Lab 3

Title: Static and Dynamic Routing

Objective:

a) To understand the concept of static routing and dynamic routing.

b) To understand different routing parameters and protocols.

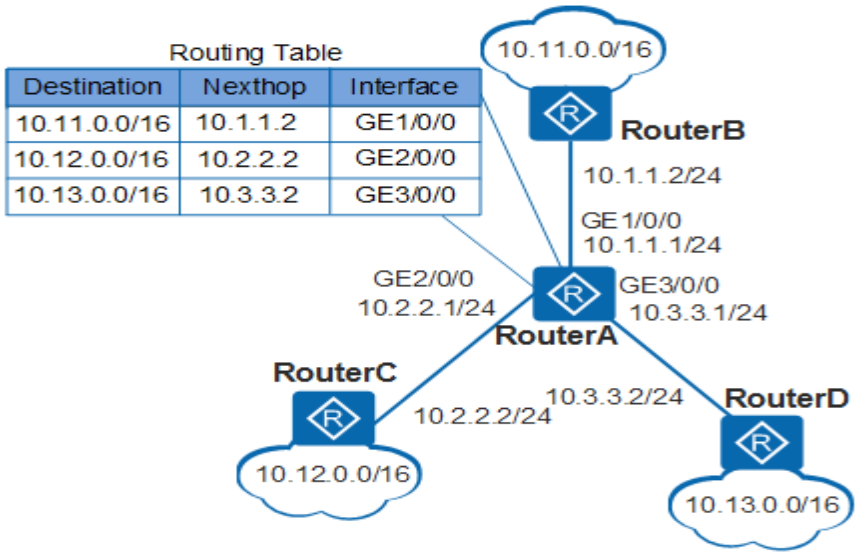
Software requirements

SN	Software	Specification
1.	Cisco Packet Tracer	Version above 7.0
2.	Windows OS	Windows 10

Related theory

When a device has multiple paths to reach a destination, it always selects one path by preferring it over others. This selection process is termed as Routing. Routing is done by special network devices called routers. So for a packet to be forwarded to the destination needs to be transmitted from multiple routers using some routing algorithm. The selection of best path is done by considering certain factors such as no. of hops, delay, bandwidth etc.

To forward incoming data packets, a router learns all available routes in the network and stores them in a table known as the ***routing table*.**



There are two types of routes: static route and dynamic route. A router can learn these routes through two types of routing: static routing and dynamic routing.

Static Routing – This is the method by which an administrator manually adds routes to the routing table of a router. i.e. routing tables are not automatically updated but are updated manually. This is a method for small networks but it is not scalable for larger networks.

Dynamic routing – is when protocols, called routing protocols, are used to build the routing tables across the network. Using a routing protocol is easier than static routing, **but it is more expensive in terms of CPU and bandwidth usage**. Every routing protocol defines its own rules for communication between routers and selecting the best route.

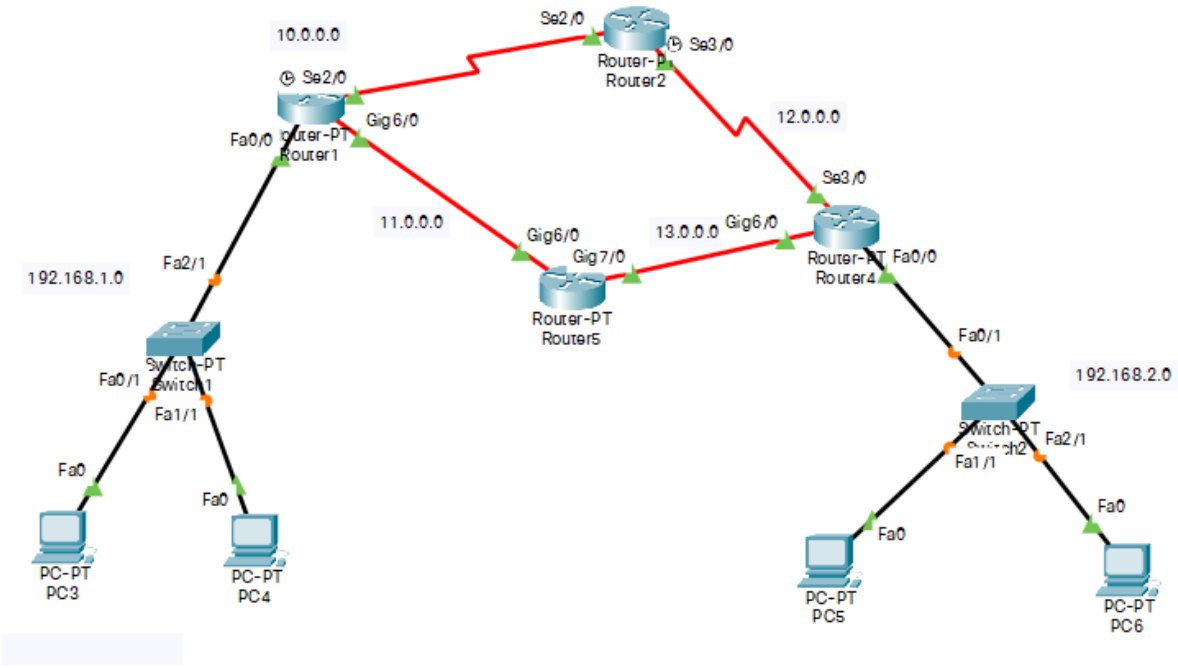
Procedure For Static Routing

1. Click on the router you want to do static routing on.
2. Go to configuration.
3. Click on Static.
4. Provide appropriate network address, subnet mask and next hop.
5. Repeat this process for all the routers.

Procedure For Dynamic Routing

1. Click on the router you want to do static routing on.
2. Go to configuration.
3. Click on RIP.
4. Provide appropriate network addresses.
5. Repeat this process for all the routers.

Observation:



Commands used:-

Configuring DHCP Router(config-if)#ip dhcp pool net

Router(dhcp-config)#network 192.168.1.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.1.1

// Exclude IP

Router(config)#ip dhcp excluded-address 192.168.1.4 192.168.1.10

// Remove DHCP Router(config)#no ip dhcp pool net

Static Routing

R1# show running-config => Show all of the set configuration

R1#show ip route => To show routing table

R1(config)#ip route 192.168.2.0 255.255.255.0 10.0.0.2 => Add to the routine table

Dynamic Routing

Router(config)#router rip

In PC terminal

C:\>tracert 192.168.2.2 => Shows the path removing RIP

Router(config)#no router rip

Router(config-router)#network 192.168.1.0 0.0.0.255 area 0

Router(config)#router bgp 100 => for bgp

For EIGRP,

Router(Config)#router EIGRP 10
Router(config-router)#network 10.0.0.0

Conclusion:

Hence, Static and dynamic routing was obtained.