Andres Hung, Jennessa Sierra

Classwork

255.255.255.240 (11110000) 2^4 16-32 255.255.255.11100000 32-64-96-128

- Show that the server with IP address 203.125.72.28/28 and the server with IP address 203.125.72.34/28 do not belong to the same network.

First determine network characteristics for both.

203.125.72.28 /**28**
Network ID: 203.125.72.**16**
Broadcast IP: 203.125.72.**31**
First Host IP: 203.125.72.**17**
Last Host IP: 203.125.72.**30**
Next Network: 203.125.72.**32**
# of IP Addresses: **16** (14 usable)
CIDR/Subnet: 255.255.255.**240**

203.125.72.34 /**28**
Network ID: 203.125.72.**32**
Broadcast IP: 203.125.72.**47**
First Host IP: 203.125.72.**33**
Last Host IP: 203.125.72.**46**
Next Network: 203.125.72.**48**
# of IP Addresses: **16** (14 usable)
CIDR/Subnet: 255.255.255.**240**

We can see that the Network ID for the two IP addresses are different, thus on different networks.

- The given IP address of a host is 192.168.100.102/27.
  - Show that this host belongs to the network: 192.168.100.96/27.
  - Show that the broadcast address of this network 192.168.100.127 is.
  - show that all participants on this network have an IP address which lies between 192.168.100.97 and 192.168.100.126.

Andres Hung, Jennessa Sierra

First we determine the network characteristics for the IP Address 192.168.100.102 /27.

Network ID: 192.168.100.**96**
Broadcast IP: 192.168.100.**127**
First Host IP: 192.168.100.**97**
Last Host IP: 192.168.100.**126**
Next Network: 192.168.100.**128**
# of IP Addresses: **32** (30 usable)
CIDR/Subnet: 255.255.255.**224**

The network ID determined shows that the host IS on the 192.168.100.96 /27 network. This was determined by incrementing by the group size (32) starting from .0 until you get the ranges where .102 is between. You get .96 which is the network ID and .128 which is the next network.

The broadcast address determined showed that it is 192.168.100.127. You get this by subtracting 1 from the next network (192.168.100.128 - 1).

The usable hosts are calculated with the range you get starting from adding 1 to the network ID and ending with the broadcast address - 1. You get participants in the range 192.168.100.97 to 192.168.100.126 inclusive.

- A corporate network is composed of different subnets.
  The participants with the following IP addresses belong to three different subnets: 172.23.136.45, 172.23.139.78 and 172.23.140.197.
  The participants with IP address 172.23.126.120 and 172.23.127.92 do belong to the same subnet.

  Show that the CIDR suffix /23 will be within the corporate network.

A /23 network has a subnet mask of 255.255.254.0

Convert the 3rd octets of the IP addresses into binary.

IP Addresses

1. 172.23.136.45 = 172.23.10001000.45
2. 172.23.139.78 = 172.23.10001011.78
3. 172.23.140.197 = 172.23.10001100.197
4. 172.23.126.120 = 172.23.01111110.120
5. 172.23.127.92 = 172.23.01111111.92

Andres Hung, Jennessa Sierra

In a /23 subnet mask, the first 7 bits are part of the network, with the last one being the host. .120 and .92 are on the same /23 subnet, but the .45, .78, and .197 differ in /23 subnets.

Thus the /23 CIDR is within the corporate network with 172.23.136.45, 172.23.139.78, and 172.23.140.197 being on different subnets and 172.23.126.120 and 172.23.127.92 belonging to the same subnet.

Classwork

1- You have been allocated a class A network address of **29.0.0.0**. You need to create at least 20 networks and each network will support a maximum of 160 hosts. Would the following two subnet masks Work?

255.255.0.0 and or **255.255.255.0**

255.255.0.0
NNNNNNNN.SSSSSSSS.HHHHHHHH.HHHHHHHH

For Class A 8 bits are available to us for subnetting, giving us 256 (2^8) subnets.
16 host bits gives us 65534 available hosts per network (2^16 - 2).
This subnet mask would work for 20 networks and 160 hosts.

255.255.255.0
NNNNNNNN.SSSSSSSS.SSSSSSSS.HHHHHHHH

For Class A 16 bits are available to us for subnetting, giving us 65536 subnets.
8 host bits gives us 254 available hosts per network (2^8 - 2).
This subnet mask would work for 20 networks and 160 hosts.

Answer: Both 255.255.0.0 and 255.255.255.0 masks would work.

Classwork

2. – You have been allocated a class B network address of 135.1.0.0 and and need to create 4 subnets each with around 200 hosts what is the easiest mask to use to satisfy the criteria?

Class B is NNNNNNNN.NNNNNNNN.HHHHHHHH.HHHHHHHH

For subnetting, we need at least 2 bits as 2^2 = 4 possible networks.
This leaves us with 14 bits for hosts, which is enough for us. 2^14 - 2 = 16382.

Andres Hung, Jennessa Sierra

The easiest mask that satisfies the criteria is 11111111.11111111.11000000.00000000 or /18 as this gives us the extra 2 bits for the 4 subnets.

Classwork

3. Write the IP address 222.1.1.20 mask 255.255.255.192 in CIDR notation

222.1.1.20 /26

Classwork

4. Write the IP address 135.1.1.25 mask 255.255. 248.0 in CIDR notation

135.1.1.25 /21