

## Subnetting

A class C network (192.68.132.X) has been divided up into three subnets. The subnet masks used for this network are the following:

Sub Network ID	Subnet Mask
A	255.255.255.64
B	
C	255.255.255.128
D	255.255.255.192

A single router is used to connect all of the sub networks together. The forwarding table for the router is the following, and this router is the default router for all hosts.

Sub Network Number	Subnet Mask	Next Hop
192.68.132.0	255.255.255.128	Interface 0
192.68.132.128	255.255.255.128	Interface 1
192.68.132.0	255.255.255.192	Interface 0
192.68.132.128	255.255.255.192	Interface 1
192.68.132.192	255.255.255.192	Interface 2
Default		Router 2

A) A host on Sub Network A wants to send a packet with destination IP address 192.68.132.54. Does

10000000 – 128 /25

11000000 – 192 /26

11100000 - 224 /27

11110000 - 240 /28

**Subnet Example:**

Have a Class C network 212.1.1/24 (254 possible hosts ) for an organization. Come up with a set of subnet masks for the last byte of the Class C network address that divides the 256 hosts such that each subnet can hold the number of hosts indicated. Look at the number of hosts and use a mask that will give you a number of hosts (based on a power of 2) greater than that required. I.e. if you need 5 hosts on a subnet, then create one that has  $2^3 - 2$  or 6 hosts possible (remember one host represents the network and one is for broadcast).

Department A: 75 hosts

Department B: 35 hosts

Department C: 20 hosts

Department D: 18 hosts

Solution:

For Department A, need a subnet with  $2^7 - 2 = 126$  hosts

For Department B, need a subnet with  $2^6 - 2 = 62$  hosts

For Department C, need a subnet with  $2^5 - 2 = 30$  hosts

For Department D, need a subnet with  $2^5 - 2 = 30$  hosts

Use Subnet mask of 255.255.255.128 to create sub networks 212.1.1.0 and 212.1.1.128. Use 212.1.1.0 for Department A

Use Subnet mask of 255.255.255.192 to create subnets 212.1.1.128 and 212.1.1.192. Use 212.1.1.128 for Department B

Use Subnet mask of 255.255.255.224 to create subnets 212.1.1.192 and 212.1.1.224. use 212.1.1.192 for Department C and 212.1.1.224 for Department D

Subnet Mask	Binary	/#	Subnet	Department
255.255.255.128	10000000	/25	212.1.1.0	A
255.255.255.192	11000000	/26	212.1.1.128	B
255.255.255.224	11100000	/27	212.1.1.192	C
255.255.255.224	11100000	/27	212.1.1.224	D