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MIDTERM LAB EXAMINATION
IT 413 – ADVANCED INFORMATION ASSURANCE AND SECURITY
IT DEPARTMENT
1ˢᵗ Semester AY 2024-2025

Name : Lipata, Riazel, A.   Date   : November 21, 2024
Section: 4107   Score : _____

General Directions:

1. Use the provided **Answer Sheet**.
2. Read, understand, analyze, and follow the instructions. Failure to comply with the instructions will be marked wrong.
3. Cheating or any form of academic dishonesty is not allowed. Anyone caught doing such will be subjected to disciplinary actions based on the Student Discipline Manual 2017 Edition
4. Do not use pencils, friction pens, or any erasable pens in answering.
5. No extra sheets of paper allowed. Use the back page of your test paper if needed. Erasures, alterations of any form are not allowed, and will not be considered.

Laboratory Exam: Using Diagnostic Commands in Packet Tracer

Objective:
Students will learn to use diagnostic commands to gather information about end-user devices, network devices, and diagnose connectivity issues within a network using Cisco Packet Tracer.

Instructions:
Complete each part of this exam step-by-step, following the specific commands for each device type and section. After completing each part, document your findings and answer the provided questions.

Part 1: Gather End User Device Settings

Objective:

Use diagnostic commands to gather information about IP configuration and connectivity on end-user devices.

Steps:

1. **Open Packet Tracer and Load the Network Topology.**
    Open the network topology provided by your instructor or create a simple network with at least two PCs connected to a switch and a router.
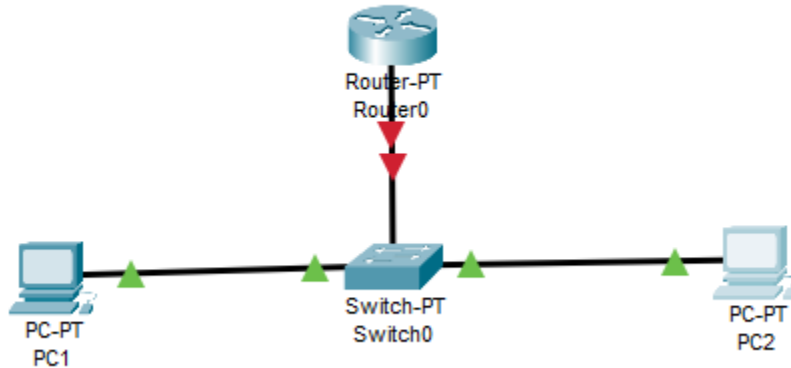
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2. **Select an End User Device (PC1).**

I opened first PC1's IP Configuration and assigned an IPv4 address, and default gateway.

3. **Open the Command Prompt on the Device:**
   o On PC1, click **Desktop** > **Command Prompt**.

4. **Use the `ipconfig` Command:**

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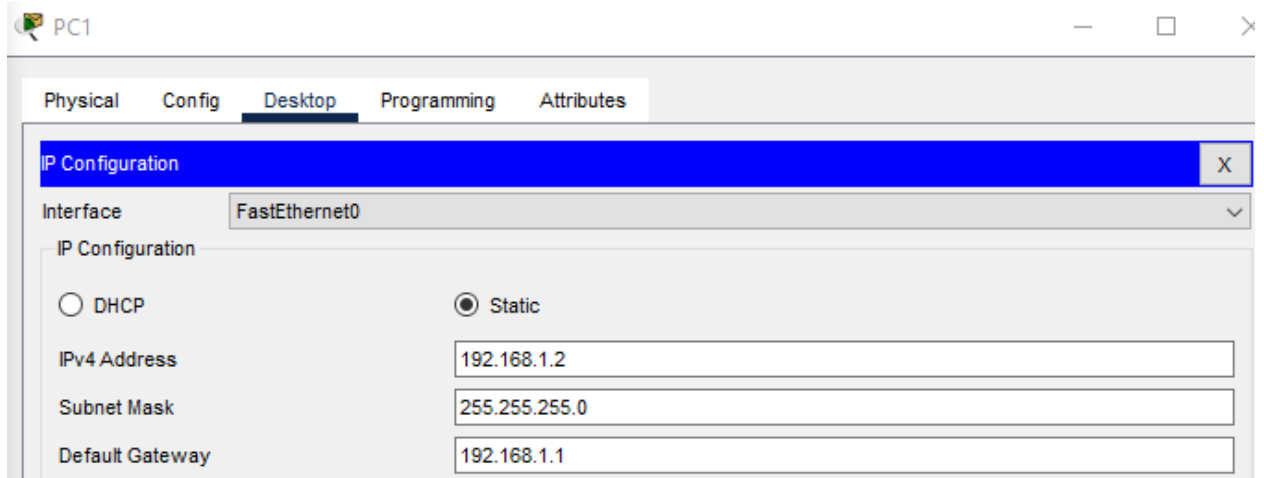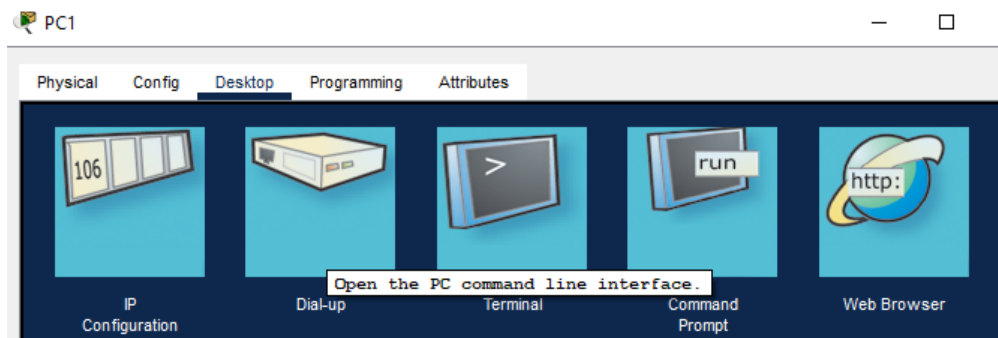**Golden Country Homes, Alangilan, Batangas City, Philippines 4200**
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o   In the command prompt, type `ipconfig` and press **Enter**.

```
PC1                                                    —   □   ×

Physical   Config   Desktop   Programming   Attributes

Command Prompt                                              X

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

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::290:21FF:FE7A:47DC
   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

C:\>
```

Type the command ipconfig and press Enter.

o   Note the following:

- **IP Address**   =   192.168.1.2
- **Subnet Mask**   =   255.255.255.0
- **Default Gateway**   =   192.168.1.1

5. **Document Your Findings for PC1.**
   Write down the IP configuration information you retrieved for reference.

   FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::290:21FF:FE7A:47DC
   IPv6 Address....................: ::
   IPv4 Address....................: 192.168.1.2
   Subnet Mask....................: 255.255.255.0
   Default Gateway.................: :: 192.168.1.1

6. **Repeat for Additional PCs (PC2, etc.).**
   o   Use the same `ipconfig` command on any additional PCs and document their settings.
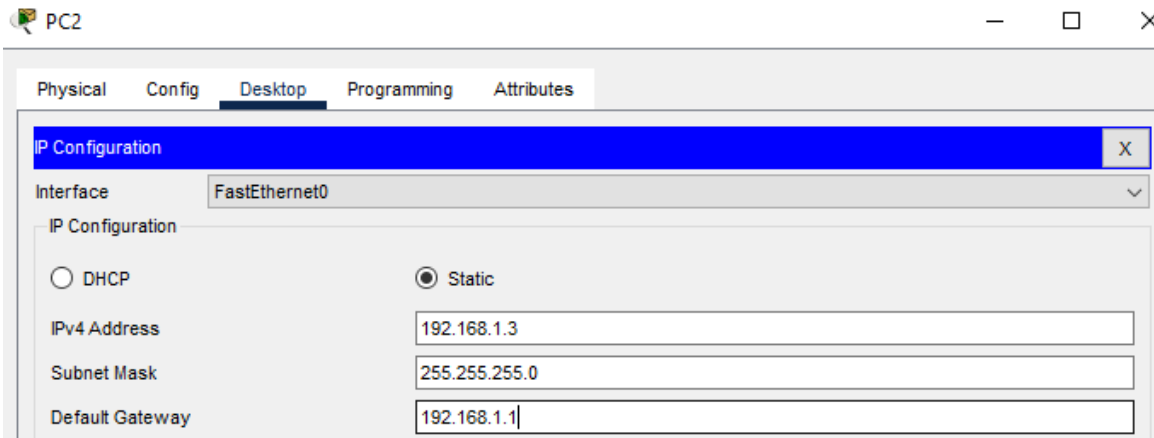
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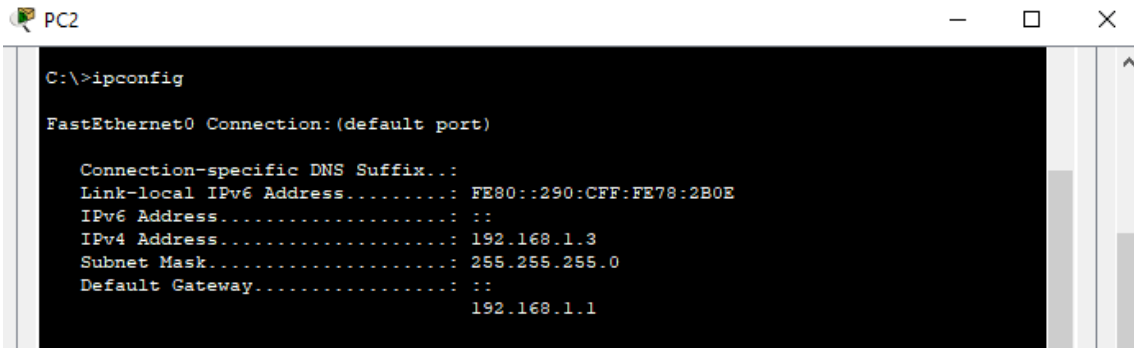Tel Nos.: (+63 +43) 425-0139 local 2222 / 2223
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I opened first PC2's IP Configuration and assigned an IPv4 address, and default gateway.

Then, open command prompt in desktop to run ipconfig

Provide the following Output for both PCs:

- **PC1:**
  - **IP Address:**   192.168.1.2
  - **Subnet Mask:**   255.255.255.0
  - **Default Gateway:**   192.168.1.1
- **PC2:**
  - **IP Address:**   192.168.1.3
  - **Subnet Mask:**   255.255.255.0
  - **Default Gateway:**   192.168.1.1

Part 2: Gather Information about Network Devices

Objective:

Use diagnostic commands to gather information about network device configurations, including routers and switches.

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Steps:

1. **Select a Network Device (Router1).**
2. **Access the CLI on the Router:**
   o Click on **Router1 > CLI**.

```
Router0                                                    —    □

Press RETURN to get started!


Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
|
                                                    Copy        Paste
```

Before proceeding, I configured the router first.

3. **Use the `show ip interface brief` Command:**
   o Type `show ip interface brief` and press **Enter**.
   o Note the interface statuses and IP addresses.

```
Router0                                                    —    □    ×

Router#enable
Router#show ip interface brief
Interface            IP-Address      OK? Method Status                Protocol
FastEthernet0/0      192.168.1.1     YES manual up                    up
FastEthernet1/0      unassigned      YES unset  administratively down down
Serial2/0            unassigned      YES unset  administratively down down
Serial3/0            unassigned      YES unset  administratively down down
FastEthernet4/0      unassigned      YES unset  administratively down down
FastEthernet5/0      unassigned      YES unset  administratively down down
Router#
                                                    Copy        Paste
```


4. **Use the `show running-config` Command:**
   o Type `show running-config` and press **Enter**.

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Router0 — Physical / Config / CLI / Attributes

```
Router#show running-config
Building configuration...

Current configuration : 699 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
ip cef
no ipv6 cef
!
```

```
interface FastEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial2/0
 no ip address
 shutdown
!
interface Serial3/0
 no ip address
 shutdown
!
interface FastEthernet4/0
 no ip address
 shutdown
!
interface FastEthernet5/0
 no ip address
 shutdown
!
ip classless
!
ip flow-export version 9
!
```

```
line con 0
!
line aux 0
!
line vty 0 4
 login
!
end
```

o Review the output to locate:
- **Interface IP Configurations**

```
interface FastEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
!
```

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- ▪ **Routing Protocols (if any)**
- ▪ **Access Control Lists (if any)**

5. **Repeat for Additional Network Devices (Switches).**
   - o Use `show running-config` and `show vlan brief` commands on any switches to check VLANs and port configurations.

For show running-config brief :

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```
Switch0                                                    —    □

!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end

Switch#
```

Provide the following Output for Network Devices:

- **Output for Router (`show ip interface brief`):**
  - Interface   IP-Address   OK? Method Status   Protocol

  - FastEthernet0/0   192.168.1.1   YES manual up   up

- **Output for Router (`show running-config`):**
  - interface FastEthernet0/0
  - ip address 192.168.1.1 255.255.255.0

Part 3: Diagnose Connectivity Issues

Objective:

Use diagnostic commands to identify and resolve connectivity issues in the network.

Steps:

1. **Use the `ping` Command to Test End-to-End Connectivity:**
   - On **PC1**, open **Command Prompt** and type `ping <IP Address of PC2>` (replace `<IP Address of PC2>` with the actual IP).

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```
PC1                                                                    —  □

C:\>
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=2ms TTL=128
Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>|
```

  o Observe the results:
     ▪ If successful, there should be replies from the destination IP.
     ▪ If it fails, note any error messages like "Request timed out."

2. **Identify the Connectivity Issue (If Any):**
   o If the `ping` test fails, use the following steps to diagnose:
      ▪ **Check IP Configuration:** Re-run `ipconfig` on both PCs to ensure IP addresses and default gateways are correct.
      ▪ **Ping the Default Gateway:** On each PC, ping the default gateway. If this fails, there may be an issue with the router.

3. **Use `tracert` (Traceroute) to Locate Network Breakpoints:**
   o On **PC1**, in the command prompt, type `tracert <IP Address of PC2>`.

```
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=2ms TTL=128
Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>tracert 192.168.1.3

Tracing route to 192.168.1.3 over a maximum of 30 hops:

  1    0 ms      0 ms      1 ms      192.168.1.3

Trace complete.

C:\>|
```

  o Analyze each hop:
     ▪ If the trace stops at a specific device, investigate that device's settings and connectivity.

4. **Use the `show ip route` Command on the Router:**
   o On **Router1**, access the CLI and type `show ip route`.

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- o Ensure the router has routes to each network. If there's a missing route, add it (using `ip route` for static routes).

Provide a result:

- **Ping Test on PC1:**

```
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=2ms TTL=128
Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

- **Output and Screenshot for Traceroute Output on PC1:**
  - o _____
  - o _____
  - o _____

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