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COMPUTER NETWORKS

1st Lab Report

Done by,

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III-Year CSC – C Section

SRMIST

PART: 1 Introduction to Packet Tracer

Familiarizing with Different tools and components available:

1) Packet Tracer UI:

   It allows you to stimulate real networks. It provides three main menus that you can use for the following:

   - Add Devices and connect them via cables or wireless.
   - Select, delete, inspect, label, and group components within your network.
   - Manage your network.

Packet Tracer also provides a variety of tabs for device configuration including the following:

- Physical
- Config
- CLI
- Desktop
- Services

PART: 2 PEER TO PEER COMMUNICATION SETUP:

Objective:

To demonstrate the Copper Cross-over cabling by designing a Peer-to-Peer Network.

Components:

Device – PC's – 2 Numbers, Copper Cross-Over Cable – 1 Number.

Addressing:

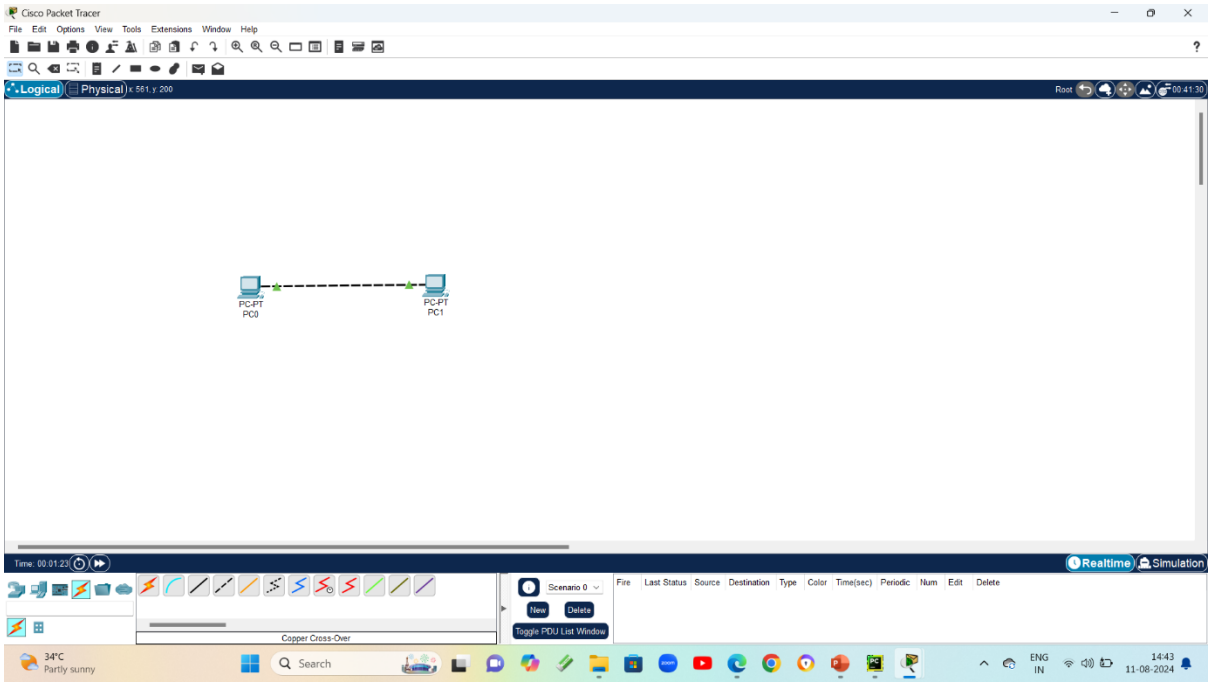
PC0: IP address: 192.168.1.1, Subnet Mask: 255.255.255.0

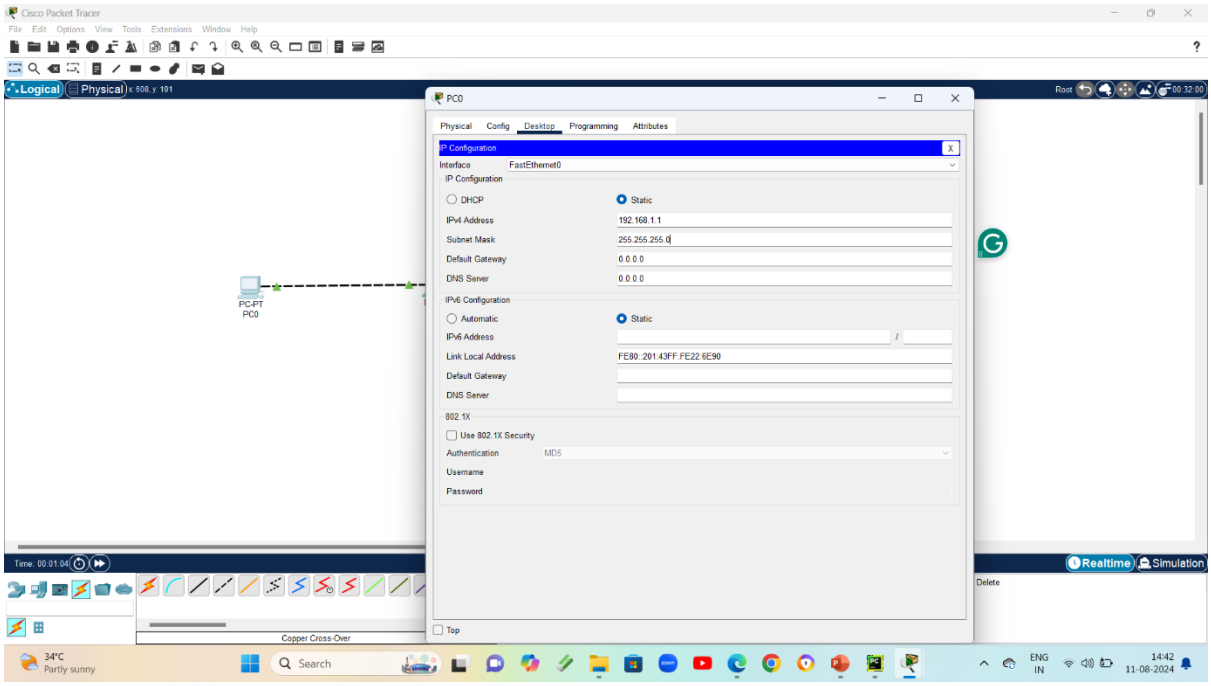
PC1: IP address: 192.168.1.2, Subnet Mask: 255.255.255.0

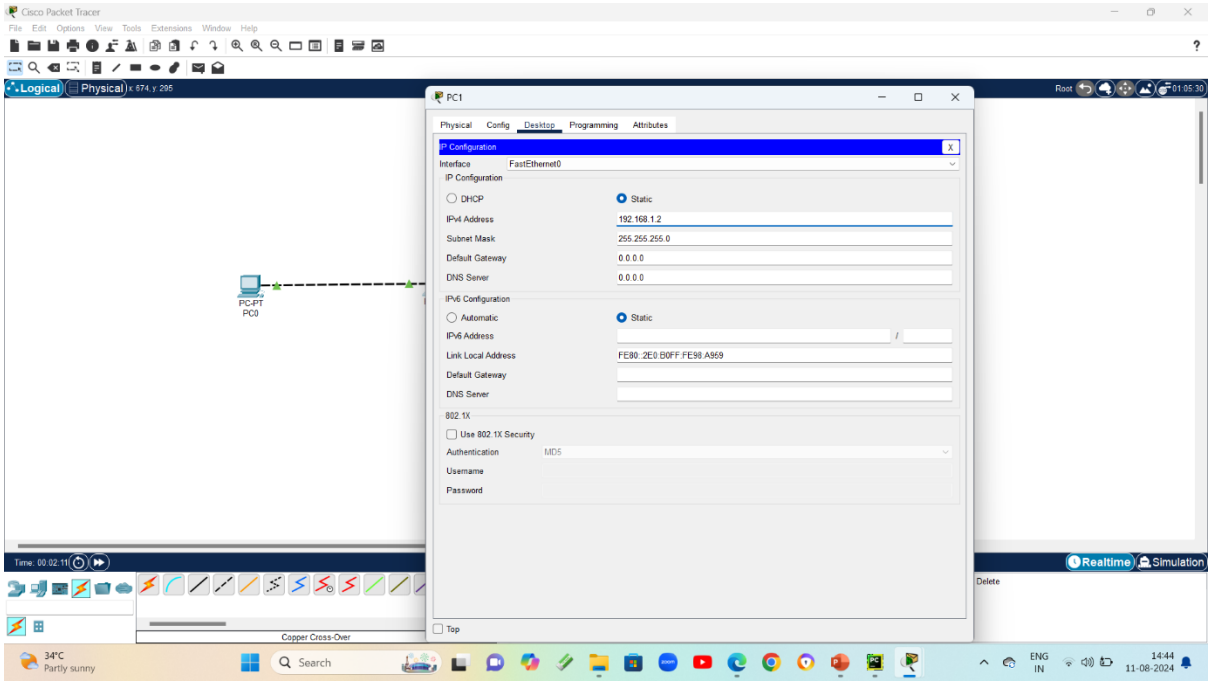
Procedure:

- Open Packet Tracer and create a new network.
- Add two PCs to the workspace.
- Use a copper straight-through cable to connect the FastEthernet0 port of PC0 to the FastEthernet0 port of PC1.
- Assign IP addresses to both PCs:
  - PC0: IP address: 192.168.1.1, Subnet Mask: 255.255.255.0
  - PC1: IP address: 192.168.1.2, Subnet Mask: 255.255.255.0
- Open the command prompt on PC0 and ping PC1 using the command ping 192.168.1.2.

Screenshots:




Cisco Packet Tracer
PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
DHCP
Static
IPv4 Address
192.168.1.1
Subnet Mask
255.255.255.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::201:43FF:FE22:6E90
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
PC-PT
PC0
Copper Cross-Over
Realtime
Simulation
Delete
34°C
Partly sunny
Search
ENG
IN
14:42
11-08-2024


Cisco Packet Tracer
PC1
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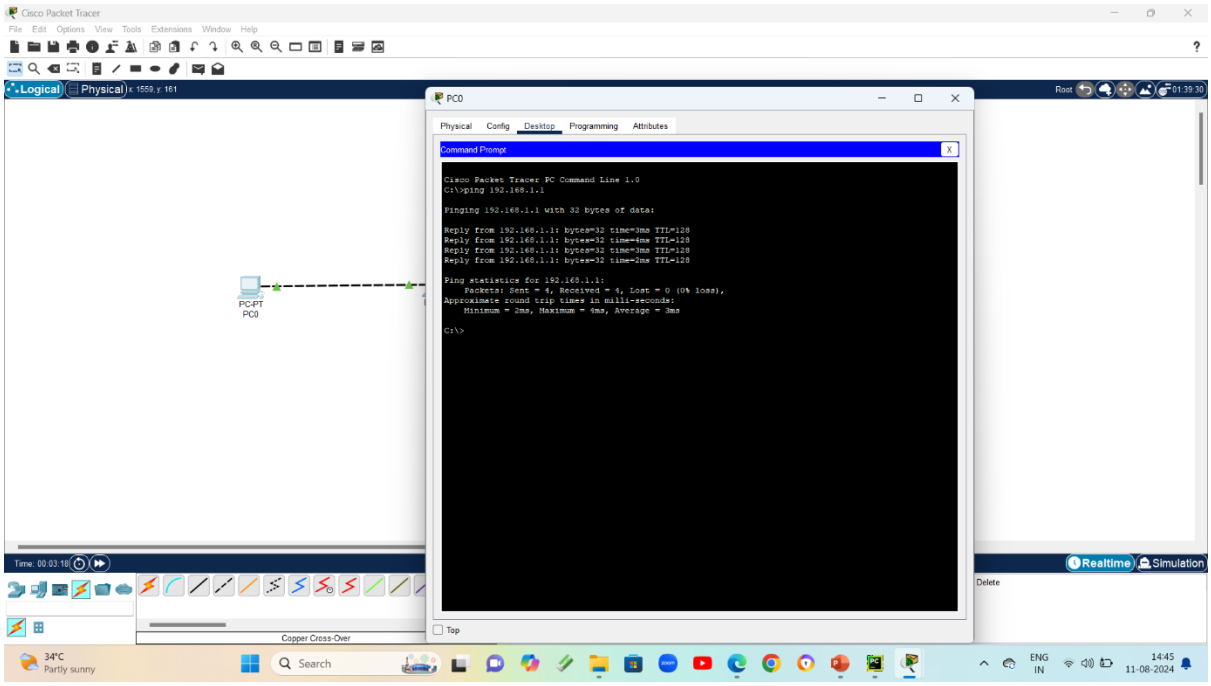
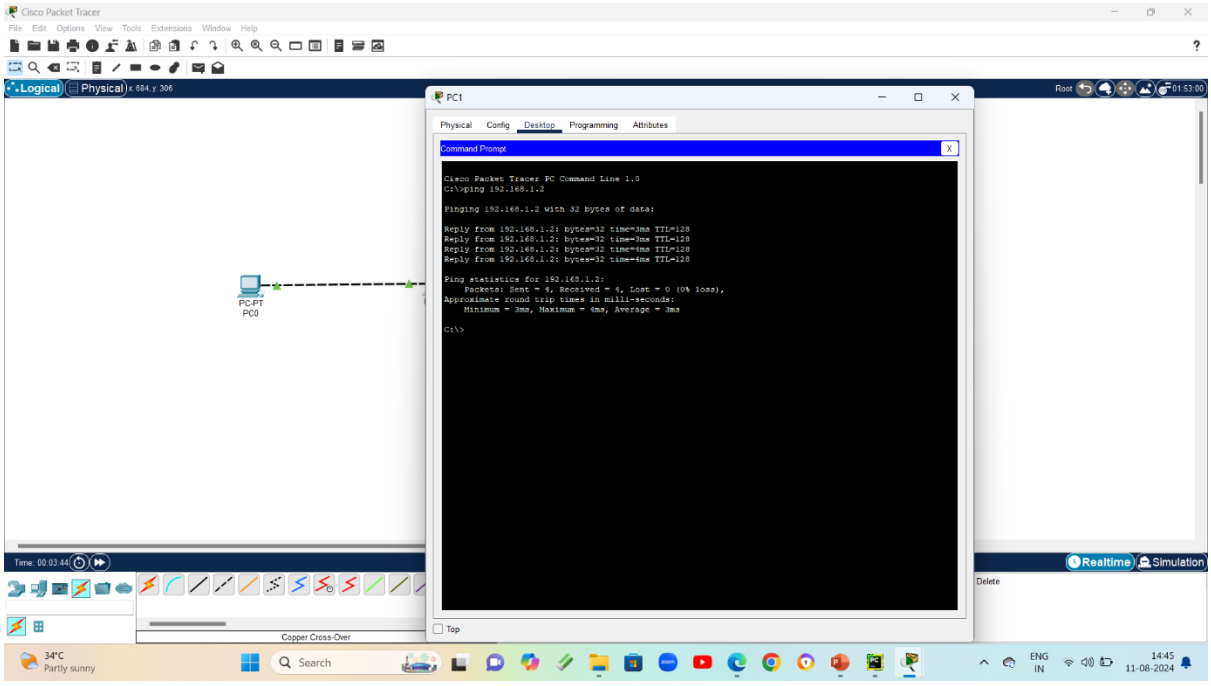
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2E0:B0FF:FE98:A969
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
PC-PT
PC0
Copper Cross-Over
Realtime
Simulation
Delete
34°C
Partly sunny
Search
ENG
IN
14:44
11-08-2024





PART 3: STUDY OF NETWORK CABLES AND COLOR CODES:

Types of Network Cables:

1. Twisted Pair Cables:

- ✓ Unshielded Twisted Pair (UTP): Commonly used for Ethernet cables; has no additional shielding, making it flexible and less expensive.
- ✓ Shielded Twisted Pair (STP): Includes an additional shielding to reduce electromagnetic interference; used in environments with a lot of interference.

2. Coaxial Cables:
   - ✓ Used primarily in older networks and for cable television. It has a single copper conductor at its center.
3. Fiber Optic Cables:
   - ✓ Transmit data as light signals through glass or plastic fibers, offering much higher speeds and distances compared to twisted pair cables.

Ethernet Cable Categories:

1. Cat5:
   - ✓ Supports up to 100 Mbps at 100 MHz.
   - ✓ Mostly outdated but still found in some older installations.
2. Cat5e (Enhanced):
   - ✓ Supports up to 1 Gbps at 100 MHz.
   - ✓ Reduces interference and crosstalk compared to Cat5.
3. Cat6:
   - ✓ Supports up to 10 Gbps at 250 MHz.
   - ✓ Has tighter specifications and better performance than Cat5e, especially for longer distances.
4. Cat6a (Augmented):
   - ✓ Supports up to 10 Gbps at 500 MHz.
   - ✓ Better performance over longer distances than Cat6.
5. Cat7:
   - ✓ Supports up to 10 Gbps at 600 MHz.
   - ✓ Shielded and offers very high performance, suitable for data centers and environments with high interference.

Color Coding for Ethernet Cables:

Ethernet cables often follow a color-coding standard to ensure consistent and reliable connections. The most common standard is TIA/EIA-568, which includes two wiring schemes: T568A and T568B.

- T568A Wiring Scheme:
    1. White/Green
    2. Green
    3. White/Orange
    4. Blue
    5. White/Blue
    6. Orange
    7. White/Brown
    8. Brown
- T568B Wiring Scheme (more commonly used in the U.S.):
    1. White/Orange
    2. Orange
    3. White/Green
    4. Blue
    5. White/Blue
    6. Green
    7. White/Brown
    8. Brown

Notes:

- Straight-through cables are used to connect different types of devices, such as a computer to a switch or router.
- Crossover cables are used to connect similar devices, such as two computers directly.