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Computer Networks

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Section no – 2

Exp: 2: Execute the following networking commands like ipconfig, tracert, telnet, netsh, ping, nslookup and netstat in the command prompt with simple topology.

step-by-step guide to opening Cisco Packet Tracer and executing the commands in a simple topology:

Step 1: Launch Cisco Packet Tracer:

Double-click the Cisco Packet Tracer icon on your desktop or find it in your applications list to open the program.

Step 2: Create a Simple Network Topology

1. Add Devices:

- o Routers and Switches: Drag and drop a router and a switch from the device list onto the workspace.
- o PCs: Drag and drop two PCs onto the workspace.

2. Connect Devices:

- o Use the Connection tool to connect the devices:
 - . Connect one PC to the switch using a copper straight-through cable.
 - . Connect the switch to the router using another copper straight-through cable.

Step 3: Configure Devices

1. Configure the Router:

- Click on the router.
- Go to the Config tab.
- Assign IP addresses to the router interfaces.

Example:

- . Interface G0/0: IP address 192.168.1.1, Subnet Mask 255.255.255.0
- . Interface G0/1: IP address 192.168.2.1, Subnet Mask 255.255.255.0

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/0

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0001.644A.5501

IP Configuration

IPv4 Address 192.168.0.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Physical **Config** CLI Attributes

GLOBAL

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Algorithm Settings

ROUTING

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VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/1

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0001.644A.5502

IP Configuration

IPv4 Address 192.168.1.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

2. Configure the PCs:

- Click on each PC.
- Go to the Desktop tab and then IP Configuration.
- Assign IP addresses to each PC.

Example:

- . PC0: IP address 192.168.1.2, Subnet Mask 255.255.255.0, Default Gateway 192.168.1.1
- . PC1: IP address 192.168.2.2, Subnet Mask 255.255.255.0, Default Gateway 192.168.2.1

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.0.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::207:ECFF:FE80:61BA

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::201:97FF:FE3B:78D6

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

Step 4: Execute Networking Commands

1. Open Command Prompt on a PCO

o Click on a PCO.

o Go to the Desktop tab and open the Command Prompt.

1. ipconfig:

This command displays all current TCP/IP network configuration values and refreshes DHCP and DNS settings.

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: FE80::207:ECFF:FEB0:61BA
    IPv6 Address.....: ::
    IPv4 Address.....: 192.168.0.2
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                        192.168.0.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                        0.0.0.0

```

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: FE80::201:97FF:FE3B:78D6
    IPv6 Address.....: ::
    IPv4 Address.....: 192.168.1.2
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                        192.168.1.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                        0.0.0.0

```

2. tracert:

This command traces the path taken to a destination by sending ICMP Echo Request messages.

```

Cisco Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.0.2

Tracing route to 192.168.0.2 over a maximum of 30 hops:

  1   4 ms      0 ms      2 ms      192.168.0.2

Trace complete.

```

```
Cisco Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.1.2

Tracing route to 192.168.1.2 over a maximum of 30 hops:

  1   5 ms      2 ms      4 ms      192.168.1.2
Trace complete.
```

3. telnet:

This command is used for interactive communication with another host using the Telnet protocol.

telnet <destination IP> <port>

Configure the Router

1. Assign IP Address:

Click on the router.

Go to the Config tab.

Select the interface connected to the switch (e.g., G0/0).

o Assign IP address: 192.168.1.1, Subnet Mask: 255.255.255.0

```
Router>enable
```

```
Router>configure terminal
```

```
Router(config-if)#line vty 0 4
```

```
Router(config-line)#password cisco
```

```
Router(config-line)#login
```

```
Router(config-line)#exit
```

```
Router(config)#end
```

```
Router#
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
Router#write memory
```

```
Building configuration ...
```

```
[OK]
```

```
Router (config-if) line vty 0 4
```

Router (config-line) #password cisco

Router (config-line) #login

Router (config-line) #exit

Router (config) #end

Router#

&SYS-5-CONFIG I: Configured from console by console

Router#write memory

Building configuration ...

[OK]

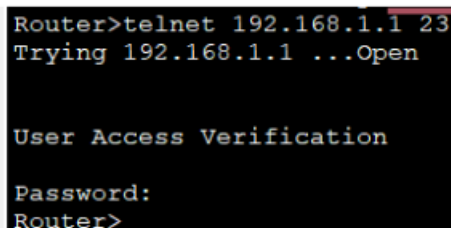
Telnet from PC to Router

1. Open Command Prompt:

o On the PCO, go to the Desktop tab and open the Command Prompt.

2. Execute Telnet Command:

telnet <destination IP> <port>



```
Router>telnet 192.168.1.1 23
Trying 192.168.1.1 ...Open

User Access Verification

Password:
Router#
```

Router>telnet 192.168.1.1 23

Trying 192.168.1.1 ... Open

User Access Verification

Password:

Router>

Telnet Security: Telnet is an unencrypted protocol and is not secure. For real-world applications, consider using SSH for secure remote connections.

Enabling Telnet on a Real Router: If using real equipment, make sure Telnet is enabled and the device is configured to accept Telnet connections.

4. Router configuration and Brief Ip Interface

This command is a scripting utility that allows you to display or modify the network configuration of a computer.

```
Router#show ip interface brief
```

```
Interface
```

```
GigabitEthernet0/0
```

```
GigabitEthernet0/1
```

```
Vlan1
```

```
Router#|
```

```
IP-Address
```

```
192.168.1.1
```

```
192.168.2.1
```

```
unassigned
```

```
Protocol
```

```
OK? Method Status
```

```
YES manual up
```

```
YES manual up
```

```
YES unset administratively down down
```

5. Ping 192.168.2.2

```

C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time=8ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>

```

6. nslookup

nslookup www.google.com

I This command queries the DNS to obtain domain name or IP address mapping.

To use the nslookup command to resolve a domain name to an IP address in

Cisco Packet Tracer, you'll need to ensure that the DNS server is properly

configured in your network topology.

1. Add one server (to act as a DNS server).

2. Connect both PCs and the server to the switch using copper straight-through cables.

Configure the DNS Server

1. Assign IP Address:

- o Click on the server.
- o Go to the Config tab and select the FastEthernet0 interface.
- o Assign IP address: 192.168.1.3, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.1.1.

Configure DNS Service:

- . Go to the Services tab on the server.
- . Sss (e.g., 8.8.8.8)

Use the nslookup Command

1. Open Command Prompt on PCO:

Go to the Desktop tab on PCO.

- o Open the Command Prompt.

2. Execute the nslookup Command:

3. nslookup www.google.com

```
C:\>nslookup www.google.com

Server: [255.255.255.255]
Address: 255.255.255.255

Non-authoritative answer:
Name: www.google.com
Address: 8.8.8.8
```

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS**
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type A Record

Address

No.	Name	Type	Detail
0	www.google.com	A Record	8.8.8.8

I DNS Server Configuration: Ensure that the DNS server is correctly configured and running.

I DNS Entries: The DNS entry for www.google.com should be added to the DNS server with an IP address.

I Network Configuration: Ensure that all devices are correctly connected and configured with appropriate IP addresses, subnet masks, and default gateways.

Gôn IP addhee: 192 188 1 1

Go1 IP adeee:100 180 2 1

PC1 IP akaesa: 192 1A8 12 PC-PT

PCO

PC-PT

PC1

Defaaul Galexy 192 188 1 1

7. Netstat

This command displays network connections for the Transmission Control

Protocol (TCP), routing tables, and a number of network interface and network protocol statistics.

The netstat command is used to display network connections, routing tables, interface statistics, masquerade connections, and multicast memberships.

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Deteut Ceteway 192.108.2.1

