

PRACTICAL-3

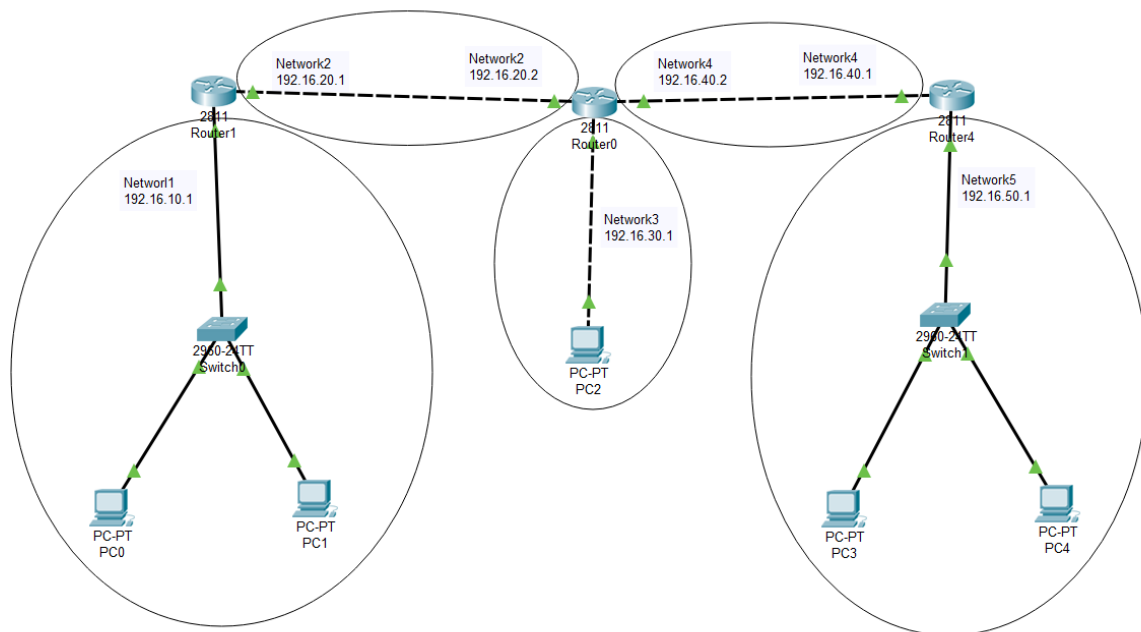
Aim: Demonstrate the static routing configuration between 3 router using Cisco packet tracer.

Theory:

Static Routing:

- Static Routing is a form of routing that occurs when a router uses a manually-configured routing entry.
- Difference between Static and Dynamic routing is that, static routes are fixed and do not change if the network is changed or reconfigured.
- It is used on a router to maximize routing efficiency and to provide backups in the event that dynamic routing information fails to be exchanged.
- Static routing can also be used in stub networks, or to provide a gateway of last resort.

Topology:



(3.1) Topology of Static Routing

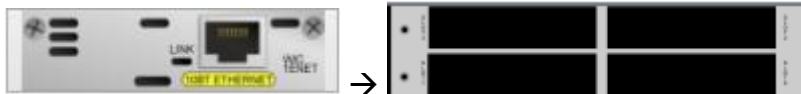
Steps of Configuration:

- First step is to create the topology. For that click on the device and drop on workplace and connect all the devices with the necessary cables.
- In order to connect Router2 to Router0;

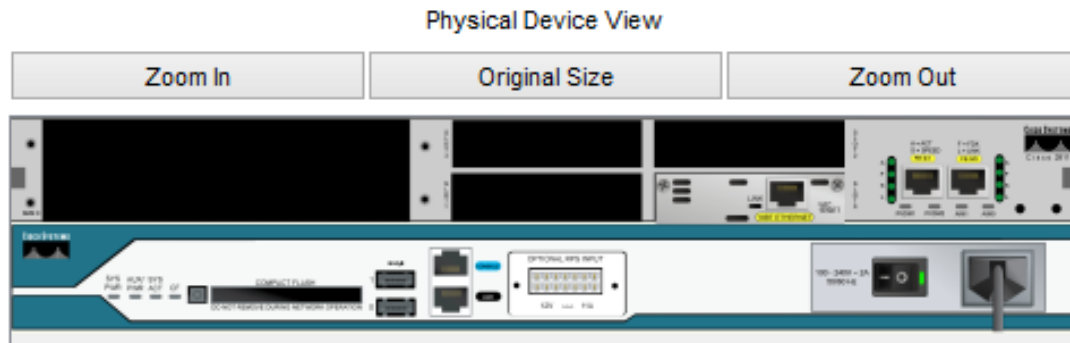
- Click on Router0 and click on Physical Tab in it. Than select WIC-1ENET from vertical scrollbar.
- Switch off the Router0, click on the switch from Physical View Device;



- Put WIC-1ENET to one of the empty ports of Router0;



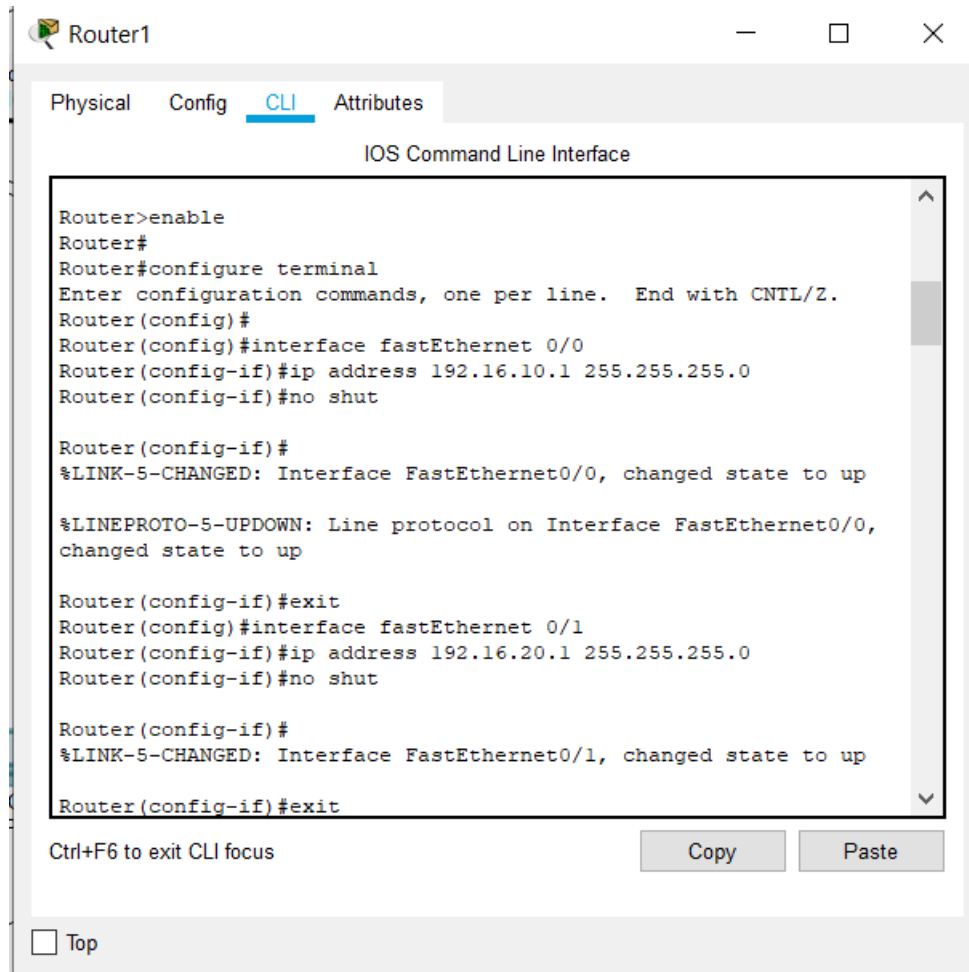
- Now, Switch on the Router0.
- Final view of Router0;



(3.2) Physical Device view of Router0.

- Now, connect Router2 with Router0.
- Provide the IP address and Gateway to Network 1 PCs by clicking on the PC and selecting desktop tab in that IP configuration option;
- PC0 ; IP address : 192.168.10.2
- PC1 ; IP address : 192.168.10.3
- Both; Gateway: 192.168.10.1
- Next step is to configure the Router1 in order to create Static Routing;
- Click on the Router1 and go to CLI tab
- To get into configuration mode, write Router > enable
- To configure the terminal, write Router # configure terminal
- To assign the port to Network 1, write Router(config) # interface fastEthernet 0/0
- To assign IP address to port 0/0, write Router (config-if) # ip address 192.168.10.1 255.255.255.0
- To switch on the router, write Router (config-if) # no shut
- To exit from the interface, write Router (config-if) # exit.
- To assign the port to Network 2, write Router(config) # interface fastEthernet 0/1

- To assign IP address to port 0/1, write Router (config-if) # ip address 192.168.20.1 255.255.255.0
- To switch on the router, write Router (config-if) # no shut
- To exit from the interface, write Router (config-if) # exit.



(3.3) Configure the Router1

- Next step is to configure the Router0 in order to create Static Routing;
- ✓ Click on the Router0 and go to CLI tab
- ✓ To get into configuration mode, write
Router > enable
- ✓ To configure the terminal, write
Router # configure terminal
- ✓ To assign the port to Network 2, write
Router(config) # interface fastEthernet 0/0
- ✓ To assign IP address to port 0/0, write
Router (config-if) # ip address 192.168.20.1 255.255.255.0
- ✓ To switch on the router, write

- Router (config-if) # no shut
- ✓ To exit from the interface, write
Router (config-if) # exit.
- Follow the same steps to configure Router 0's other ports (0/1 and 0/0/0).



The screenshot shows the Router0 CLI interface with the following commands and output:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 192.16.20.1
% Incomplete command.
Router(config-if)#ip address 192.16.20.1 255.255.255.0
Router(config-if)#no shut

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
%IP-4-DUPADDR: Duplicate address 192.16.20.1 on FastEthernet0/0,
sourced by 0040.0B09.3C02
%IP-4-DUPADDR: Duplicate address 192.16.20.1 on FastEthernet0/0,
sourced by 0040.0B09.3C02

Router(config-if)#exit
Router(config)#interface fastEthernet 0/1
Router(config-if)#ip address 192.16.30.1 255.255.255.0
Router(config-if)#no shut

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

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

Router(config-if)#exit
Router(config)#interface fastEthernet 0/2
%Invalid interface type and number
Router(config)#interface ethernet 0/0/0
Router(config-if)#ip address 192.16.40.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Ethernet0/0/0, changed state to up

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

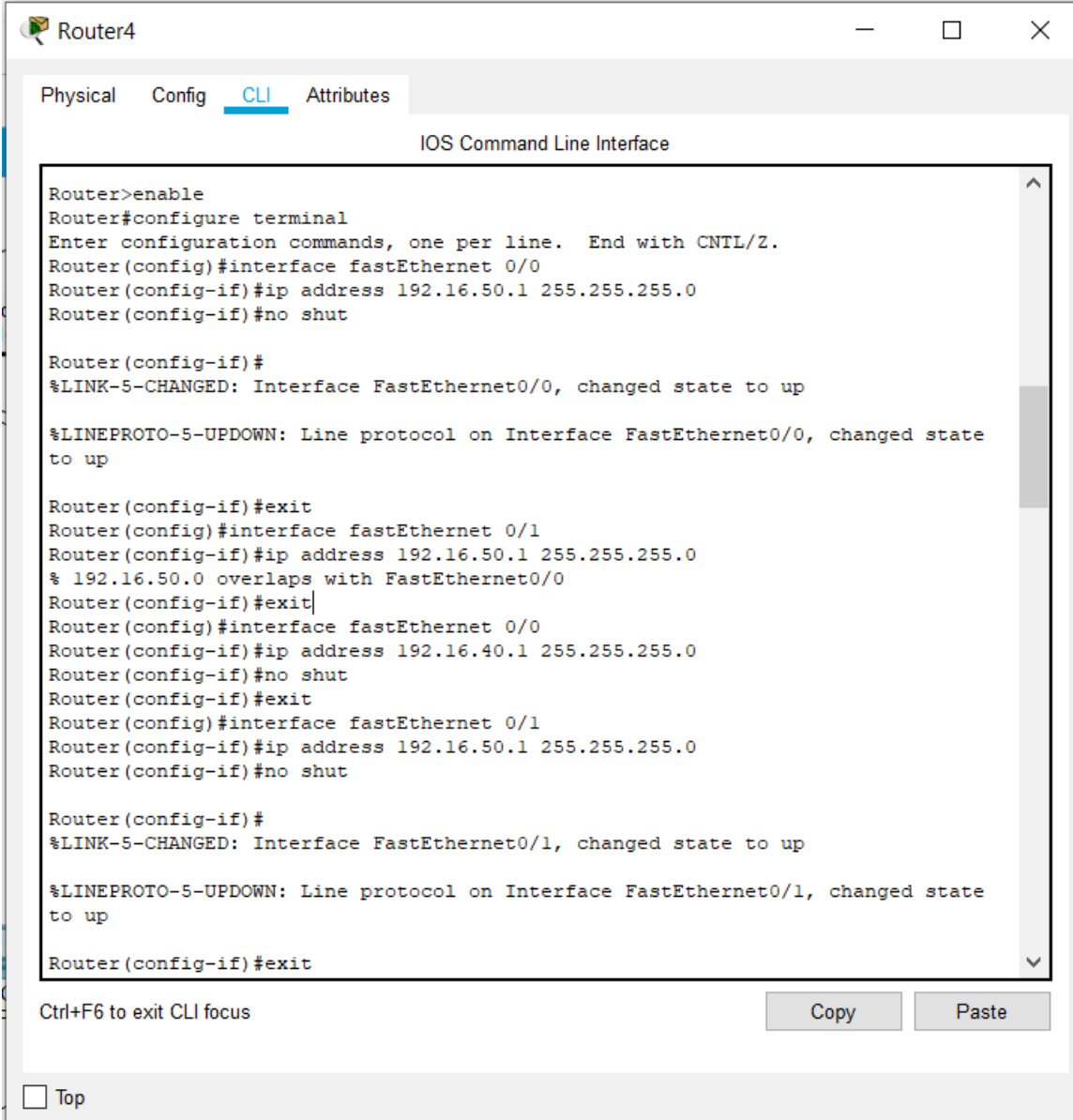
Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

(3.4) Configure the Router0

- Follow the same steps to configure Router 4.



The screenshot shows the CLI window for Router4. The 'CLI' tab is selected. The terminal output shows the following commands and responses:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 192.16.50.1 255.255.255.0
Router(config-if)#no shut

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 fastEthernet 0/1
Router(config-if)#ip address 192.16.50.1 255.255.255.0
% 192.16.50.0 overlaps with FastEthernet0/0
Router(config-if)#exit
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 192.16.40.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#interface fastEthernet 0/1
Router(config-if)#ip address 192.16.50.1 255.255.255.0
Router(config-if)#no shut

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

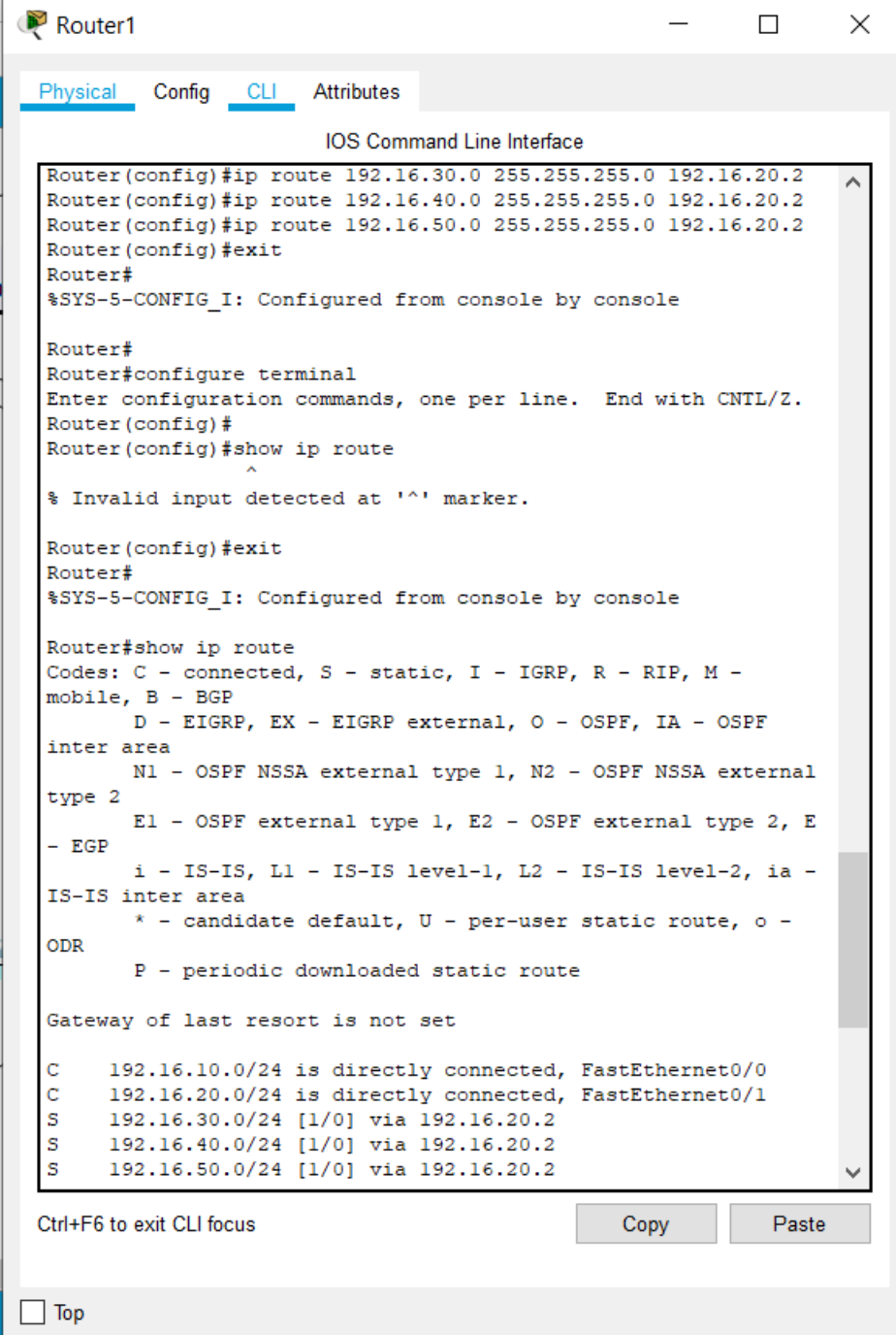
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#exit
```

At the bottom of the window, there is a status bar with the text 'Ctrl+F6 to exit CLI focus' and two buttons: 'Copy' and 'Paste'. A 'Top' button is also visible at the bottom left of the window frame.

- Next step is to provide route to message From Router 1 to other Routers in order to create Static Routing;
- ✓ To provide route to message from Network 1 to Network 3;
Router(config)#ip route 192.168.30.0 255.255.255.0 192.168.20.2
- ✓ To provide route to message from Network 1 to Network 4;

- Router(config)#ip route 192.168.40.0 255.255.255.0 192.168.20.2
- ✓ To provide route to message from Network 1 to Network 5;
- Router(config)#ip route 192.168.50.0 255.255.255.0 192.168.20.2



The screenshot shows a Cisco Router CLI window titled "Router1". The "CLI" tab is selected. The command history shows the following sequence of commands and outputs:

```

Router(config)#ip route 192.16.30.0 255.255.255.0 192.16.20.2
Router(config)#ip route 192.16.40.0 255.255.255.0 192.16.20.2
Router(config)#ip route 192.16.50.0 255.255.255.0 192.16.20.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#show ip route
^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M -
mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF
inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E
- EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia -
IS-IS inter area
        * - candidate default, U - per-user static route, o -
ODR
        P - periodic downloaded static route

Gateway of last resort is not set

C    192.16.10.0/24 is directly connected, FastEthernet0/0
C    192.16.20.0/24 is directly connected, FastEthernet0/1
S    192.16.30.0/24 [1/0] via 192.16.20.2
S    192.16.40.0/24 [1/0] via 192.16.20.2
S    192.16.50.0/24 [1/0] via 192.16.20.2
  
```

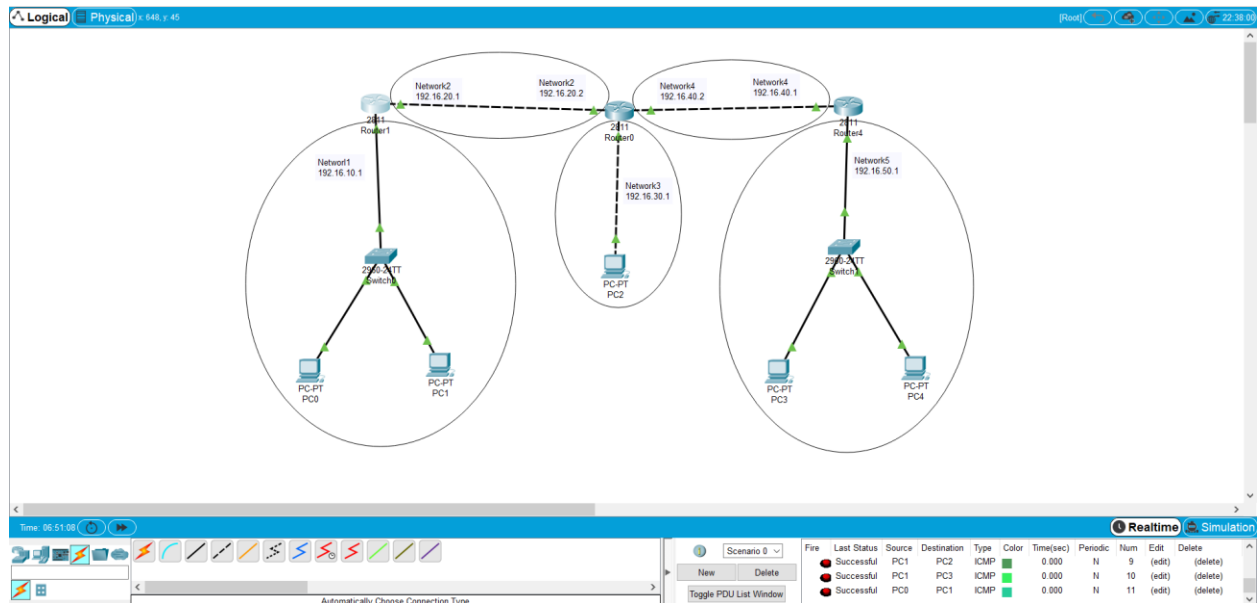
At the bottom of the window, there is a "Ctrl+F6 to exit CLI focus" message and "Copy" and "Paste" buttons. A "Top" button is also visible at the bottom left.

(3.5) Connection b/w Router 1 to Other Routers

- Follow the same steps to provide route to message From Router 0 and Router 4 to other Routers in order to create Static Routing.

Check Network Topology:

- To check the topology is working or not drop a package on the one PC of Network 1 and try to receive it by the PC of Network 3.
- Now drop the package on PC of Network 3 and try to receive it by the PC of Network 5.



(3.6) Successful Message Passed

Conclusion:

From this practical, I have learnt about the configuration of Static Routing and what are the advantages and disadvantage of it by doing live configuration of it in Cisco Packet Tracer.