INFOTC 3850: Computer System Administration
Spring 2019

Laboratory # 2

Computer Network Overview

Due February 14, Hrs. 11:59 pm

I. Objectives

1) Obtain and understand network configuration
2) Explore VMware Workstation/Fusion tools (snapshot and clone)
3) Configuring static IP addresses with pure class C IP addresses and subnetting.

I. Material Required

Two CentOS Linux VMs.

II. Activity

1) Go through the Computer Network Overview material and get familiar with Subnetting.
2) Get ready two CentOS VMs so you will implement networking concepts.

III. Review Questions

Answer the following questions:

1. There are two virtual machines connected via vSwitch, the first one with 200.100.44.1/24 and the second one with 200.100.55.2/24. Assuming there is no firewall enabled between them that could prevent the communication, can they reach (ping) to each other? Explain your answer.

2. Class A private IP has the range of:
    a. 10.0.0.0 – 10.255.255.255
    b. 10.0.0.0 – 10.0.0.255
    c. 1.0.0.0 – 126.255.255.255
    d. 1.0.0.0 – 126.0.0.255

3. Check the correct classification (if the IP address is a Network ID, Broadcast or a Valid IP) of the following IP addresses:

IP/CIDR	Network ID	Broadcast	Valid IP
192.168.1.65/26			
200.168.1.127/25			
192.168.1.223/27			
192.168.1.223/28			
199.199.199.24/29			

4. Which of the following is the mask for 200.100.1.1/30? Explain your answer.
    a. 255.255.255.248
    b. 255.255.255.252
    c. 255.255.255.192

5. The mask 255.255.255.240 is equivalent to which CIDR? Explain your answer.
    a. /27
    b. /28
    c. /29
    d. /30

6. How many subnets exist in the CIDR /29? Show the steps used to get the answer

7. How many valid IP addresses (in a subnet) exist in the CIDR/30? Show the steps used to get the answer

8. The mask 11111111.11111111.11111111.11100000 shows that there are:

    a. 2 subnets
    b. 4 subnets
    c. 8 subnets
    d. 16 subnets

    How did you obtain the answer?

9. Fill out the following table with the correct information for a class C.

CIDR	Mask	Number of subnets	Numbers of IP addresses per subnet	Number of valid IP addresses per subnet
/25				
/26				
/27				
/28				
/29				
/30				

10. Assuming two nodes are connected directly and no firewall is enabled, can the systems reach to each other with the command ping? Check the correct answers.

System A IP	System B IP	Yes	No
192.168.10.1/24	192.168.10.252/24		
172.16.1.100/16	172.16.2.101/16		
200.20.20.20/25	200.20.20.23/25		
192.168.1.1/24	192.168.2.100/24		

11. Convert the following numbers from decimal to binary
    a. 172
    b. 192
    c. 56
    d. 200

12. Convert the following numbers from binary to decimal
    a. 01011
    b. 1111011
    c. 1010010
    d. 0100101

13. Are the following IP addresses public, private or special? If special which one? If public/private which class?
    a. 169.254.1.1

b. 168.0.0.1
c. 127.0.0.1
d. 200.2.2.2
e. 8.8.8.8
f. 172.30.1.1
g. 192.168.200.200
h. 169.254.169.254

14. Using the 5th subnet of the 192.168.123.0/28, assign the first valid IP and the last valid IP of that subnet to your CentOS systems.
    Take **four** screenshots:
    a. the network configuration for both systems
    b. the execution of the ping command for both systems
    Add the screenshots for this question to your report, along with the answers of the previous questions.