

Alex Smetana

CIS 250 Assignment 4: Subnetting

Points: 50

Date Due: See date online

Deliverable: This document.

Collaboration: This is an individual assignment.

Learning Objective(s):

Examine core concepts in designing and managing a network infrastructure.

Complete the following (points as marked)

1. List the private address spaces and subnet masks for Classes A through C. (3 points)

A: 10.0.0.0

B: 172.16.0.0 – 172.31.0.0

C: 192.168.0.0 – 192.168.255.0

2. You have a Class B network and need 29 subnets. What is the subnet mask in bit notation (/xx)? (1 point)

/21

$2^5 = 32$ Subnets

$2^{11} = 2048 - 2 = 2046$ Hosts

3. You need to subnet a class C network that has five subnets, each with at least 16 hosts. Which classful subnet mask would you use (in dotted quad notation xxx.xxx.xxx.xxx)? (4 points)

255.255.255.224

Class: C

N: 24

S: $3 = 2^3 = 8$ Subnets

H: $5 = 2^5 = 32 - 2 = 30$ hosts

/27

4. As the network engineer, you are asked to design an IP subnet plan that calls for five subnets. The largest subnet needs a minimum of 5000 hosts. Management requires that a single mask must be used throughout the Class B network. Assuming the 157.22.0.0 network, what is the subnet mask that would meet these requirements in masked bit notation (/xx)? (4 points)

/19

Class B

N: 16

S: 3

H: 13

$2^3 = 8$ Subnets

$2^{12} = 4096 - 2 = 4094$ Hosts

5. As the network engineer, you are asked to design a plan for an IP subnet that calls for 25 subnets. The largest subnet needs a minimum of 750 hosts. Management requires that a single mask must be used throughout the Class B network. What subnet mask that would meet the requirements assuming a network of 172.16.0.0 (in dotted quad notation xxx.xxx.xxx.xxx)? (4 points)

255.255.248.0

172.16.0.0

N: 16

S: 5

H: 11

$2^5 = 32$ Subnet

$2 = 2048 - 2 = 2046$ Hosts

6. As the network engineer, you are asked to design an IP subnet plan that calls for three subnets. The largest subnet needs a minimum of 52 hosts. Management requires that a single mask must be used throughout the Class C network. What subnet mask will meet these requirements (in dotted quad xxx.xxx.xxx.xxx)? (8 points)

255.255.255.192

Class C

N: 24

S: 2

H: 6

$2^2 = 4$ Subnets

$2^6 = 64 - 2 = 62$ hosts

/26

7. As the network engineer, you are asked to design an IP subnet plan that calls for 12 subnets. The largest subnet needs a minimum of 12 hosts. Management requires that a single mask must be used throughout the Class C network. What private address range should be used for this? What subnet mask that would meet the requirements (in masked bit format /xx)? (10 points)

/28

Class C

N: 24

S: 4

H: 4

$2^4 = 16$ Subnets

$2^4 = 16 - 2 = 14$ hosts

225.255.255.240

8. As the network engineer, you are asked to design an IP subnet plan that calls for 50 subnets. The largest subnet needs a minimum of 600 hosts. Management requires that a single mask must be used throughout the Class B network. What private class B range should you use and what is the subnet mask (in /xx format)? (10 points)

/22

Class B

N: 16

S: 6

H: 10

$2^6 = 64$ subnets

$2^{10} = 1024 - 2 = 1022$ Hosts

255.255.252.0

9. As the network engineer, you are asked to design an IP subnet plan that calls for 5 subnets. The largest subnet needs 25 hosts. Management requires that a single mask must be used throughout the Class C network. What is the subnet mask that should be used (in xxx.xxx.xxx.xxx format)? (4 points)

255.255.255.224

Class: C

N: 24

S: $2^3 = 8$ Subnets

H: $2^5 = 32 - 2 = 30$ hosts

/27

10. If you have a Class C 192.168.10.0/28 network, how many usable subnets and hosts are available? (1 point)

Class: C

N: 24

S: 4 = **16 Subnets**

H: 4 = $16 - 2 = 14$ Subnets

11. The network address of 172.16.0.0/19 provides how many subnets and hosts? (1 point)

Class: B

N:16

S: 3 = $2^3 = 8$ Subnets

H: 13 = $2^{13} = 8102 - 2 = 8100$ Hosts

