Packet Tracer - Investigate a VLAN Implementation

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
S1	VLAN 99	172.17.99.31	255.255.255.0	N/A
S2	VLAN 99	172.17.99.32	255.255.255.0	N/A
S3	VLAN 99	172.17.99.33	255.255.255.0	N/A
PC1	NIC	172.17.10.21	255.255.255.0	172.17.10.1
PC2	NIC	172.17.20.22	255.255.255.0	172.17.20.1
PC3	NIC	172.17.30.23	255.255.255.0	172.17.30.1
PC4	NIC	172.17.10.24	255.255.255.0	172.17.10.1
PC5	NIC	172.17.20.25	255.255.255.0	172.17.20.1
PC6	NIC	172.17.30.26	255.255.255.0	172.17.30.1
PC7	NIC	172.17.10.27	255.255.255.0	172.17.10.1
PC8	NIC	172.17.20.28	255.255.255.0	172.17.20.1
PC9	NIC	172.17.30.29	255.255.255.0	172.17.30.1

Objectives

Part 1: Observe Broadcast Traffic in a VLAN Implementation

Part 2: Observe Broadcast Traffic without VLANs

Background

In this activity, you will observe how broadcast traffic is forwarded by the switches when VLANs are configured and when VLANs are not configured.

Instructions

Part 1: Observe Broadcast Traffic in a VLAN Implementation

Step 1: Ping from PC1 to PC6.

a. Wait for all the link lights to turn to green. To accelerate this process, click **Fast Forward Time** located in the bottom tool bar.

b. Click the **Simulation** tab and use the **Add Simple PDU** tool. Click **PC1**, and then click **PC6**.

c. Click the **Capture/Forward** button to step through the process. Observe the ARP requests as they traverse the network. When the Buffer Full window appears, click the **View Previous Events** button.

Were the pings successful? Explain.

O ping não teve sucesso, poque o ping foi solicitado para o PC6 que se encontra na VLAN30. O pacote saiu do PC1 que esta na VLAN10, provavelmente o switchs não foram configurados corretamente

Look at the Simulation Panel, where did **S3** send the packet after receiving it?

O switch 3 enviou para o PC4 que se encontra na mesma VLAN do PC1 a VLAN30

In normal operation, when a switch receives a broadcast frame on one of its ports, it forwards the frame out all other ports. Notice that **S2** only sends the ARP request out F0/1 to **S1**. Also notice that **S3** only sends the ARP request out F0/11 to **PC4**. **PC1** and **PC4** both belong to VLAN 10. **PC6** belongs to VLAN 30. Because broadcast traffic is contained within the VLAN, **PC6** never receives the ARP request from **PC1**. Because **PC4** is not the destination, it discards the ARP request. The ping from **PC1** fails because **PC1** never receives an ARP reply.

Step 2: Ping from PC1 to PC4.

a. Click the **New** button under the Scenario 0 dropdown tab. Now click on the **Add Simple PDU** icon on the right side of Packet Tracer and ping from **PC1** to **PC4**.

b. Click the **Capture/Forward** button to step through the process. Observe the ARP requests as they traverse the network. When the Buffer Full window appears, click the **View Previous Events** button.

Were the pings successful? Explain.

O ping foi teve sucesso, poque o ping foi solicitado para o PC4 que se encontra na VLAN10 do PC1.

c. Examine the Simulation Panel.

When the packet reached **S1**, why does it also forward the packet to **PC7**?

Porque o PC7 também se encontra na VLAN10 e por este motivo o pacote foi enviado para o PC7 para verificar o endereçamento MAC.

Part 2: Observe Broadcast Traffic without VLANs

Step 1: Clear the configurations on all three switches and delete the VLAN database.

a. Return to **Realtime** mode.

b. Delete the startup configuration on all 3 switches.

What command is used to delete the startup configuration of the switches?

Restaurando p/ condição padrão de fabrica, remora todos os cabos exceto o console e com o equip. ligado
s1#_erase startup-config

Where is the VLAN file stored in the switches?

As informações dos VLANs estão no arquivo "vlan.dat" que fica armazenado na memoria FLASH

c. Delete the VLAN file on all 3 switches.

What command deletes the VLAN file stored in the switches?

Apagando o arquivo de configuração das VLANs
s1#_delete flash:vlan.dat ou simplificado delete valn.dat

Step 2: Reload the switches.

Use the **reload** command in privileged EXEC mode to reset all the switches. Wait for the entire link to turn green. To accelerate this process, click **Fast Forward Time** located in the bottom yellow tool bar.

Step 3: Click Capture/Forward to send ARP requests and pings.

a. After the switches reload and the link lights return to green, the network is ready to forward your ARP and ping traffic.

b. Select **Scenario 0** from the drop-down tab to return to Scenario 0.

c. From **Simulation** mode, click the **Capture/Forward** button to step through the process. Notice that the switches now forward the ARP requests out all ports, except the port on which the ARP request was received. This default action of switches is why VLANs can improve network performance. Broadcast traffic is contained within each VLAN. When the **Buffer Full** window appears, click the **View Previous Events** button.

Reflection Questions

1. If a PC in VLAN 10 sends a broadcast message, which devices receive it?

Todos os host receberão a solicitação ARP, menos o host que fez o envio

2. If a PC in VLAN 20 sends a broadcast message, which devices receive it?

Todos os host receberão a solicitação ARP, menos o host que fez o envio

3. If a PC in VLAN 30 sends a broadcast message, which devices receive it?

Todos os host receberão a solicitação ARP, menos o host que fez o envio

4. What happens to a frame sent from a PC in VLAN 10 to a PC in VLAN 30?

Todos os host receberão a solicitação ARP, mas o pacote será descarta pois a resposta não estará endereçado corretamente no seu retorno

5. In terms of ports, what are the collision domains on the switch?

Quando dois ou mais dispositivos na mesma rede tentam se comunicar ao mesmo tempo, ocorre a colisão por congestionamento

6. In terms of ports, what are the broadcast domains on the switch?

São conjuntos de switch interconectados entre sí formando um único domínio de broasdcast (broadcast domains)