International University
School of Computer Science and Engineering
Course: System & Network Administration
Course ID: IT125IU

Laboratory Session 8

This session introduce students to networking in Linux environment.

0.1 IP addressing

Question 1. What are the private IP address ranges and when to use them?

Question 2. Suppose IU wants to use the private network 172.16.0.0/16. There are 10 different departments in IU.
a. Assign each department a subnet that has at most 30 host IPs. Show the IP range for each department.

b. What is the subnet mask?

c. How many hosts can each subnet have?

d. What is the IP address of host 3 on subnet 2 ?

e. Combine left-over subnets to form a subnet that has more then 5000 host IPs. This subnet is used for students' wifi.

Question 3. Given the subnet Mask 255.255.255.224. What is the host address and subnet of the following IP address 10.1.2.167?

0.2 Network Configuration

Question 4. Use command-line to show your machine IP address.

Question 5. Change your virtual machine IP address to a new one using `ip` command.

Question 6. Change your virtual machine IP address to a new one using configuration file `/etc/network/interfaces`.

Question 7. Use command-line to show your machine MAC address. Can you change your network interface's MAC address.

Question 8. Use command-line to show your machine route table. Determine the default route.

Question 9. Use command-lines to change your default route to a different IP address. What happens then?

Question 10. Change the DNS server to Google DNS server "8.8.8.8" using `/etc/resolv.conf`.

Question 11. Use `dhclient` to renew IP from DHCP. Show your new IP address.

Question 12. Release the current DHCP lease with `dhclient`.

0.3 Network Troubleshooting

Question 13. What can you do with `ping` command in troubleshooting network problem? Show examples.

Question 14. How is TTL used in `traceroute`? Show example and explain the result.

Question 15. Use `tcpdump` to monitor all `http` and `https` traffic. Show your result.

Question 16. Explain why you might want to use `ping`. Explain why you might want to use `traceroute` instead of `ping`.

Question 17. Explain why you might want to use `nslookup`. Show examples.

Question 18. How does `nslookup` differ from `dig` and `host`? Show examples.

Question 19. How would you specify using `dig` that you only want to obtain information for the listings of NSs?

Question 20. What is SOA in DNS?

Question 21. How does ssh differ from telnet?

0.4 Network Scripting

Question 22. Write a script to test Internet connection of your computer. Explain how it works?

0.5 Lab Work Submission

Write your answers together with screenshots of your work in a single file by the name **name_id_l8.pdf**. Submit that file to Blackboard.