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U N I V E R S I T Y
Maximising Human Potential

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Assignment No	Four

Assignment Number - 04

Title : Configuration of router by using router commands and implementation of static routing

Problem Statement Using a Network Simulator (e.g. packet tracer) Configure routers for static routing

Theory :

Router – Router is a network device that allows you to direct data traffic to an appropriate destination. Router maintain routing table that contain IP addresses of computers over the network. A router has different components that enable proper functioning.

**Cisco IOS supports various command modes, among those followings are the main command modes.**

• User EXEC Mode

• Privileged EXEC Mode

• Global Configuration Mode

• Interface Configuration Mode

• Sub Interface Configuration Mode

• Setup Mode

Mode	Prompt	Command to enter	Command to exit
User EXEC	Router >	Default mode after booting. Login	Use **exit** command
Privileged EXEC	Router #	Use **enable** command from user exec mode	Use **exit** command
Global Configuration	Router(config)#	Use **configure terminal** command	Use **exit** command
Interface Configuration	Router(config-if)#	Use **interface type** *number* command from global configuration mode	Use **exit** command to return in global configuration
Sub-Interface Configuration	Router(config-subif)	Use **interface type** *sub interface number*command from global configuration mode or interface configure mode	Use **exit** to return previous mode. Use **end** command to return in privileged

Some important router Command

Command	Description
Router(config)#interface serial 0/0/0	Enter into serial interface 0/0/0
Router(config- Connecte to interface	Optional command. It set description on interface that is locally significant
Router(config-if)#ip address 10.0.0.1 255.0.0.0	Assigns address and subnet mask to
Router(config-if)#clock rate 64000	DCE side only command. Assigns a clock
Router(config-if)#bandwidth 64	DCE side only command. Set bandwidth for
Router(config-if)#no shutdown	Turns interface on

Configuration of static Routing
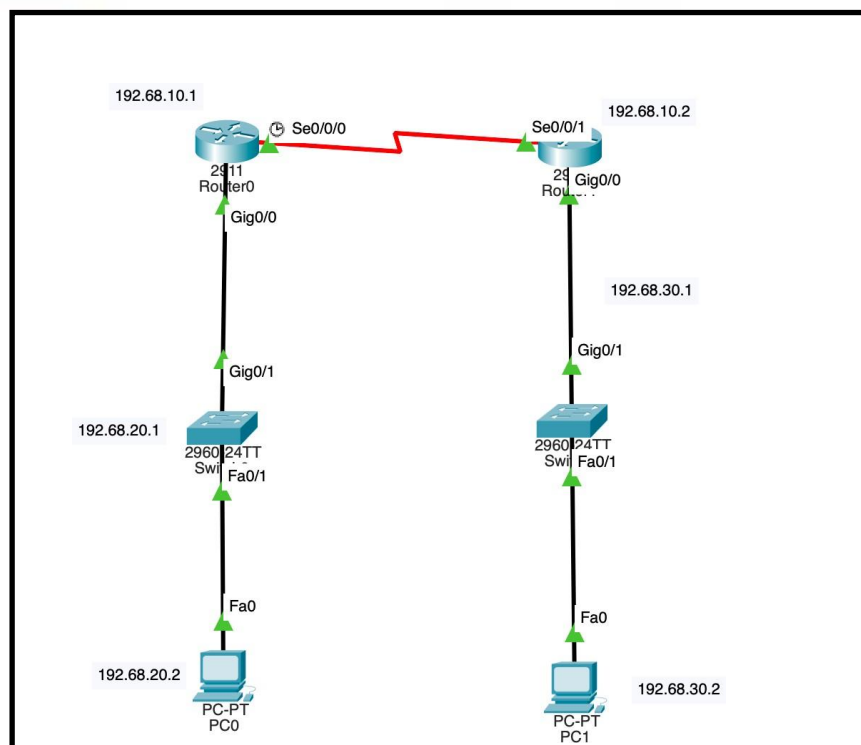
Code

Basic Router Configuration – Static Routing

Router0 Configuration

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 0/0/0
Router(config-if)#clock rate 64000
Router(config-if)#ip address 192.68.10.1 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#interface gigabitethernet 0/0
Router(config-if)#ip address 192.68.20.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial 0/0/0
Router(config-if)#clock rate 64000
Router(config-if)#ip address 192.68.10.1 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#interface gigabitethernet 0/0
Router(config-if)#ip address 192.68.20.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
copy running-config startup-config
                     ^
% Invalid input detected at '^' marker.

Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
```

Router1 Configuration

Router>enable

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface serial 0/0/1

Router(config-if)#ip address 192.68.10.2 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#exit

Router(config)#interface gigabitethernet 0/0

Router(config-if)#ip address 192.68.30.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#exit

Router(config)#exit

Router#

%SYS-5-CONFIG_I: Configured from console by console

copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

Router#

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial 0/0/1
Router(config-if)#ip address 192.68.10.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface gigabitethernet 0/0
Router(config-if)#ip address 192.68.30.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#copy running-config startup-config
                  ^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
```

Conclusion : In conclusion, configuring static routing with two routers in a computer network provides a fundamental understanding of routing mechanisms. Through this setup, we were able to manually define routes between different network segments, ensuring proper communication across the routers. Static routing, while simple and reliable in small-scale networks, has limitations in scalability and adaptability to network changes. This exercise helped solidify concepts such as routing tables, next-hop addresses, and the flow of packets between routers. However, for larger and more dynamic networks, dynamic routing protocols would offer greater flexibility and efficiency.