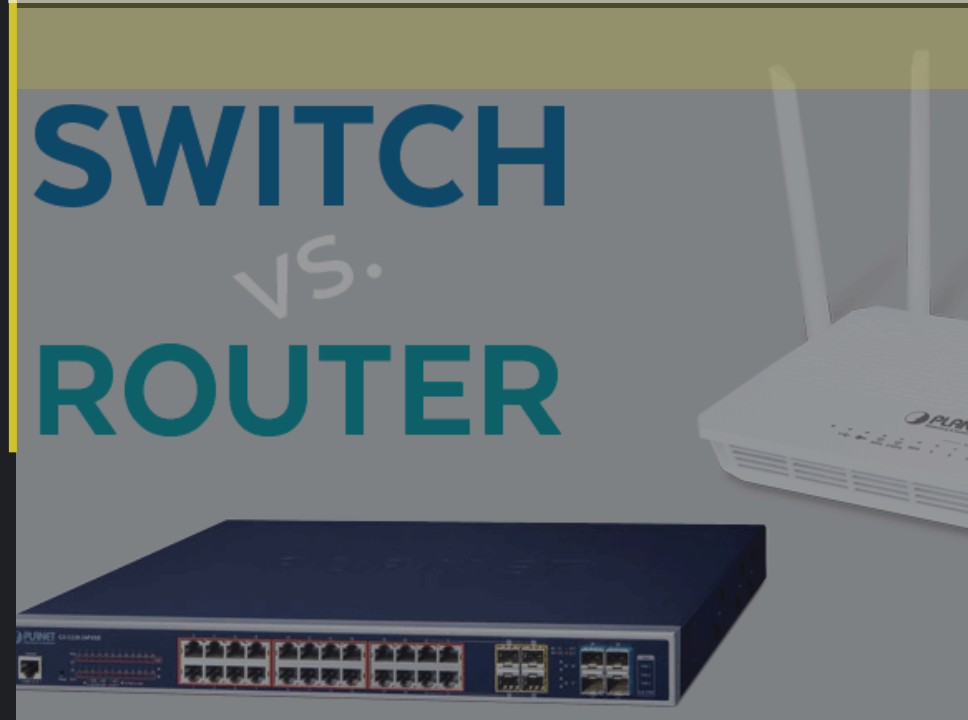
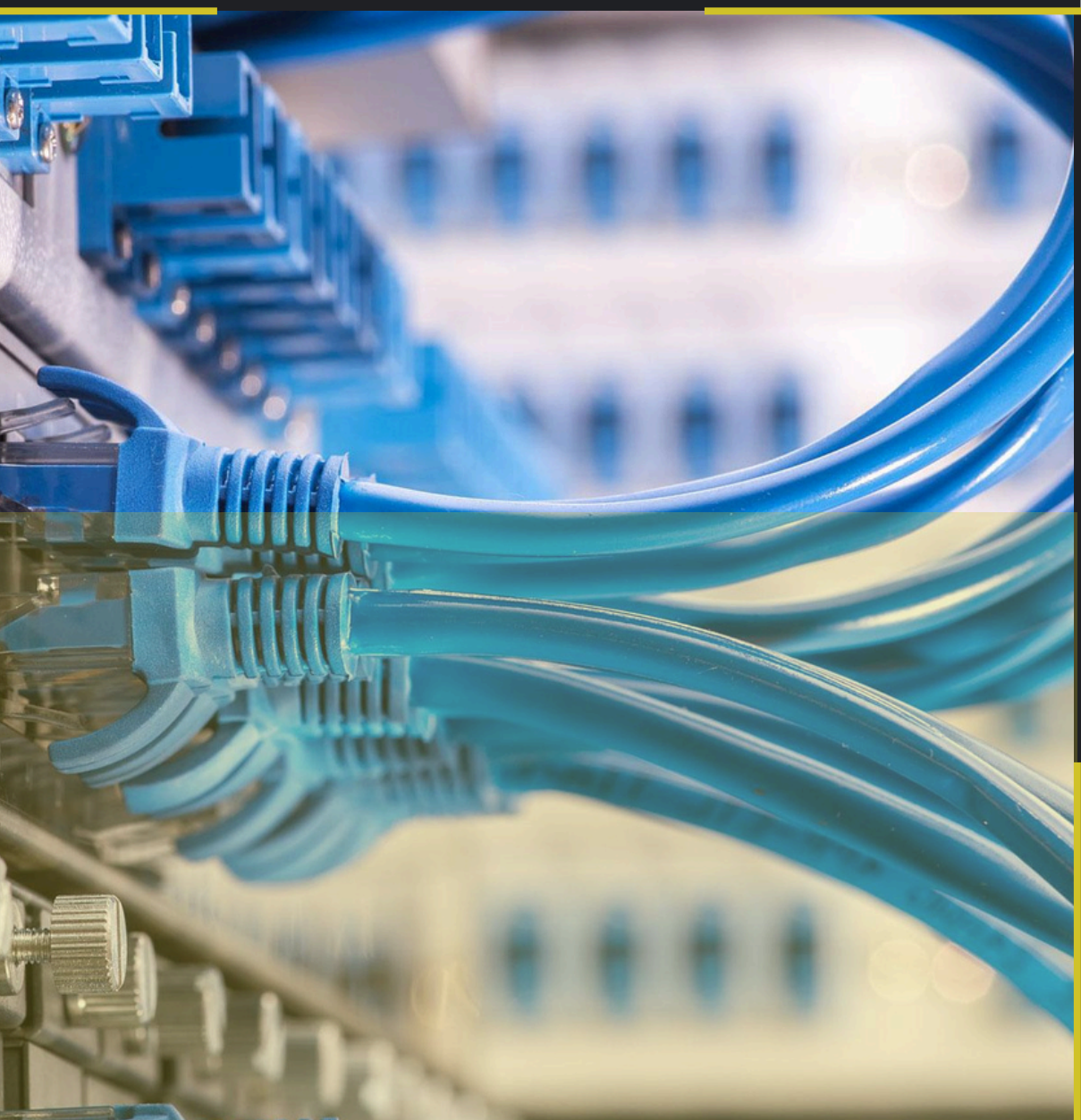
NETWORKING

ASSIGNMENT#2





Submitted To

Mr Richi FURMAH

Presented By

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THE QUESTION

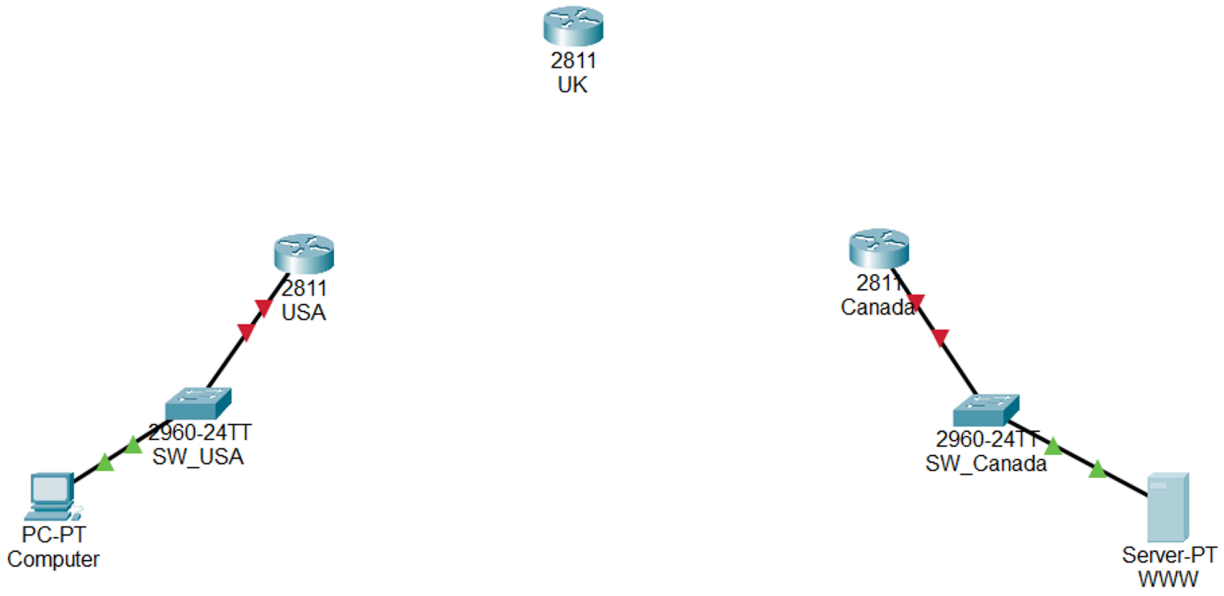
This project involves designing a networking infrastructure consisting of two parts (as shown in the diagram below) :

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 bridged this client side to the server side.

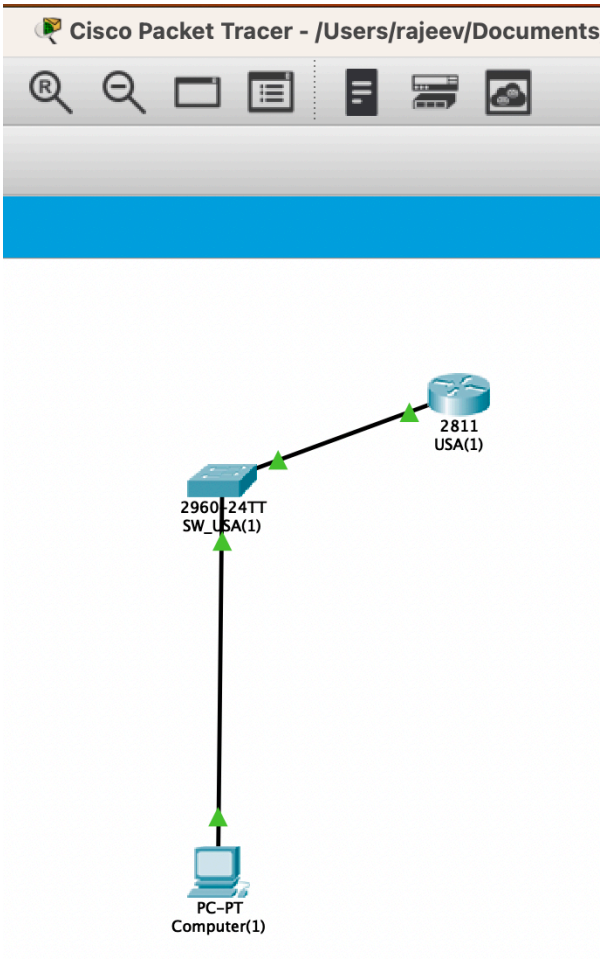
2. **Server side (right-hand side)**

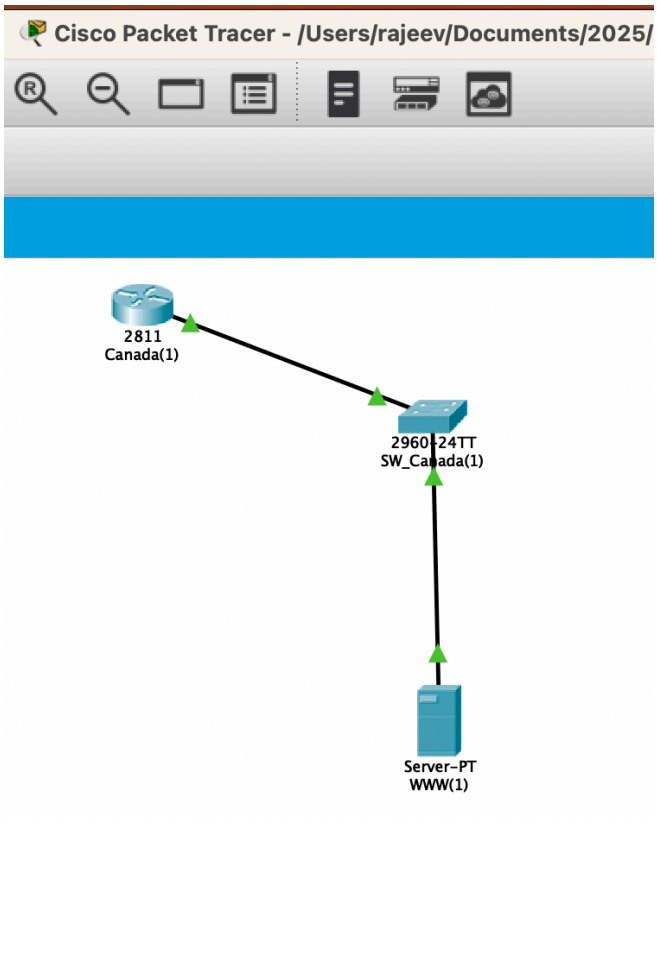
On the server-hand side, we have a server (WWW) which is similarly connected to a switch which in turn is connected to the server router. This server router is then connected to the second router to allow connection from the client side.



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



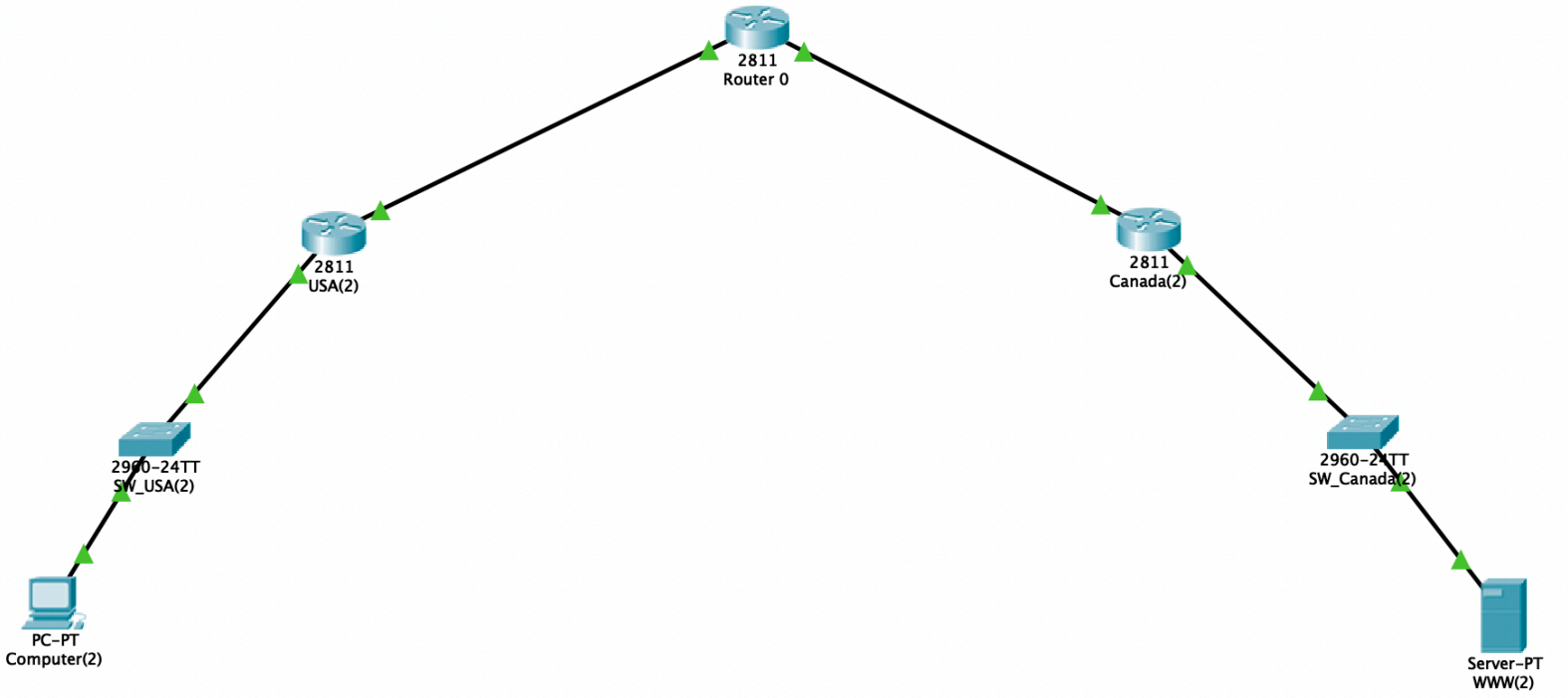


CLIENT **SERVER**

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

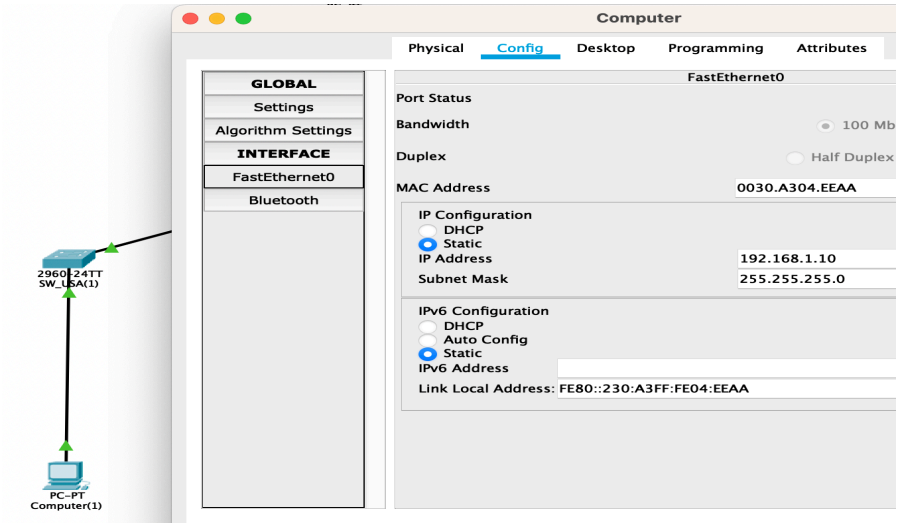
Let's use these IP subnets:

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

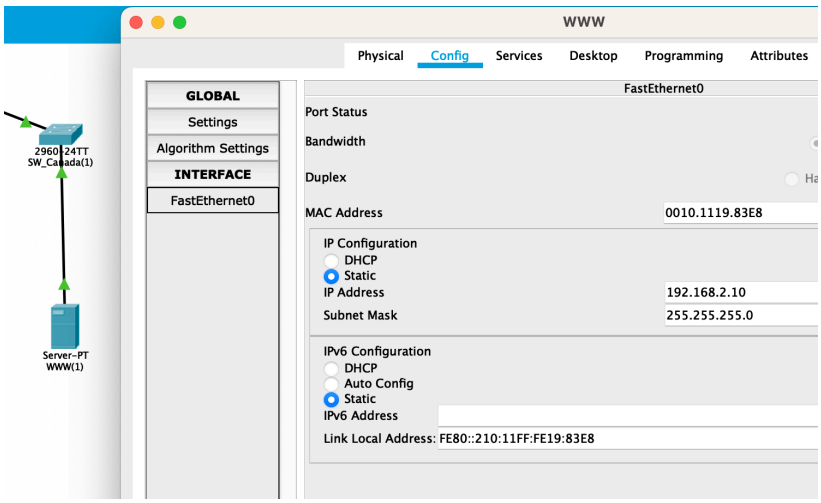
On Laptop:

- 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

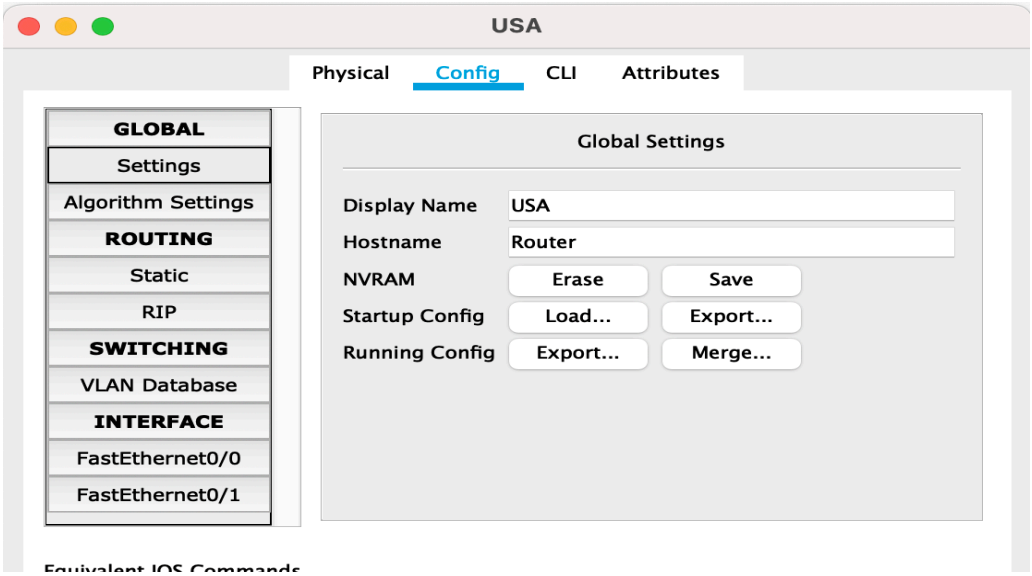
ip address 10.0.0.1 255.255.255.252

no shutdown

exit

ip route 192.168.2.0 255.255.255.0 10.0.0.2

exit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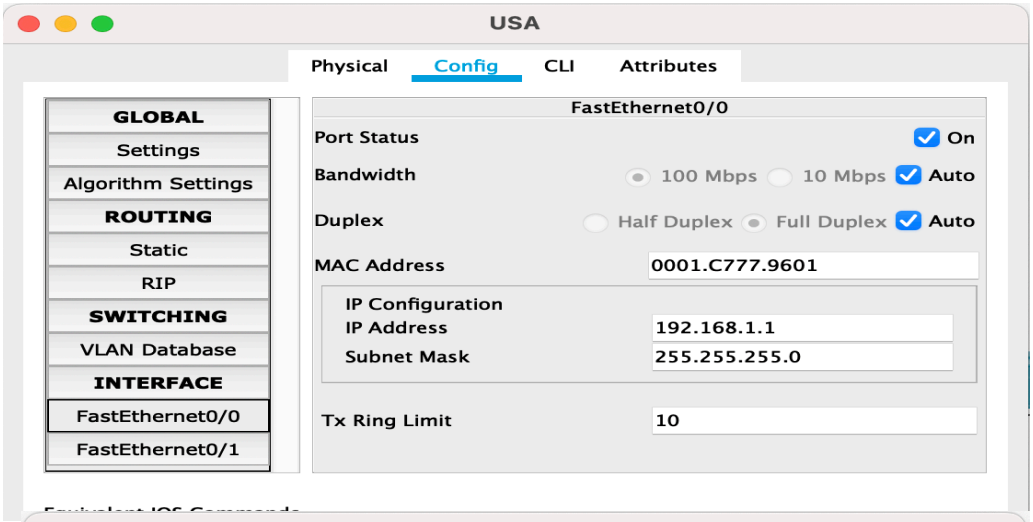
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Global Settings
Display Name
USA
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Export...
Merge...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CLI
Attributes
GLOBAL
Settings
Algorithm Settings
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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
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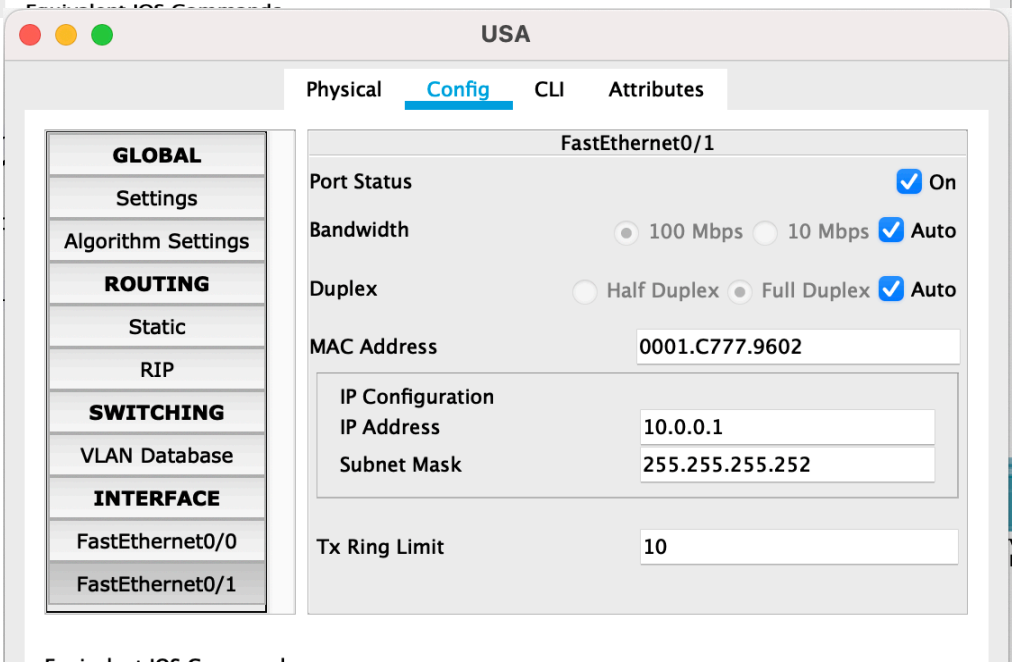
IP Configuration
IP Address
192.168.1.1
Subnet Mask
255.255.255.0
Tx Ring Limit
10


USA
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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

Router 0:

enable

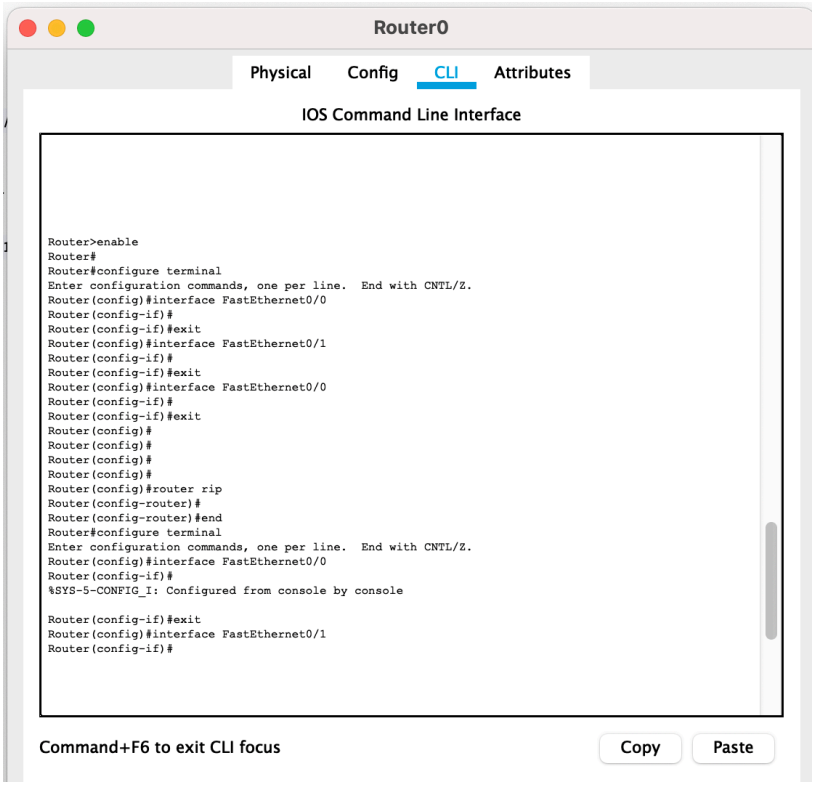
configure terminal

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

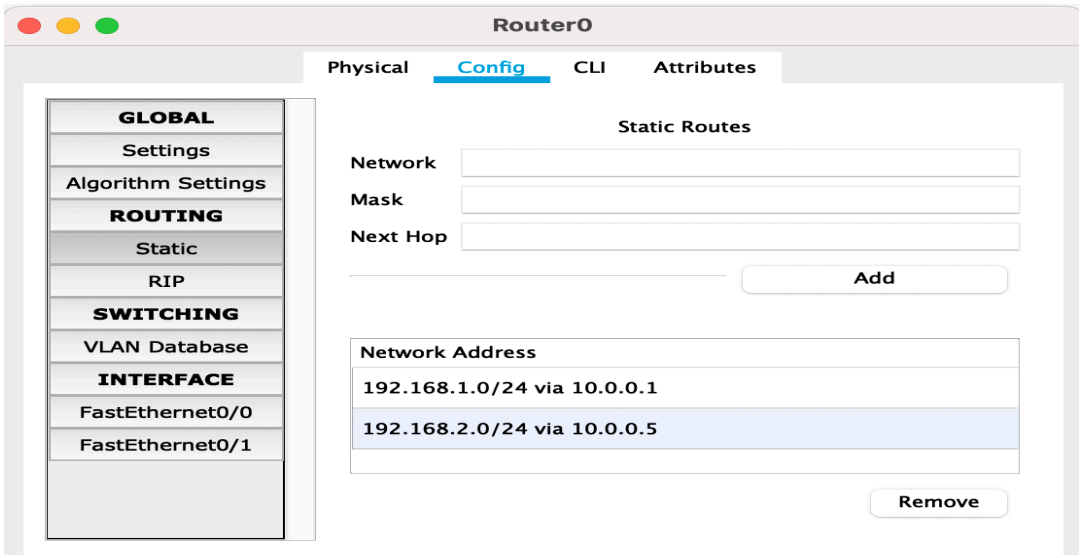
no shutdown

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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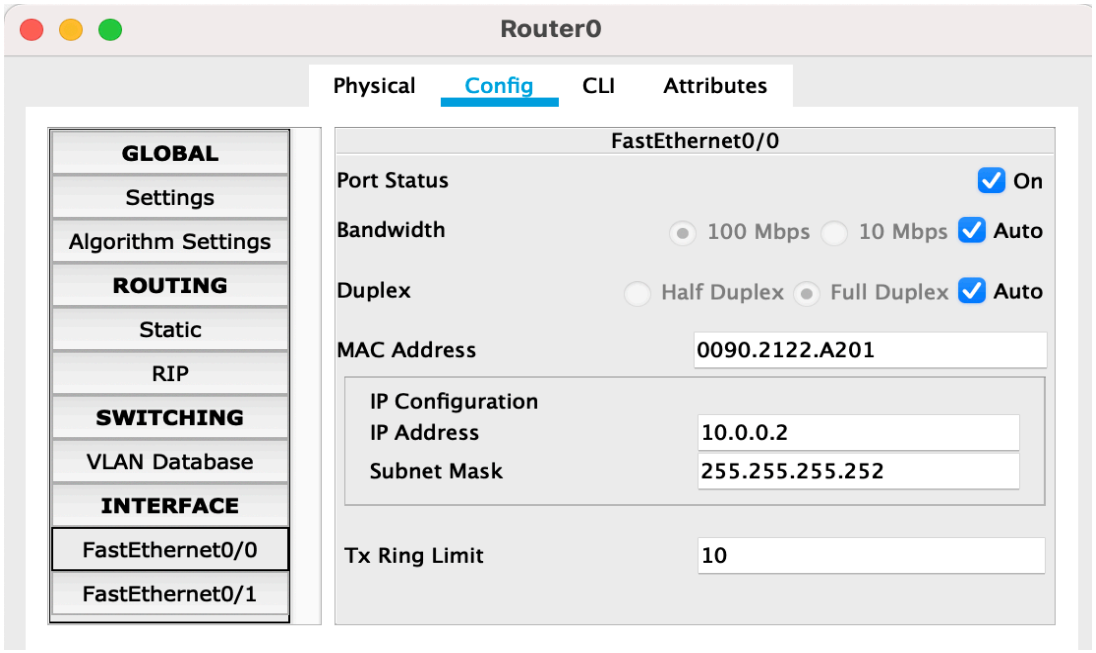
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
192.168.1.0/24 via 10.0.0.1
192.168.2.0/24 via 10.0.0.5
Remove


Router0
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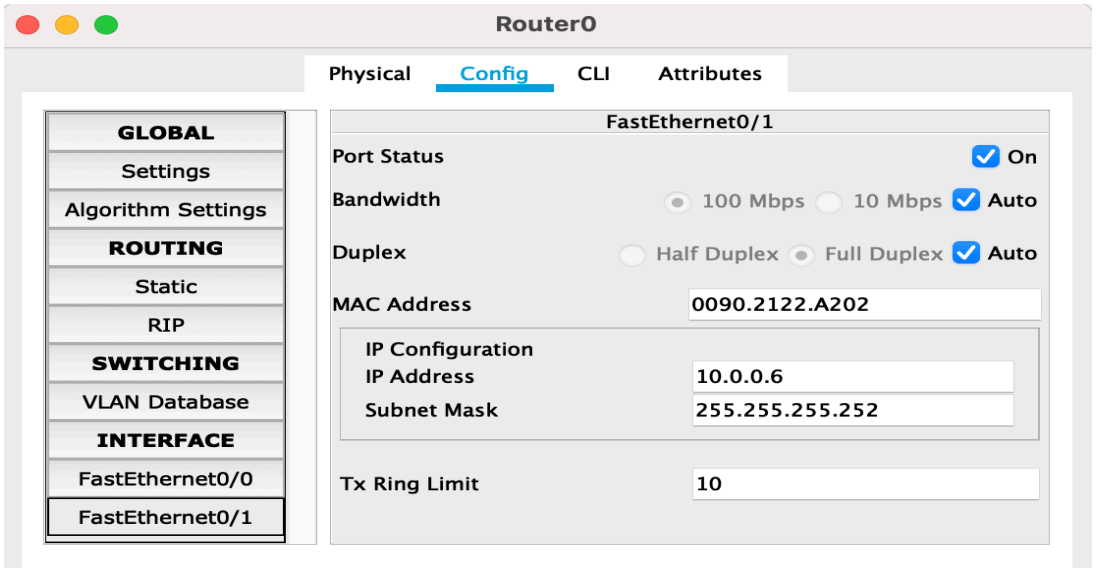
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0090.2122.A201
IP Configuration
IP Address
10.0.0.2
Subnet Mask
255.255.255.252
Tx Ring Limit
10


Router0
Physical
Config
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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

Router 2

enable

configure terminal

interface GigabitEthernet0/0

ip address 192.168.2.1 255.255.255.0

no shutdown

exit

interface GigabitEthernet0/1

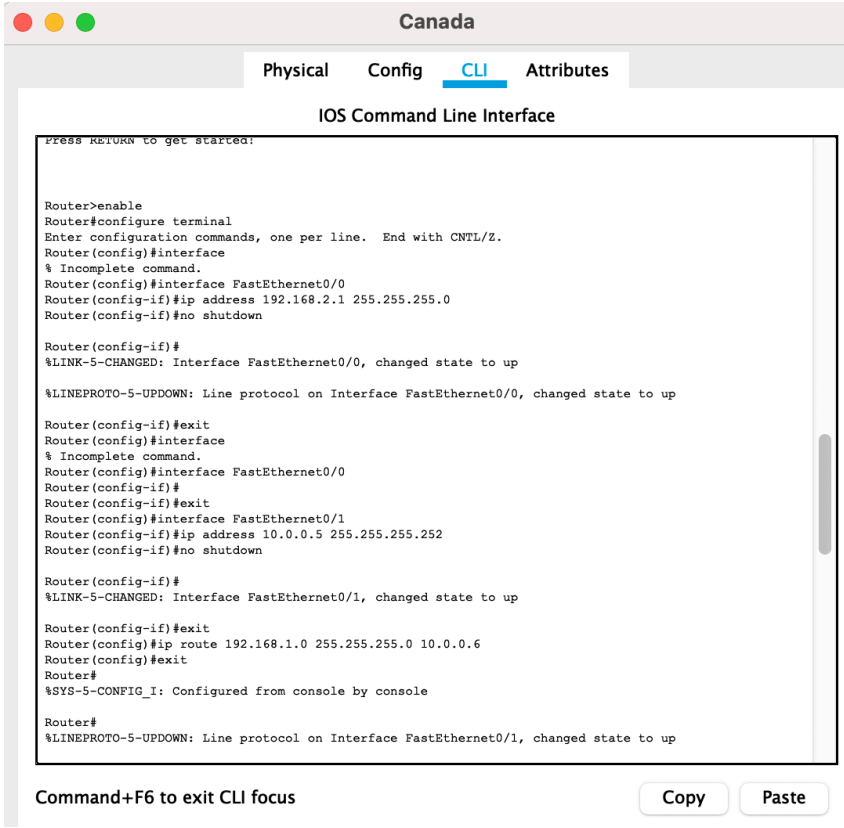
ip address 10.0.0.5 255.255.255.252

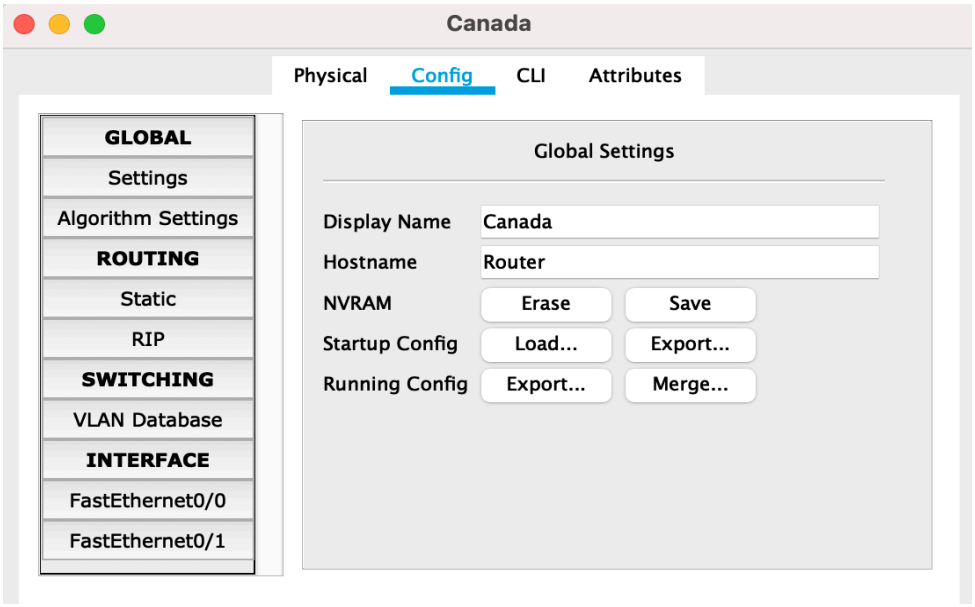
no shutdown

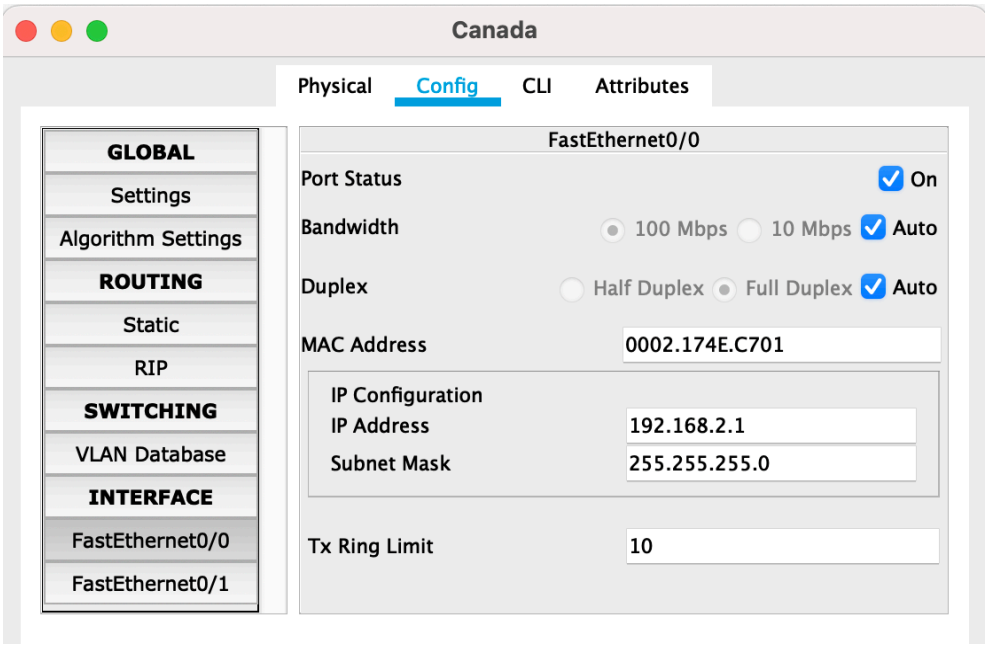
exit

ip route 192.168.1.0 255.255.255.0 10.0.0.6

exit




Canada
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Global Settings
Display Name
Canada
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Export...
Merge...


Canada
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Attributes
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Static
RIP
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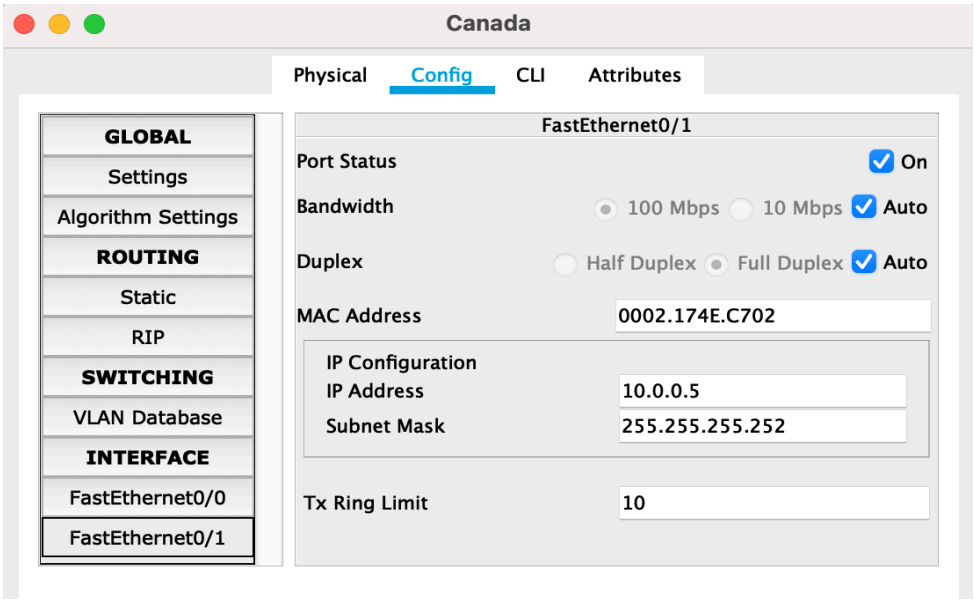
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0002.174E.C701
IP Configuration
IP Address
192.168.2.1
Subnet Mask
255.255.255.0
Tx Ring Limit
10


Canada
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
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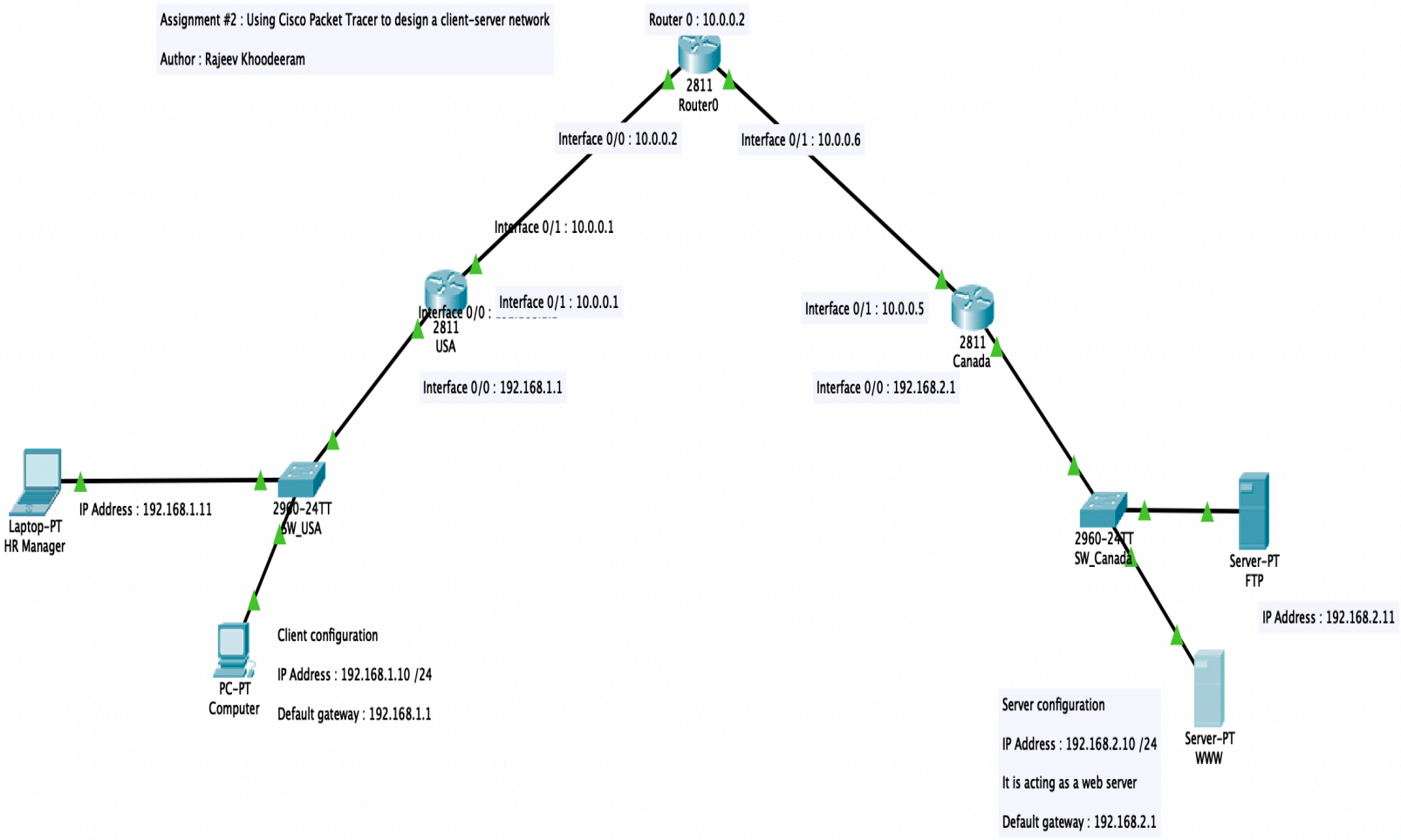
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
FastEthernet0/1
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0002.174E.C702
IP Configuration
IP Address
10.0.0.5
Subnet Mask
255.255.255.252
Tx Ring Limit
10

Step 6 : The final architecture



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 :