

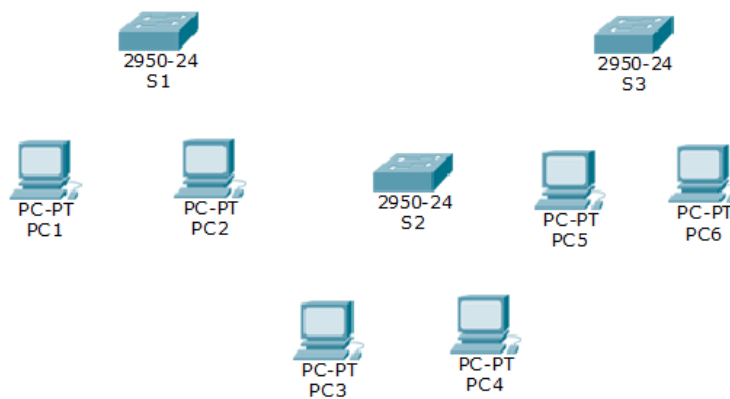
Static and Dynamic Routing using Packet Tracer

For this lab, first read Chapter 1 to Chapter 6 of 'Packet Tracer Network Simulator' by Jesin A and perform/practice given examples in Packet tracer. The Pdf is attached with this email.

Lab Activity

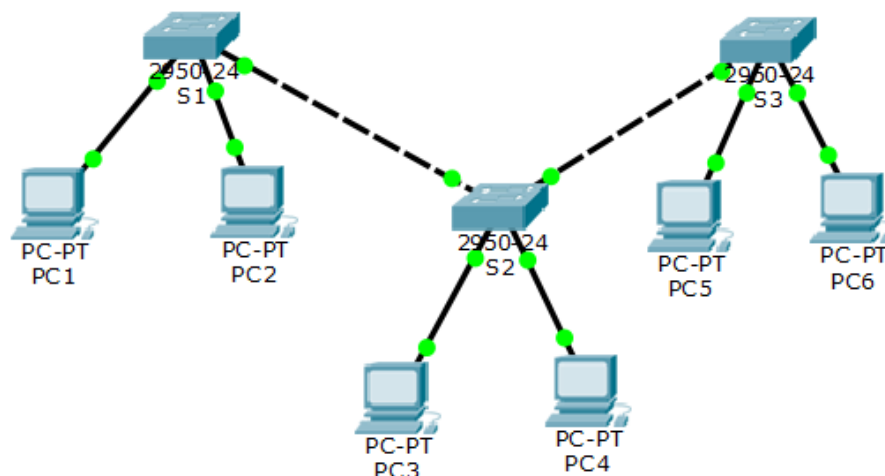
In this Lab, you will see how routing is done in CISCO routers using packet tracer.

Please choose following devices for this lab activity. You can also rename your devices to S1, PC1 as being done in this figure.



A) Building LANs

Connect these 3 switches and 6 computers on the panel as shown below:



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PC Connections

Make the following connections using copper straight-through cables.

- Connect **PC1** with **f0/1** of **SW1** and **PC2** with port **f0/2** of **SW1**
- Connect **PC3** with port **f0/1** of **SW2** and **PC4** with port **f0/2** of **SW2**
- Connect **PC5** with port **f0/1** of **SW3** and **PC6** with port **f0/2** of **SW3**

Switch Connections

Make the following connections using copper cross-over cables.

- Connect port **f0/6** of **SW1** and port **f0/6** of **SW2**
- Connect port **f0/7** of **SW2** and port **f0/7** of **SW3**

IP Assignment

- Assign IP 192.168.x.1 to **PC1** and 192.168.x.2 to **PC2**
- Assign IP 192.168.y.1 to **PC3** and 192.168.y.2 to **PC4**
- Assign IP 192.168.z.1 to **PC5** and 192.168.z.2 to **PC6**

Here x, y, and z will be derived from your roll nos.

x = Your roll no.

y = 255 - Your roll no.

z = |128 - Your roll no.| (Take modulus of the result so that Z is a positive value)

For example, for roll no. 2012-EE-240, x = 240, y = 15, z = 112 and for roll no. 2012-EE-10, x = 10, y=245, z = 118

If any two of your x, y or z values come out to be same, add one in the later one so that no two subnets have the same prefix.

Now answer the following questions:

1) Will PC1 be able to ping PC2? If no, why not?

2) Will PC1 be able to ping PC3? If no, why not?

3) Add simple PDU to check the connectivity to PC2, PC4, and PC6 from PC1. Also check the connectivity using the command line interface. Ping PC2, PC4, and PC6 from PC1, take screenshots of the command prompt, and write your observations.

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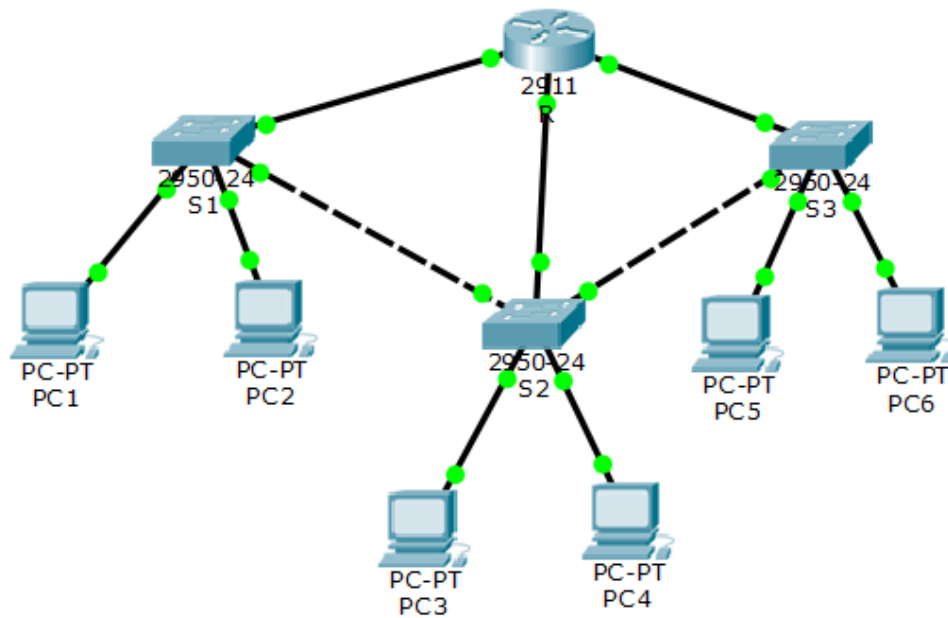
B) Connecting multiple networks

Now change your topology as shown below in the figure:

Configure IP 192.168.x.100 on **g0/0** of router **R1**

Configure IP 192.168.y.100 on **g0/1** of router **R1**

Configure IP 192.168.z.100 on **g0/2** of router **R1**



Add simple PDU to check connectivity from **PC1** to **PC2**, **PC1** to **PC4** and **PC1** to **PC6**. Moreover, use CLI to ping PC2, PC4, and PC6 from PC1. Take screenshots of the command prompt.

4) Is PC2 accessible? If no, why not?

5) Is PC4 accessible? If no, why not?

6) Is PC6 accessible? If no, why not?

C) Adding Default Gateway

Add **default gateway** for all three networks on respective PCs.

Hint: Default gateway address of these networks will be the IP Address of the respective interfaces of the router.

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Add simple PDU to check connectivity from **PC1** to **PC2**, **PC1** to **PC4** and **PC1** to **PC6**. Moreover, use CLI to ping PC2, PC4, and PC6 from PC1. Add screenshots of the command prompt.

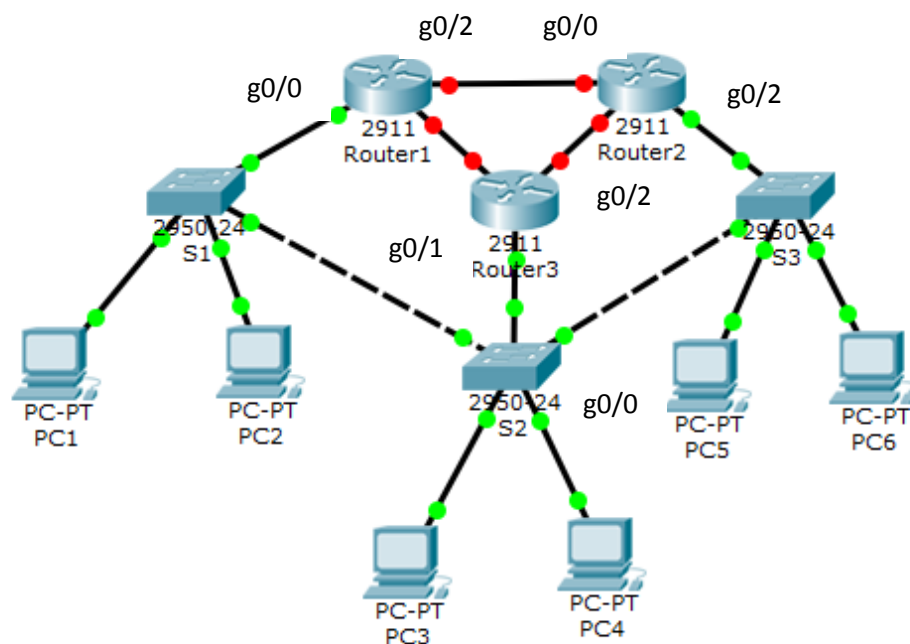
7) Is PC2 accessible? If no, why not?

8) Is PC4 accessible? If no, why not?

9) Is PC6 accessible? If no, why not?

D) Adding Multiple Routers

Add two more routers as shown in the figure below: (All interfaces are not labeled here)



Do the following:

- Configure IP Addresses on PCs along with their respective default gateways
- Configure IP Addresses on router interfaces as follows:

Configure IP 192.168.x.100/24 on g0/0 of router Router1

Configure IP 10.y.0.2/30 on g0/1 of router Router1

Configure IP 10.x.0.1/30 on g0/2 of router Router1

Configure IP 10.x.0.2/30 on g0/0 of router Router2

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Configure IP 10.z.0.2/30 on g0/1 of router Router2

Configure IP 192.168.z.100/24 on g0/2 of router Router2

Configure IP 10.y.0.1/30 on g0/0 of router Router3

Configure IP 192.168.y.100/24 on g0/1 of router Router3

Configure IP 10.z.0.1/30 on g0/2 of router Router3

- Configure static routes on all three routers so that PCs of one switch may be able to ping to the PCs of other switch. On each router, you will have to add two static routes for other two networks. (Chapter 6 of PDF)

- Add simple PDU or ping different PCs to check connectivity.

If you have been successful in making all PCs to communicate with one another, attempt the following parts:

10) Go to router R1 and run command ***show ip route*** and take a screenshot of its result

11) Go to router R1 and run command ***show ip int bri*** and take a screenshot of its result

12) Go to router R2 and run command ***show ip route*** and take a screenshot of its result

13) Go to router R2 and run command ***show ip int bri*** and take a screenshot of its result

14) Go to router R3 and run command ***show ip route*** and take a screenshot of its result

15) Go to router R3 and run command ***show ip int bri*** and take a screenshot of its result

- For the same network, configure dynamic routing now (Chapter 6 of PDF) and repeat questions **11, 13, and 15** after successfully making all PCs communicate with one another. In your report, mark these parts as **16, 17, and 18**.

19) What have you understood from static routing and dynamic routing? Which one is suitable for small number of networks and why? Which one is suitable in Large number of networks and why?