EXPERIMENT-6

Objective: Design & implement a network setup for our University

Resources Required:

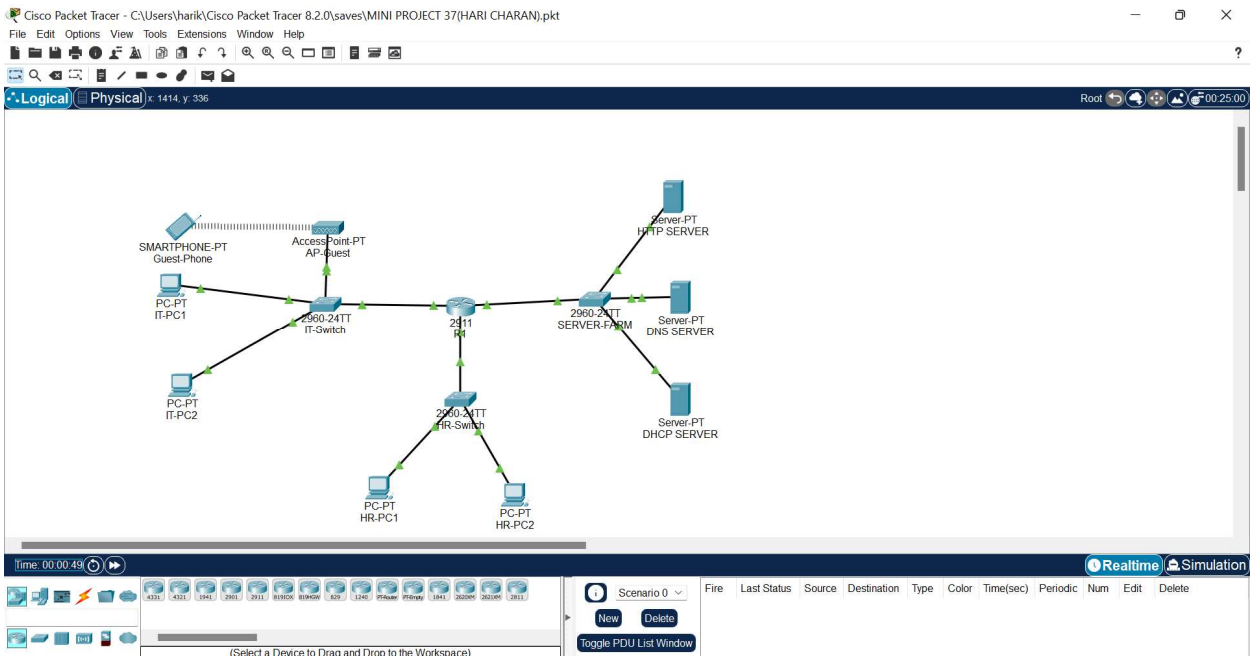
laptop, cisco packet tracer

Theory:

Switch: A network switch or switching hub is a computer networking device that connects network segments.The term commonly refers to a network bridge that processes and routes data at the data link layer (layer 2) of the OSI model. Switches that additionally process data at the network layer (layer 3 and above) are often referred to as Layer 3 switches or multilayer switches.

Router: A router is an electronic device that interconnects two or more computer networks, and selectively interchanges packets of data between them. Each data packet contains address information that a router can use to determine if the source and destination are on the same network, or if the data packet must be transferred from one network to another. Where multiple routers are used in a large collection of interconnected networks, the routers exchange information

Procedure: **Topology:**



Addressing table:

Device	Interface	IPv6 address/prefix		Default gateway	comments
		IP address	Subnet mask		
R1	G0/0	2001:DB8:ACAD:1::1/64		Not applicable	Connected to IT-Switch G0/1
		192.168.1.1	255.255.255.128	Not applicable	
	G0/1	2001:DB8:ACAD:128::1/64		Not applicable	Connected to HR-Switch G0/1
		192.168.1.129	255.255.255.192	Not applicable	
	G0/2	2001:DB8:ACAD:1::1/64		Not applicable	Connected to SERVER-FARM G0/1
		192.168.1.193	255.255.255.224	Not applicable	
IT-Switch	VLAN1	192.168.1.2	255.255.255.128	192.168.1.1	SVI for IT-Switch management
HR-Switch	VLAN 1	192.168.1.130	255.255.255.192	192.168.1.129	SVI for HR-Switch management
SERVER-FARM	VLAN 1	192.168.1.194	255.255.255.224	192.168.1.193	SVI for SERVER-FARM management
HTTP SERVER	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to SERVER-FARM Fa0/1
		192.168.1.221	255.255.255.224	192.168.1.193	
DNS SERVER	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to SERVER-FARM Fa0/2
		192.168.1.222	255.255.255.224	192.168.1.193	
DHCP SERVER	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to SERVER-FARM Fa0/3
		192.168.1.220	255.255.255.224	192.168.1.193	
IT-PC1	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to IT-Switch Fa0/1
		192.168.1.3	255.255.255.128	192.168.1.1	
IT-PC2	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to IT-Switch Fa0/2
		192.168.1.4	255.255.255.128	192.168.1.1	
HR-PC1	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to HR-Switch Fa0/1
		192.168.1.131	255.255.255.192	192.168.1.129	
HR-PC2	NIC	2001:DB8:ACAD:1::1/64		FE80::1	Connected to HR-Switch Fa0/2
		192.168.1.132	255.255.255.192	192.168.1.129	

Guest_phone	Wireless NIC	SLAAC	Wirelessly connected to AP_Guest
		DHCP	

Set the topology as shown in above figure.

Step 1: Configure the router host name.

Set the host name on the router to **R1** by using these commands.

Router>**enable**

Router#**configure terminal**

Router(config)#**hostname R1**

Step 2: Configure the privileged mode and secret passwords.

a. In global configuration mode, set the password to **cisco**.

R1(config)#**enable password cisco**

Set an encrypted privileged password to **cisco123** using the **secret** command.

R1(config)#**enable secret cisco123**

Step 3: Configure the console password.

a. In global configuration mode, switch to line configuration mode to specify the console line.

R1(config)#**line console 0**

Set the password to **cisco123**, require that the password be entered at login, and then exit line configuration mode.

R1(config-line)#**password cisco123**

R1(config-line)#**login**

R1(config-line)#**exit**

R1(config)#

Step 4: Configure the vty password to allow Telnet access to the router.

a. In global configuration mode, switch to line configuration mode to specify the vty lines.

R1(config)#**line vty 0 15**

Set the password to **cisco123**, require that the password be entered at login, exit line configuration mode, and then

exit the configuration session.

R1(config-line)#**password cisco123**

R1(config-line)#**login**

R1(config-line)#**exit**

R1(config)#

Step 5: Configure password encryption, a MOTD banner, and turn off domain server lookup.

a. Currently, the line passwords and the enable password are shown in clear text when you show the

running configuration. Verify this now by entering the **show running-config** command.

To avoid the security risk of someone looking over your shoulder and reading the passwords, encrypt all clear text passwords.

R1(config)#**service password-encryption**

Use the **show running-config** command again to verify that the passwords are encrypted.

To provide a warning when someone attempts to log in to the router, configure a MOTD banner

R1(config)#**banner motd Authorized Access Only**

R1>**emable**

Translating "emable"...domain server (255.255.255.255)

To prevent this from happening, use the following command to stop all DNS lookups from the router

CLI.

Save the running configuration to the startup configuration.

R1(config)#**end**

R1#**copy run start**

FOR A IT-SWITCH:

Step 1: Establish a console connection to a switch.

For this activity, direct access to the IT-Switch Config and CLI tabs is disabled. You must establish a console session through IT-PC1.

Step 2: Configure the host name and VLAN 1.

a. Configure the switch host name as IT-Switch.

b. Configure port Fa0/1. Set the mode on Fast Ethernet 0/1 to access mode.

i. IT-Switch (config)#**interface fastethernet 0/1**

ii. IT-Switch (config-if)#**switchport mode access**

c. Configure IP connectivity on S1 using VLAN 1.

i. IT-Switch (config)#**interface vlan 1**

ii. IT-Switch (config-if)#**ip address 172.17.99.11 255.255.255.0**

iii. IT-Switch (config-if)#**no shutdown**

FOR SERVER-FARM:

Step 1: Establish a console connection to a switch.

For this activity, direct access to the SERVER-FARM Config and CLI tabs is disabled. You must establish a console session through IT-PC1.

Step 2: Configure the host name and VLAN 1.

a. Configure the switch host name as IT-Switch.

b. Configure port Fa0/1. Set the mode on Fast Ethernet 0/1 to access mode.

i. SERVER-FARM (config)#**interface fastethernet 0/1**

ii. SERVER-FARM (config-if)#**switchport mode access**

c. Configure IP connectivity on S1 using VLAN 1.

i. SERVER-FARM (config)#**interface vlan 1**

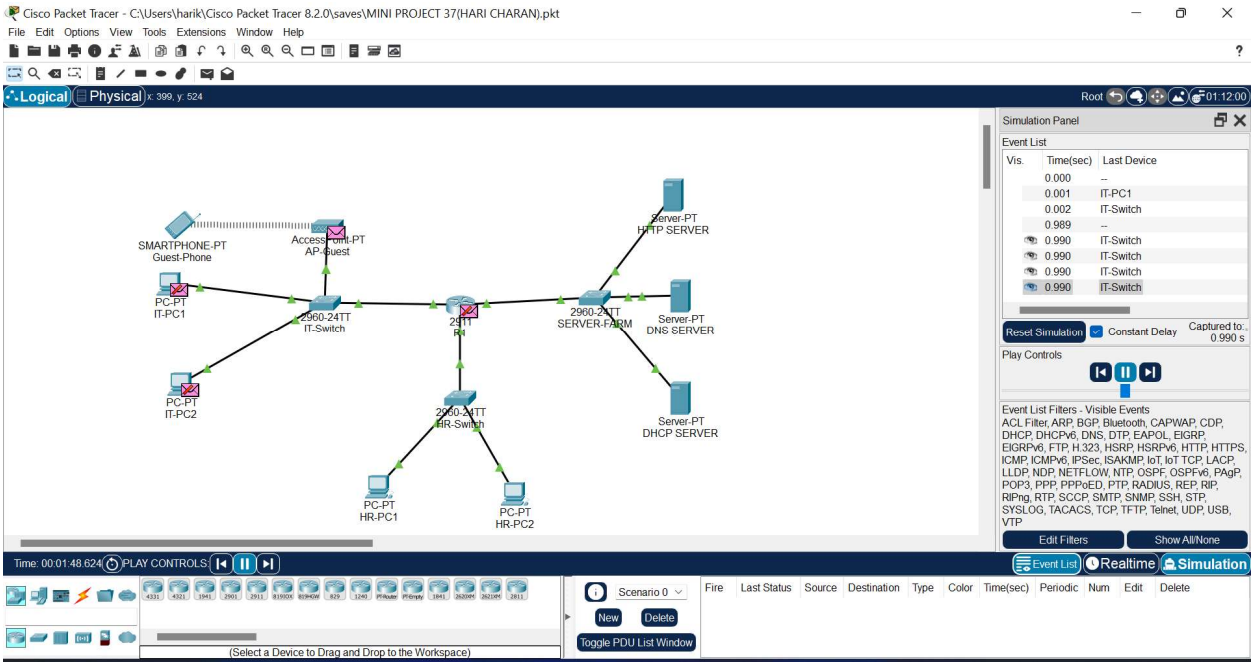
ii. SERVER-FARM (config-if)#**ip address 172.17.99.11 255.255.255.0**

iii. SERVER-FARM (config-if)#**no shutdown**

Setup all the ip addresses of end devices as shown in addressing table.

Simulate the topology the results are shown below.

SIMULATION:



Conclusion:

We have designed & simulated a network setup for our University.