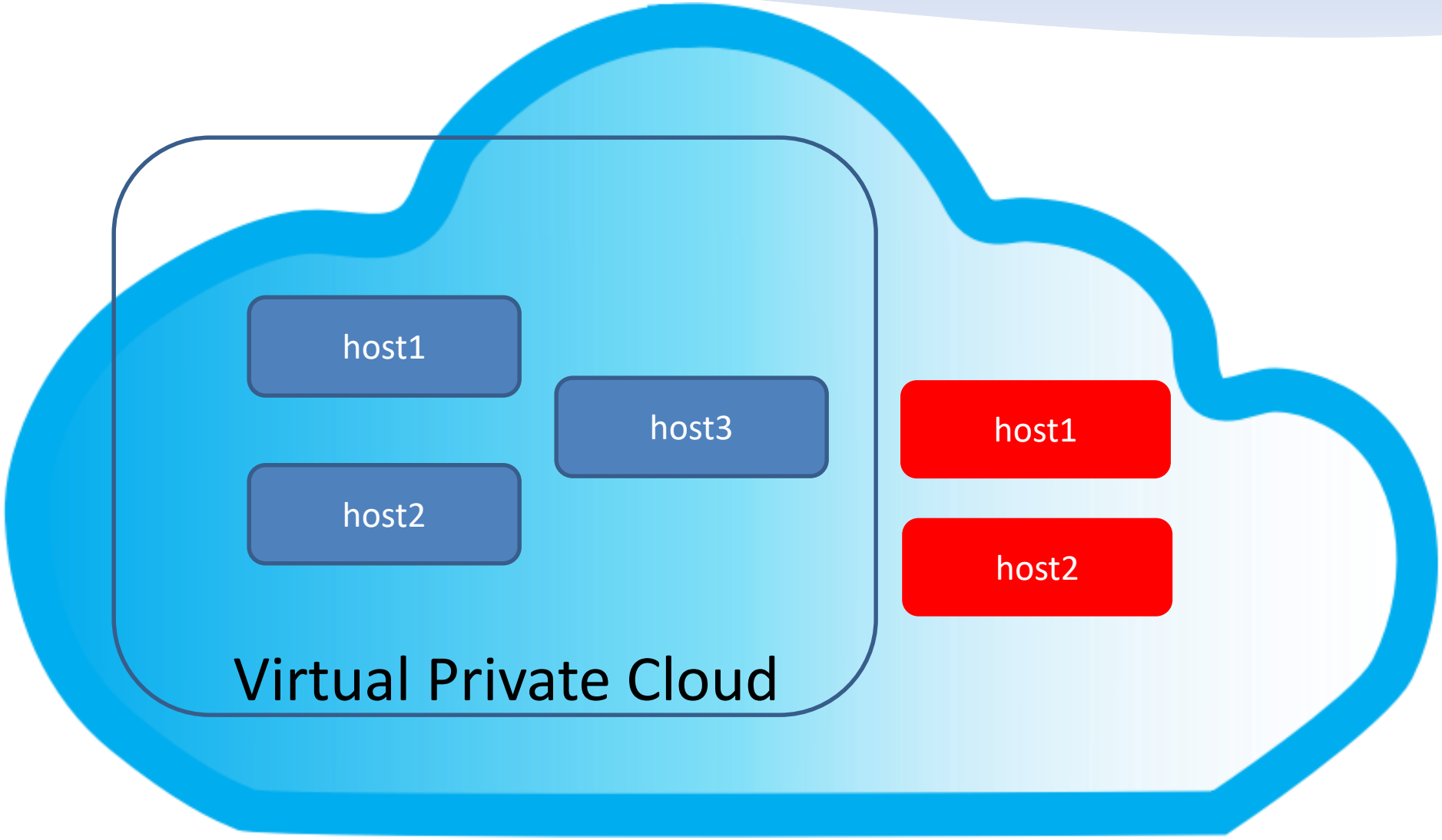
Range: 166.70.10.1-62

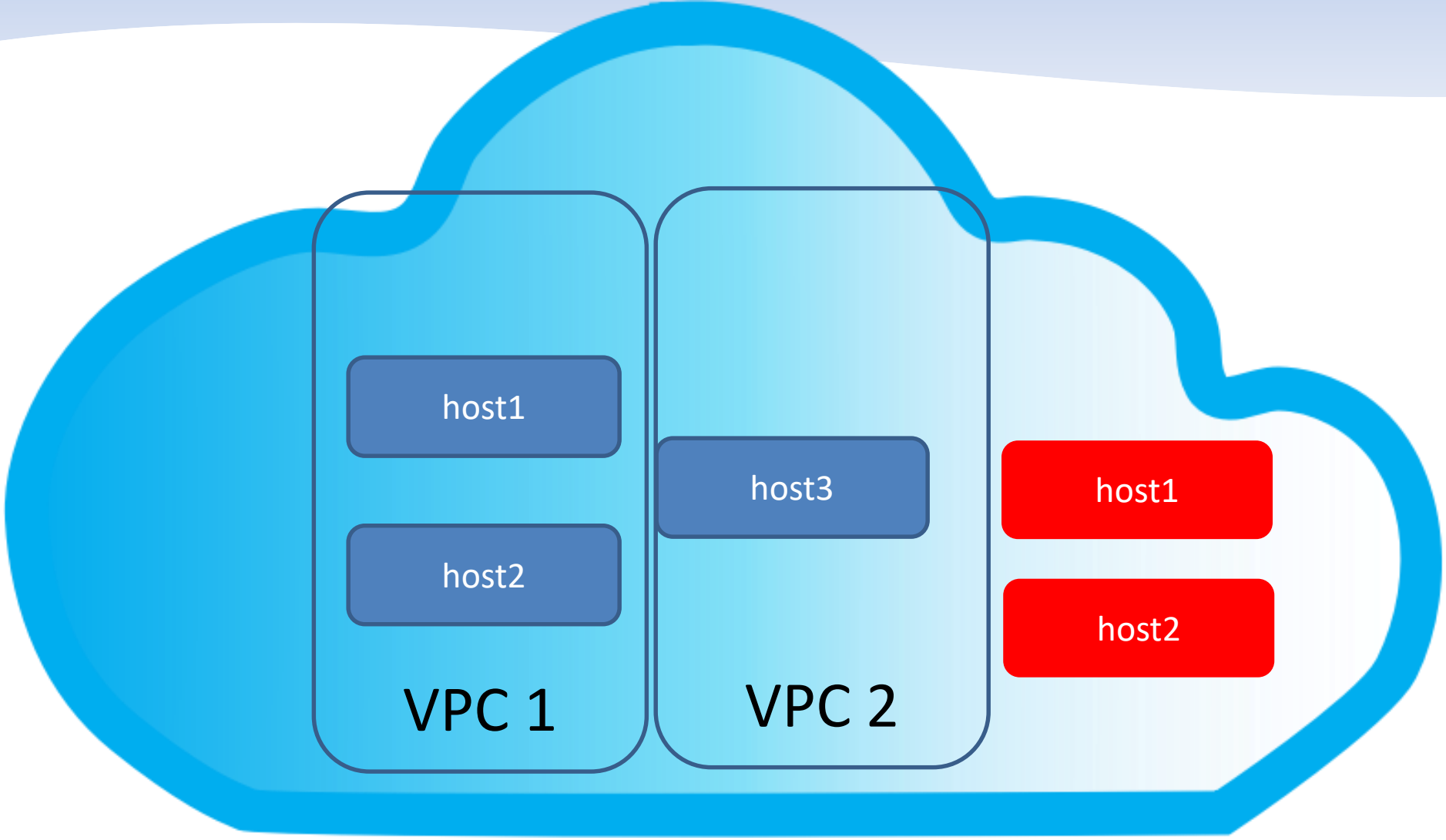
2nd Subnet with 15 hosts 166.70.10.64/28
Mask 255.255.255.240
Broadcast 166.70.10.79

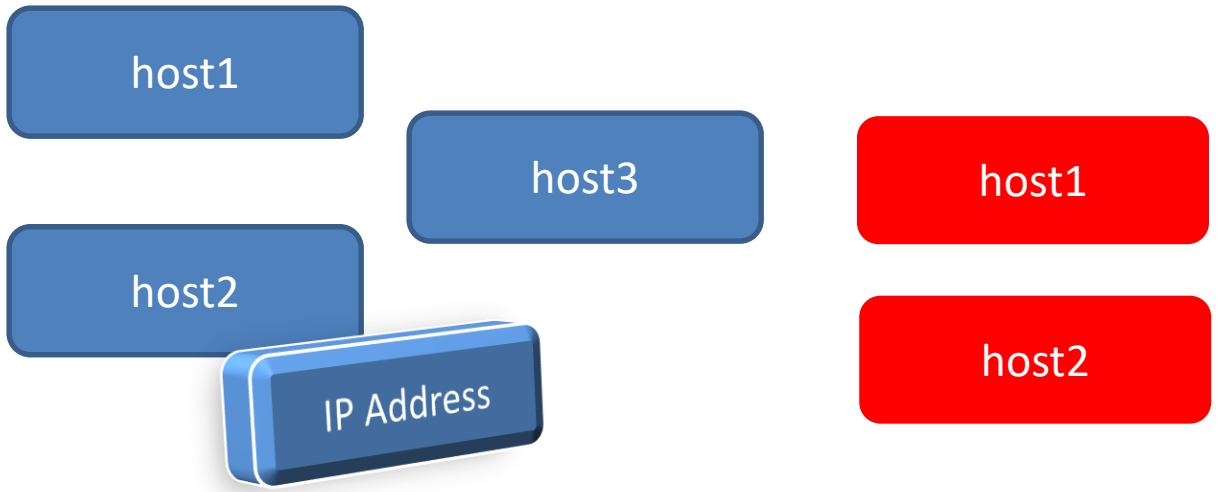
Range: 166.70.10.64-78

3rd Subnet with 15 hosts 166.70.10.80/28
Mask 255.255.255.240
Broadcast 166.70.10.95

Range: 166.70.10.80-94


host1
host3
host2
host1
host2
Virtual Private Cloud


host1
host2
VPC 1
host3
VPC 2
host1
host2



Elastic IP

What you learned today

- IP Addressing
- Class of Networks
- Subnetting
- Subnet Masking
- CIDR Notation
- Virtual Private Cloud
- Elastic IP

Thank You!

Blog: arup.blogspot.com
Tweeter: @ArupNanda
Facebook.com/ArupKNanda
Google Plus: +ArupNanda