

NETWORKING

ASSIGNMENT#2

Cisco Packet Tracer



SWITCH vs. ROUTER



Submitted To

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JUNE 29, 2025

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THE QUESTION

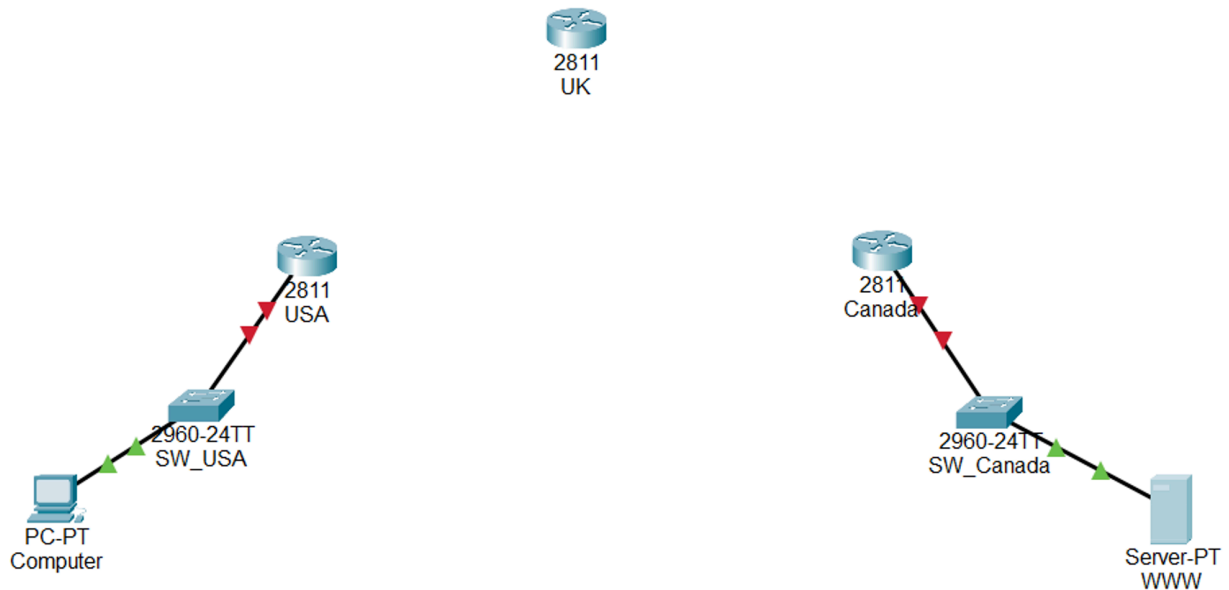
This project involves designing a networking infrastructure consisting of two parts (as shown in the diagram below) :

1. Client side (left-hand side)

On the client-hand side, we have a computer connected to a switch which in turn is connected to a router. A second router is used to bridge this client side to the server side.

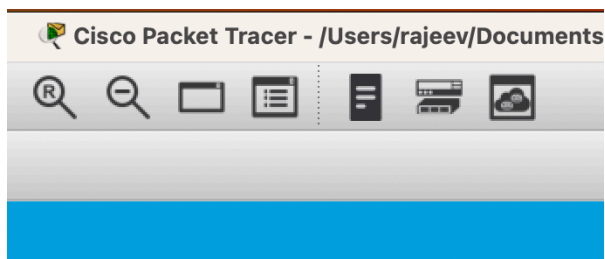
2. Server side (right-hand side)

On the server-hand side, we have a server (WWW) which is similarly connected to a switch which in turn is connected to the server router. This server router is then connected to the second router to allow connection from the client side.

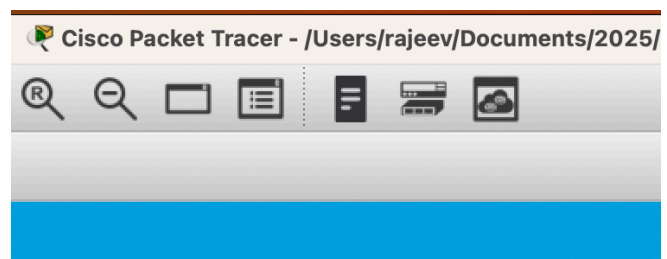


Step 1: Designing the infrastructure in Cisco Packet Tracer

- From **Devices** > **End Devices** drag and drop **Laptop** on the left side
- From **Devices** > **Switches** drag and drop 2 switches (one left, one right)
- From **Devices** > **Routers** drag and drop 3 routers (Router1 on left, Router2 on right, Router3 in middle)
- From **Devices** > **End Devices** drag and drop a **Server** on the right side



CLIENT

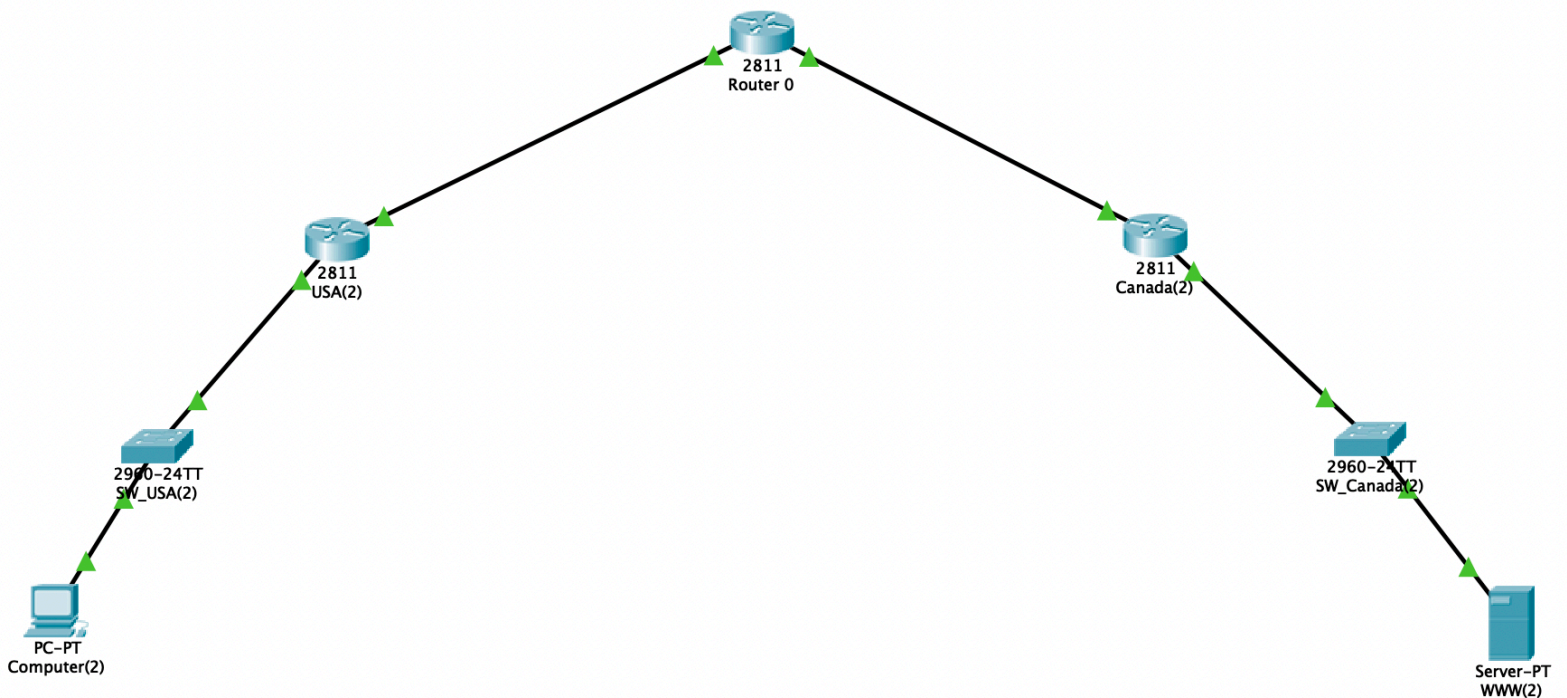


SERVER

Step 2: Connect devices using cables

Use **Copper Straight-Through** cables for these connections:

- Laptop → Left Switch
- Left Switch → Router1 (e.g., GigabitEthernet0/0)
- Server → Right Switch
- Right Switch → Router2 (e.g., GigabitEthernet0/0)
- Router1 → Router3 (use GigabitEthernet interfaces, e.g., G0/1 on Router1 to G0/0 on Router3)
- Router2 → Router3 (e.g., G0/1 on Router2 to G0/1 on Router3)



Step 3: Assign IP addressing scheme

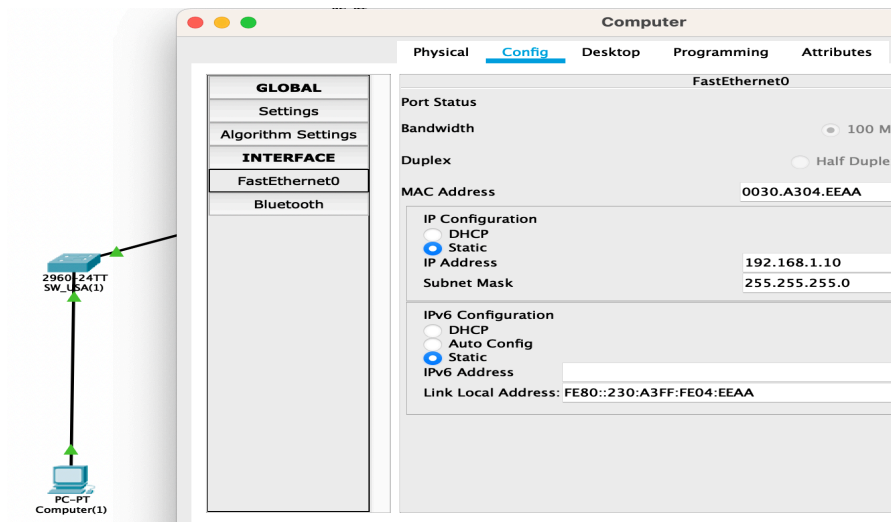
Let's use these IP subnets:

Device Interface	IP Address	Subnet Mask
Laptop (static)	192.168.1.10	255.255.255.0
Left Switch (no IP needed)	N/A	N/A
Router1 G0/0 (to Left Switch)	192.168.1.1	255.255.255.0
Router1 G0/1 (to Router0)	10.0.0.1	255.255.255.252
Router0 G0/0 (to Router1)	10.0.0.2	255.255.255.252
Router0 G0/1 (to Router2)	10.0.0.6	255.255.255.252
Router2 G0/1 (to Router0)	10.0.0.5	255.255.255.252
Router2 G0/0 (to Right Switch)	192.168.2.1	255.255.255.0
Right Switch (no IP needed)	N/A	N/A
Server	192.168.2.10	255.255.255.0

Step 4: Configure devices

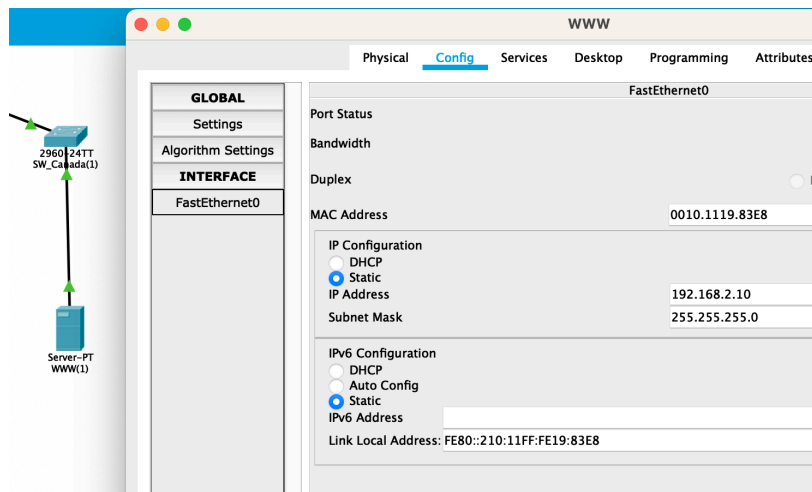
On Laptop:

- IP: 192.168.1.10
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1



On Server:

- IP: 192.168.2.10
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.2.1



Step 5: Configure Routers

Open CLI on each router and enter these commands:

Router1 (client; left-hand side):

enable

configure terminal

interface GigabitEthernet0/0

ip address 192.168.1.1 255.255.255.0

no shutdown

exit

interface GigabitEthernet0/1

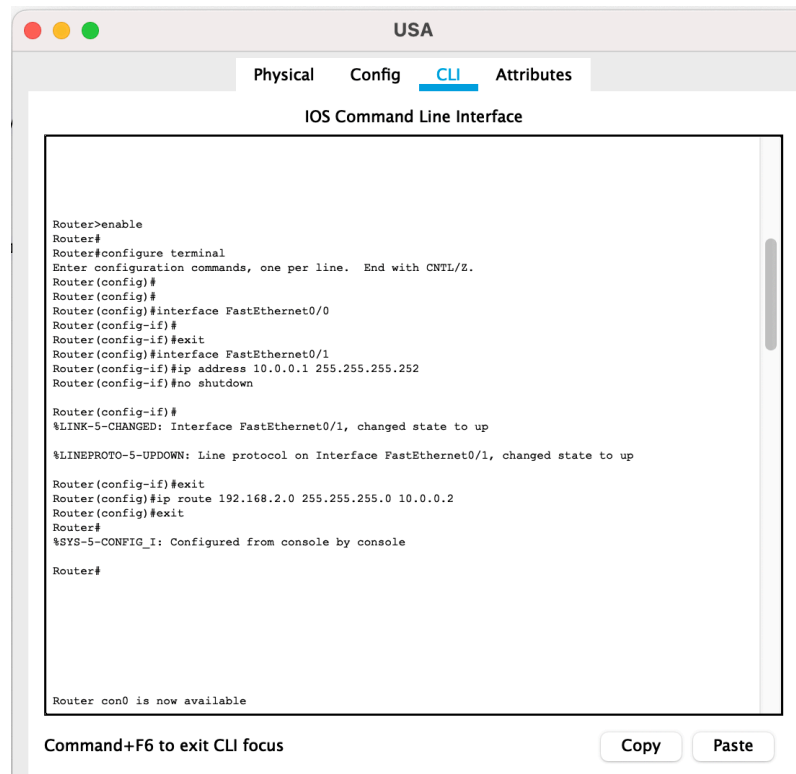
ip address 10.0.0.1 255.255.255.252

no shutdown

exit

**ip route 192.168.2.0 255.255.255.0
10.0.0.2**

exit



USA

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Global Settings

Display Name

USA

Hostname

Router

NVRAM

Erase

Save

Startup Config

Load...

Export...

Running Config

Export...

Merge...

Equivalent IOS Commands

USA

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/0

Port Status

☒ On

Bandwidth

☐ 100 Mbps
☐ 10 Mbps
☒ Auto

Duplex

☐ Half Duplex
☐ Full Duplex
☒ Auto

MAC Address

0001.C777.9601

IP Configuration

IP Address

192.168.1.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

USA

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/1

Port Status

☒ On

Bandwidth

☐ 100 Mbps
☐ 10 Mbps
☒ Auto

Duplex

☐ Half Duplex
☐ Full Duplex
☒ Auto

MAC Address

0001.C777.9602

IP Configuration

IP Address

10.0.0.1

Subnet Mask

255.255.255.252

Tx Ring Limit

10

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Router 0:

enable

configure terminal

interface GigabitEthernet0/0

ip address 10.0.0.2 255.255.255.252

no shutdown

exit

interface GigabitEthernet0/1

ip address 10.0.0.6 255.255.255.252

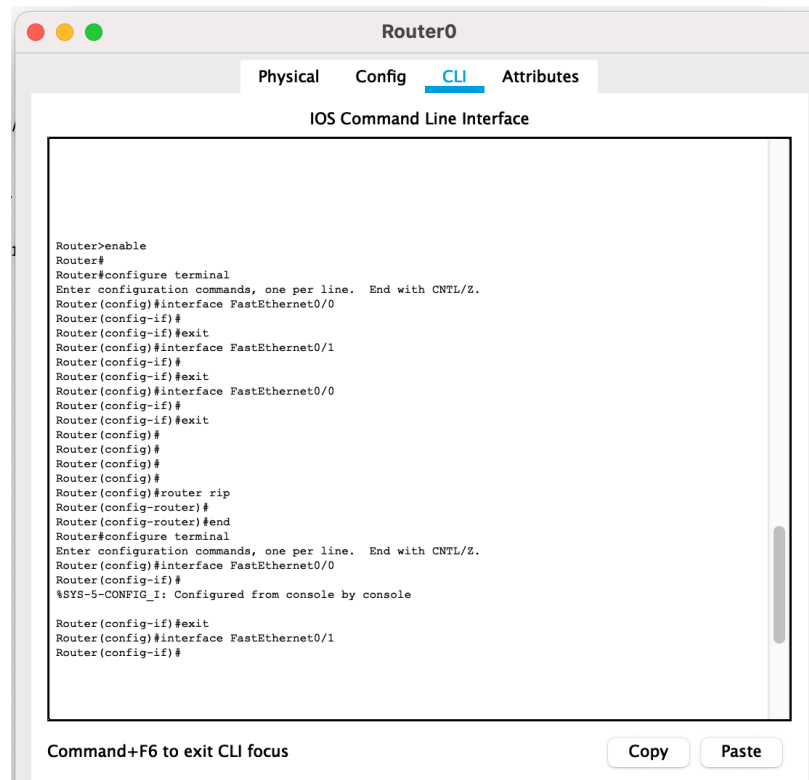
no shutdown

exit

**ip route 192.168.1.0 255.255.255.0
10.0.0.1**

**ip route 192.168.2.0 255.255.255.0
10.0.0.5**

exit



Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Static Routes

Network

Mask

Next Hop

Add

Network Address

192.168.1.0/24 via 10.0.0.1

192.168.2.0/24 via 10.0.0.5

Remove

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth

☐ 100 Mbps
☐ 10 Mbps
☒ Auto

Duplex

☐ Half Duplex
☒ Full Duplex
☒ Auto

MAC Address

0090.2122.A201

IP Configuration

IP Address

10.0.0.2

Subnet Mask

255.255.255.252

Tx Ring Limit

10

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth

☐ 100 Mbps
☐ 10 Mbps
☒ Auto

Duplex

☐ Half Duplex
☒ Full Duplex
☒ Auto

MAC Address

0090.2122.A202

IP Configuration

IP Address

10.0.0.6

Subnet Mask

255.255.255.252

Tx Ring Limit

10

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Router 2

enable

configure terminal

interface GigabitEthernet0/0

ip address 192.168.2.1 255.255.255.0

no shutdown

exit

interface GigabitEthernet0/1

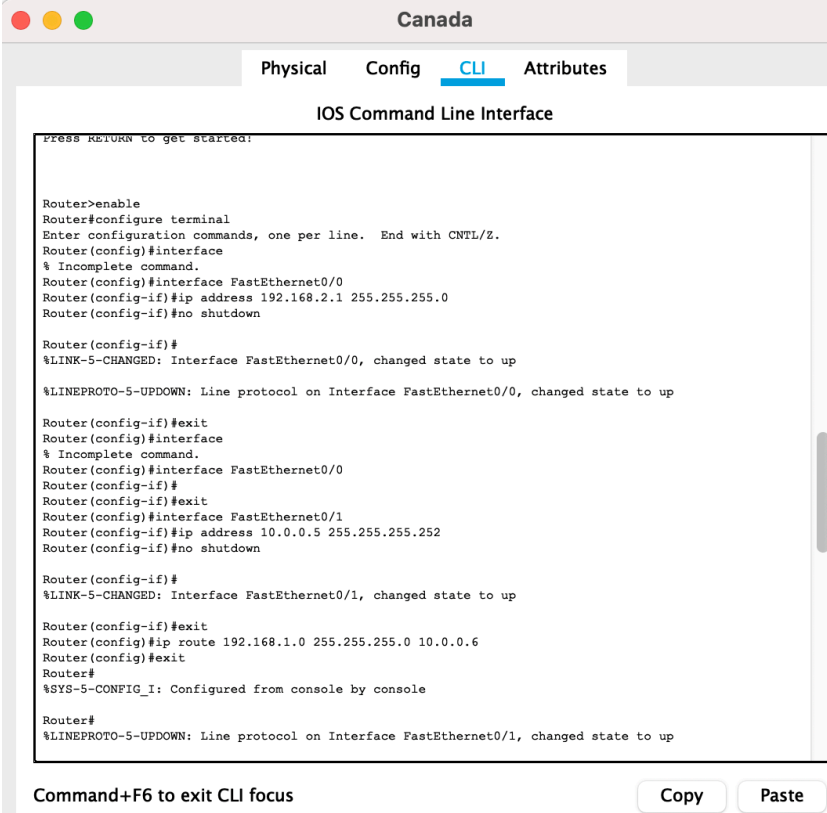
ip address 10.0.0.5 255.255.255.252

no shutdown

exit

**ip route 192.168.1.0 255.255.255.0
10.0.0.6**

exit



The screenshot shows a network simulator window titled "Canada" with tabs for Physical, Config, CLI (selected), and Attributes. The CLI tab displays the "IOS Command Line Interface" with the following commands and output:

```
Press RETURN to get started:

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface
% Incomplete command.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
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)#interface
% Incomplete command.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 10.0.0.5 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#ip route 192.168.1.0 255.255.255.0 10.0.0.6
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

At the bottom of the window, there is a status bar that says "Command+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

Canada

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Global Settings

Display Name

Hostname

NVRAM

Startup Config

Running Config

Canada

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address

IP Configuration

IP Address

Subnet Mask

Tx Ring Limit

Canada

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address

IP Configuration

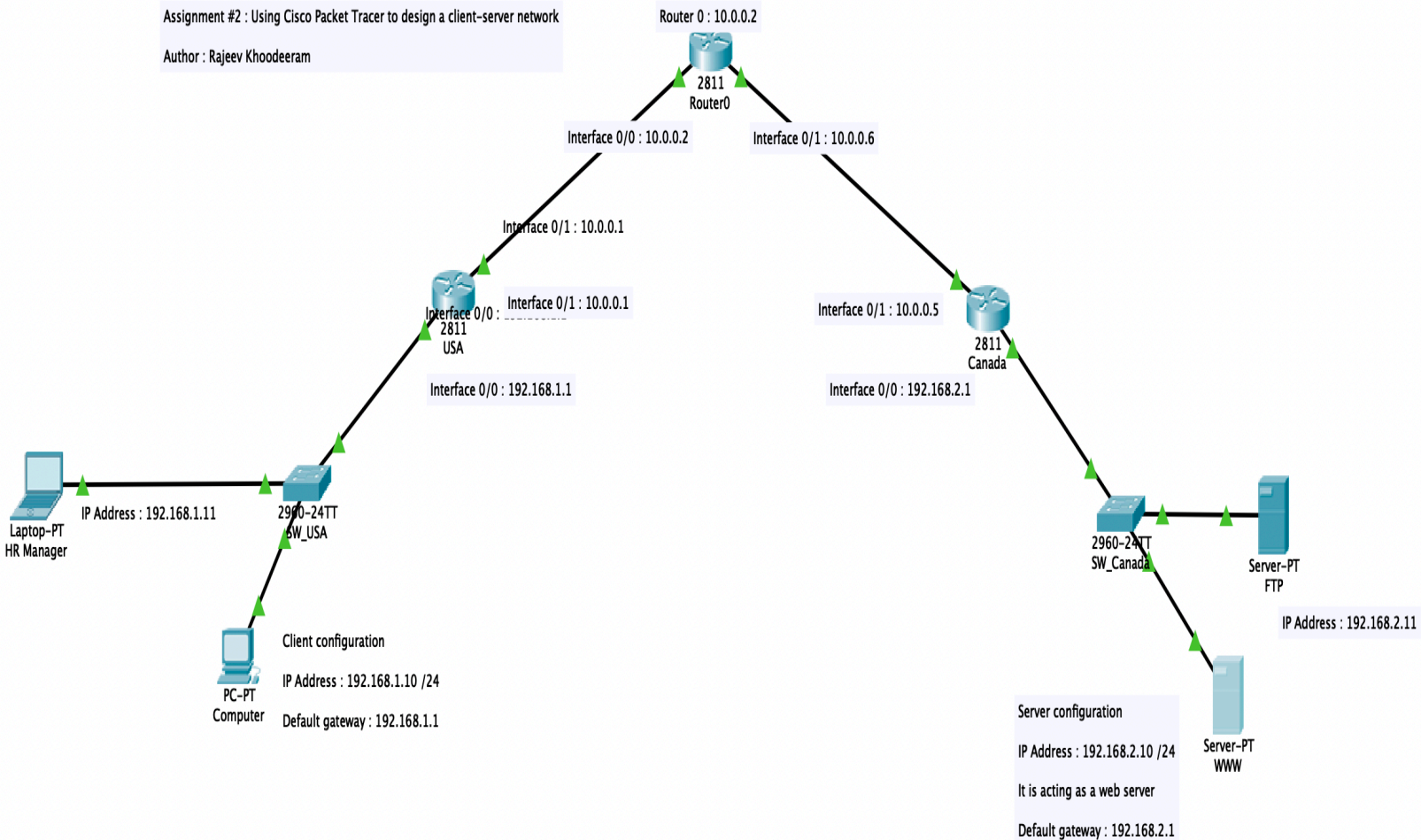
IP Address

Subnet Mask

Tx Ring Limit

Step 6 : The final architecture

Assignment #2 : Using Cisco Packet Tracer to design a client-server network
Author : Rajeev Khoodeeram



LIST OF DEVICES

- (a) 3 ROUTERS
- (b) 2 SWITCHES
- (c) 2 SERVERS
- (d) 2 HOSTS (COMPUTERS)

Step 7: Test connectivity

- From Laptop, open **Command Prompt** and ping 192.168.2.10 (the server)
- From Client, ping 192.168.2.10 (the server)

If everything is set up correctly, the ping should succeed, indicating the networks are communicating through Router3.

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Request timed out.
Request timed out.

Ping statistics for 192.168.2.10:
    Packets: Sent = 3, Received = 0, Lost = 3 (100% loss),

Control-C
^C
C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Reply from 192.168.2.10: bytes=32 time=1ms TTL=125
Reply from 192.168.2.10: bytes=32 time=2ms TTL=125
Reply from 192.168.2.10: bytes=32 time=1ms TTL=125
Reply from 192.168.2.10: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 1ms
```

- Open a browser in Computer host and visit <http://192.168.2.10> — the web page loads as follows :


Computer

Physical Config **Desktop** Programming Attributes

Web Browser

URL <http://192.168.2.10> Go Stop

Cisco Packet Tracer



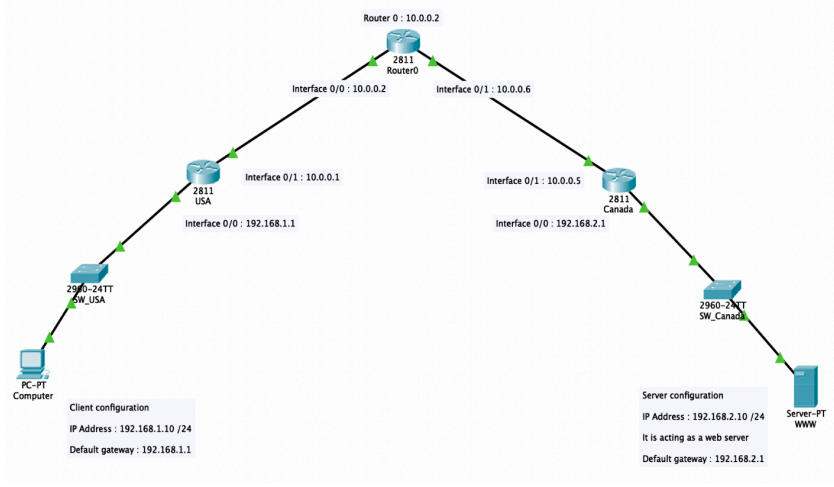
Welcome to Cisco Packet Tracer - Assignment #2 @Rajeev Khoodeeram

Author : Dr Rajeev Khoodeeram

Project : Designing a client server model as follows :

1. Left hand side (Client) : PC connects to a switch which in turn connect to a router
2. Right hand side (Server / WWW) : Server connects to a switch which in turn connects to a router

Both networks are connected via another router.



Client configuration
 IP Address : 192.168.1.10 /24
 Default gateway : 192.168.1.1

Server configuration
 IP Address : 192.168.2.10 /24
 It is acting as a web server
 Default gateway : 192.168.2.1