CSE 320 - Computer Networks

LAB Session 3

19.03.2024

Packet Tracer:
https://www.packettracernetwork.com/download/download-packet-tracer.html
https://skillsforall.com/resources/lab-downloads?courseLang=en-US

Packet Tracer Everywhere: https://github.com/PTAnywhere/ptAnywhere-installation

1. **Configure a network with two subnets, each connected to a Cisco 2901 router, and enable routing between them to allow PCs on different subnets to communicate. Understand the basics of IP addressing and routing.**

a. ***Step 1: Open Cisco Packet Tracer***

Launch Cisco Packet Tracer on your computer. If you don't have it installed, you need to download and install it from Cisco Networking Academy's website.

b. ***Step 2: Place Devices***

Required Equipment

- 2 Cisco 2901 routers (Router0 and Router1)
- 2 Cisco 2960 switches (Switch0 and Switch1)
- 4 PCs (PC0, PC1, PC2, and PC3)

Topology

- **Subnet A:** 192.168.1.0/24
  - **Devices:** PC0, PC1 connected to Switch0, which is connected to Router0
- **Subnet B:** 192.168.2.0/24
  - **Devices:** PC2, PC3 connected to Switch1, which is connected to Router1
- Router0 and Router1 are connected via their GigabitEthernet0/1 interfaces.

c. ***Step 3: Cable the Network***

- Connect Router0 GigabitEthernet0/0 to Switch0.

- Connect Router1 GigabitEthernet0/0 to Switch1.
- Connect Router0 GigabitEthernet0/1 to Router1 GigabitEthernet0/1 for the router-to-router link.
- Connect PC0 and PC1 to Switch0; connect PC2 and PC3 to Switch1.

d. Step 4: Configure PC IP Settings

- PC0: IP Address 192.168.1.2/24, Default Gateway 192.168.1.1
- PC1: IP Address 192.168.1.3/24, Default Gateway 192.168.1.1
- PC2: IP Address 192.168.2.2/24, Default Gateway 192.168.2.1
- PC3: IP Address 192.168.2.3/24, Default Gateway 192.168.2.1

e. Step 5: Configure Routers

Router 0

```
enable
configure terminal
interface GigabitEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 no shutdown
exit
interface GigabitEthernet0/1
 ip address 10.1.1.1 255.255.255.252
 no shutdown
exit
ip route 192.168.2.0 255.255.255.0 10.1.1.2
end
```

Router 1

```
enable
configure terminal
interface GigabitEthernet0/0
 ip address 192.168.2.1 255.255.255.0
 no shutdown
exit
interface GigabitEthernet0/1
 ip address 10.1.1.2 255.255.255.252
 no shutdown
exit
ip route 192.168.1.0 255.255.255.0 10.1.1.1
end
```

***f.* Step 6: Test Connectivity**

Test the connectivity between PCs in different subnets using the ping command. For example, from PC0, ping PC2's IP address (192.168.2.2). All pings should be successful if configurations are correct.

g. **Step 7: Save Your Work**
Don't forget to save your Packet Tracer file by going to File > Save As, and give it a meaningful name.

2. Another Simple:

Configure two VLANs on a Cisco 2960 switch to segment network traffic between two groups of PCs. Understand the concept of VLANs, how they can separate network traffic, and enhance network security and performance.

Required Equipment:

- 1 Cisco 2960 switch
- 4 PCs (PC0, PC1 for VLAN 10; PC2, PC3 for VLAN 20)
- Connecting cables

Network Topology

- All devices are connected to a single Cisco 2960 switch.
- PCs are divided into two VLANs: VLAN 10 (PC0 and PC1) and VLAN 20 (PC2 and PC3).

Connect all PCs to the Cisco 2960 switch.

- PC0 and PC1 to switch ports FastEthernet0/1 and FastEthernet0/2, respectively.
- PC2 and PC3 to switch ports FastEthernet0/3 and FastEthernet0/4, respectively.

Switch Configuration:

```
enable
configure terminal
hostname Switch
no ip domain-lookup
```

Create VLANs:

```
vlan 10
name Accounting
exit
vlan 20
name HR
exit
```

Assign Ports to VLANs:

- Assign FastEthernet0/1 and FastEthernet0/2 to VLAN 10.

- Assign FastEthernet0/3 and FastEthernet0/4 to VLAN 20.

For VLAN 10:

```
interface range FastEthernet0/1 - 2
switchport mode access
switchport access vlan 10
exit
```

For VLAN 20:

```
interface range FastEthernet0/3 - 4
switchport mode access
switchport access vlan 20
exit
```

Verify VLAN Configuration

```
show vlan brief
```

Verify VLAN Configuration

VLAN 10:

- PC0: IP Address 192.168.10.2/24
- PC1: IP Address 192.168.10.3/24

VLAN 20:

- PC2: IP Address 192.168.20.2/24
- PC3: IP Address 192.168.20.3/24

Why would it not work?

Take Home:

***Objective*:**

Design a small office network using Cisco Packet Tracer, implementing VLANs, inter-VLAN routing, and basic security features. Analyze the network's performance and security posture.

Requirements

Design a Network:

- Use Cisco Packet Tracer to design a network for a small office.
- The network should include at least three VLANs: Admin, Sales, and IT.
- Each VLAN should have at least two PCs connected to a Cisco 2960 switch.
- Include a Cisco router (e.g., 2901) for inter-VLAN routing.

Configure the Network:

- VLAN Configuration: Create and assign VLANs on the switch.

- Router Configuration: Set up the router for inter-VLAN routing using subinterfaces.
- PC Configuration: Assign appropriate static IP addresses to PCs in their respective VLANs.
- Security Configuration: Implement basic security measures such as secure passwords, SSH for remote access, and port security on the switch.

Documentation:

- Document each step of your design and configuration process.
- Include screenshots from Cisco Packet Tracer as evidence of your work.
- Submit a single PDF file.

Deadline: 27/03/2024 23:59