Variable Length Subnet Mask

*This lab section is intended to demonstrate the use of CIDR notation to create “Classless” network of various sizes - creating subnets that do not follow the old “Classful” address assignments.*

1. Use steps 1 through 11 of the “Lab Configuration Instructions” handout to set up your network connection.
2. Verify host A (left computer) is plugged into port 1
3. Verify host B (right computer) is plugged into port 2
4. Configure your computer’s network address (start at step 13 of the Lab Config Instructions handout)
   1. If you are **host A, set the IP Address for the Computer as 192.168.x.100** where “x” is your switch number.
   2. If you are **host B, set the IP Address for the Computer as 192.168.x.200** where “x” is your switch number.
   3. **Set the Subnet Mask to 255.255.255.128** (both computers).
   4. Do not set a Default Gateway.
   5. Make sure you click on “OK” and “Close” buttons and all the pop-up windows are closed. It may take a minute for the system to process your new IP configuration.
5. Using ipconfig command, verify and record your IP addr and subnet mask. Use these two pieces of info to calculate your Net ID. Circle “Host A” if you are Host A, or “Host B” if you are Host B. Fill out your Host (A or B) info in the following table. Share your info with your partner. Copy your partner’s Host info to your handout.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Host A | | |  | | *Host B* |
| IP Addr | | 192.168.\_x\_.100 |  | | 192.168.\_x\_.200 | | |
| Subnet Mask | | 255.255.255.128 |  | | 255.255.255.128 | | |
| Network ID | | 192.168.\_x\_.\_0\_ |  | | 192.168.\_x\_.128 | | |

1. Represent your network in slash notation (Net ID/subnet mask).

192.168.x.128 /25

1. Use the “ping” command to ping your partner’s computer. If two computers can ping each other, it means they are in the same subnet (Their Net IDs are the same).
2. Were you successful? No\_\_\_\_\_
3. Why or why not? If not successful, what error message did you get?

\_\_No, because they don’t share the same Network ID. (error message)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the valid IP range given the IP address 192.168.x.100/25? (“x” is your switch number)   
    192.168.x.1 to 192.168.x.126
2. What is the valid IP range given the IP address 192.168.x.200/25  
   192.168.x.129 to 192.168.x.254
3. On **host B set the IP address to 192.168.x.20**
4. Use the “ping” command to ping your partner’s computer
5. Were you successful? \_Yes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Why or why not?

\_Because they share the same Network ID now.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Given the IP addresses **192.168.x.120** and **192.168.x.140** what would be the **largest** subnet mask that would allow both computers to talk? 255.255.255.0
2. What is the network in slash notation? 192.168.x.0/24
3. On **host A set the IP Address to 10.224.1.1**
4. On **host B set the IP Address to 10.224.1.15**
5. Find the subnet mask that creates the **smallest** subnet that will allow these hosts to communicate (ping).
6. What is the subnet mask? 255.255.255.224
7. What is the “network id”? 10.224.1.0
8. What is the broadcast address for this network? 10.224.1.31
9. What is the valid IP range given the network ID and subnet mask from above?

10.224.1.1 to 10.224.1.30

1. What is the network in slash notation? 10.224.1.0/27
2. Test this by **entering the subnet mask into both computer A and computer B**.
3. Do not set a Default Gateway.
4. Make sure your partner is at this step then **use the “ping” command** to ping your partner’s computer.
5. Were you successful? If not, go back and try again before continuing.
6. On **host A set the IP Address to 172.16.20.30**
7. On **host B set the IP Address to 172.16.20.50**
8. Find the subnet mask that creates the **smallest** subnet that will allow these hosts to communicate (ping).
9. What is the subnet mask? 255.255.255.192
10. What is the “network id”? 172.16.20.0
11. What is the broadcast address for this network? 172.16.20.63
12. What is the valid IP range given the network ID and subnet mask from above?

172.16.20.1 to 172.16.20.62

1. What is the network in slash notation? 172.16.20.0/26
2. Test this by **entering the subnet mask into both computer A and computer B**.
3. Do not set a Default Gateway
4. Make sure your partner is at this step then **use the “ping” command** to ping your partner’s computer
5. Were you successful? If not, go back and try again before continuing.
6. On **host A set the IP Address for the Computer as 10.1.137.12**
7. On **host B set the IP Address for the Computer as 10.1.137.15**
8. Find the subnet mask that creates the **smallest** subnet that will allow these hosts to communicate (ping).
9. What is the subnet mask? 255.255.255.224
10. What is the “network id”? 10.1.137.0
11. What is the broadcast address for this network? 10.1.137.31
12. What is the valid IP range given the network ID and subnet mask from above?

10.1.137.1 to 10.1.137.30

1. What is the network in slash notation? 10.1.137.0/27
2. Test this by **entering the subnet mask into both computer A and computer B**.
3. Do not set a Default Gateway.
4. Make sure your partner is at this step then **use the “ping” command** to ping your partner’s computer.
5. Were you successful? If not, go back and try again before continuing.
6. On **host A set the IP Address to 172.16.11.74**
7. On **host B set the IP Address to 172.16.11.78**
8. Find the subnet mask that creates the **smallest** subnet that will allow these hosts to communicate (ping).
9. What is the subnet mask? 255.255.255.248
10. What is the “network id”? 172.16.11.72
11. What is the broadcast address for this network? 172.16.11.79
12. What is the valid IP range given the network ID and subnet mask from above?

172.16.11.73 to 172.16.11.78

1. What is the network in slash notation? 172.16.11.72/29
2. Test this by **entering the subnet mask into both computer A and computer B**.
3. Do not set a Default Gateway.
4. Make sure your partner is at this step then **use the “ping” command** to ping your partner’s computer.
5. Were you successful? If not, go back and try again before continuing.
6. On **host A set the IP Address to 172.16.11.75**
7. On **host B set the IP Address to 172.16.12.88**
8. Find the subnet mask that creates the **smallest** subnet that will allow these hosts to communicate (ping).
9. What is the subnet mask? 255.255.248.0
10. What is the “network id”? 172.16.8.0
11. What is the broadcast address for this network? 172.16.15.255
12. What is the valid IP range given the network ID and subnet mask from above?

172.16.8.1 to 172.16.15.254

1. What is the network in slash notation? 172.16.8.0/21
2. Test this by **entering the subnet mask into both computer A and computer B**.
3. Do not set a Default Gateway.
4. Make sure your partner is at this step then **use the “ping” command** to ping your partner’s computer.
5. Were you successful? If not, go back and try again before continuing.

Reconfigure the computer - IMPORTANT

1. Starting at step 18 of the “Lab Configuration Instructions”, reconfigure your computer so that it will work for the next class.
2. Log in with your student account to make sure the computer is ready for the next student.
3. When done, record your host’s IP address here: \_\_\_.\_\_\_.\_\_\_.\_\_\_
4. Don’t forget to log out.