Content

Title pages

ABSTRACT

Router

is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. A data packet is typically forwarded from one router to another router through the networks that constitute an internetwork until it reaches its destination node.

Switch

A **network switch** (also called **switching hub**, **bridging hub**, officially **MAC bridge**) is a computer networking device that connects devices together on a computer network by using packet switching to receive, process, and forward data to the destination device.

A network switch is a multiport network bridge that uses hardware addresses to process and forward data at the data link layer (layer 2) of the OSI model. Some switches can also process data at the network layer (layer 3) by additionally incorporating routing functionality. Such switches are commonly known as layer-3 switches or multilayer switches.

BACKGROUND

What is Packet Tracer ?

Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. Packet Tracer makes use of a drag and drop user interface, allowing users to add and remove simulated network devices as they see fit. The software is mainly focused towards Certified Cisco Network Associate Academy students as an educational tool for helping them learn fundamental CCNA concepts. Previously students enrolled in a CCNA Academy program could freely download and use the tool free of charge for educational use. Since August 2017 with version 7.1 is free to everyone.

Packet Tracer can be run on iOS, Linux and Microsoft Windows. A similar Android and iOS apps are also available. Packet Tracer allows users to create simulated network topologies by dragging and dropping routers, switches and various other types of network devices. A physical connection between devices is represented by a "cable" item. Packet Tracer supports an array of simulated Application Layer protocols, as well as basic routing with RIP, OSPF, EIGRP, BGP, to the extents required by the current CCNA curriculum. As of version 5.3, Packet Tracer also supports the Border Gateway Protocol.

In addition to simulating certain aspects of computer networks, Packet Tracer can also be used for collaboration. As of Packet Tracer 5.0, Packet Tracer supports a multi-user system that enables multiple users to connect multiple topologies together over a computer network. Packet Tracer also allows instructors to create activities that students have to complete. Packet Tracer is often used in educational settings as a learning aid. Cisco Systems claims that Packet Tracer is useful for network experimentation.

What is VLAN in networking ?

A VLAN is a group of end stations in a switched network that is logically segmented by function, project team, or application, without regard to the physical locations of the users. VLANs have the same attributes as physical LANs, but you can group end stations even if they are not physically located on the same LAN segment.

Any port can belong to a VLAN, and unicast, broadcast, and multicast packets are forwarded and flooded only to end stations in that VLAN. Each VLAN is considered a logical network. Packets destined for stations that do not belong to the VLAN must be forwarded through a router.

Student ID	Student Name	Signature

Final project

Course: COMPUTER NETWORKS 370

Semester-Year: **SECOND SEMESTER _2017-18**

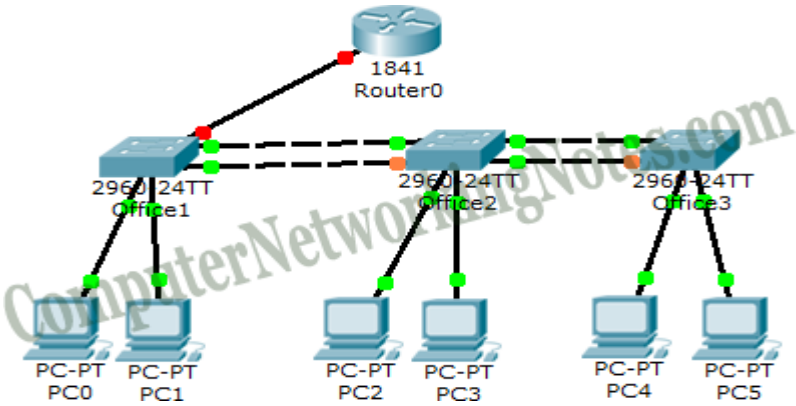
Day: Thursday **Date: 05-04-2018**

Question No.	Points Assigned	Points Awarded
VLANConfiguration	4	
R0 Configuratoin	4	
R1 (ISP) Configuration	4	
Total	**12**	

Instructor Name	Mr.Aabid Mir
Signature	

Instructions: *Please submit the project report along with the configured packet tracer file in the dead week during LAB session.*

Adding an additional router configured as ISP (Internet Service Provider) to the VLAN.



In the above network, Office1 Switch is configured as VTP Server. Office2 and Office3 switches are configured as VTP clients. We only need to create VLANs in VTP Server. VTP Server will propagate this information to all VTP clients automatically.

Configurations used in this topology are following:

PCs Configuration

Device	IP Address	Subnet Mask	Gateway	VLAN	Connected With
PC0	10.0.0.2	255.0.0.0	10.0.0.1	VLAN 10	Office 1 Switch on F0/1
PC1	20.0.0.2	255.0.0.0	20.0.0.1	VLAN 20	Office 1 Switch on F0/2
PC2	10.0.0.3	255.0.0.0	10.0.0.1	VLAN 10	Office 2 Switch on F0/1
PC3	20.0.0.3	255.0.0.0	20.0.0.1	VLAN 20	Office 2 Switch on F0/2
PC4	10.0.0.4	255.0.0.0	10.0.0.1	VLAN 10	Office 3 Switch on F0/1
PC5	20.0.0.4	255.0.0.0	20.0.0.1	VLAN 20	Office 3 Switch on F0/2

Office 1 Switch Configuration

Port	Connected To	VLAN	Link	Status
F0/1	With PC0	VLAN 10	Access	OK
F0/2	With PC1	VLAN 20	Access	OK
Gig1/1	With Router	VLAN 10,20	Trunk	OK
Gig 1/2	With Switch2	VLAN 10,20	Trunk	OK
F0/24	Witch Switch2	VLAN 10,20	Trunk	STP - Blocked

Office 2 Switch Configuration

Port	Connected To	VLAN	Link	Status
F0/1	With PC0	VLAN 10	Access	OK
F0/2	With PC1	VLAN 20	Access	OK
Gig 1/2	With Switch1	VLAN 10,20	Trunk	OK
Gig 1/1	With Switch3	VLAN 10,20	Trunk	OK
F0/24	Witch Switch1	VLAN 10,20	Trunk	STP - Blocked
F0/23	Witch Switch3	VLAN 10,20	Trunk	STP - Blocked

Office 3 Switch Configuration

Port	Connected To	VLAN	Link	Status
F0/1	With PC0	VLAN 10	Access	OK
F0/2	With PC1	VLAN 20	Access	OK
Gig 1/1	With Switch2	VLAN 10,20	Trunk	OK
F0/24	Witch Switch1	VLAN 10,20	Trunk	STP - Blocked

Router Configuration

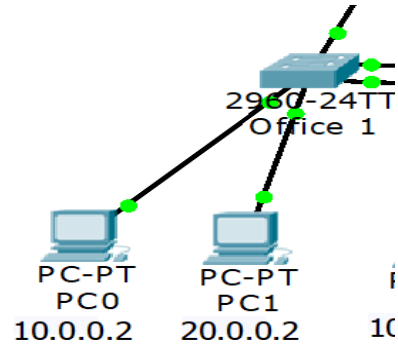
Port	Connected To	VLAN	Link	Status
Fa0/0	with Office 1 Switch Gig 1/2	VLAN 10, 20	Trunk	Ok

VLAN Configuration

VLAN Number	VLAN Name	Gateway IP	PCs
10	Sales	10.0.0.1	PC0,PC2,PC4
20	Management	20.0.0.1	PC1,PC3,PC5

After configuring and testing the above network, you are required to add an extra router R1 and configure it to act as an ISP to the current VLAN settings.

COMMAND

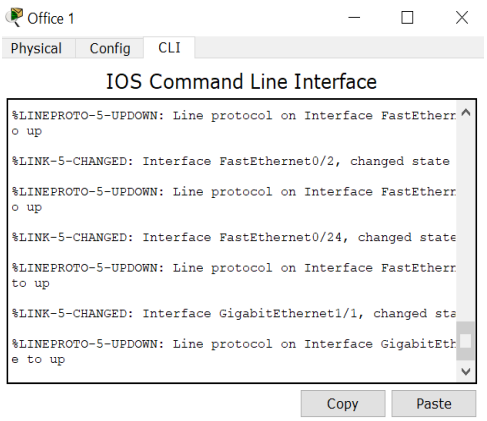


Command to configure the VLAN :

- Go to Switch 1 (office 1) . And then
- go to (CLI) , Afterword write the command:

before write press ENTER then write:

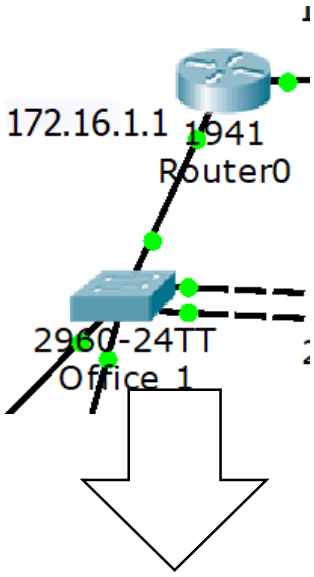
- Switch>**enable**
- Switch#**configure terminal**
- Switch(config)#**interface FastEthernet 0/1**
- Switch(config-if)#**int fa0/1**
- Switch(config-if)#**switchport access VLAN 10**
- Switch(config-if)#**exit**
- Switch(config)# **interface FastEthernet 0/2**
- Switch(config-if)#**int fa0/2**
- Switch(config-if)#**switchport access VLAN 20**

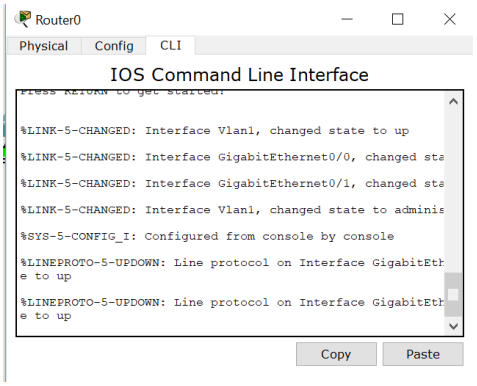


❖ **Do the same thing with office2 & office3**

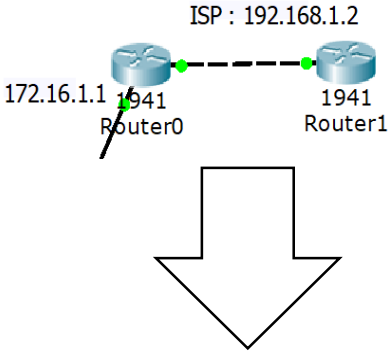
Command to configure the R0:

- Go to Router 1 . And then
- go to (CLI) , Afterword write the command:
  - Router(config-if)#**int g0/0**
  - Router(config-if)#**no sh**
  - Router(config-if)#**ip add 172.16.1.1 255.255.255.0**
  - Router(config-if)#**do wr**



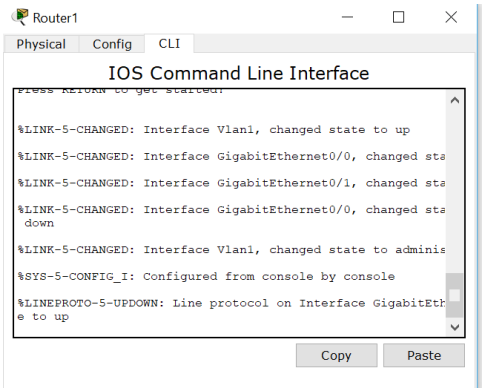


Command to configure the R1 as (ISP)



- Go to Router 1 . And then
- go to (CLI) , Afterword write the command:

  Continue with configuration dialog? [yes/no]: **n**
  - Router>**en**
  - Router#**conf t**
  - Router(config)#**do sh ip int br**
  - Router(config)#**int g0/1**
  - Router(config-if)#**no sh**
  - Router(config-if)#**ip add 192.168.1.1 255.255.255.0**
  - Router(config-if)#**do wr**



❖ **Do the same thing with router 0 but with different ip address**

Conclusion

ROUTER is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. **SWITCH** A network switch is a computer networking device that connects devices together on a computer network by using packet switching to receive, process, and forward data to the destination device.

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