NATIONAL UNIVERSITY OF COMPUTER & EMERGING SCIENCE
Computer Networks Lab (CL307)
Lab Session 04

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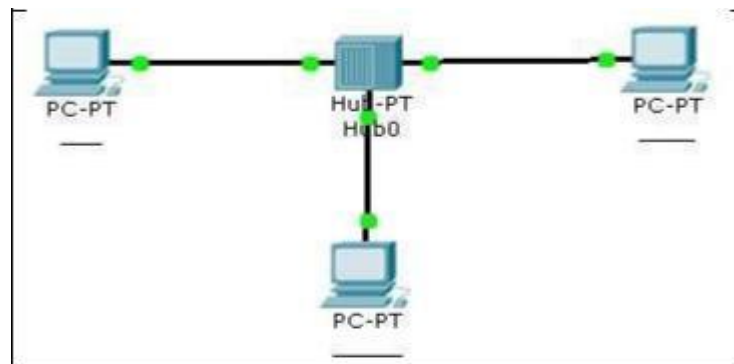
OBJECTIVES:
SOCKET PROGRAMMING (Recap and remaining examples from Lab#03)
HANDS ON - CISCO PACKET TRACER NETWORK DEVICES AND CONNECTION TYPES

Network Infrastructure

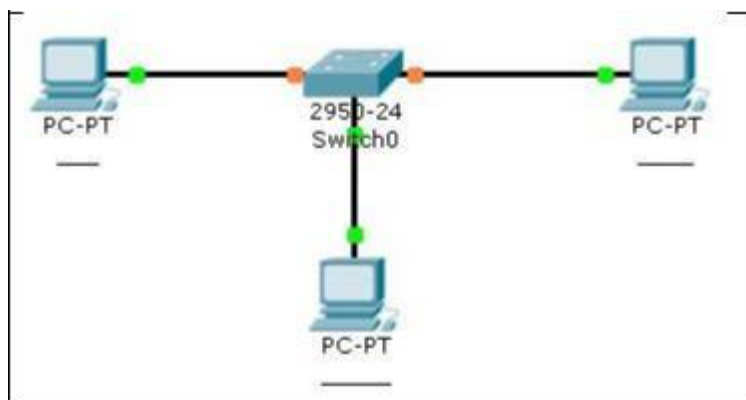**Aim: Study of following Network (Layer 1, Layer 2 and Layer 3) Devices in Detail (Recap).**

- **Hub**
- **Switch**
- **Router**

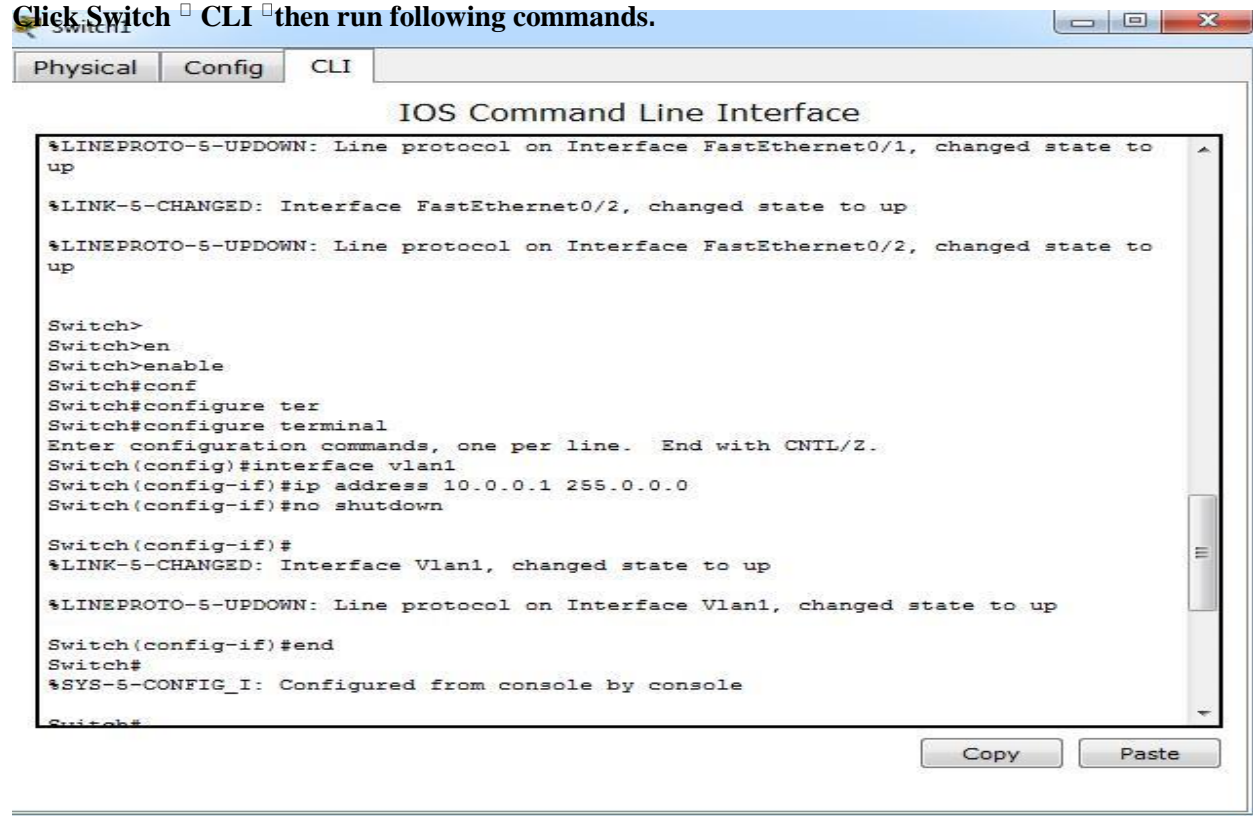**Task#1: Understand Network Topology and network hardware (L1) devices.**

At which layer the HUB operates? _____

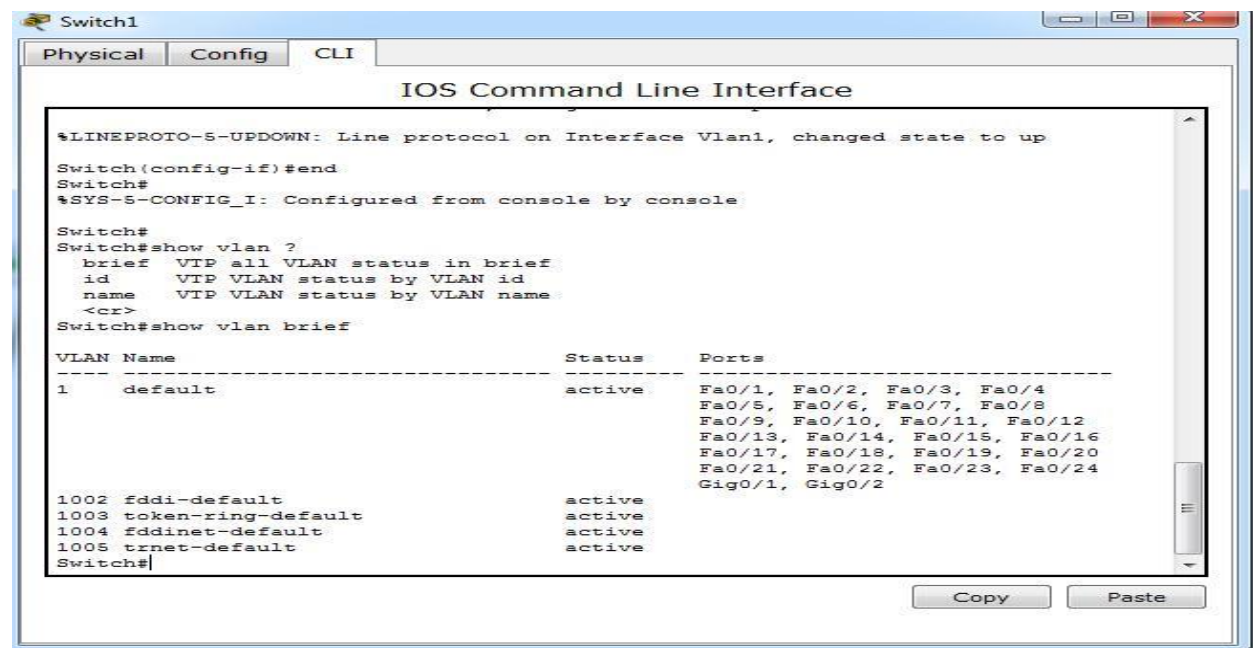**Task#2: Understand Network Topology and network hardware (L2) devices.**

CONFIGURATION:
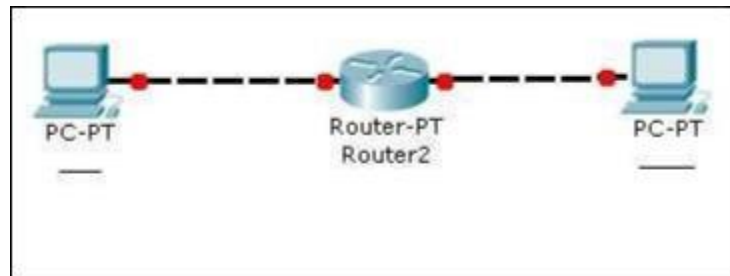**Click Switch ▢ CLI ▢then run following commands.**

We have to assign IP address on Interface Vlan1 which is default interface in Switch as shown below.

At which layer the SWITCH operates? _____

Task#3: Understand Network Topology and network hardware (L3) devices.

CONFIGURATION:

At which layer the ROUTER operates? _____

Task#4: Configure the following network by utilizing cluster feature.

Cluster View of the Network: Make sure cluster will not affect any physical configuration it is just simple representation of a complex or large network.
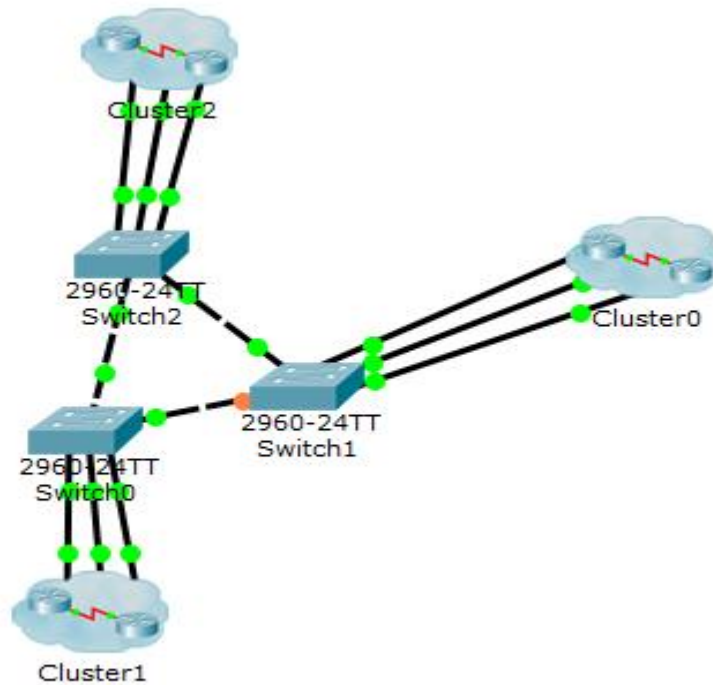
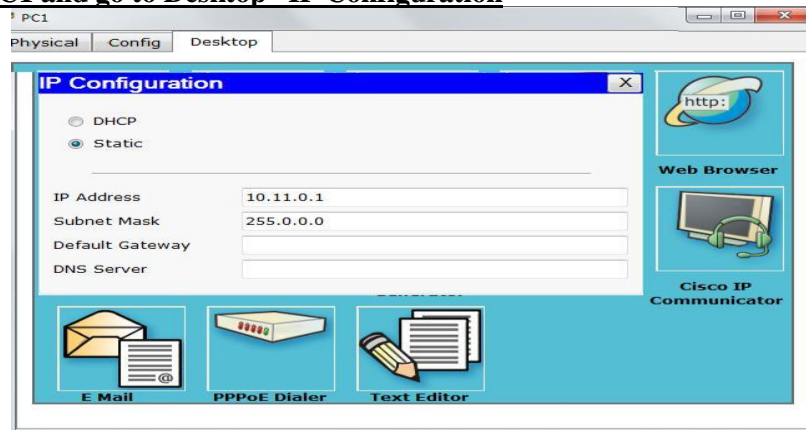**Task#5: Design the following network, by picking up one router and one desktop pc connect it with console port.**

Task#5: Start the packet tracer and configure the following network and show the packet header format of ICMP protocol.
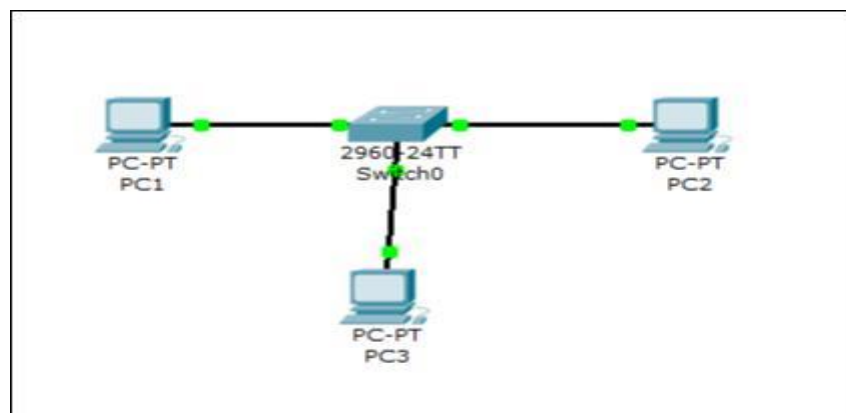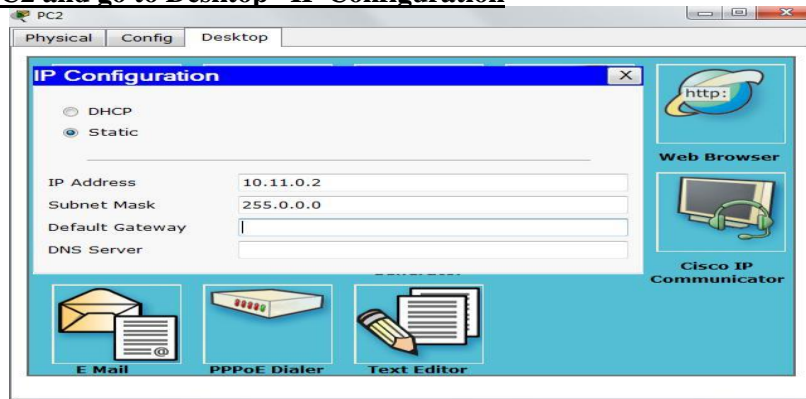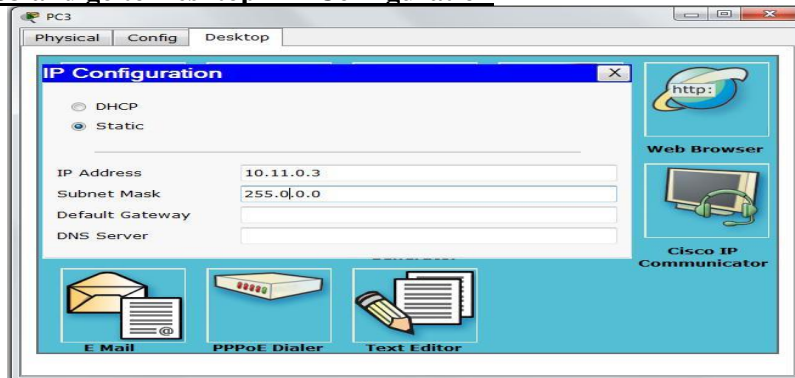
Step#1: configure PC1.

a) Click on the PC1 and go to Desktop □IP Configuration

b) Click on the PC2 and go to Desktop □IP Configuration

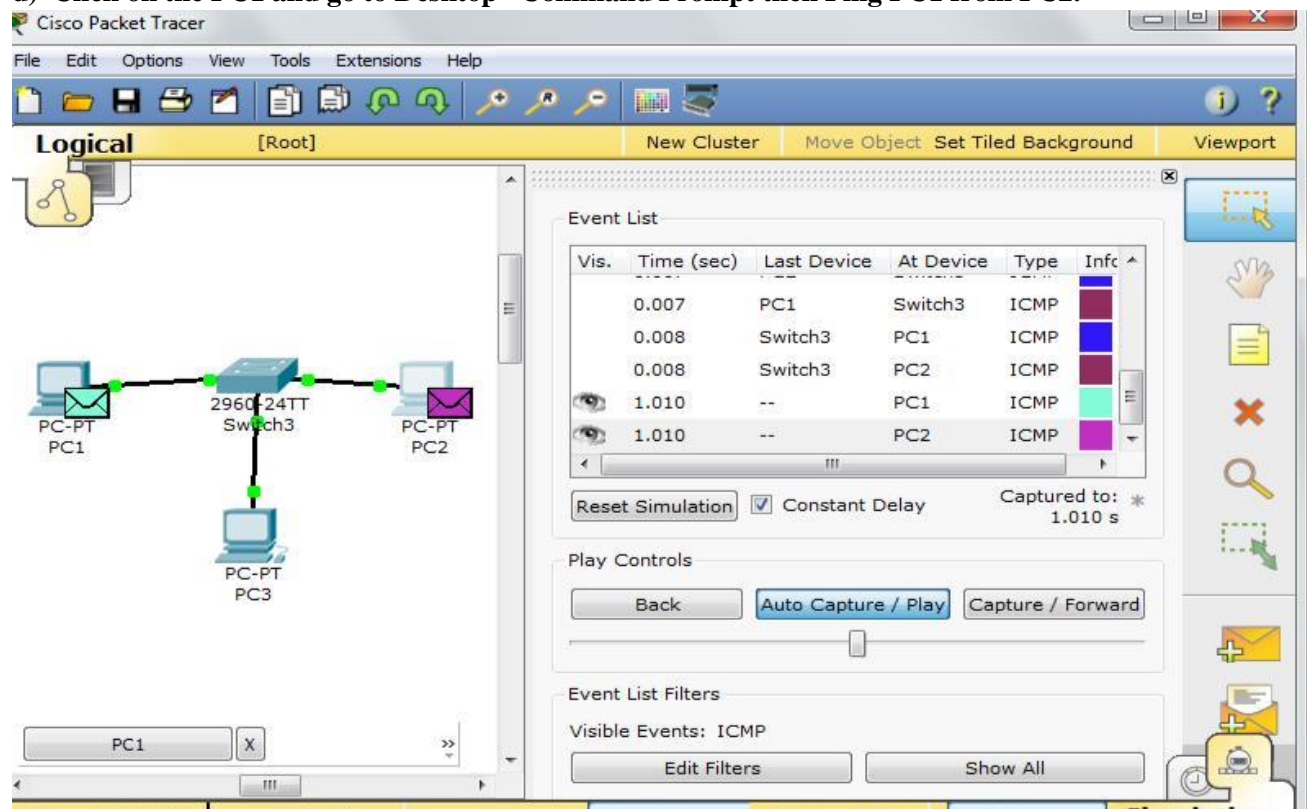**c) Click on the PC3 and go to Desktop ◻IP Configuration**

Step#2:

a) Now click on simulation icon in the right bottom of packet Tracer.

b) Now click on edit filter and to capture ICMP protocol packets, Click on ICMP check box.

c) Now click on auto capture /play icon for packet capturing.

d) Click on the PC1 and go to Desktop ◻Command Prompt then Ping PC1 from PC2.

Step#3: Now click on the ICMP packet show its header.

a) Shows OSI layers involved in transmission.

The popped up window (below) will enable you to trace the content of the message through the OSI layer and what changes will occur at each layer (use next and previous buttons to trace each layer content).

b) Shows Inbound PDU Details.

The inbound tab shows the content of the message (header format) during the receiving process.

c) Shows Outbound PDU Details.

The outbound tab shows the content of the message (header format) during the Sending process

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PDU Information at Device: Switch3                              [X]

OSI Model    Inbound PDU Details    Outbound PDU Details

PDU Formats

  Ethernet II
  0            4          8              14          19  Bytes
        PREAMBLE:              DEST MAC:        SRC MAC:
        101010...1011          0030.A30B.95A8   000C.8561.C7A4

        TYPE:          DATA (VARIABLE LENGTH)        FCS:
        0x800                                        0x0

  IP
  0    4      8           16     19               31  Bits
        4    IHL    DSCP: 0x0              TL: 128
             ID: 0xe          0x0               0x0
        TTL: 128       PRO: 0x1         CHKSUM
                    SRC IP: 10.11.0.2
                    DST IP: 10.11.0.1
                OPT: 0x0                  0x0
               DATA (VARIABLE LENGTH)

  ICMP
  0          8          16                 31  Bits
     TYPE: 0x8   CODE: 0x0        CHECKSUM
        ID: 0x3            SEQ NUMBER: 5
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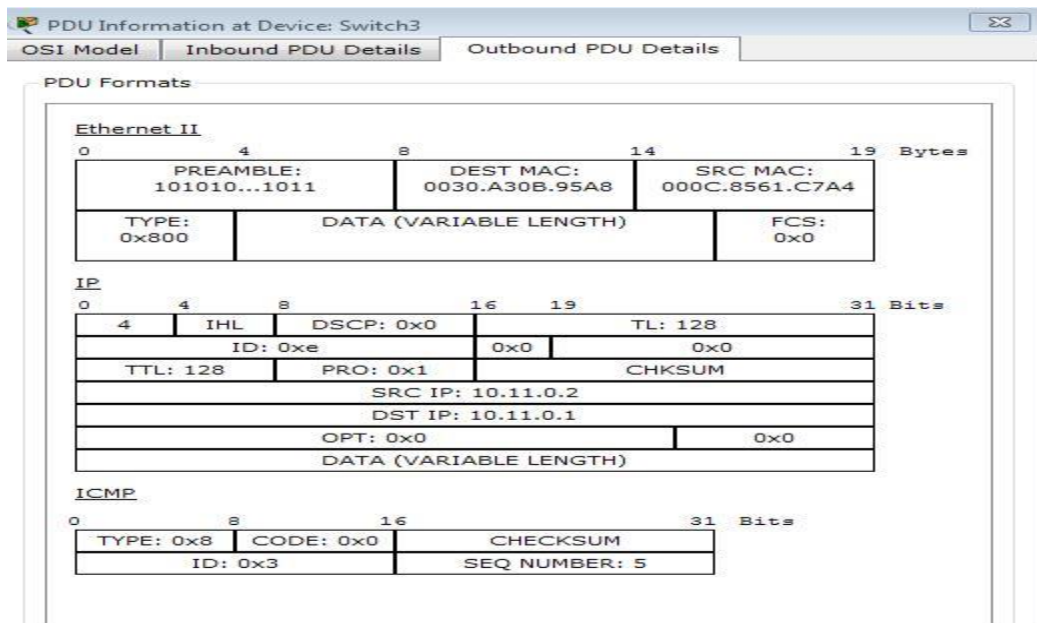
Reading Material for Students
Cisco Network Devices: Chapter#02 from provided reference material.
Cisco Connection Wires: Chapter#04 from provided reference material.