Assignment 5: Configuration of IP static routing using three routers, three switches and six PC


1841
Router0


1841
Router1


1841
Router2


2950-24
Switch0


2950-24
Switch1


2950-24
Switch2


PC-PT
PC0


PC-PT
PC1

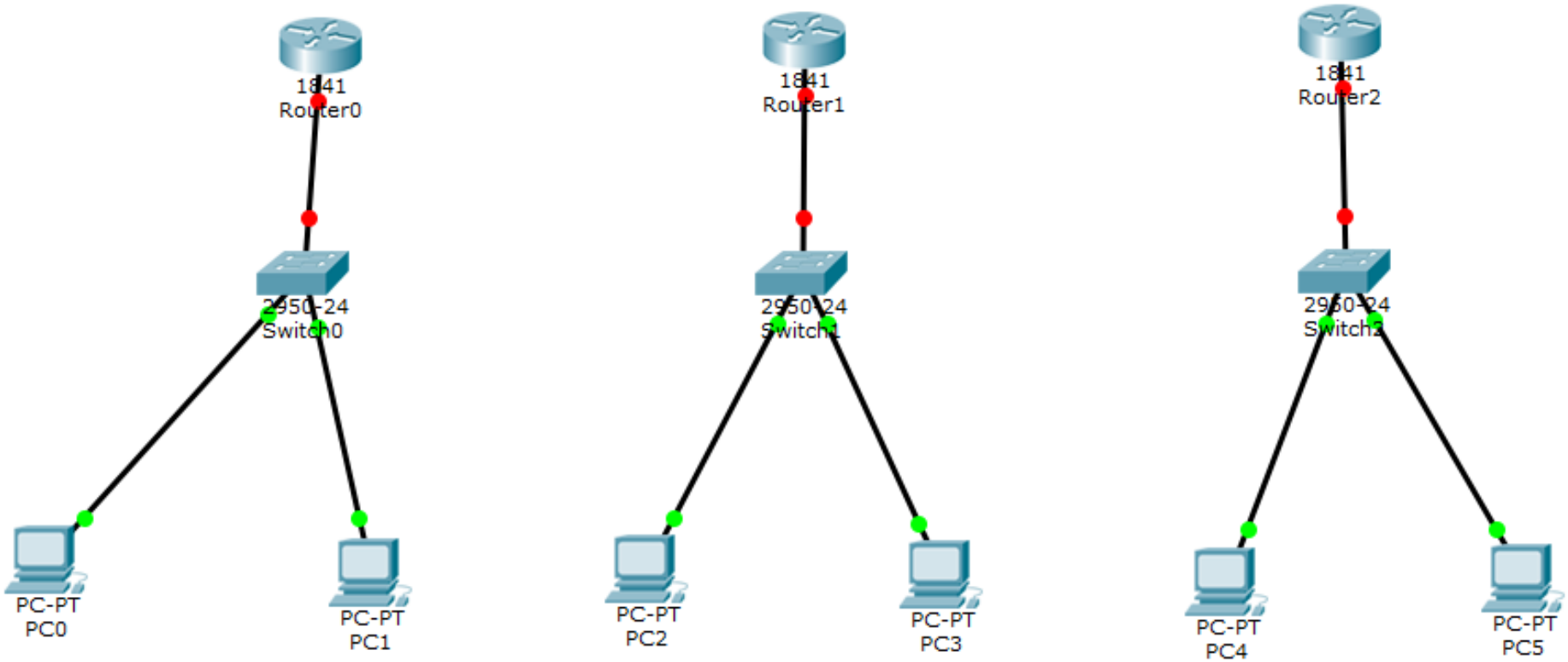

PC-PT
PC2


PC-PT
PC3

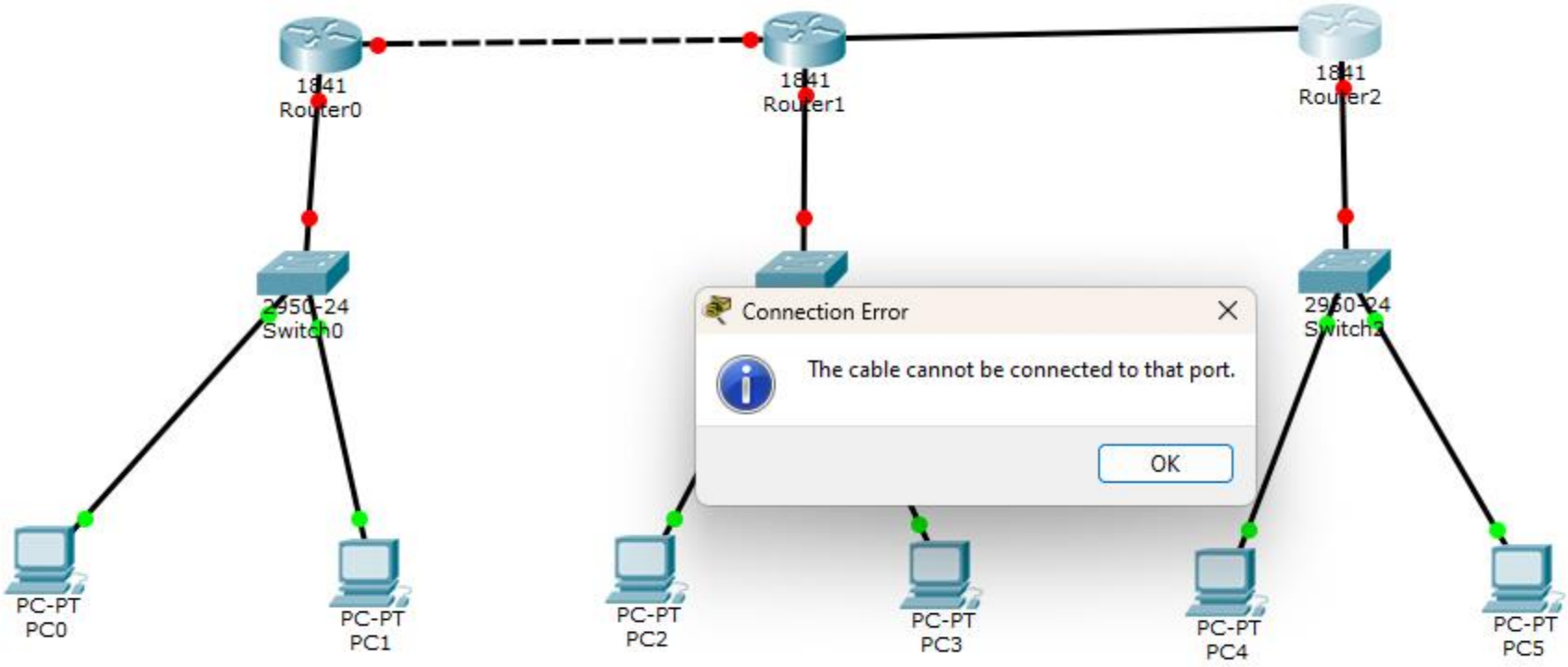

PC-PT
PC4


PC-PT
PC5

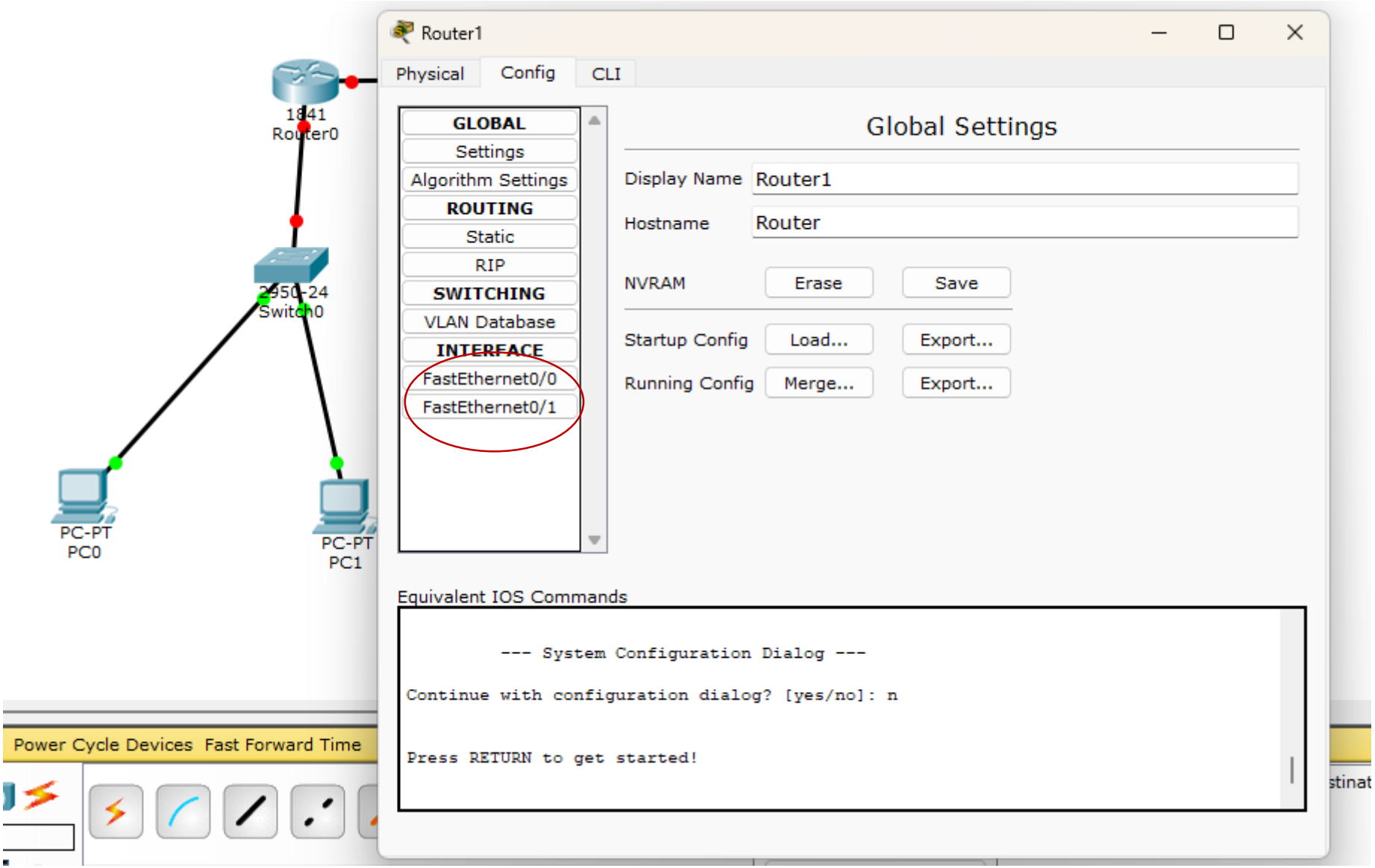
Now we want to connect all the devices. Connection should be made from lower end device to upper end device as we are taking different layers of end devices. We are using automatic connection.


1841
Router0
2950-24
Switch0
PC-PT
PC0
PC-PT
PC1
1841
Router1
2950-24
Switch1
PC-PT
PC2
PC-PT
PC3
1841
Router2
2950-24
Switch2
PC-PT
PC4
PC-PT
PC5

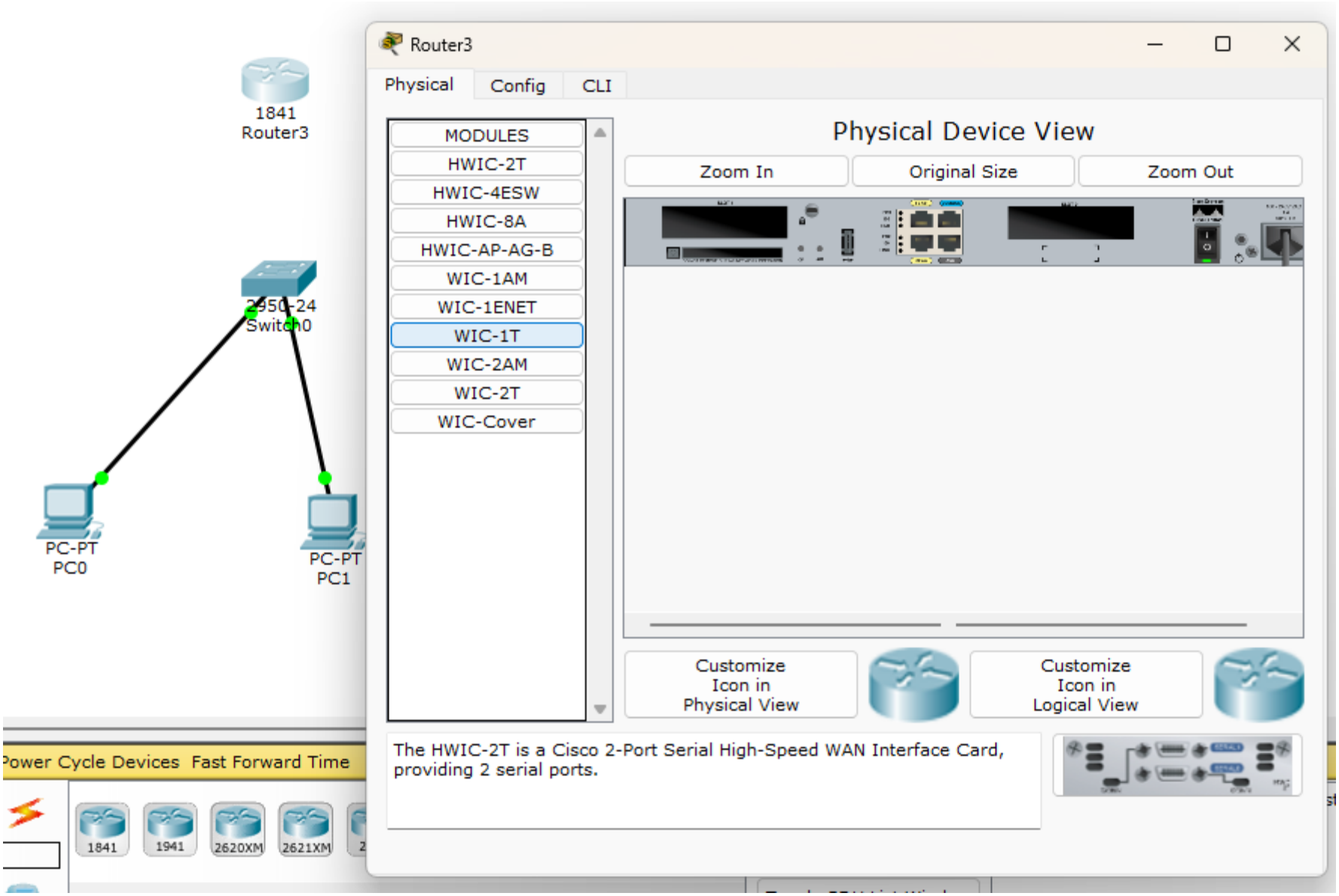
Now we will connect routers. Connection from router0 to router1 can easily made. However, there is a problem in making connection between router1 to router2.


1841
Router0
1841
Router1
1841
Router2
2950-24
Switch0
2960-24
Switch2
Connection Error
The cable cannot be connected to that port.
OK
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
PC-PT
PC4
PC-PT
PC5

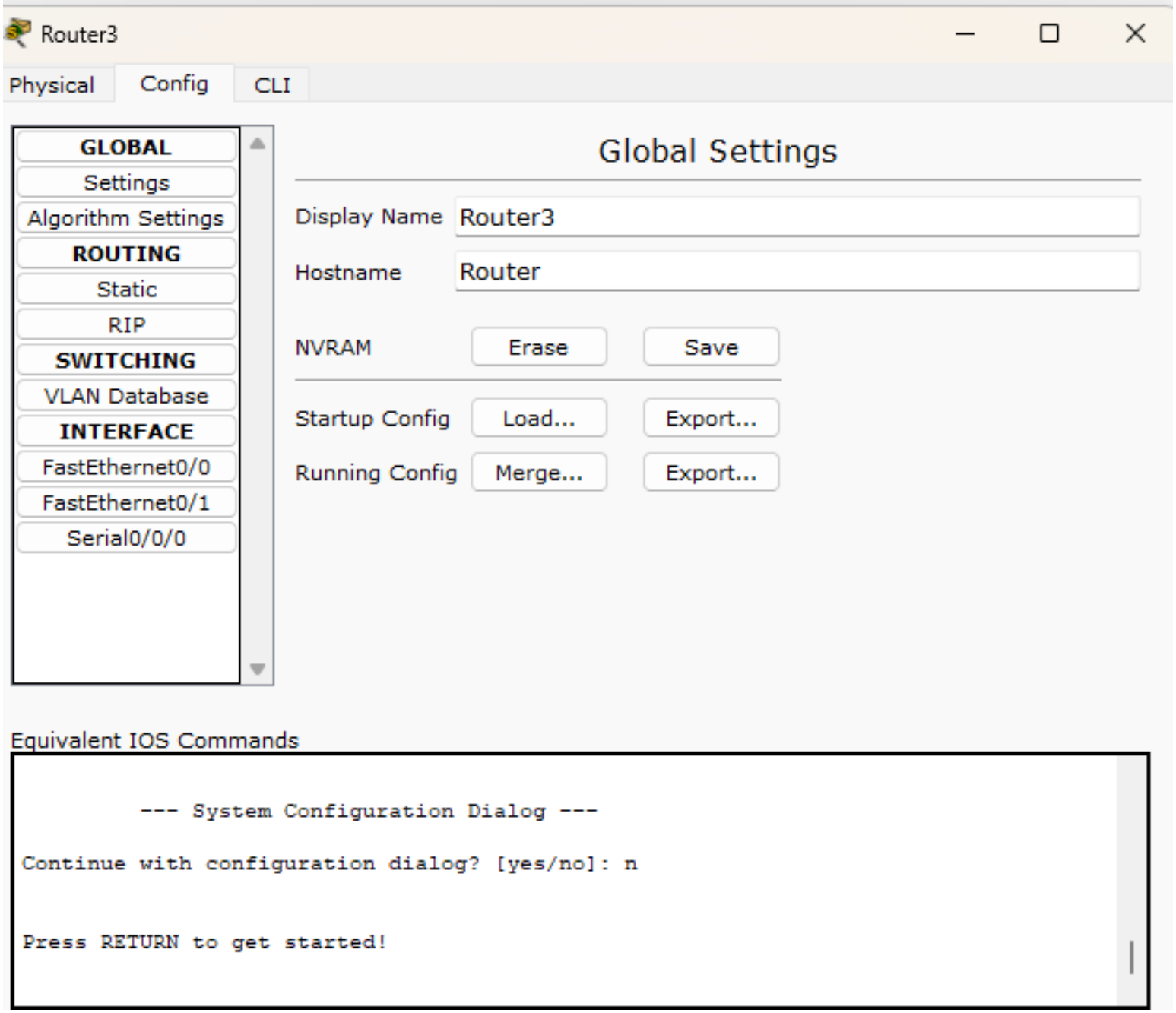
Go to router configuration, it will allow only two wires to connect.


1841
Router0
2950-24
Switch0
PC-PT
PC0
PC-PT
PC1
Router1
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Global Settings
Display Name
Router1
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Merge...
Export...
Equivalent IOS Commands
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Power Cycle Devices
Fast Forward Time

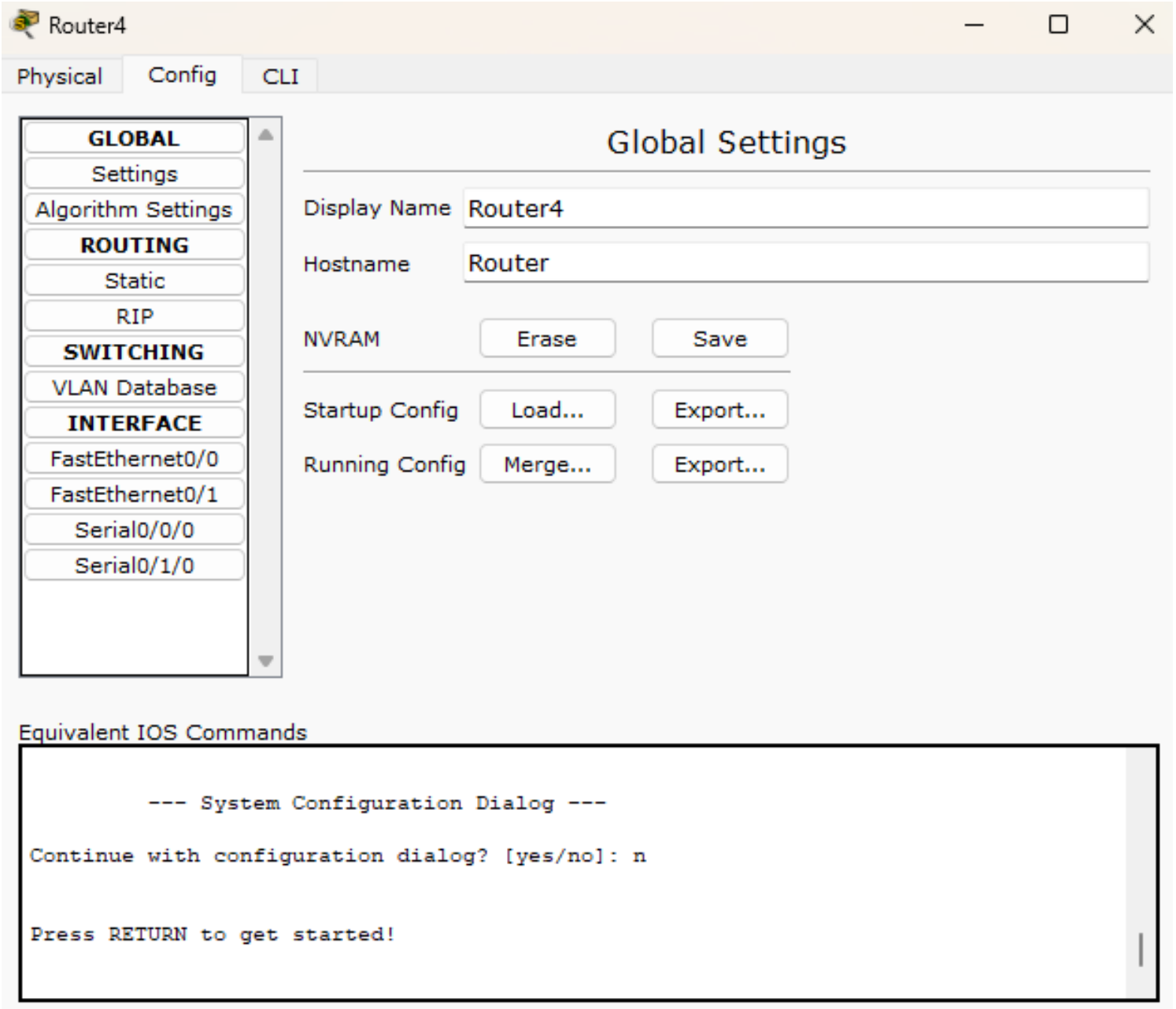
We need to add extra port to the router.


1841
Router3
2950-24
Switch0
PC-PT
PC0
PC-PT
PC1
Router3
Physical
Config
CLI
MODULES
HWIC-2T
HWIC-4ESW
HWIC-8A
HWIC-AP-AG-B
WIC-1AM
WIC-1ENET
WIC-1T
WIC-2AM
WIC-2T
WIC-Cover
Physical Device View
Zoom In
Original Size
Zoom Out
Customize
Icon in
Physical View
Customize
Icon in
Logical View
The HWIC-2T is a Cisco 2-Port Serial High-Speed WAN Interface Card,
providing 2 serial ports.
Power Cycle Devices
Fast Forward Time
1841
1941
2620XM
2621XM

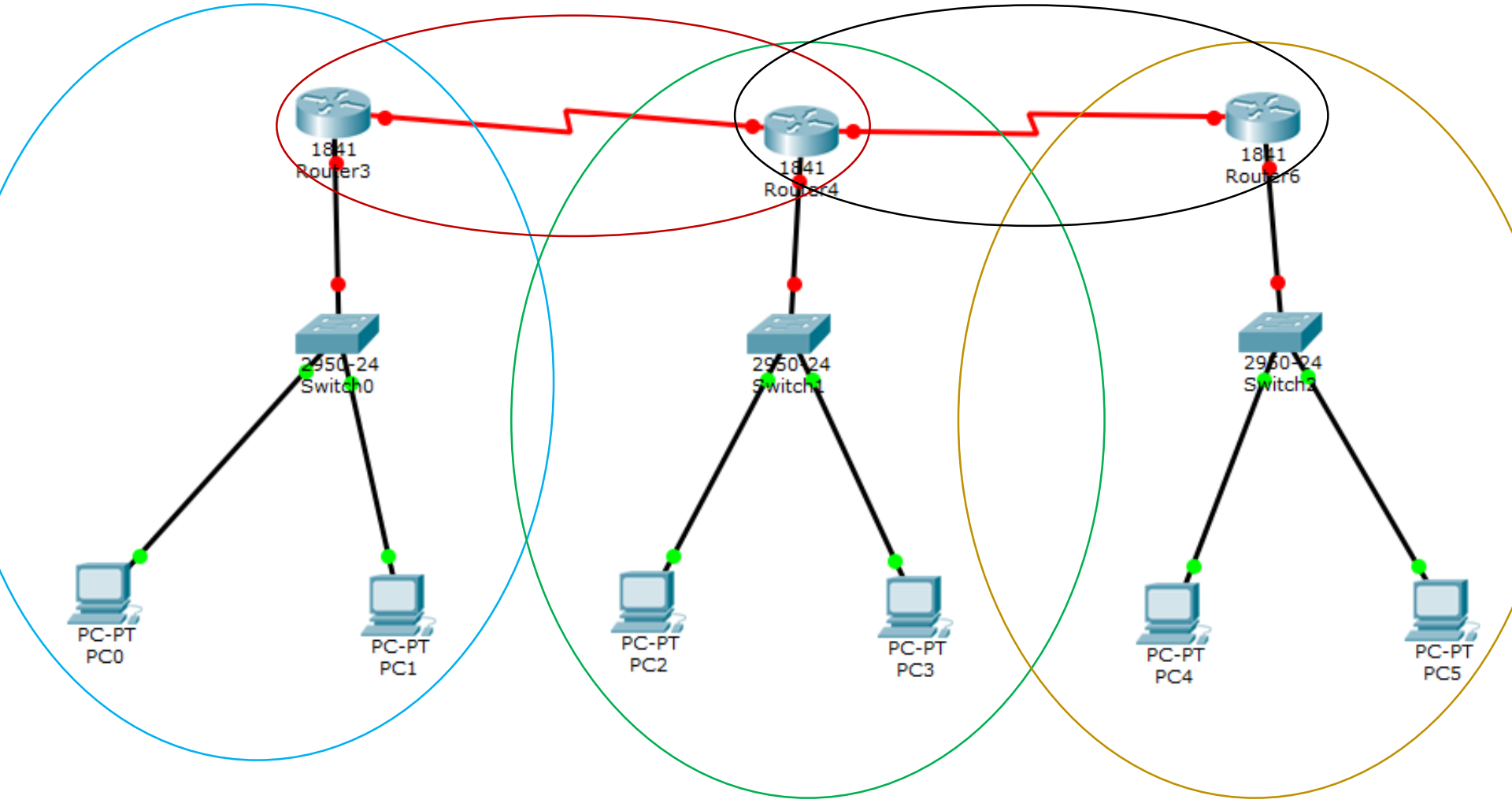
Go to physical of router3. Chose WIC-1T. Turn the switch off. Take an extra port from bottom and place it. Then turn on the switch. Then go to the configure mode of router. It will show three ports.


Router3
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Global Settings
Display Name
Router3
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Merge...
Export...
Equivalent IOS Commands
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!

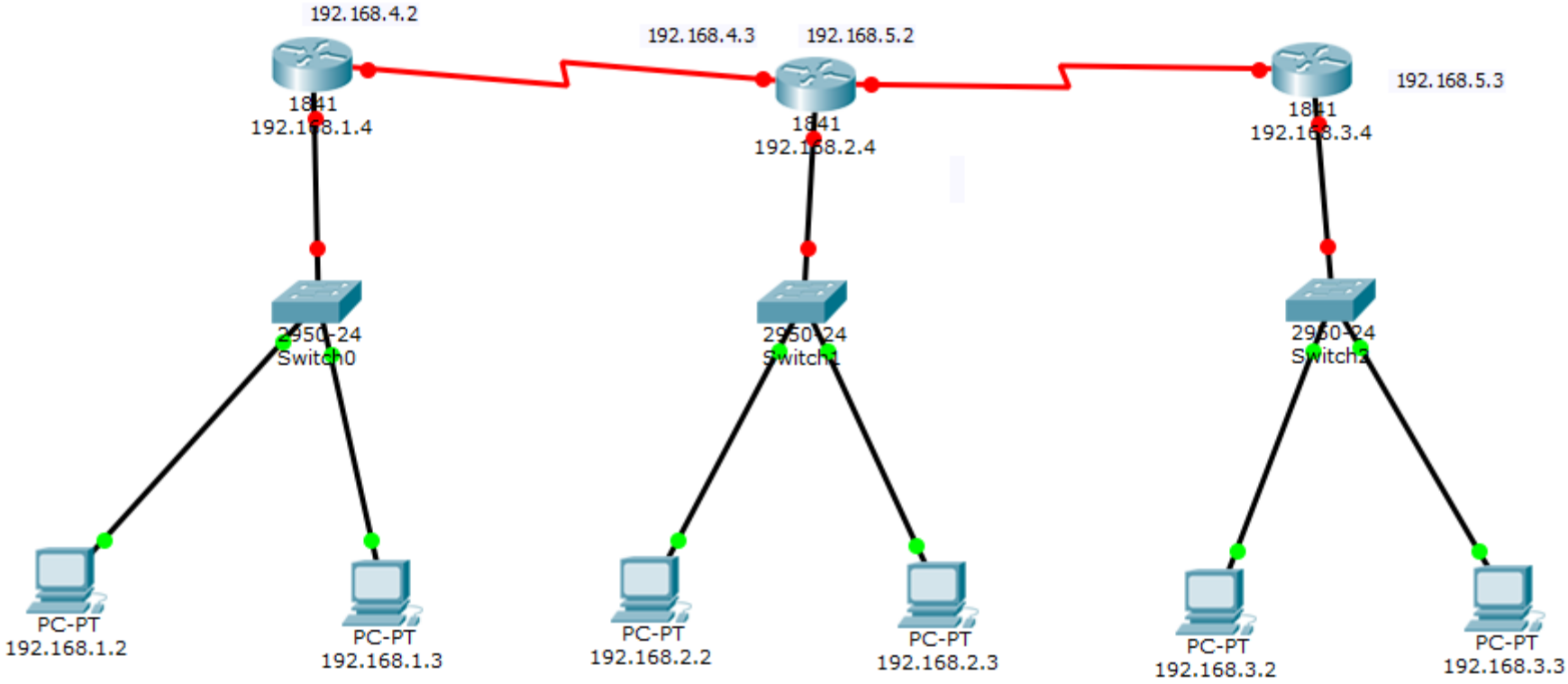
Similarly we will add 1 extra port to router5. And 2 extra port to router4.

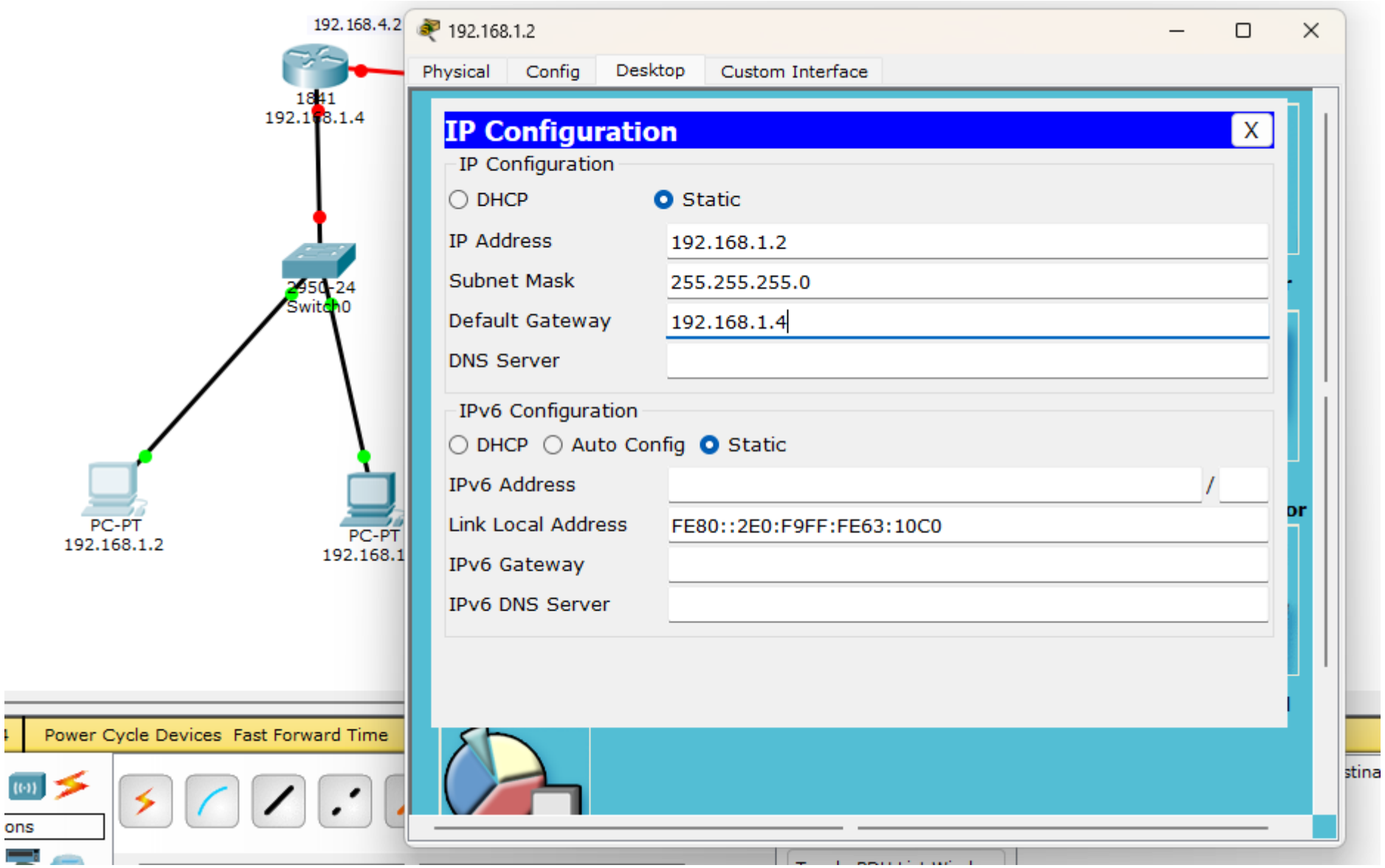

Router4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/1/0
Global Settings
Display Name
Router4
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Merge...
Export...
Equivalent IOS Commands
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!

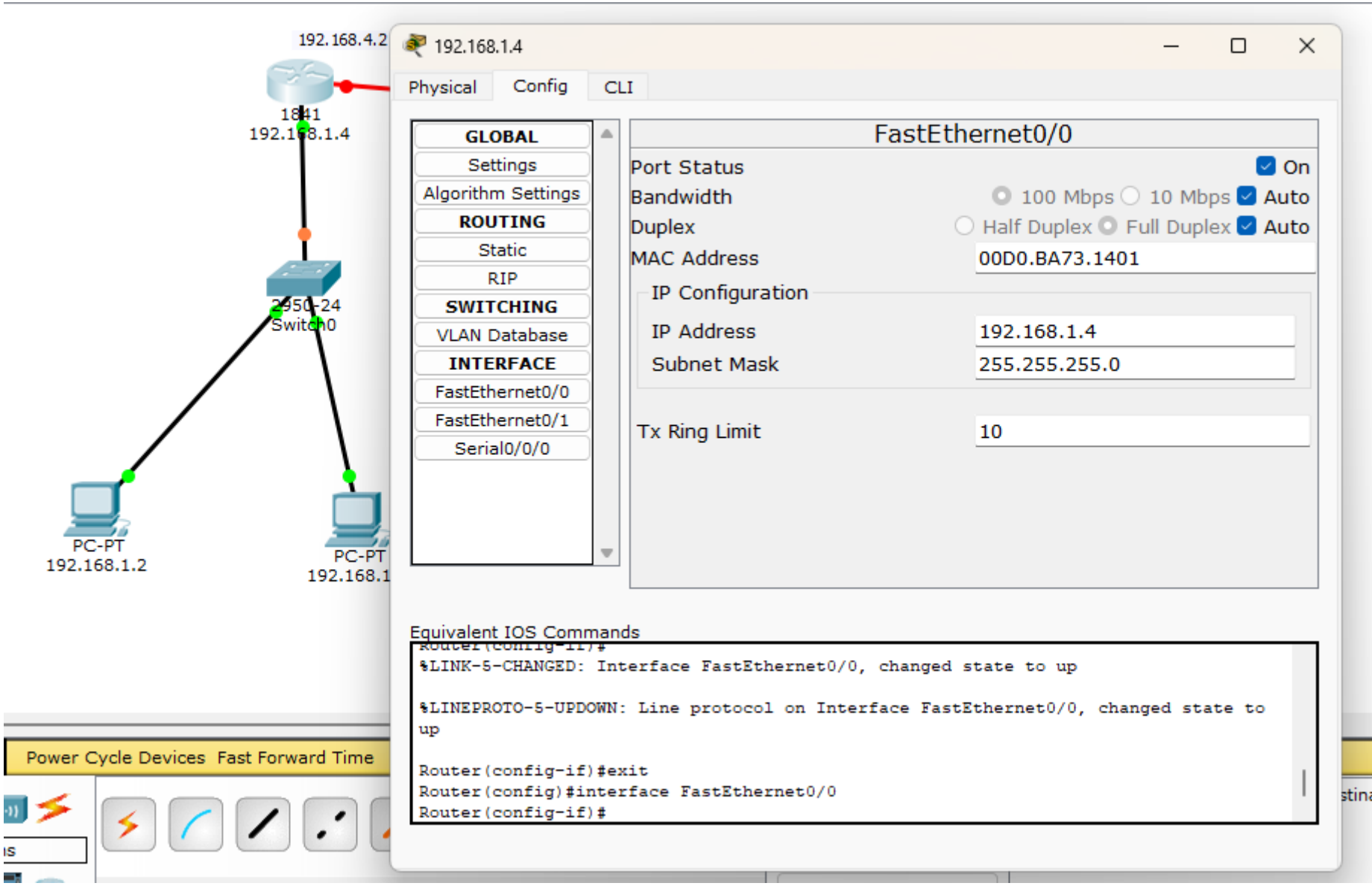
Let us connect all routers.

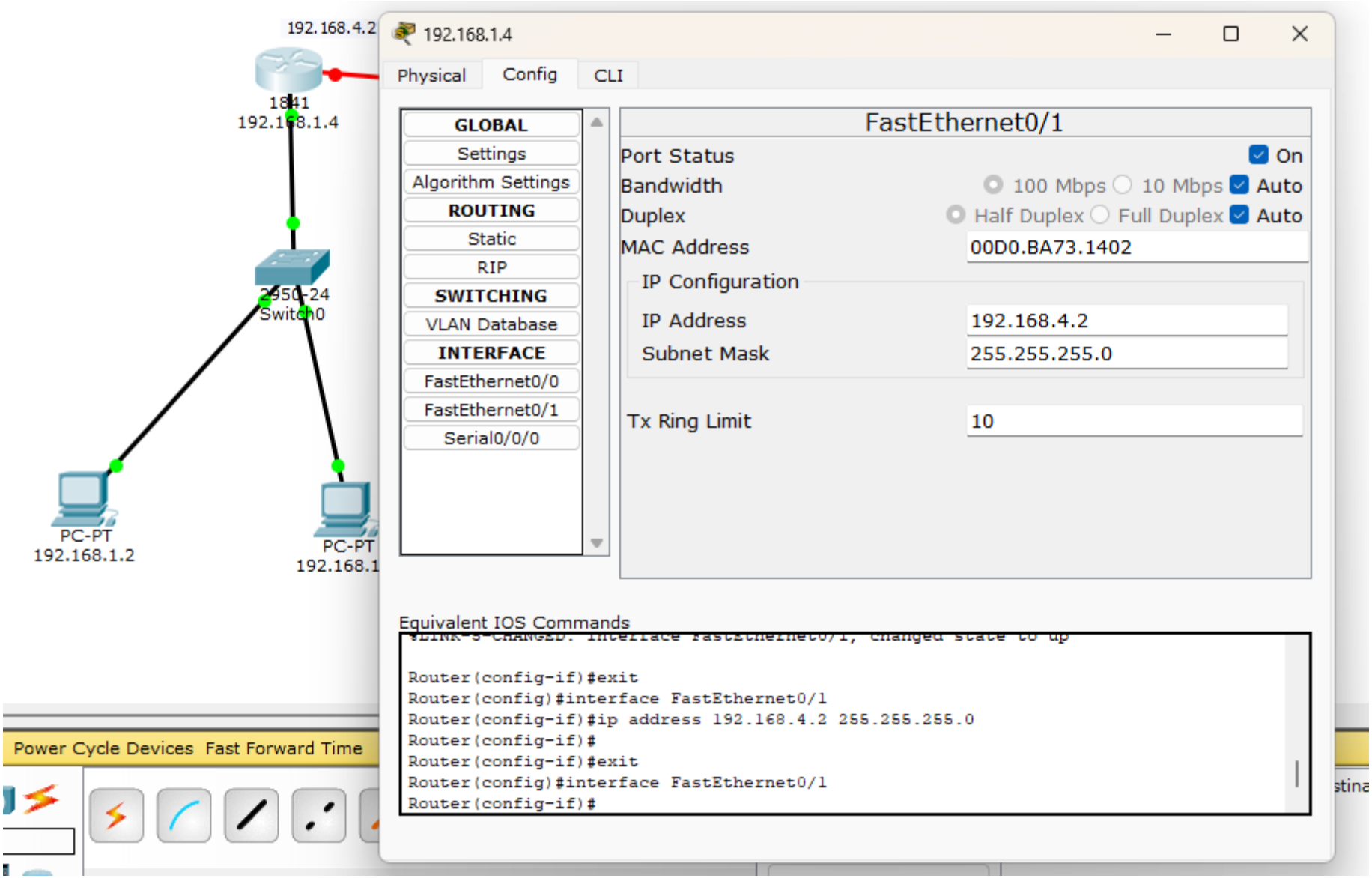

1841
Router3
1841
Router4
1841
Router6
2950-24
Switch0
2950-24
Switch1
2950-24
Switch2
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
PC-PT
PC4
PC-PT
PC5

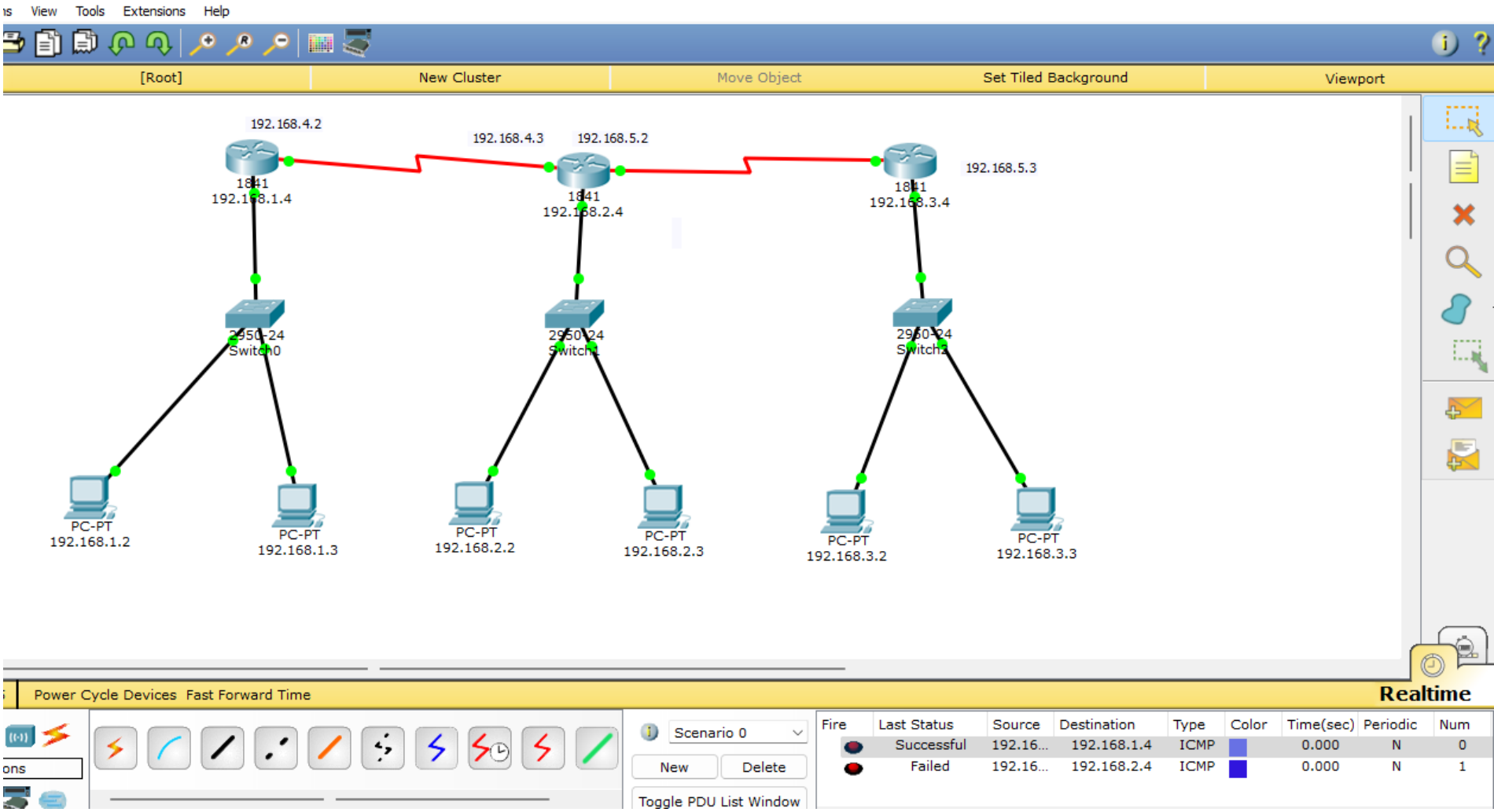
Let us provide IP addresses to each end devices.


192.168.4.2
192.168.4.3
192.168.5.2
192.168.5.3
1841
192.168.1.4
1841
192.168.2.4
1841
192.168.3.4
2950-24
Switch0
2950-24
Switch1
2950-24
Switch2
PC-PT
192.168.1.2
PC-PT
192.168.1.3
PC-PT
192.168.2.2
PC-PT
192.168.2.3
PC-PT
192.168.3.2
PC-PT
192.168.3.3

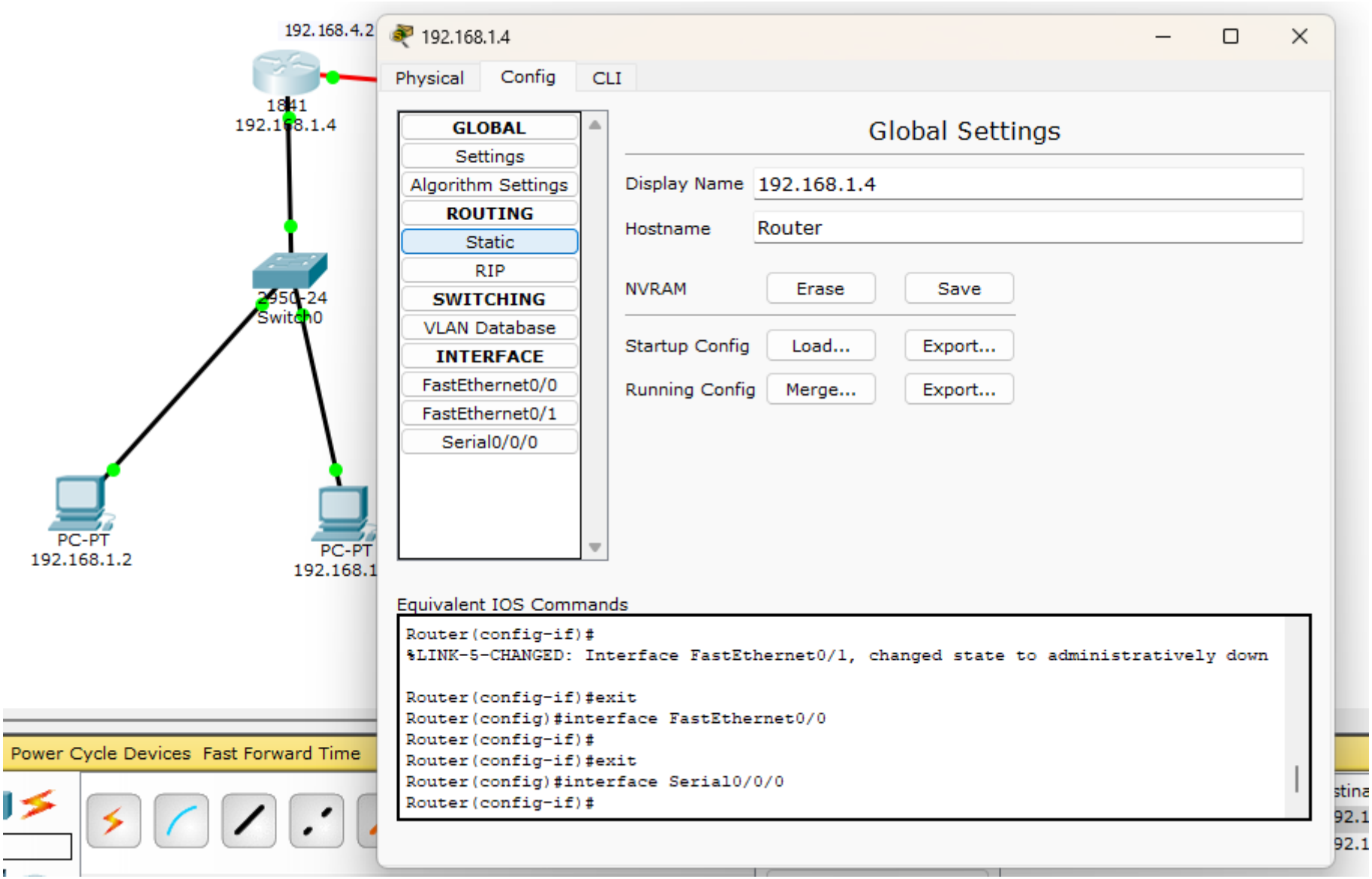

192.168.4.2
1841
192.168.1.4
2950-24
Switch0
PC-PT
192.168.1.2
PC-PT
192.168.1
192.168.1.2
Physical
Config
Desktop
Custom Interface
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
192.168.1.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.4
DNS Server
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::2E0:F9FF:FE63:10C0
IPv6 Gateway
IPv6 DNS Server
Power Cycle Devices
Fast Forward Time

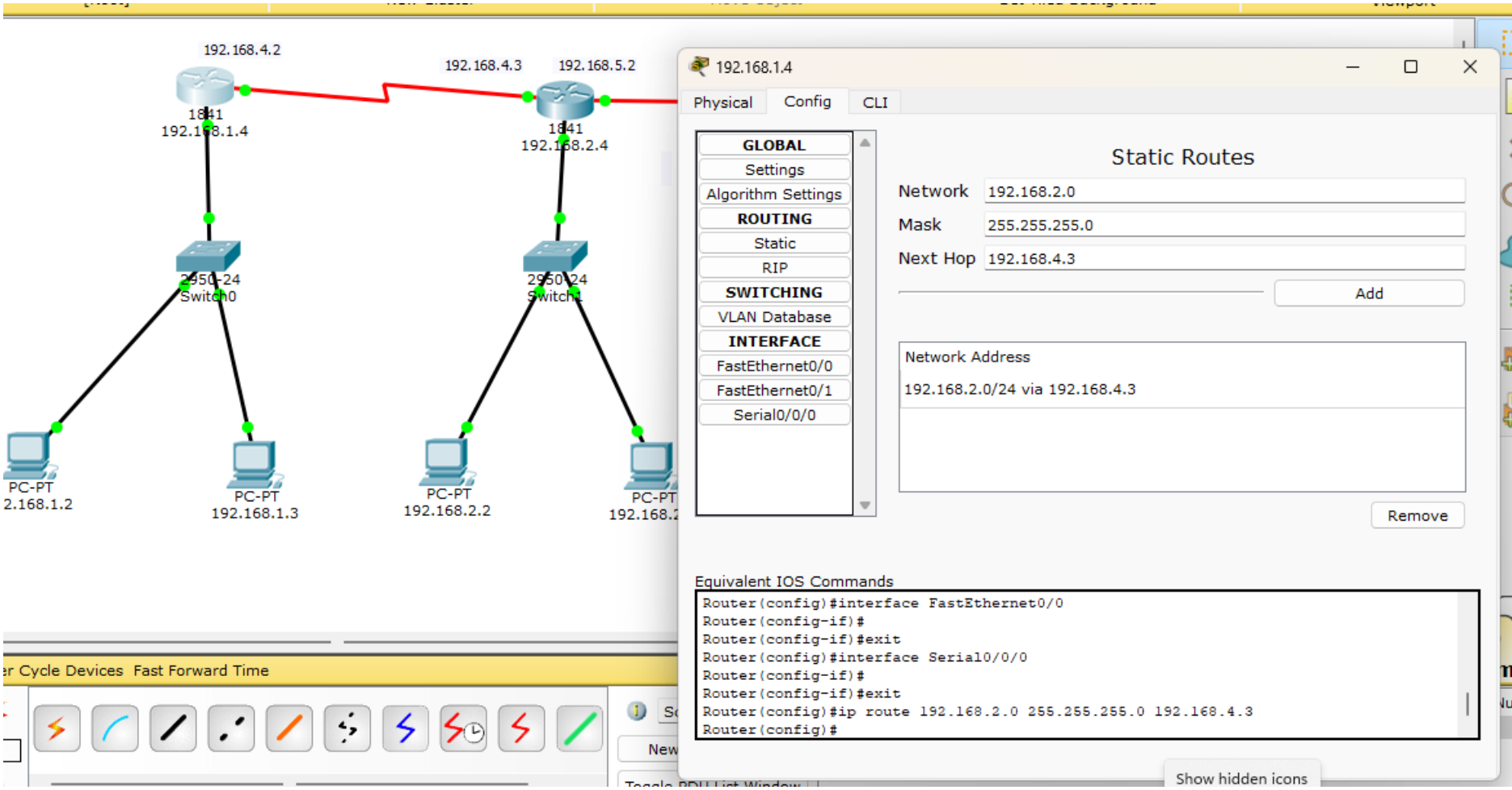

192.168.4.2
1841
192.168.1.4
2950-24
Switch0
PC-PT
192.168.1.2
PC-PT
192.168.1
Power Cycle Devices
Fast Forward Time
192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
00D0.BA73.1401
IP Configuration
IP Address
192.168.1.4
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
%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 FastEthernet0/0
Router(config-if)#

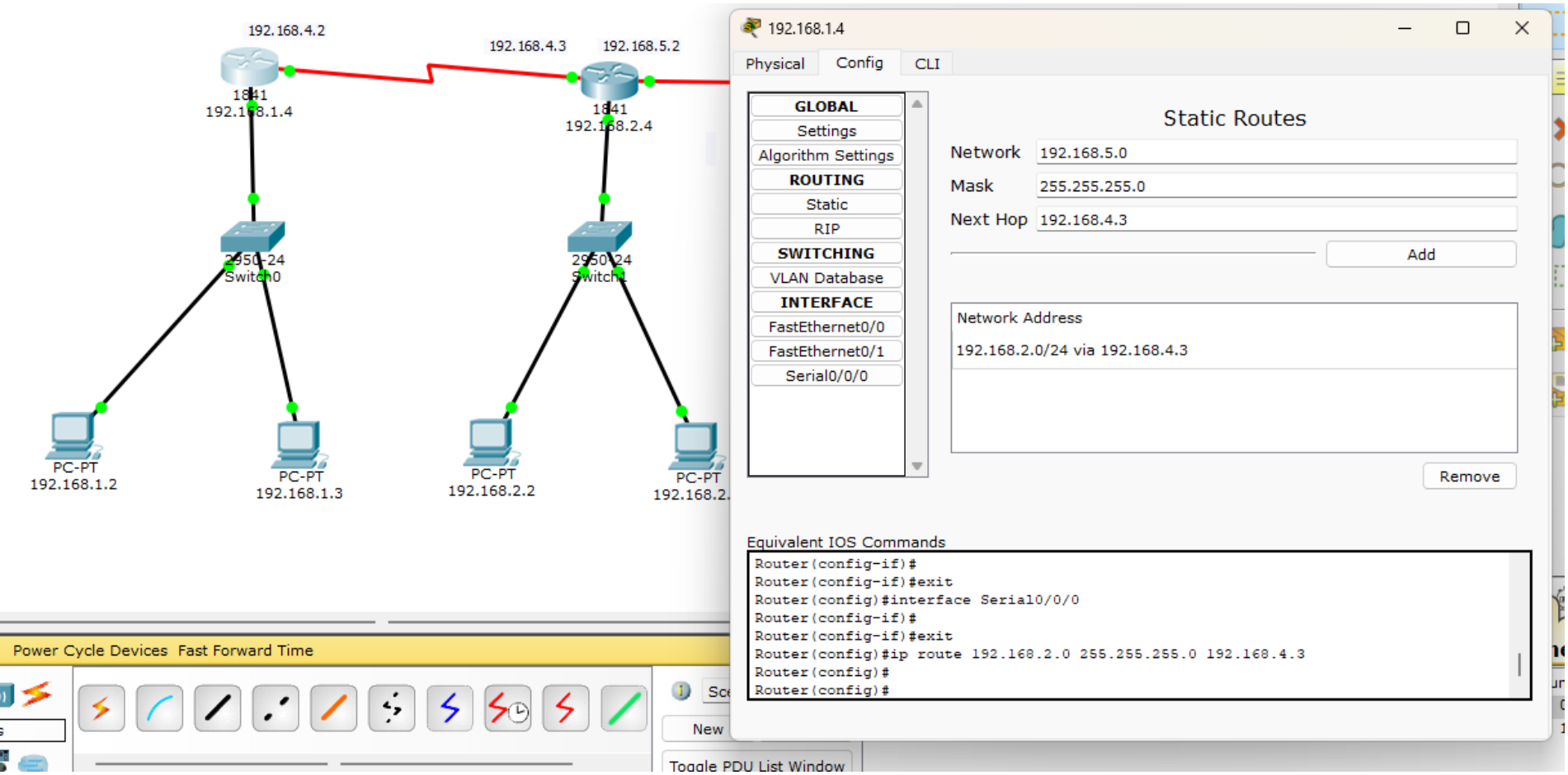

192.168.4.2
1841
192.168.1.4
2950-24
Switch0
PC-PT
192.168.1.2
PC-PT
192.168.1
192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
FastEthernet0/1
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
00D0.BA73.1402
IP Configuration
IP Address
192.168.4.2
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 192.168.4.2 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Power Cycle Devices
Fast Forward Time

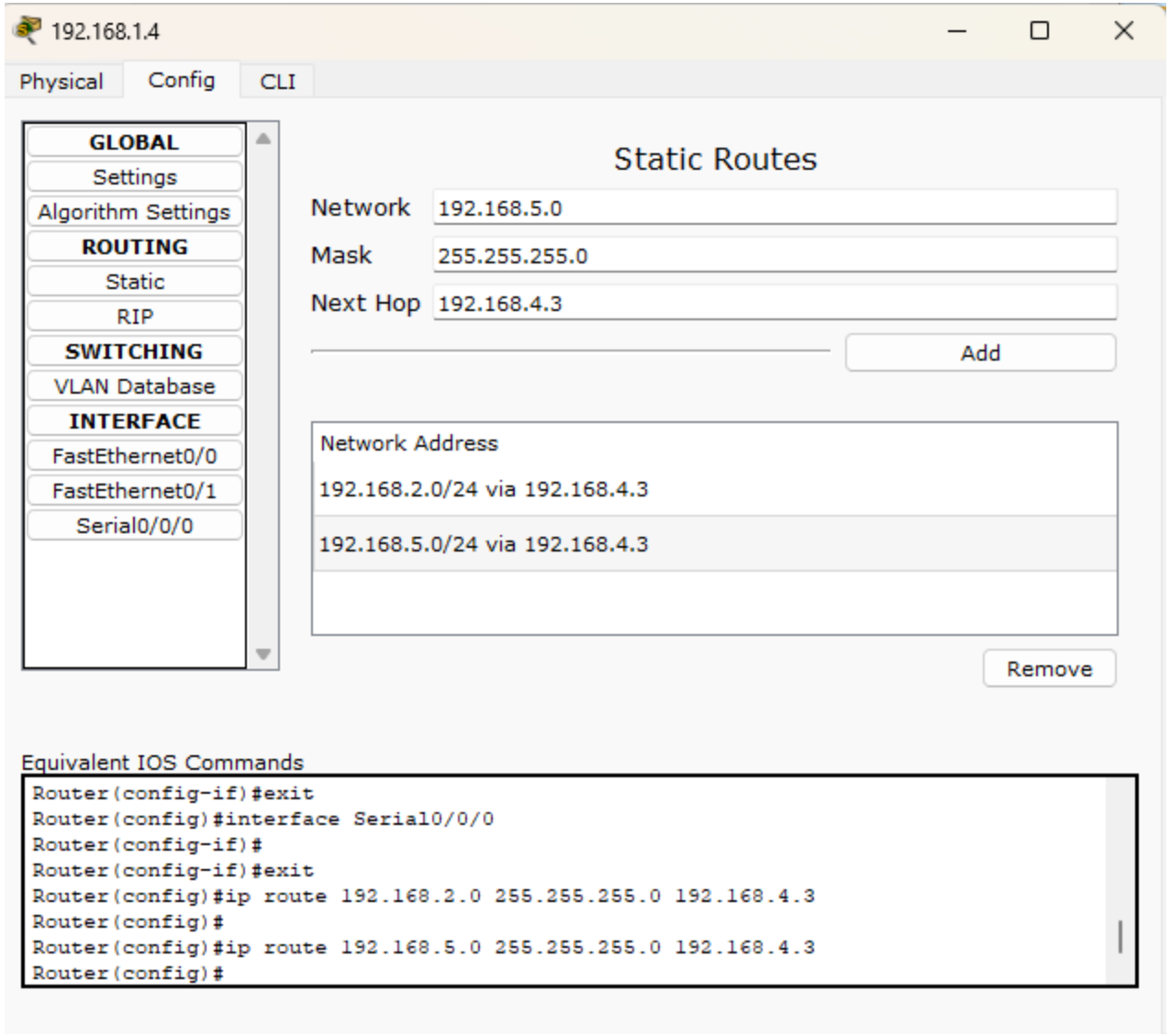


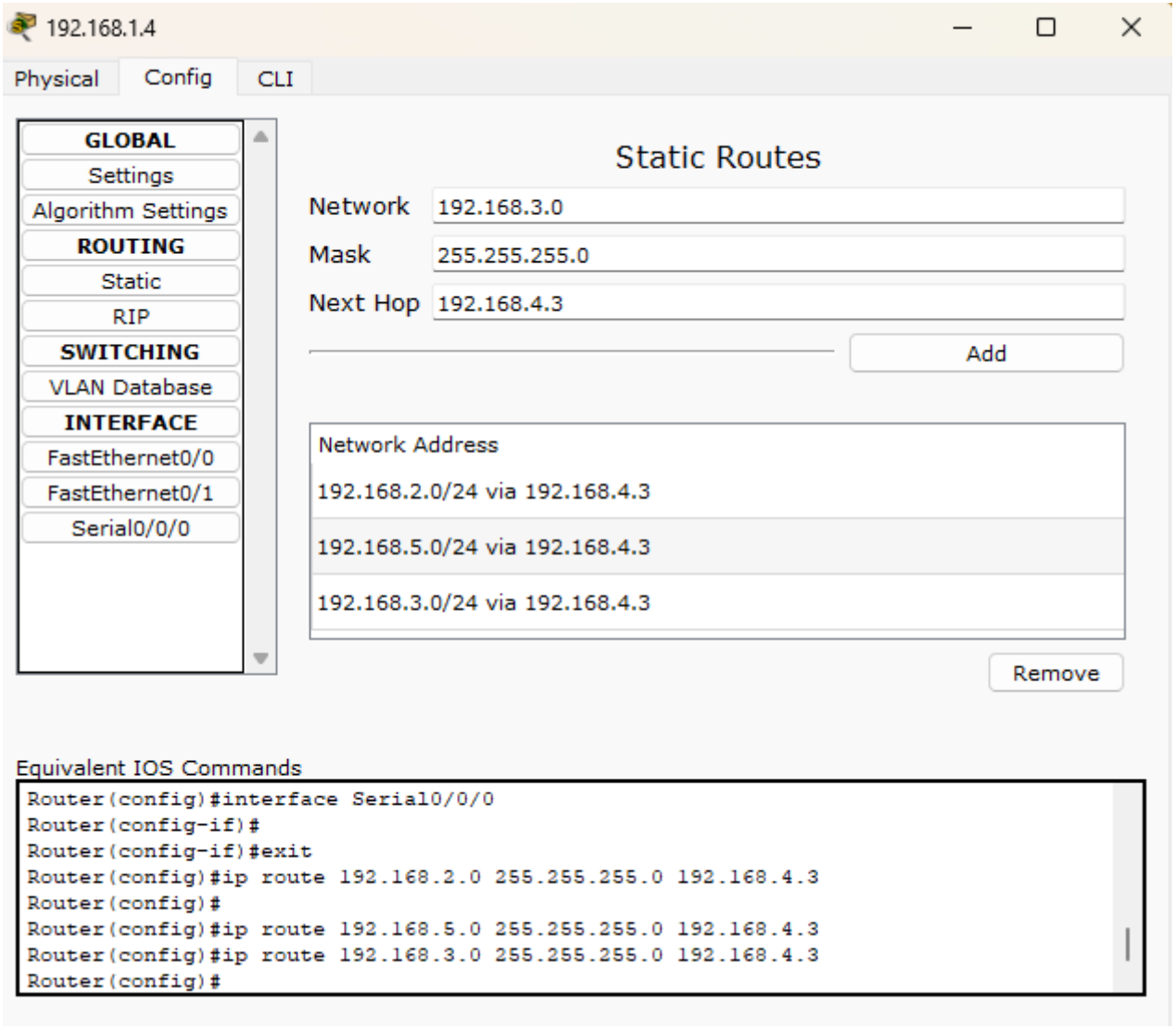
We need to configure router4 for static routing.


192.168.4.2
1841
192.168.1.4
2950-24
Switch0
PC-PT
192.168.1.2
PC-PT
192.168.1
192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Global Settings
Display Name
192.168.1.4
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Merge...
Export...
Equivalent IOS Commands
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Power Cycle Devices
Fast Forward Time

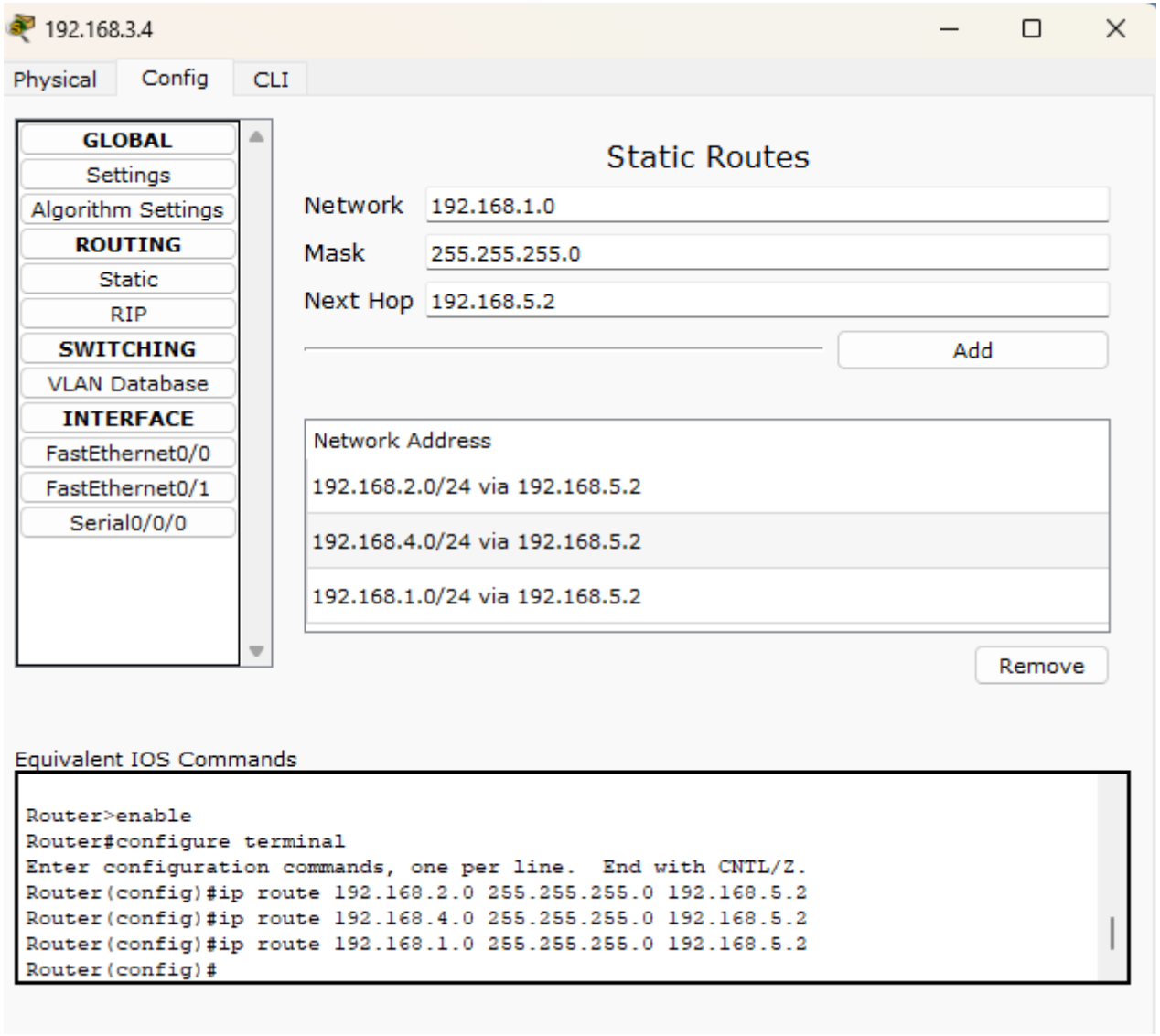

192.168.4.2
192.168.4.3
192.168.5.2
1841
192.168.1.4
1841
192.168.2.4
2950-24
Switch0
2950-24
Switch1
PC-PT
2.168.1.2
PC-PT
192.168.1.3
PC-PT
192.168.2.2
PC-PT
192.168.2
192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Static Routes
Network
192.168.2.0
Mask
255.255.255.0
Next Hop
192.168.4.3
Add
Network Address
192.168.2.0/24 via 192.168.4.3
Remove
Equivalent IOS Commands
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.4.3
Router(config)#
r Cycle Devices Fast Forward Time
Show hidden icons

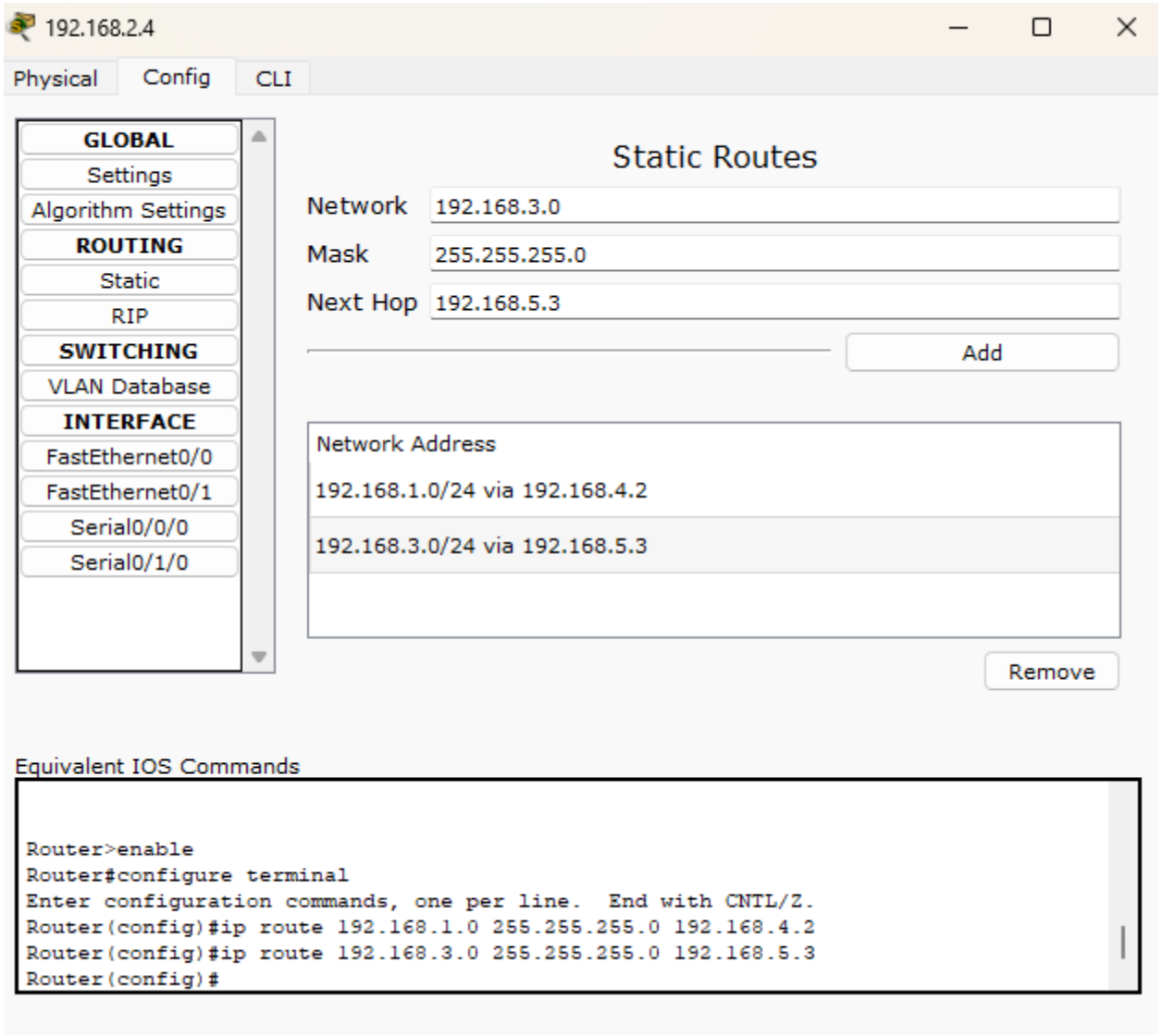

192.168.4.2
192.168.4.3
192.168.5.2
1841
192.168.1.4
1841
192.168.2.4
2950-24
Switch0
2950-24
Switch1
PC-PT
192.168.1.2
PC-PT
192.168.1.3
PC-PT
192.168.2.2
PC-PT
192.168.2.
192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Static Routes
Network
192.168.5.0
Mask
255.255.255.0
Next Hop
192.168.4.3
Add
Network Address
192.168.2.0/24 via 192.168.4.3
Remove
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.4.3
Router(config)#
Router(config)#
Power Cycle Devices
Fast Forward Time
New
Toggle PDU List Window

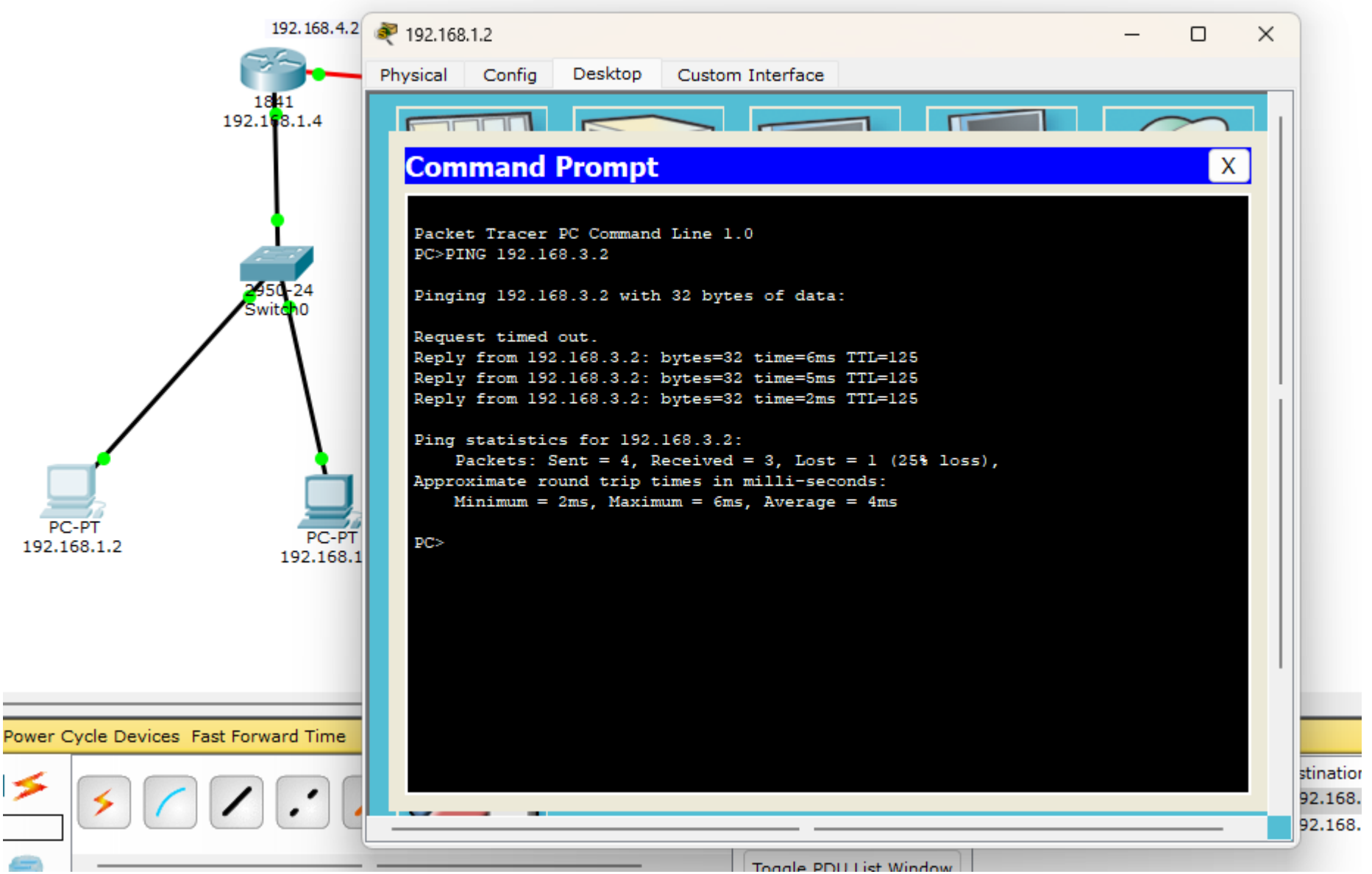

192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Static Routes
Network 192.168.5.0
Mask 255.255.255.0
Next Hop 192.168.4.3
Add
Network Address
192.168.2.0/24 via 192.168.4.3
192.168.5.0/24 via 192.168.4.3
Remove
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.4.3
Router(config)#
Router(config)#ip route 192.168.5.0 255.255.255.0 192.168.4.3
Router(config)#


192.168.1.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Static Routes
Network 192.168.3.0
Mask 255.255.255.0
Next Hop 192.168.4.3
Add
Network Address
192.168.2.0/24 via 192.168.4.3
192.168.5.0/24 via 192.168.4.3
192.168.3.0/24 via 192.168.4.3
Remove
Equivalent IOS Commands
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.4.3
Router(config)#
Router(config)#ip route 192.168.5.0 255.255.255.0 192.168.4.3
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.4.3
Router(config)#

We have to do similar thing for router5 and router6


192.168.3.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Static Routes
Network 192.168.1.0
Mask 255.255.255.0
Next Hop 192.168.5.2
Add
Network Address
192.168.2.0/24 via 192.168.5.2
192.168.4.0/24 via 192.168.5.2
192.168.1.0/24 via 192.168.5.2
Remove
Equivalent IOS Commands
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.5.2
Router(config)#ip route 192.168.4.0 255.255.255.0 192.168.5.2
Router(config)#ip route 192.168.1.0 255.255.255.0 192.168.5.2
Router(config)#


192.168.2.4
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/1/0
Static Routes
Network 192.168.3.0
Mask 255.255.255.0
Next Hop 192.168.5.3
Add
Network Address
192.168.1.0/24 via 192.168.4.2
192.168.3.0/24 via 192.168.5.3
Remove
Equivalent IOS Commands
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.1.0 255.255.255.0 192.168.4.2
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.5.3
Router(config)#


192.168.4.2
1841
192.168.1.4
2950-24
Switch0
PC-PT
192.168.1.2
PC-PT
192.168.1
192.168.1.2
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>PING 192.168.3.2
Pinging 192.168.3.2 with 32 bytes of data:
Request timed out.
Reply from 192.168.3.2: bytes=32 time=6ms TTL=125
Reply from 192.168.3.2: bytes=32 time=5ms TTL=125
Reply from 192.168.3.2: bytes=32 time=2ms TTL=125
Ping statistics for 192.168.3.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 6ms, Average = 4ms
PC>
Power Cycle Devices
Fast Forward Time
Toggle PDU List Window