

# Unit 7a

# Subnetting

960131 Digital Industry Infrastructure 1

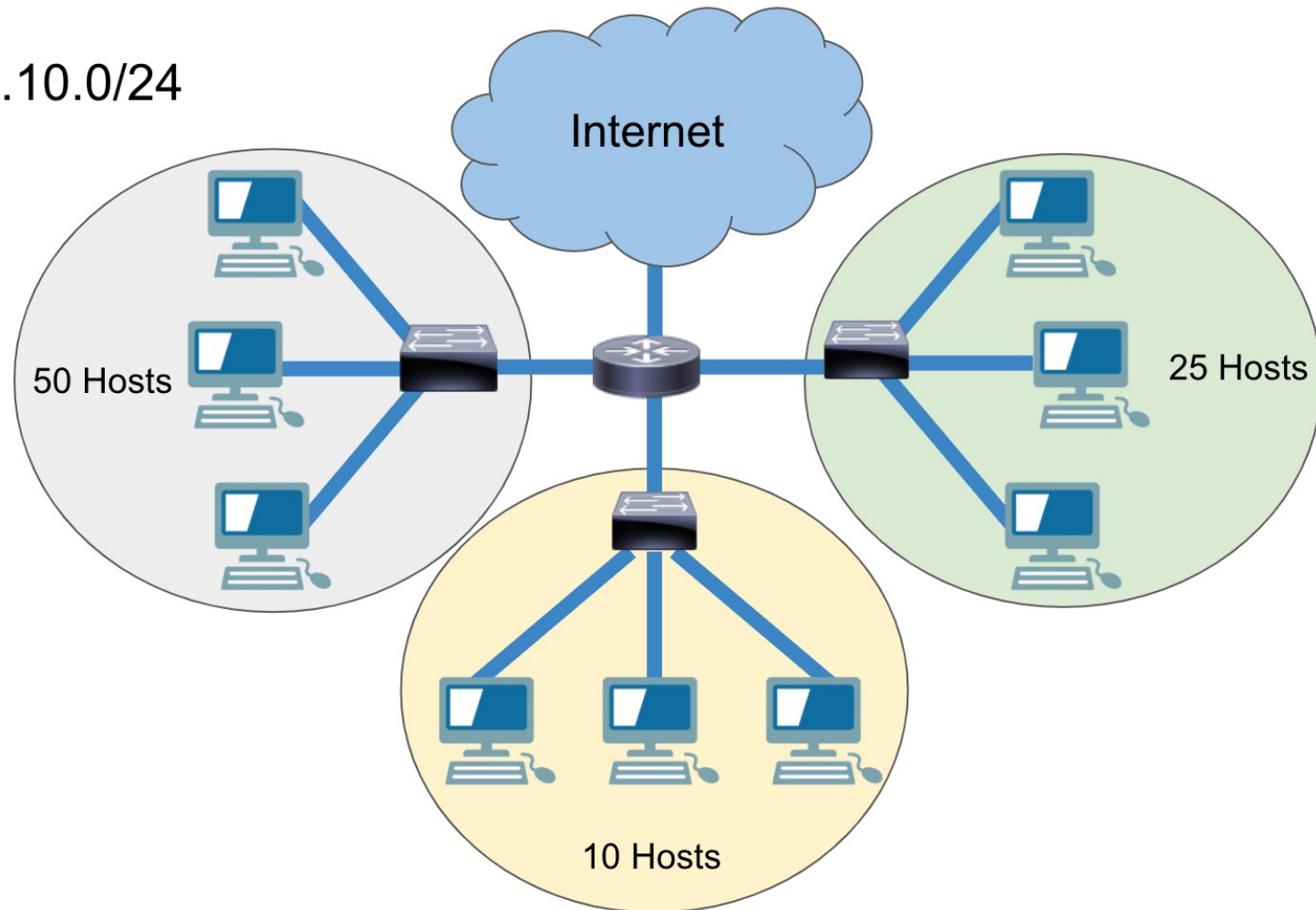
Waranya Mahanan

College of Arts, Media and Technology

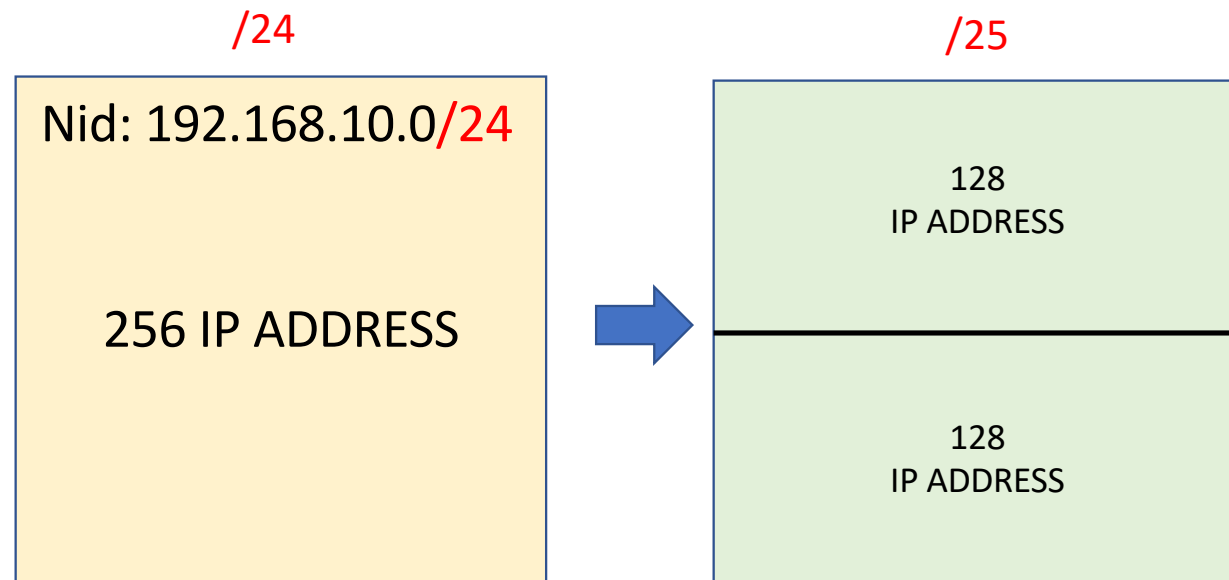
Chiang Mai University

# How to Subnetting

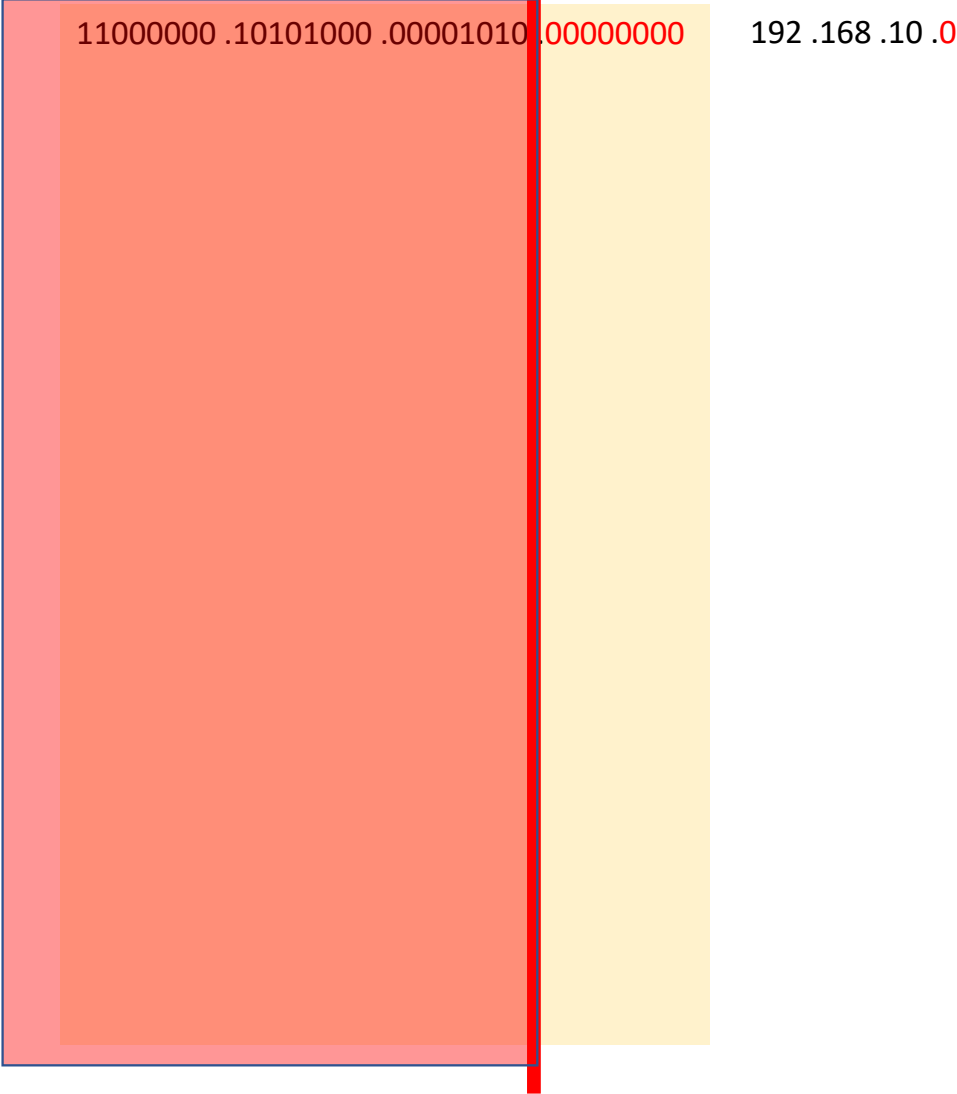
192.168.10.0/24



# How to Subnetting



Network ID: 192.168.10.0/24



• 192.168.10.0/24

11000000	.10101000	.00001010	00000000
11000000	.10101000	.00001010	00000001
11000000	.10101000	.00001010	00000010
11000000	.10101000	.00001010	00000011
11000000	.10101000	.00001010	00000100
11000000	.10101000	.00001010	00000101
11000000	.10101000	.00001010	00000110
...			
...			
...			
...			
...			
...			
...			
11000000	.10101000	.00001010	11111110
11000000	.10101000	.00001010	11111111

192 .168 .10 .0
192 .168 .10 .1
192 .168 .10 .2
192 .168 .10 .3
192 .168 .10 .4
192 .168 .10 .5
192 .168 .10 .6
...
...
...
...
...
...
...
192 .168 .10 .254
192 .168 .10 .255

256 IP Addresses

Network ID (Nid) / Subnet ID

254 Hosts

Broadcast ID

• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
...	...
...	...
...	...
...	...
...	...
...	...
...	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address



Network ID : 192.168.10.0/25

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
--	-----------------

• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
...	...
...	...
...	...
...	...
...	...
...	...
...	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255



256 IP Address

Network ID : 192.168.10.0/25

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
...	...
...	...
11000000 .10101000 .00001010 .01111110	192 .168 .10 .126
11000000 .10101000 .00001010 .01111111	192 .168 .10 .127

128 IP Address

• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address

Network ID : 192.168.10.0/25

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
....	....
....	....
11000000 .10101000 .00001010 .01111110	192 .168 .10 .126
11000000 .10101000 .00001010 .01111111	192 .168 .10 .127

128 IP Address

Network ID : 192.168.10.128/25

11000000 .10101000 .00001010 .10000000	192 .168 .10 .128
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128 IP Address



• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address

Network ID : 192.168.10.0/25

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
...	...
...	...
11000000 .10101000 .00001010 .01111110	192 .168 .10 .126
11000000 .10101000 .00001010 .01111111	192 .168 .10 .127

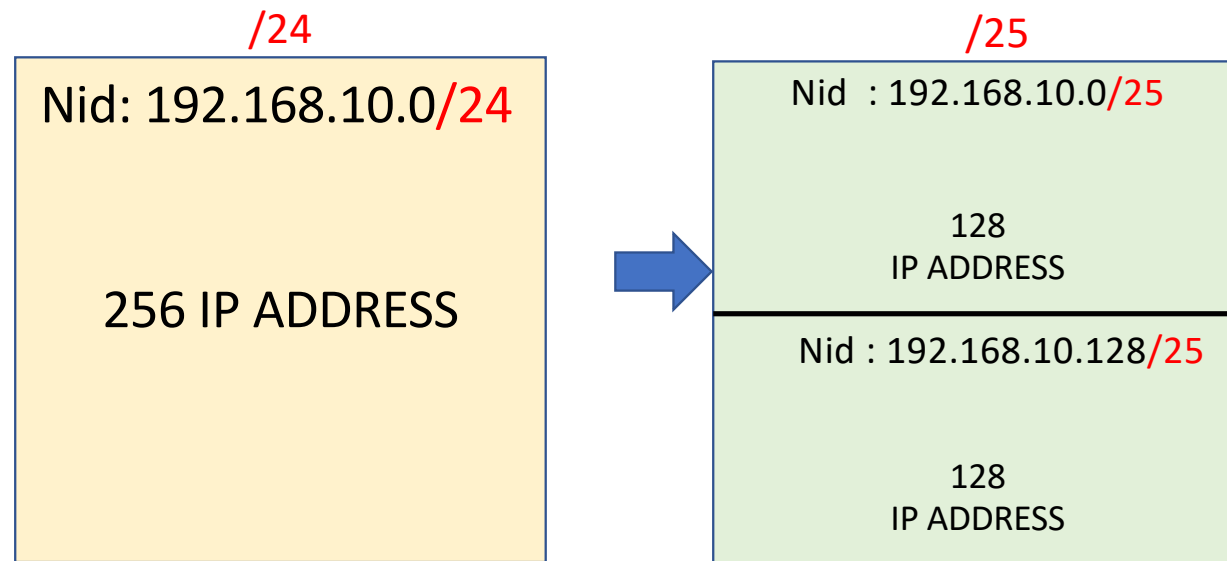
128 IP Address

Network ID : 192.168.10.128/25

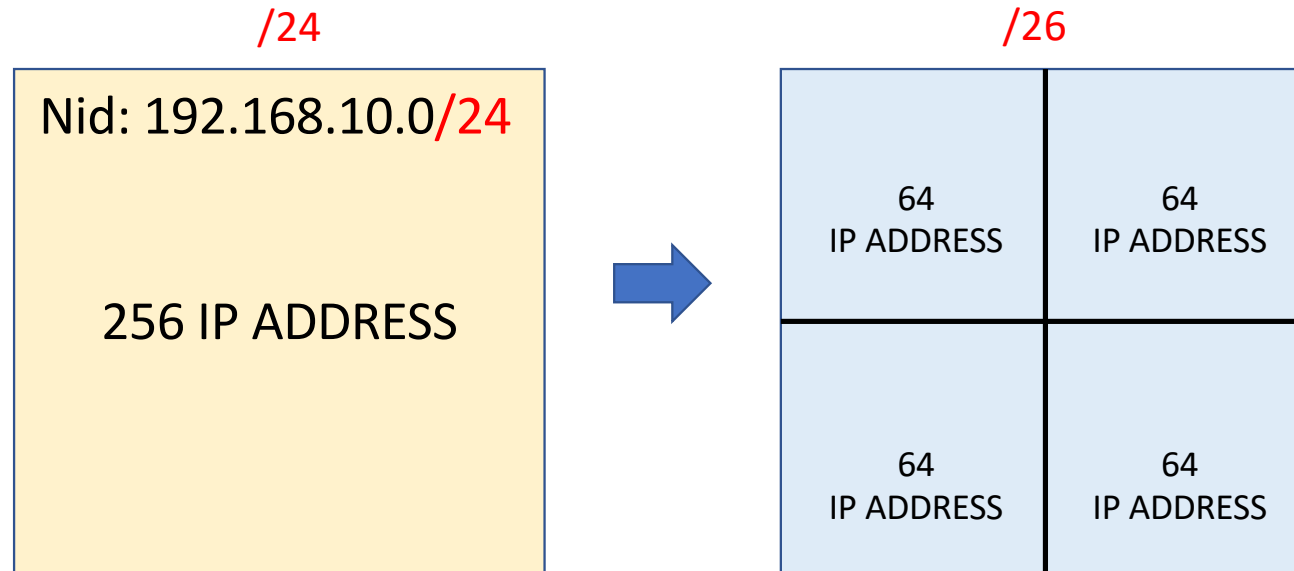
11000000 .10101000 .00001010 .10000000	192 .168 .10 .128
11000000 .10101000 .00001010 .10000001	192 .168 .10 .129
11000000 .10101000 .00001010 .10000010	192 .168 .10 .130
...	...
...	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

128 IP Address

# How to Subnetting



# How to Subnetting



• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000
11000000 .10101000 .00001010 .00000001
11000000 .10101000 .00001010 .00000010
11000000 .10101000 .00001010 .00000011
11000000 .10101000 .00001010 .00000100
11000000 .10101000 .00001010 .00000101
11000000 .10101000 .00001010 .00000110
...
...
...
...
...
...
...
11000000 .10101000 .00001010 .11111110
11000000 .10101000 .00001010 .11111111

192 .168 .10 .0
192 .168 .10 .1
192 .168 .10 .2
192 .168 .10 .3
192 .168 .10 .4
192 .168 .10 .5
192 .168 .10 .6
...
...
...
...
...
...
192 .168 .10 .254
192 .168 .10 .255

256 IP Address

Network : 192.168.10.0/26

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
--	-----------------

• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
....	...
....	...
....	...
....	...
....	...
....	...
....	...
....	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address



Network : 192.168.10.0/26

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
....	...
11000000 .10101000 .00001010 .00111110	192 .168 .10 .62
11000000 .10101000 .00001010 .00111111	192 .168 .10 .63

64 IP Address

• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
....	...
....	...
....	...
....	...
....	...
....	...
....	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address

Network : 192.168.10.0/26

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
....	...
11000000 .10101000 .00001010 .00111110	192 .168 .10 .62
11000000 .10101000 .00001010 .00111111	192 .168 .10 .63

64 IP Address

Network : 192.168.10.64/26

11000000 .10101000 .00001010 .01000000	192 .168 .10 .64
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• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
....	...
....	...
....	...
....	...
....	...
....	...
....	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255



256 IP Address

Network : 192.168.10.0/26

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
....	...
11000000 .10101000 .00001010 .00111110	192 .168 .10 .62
11000000 .10101000 .00001010 .00111111	192 .168 .10 .63

64 IP Address

Network : 192.168.10.64/26

11000000 .10101000 .00001010 .01000000	192 .168 .10 .64
11000000 .10101000 .00001010 .01000001	192 .168 .10 .65
....	...
11000000 .10101000 .00001010 .01111110	192 .168 .10 .126
11000000 .10101000 .00001010 .01111111	192 .168 .10 .127

64 IP Address

• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
....	...
....	...
....	...
....	...
....	...
....	...
....	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address

Network : 192.168.10.0/26

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
....	...
11000000 .10101000 .00001010 .00111110	192 .168 .10 .62
11000000 .10101000 .00001010 .00111111	192 .168 .10 .63

64 IP Address

Network : 192.168.10.64/26

11000000 .10101000 .00001010 .01000000	192 .168 .10 .64
11000000 .10101000 .00001010 .01000001	192 .168 .10 .65
....	...
11000000 .10101000 .00001010 .01111110	192 .168 .10 .126
11000000 .10101000 .00001010 .01111111	192 .168 .10 .127

64 IP Address

Network : 192.168.10.128/26

11000000 .10101000 .00001010 .10000000	192 .168 .10 .128
11000000 .10101000 .00001010 .10000001	192 .168 .10 .129
....	...
11000000 .10101000 .00001010 .10111110	192 .168 .10 .190
11000000 .10101000 .00001010 .10111111	192 .168 .10 .191

64 IP Address



• 192.168.10.0/24

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2
11000000 .10101000 .00001010 .00000011	192 .168 .10 .3
11000000 .10101000 .00001010 .00000100	192 .168 .10 .4
11000000 .10101000 .00001010 .00000101	192 .168 .10 .5
11000000 .10101000 .00001010 .00000110	192 .168 .10 .6
....	...
....	...
....	...
....	...
....	...
....	...
....	...
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255

256 IP Address

Network : 192.168.10.0/26

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0	64 IP Address
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1	
....	...	
11000000 .10101000 .00001010 .00111110	192 .168 .10 .62	
11000000 .10101000 .00001010 .00111111	192 .168 .10 .63	

Network : 192.168.10.64/26

11000000 .10101000 .00001010 .01000000	192 .168 .10 .64	64 IP Address
11000000 .10101000 .00001010 .01000001	192 .168 .10 .65	
....	...	
11000000 .10101000 .00001010 .01111110	192 .168 .10 .126	
11000000 .10101000 .00001010 .01111111	192 .168 .10 .127	

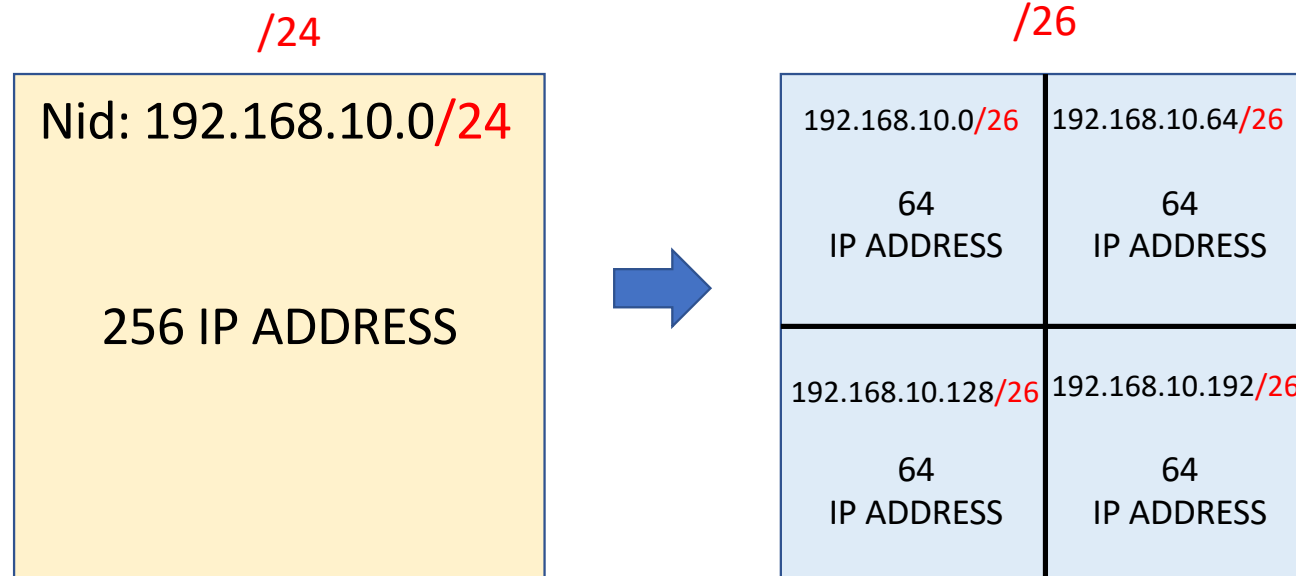
Network : 192.168.10.128/26

11000000 .10101000 .00001010 .10000000	192 .168 .10 .128	64 IP Address
11000000 .10101000 .00001010 .10000001	192 .168 .10 .129	
....	...	
11000000 .10101000 .00001010 .10111110	192 .168 .10 .190	
11000000 .10101000 .00001010 .10111111	192 .168 .10 .191	

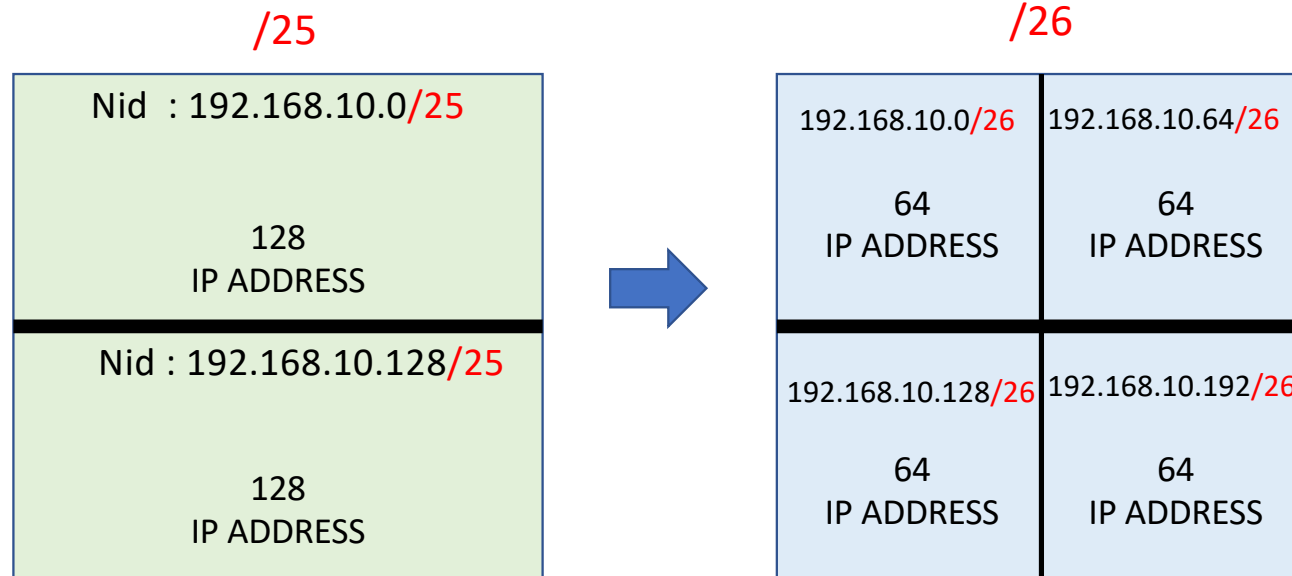
Network : 192.168.10.192/26

11000000 .10101000 .00001010 .11000000	192 .168 .10 .192	64 IP Address
11000000 .10101000 .00001010 .11000001	192 .168 .10 .193	
....	...	
11000000 .10101000 .00001010 .11111110	192 .168 .10 .254	
11000000 .10101000 .00001010 .11111111	192 .168 .10 .255	

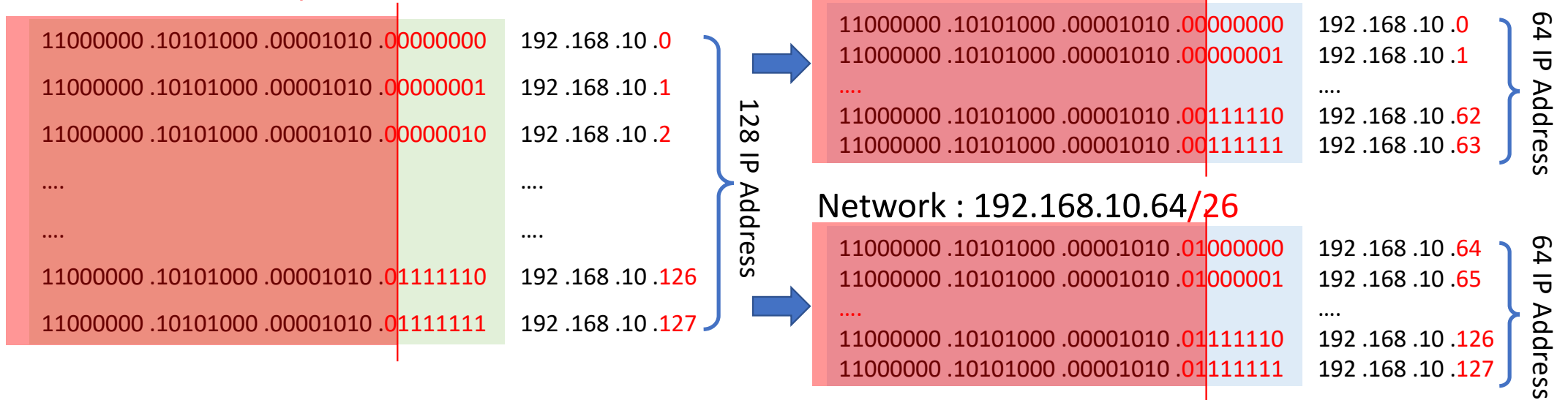
# How to Subnetting



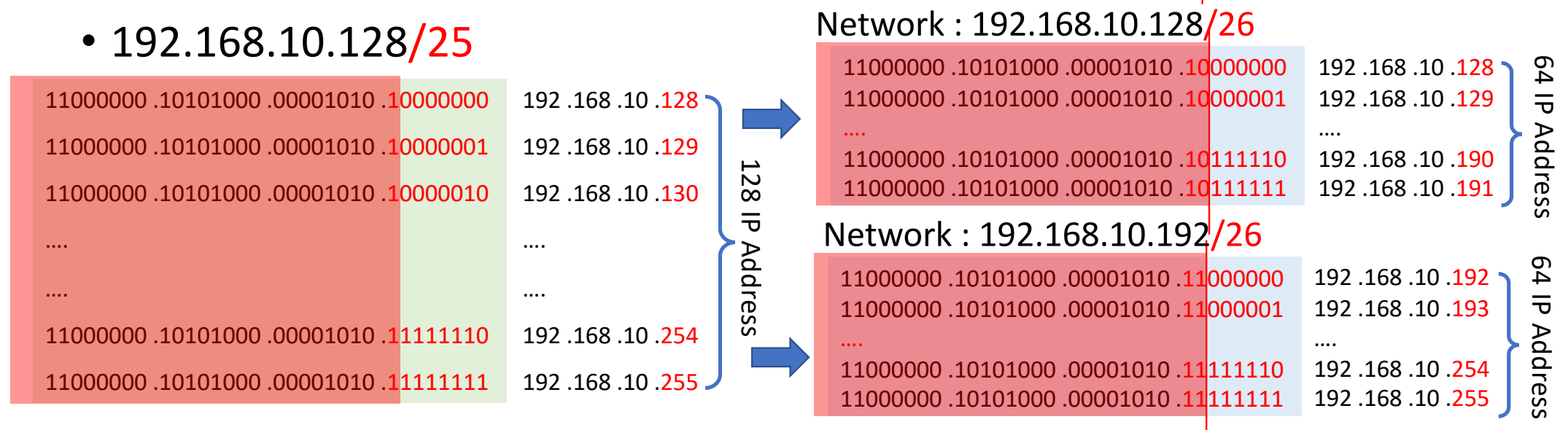
# How to Subnetting



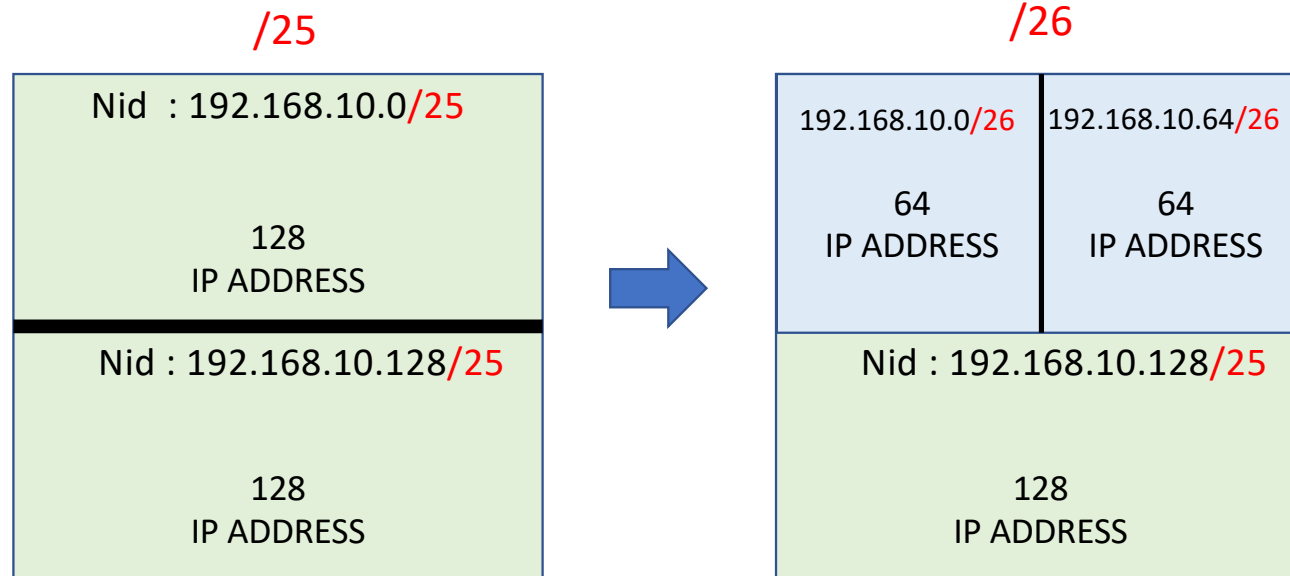
- 192.168.10.0/25



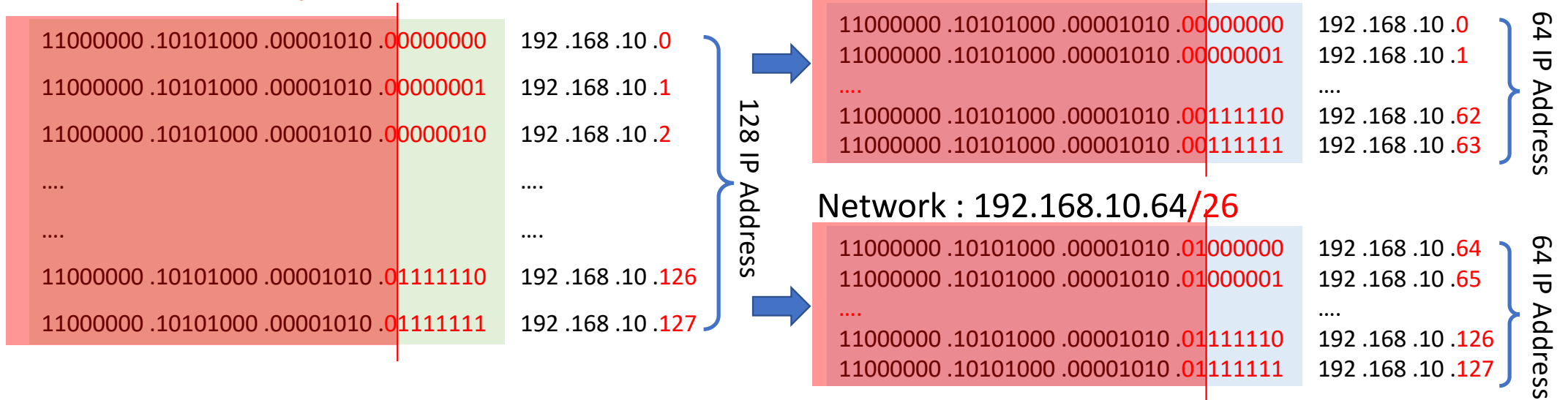
- 192.168.10.128/25



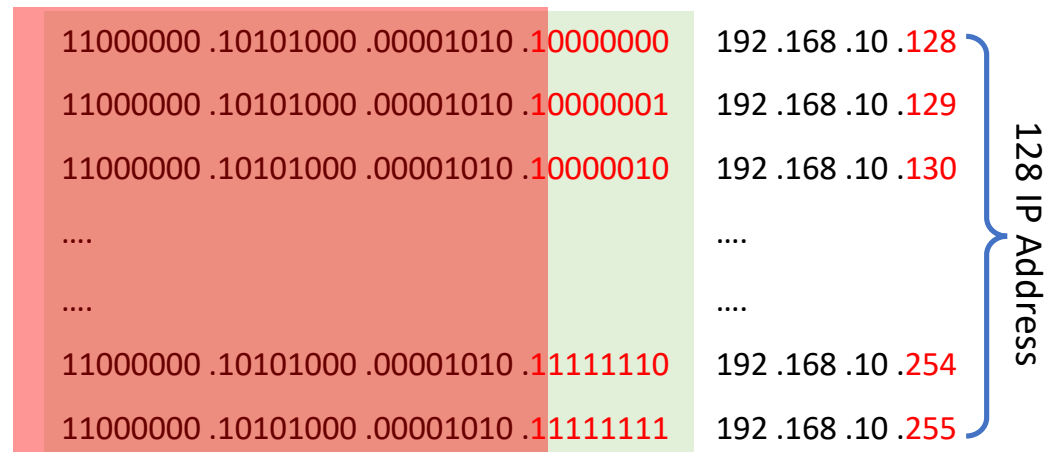
# How to Subnetting



- 192.168.10.0/25



- 192.168.10.128/25



/24

Nid: 192.168.10.0/24

256 IP ADDRESS



/25

Nid : 192.168.10.0/25

128  
IP ADDRESS

Nid : 192.168.10.128/25

128  
IP ADDRESS



/26

192.168.10.0/26

64  
IP ADDRESS

192.168.10.64/26

64  
IP ADDRESS

192.168.10.128/26

64  
IP ADDRESS

192.168.10.192/26

64  
IP ADDRESS

/27

192.168.10.0/27

32  
IP ADDRESS

192.168.10.32/27

32  
IP ADDRESS

192.168.10.64/27

32  
IP ADDRESS

192.168.10.96/27

32  
IP ADDRESS

192.168.10.128/27

32  
IP ADDRESS

192.168.10.160/27

32  
IP ADDRESS

192.168.10.192/27

32  
IP ADDRESS

192.168.10.224/27

32  
IP ADDRESS



/28

....0/28

16  
IP Address

....16/28

16  
IP Address

..32/28

16  
IP Address

....48/28

16  
IP Address

....64/28

16  
IP Address

....80/28

16  
IP Address

....92/28

16  
IP Address

..112/28

16  
IP Address

....128/28

16  
IP Address

..144/28

16  
IP Address

....160/28

16  
IP Address

....176/28

16  
IP Address

..192/28

16  
IP Address

..208/28

16  
IP Address

...224/28

16  
IP Address

...240/28

16  
IP Address



/29

....0/29

8  
IP Addresses each

# How to Subnetting

Network ID : 192.168.10.0/24

ต้องการแบ่ง subnet สำหรับ

50 hosts

25 hosts

10 hosts

แต่ละ subnet มี

1. Network ID = ?

2. Host Range = ?

3. Number of hosts = ?



# How to Subnetting

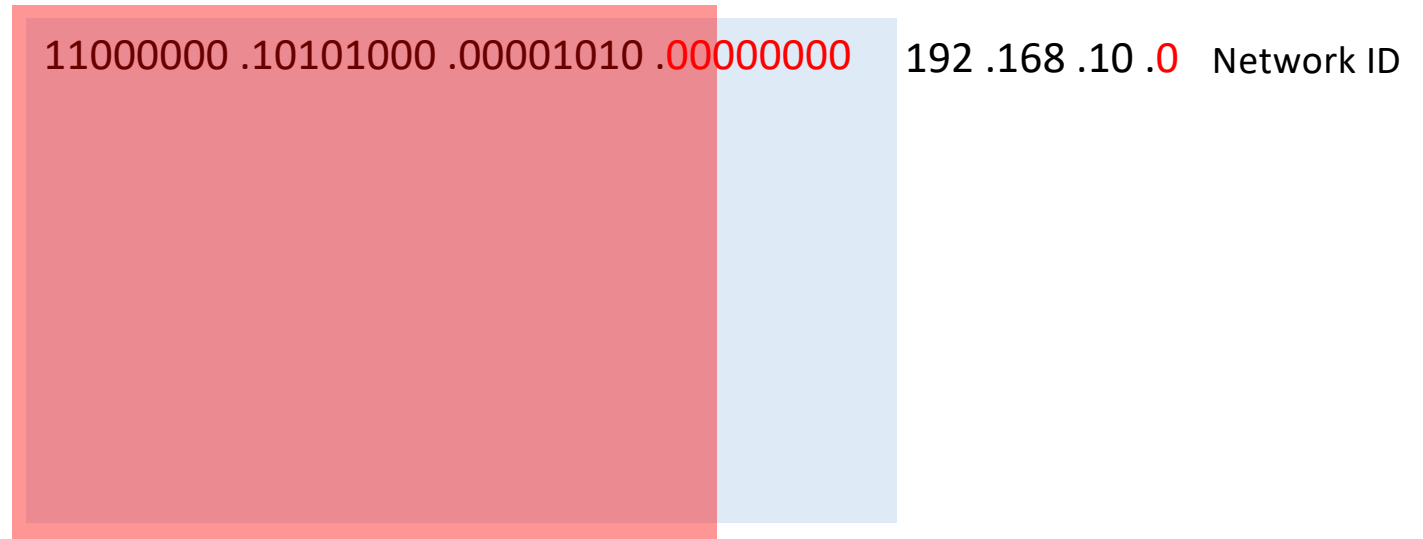
- 50 hosts

192.168.10.0/26 64 IP ADDRESS	192.168.10.64/26 64 IP ADDRESS
192.168.10.128/26 64 IP ADDRESS	192.168.10.192/26 64 IP ADDRESS

subnet 1

1. Network ID = ?
2. Host Range = ?
3. Number of hosts = ?

IP Address : 192.168.10.0



# How to Subnetting

IP Address : 192.168.10.0

- 50 hosts

192.168.10.0/26	192.168.10.64/26
64 IP ADDRESS	64 IP ADDRESS
192.168.10.128/26	192.168.10.192/26
64 IP ADDRESS	64 IP ADDRESS

11000000 .10101000 .00001010 .00000000	192 .168 .10 .0	Network ID
11000000 .10101000 .00001010 .00000001	192 .168 .10 .1	62 Hosts
11000000 .10101000 .00001010 .00000010	192 .168 .10 .2	
....	...	
....	...	
11000000 .10101000 .00001010 .00111101	192 .168 .10 .61	
11000000 .10101000 .00001010 .00111110	192 .168 .10 .62	
11000000 .10101000 .00001010 .00111111	192 .168 .10 .63	Broadcast ID

subnet 1

1. Network ID = 192.168.10.0/26
2. Host Range = 192.168.10.1 – 192.168.10.62
3. Number of hosts = 62

# How to Subnetting

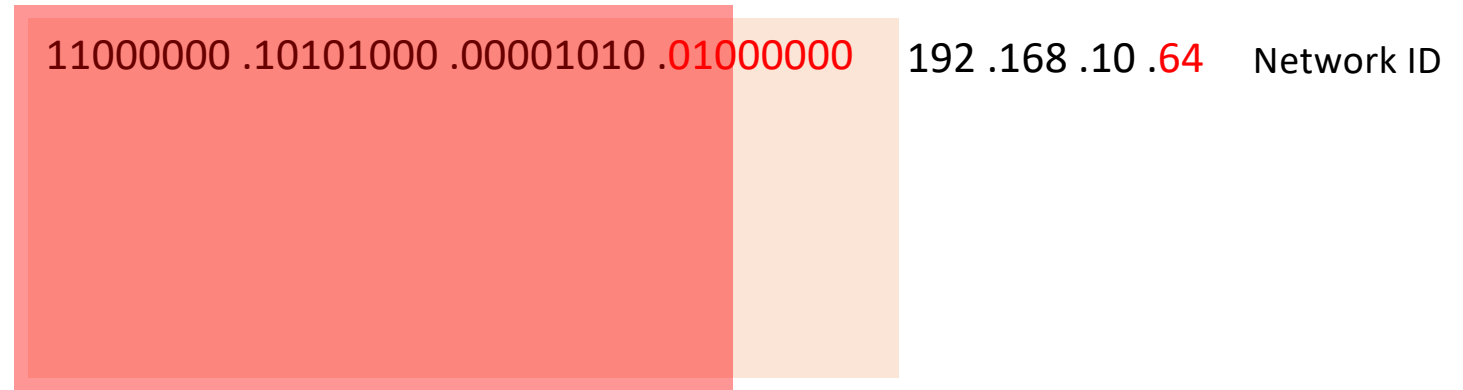
<del>192.168.10.0/26</del> 50 Host	192.168.10.64/27 32 IP ADDRESS
	192.168.10.96/27 32 IP ADDRESS
192.168.10.128/26 64 IP ADDRESS	192.168.10.192/26 64 IP ADDRESS

# How to Subnetting

IP Address : 192.168.10.0

- 25 hosts

<del>192.168.10.0/26</del> 50 Host	192.168.10.64/27 32 IP ADDRESS
	192.168.10.96/27 32 IP ADDRESS
192.168.10.128/26 64 IP ADDRESS	192.168.10.192/26 64 IP ADDRESS



subnet 11

1. Network ID = ?
2. Host Range = ?
3. Number of hosts = ?

# How to Subnetting

IP Address : 192.168.10.0

- 25 hosts

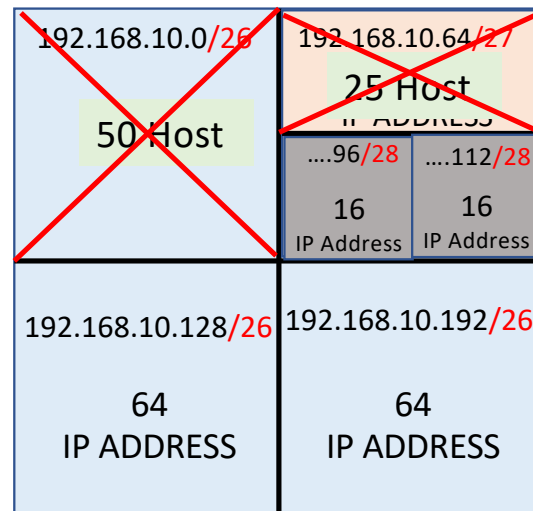
<del>192.168.10.0/26</del> <div>50 Host</div>	192.168.10.64/27 32 IP ADDRESS <hr/> 192.168.10.96/27 32 IP ADDRESS
192.168.10.128/26 64 IP ADDRESS	192.168.10.192/26 64 IP ADDRESS

11000000 .10101000 .00001010 .01000000	192 .168 .10 .64	Network ID
11000000 .10101000 .00001010 .01000001	192 .168 .10 .65	} 30 Hosts
....	...	
....	...	
11000000 .10101000 .00001010 .01011110	192 .168 .10 .94	
11000000 .10101000 .00001010 .01011111	192 .168 .10 .95	Broadcast ID

subnet ၁၆

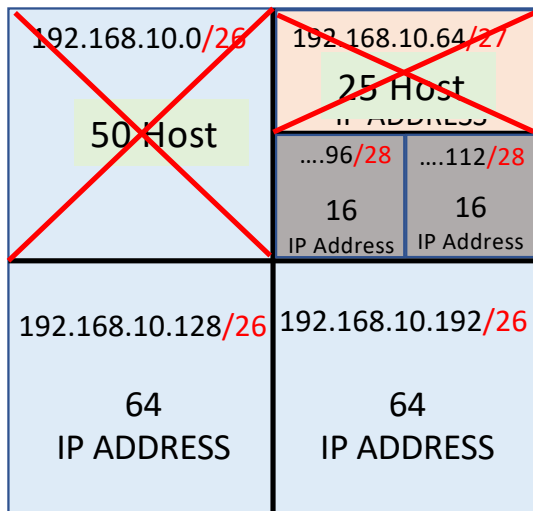
1. Network ID = 192.168.10.64/27
2. Host Range = 192.168.10.65 – 192.168.10.94
3. Number of hosts = 30

# How to Subnetting

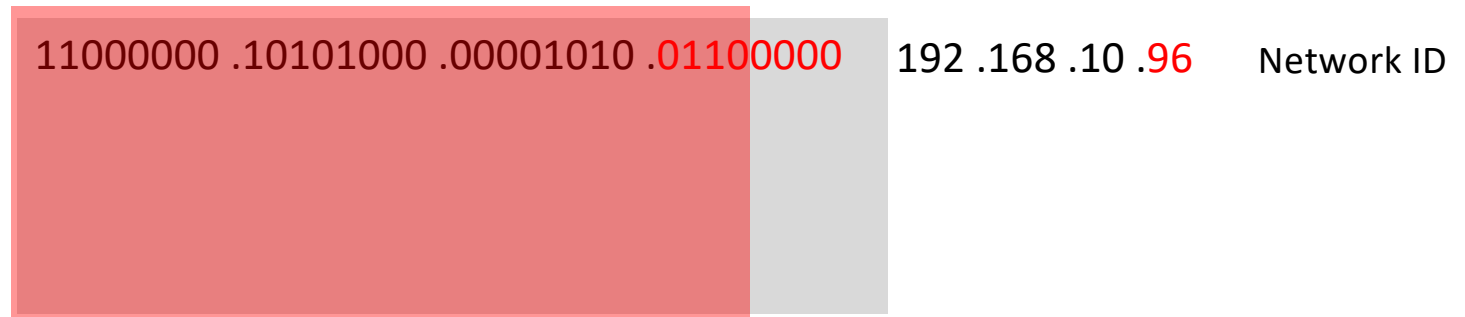


# How to Subnetting

- 10 hosts



IP Address : 192.168.10.0



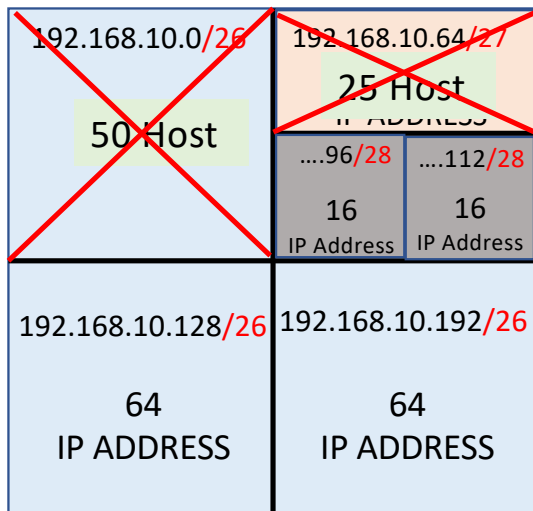
subnet 11

1. Network ID = ?
2. Host Range = ?
3. Number of hosts = ?

# How to Subnetting

IP Address : 192.168.10.0

- 10 hosts



```

11000000 .10101000 .00001010 .01100000
11000000 .10101000 .00001010 .01100001
....
11000000 .10101000 .00001010 .01101110
11000000 .10101000 .00001010 .01101111
    
```

```

192 .168 .10 .96      Network ID
192 .168 .10 .97      } 14 Hosts
....
192 .168 .10 .110
192 .168 .10 .111     Broadcast ID
    
```

subnet 11

1. Network ID = 192.168.10.96/28
2. Host Range = 192.168.10.97 – 192.168.10.110
3. Number of hosts = 14



# How to Subnetting

Network ID : 192.168.10.0/24

ต้องการแบ่ง subnet สำหรับ

## 50 hosts

- Network ID = 192.168.10.0/26
- Host Range = 192.168.10.1 – 192.168.10.62
- Number of hosts = 62

## 25 hosts

- Network ID = 192.168.10.64/27
- Host Range = 192.168.10.65 – 192.168.10.94
- Number of hosts = 30

## 10 hosts

- Network ID = 192.168.10.96/28
- Host Range = 192.168.10.97 – 192.168.10.110
- Number of hosts = 14

