## SUBNETTING

Convert the following IPv4 addresses into binary. Include all leading zeros.

192.168.208.63

- 11000000.10101000.11010000.00111111

10.15.223.44

- 00001010.00001111.11011111.00101100

172.16.225.20

- 10101100.00010000.11100001.00010100

187.32.250.112

- 10111011.00100000.11111010.01110000

172.30.119.99

- 10101100.00011110.01110111.01100011

Conver the following IPv4 addresses from binary to decimal.

10101100.10010010.00010111.11011011

- 172.146.23.219

11100110.00010101.00110110.00100100

- 230.21.54.36

00000011.11111100.11000101.01010101

- 3.252.197.85

00001010.00001010.11001001.11111111

- 10.10.201.255

Classless Inter-Domain Routing (CIDR) Subnetting

Instructions: Using CIDR subnetting, create an IP address scheme using the following scenario. You will need to create a subnet for each department. Your subnet must be large enough to include all department users into one subnet. Hint: you'll need to reference the subnet mask chart, shown in the lecture slides, to determine the proper subnet.

Department # of Hosts

Sales 4084

Marketing 518

Finance 243

Logistics 112

Administration 67

IT Department 25

Router-to-Router A 2

Router-to-Router B 2

Router-to-Router C 2

Your beginning network ID is: 172.18.0.0/16

For each subnet, you will need to show:

Subnet 1

Department name

- Sales

Network ID

- 172.18.0.0/20

Host IP Range

- 172.18.0.0 - 172.18.15.254

Broadcast IP

- 172.18.15.254

Subnet 2

Department name

- Marketing

Network ID

- 172.18.16.0/22

Host IP Range

- 172.18.16.1 - 172.18.19.254

Broadcast IP

- 172.18.19.255

Subnet 3

Department name

- Finance

Network ID

- 172.18.20.0/24

Host Ip Range

- 172.18.20.1 - 172.18.20.254

Broadcast IP

- 172.18.20.255

Subnet 4

Department name

- Logistics

Network ID

- 172.18.21.0/25

Host IP Range

- 172.18.21.1 - 172.18.21.126

Broadcast IP

- 172.18.21.127

Subnet 5

Department name

- Administration

Network ID

- 172.18.21.128/25

Host IP Range

- 172.18.21.129 - 172.18.21.254

Broadcast IP

- 172.18.21.255

Subnet 6

Department name

- IT Department

Network ID

- 172.18.22.0/27

Host IP Range

- 172.18.22.1 - 172.18.22.30

Broadcast IP

- 172.18.22.31

Variable-Length Subnet Masking (VLSM)

Instructions: Like the last scenario, you will create a subnet for each department. This time, you are going to use VLSM to find the right-sized subnet for each department. When creating your network ID, make sure you include CIDR notation. Hint: you will need to utilize the subnet mask table from the lecture slides to find the correct sized subnet.

Department # of Hosts

Sales 4095

Marketing 509

Finance 220

Logistics 99

Administration 95

IT Department 24

Printers 10

Router-to-Router A 2

Router-to-Router B 2

Your beginning network ID is: 172.27.0.0/16

For each subnet, you will need to show:

Subnet 1

Department name

- Sales

Network ID

- 172.27.0.0/20

Host IP Range

- 172.27.0.1 - 172.27.15.254

Broadcast IP

- 172.27.15.255

Subnet 2

Department name

- Marketing

Network ID

- 172.27.16.0/23

Host IP Range

- 172.27.16.1 - 172.27.17.254

Broadcast IP

- 172.27.17.255

Subnet 3

Department name

- Finance

Network ID

- 172.27.18.0/24

Host Ip Range

- 172.27.18.1 - 172.27.18.254

Broadcast IP

- 172.27.18.255

Subnet 4

Department name

- Logistics

Network ID

- 172.27.19.0/25

Host IP Range

- 172.27.19.1 - 172.27.19.126

Broadcast IP

- 172.27.19.127

Subnet 5

Department name

- Administration

Network ID

- 172.27.19.128/25

Host IP Range

- 172.27.19.129 - 172.27.19.254

Broadcast IP

- 172.27.19.255

Subnet 6

Department name

- IT Department

Network ID

- 172.27.20.0/27

Host IP Range

- 172.27.20.1 - 172.27.20.30

Broadcast IP

- 172.27.20.31

Subnet 7

Department name

- Printers

Network ID

- 172.27.20.32/28

Host IP Range

- 172.27.20.33 - 172.27.20.46

Broadcast IP

- 172.27.20.47