PACKET TRACER

Lab 3

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CONSTRUCTION OF A LAN

- Needed: a computer, a 2960 switch, a server.
- Connection: attach a copper straight-through cable to the computers' FastEthernet 0 and connect it to the first FastEthernet port of the switch. Connect the server's FastEthernet 0 port with the next available port of the switch.
- Now make them communicate. How? Give them some IP addresses!

SERVER IP CONFIGURATION
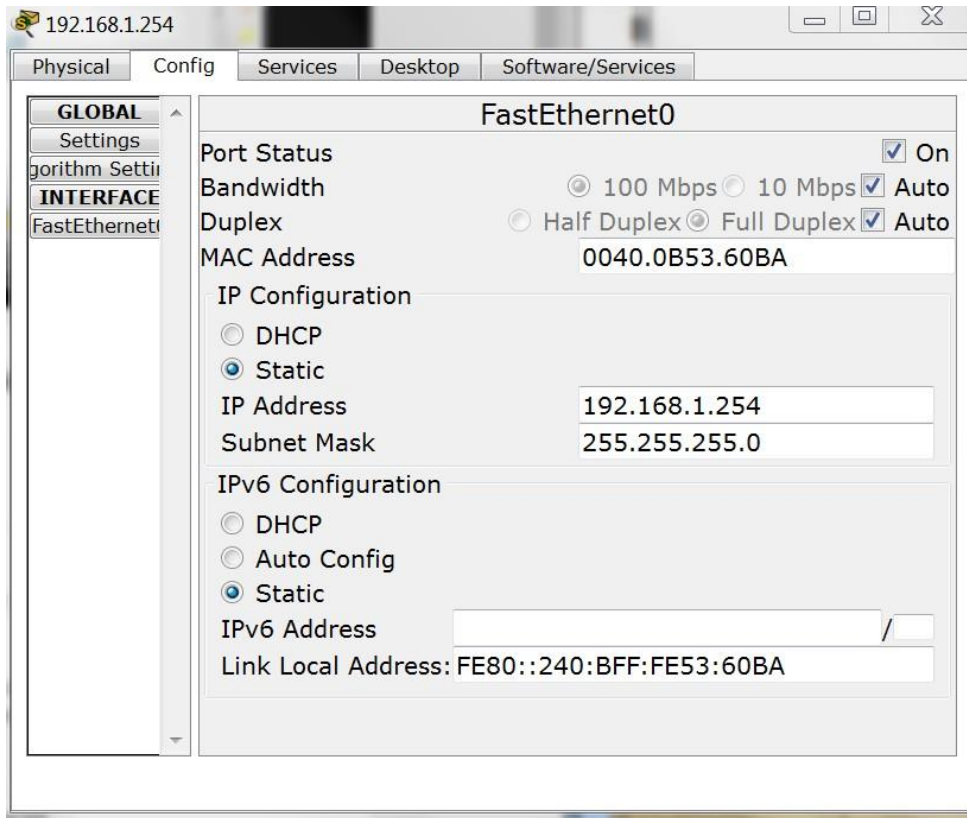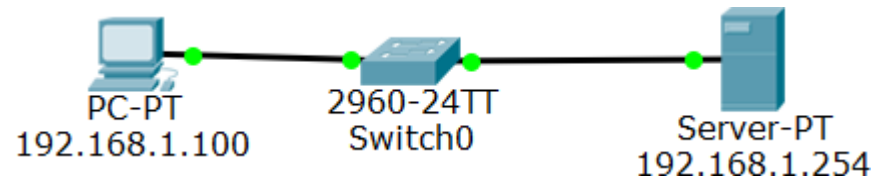
The server is configured as on the left hand side figure. The address is automatically associated a /24 network mask.

COMPUTER IP CONFIGURATION

CHECKING THE CONNECTIVITY

- Go to the computer and click on it.
- Select the Desktop tab and click on Command Prompt.
- Write the following command: "ping 192.168.1.254".

FTP (FILE TRANSFER PROTOCOL) SERVER

- Go to the Services tab, select FTP and create a new user having the username and password student, with the permissions to write and read. Click on the Add button.

- Turn the FTP server on and off.

The web server can be tested by click on the computer, after which the Desktop tab is chosen and open the Web Browser. Type the server's IP address: 192.168.1.254.

TEST THE CONNECTIVITY BY THE USE OF FTP

- The client can also try to connect to the FTP server through the command prompt (of the computer, of course).

ftp 192.168.1.254

- Enter the created user's details.
- The exit of the connection is done through the "quit" command.

CONNECTIVITY CHECK THROUGH MESSAGES

- Click on the button Simulation which is placed in the right hand side corner, at the bottom of the page. Here you can visualize all the events as well as the state of certain events.

- Select the yellow envelope and send it from the computer to the server by clicking on them and then run the simulation by click on the button "Auto Capture / Play".

- The result of the event will be displayed below.

ACTIVITY 2

- Create a topology with two switches connected together and two computers linked to each of the switches.

Before you can send packets, you must configure each computer's IP address.

By clicking on the computer, a window appears where you can configure the computers. Go to the tab " Desktop" and click on the icon "IP Configuration". Fill in the "IP Address" with an address in the range 192.168.1.1 - 192.168.1.5 and the "Subnet Mask" with the value 255.255.255.0 . The remaining fields are empty.

Check the connectivity between each two computers

ACTIVITY 3 - POPULATING THE SWITCHING TABLE

MAC address: 000B.BED9.C904

MAC address: 00E0.8F27.5871

MAC address: 0090.0C1A.03DE

MAC address: 0060.70CA.83CD
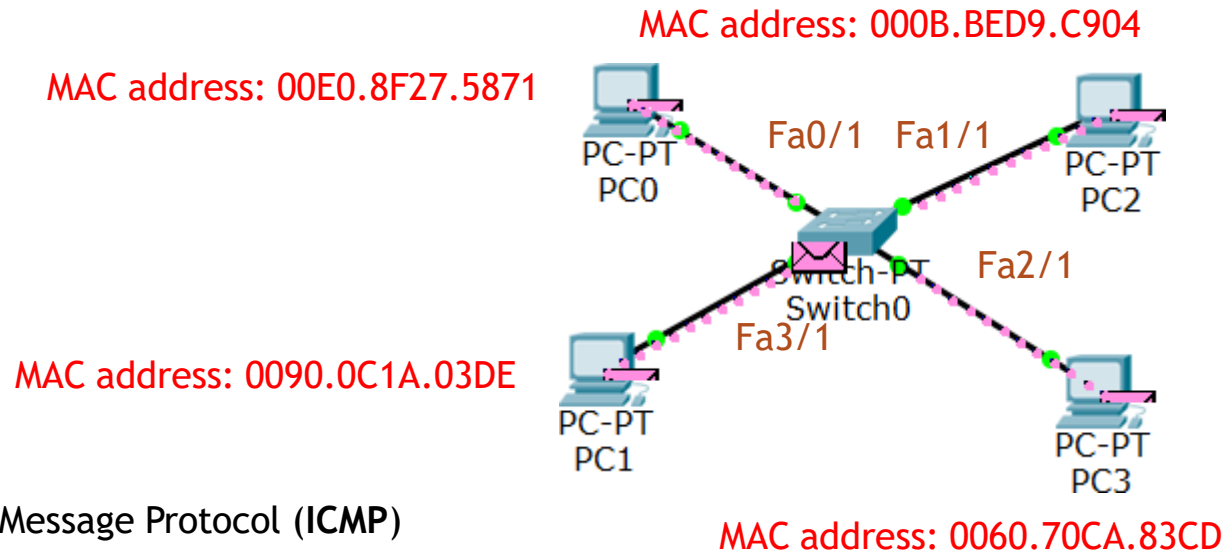
- Internet Control Message Protocol (**ICMP**)
- Address resolution protocol (**arp**)

- Send a package from PC1 to PC2 and analyze what happens after viewing the simulation.

Click on the switch, select the CLI tab, press Enter and write the command "show mac-address-table" in order to see the switching table.

- Send a package from PC2 to PC3. What happens? Check the switching table.
- Send a package from PC1 to PC3. What happens? Check the switching table.

ACTIVITY 4 – SPANNING TREE PROTOCOL

- STP (Spanning Tree Protocol) is a protocol in which switches prevent loops in the network (especially broadcast storms). A spanning tree is created between switches (one switch is the root bridge, the root of the tree) that establishes a unique way to get from one switch to another switch.

- One port of the switch Switch1 (Fa0/1) is blocked by the STP perspective, meaning that it does not send data packets.
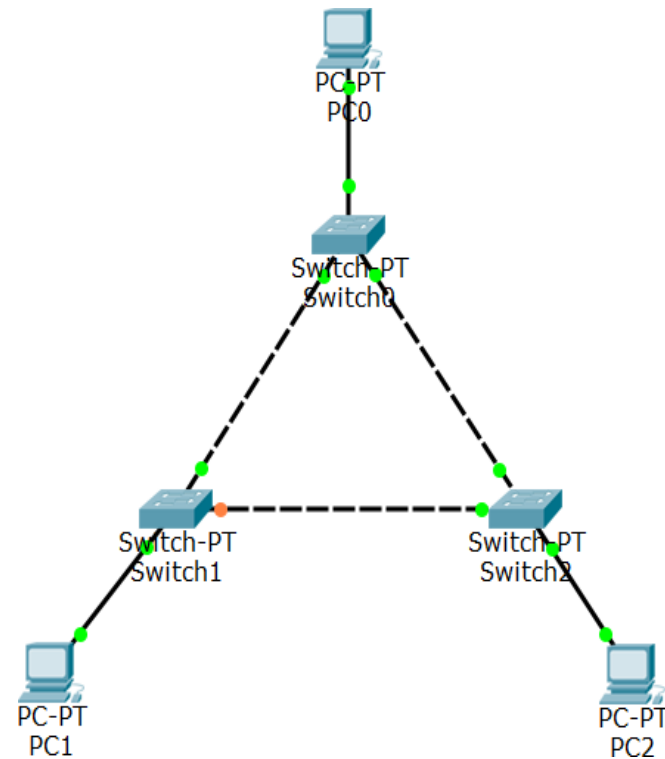
ACTIVITY 4 (CONTINUATION)

- To populate the switching tables of switches send packages to check the connection between all stations.

- In the Simulation mode send a package from station PC1 to the station PC2 . Notice the path followed by package: though it would be a shorter road between Switch1 and Switch2 package, it follows the path Switch1, Switch0, Switch2; this is due to the link Switch1 - Switch2 that is disabled.

- In the current topology , Switch0 is a root bridge and it also is the root of the spanning tree.

ACTIVITY 4 (CONTINUATION)

- For each switch open the console (the CLI interface) and run the command

show spanning –tree

- For the Switch1, you get such information:

```
Switch#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0007.EC9C.D291
             Cost        19
             Port        2(FastEthernet1/1)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     0060.5C08.3EDC
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa1/1            Root FWD 19        128.2    P2p
Fa0/1            Altn BLK 19        128.1    P2p
Fa2/1            Desg FWD 19        128.3    P2p
```

ACTIVITY 4 (CONTINUATION)

⊙ The address of the root bridge (Root ID) is 0007.EC9C.D291, i.e. the address of a port belonging to Switch0. The current ID (of Switch1) is 0060.5C08.3EDC . The port FA1/1 is in the state FORWARDING and it is the link to the root bridge.

• The port Fa0/1 is in the state BLOCKED: part of the disabled bond Switch1 – Switch2.

•->Run the command "show spanning –tree" on the other switches and analyze the output of the commands.

```
Switch#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0007.EC9C.D291
             Cost        19
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```

HOMEWORK

◉ A router will display port configuration information including IP address, port status, and MAC address.

◉ A server will display IP address, MAC address, and Gateway information

◉ A switch will display port configuration information including IP address, MAC address, port status, and VLAN membership.

◉ A PC will display IP address, MAC address, and Gateway information.
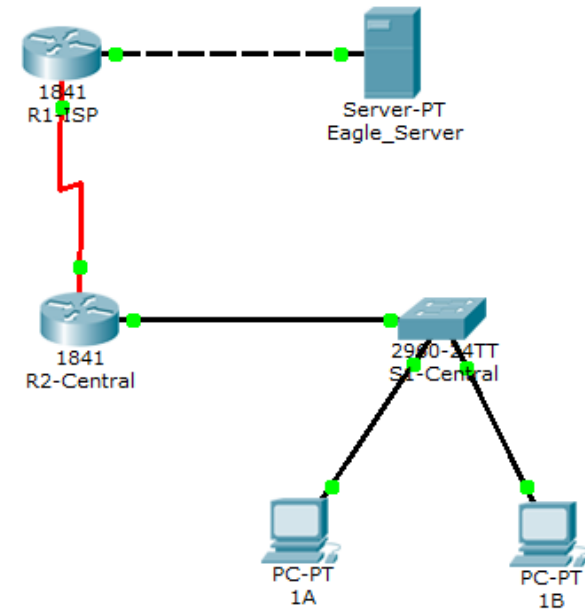
Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1-ISP	Fa0/0	192.168.254.253	255.255.255.0	N/A
	S0/0/0	10.10.10.6	255.255.255.252	N/A
R2-Central	Fa0/0	172.16.255.254	255.255.0.0	N/A
	S0/0/0	10.10.10.5	255.255.255.252	N/A
S1-Central	VLAN 1	172.16.254.1	255.255.0.0	172.16.255.254
PC 1A	NIC	172.16.1.1	255.255.0.0	172.16.255.254
PC 1B	NIC	172.16.1.2	255.255.0.0	172.16.255.254
Eagle Server	NIC	192.168.254.254	255.255.255.0	192.168.254.253

◦ DHCP – Dynamic Host Configuration Protocol

◦ DNS = Domain Name System

◦ UDP = User Datagram Protocol

◦ TCP = Transmission Control Protocol