



Department of Computer Science and Engineering
Faculty of Engineering, University of Moratuwa
CS 2033 – Data Communication and Networking
B. Sc. Engineering Semester 3

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Field: **CSE**

Index No **210518H**

Lab 5 : IP Addressing

1. How many octets are there in an IP address?

4

2. How many bits per octet?

8

3. List all the private IP address blocks.

Class A: 10.0.0.0 to 10.255.255.255

Class B: 172.16.0.0 to 172.31.255.255

Class C: 192.168.0.0 to 192.168.255.255

4. Determine the network and broadcast addresses, number of hosts for the given IPv4 addresses, and prefixes in the following table.:

Host IP address	Network address	Number of hosts	Broadcast address
192.168.100.25/28	192.168.100.16	14	192.168.100.31
172.30.10.130/30	172.30.10.128	2	172.30.10.131
10.1.113.75/19	10.1.96.0	8190	10.1.127.255
172.16.104.99/27	172.16.104.96	30	172.16.104.127
128.107.14.191/22	128.107.12.0	1022	128.107.13.255

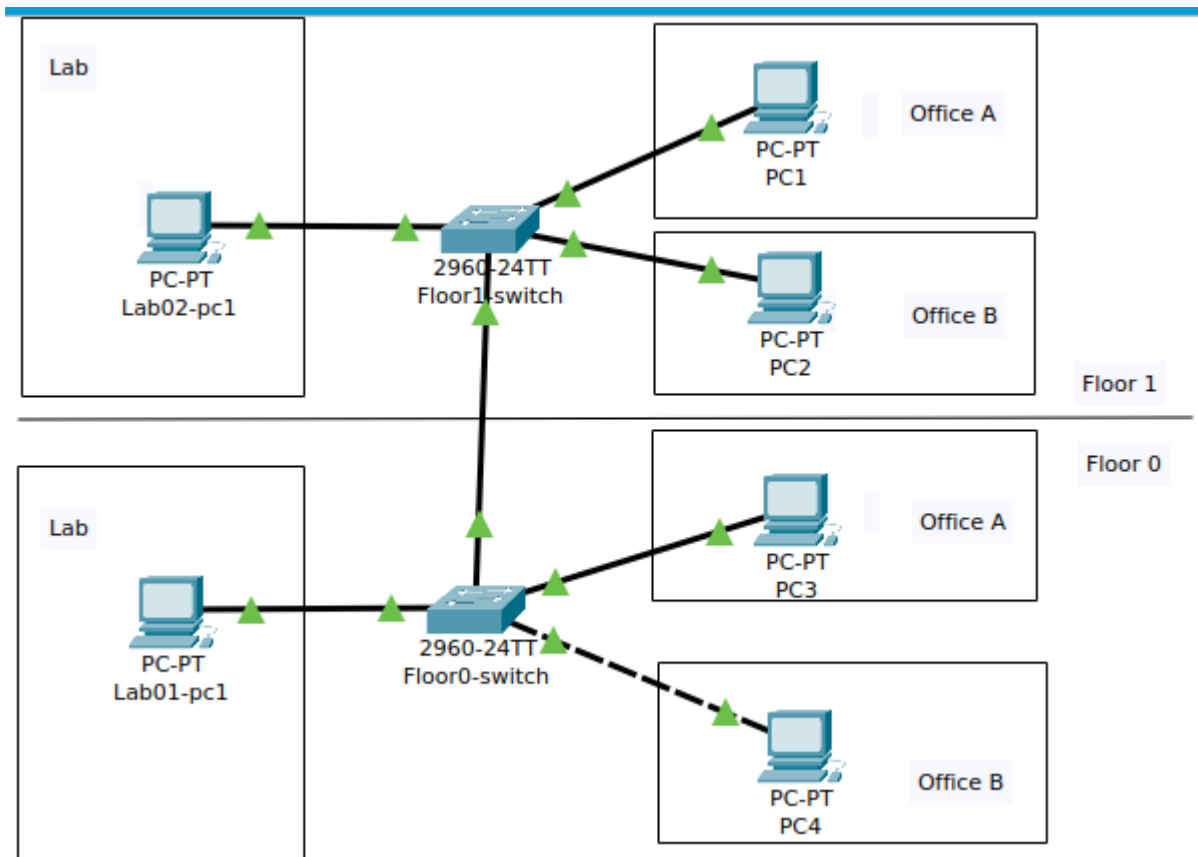
4. You are given an IP block of 10.10.10.0/24

- a. subnet and allocate IP addresses to a laboratory with 30 computers and 2 offices with 5 computers each in an optimal way, and complete the following table

Location	Network address	Broadcast address	First usable address	Last usable address
Laboratory	10.10.10.0	10.10.10.31	10.10.10.1	10.10.10.30
Office A	10.10.10.32	10.10.10.39	10.10.10.33	10.10.10.38
Office B	10.10.10.40	10.10.10.47	10.10.10.41	10.10.10.46

- b. Create a network as shown in the picture below, as shown laboratory computers and office computers are distributed among two floors. Each floor has a switch to connect computers. These switches are connected using ethernet interfaces.

Note: In the network engineering lab, there are 6 workstations, each equipped with three computers, and a switch. You can assume each workstation to be a floor (as mentioned in the diagram above) and take one computer each for Lab-pc, Office A and Office B. For this lab a single group requires two workstations. Thus, arrange into groups of 8 or 9 so that there will be three student groups at a time in the lab, each group having two workstations.



- c. Assign IP addresses to each computer based on your IP address plan.

Lab01-pc1 : 10.10.10.1

Lab02-pc1 : 10.10.10.2

PC3 (Office A) : 10.10.10.33

PC1 (Office A) : 10.10.10.34

PC4 (Office B) : 10.10.10.41

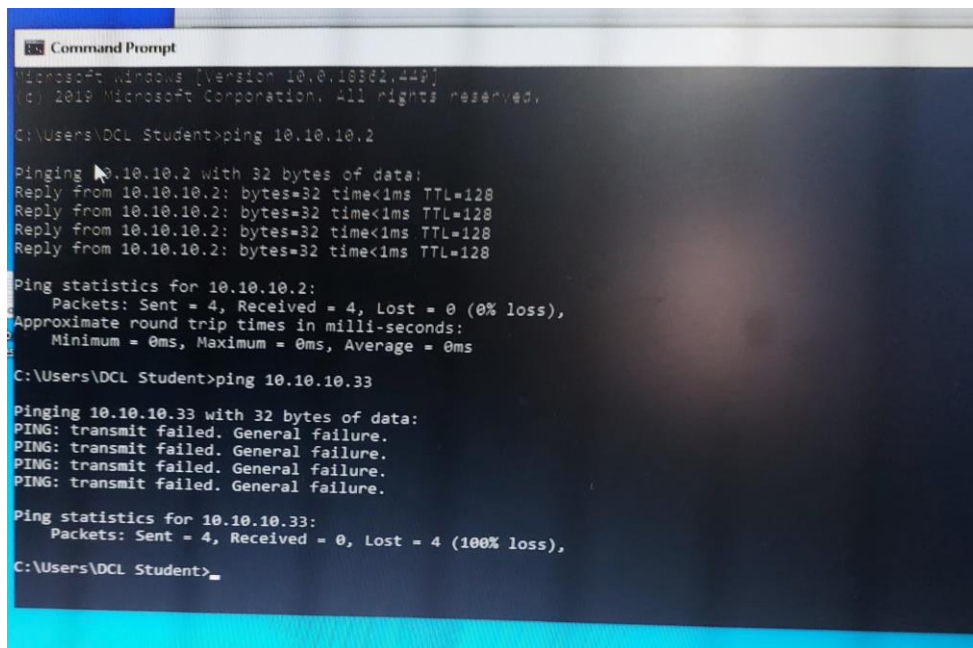
PC2 (Office B) : 10.10.10.42

- d. Ping to different computers as given in the table, write your observation, and state why you could/could not ping.

Computer from → to	Observation	Reason
Lab01-pc1 → Lab02-pc2	Success	Same Subnet
Lab01-pc1 → PC3	Host Unreachable	Different Subnet
PC3 → PC1	Success	Same Subnet
PC3 → PC4	Host Unreachable	Different Subnet

Note: Each of one of you should do an individual labsheet submission to moodle submission link.

• Lab01-pc1



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Microsoft Windows [Version 10.0.18362.1449]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\DCL Student>ping 10.10.10.2

Pinging 10.10.10.2 with 32 bytes of data:
Reply from 10.10.10.2: bytes=32 time<1ms TTL=128
Reply from 10.10.10.2: bytes=32 time<1ms TTL=128
Reply from 10.10.10.2: bytes=32 time<1ms TTL=128
Reply from 10.10.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\DCL Student>ping 10.10.10.33

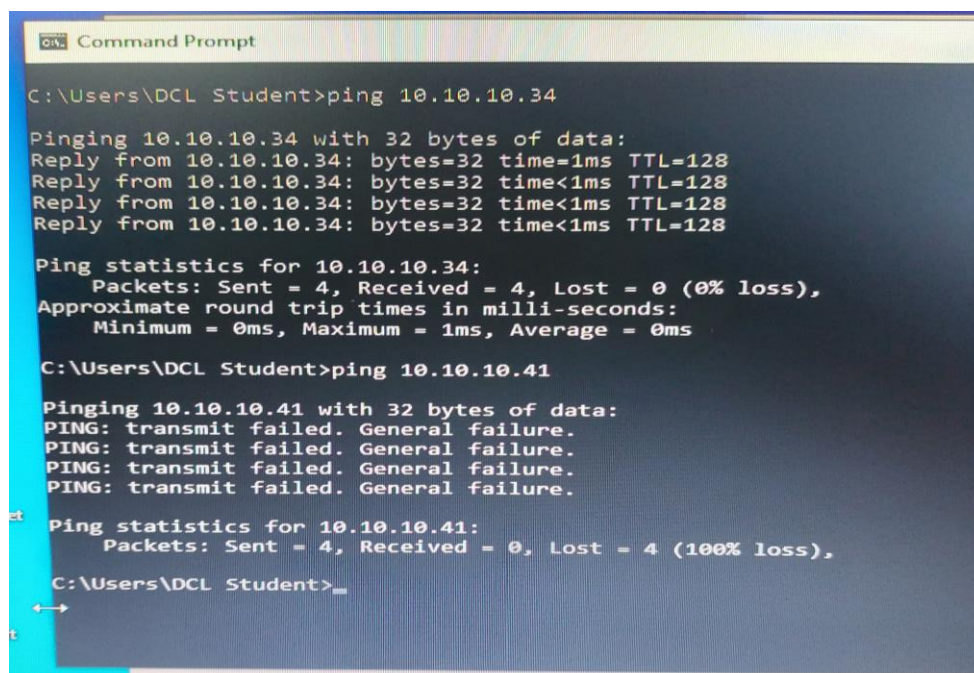
Pinging 10.10.10.33 with 32 bytes of data:
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.

Ping statistics for 10.10.10.33:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\DCL Student>

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• PC3



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Microsoft Windows [Version 10.0.18362.1449]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\DCL Student>ping 10.10.10.34

Pinging 10.10.10.34 with 32 bytes of data:
Reply from 10.10.10.34: bytes=32 time=1ms TTL=128
Reply from 10.10.10.34: bytes=32 time<1ms TTL=128
Reply from 10.10.10.34: bytes=32 time<1ms TTL=128
Reply from 10.10.10.34: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\DCL Student>ping 10.10.10.41

Pinging 10.10.10.41 with 32 bytes of data:
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.

Ping statistics for 10.10.10.41:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\DCL Student>

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