CISCO CCNA1

CCNA Routing and Switching: Introduction to Networks

HOOFDSTUK 8

Subnetting IP networks

DE HOGESCHOOL
MET HET NETWERK

Hogeschool PXL – Elfde-Liniestraat 24 – B-3500 Hasselt
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CCNA1 - Overzicht

- OSI model en de belangrijkste (LAN) protocollen.
- Data Flow in een LAN
  (verklaring volgens het OSI model).
- IP en **subnetting**.
- Het toepassen en onderzoeken van bovenstaande 3 in Packettrace oefeningen.

Inhoud hoofdstuk 8

8. Subnetting IP neworks

Hoofdstuk 8 handelt over het verdelen van een netwerk in subnetwerken. Voor subnetting te begrijpen is het belangrijk dat je de opbouw van een IP adres begrijpt en dat je vlot binair kan tellen.

Doelstellingen:

- De noodzaak van subnetten begrijpen (broadcast domein)
- Berekenen van het aantal geldige host in een netwerk
- Een voor opgegeven netwerk kunnen opsplitsen in verschillende subnetten (VLSM). Geef voor elk subnet het netwerkadres, broadcast adres, range en subnetmask.
- Een netwerk opgesplitst in subnets kunnen berekenen en configureren. (=packettrace oefening!)
- Het verschil kennen tussen subnetten met IPv4 en IPv6

Activity & PT:

- 8.1.4.4 Calculate the subnet mask
- 8.1.4.4 Determing the number of bits to borrow
- 8.1.4.7 PT Subnetting
- 8.1.5.6 Practicing VLSM
- 8.2.1.4 PT Designing and implementing a VLSM addressing
- 8.3.1.4 PT implementing subnetted IPv6 addressing scheme

Leertip:

De packettraceoefening 8.1.5.6 Practicing VLSM is een goede herhaling voor dit hoofdstuk.

Inhoud hoofdstuk 8

Leertip VLSM:

1. Zorg dat je vlot binair kan tellen! (tip: cisco binary game)
2. Oefen ANDing (via de netwerkmask Netwerk- en hostgedeelte berekenen)
3. prefix notatie
4. Aantal geldige host binnen een netwerk berekenen.
5. Begrijp waarom subnetten nodig is en hoe je een netwerk kan opsplitsen
6. Start met eenvoudige oefeningen (8.1.4.4)
7. Oefen VLSM (Subenetten met een variabele subnetgrootte. = PT 8.2.1.4)
8. bekijk de video van Mr. Heyns (Leermaterialen>extra)

Cisco Networking Academy
Mind Wide Open

Chapter 8:

Subnetting IP networks

Introduction to Networks v5.1

Chapter Outline

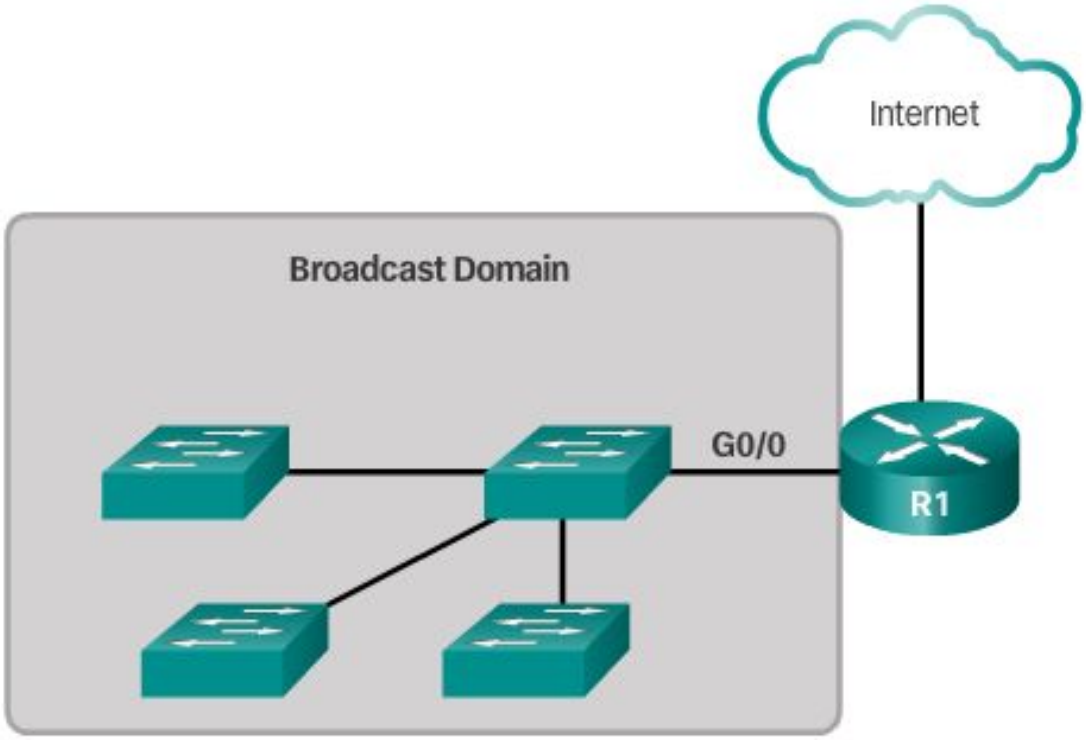
Section 8.1: Subnetting an IPv4 Network

8.1.1 Network Segmentation
8.1.2 Subnetting an IPv4 Network
8.1.3 Subnetting a /16 and a /8 Prefix
8.1.4 Subnetting to Meet Requirements

Topic 8.1.1:
Network Segmentation

8.1.1.1 Broadcast Domains

Each router interface connects a *broadcast domain* and broadcasts are only propagated within its specific broadcast domain.

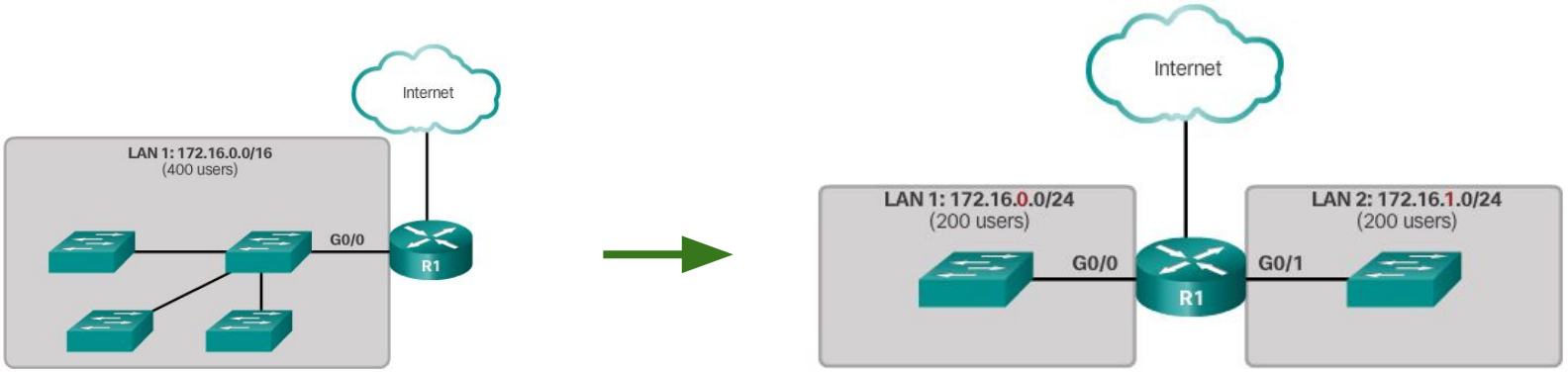


8.1.1.2 Problems with Large Broadcast Domains

PROBLEM: Large Broadcast Domains

- **Broadcast traffic** → Slow network operations
- **Broadcast packet** → Slow device operations

SOLUTION: Subnetting

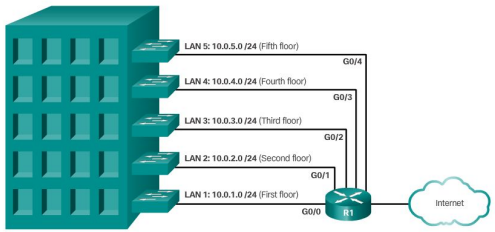


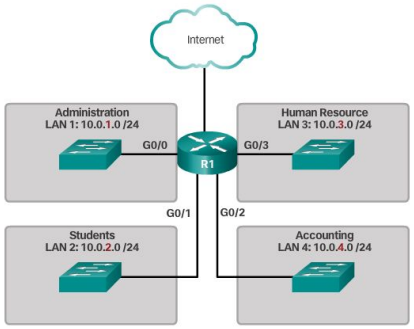
1 Broadcast domain (400 users) → subnetting → 2 Broadcast domains (2*200 users)

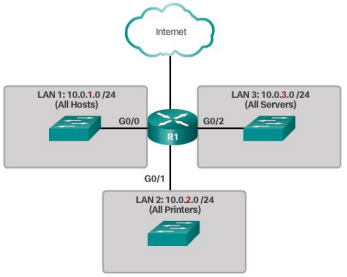
8.1.1.3 Reasons for Subnetting

Network administrators can group devices and services into subnets that are determined by:

- Location
- Organizational unit
- Device type







Topic 8.1.2:
Subnetting an IPv4 Network

8.1.2.1 Octet Boundaries

Prefix Length	Subnet Mask	Subnet Mask in Binary (n = network, h = host)	# of hosts
/8	255.0.0.0	nnnnnnnn.hhhhhhhh.hhhhhhhh.hhhhhhhh 11111111.00000000.00000000.00000000	16,777,214
/16	255.255.0.0	nnnnnnnn.nnnnnnnn.hhhhhhhh.hhhhhhhh 11111111.11111111.00000000.00000000	65,534
/24	255.255.255.0	nnnnnnnn.nnnnnnnn.nnnnnnnn.hhhhhhhh 11111111.11111111.11111111.00000000	254

Prefix = # of networkbits.
→ host bits = 32 - networkbits!

#of hosts = (2^ “hosts-bits’) - 2

/8 → (2^24) - 2 # of hosts = 16777214

/16 → (2^16) - 2 # of hosts = 65534

/24 → (2^8) - 2 # of hosts = 254

8.1.2.2 Subnetting on the Octet Boundary

Example: 10.0.0.0/8 = internal network address

→ 16.777.214 hosts in one broadcast! ⇒ **Subnet !!**

→ 10.0.0.0/16 - 10.255.0.0/16

⇒ 256 subnets

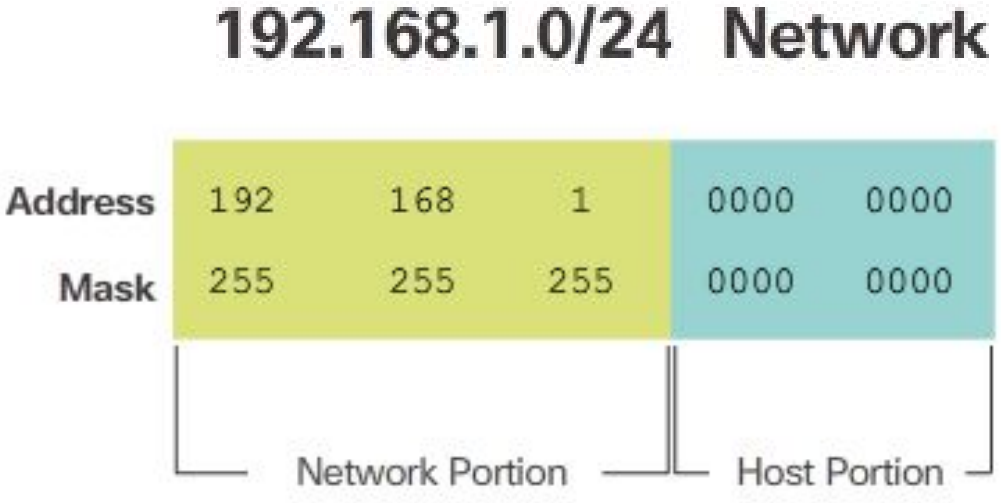
⇒ 65.534 host

Subnet Address (256 Possible Subnets)	Host Range (65,534 possible hosts per subnet)	Broadcast
10.0.0.0/16	10.0.0.1 - 10.0.255.254	10.0.255.255
10.2.0.0/16	10.2.0.1 - 10.2.255.254	10.2.255.255
10.3.0.0/16	10.3.0.1 - 10.3.255.254	10.3.255.255
10.4.0.0/16	10.4.0.1 - 10.4.255.254	10.4.255.255
...	...	...
10.255.0.0/16	10.255.0.1 - 10.255.255.254	10.255.255.255

8.1.2.3 Classless Subnetting

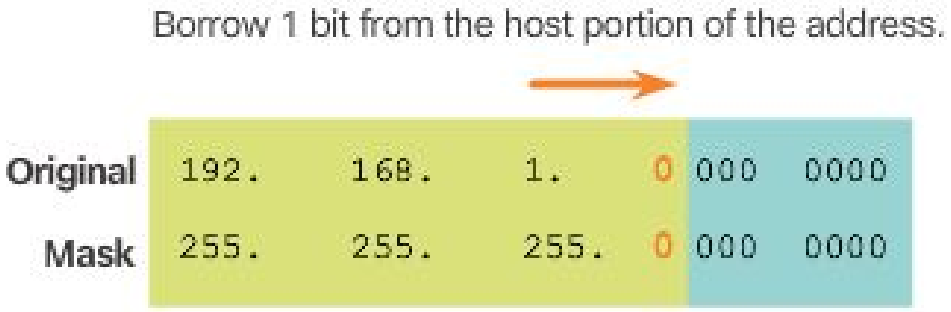
Prefix Length	Subnet Mask	Subnet Mask in Binary (n = network, h = host)	# of subnets	# of hosts
/25	255.255.255.128	nnnnnnnn.nnnnnnnn.nnnnnnnn.nhhhhhhh 11111111.11111111.11111111.10000000	2	126
/26	255.255.255.192	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnhhhhhh 11111111.11111111.11111111.11000000	4	62
/27	255.255.255.224	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnnhhhhh 11111111.11111111.11111111.11100000	8	30
/28	255.255.255.240	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnnnhhhh 11111111.11111111.11111111.11110000	16	14
/29	255.255.255.248	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnnnnhhh 11111111.11111111.11111111.11111000	32	6
/30	255.255.255.252	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnnnnnhh 11111111.11111111.11111111.11111100	64	2

8.1.2.6 Classless Subnetting Example



→ Host portion = 8 bits
⇒ #of hosts = (2^8) - 2 = 254

8.1.2.6 Classless Subnetting Example



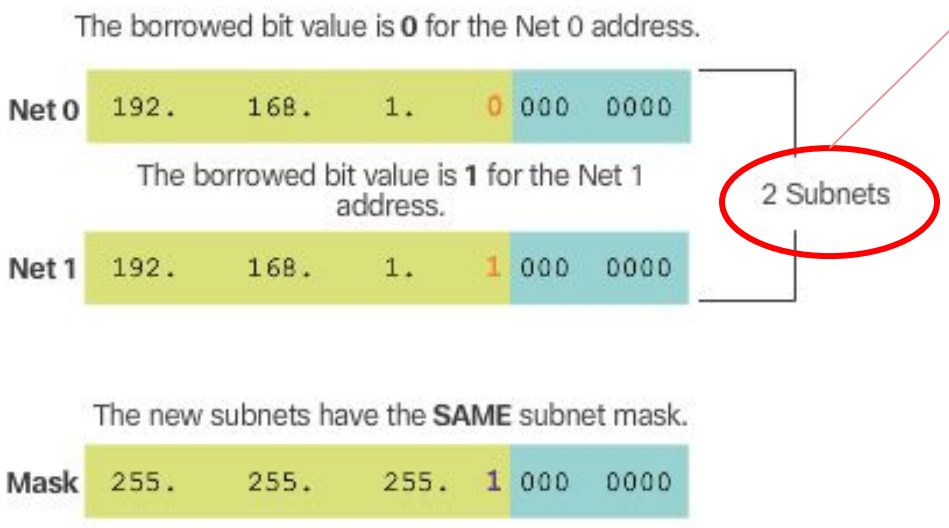
→ borrow 1 bit ⇒ 1^2 = 2 subnets

→ Host portion = 7 bits

⇒ # of hosts = (2^7) - 2 = 126

8.1.2.6 Classless Subnetting Example

1 bit borrowed → 2 subnets



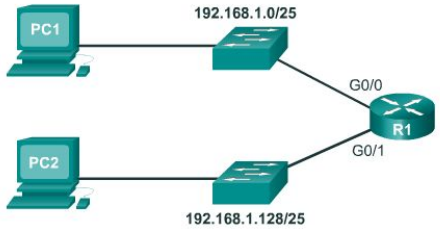
Net0: 192.168.1.0 /25

Net1: 192.168.1.128 /25

subnetmasks
255.255.255.128

8.1.2.7 Creating 2 Subnets

/25 Subnetting Topology



Address Range for 192.168.1.0/25 Subnet

Network Address

192. 168. 1. 0 000 0000 = 192.168.1.0 → hostbits all on zero

First Host Address

192. 168. 1. 0 000 0001 = 192.168.1.1 → (hostbits all on zero) + 1

Last Host Address

192. 168. 1. 0 111 1110 = 192.168.1.126 → (hostbits all on 1) - 1

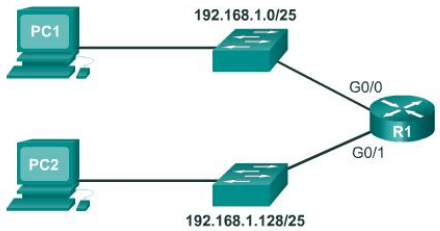
Broadcast Address

192. 168. 1. 0 111 1111 = 192.168.1.127 → hostbits all on 1

8.1.2.7 Creating 2 Subnets

Address Range for 192.168.1.128/25 Subnet

/25 Subnetting Topology



Network Address

192. 168. 1. 1 000 0000 = 192.168.1.128 → hostbits all on zero

First Host Address

192. 168. 1. 1 000 0001 = 192.168.1.129 → (hostbits all on zero) + 1

Last Host Address

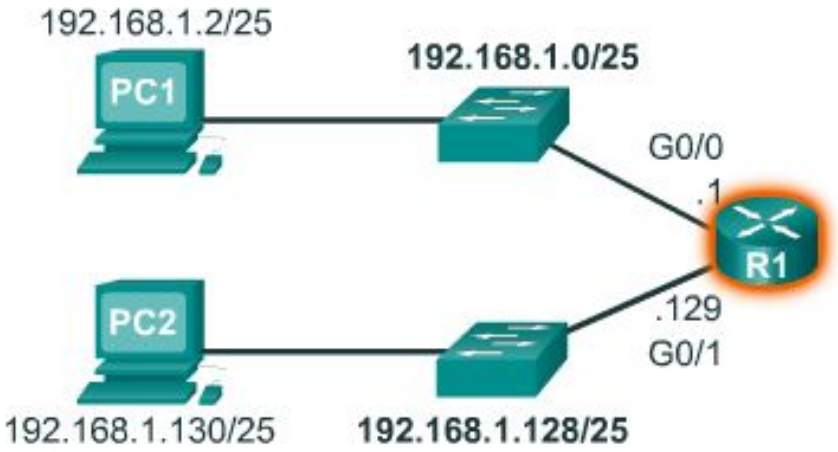
192. 168. 1. 1 111 1110 = 192.168.1.254 → (hostbits all on 1) - 1

Broadcast Address

192. 168. 1. 1 111 1111 = 192.168.1.255 → hostbits all on 1

8.1.2.7 Creating 2 Subnets (cont.)

Configure R1 Gigabit Interfaces




```
R1(config)#interface gigabitethernet 0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.128
R1(config-if)#exit
R1(config)#interface gigabitethernet 0/1
R1(config-if)#ip address 192.168.1.129 255.255.255.128
```

8.1.2.9 Subnetting Formulas

To calculate the number of subnets.

2^n

n= bits borrowed

To calculate the number of hosts.

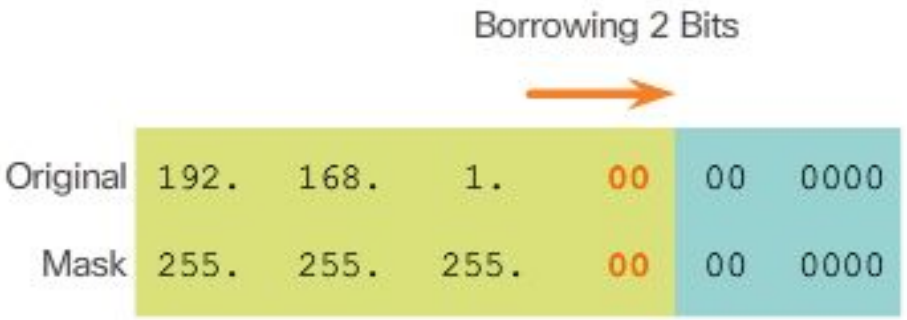
2^n-2

n= the number of bits remaining in the host field

8.1.2.10 Creating 3 Subnets

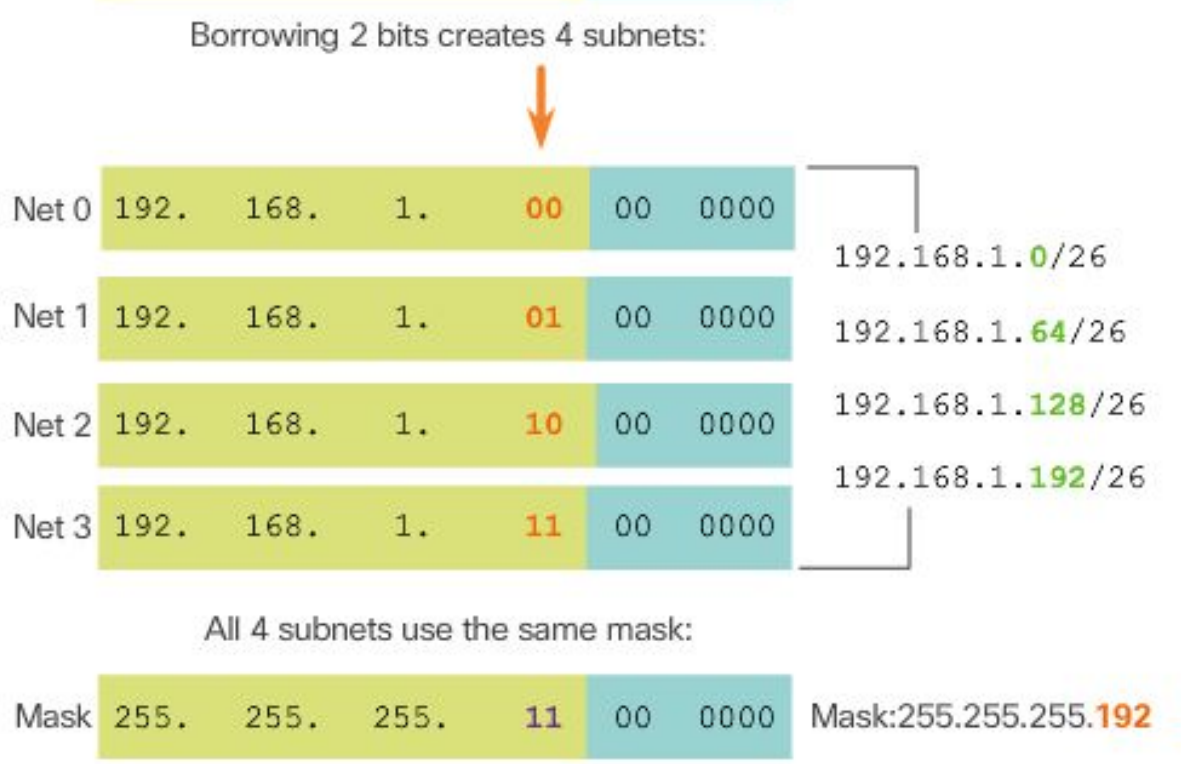
Example: 192.168.1.0/24 → 3 subnets !

Borrowing 2 Bits



→ 2^2 = 4 subnets

8.1.2.10 Creating 3 Subnets (cont.)



8.1.2.10 Creating 3 Subnets (cont.)

Address Range for 192.168.1.0/26 Subnet

Network Address

192.	168.	1.	00	00	0000	= 192.168.1.0

First Host Address

192.	168.	1.	00	00	0001	= 192.168.1.1

Last Host Address

192.	168.	1.	00	11	1110	= 192.168.1.62

Broadcast Address

192.	168.	1.	00	11	1111	= 192.168.1.63

# of hosts =
(2^6) -2 = 62

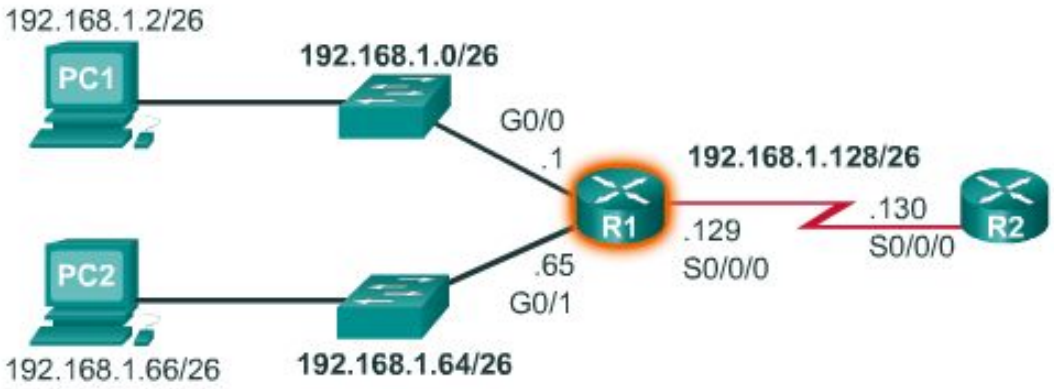
8.1.2.10 Creating 3 Subnets (cont.)

Address Ranges Nets 0 - 2

Net 0	Network	192.	168.	1.	00	00	0000	192.168.1.0
	First	192.	168.	1.	00	00	0001	192.168.1.1
	Last	192.	168.	1.	00	11	1110	192.168.1.62
	Broadcast	192.	168.	1.	00	11	1111	192.168.1.63
Net 1	Network	192.	168.	1.	01	00	0000	192.168.1.64
	First	192.	168.	1.	01	00	0001	192.168.1.65
	Last	192.	168.	1.	01	11	1110	192.168.1.126
	Broadcast	192.	168.	1.	01	11	1111	192.168.1.127
Net 2	Network	192.	168.	1.	10	00	0000	192.168.1.128
	First	192.	168.	1.	10	00	0001	192.168.1.129
	Last	192.	168.	1.	10	11	1110	192.168.1.190
	Broadcast	192.	168.	1.	10	11	1111	192.168.1.191

8.1.2.10 Creating 3 Subnets (cont.)

Configuring the Interfaces with /26 Addresses




```
R1(config)#interface gigabitethernet 0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.192
R1(config-if)#exit
R1(config)#interface gigabitethernet 0/1
R1(config-if)#ip address 192.168.1.65 255.255.255.192
R1(config-if)#exit
R1(config)#interface serial 0/0/0
R1(config-if)#ip address 192.168.1.129 255.255.255.192
```

Topic 8.1.3:
Subnetting a /16 and a /8 Prefix

8.1.3.1 Creating Subnets with a /16 prefix

Prefix Length	Subnet Mask	Network Address (n = network, h = host)	# of subnets	# of hosts
/17	255.255.128.0	nnnnnnnn.nnnnnnnn.nhhhhhhh.hhhhhhhh 11111111.11111111.10000000.00000000	2	32564
/18	255.255.192.0	nnnnnnnn.nnnnnnnn.nnhhhhhh.hhhhhhhh 11111111.11111111.11000000.00000000	4	16282
/25	255.255.255.128	nnnnnnnn.nnnnnnnn.nnnnnnnn.nhhhhhhh 11111111.11111111.11111111.10000000	512	126
/26	255.255.255.192	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnhhhhhh 11111111.11111111.11111111.11000000	1024	62
/27	255.255.255.224	nnnnnnnn.nnnnnnnn.nnnnnnnn.nnnhhhhh 11111111.11111111.11111111.11100000	2048	30

8.1.3.2 Creating 100 Subnets with a /16 Network

Network:

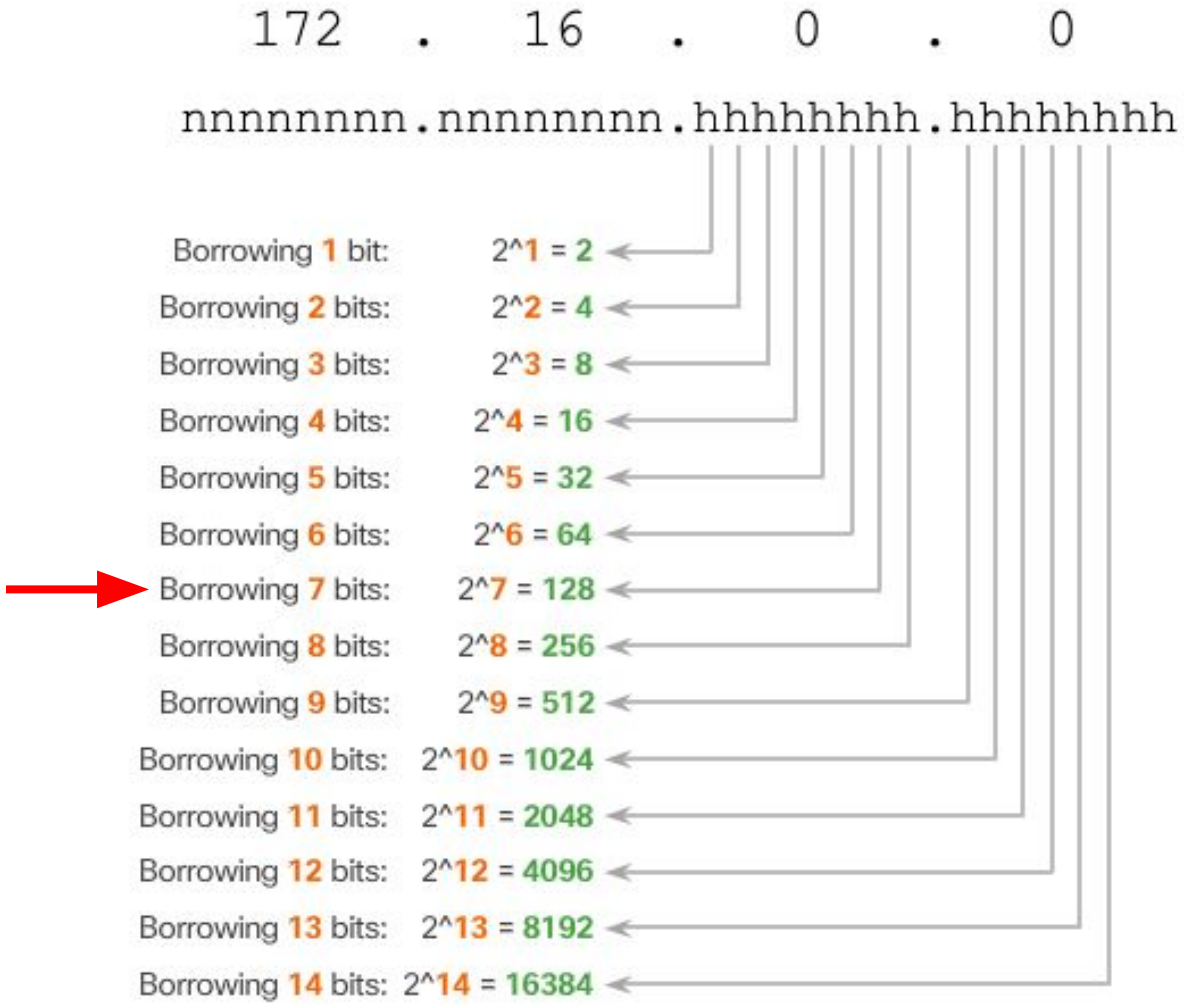
```
172   .   16   .   0   .   0
nnnnnnnn.nnnnnnnn.hhhhhhhh.hhhhhhhh
```

Question: how to create 100 subnets??

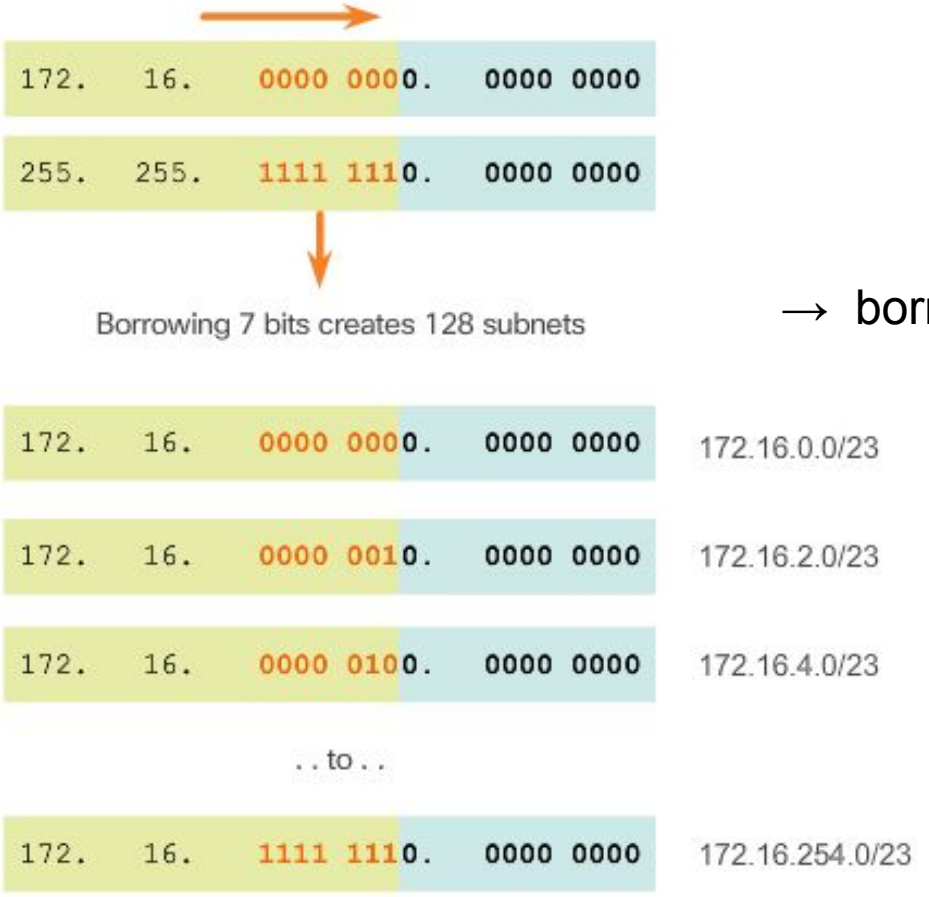
→ How many bits to borrow to create 100 subnets?

→ nr of subnets = 2 ^ borrowed bits

8.1.3.2 Creating 100 Subnets with a /16 Network



8.1.3.2 Creating 100 Subnets with a /16 Network



→ borrowing 7 bits → /23 network

8.1.3.3 Calculating the Hosts

Address Range for 172.16.0.0/23 Subnet

Network Address

172. 16. 00 00 00 00. 0000 0000 = 172.16.0.0/23

First Host Address

172. 16. 00 00 00 00. 0000 0001 = 172.16.0.1/23

Last Host Address

172. 16. 00 00 00 01. 1111 1110 = 172.16.1.254/23

Broadcast Address

172. 16. 00 00 00 01. 1111 1111 = 172.16.1.255/23

9 bits remain in host field

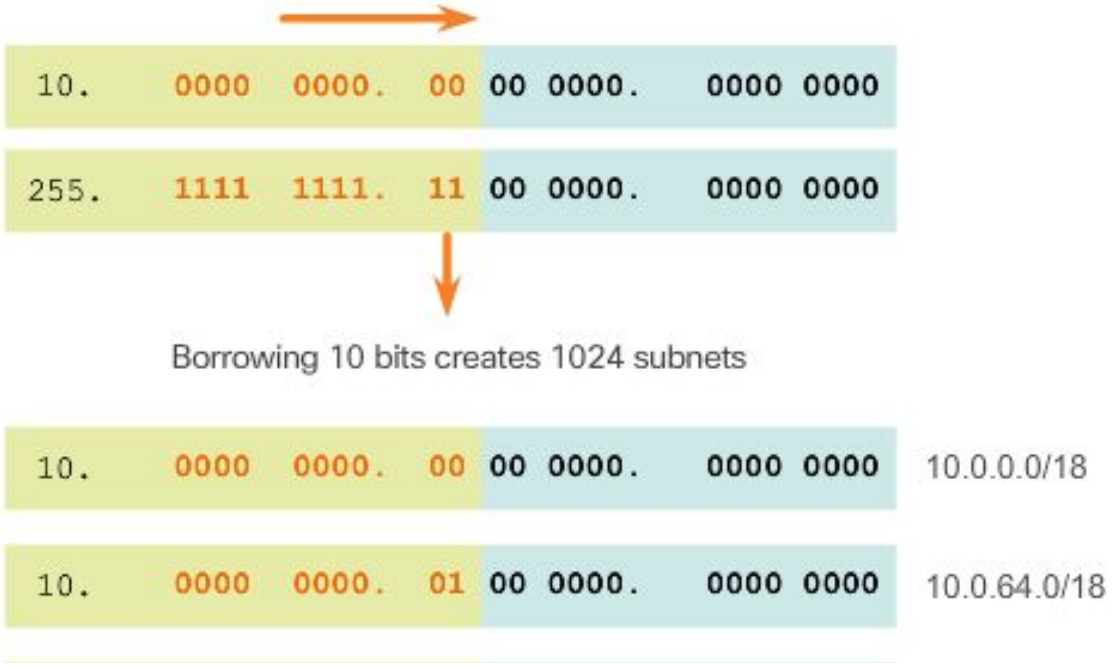
2^9 = 512 hosts per subnet
2^9 – 2 = 510 valid hosts per subnet

8.1.3.5 Creating 1000 Subnets with a /8 Network

Question: how to create 1000 subnets !!

How many bits to borrow to create 100 subnets?

→ nr of subnets = 2 ^ borrowed bits



8.1.3.5 Creating 1000 Subnets with a /8 Network

Address Range for 10.0.0.0/18 Subnet

Network Address

10. 00 00 00 00. 0000 0000. 0000 0000 = 10.0.0.0/18

First Host Address

10. 00 00 00 00. 0000 0000. 0000 0001 = 10.0.0.1/18

Last Host Address

10. 00 00 00 00. 0011 1111. 1111 1110 = 10.0.63.254/18

Broadcast Address

10. 00 00 00 00. 0011 1111. 1111 1111 = 10.0.63.255/18

14 bits remain in host field

2^14 = 16384 hosts per subnet
2^14 - 2 = 16382 valid hosts per subnet

Topic 8.1.4:
Subnetting to Meet Requirements

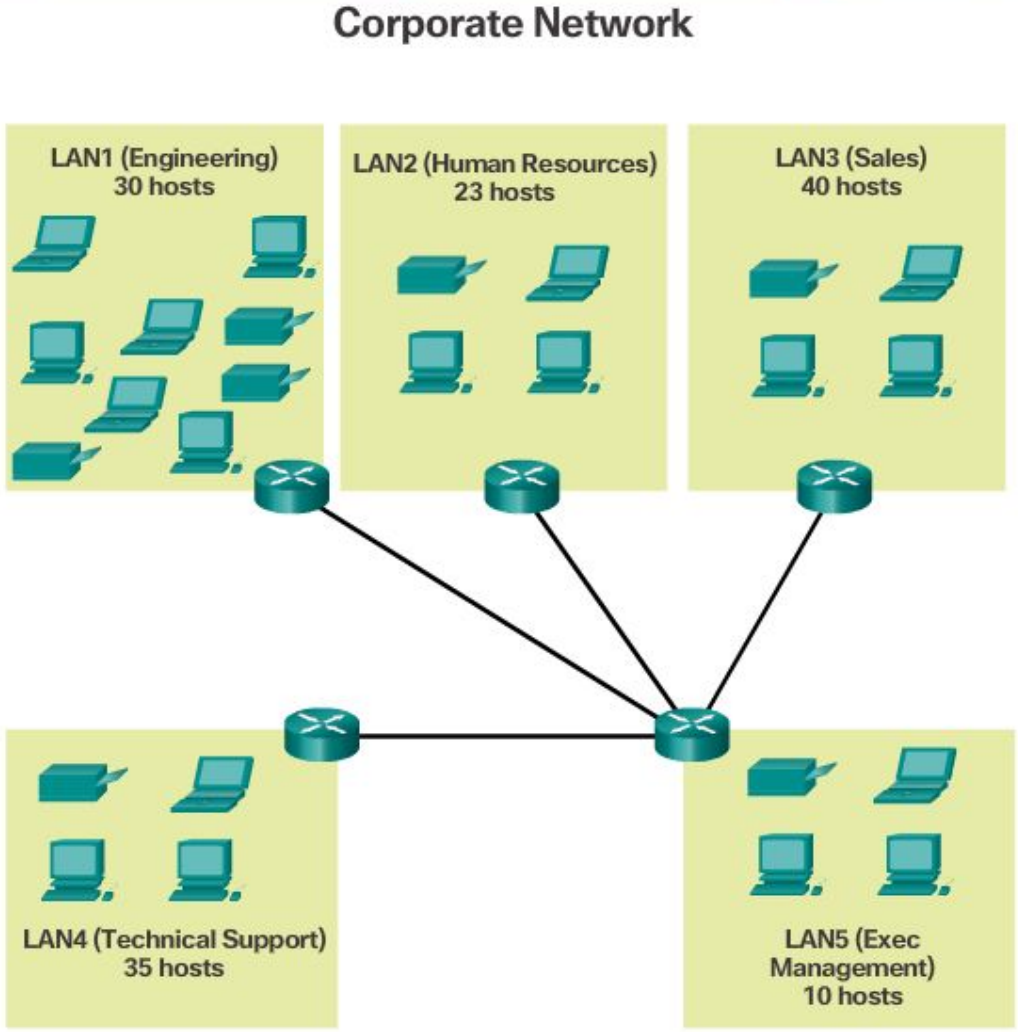
8.1.4.1 Subnetting Based on Host Requirements

Two considerations when planning subnets:

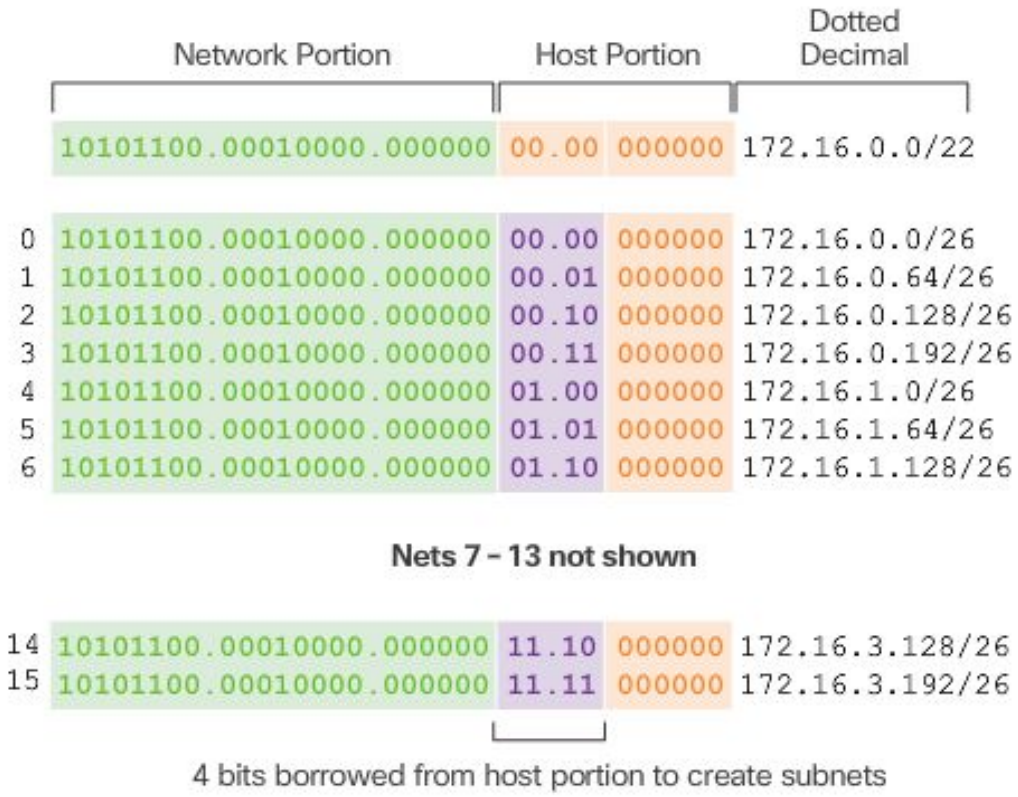
- The number of host addresses required for each network.
- The number of individual subnets needed.

The more bits borrowed to create subnets, the fewer host bits available.

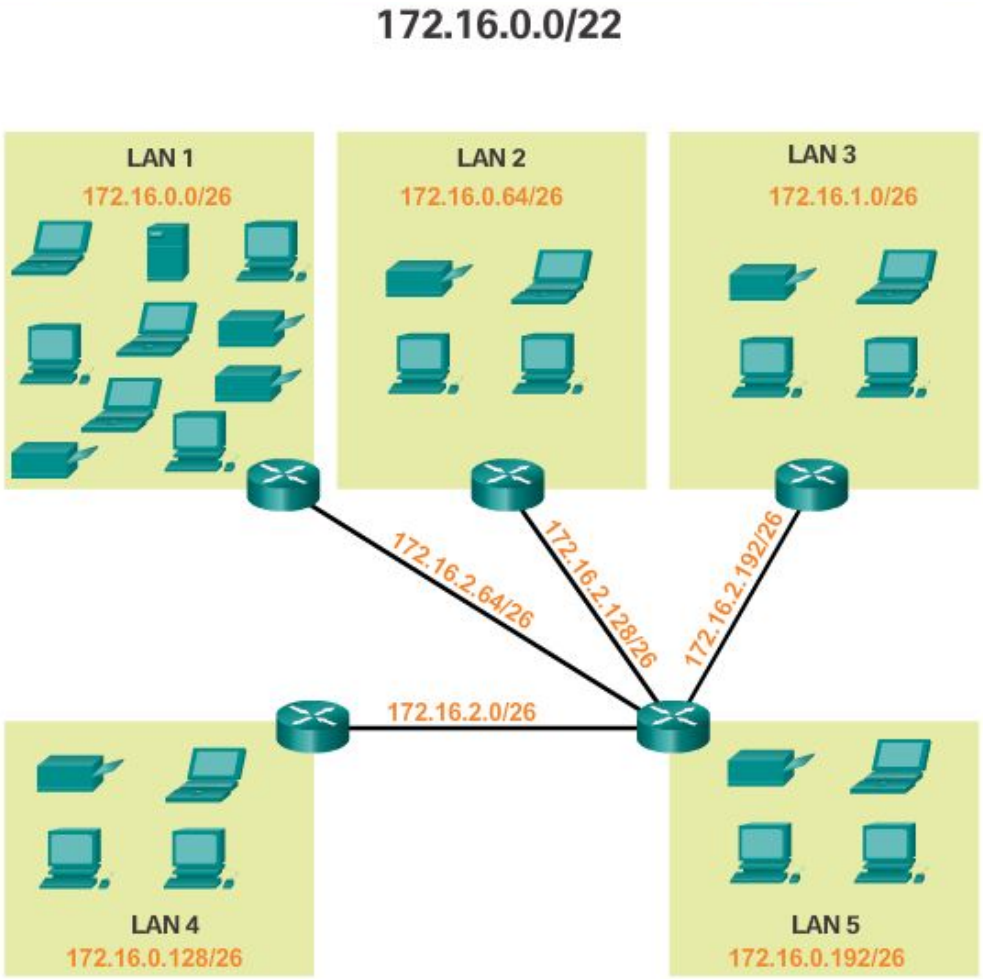
8.1.4.3 Network Requirement Example



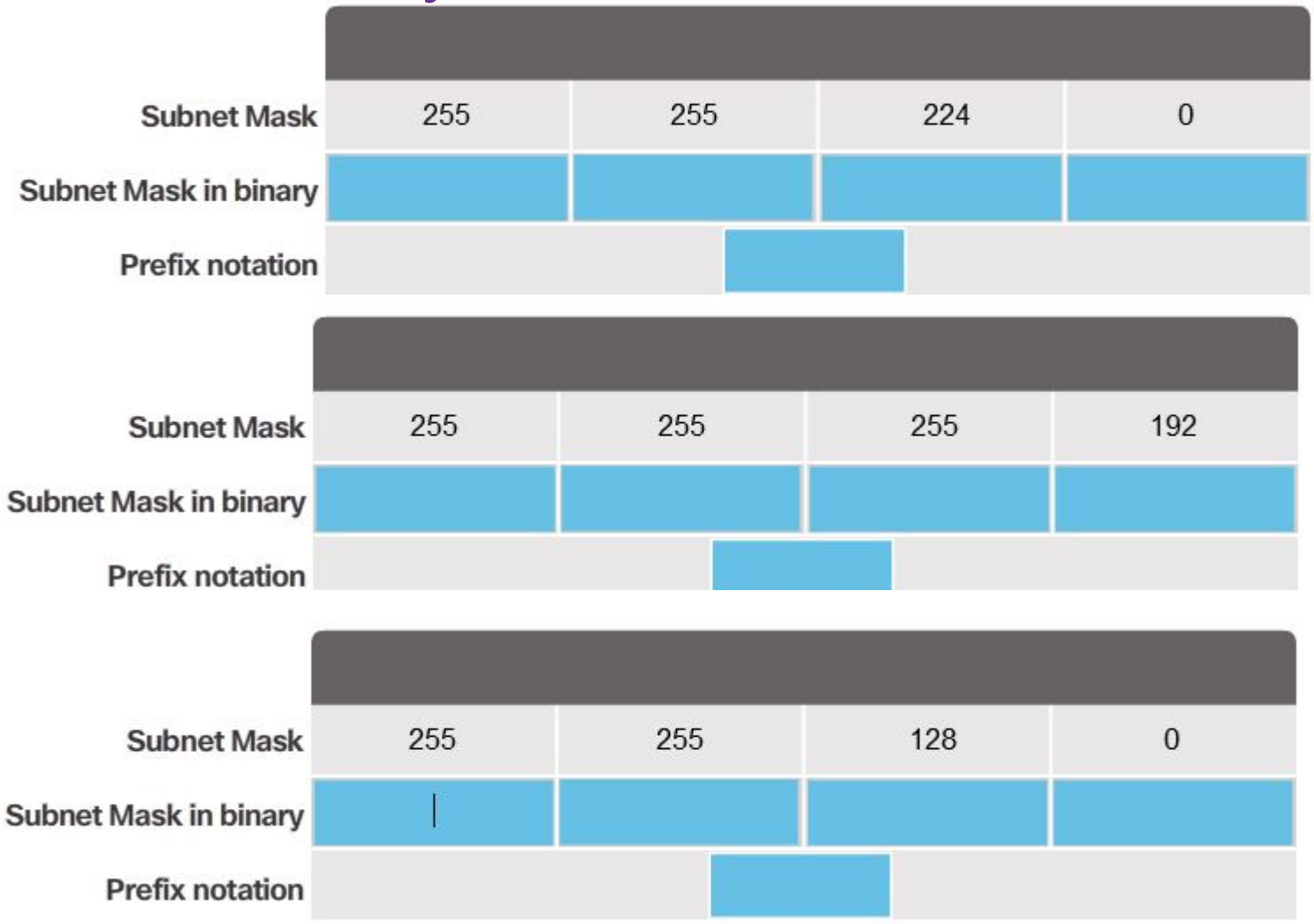
8.1.4.3 Network Requirement Example



8.1.4.3 Network Requirement Example (cont.)



8.1.4.4 Activity – Calculate the Subnet Mask



8.1.4.4 Activity – Calculate the Subnet Mask

Subnet Mask	255	255	224	0
Subnet Mask in binary	11111111	11111111	11100000	00000000
Prefix notation	/19			

Subnet Mask	255	255	255	192
Subnet Mask in binary	11111111	11111111	11111111	11000000
Prefix notation	/26			

Subnet Mask	255	255	128	0
Subnet Mask in binary	11111111	11111111	10000000	00000000
Prefix notation	/17			

8.1.4.4 Activity – Determining the Number of Bits to Borrow

Hosts Needed	Subnet Mask (binary)	Subnet Mask (decimal)	Prefix Notation (/x)
250	11111111.11111111.11111111.00000000	255.255.255.0	/24
25	. . .		
1000	. . .		
75	. . .		
10	. . .		
500	. . .		

250 Hosts needed → 2^8 = 255 → 8 hostportion bits are needed! ⇒ Subnetmask = 24 * 1 + 8* 0

25 Hosts needed → 2^5 = 32 → ….5 …

1000 Hosts needed → 2^ … = 1024 → ….

8.1.4.4 Activity – Determining the Number of Bits to Borrow

Hosts Needed	Subnet Mask (binary)	Subnet Mask (decimal)	Prefix Notation (/x)
250	11111111.11111111.11111111.00000000	255.255.255.0	/24
25	11111111 · 11111111 · 11111111 · 11100000	255.255.255.224	/27
1000	11111111 · 11111111 · 11111100 · 00000000	255.255.252.0	/22
75	11111111 · 11111111 · 11111111 · 10000000	255.255.255.128	/25
10	11111111 · 11111111 · 11111111 · 11110000	255.255.255.240	/28
500	11111111 · 11111111 · 11111110 · 00000000	255.255.254.0	/23

250 Hosts needed → 2^8 = 255 → 8 hostportion bits are needed! ⇒ Subnetmask = 24 * 1 + 8* 0

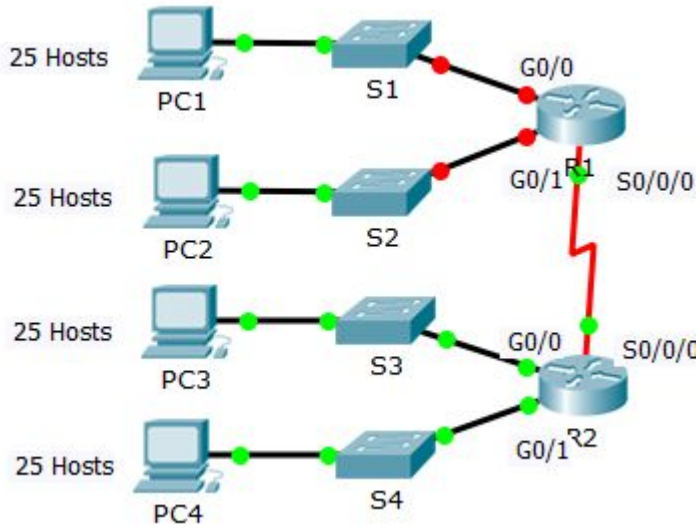
25 Hosts needed → 2^5 = 32 → 5 hostportion bits are needed ⇒ subnetmask = 27*1 + 5 *0

1000 Hosts needed → 2^10 = 1024 → 10 hostportion bits are needed ⇒ subnetmask = 22 *1 +10*0

75 Hosts needed → 2^7 = 128 → 7 hostportion bits are needed ⇒ subnetmask = 25 *1 + 7 * 0

…..

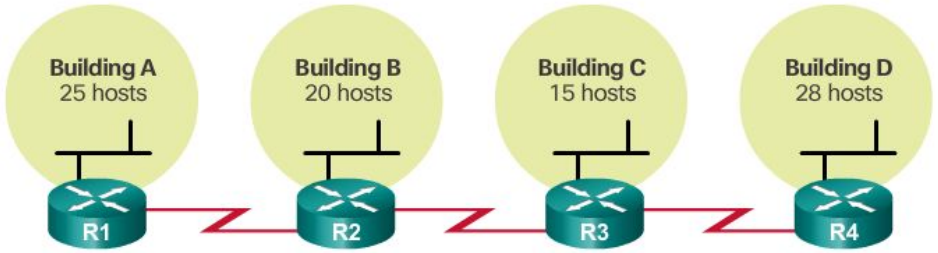
8.1.4.7 Packet tracer - subnetting Scenario 1



Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0			
	G0/1			
	S0/0/0			
R2	G0/0			
	G0/1			
	S0/0/0			
S1	VLAN 1			
S2	VLAN 1			
S3	VLAN 1			
S4	VLAN 1			
PC1	NIC			
PC2	NIC			
PC3	NIC			
PC4	NIC			

Topic 8.1.5:
Benefits of Variable Length Subnetting Masking

8.1.5.1 Traditional Subnetting Wastes Addresses



	Network portion	Host portion		
	11000000.10101000.00010100	.000	00000	192.168.20.0/24
0	11000000.10101000.00010100	.000	00000	192.168.20.0/27
1	11000000.10101000.00010100	.001	00000	192.168.20.32/27
2	11000000.10101000.00010100	.010	00000	192.168.20.64/27
3	11000000.10101000.00010100	.011	00000	192.168.20.96/27
4	11000000.10101000.00010100	.100	00000	192.168.20.128/27
5	11000000.10101000.00010100	.101	00000	192.168.20.160/27
6	11000000.10101000.00010100	.110	00000	192.168.20.192/27
7	11000000.10101000.00010100	.111	00000	192.168.20.224/27

Building LANs A, B, C, and D

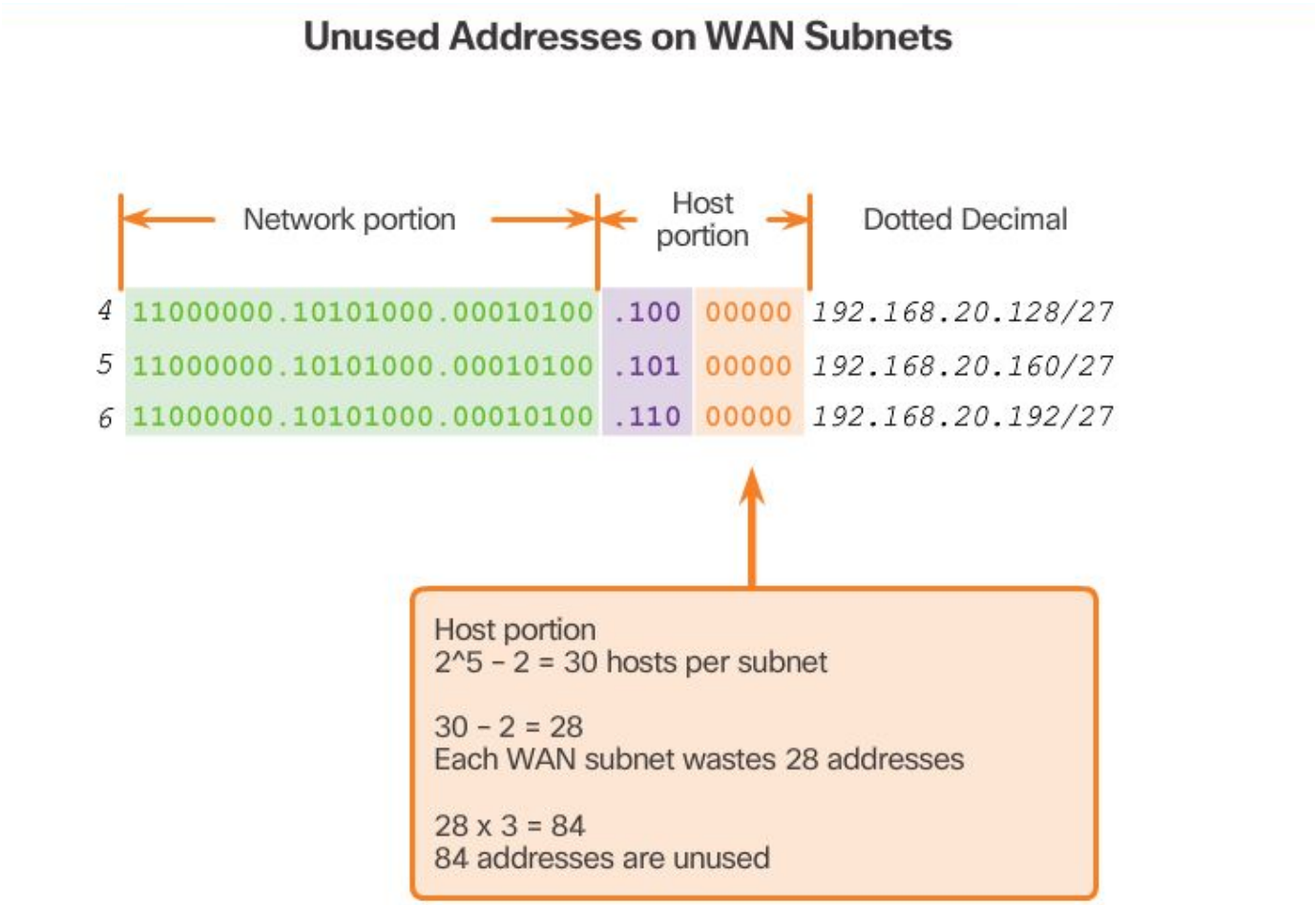
Site to Site WANs

Unused / Available

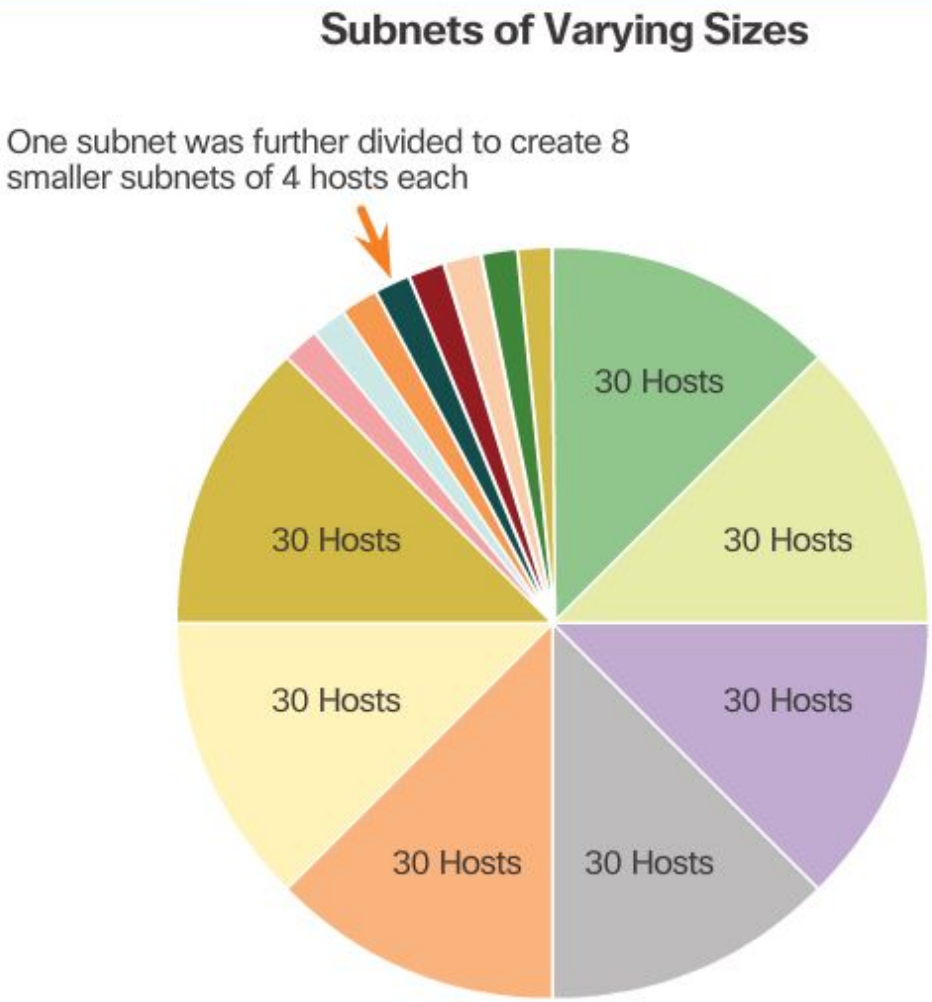
Subnet portion
2^3 = 8 subnets

Host portion
2^5 – 2 = 30 hosts per subnet

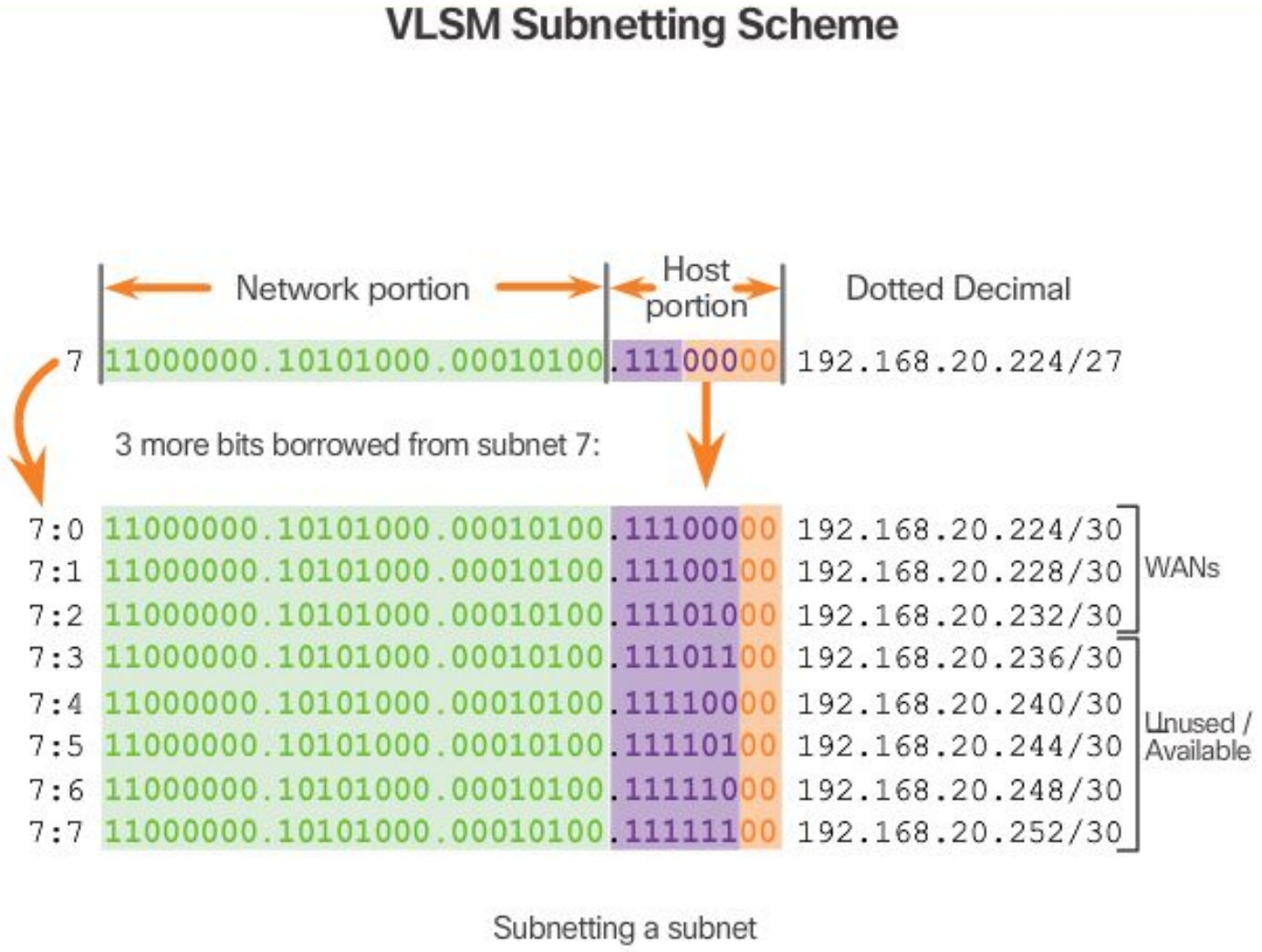
8.1.5.1 Traditional Subnetting Wastes Addresses



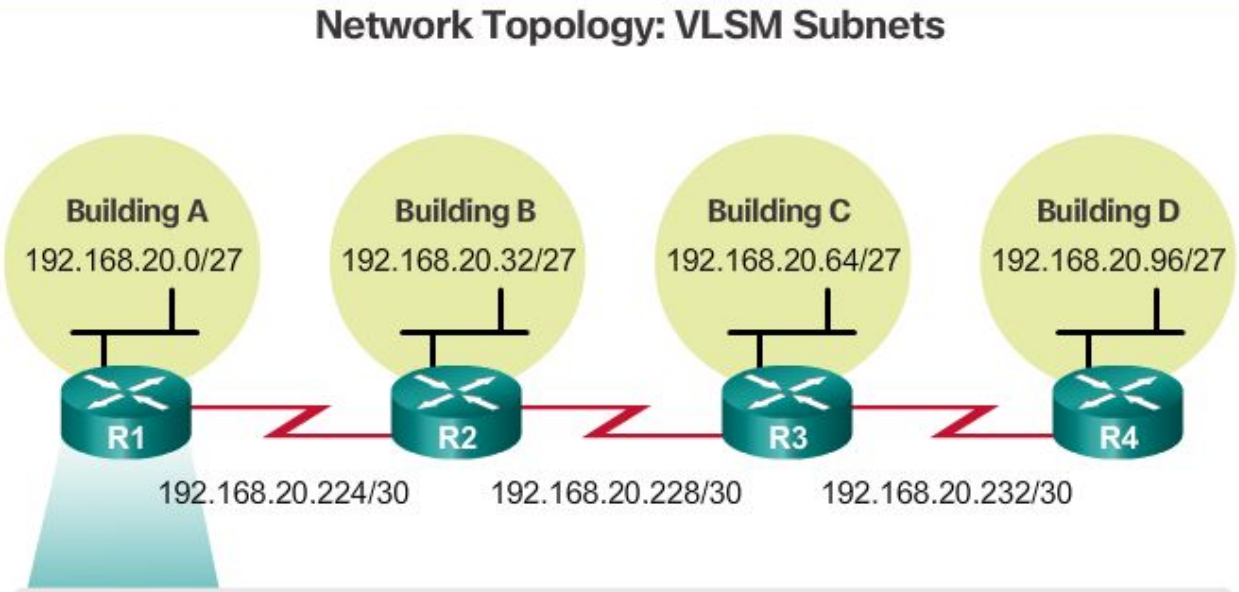
8.1.5.2 Variable Length Subnet Masks



8.1.5.3 Basic VLSM

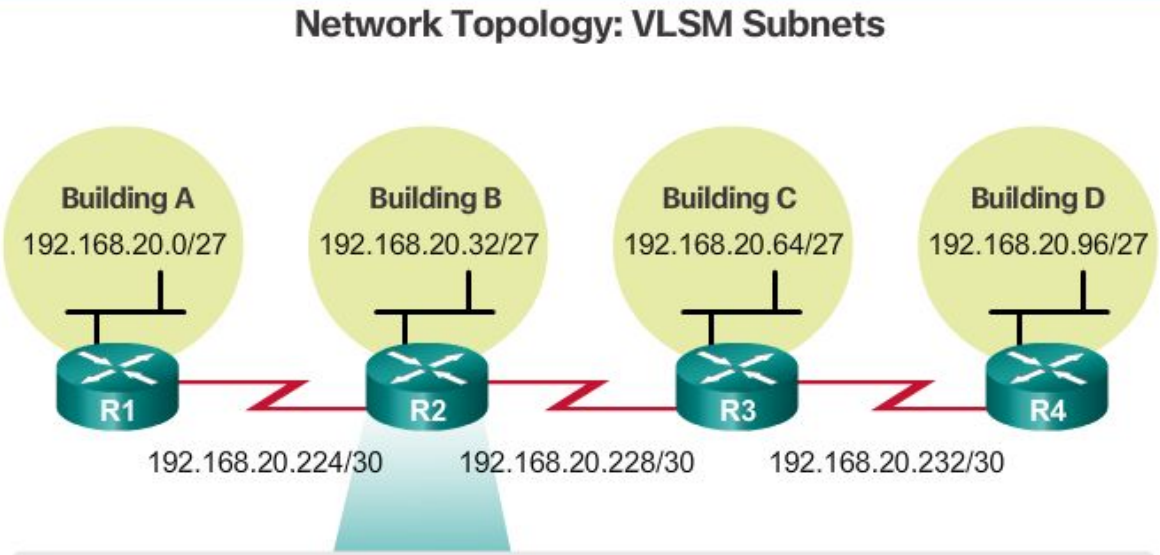


8.1.5.5 VLSM in Practice



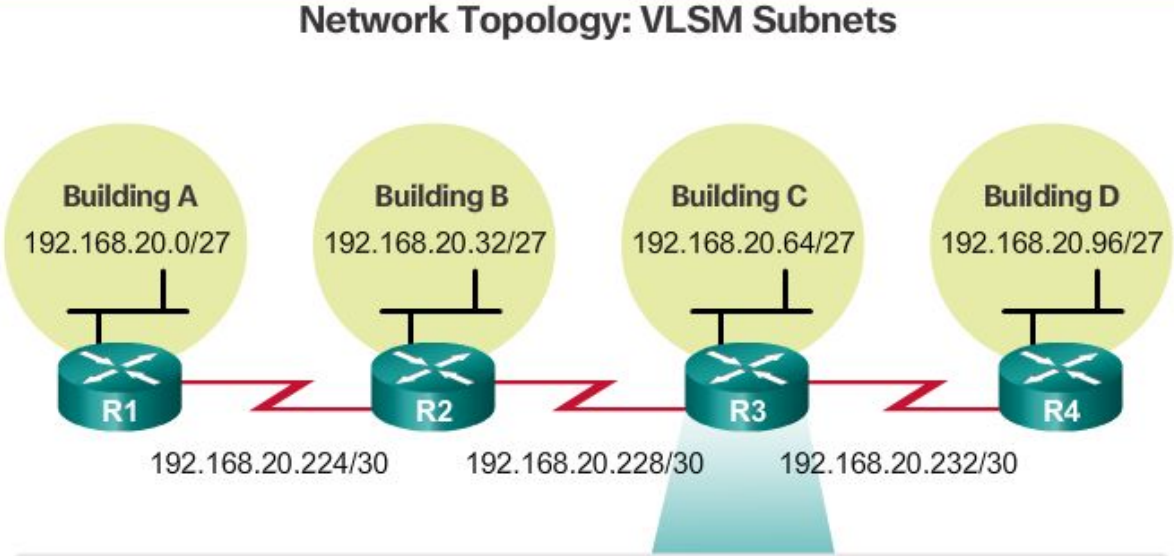

```
R1(config)# interface gigabitethernet 0/0
R1(config-if)# ip address 192.168.20.1 255.255.255.224
R1(config-if)# exit
R1(config)# interface serial 0/0/0
R1(config-if)# ip address 192.168.20.225 255.255.255.252
R1(config-if)# end
R1#
```

8.1.5.5 VLSM in Practice (cont.)



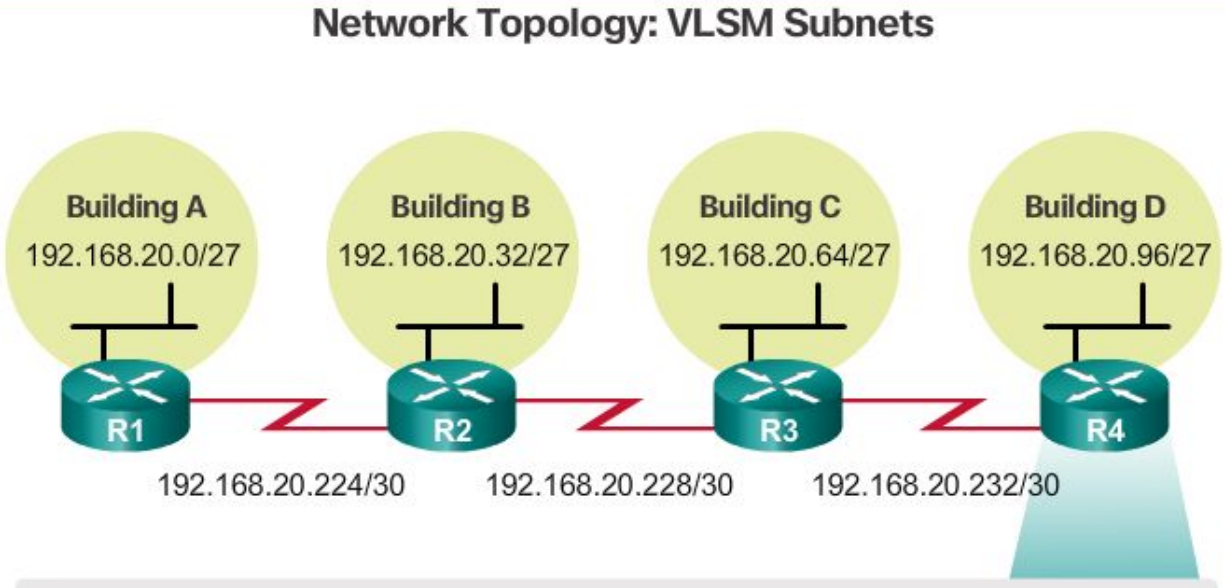

```
R2(config)# interface gigabitethernet 0/0
R2(config-if)# ip address 192.168.20.33 255.255.255.224
R2(config-if)# exit
R2(config)# interface serial 0/0/0
R2(config-if)# ip address 192.168.20.226 255.255.255.252
R2(config-if)# exit
R2(config)# interface serial 0/0/1
R2(config)# ip address 192.168.20.229 255.255.255.252
R2(config-if)# end
R2#
```

8.1.5.5 VLSM in Practice (cont.)




```
R3(config)# interface gigabitethernet 0/0
R3(config-if)# ip address 192.168.20.65 255.255.255.224
R3(config-if)# exit
R3(config)# interface serial 0/0/0
R3(config-if)# ip address 192.168.20.230 255.255.255.252
R3(config-if)# exit
R3(config)# interface serial 0/0/1
R3(config)# ip address 192.168.20.233 255.255.255.252
R3(config-if)# end
R3#
```

8.1.5.5 VLSM in Practice (Cont.)




```
R4(config)# interface gigabitethernet 0/0
R4(config-if)# ip address 192.168.20.97 255.255.255.224
R4(config-if)# exit
R4(config)# interface serial 0/0/0
R4(config-if)# ip address 192.168.20.234 255.255.255.252
R4(config-if)# end
R4#
```

8.1.5.6 VLSM Chart

VLSM Subnetting of 192.168.20.0/24

	/27 Network	Hosts
Bldg A	.0	.1 - .30
Bldg B	.32	.33 - .62
Bldg C	.64	.65 - .94
Bldg D	.96	.97 - .126
Unused	.128	.129 - .158
Unused	.160	.161 - .190
Unused	.192	.193 - .222
	.224	.225 - .254

	/30 Network	Hosts
WAN R1-R2	.224	.225 - .226
WAN R2-R3	.228	.229 - .230
WAN R3-R4	.232	.233 - .234
Unused	.236	.237 - .238
Unused	.240	.241 - .242
Unused	.244	.245 - .246
Unused	.248	.249 - .250
Unused	.252	.253 - .254

8.1.5.6 Practicing VLSM

Table 1 uses regular subnetting to accommodate the network shown.
Table 2 uses VLSM to further subnet the network

192.168.5.0-
192.168.5.63

/26

255.255.255.192

192.168.5.192-
192.168.5.255

192.168.5.64-
192.168.5.127

192.168.5.0/24
Table 1 - First Subnets Calculation

Calculate 50 users per subnet	
New Subnet Mask (decimal)	
First Prefix notation	
First **full** subnet range	
Second **full** subnet range	
Last **full** subnet range	

192.168.5.0/24
Table 2 - VLSM Calculation

Use Table 1's second full subnet range and VLSM to calculate for 20 users per subnet.	
Second **full** subnet range (/26) from Table 1	
New VLSM Subnet Mask (decimal)	
VLSM Prefix notation	
First **full VLSM** subnet range	
Last **full VLSM** subnet range	

8.1.5.6 Practicing VLSM

Table 2 uses VLSM to further subnet the network

192.168.5.0/24
Table 1 - First Subnets Calculation

Calculate 50 users per subnet	
New Subnet Mask (decimal)	255.255.255.192
First Prefix notation	/26
First **full** subnet range	192.168.5.0- 192.168.5.63
Second **full** subnet range	192.168.5.64- 192.168.5.127
Last **full** subnet range	192.168.5.192- 192.168.5.255

8.1.5.6 Practicing VLSM

Table 1 uses regular subnetting to accommodate the network shown.

192.168.5.0/24
Table 2 - VLSM Calculation

Use Table 1's second full subnet range and VLSM to calculate for 20 users per subnet.	
Second **full** subnet range (/26) from Table 1	192.168.5.64- 192.168.5.127
New VLSM Subnet Mask (decimal)	255.255.255.224
VLSM Prefix notation	/27
First **full VLSM** subnet range	192.168.5.64- 192.168.5.95
Last **full VLSM** subnet range	192.168.5.96- 192.168.5.127

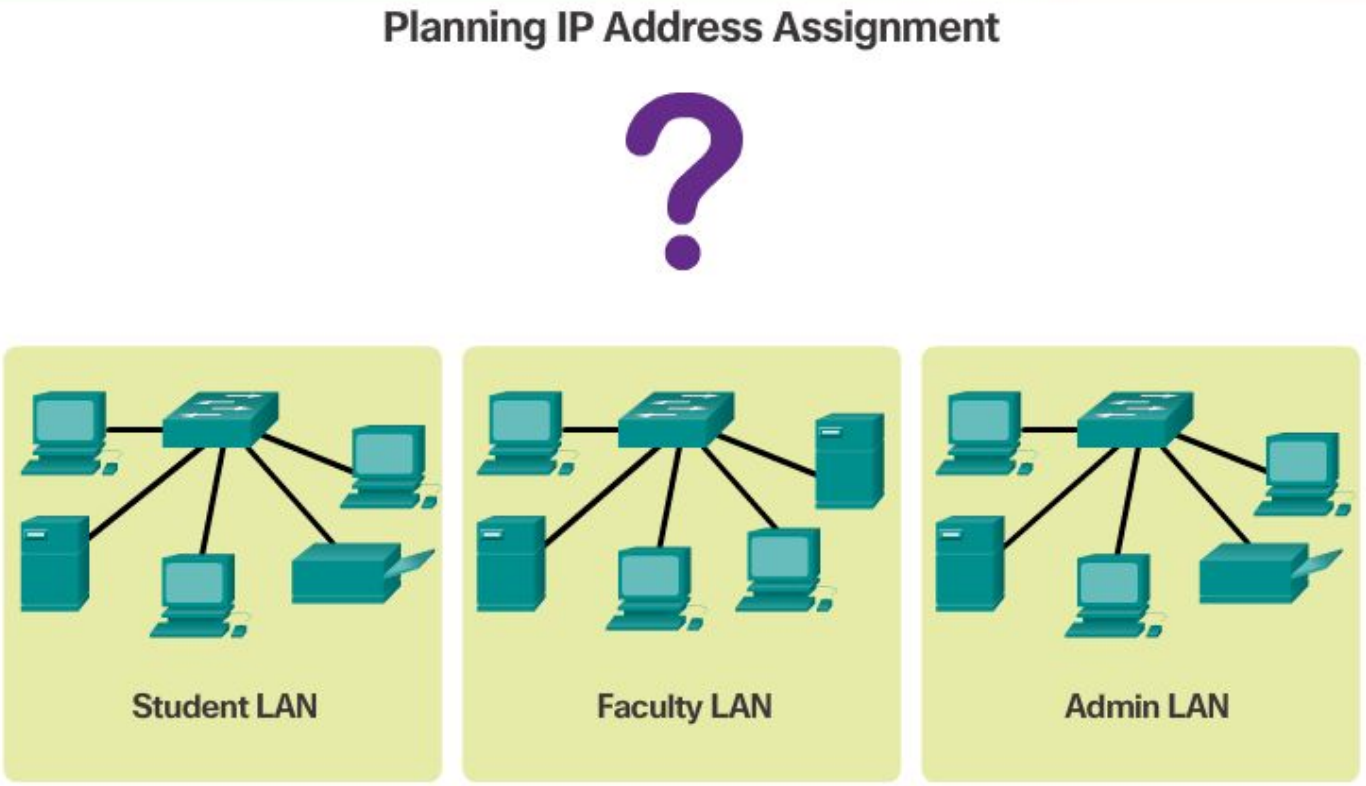
Section 8.2: Addressing Schemes

Upon completion of this section, you should be able to:

- Implement a VLSM addressing scheme.

Topic 8.2.1: Structured Design

8.2.1.1 Network Address Planning



Planning requires decisions on each subnet in terms of size, the number of hosts per subnet, and how host addresses will be assigned.

8.2.1.2 Planning to Address the Network

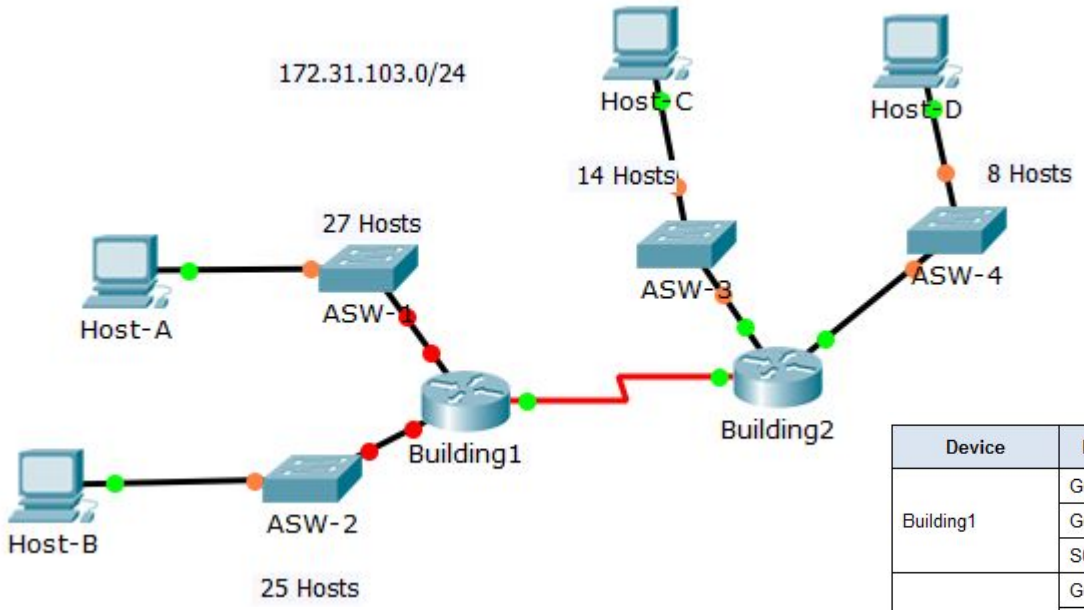
8.2.1.3 Assigning Addresses to Devices

IP Address Ranges

Network: 192.168.1.0/24

Use	First	Last
Host Devices	.1	.229
Servers	.230	.239
Printers	.240	.249
Intermediary Devices	.250	.253
Gateway (router LAN interface)	.254	

8.2.1.4 PT - Designing and Implementing a VLSM Addressing



Device	Interface	IP Address	Subnet Mask	Default Gateway
Building1	G0/0			N/A
	G0/1			N/A
	S0/0/0			N/A
Building2	G0/0			N/A
	G0/1			N/A
	S0/0/0			N/A
ASW-1	VLAN 1			
ASW-2	VLAN 1			
ASW-3	VLAN 1			
ASW-4	VLAN 1			
Host-A	NIC			
Host-B	NIC			
Host-C	NIC			
Host-D	NIC			

Section 8.3: Design Considerations for IPv6

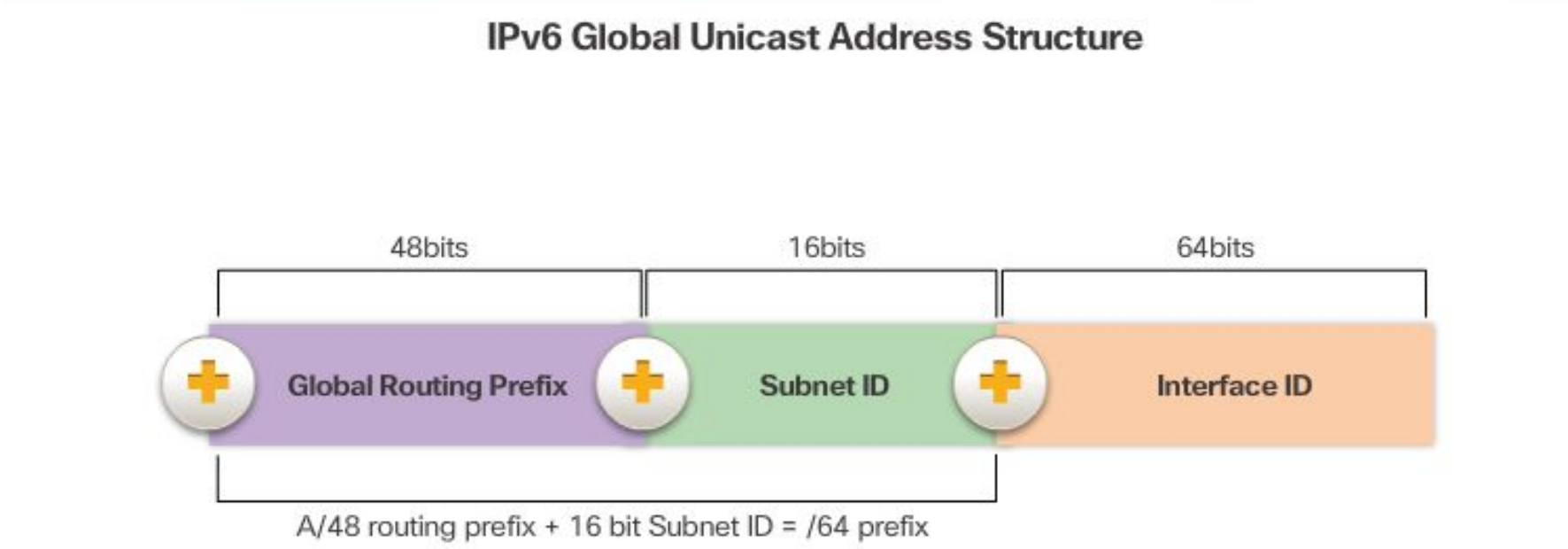
Upon completion of this section, you should be able to:

- Explain how to implement IPv6 address assignments in a business network.

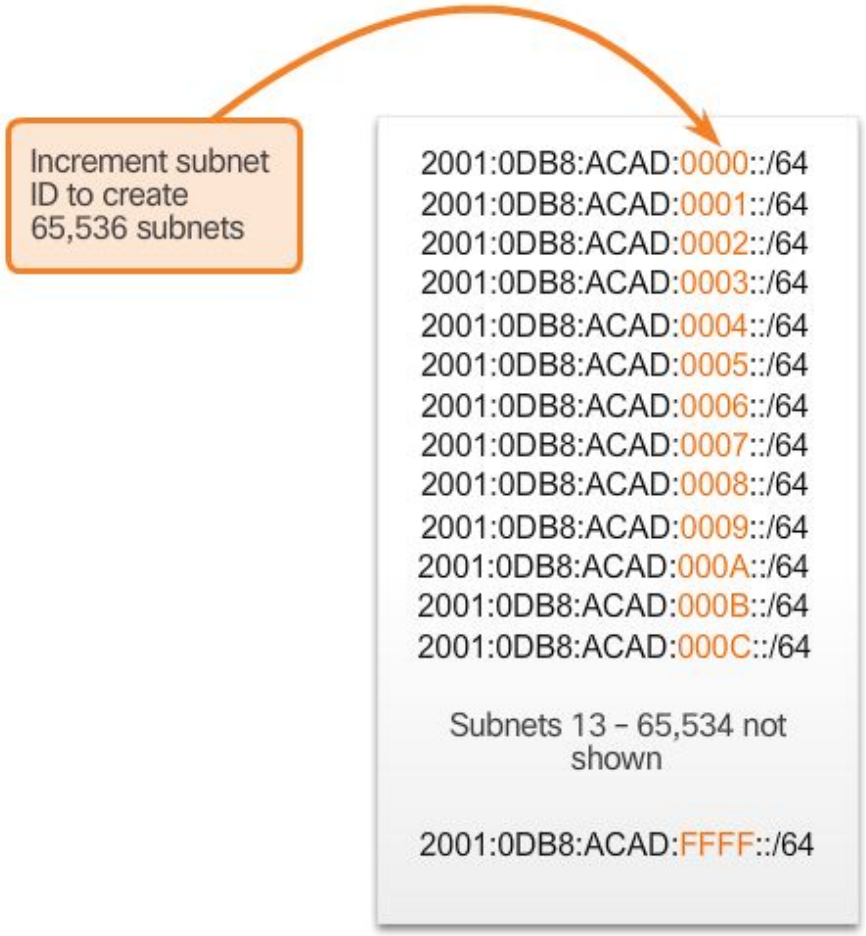
Topic 8.3.1:
Subnetting an IPv6 Network

8.3.1.1The IPv6 Global Unicast Address

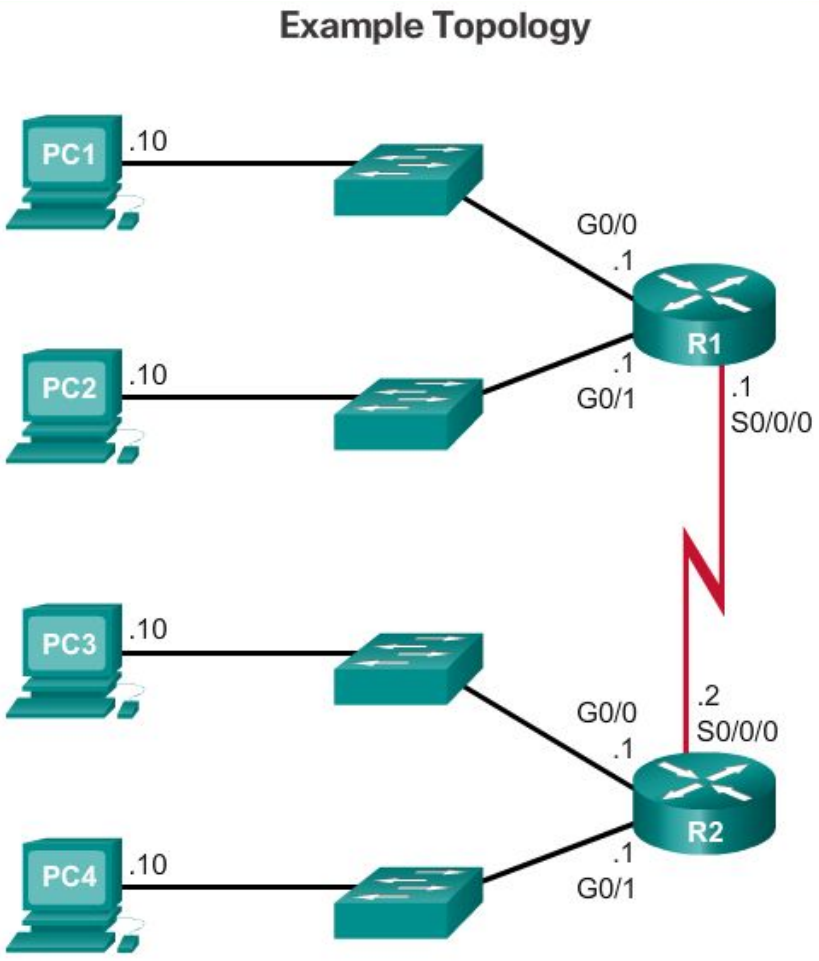
The IPv6 global unicast address normally consists of a /48 global routing prefix, a 16 bit subnet ID, and a 64 bit interface ID.



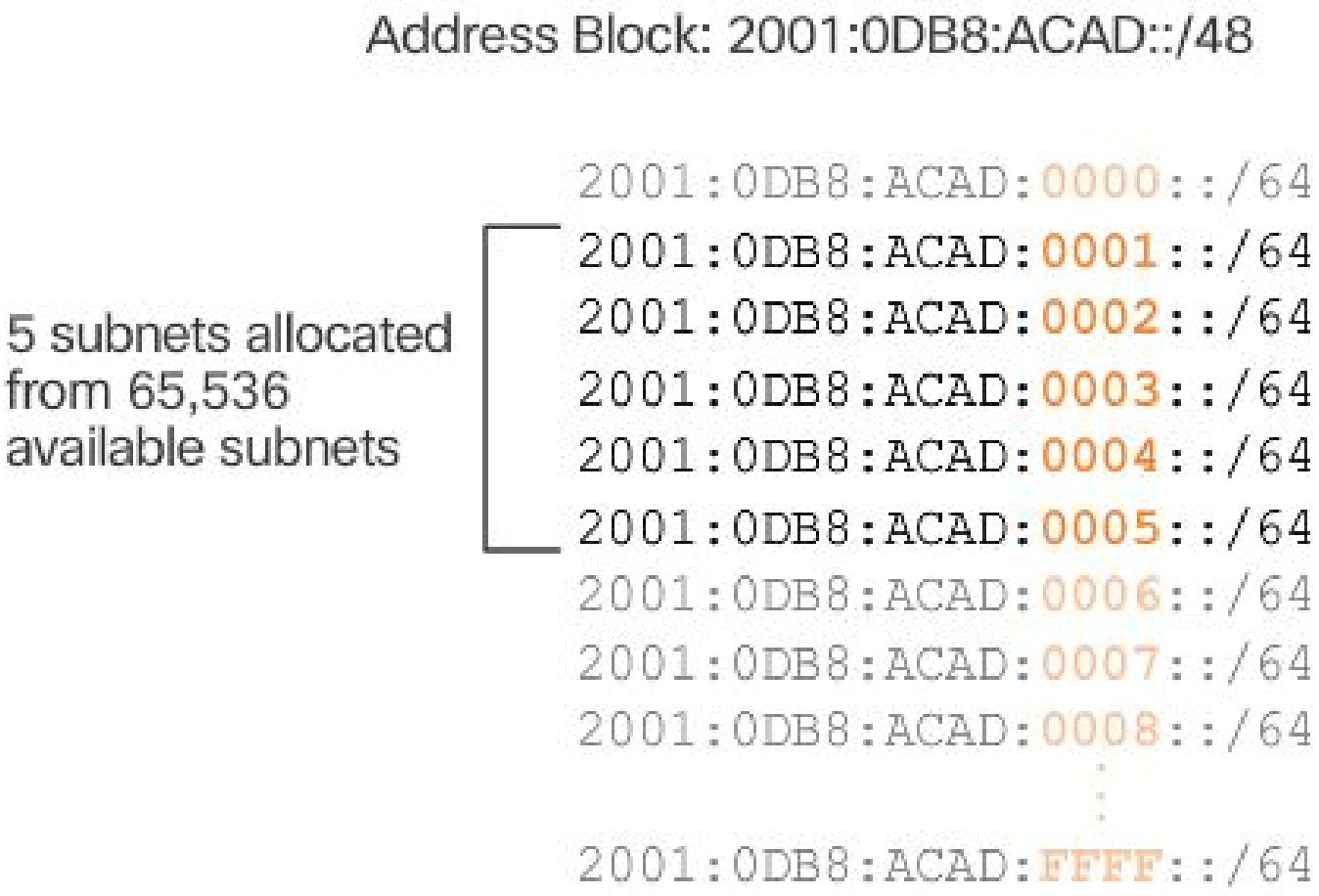
8.3.1.2 Subnetting Using the Subnet ID



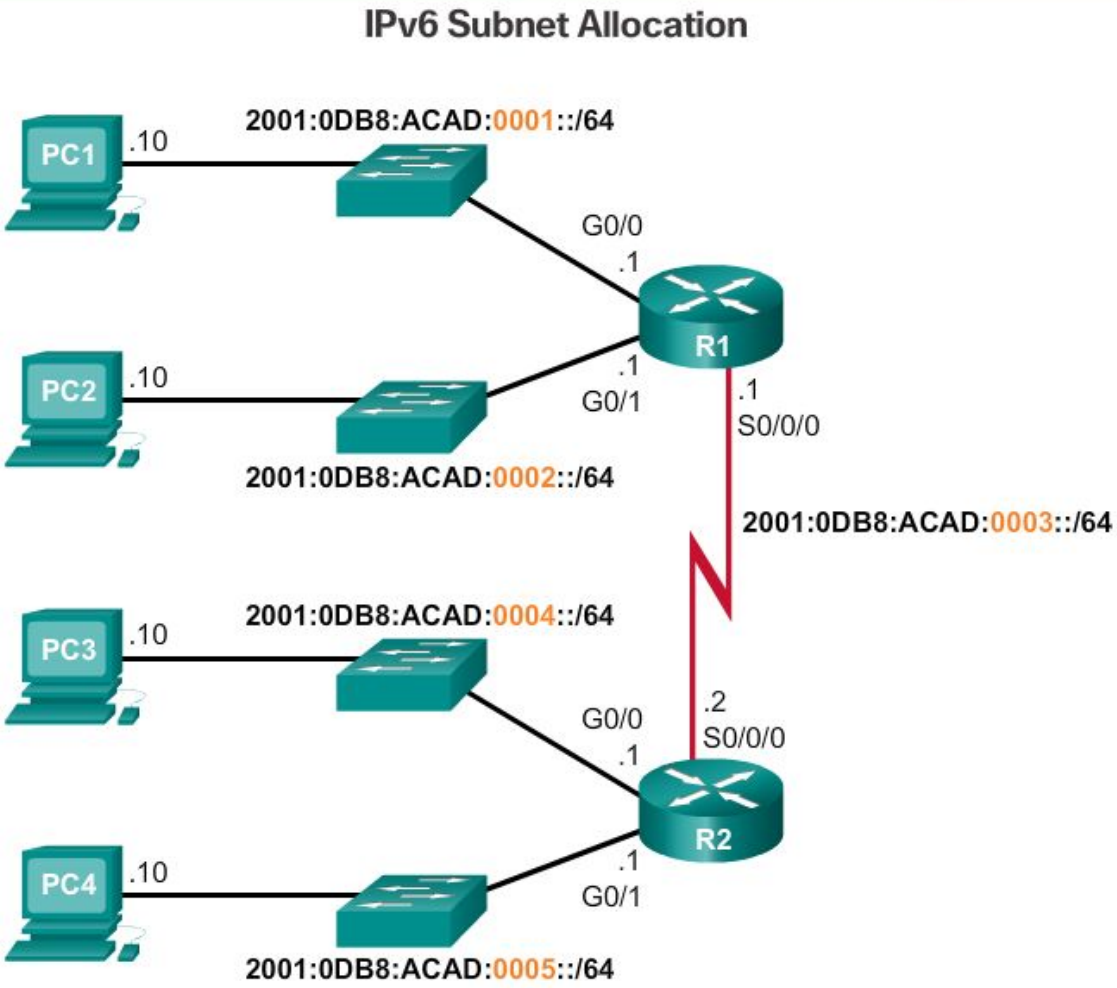
8.3.1.3 IPv6 Subnet Allocation



8.3.1.3 IPv6 Subnet Allocation (cont.)

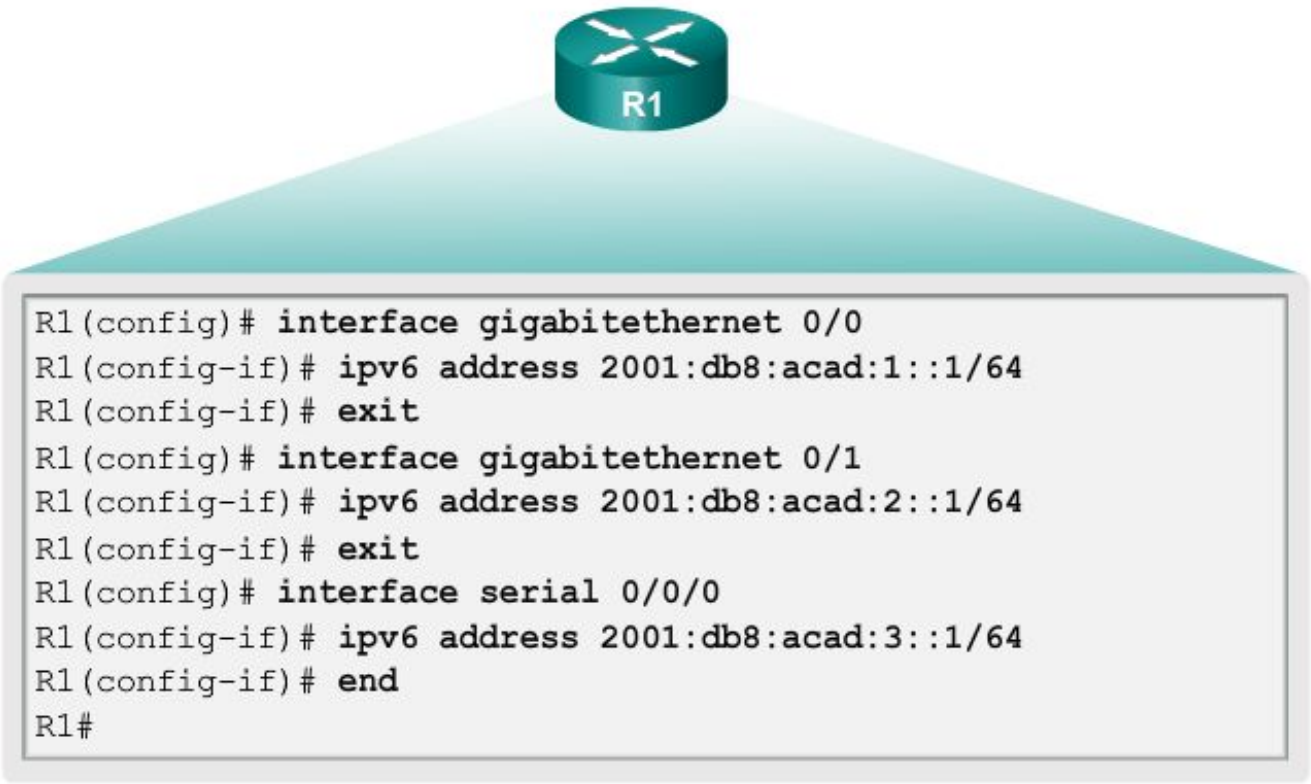


8.3.1.3 IPv6 Subnet Allocation (cont.)

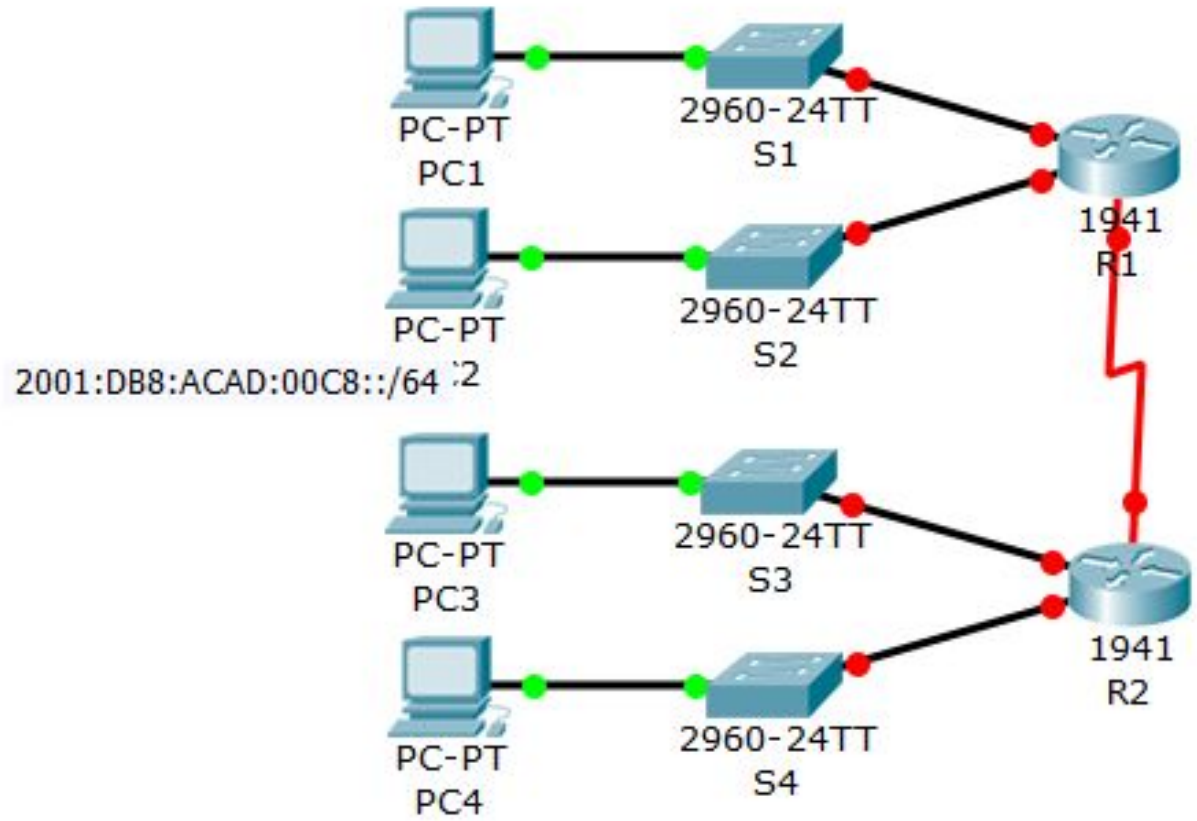


8.3.1.3 IPv6 Subnet Allocation (cont.)

IPv6 Address Configuration

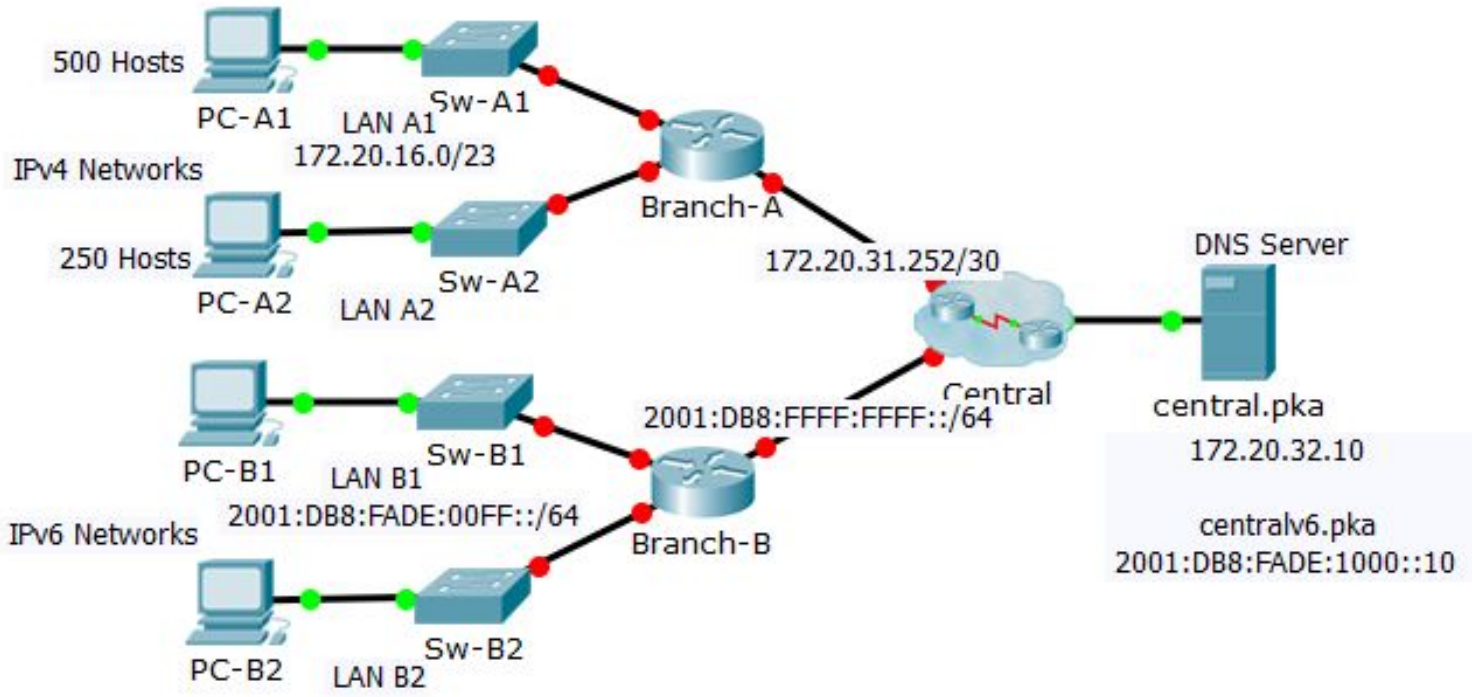


8.3.1.4 PT - Implementing subnetted IPv6 addrssing scheme



8.4 Summary

8.4.1.2 PT - Skills integration challenge



Thank you.

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