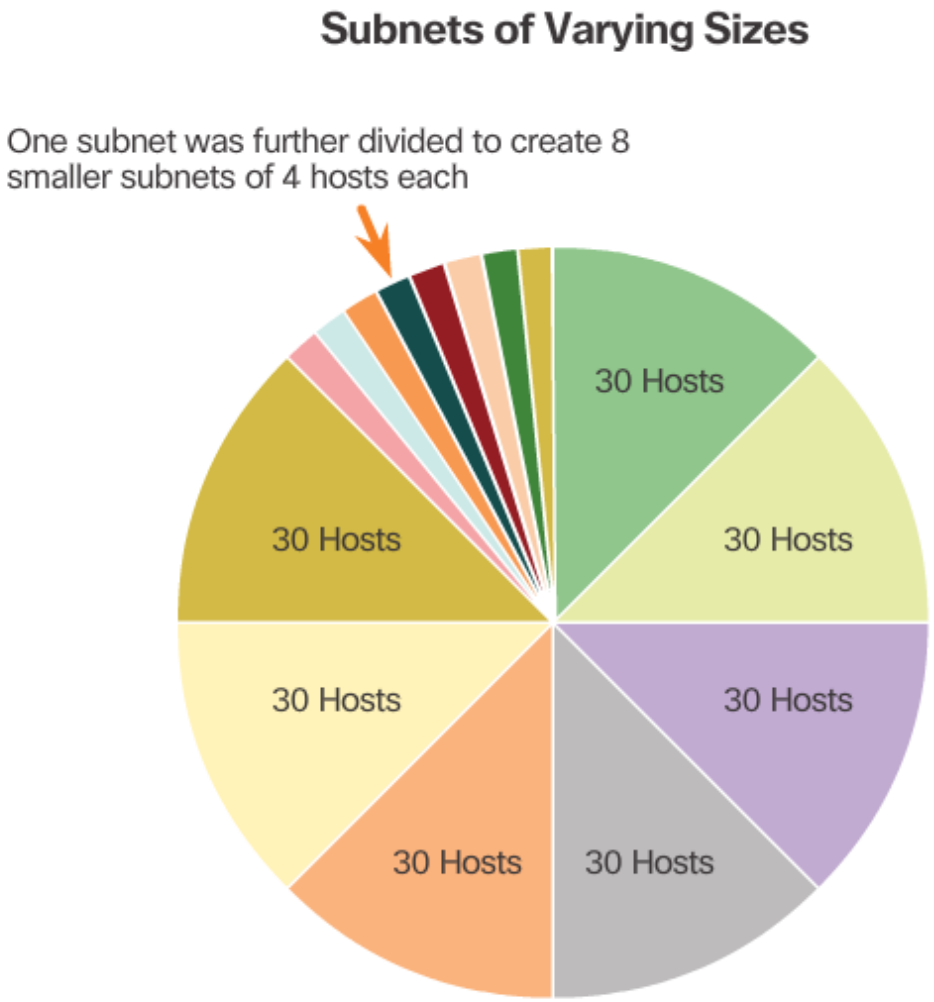
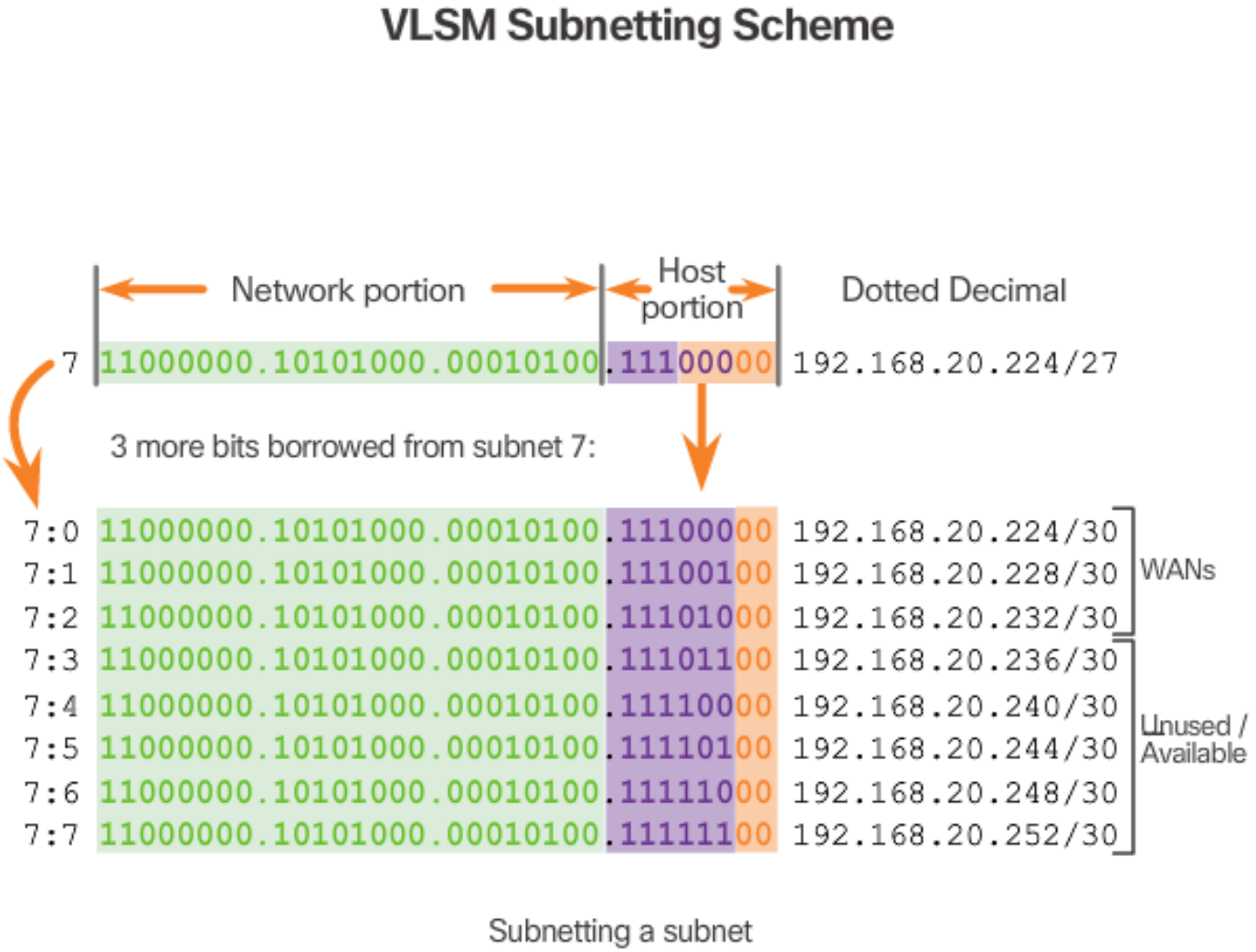
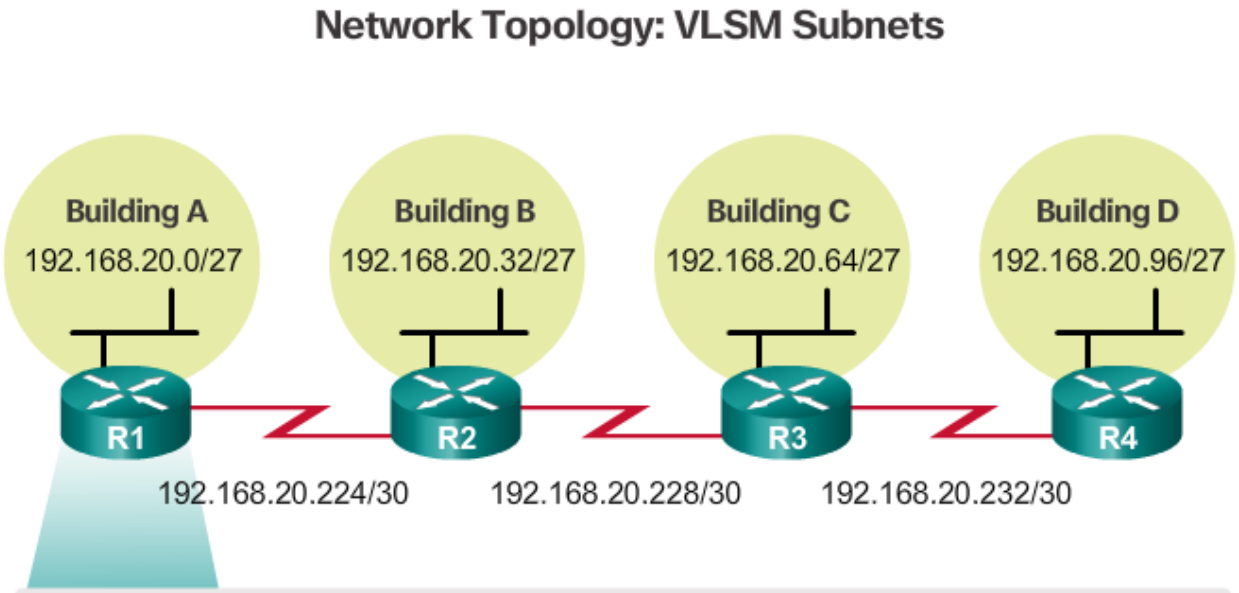
Variable Length Subnet Masks



Basic VLSM

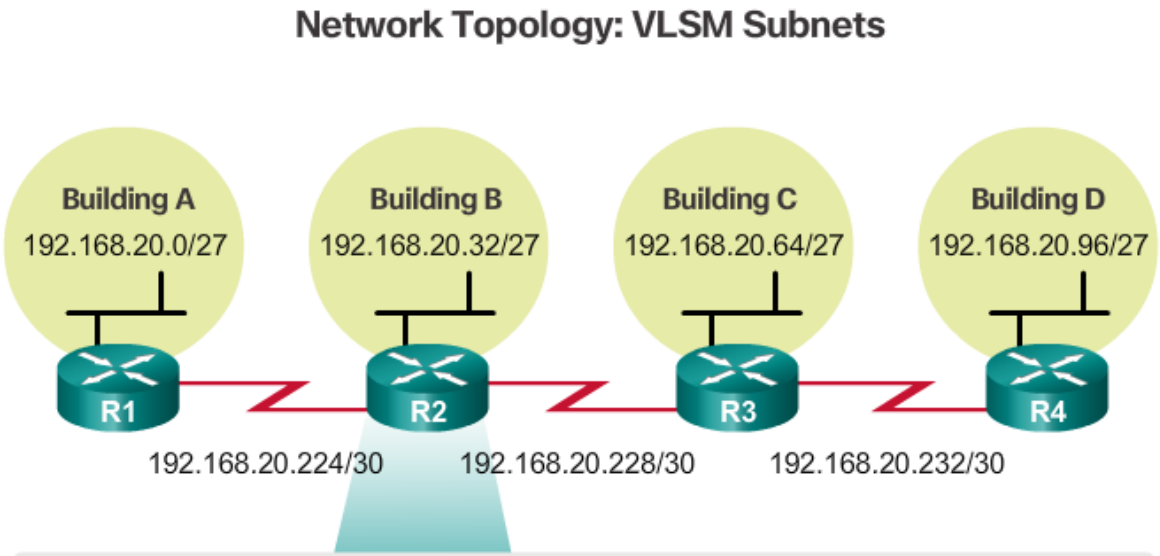


VLSM in Practice



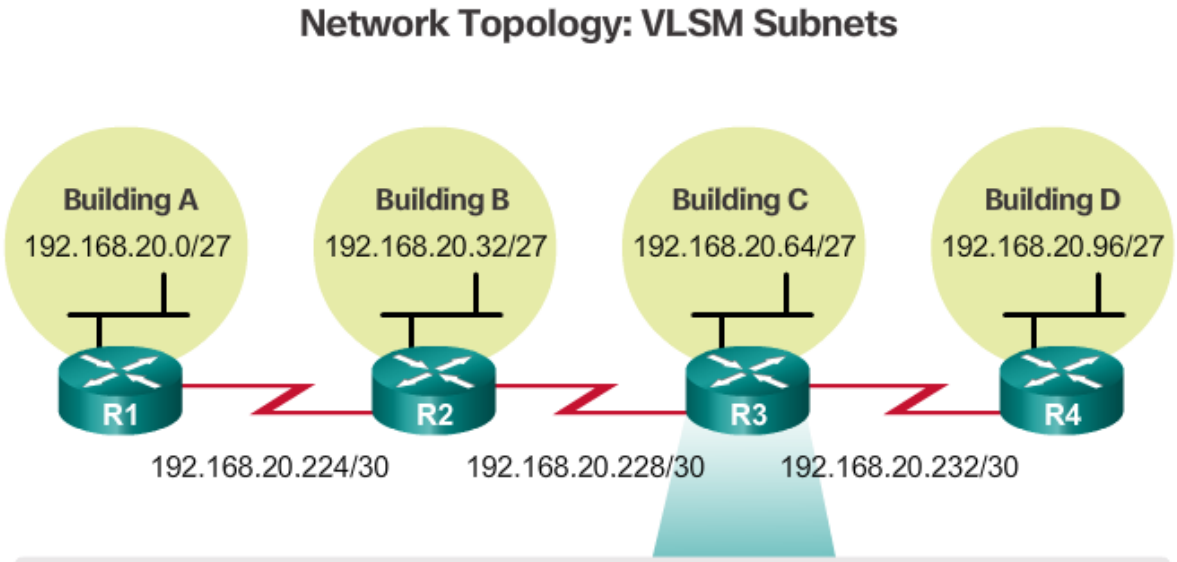

```
R1(config)# interface gigabitethernet 0/0
R1(config-if)# ip address 192.168.20.1 255.255.255.224
R1(config-if)# exit
R1(config)# interface serial 0/0/0
R1(config-if)# ip address 192.168.20.225 255.255.255.252
R1(config-if)# end
R1#
```

VLSM in Practice (cont.)



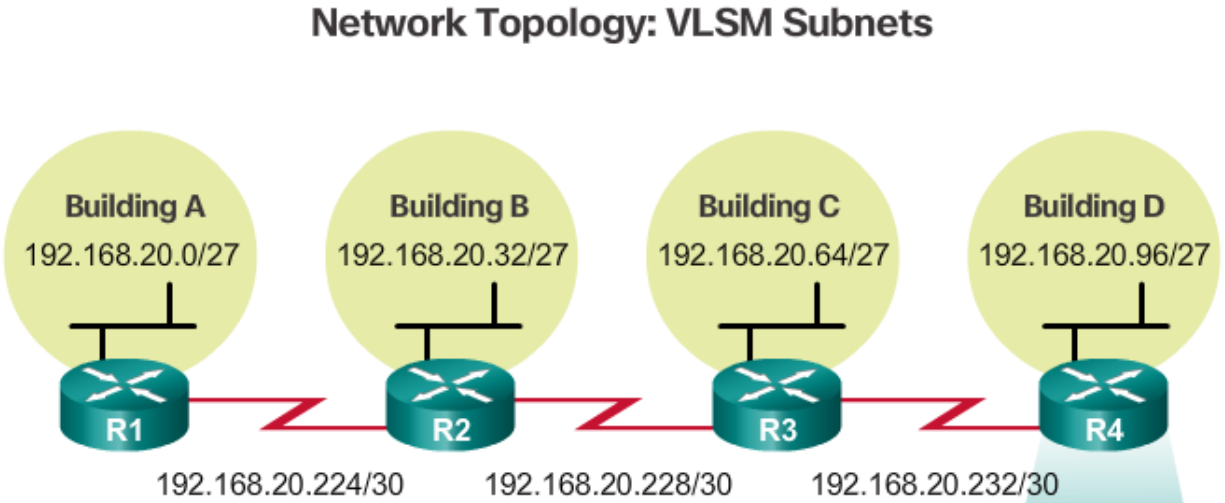

```
R2(config)# interface gigabitethernet 0/0
R2(config-if)# ip address 192.168.20.33 255.255.255.224
R2(config-if)# exit
R2(config)# interface serial 0/0/0
R2(config-if)# ip address 192.168.20.226 255.255.255.252
R2(config-if)# exit
R2(config)# interface serial 0/0/1
R2(config)# ip address 192.168.20.229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

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#
```

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#
```

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

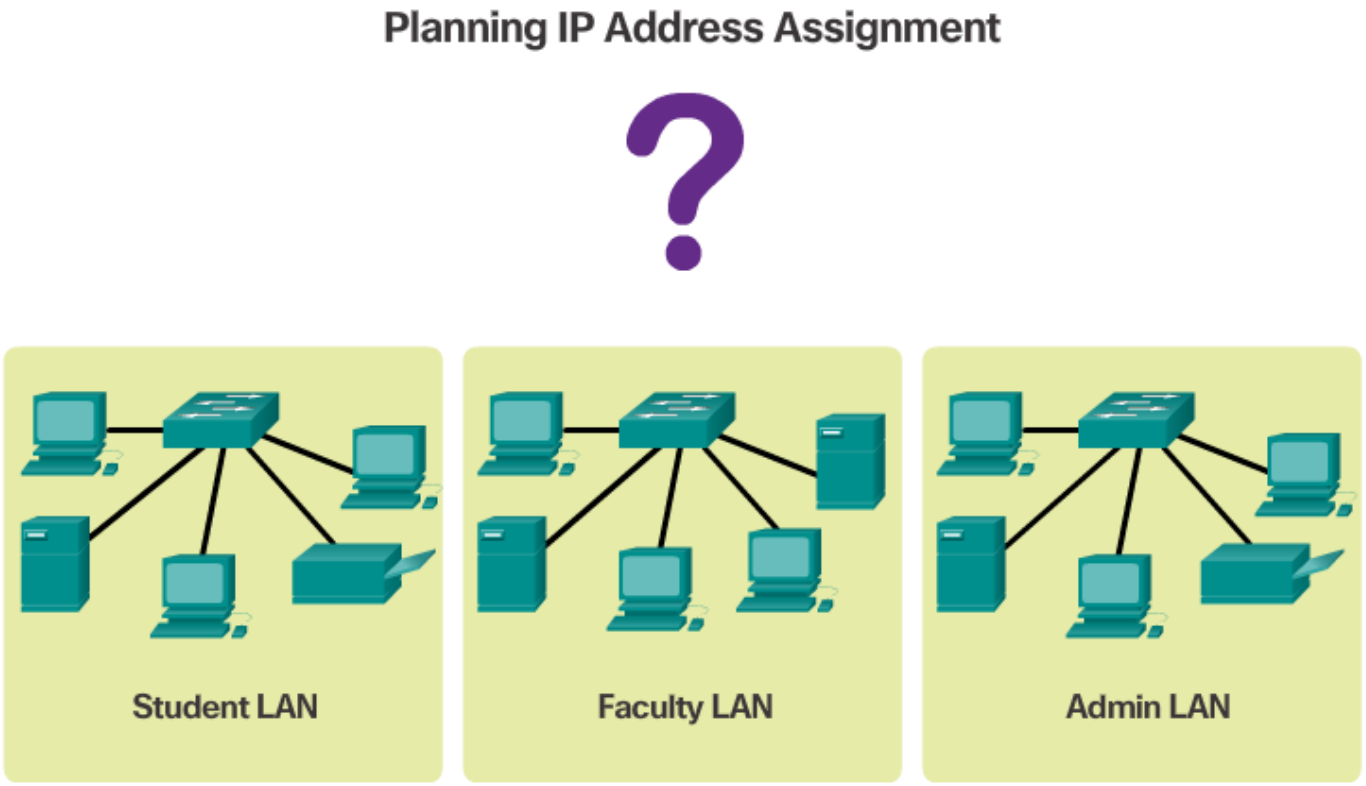
	/30 Network	Hosts
WAN R1-R2	.224	.225 - .226
WAN R2-R3	.228	.229 - .230
WAN R3-R4	.232	.233 - .234
Unused	.236	.237 - .238
Unused	.240	.241 - .242
Unused	.244	.245 - .246
Unused	.248	.249 - .250
Unused	.252	.253 - .254

Section 8.2: Addressing Schemes

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

- Implement a VLSM addressing scheme.

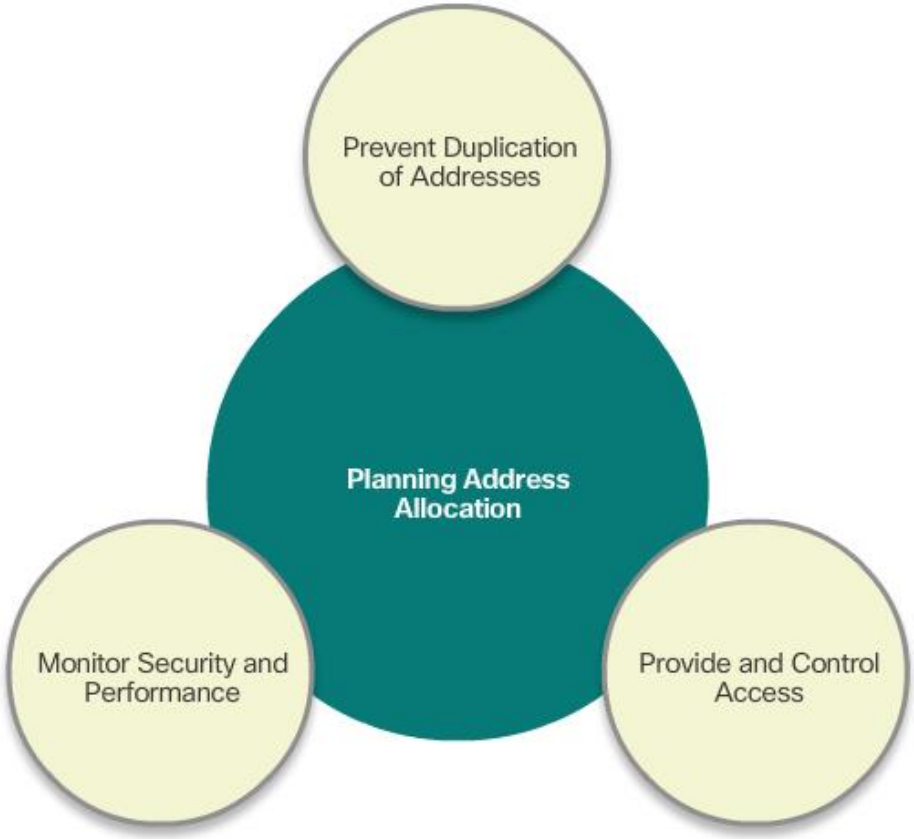
Network Address Planning



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

Planning to Address the Network

Primary Considerations when Planning Address Allocations



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	

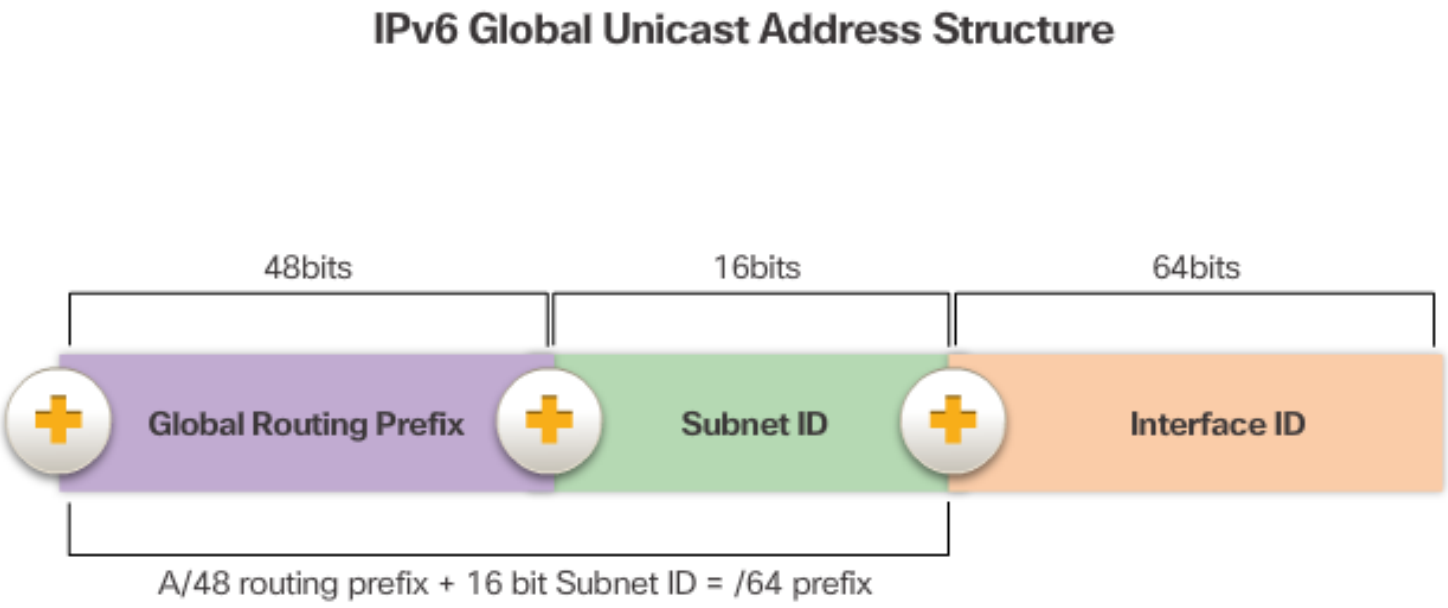
Section 8.3: Design Considerations for IPv6

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

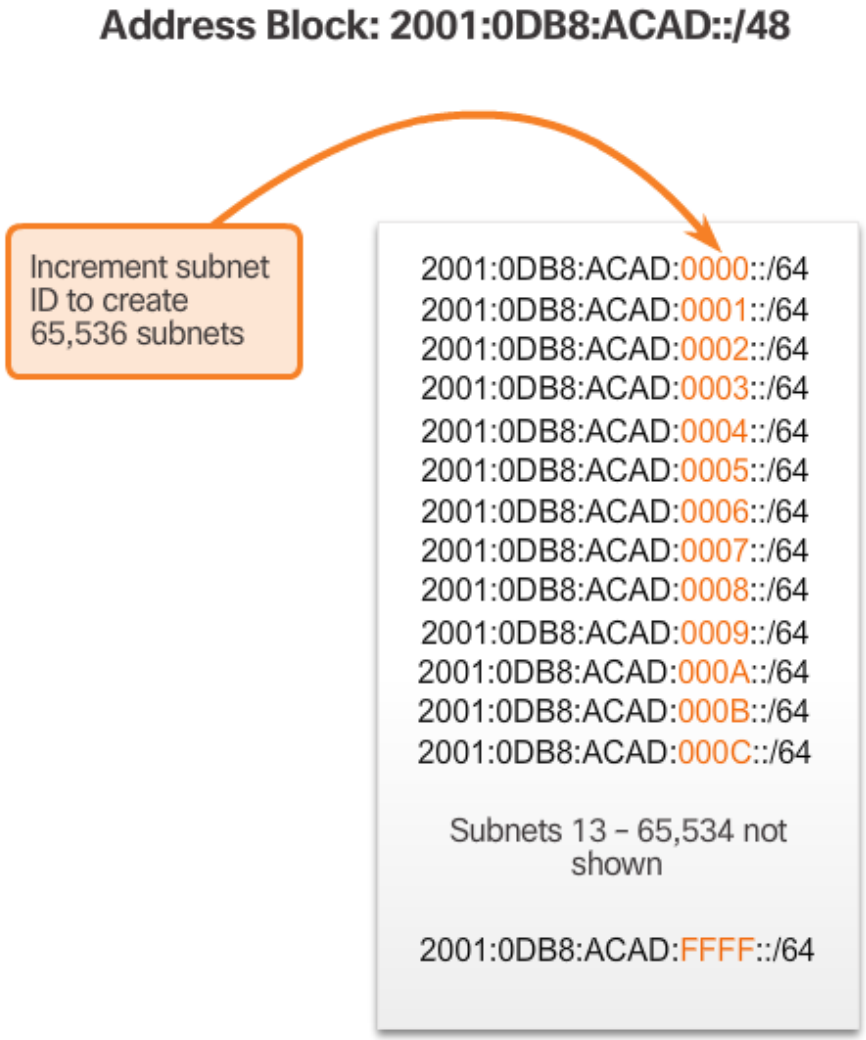
- Explain how to implement IPv6 address assignments in a business network.

The IPv6 Global Unicast Address

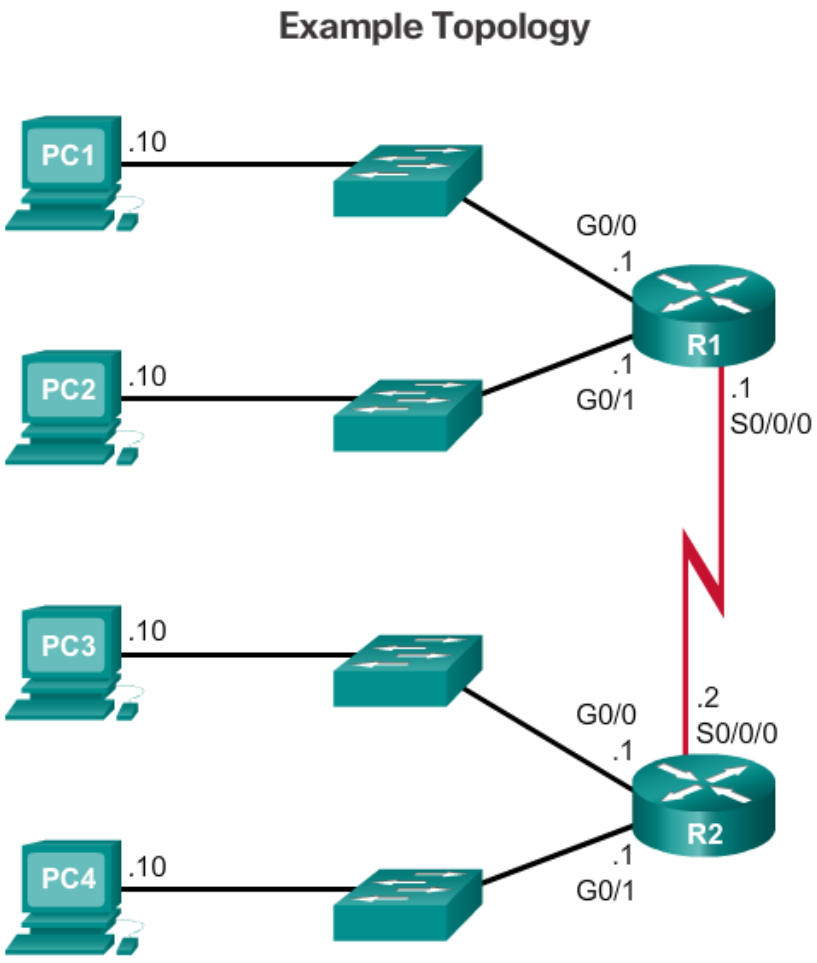
The IPv6 global unicast address normally consists of a /48 global routing prefix, a 16 bit subnet ID, and a 64 bit interface ID.



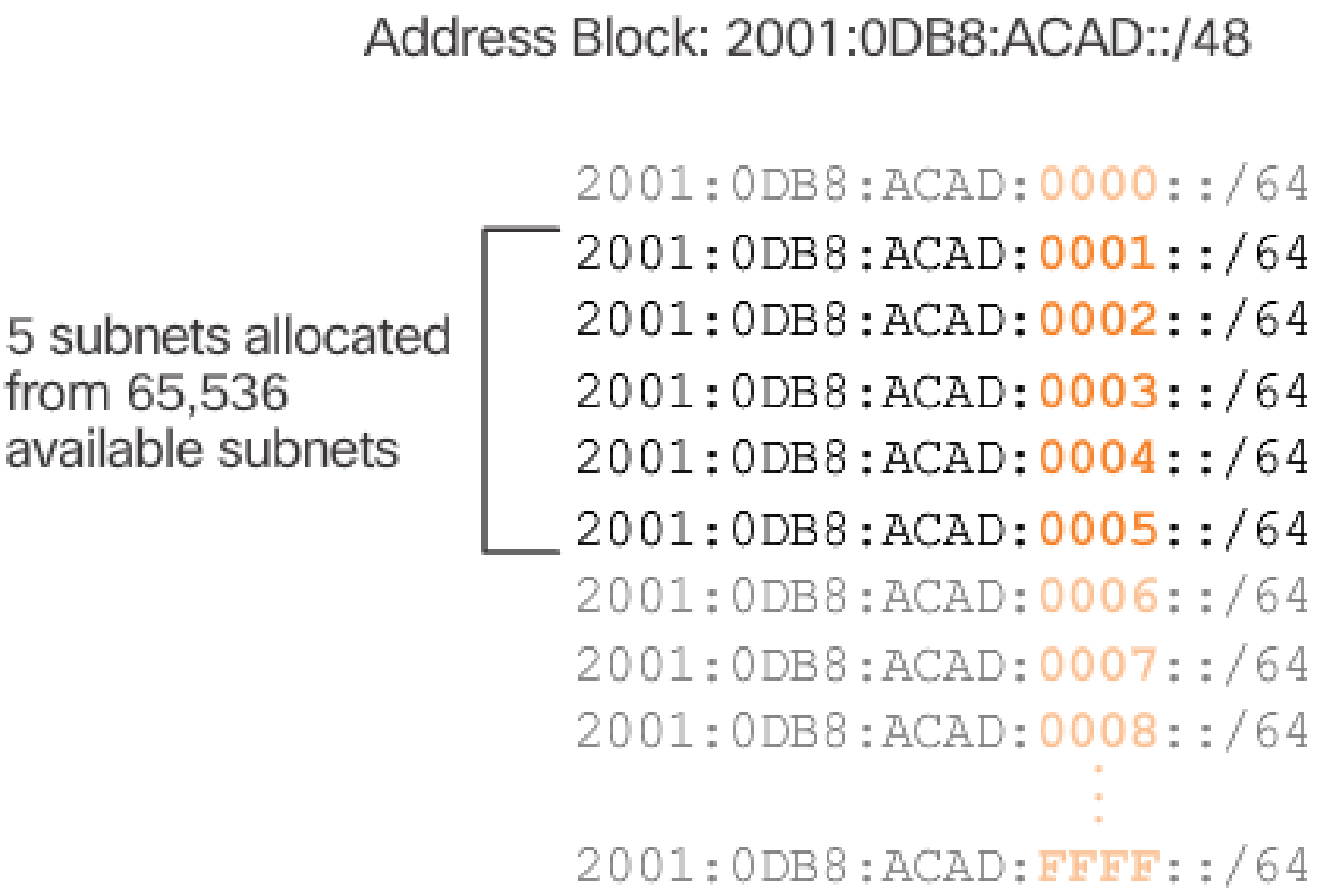
Subnetting Using the Subnet ID



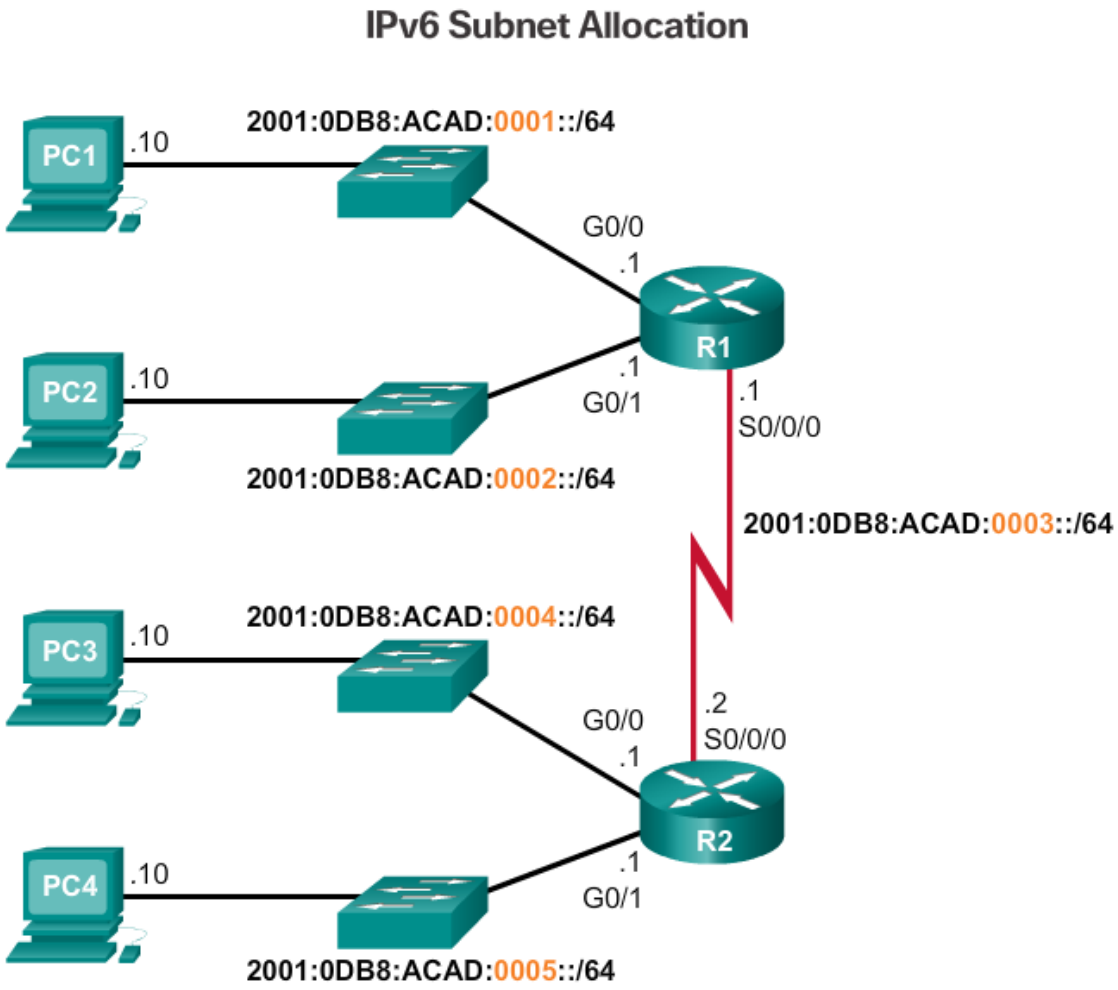
IPv6 Subnet Allocation



IPv6 Subnet Allocation (cont.)

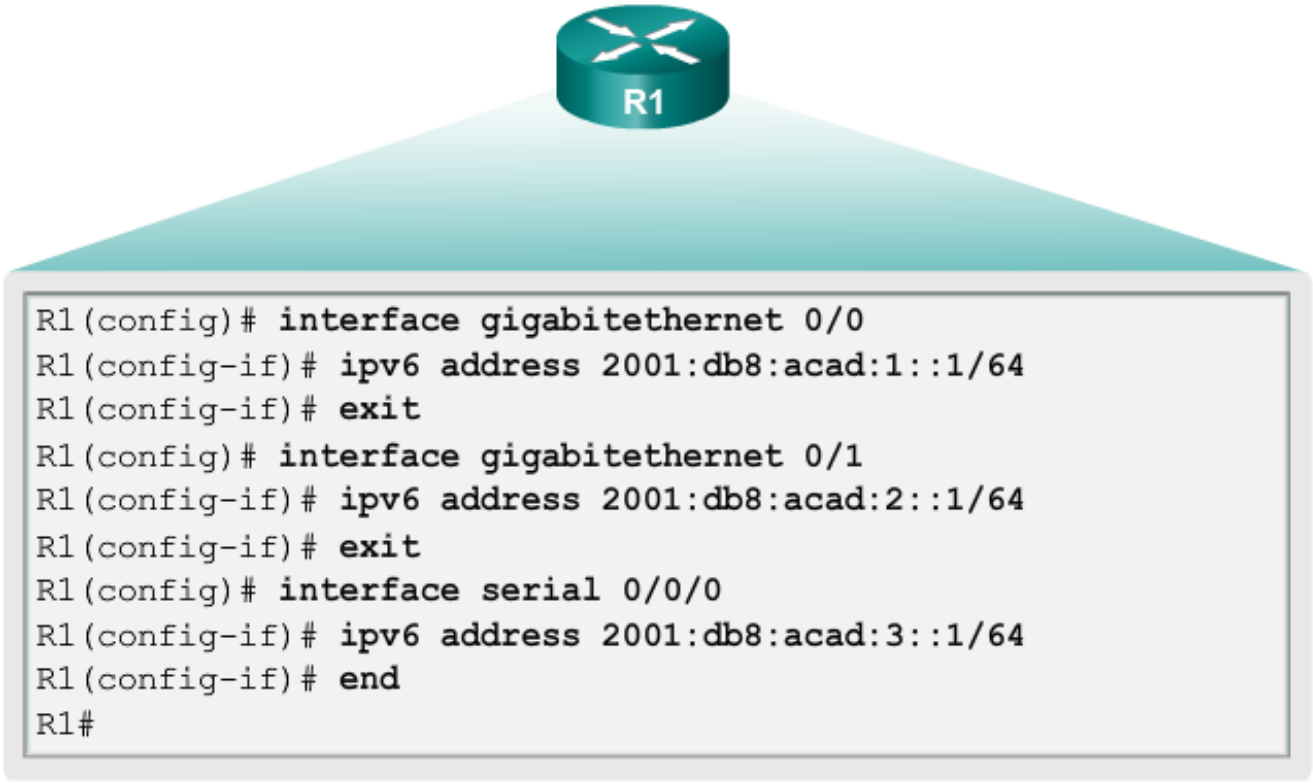


IPv6 Subnet Allocation (cont.)



IPv6 Subnet Allocation (cont.)

IPv6 Address Configuration



Section 8.4: Summary

Chapter Objectives:

- Implement an IPv4 addressing scheme to enable end-to-end connectivity in a small to medium-sized business network.
- Given a set of requirements, implement a VLSM addressing scheme to provide connectivity to end users in a small to medium-sized network.
- Explain design considerations for implementing IPv6 in a business network.