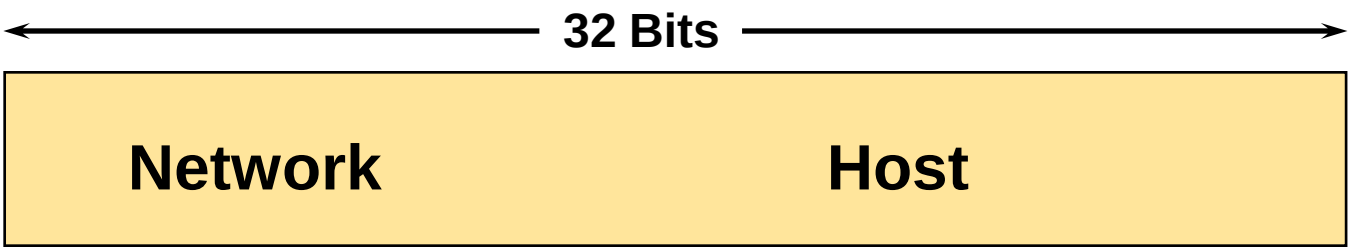
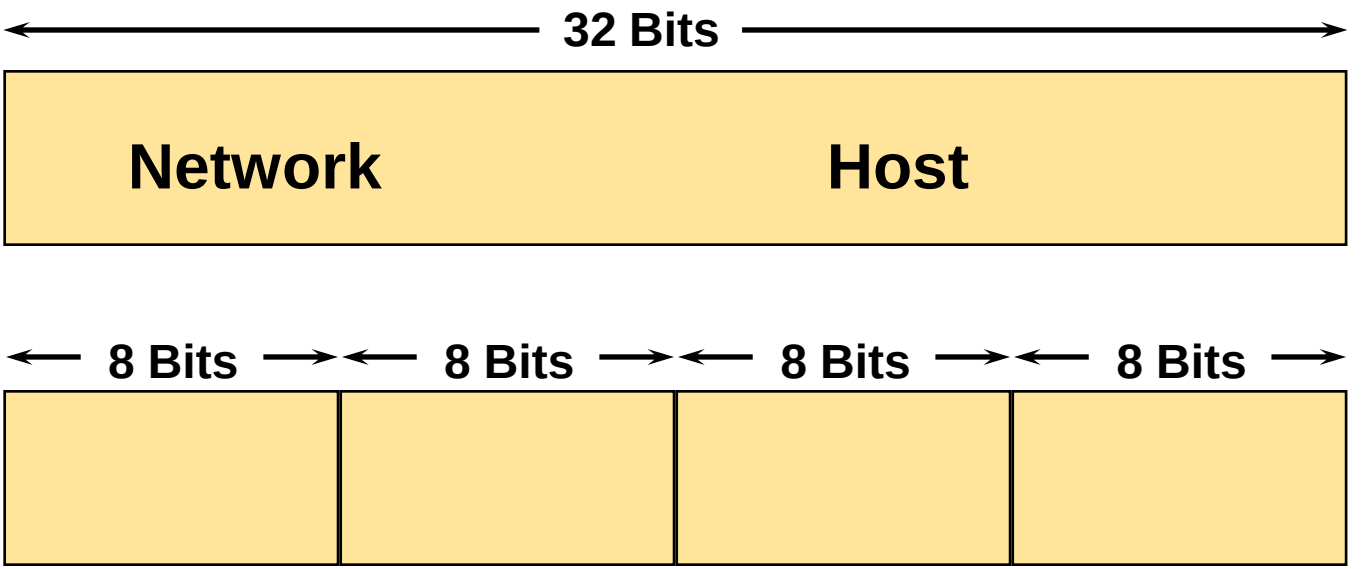
IP Address Overview

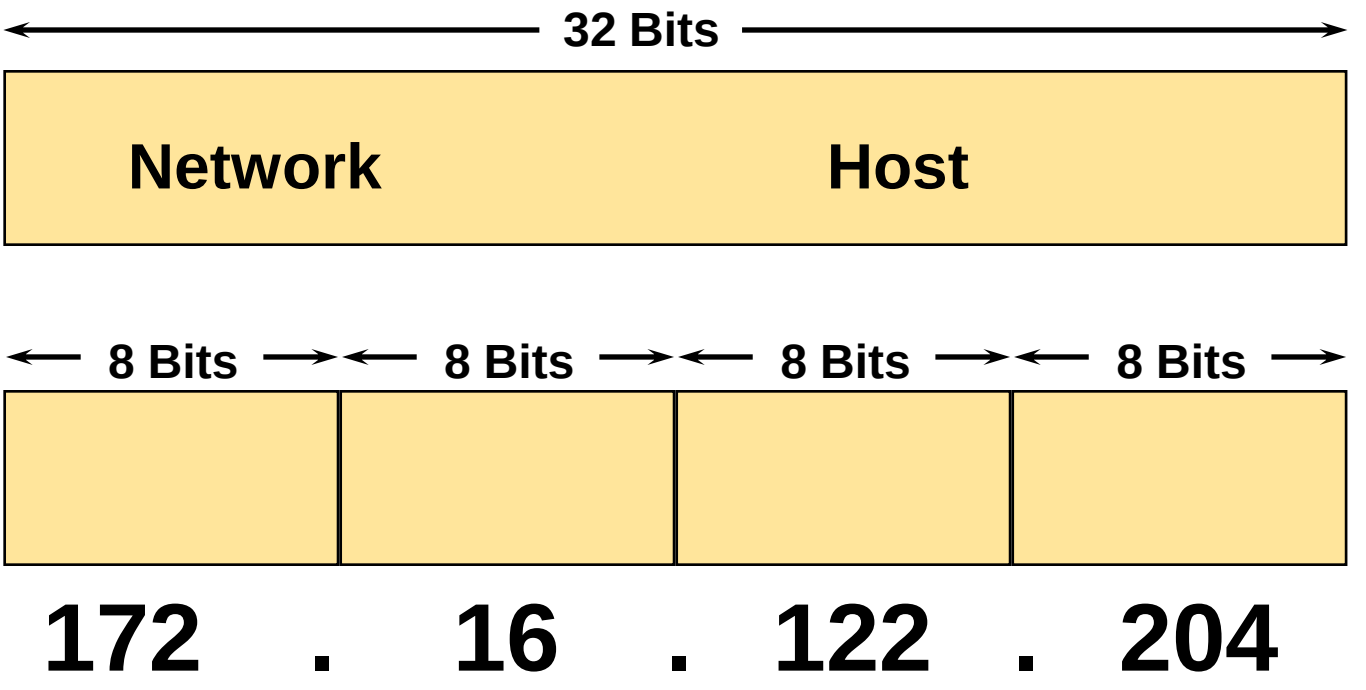
IP Addressing



IP Addressing



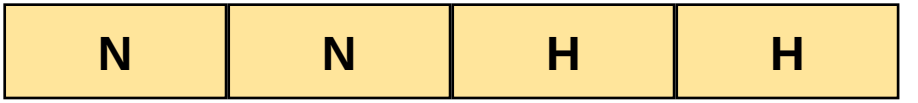
IP Addressing



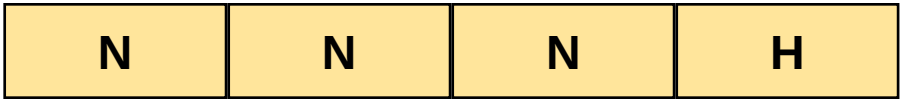
IP Address Classes

Class A:

Class B:



Class C:

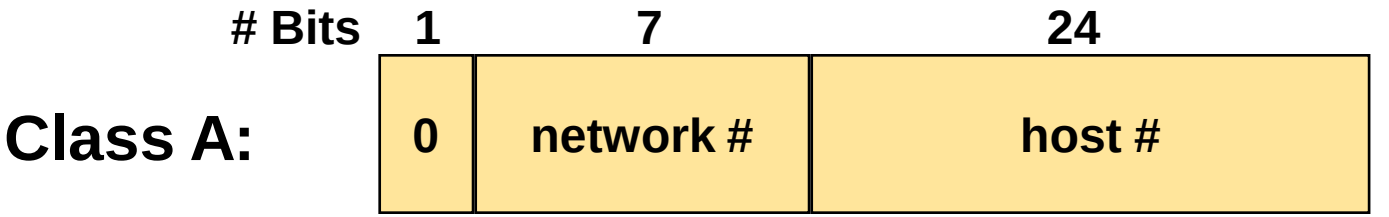


Class D: for multicast

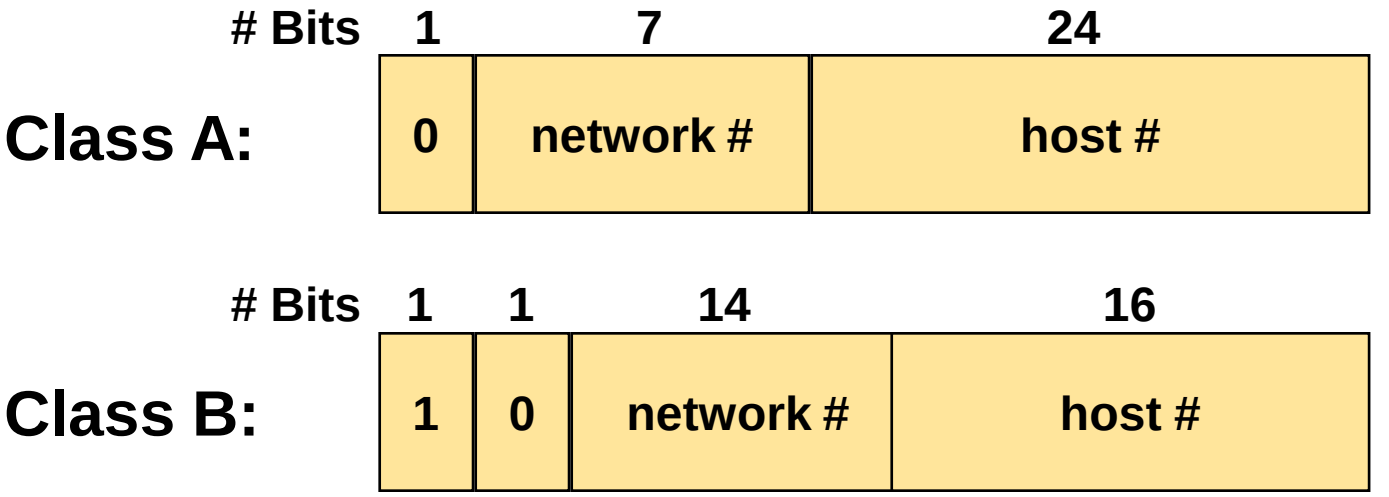
Class E: for research

N = Network number
H = Host number

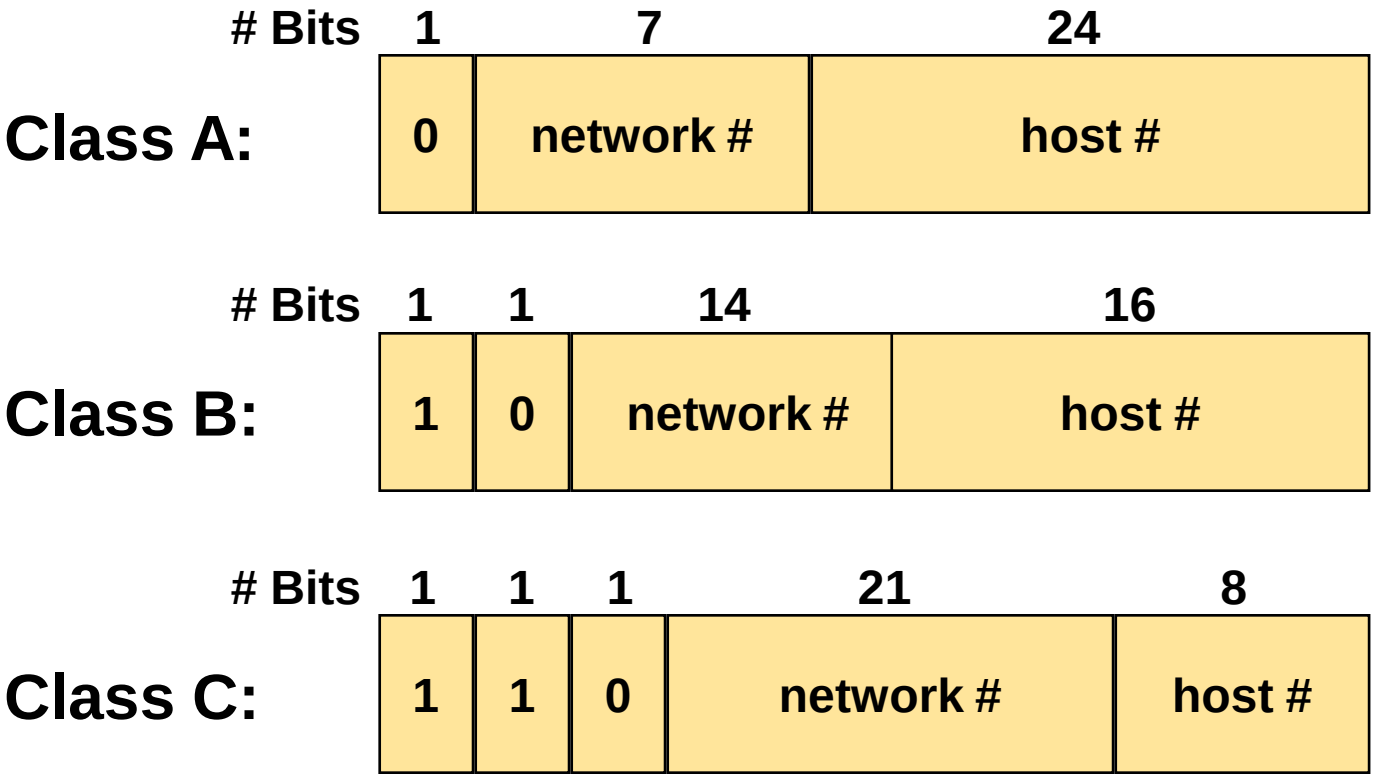
IP Address Bit Patterns



IP Address Bit Patterns



IP Address Bit Patterns



Recognizing Classes in IP Addresses (First Octet Rule)

High Order Bits	Octet in Decimal	Address Class
0	1 – 126	A
10	128 – 191	B
110	192 – 223	C

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1			
128.63.2.100			
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A		
128.63.2.100			
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	
128.63.2.100			
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100			
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B		
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64			
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C		
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2			
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C		
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C	192.6.141.0	
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C	192.6.141.0	0.0.0.2
130.113.64.16			
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C	192.6.141.0	0.0.0.2
130.113.64.16	B		
256.241.201.10			

Written Exercise: IP Address Classes

Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C	192.6.141.0	0.0.0.2
130.113.64.16	B	130.113.0.0	
256.241.201.10			

Written Exercise: IP Address Classes

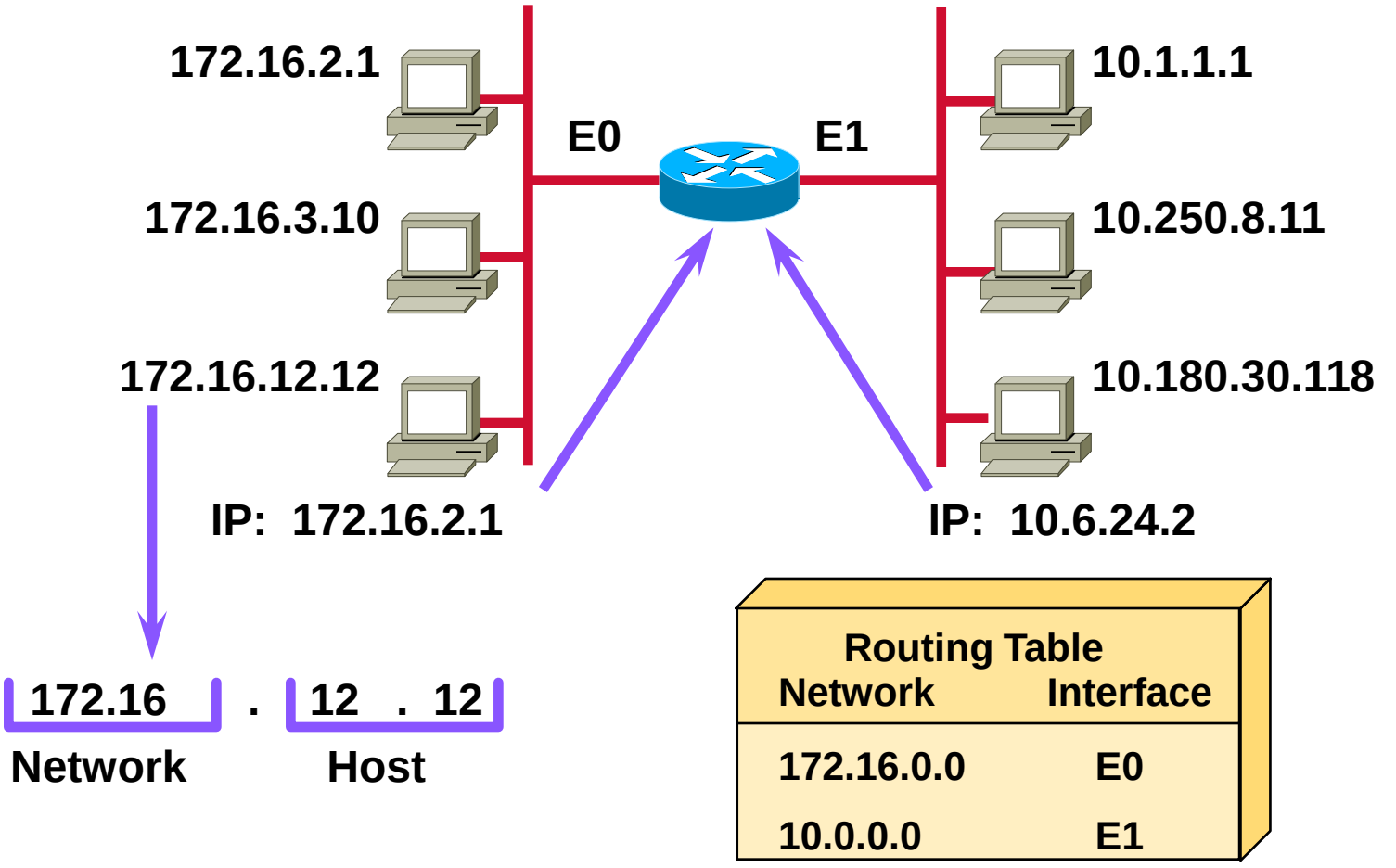
Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C	192.6.141.0	0.0.0.2
130.113.64.16	B	130.113.0.0	0.0.64.16
256.241.201.10			

Written Exercise: IP Address Classes

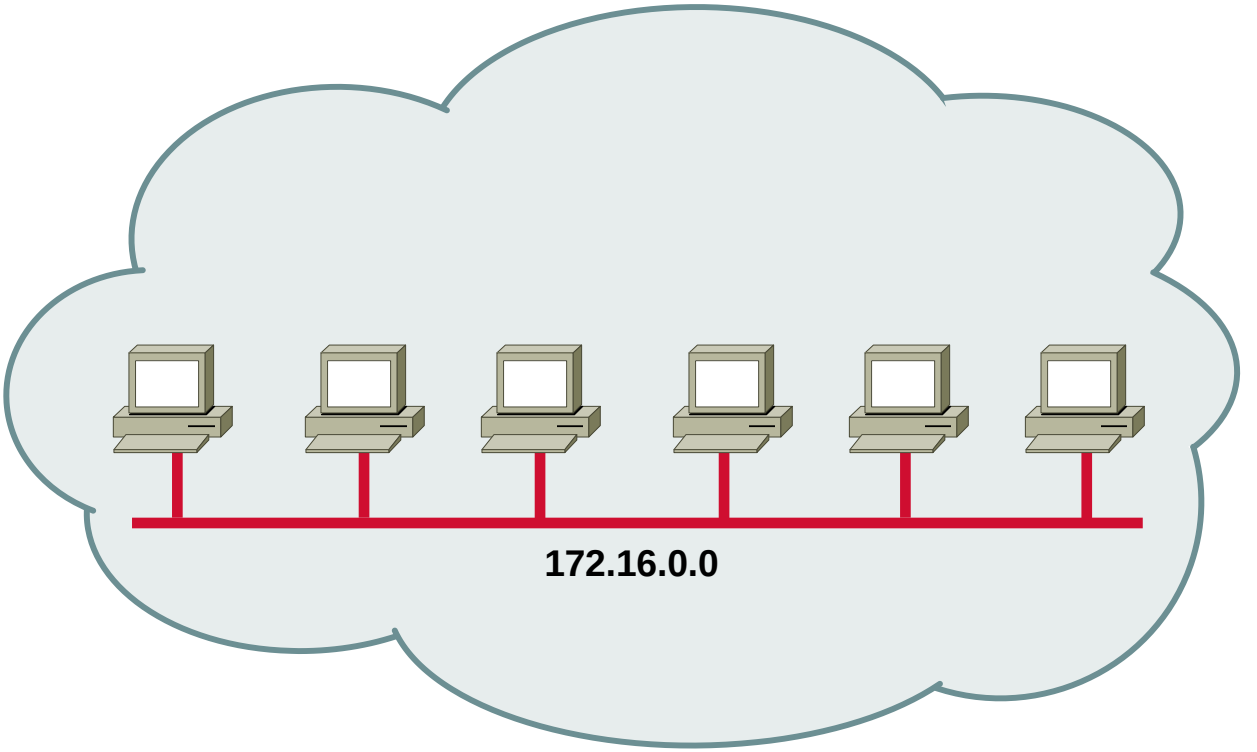
Address	Class	Network	Host
10.2.1.1	A	10.0.0.0	0.2.1.1
128.63.2.100	B	128.63.0.0	0.0.2.100
201.222.5.64	C	201.222.5.0	0.0.0.64
192.6.141.2	C	192.6.141.0	0.0.0.2
130.113.64.16	B	130.113.0.0	0.0.64.16
256.241.201.10	Nonexistent		

Configuring IP Addresses

Host Addresses

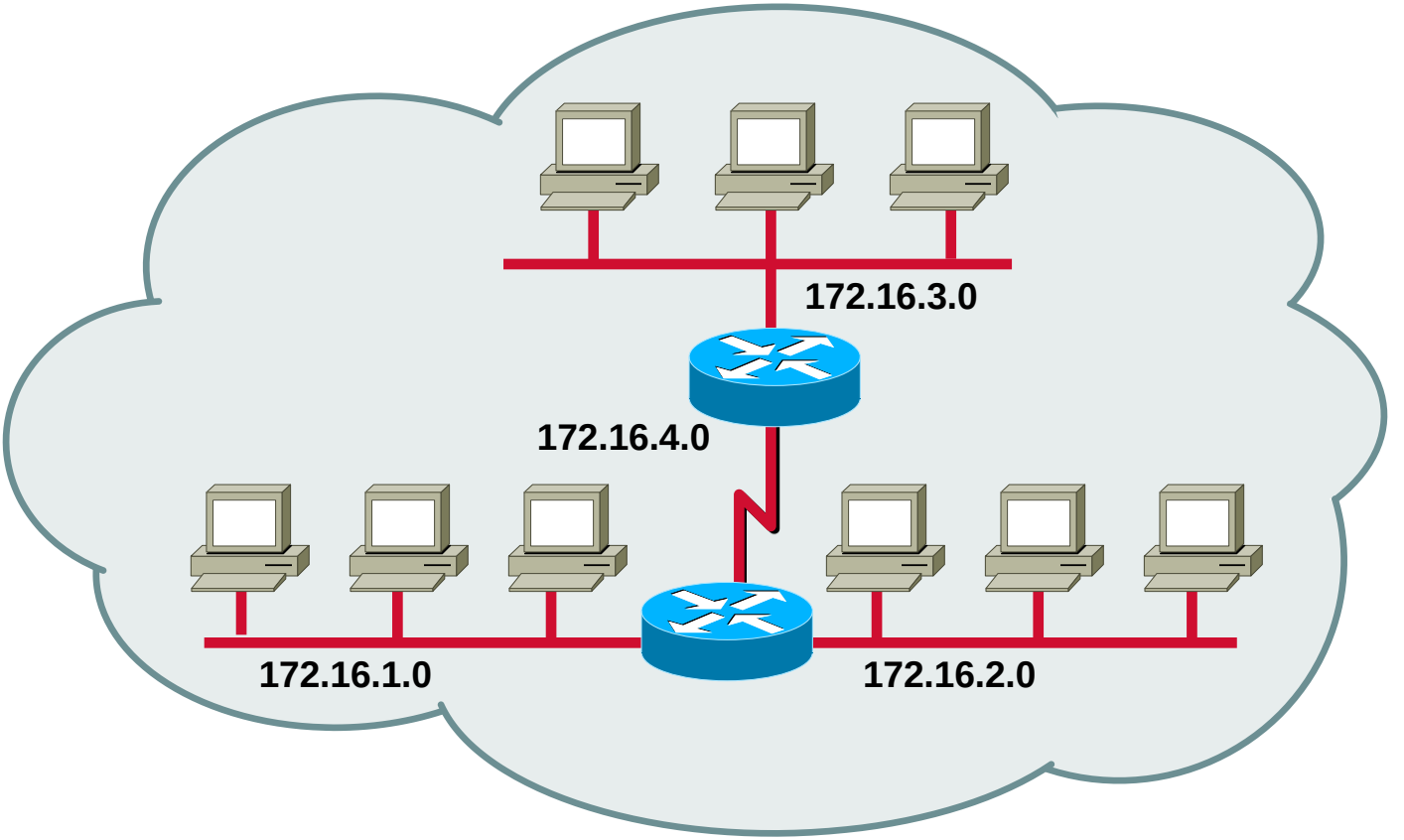


Addressing without Subnets



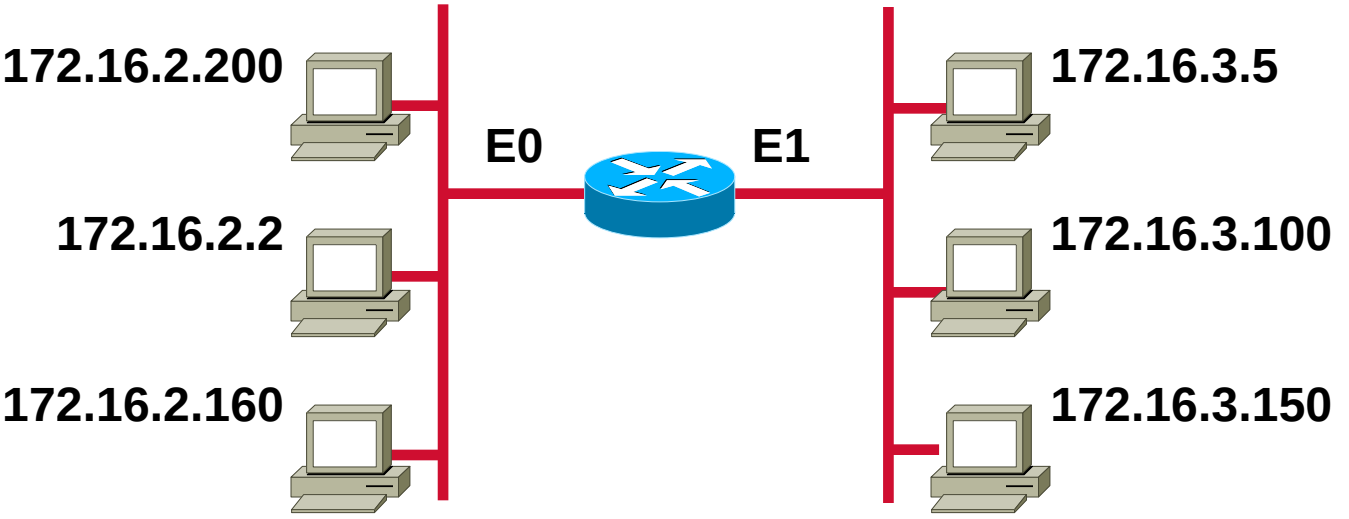
Network 172.16.0.0

Addressing with Subnets



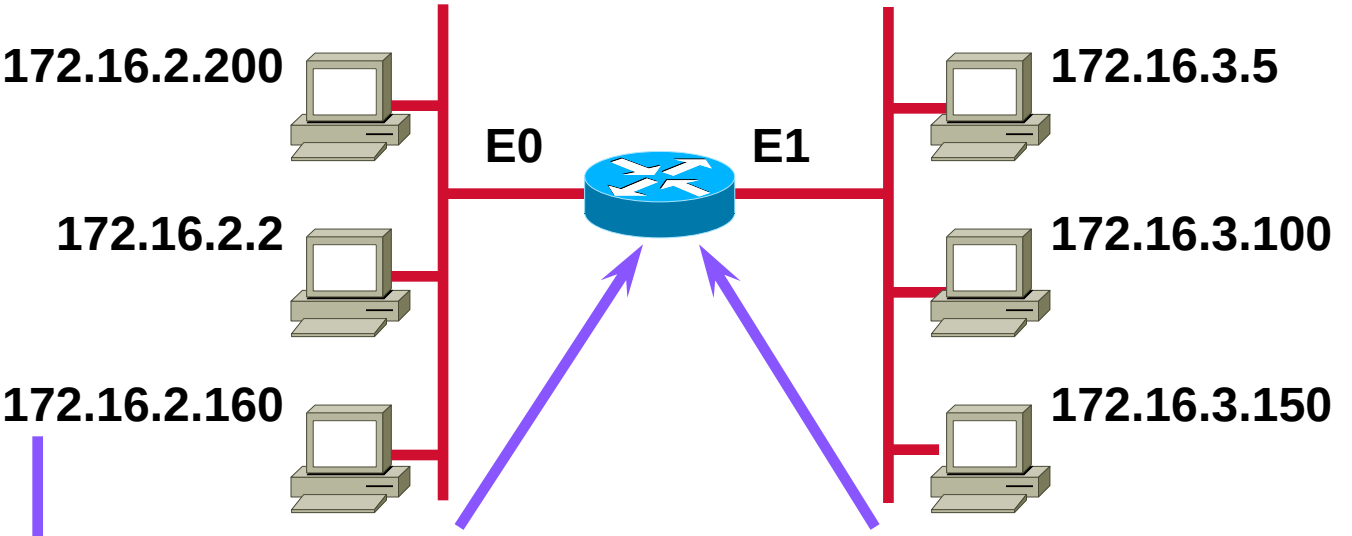
Network 172.16.0.0

Subnet Addressing



Routing Table	
Network	Interface
172.16.0.0	E0
172.16.0.0	E1

Subnet Addressing

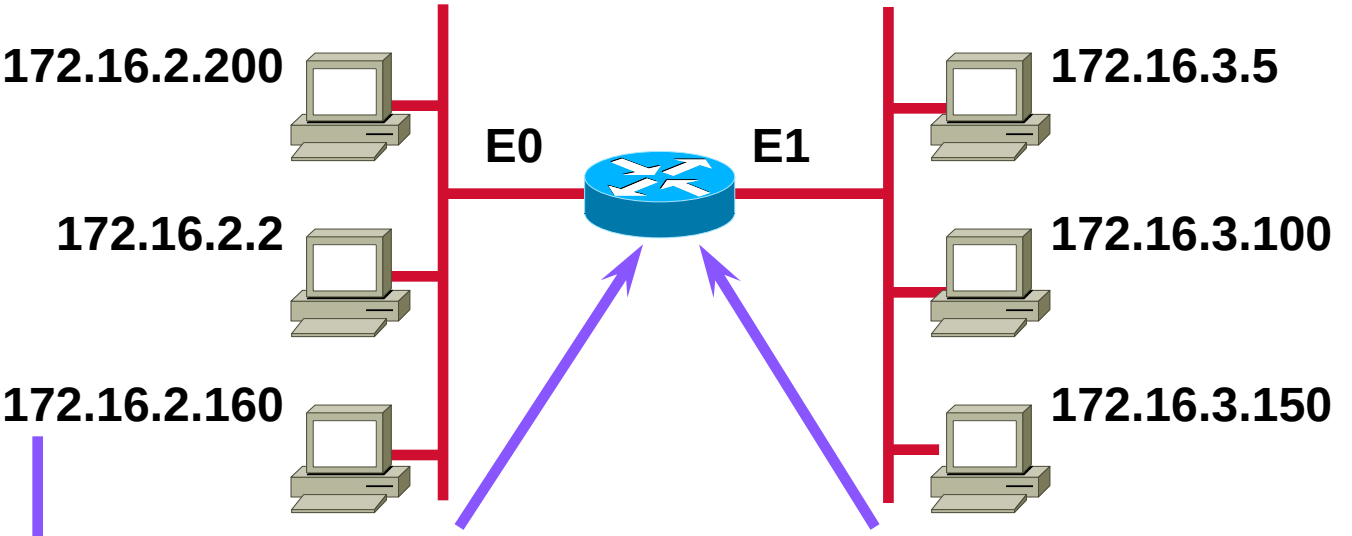


172.16 . 2 . 160

Network Subnet Host

Routing Table	
Network	Interface
172.16.0.0	E0
172.16.0.0	E1

Subnet Addressing

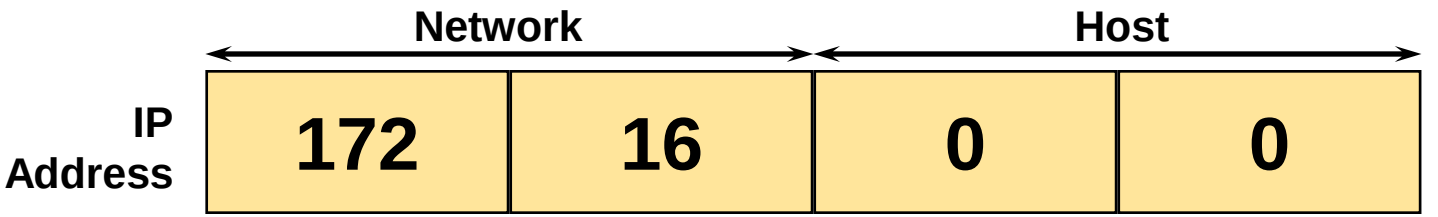


172.16 . 2 . 160

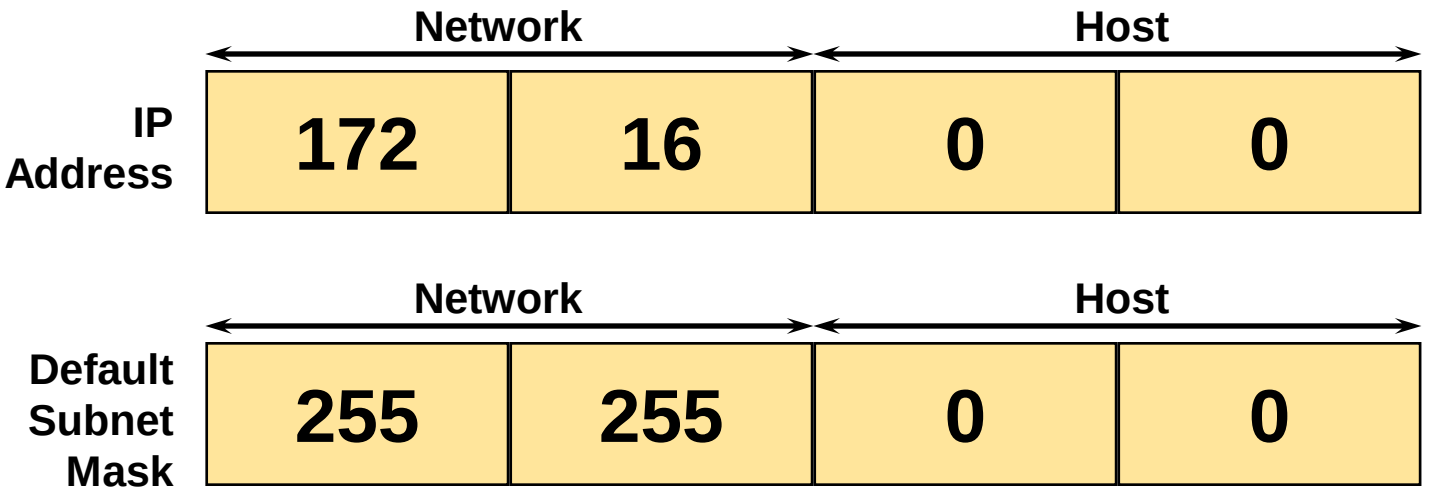
Network Subnet Host

New Routing Table	
Network	Interface
172.16.2.0	E0
172.16.3.0	E1

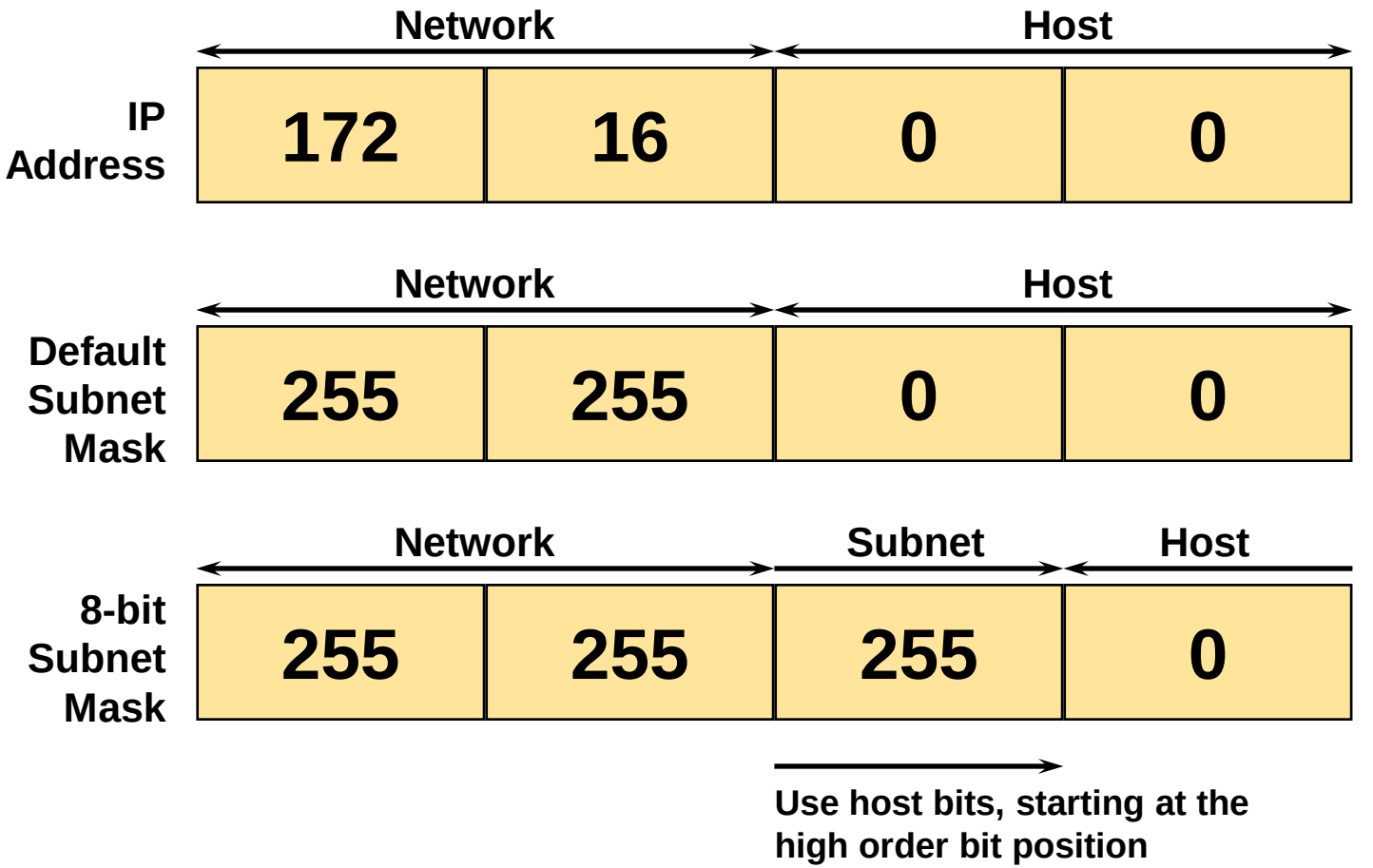
Subnet Mask



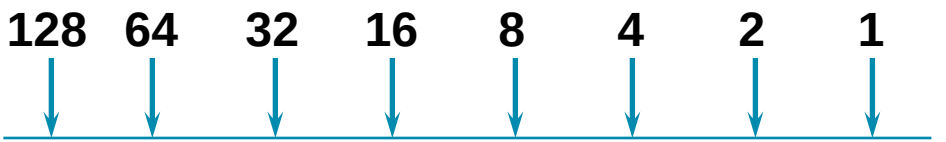
Subnet Mask



Subnet Mask

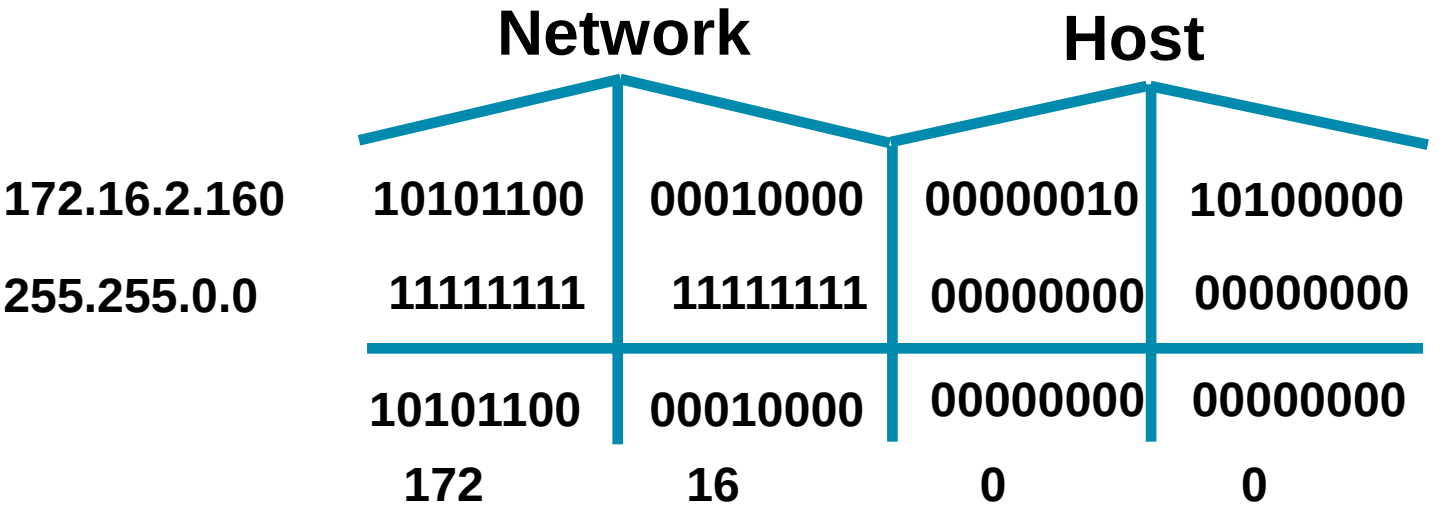


Decimal Equivalents of Bit Patterns



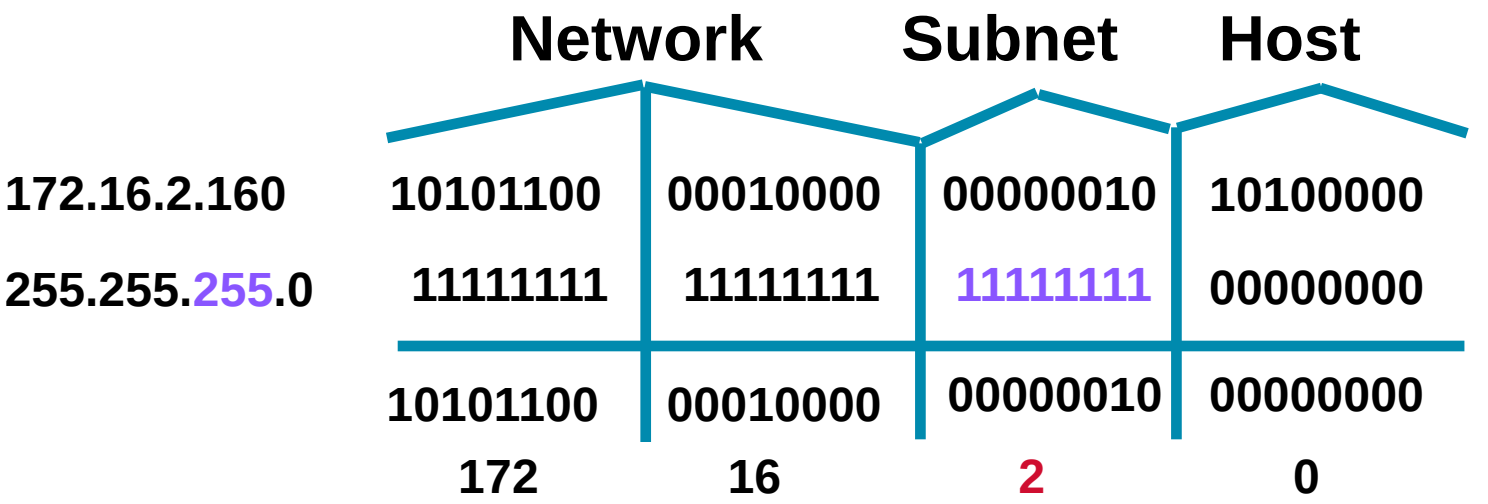
1	0	0	0	0	0	0	0	=	128
1	1	0	0	0	0	0	0	=	192
1	1	1	0	0	0	0	0	=	224
1	1	1	1	0	0	0	0	=	240
1	1	1	1	1	0	0	0	=	248
1	1	1	1	1	1	0	0	=	252
1	1	1	1	1	1	1	0	=	254
1	1	1	1	1	1	1	1	=	255

Subnet Mask without Subnets



Subnets not in use—the default

Subnet Mask with Subnets



Network number extended by eight bits

Written Exercise: Subnet Masks

Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0		
10.6.24.20	255.255.0.0		
10.30.36.12	255.255.255.0		

Written Exercise: Subnet Masks

Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0	B	
10.6.24.20	255.255.0.0		
10.30.36.12	255.255.255.0		

Written Exercise: Subnet Masks

Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0	B	172.16.2.0
10.6.24.20	255.255.0.0		
10.30.36.12	255.255.255.0		

Written Exercise: Subnet Masks

Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0	B	172.16.2.0
10.6.24.20	255.255.0.0	A	
10.30.36.12	255.255.255.0		

Written Exercise: Subnet Masks

Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0	B	172.16.2.0
10.6.24.20	255.255.0.0	A	10.6.0.0
10.30.36.12	255.255.255.0		

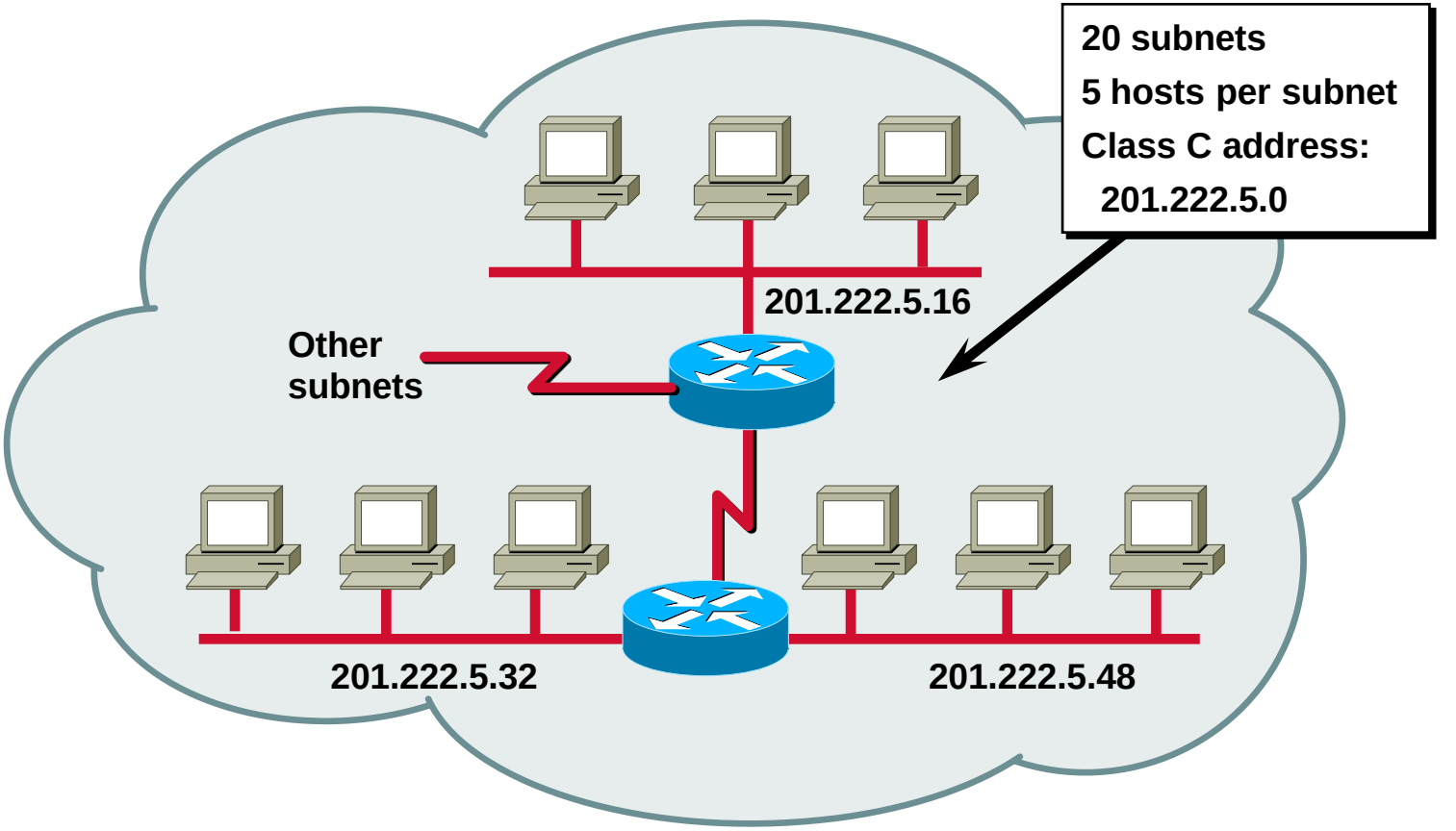
Written Exercise: Subnet Masks

Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0	B	172.16.2.0
10.6.24.20	255.255.0.0	A	10.6.0.0
10.30.36.12	255.255.255.0	A	

Written Exercise: Subnet Masks

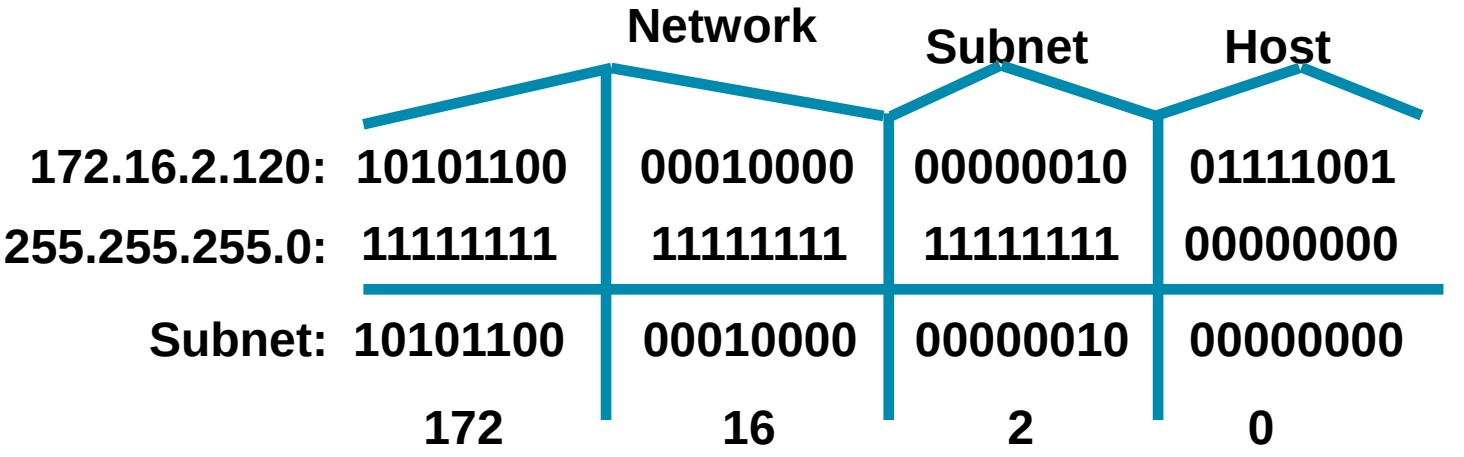
Address	Subnet Mask	Class	Subnet
172.16.2.10	255.255.255.0	B	172.16.2.0
10.6.24.20	255.255.0.0	A	10.6.0.0
10.30.36.12	255.255.255.0	A	10.30.36.0

Subnet의 계획



Class B Subnet Planning Example

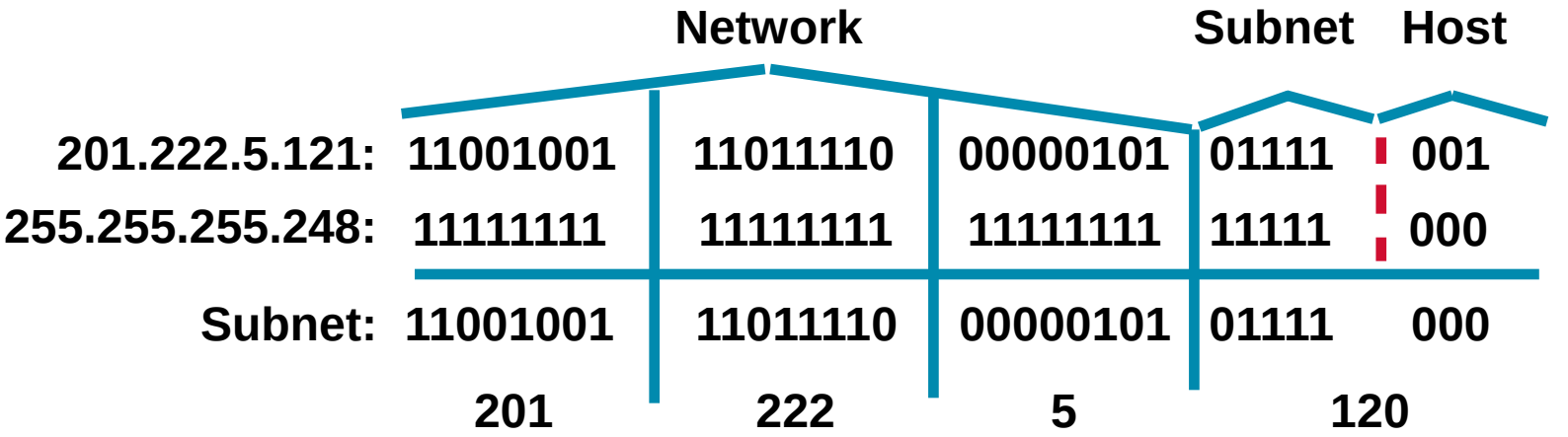
IP Host Address: 172.16.2.120
Subnet Mask: 255.255.255.0



Subnet Address = 172.16.2.0
Host Addresses = 172.16.2.1–172.16.2.254
Broadcast Address = 172.16.2.255
Eight bits of subnetting

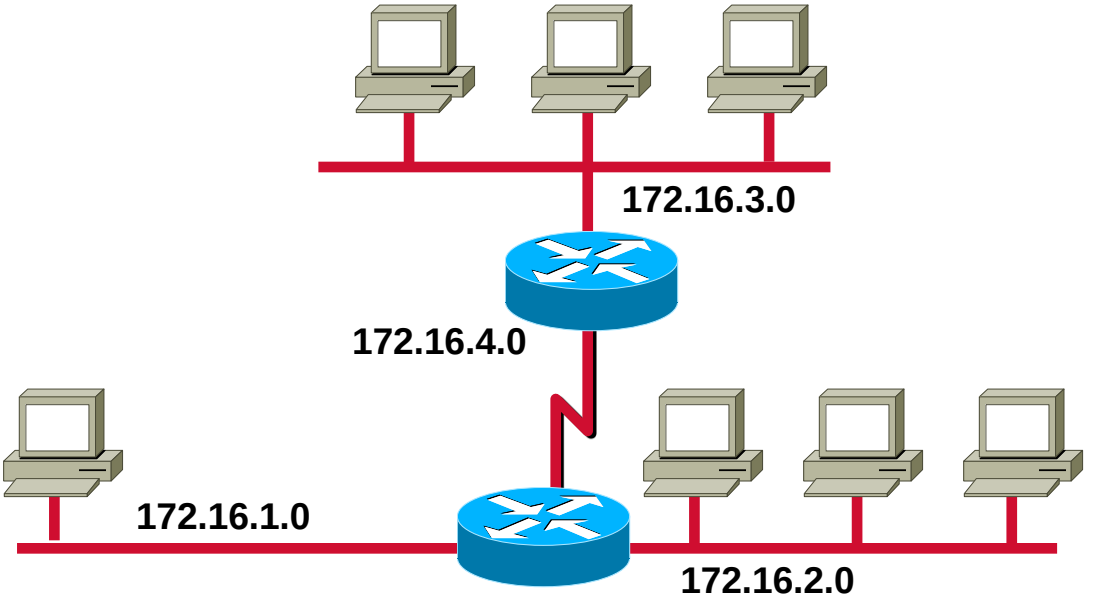
Class C Subnet Planning Example

IP Host Address: 201.222.5.121
Subnet Mask: 255.255.255.248

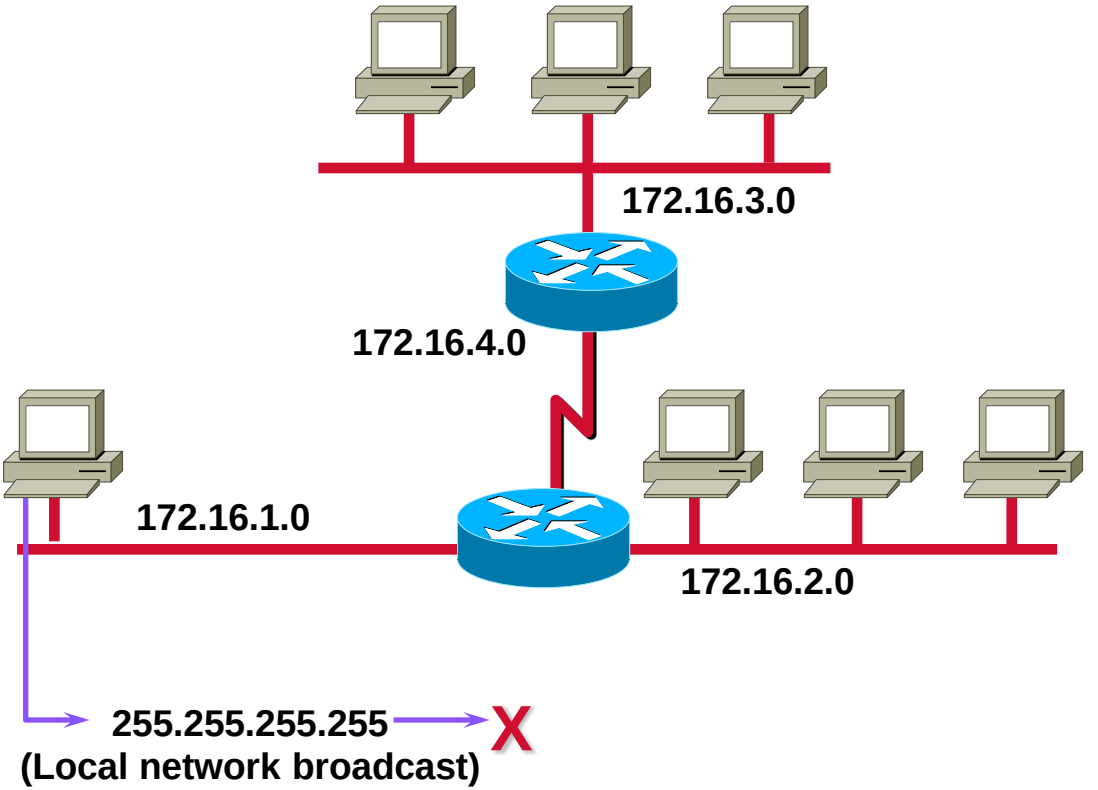


Subnet Address = 201.222.5.120
Host Addresses = 201.222.5.121–201.222.5.126
Broadcast Address = 201.222.5.127
Five Bits of Subnetting

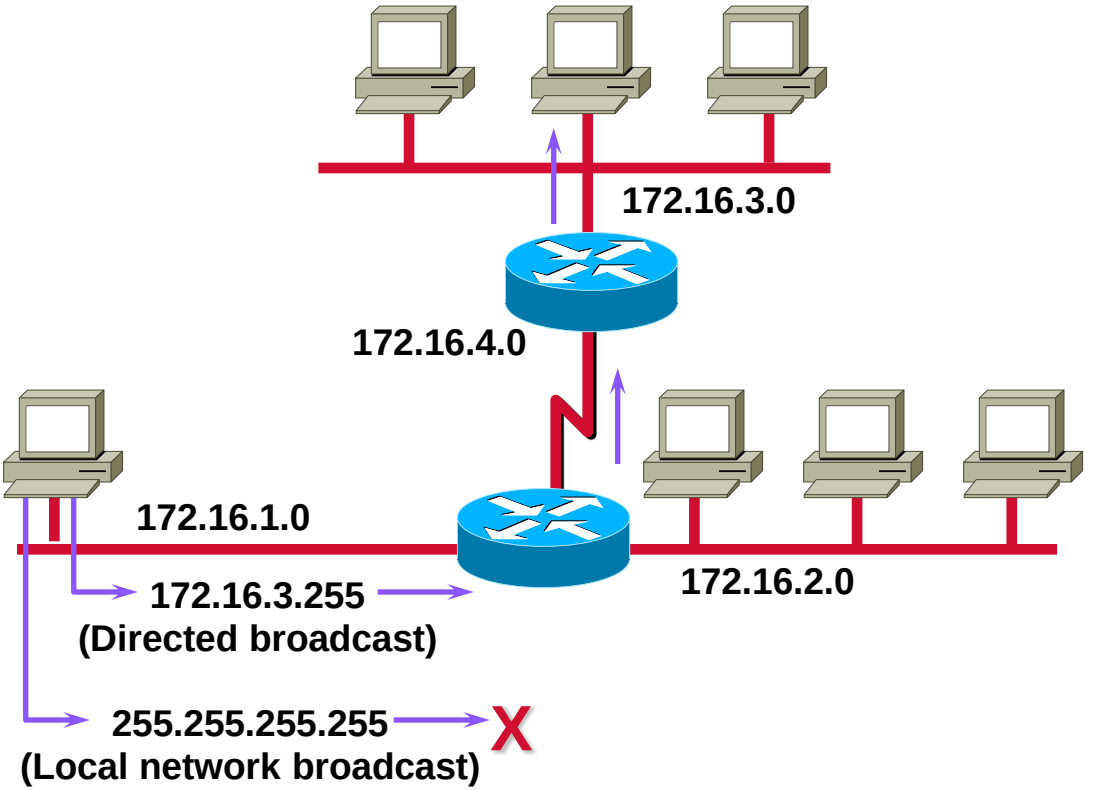
Broadcast Addresses



Broadcast Addresses



Broadcast Addresses



Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248			
15.16.193.6	255.255.248.0			
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C		
15.16.193.6	255.255.248.0			
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	
15.16.193.6	255.255.248.0			
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0			
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A		
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252			
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252	B		
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252	B	128.16.32.12	
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252	B	128.16.32.12	128.16.32.15
153.50.6.27	255.255.255.128			

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252	B	128.16.32.12	128.16.32.15
153.50.6.27	255.255.255.128	B		

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252	B	128.16.32.12	128.16.32.15
153.50.6.27	255.255.255.128	B	153.50.6.0	

Written Exercise: Broadcast Addresses

Address	Subnet Mask	Class	Subnet	Broadcast
201.222.10.60	255.255.255.248	C	201.222.10.56	201.222.10.63
15.16.193.6	255.255.248.0	A	15.16.192.0	15.16.199.255
128.16.32.13	255.255.255.252	B	128.16.32.12	128.16.32.15
153.50.6.27	255.255.255.128	B	153.50.6.0	153.50.6.127