



INSTITUTO POLITÉCNICO
NACIONAL



ESCUELA SUPERIOR DE CÓMPUTO

ADMINISTRACIÓN DE SERVICIOS EN RED

Configurando VLAN y Trunks (12 y 13)

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1. Introducción.

1.1. VLAN.

Una VLAN (Red de área local virtual o LAN virtual) es una red de área local que agrupa un conjunto de equipos de manera lógica y no física.

2. Topología.

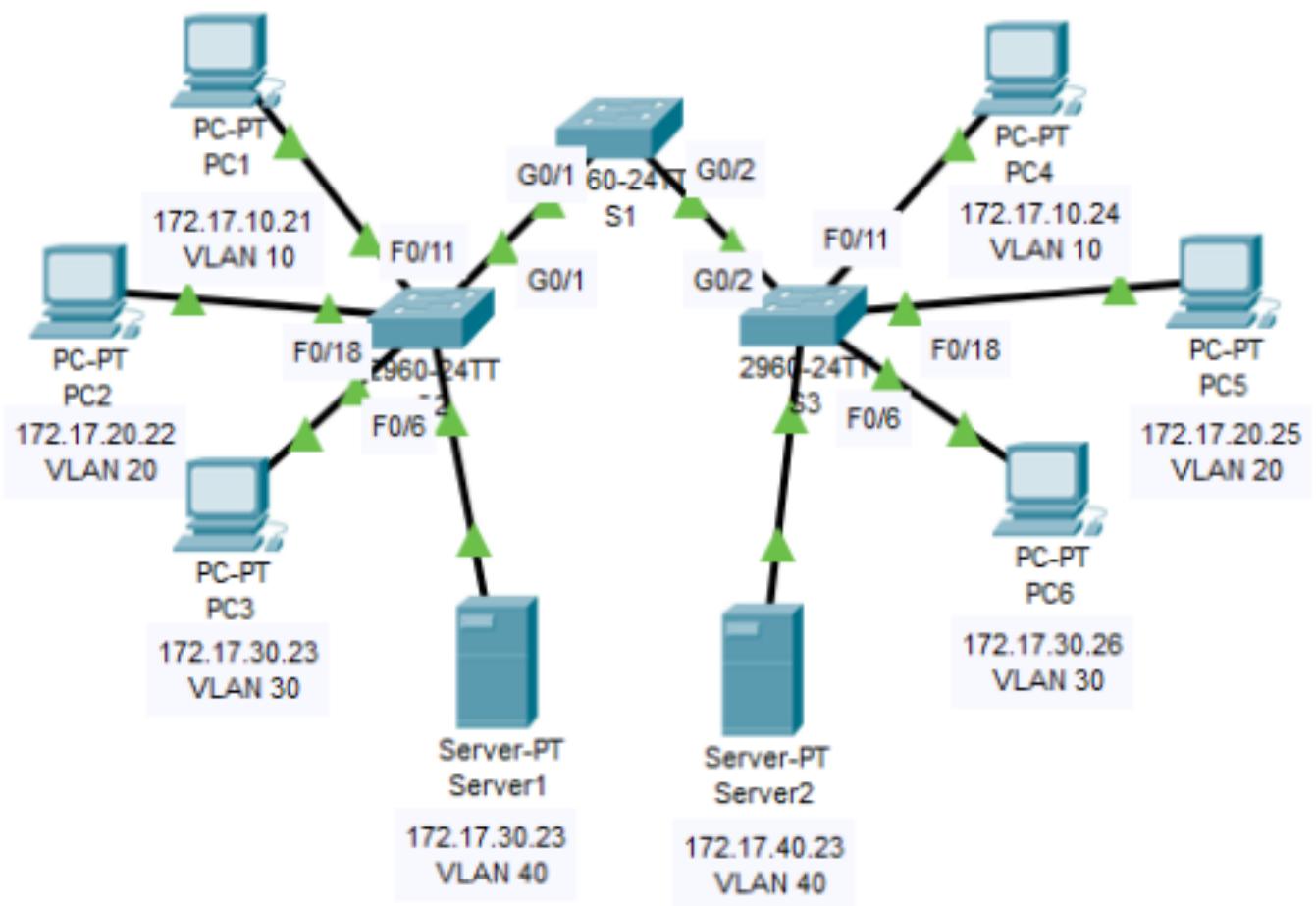


Figura 1: Topología

3. Objetivo general

Optimizar la red de dato, haciendo uso de virtualización de redes de área local (VLAN) para reducir los dominios de broadcast y agilizar el tráfico de la red.

4. Objetivos específicos

- Verificar la conectividad de los dispositivos de acuerdo a las políticas planteadas.
- Crear VLAN por área funcional para reducir dominios de broadcast.

5. Desarrollo.

5.1. Configurando VLAN'S.

Display the current VLANs. On S1, issue the command that displays all VLANs configured. By default, all interfaces are assigned to VLAN 1.

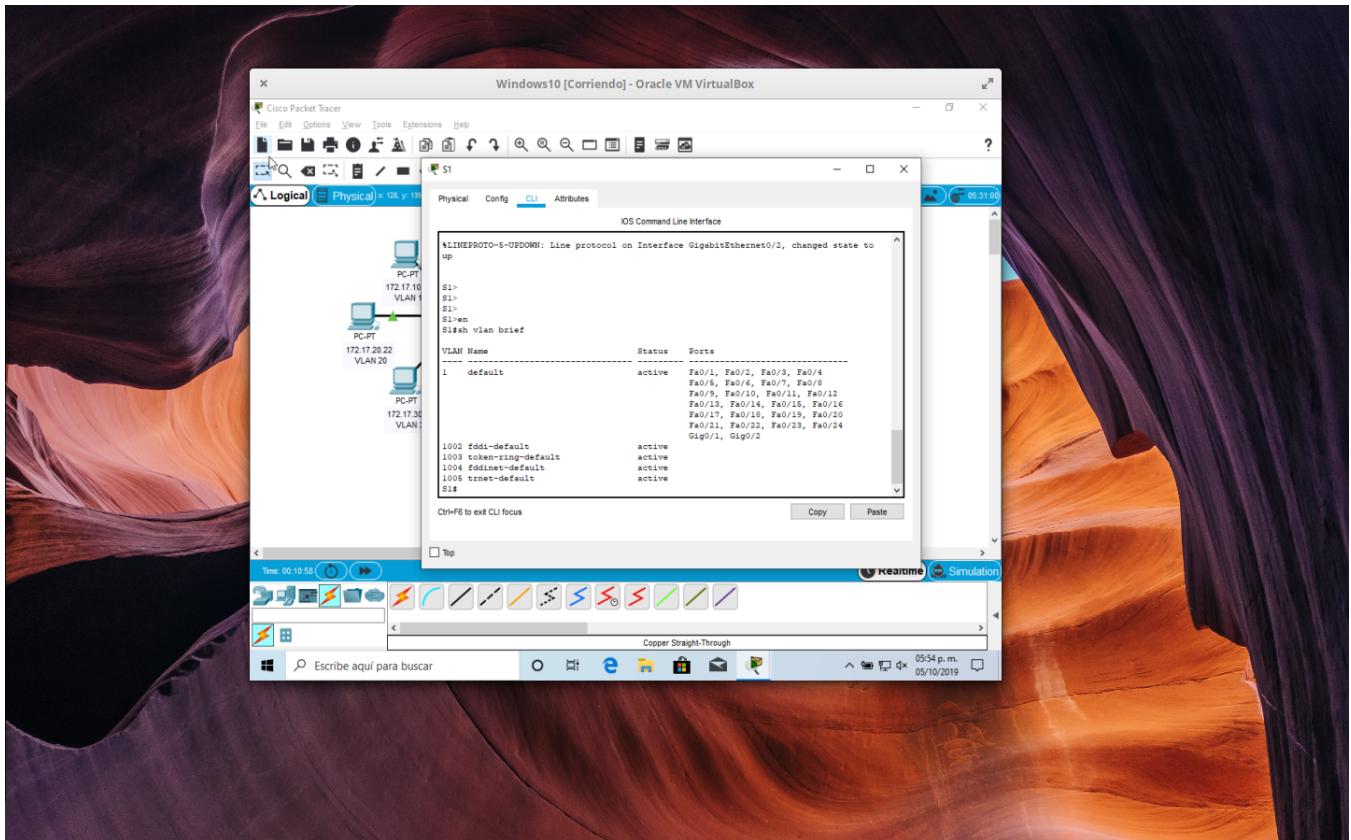


Figura 2: Configuración actual

Step 2: Verify connectivity between PCs on the same network. Notice that each PC can ping the other PC that shares the same network.

- PC1 can ping PC4
- PC2 can ping PC5
- PC3 can ping PC6
- Server1 can ping Server2

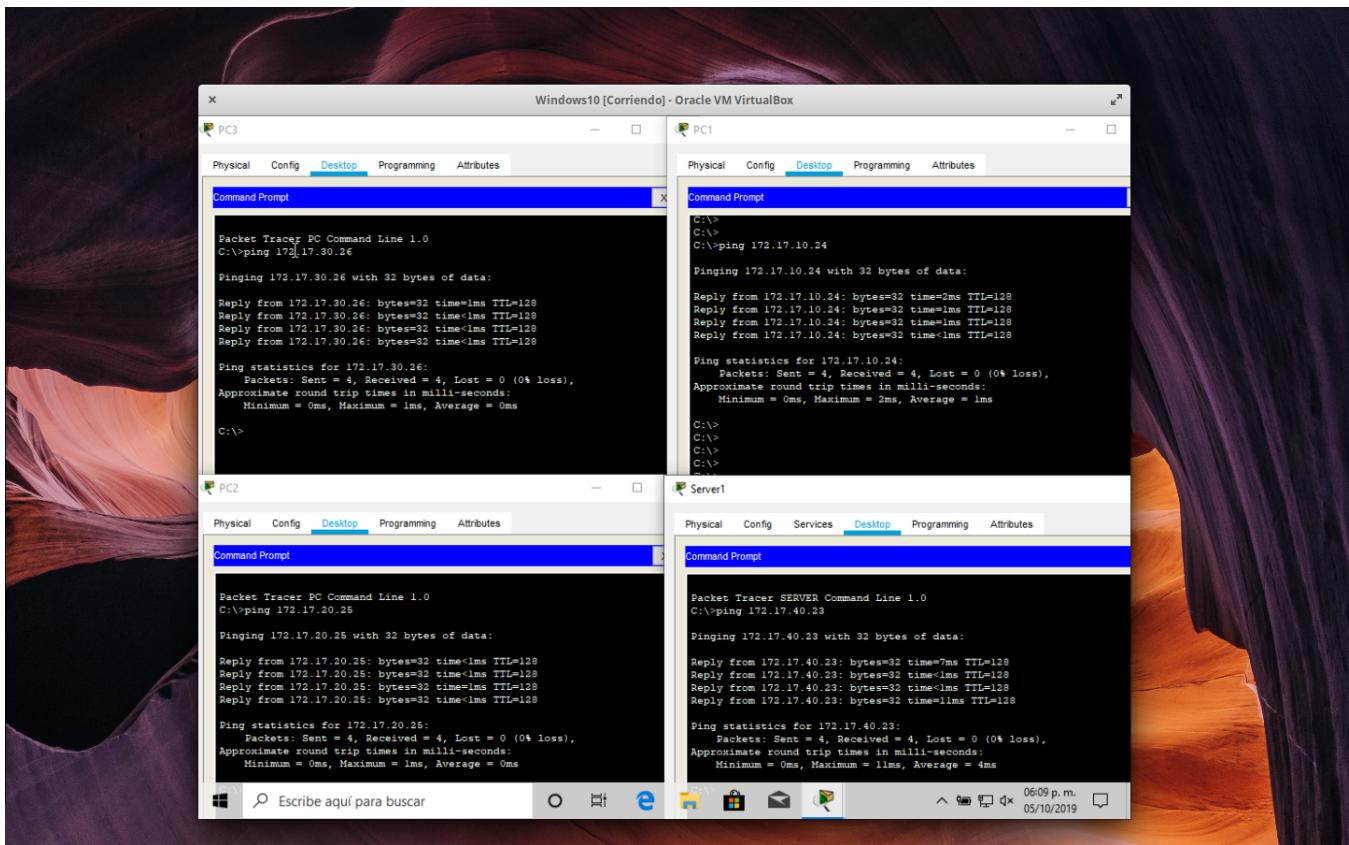


Figura 3: Pruebas de conectividad

Pings to PCs and Servers in other networks fail.

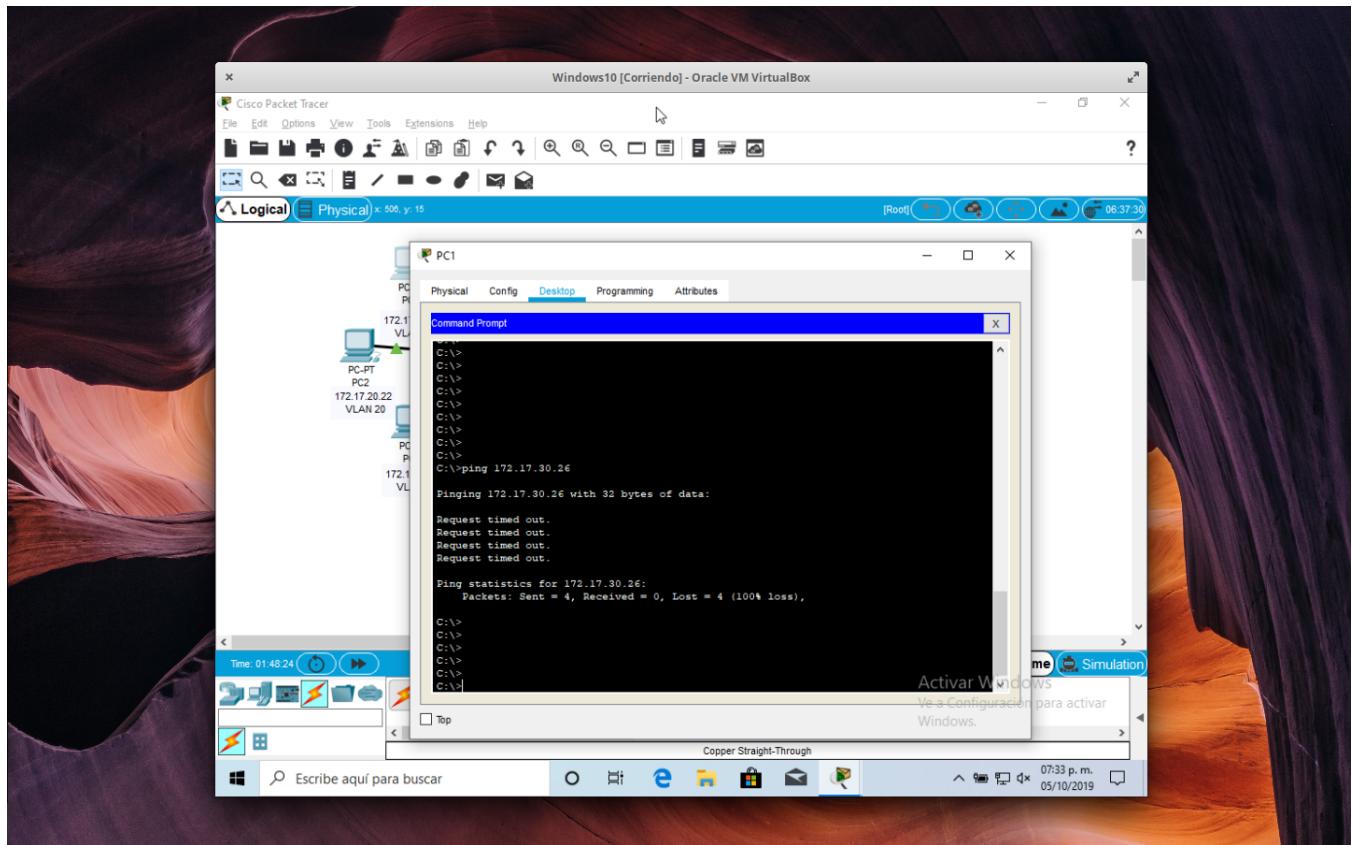


Figura 4: Configuración actual

What benefit will configuring VLANs provide to the current configuration?

Reducción de costos, mayor rendimiento, seguridad y mitigación de tormentas de broadcast.

Create and name VLANs on S1.

Create the following VLANs. Names are case-sensitive:

- VLAN 10: BuildingA
- VLAN 20: BuildingB
- VLAN 30: BuildingC
- VLAN 40: Servers
- VLAN 99: Managementamp;Native

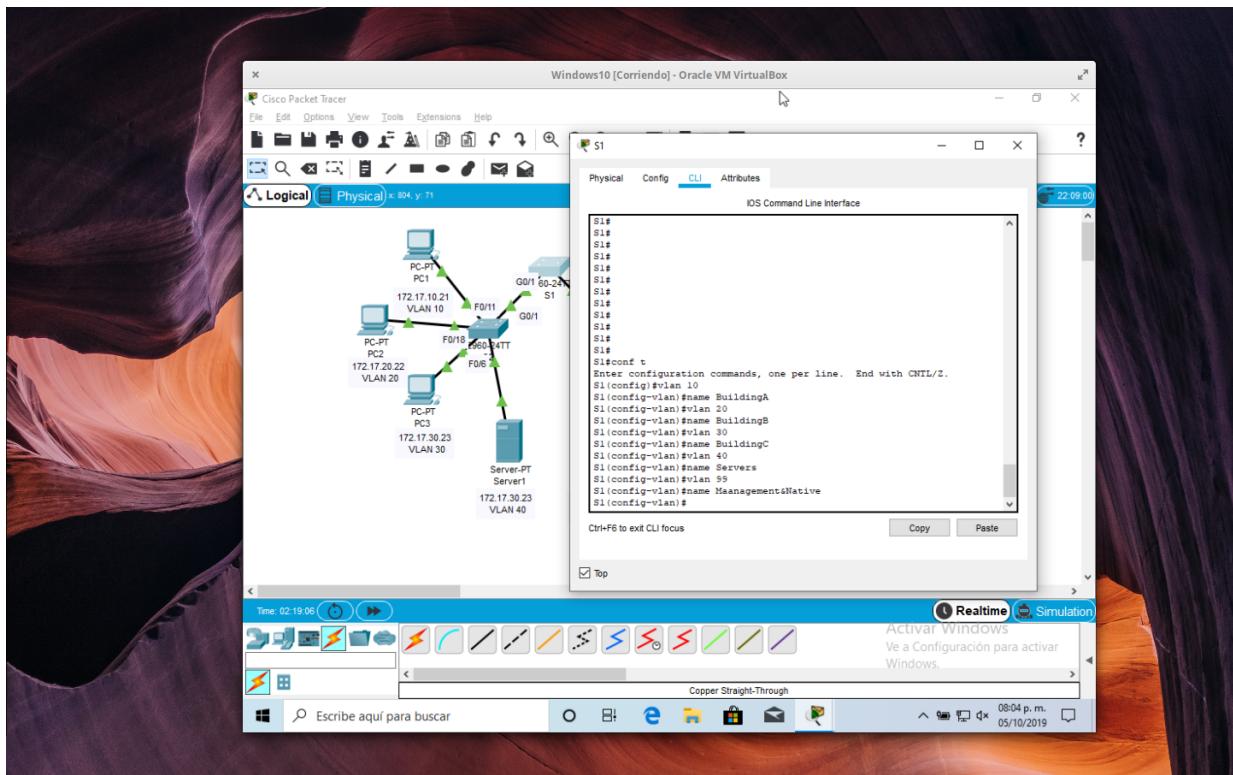


Figura 5: Creación de las VLAN en S1

Verify the VLAN configuration.

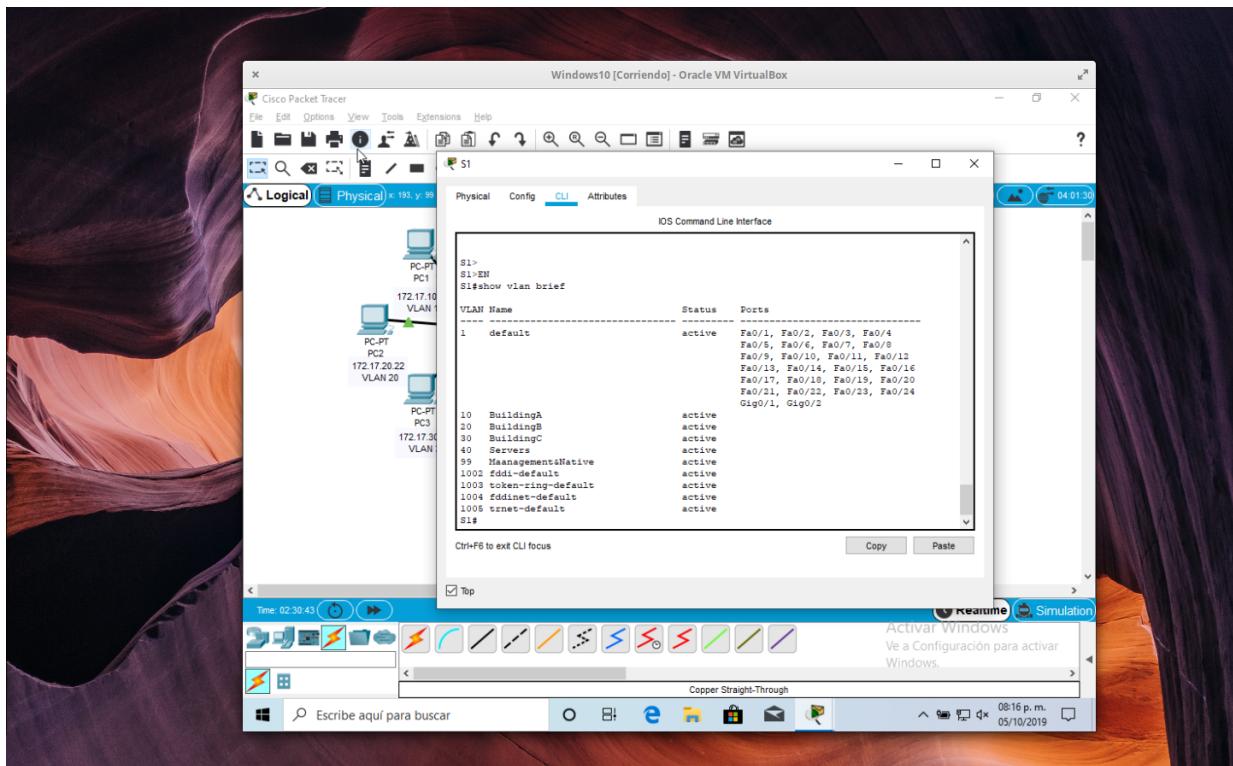


Figura 6: Verificando la configuración de las VLAN

Which command will only display the VLAN name, status, and associated ports on a switch?

show vlan brief

Using the same commands from Step 1, create and name the same VLANs on S2 and S3.

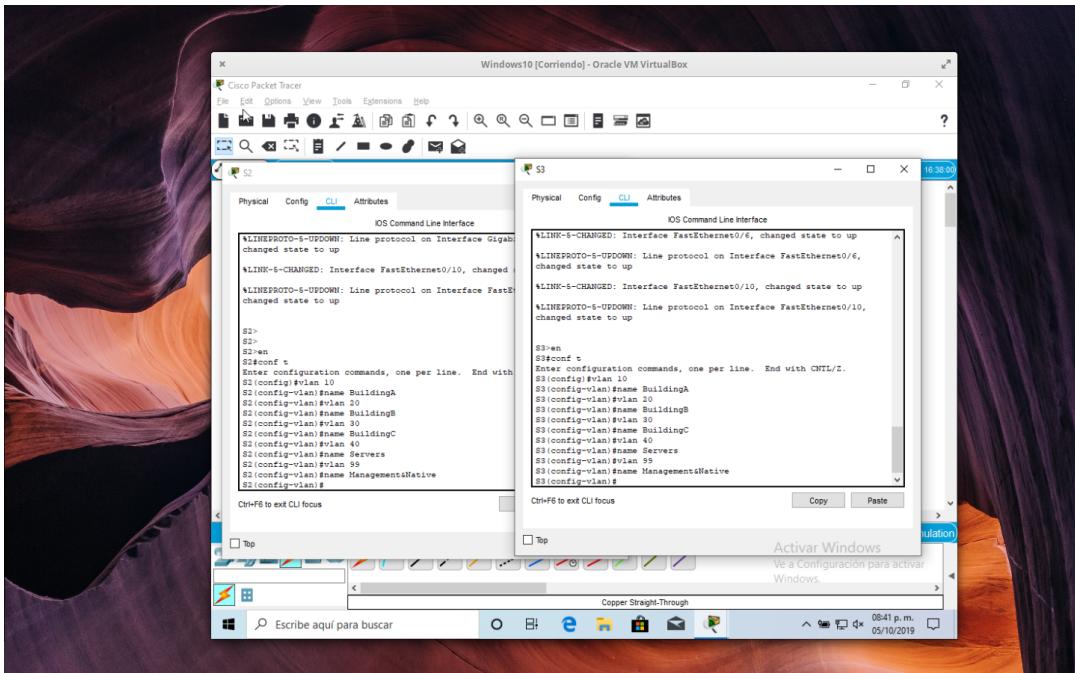


Figura 7: Creación de las VLAN en S2 y S3

Verify the VLAN configuration.

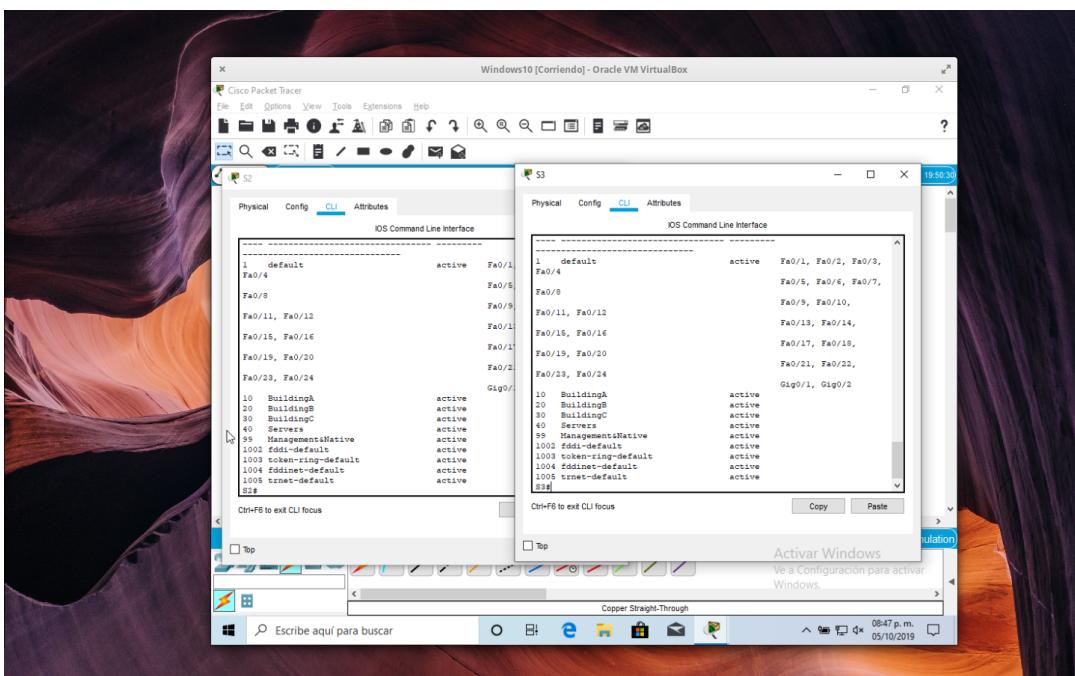


Figura 8: Verificando la creación de las VLAN en S2 Y S3

Assign VLANs to the active ports on S2.

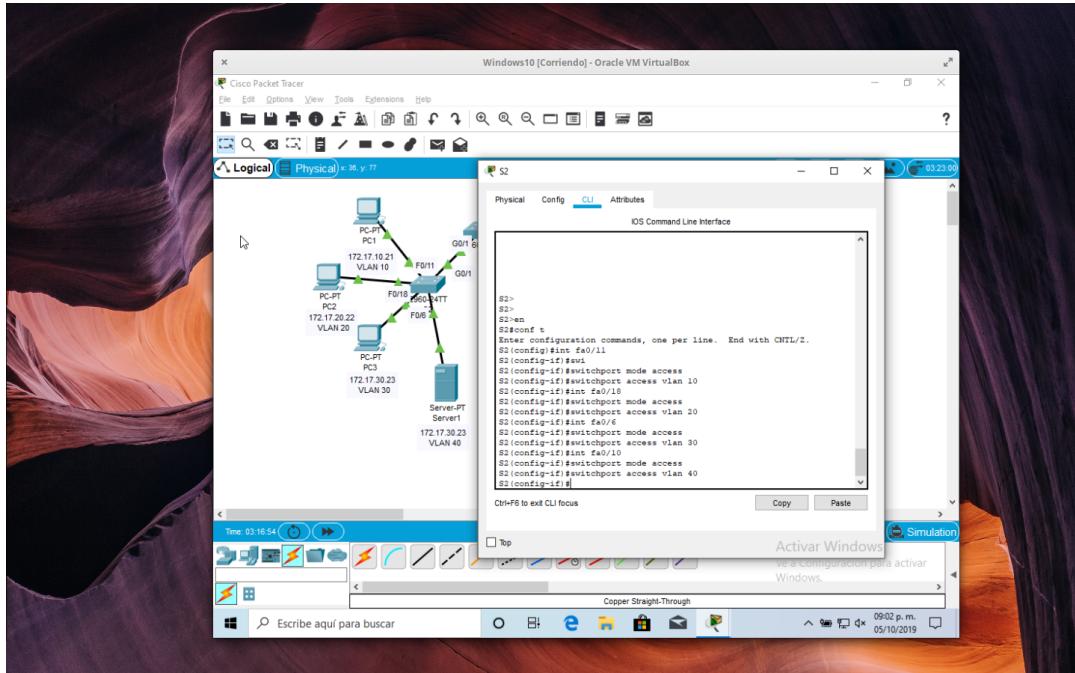


Figura 9: Asignación en S2

Assign VLANs to the active ports on S3.

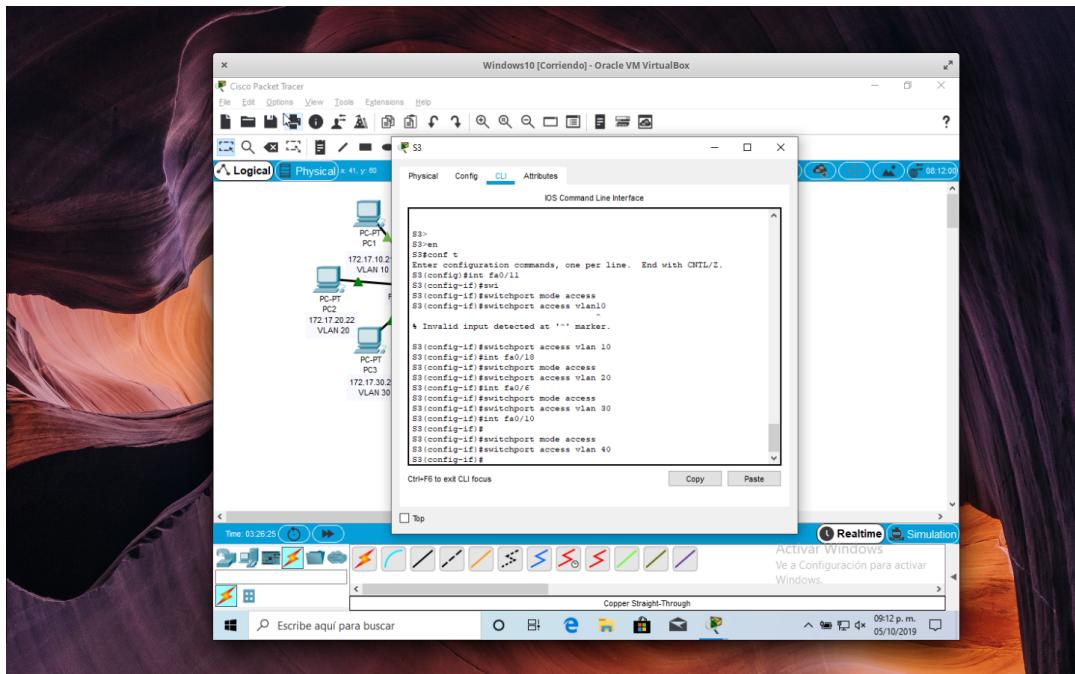


Figura 10: Asignación en S3

Previously, PCs that shared the same network could ping each other successfully.

Try pinging between PC1 and PC4. Although the access ports are assigned to the appropriate VLANs, were the pings successful? Why?

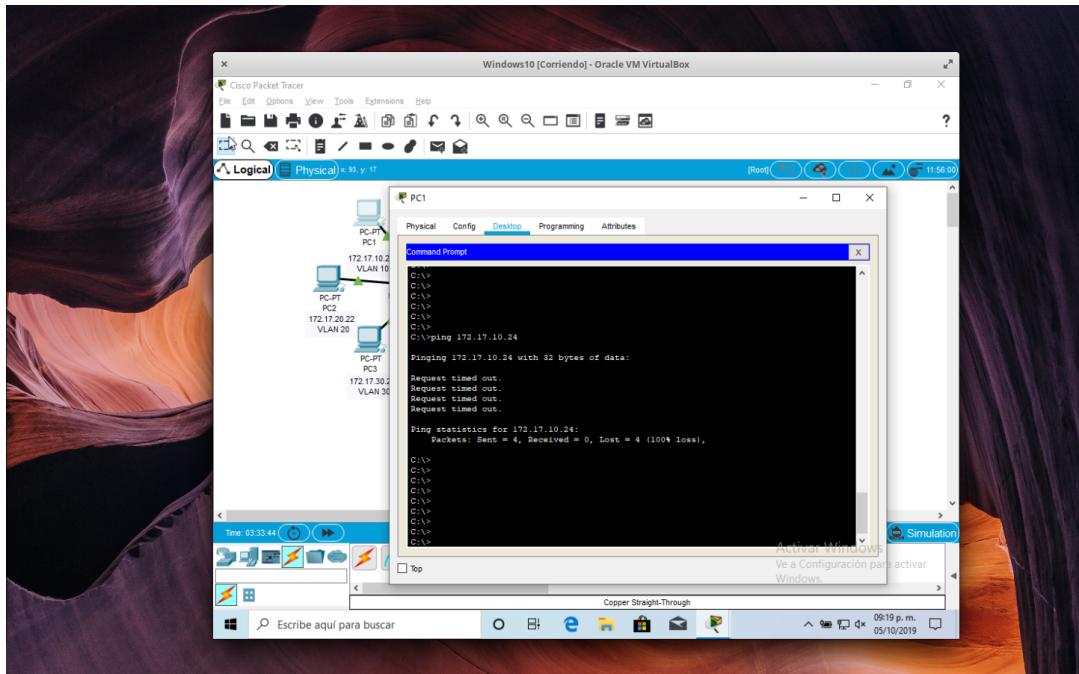


Figura 11: Prueba de conectividad entre PC1 y PC4

Los pings fallaron porque los puertos entre los switch se encuentran en la VLAN 1 y PC1 Y PC4 se encuentran en la VLAN10.

What could be done to resolve this issue?

Configurar los puertos entre los switch como puertos troncales.

5.2. Configurando Trunks.

Verify VLANs

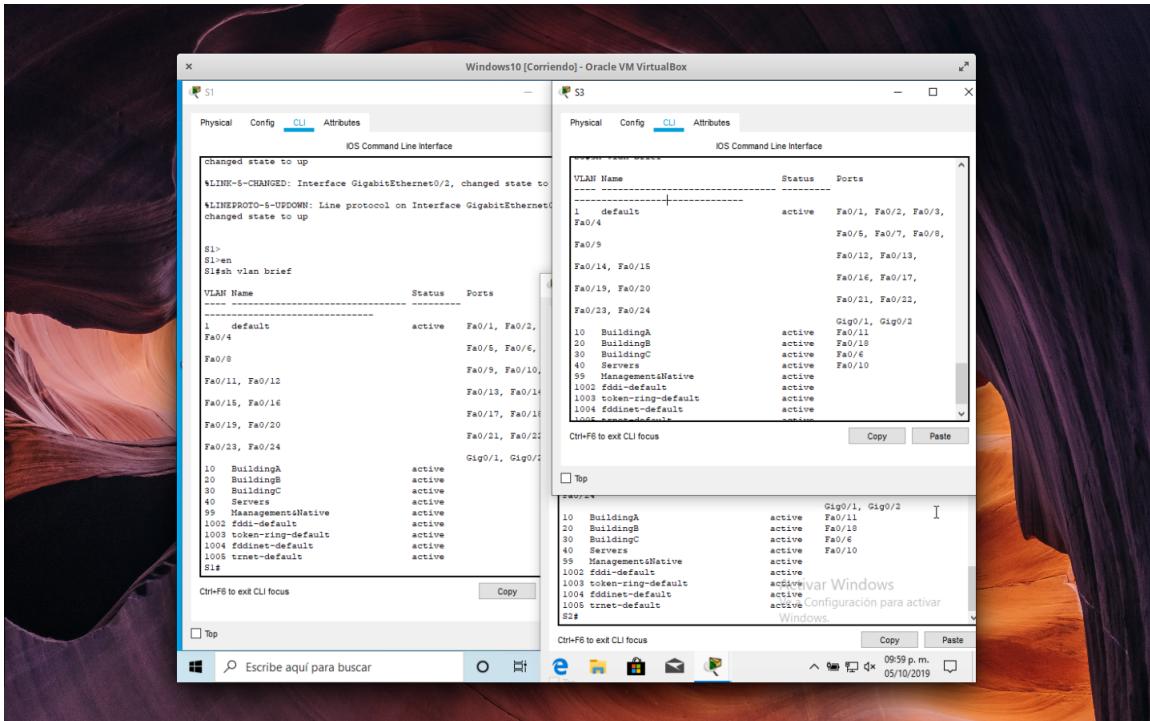


Figura 12: Verificando las VLAN en los 3 switch

Configure VLAN 99 as the native VLAN for G0/1 and G0/2 interfaces on S1.

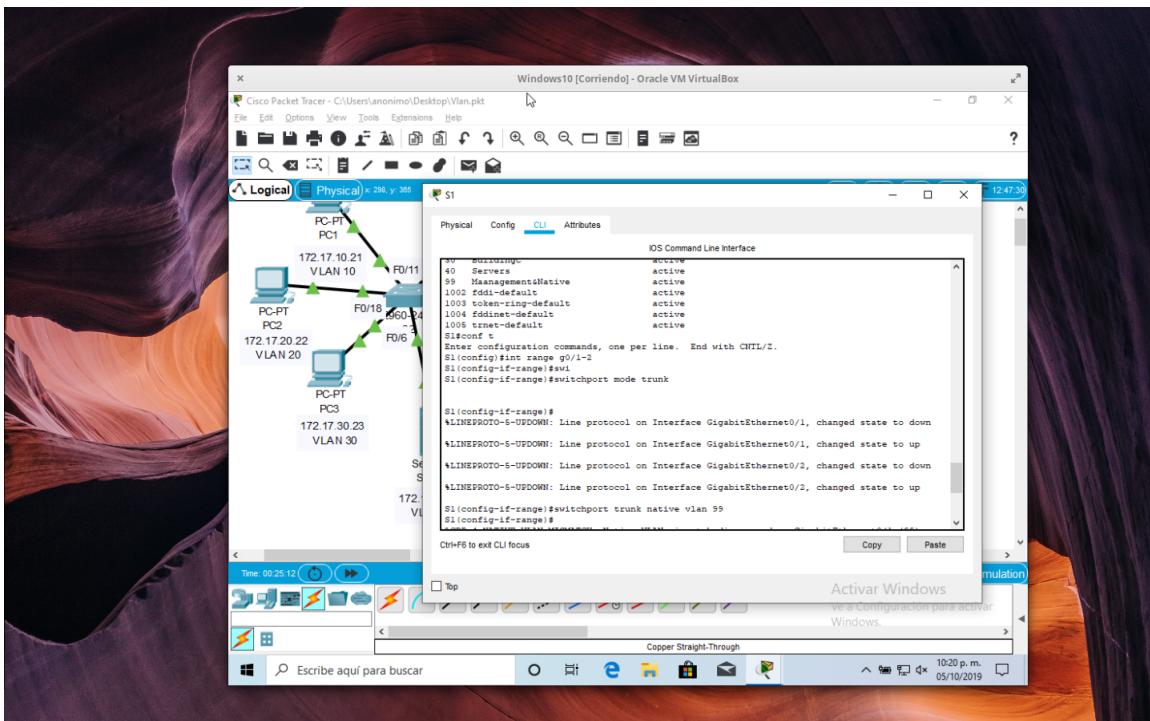


Figura 13: Configurando la VLAN 99

The trunk port takes about a minute to become active due to Spanning Tree. Click Fast Forward Time to speed the process. After the ports become active, you will periodically receive the following syslog messages:

CDP-4-NATIVEVLANMISMATCH: Native VLAN mismatch discovered on GigabitEthernet0/2 (99), with S3 GigabitEthernet0/2 (1).

CDP-4-NATIVEVLANMISMATCH: Native VLAN mismatch discovered on GigabitEthernet0/1 (99), with S2 GigabitEthernet0/1 (1).

You configured VLAN 99 as the native VLAN on S1. However, S2 and S3 are using VLAN 1 as the default native VLAN as indicated by the syslog message.

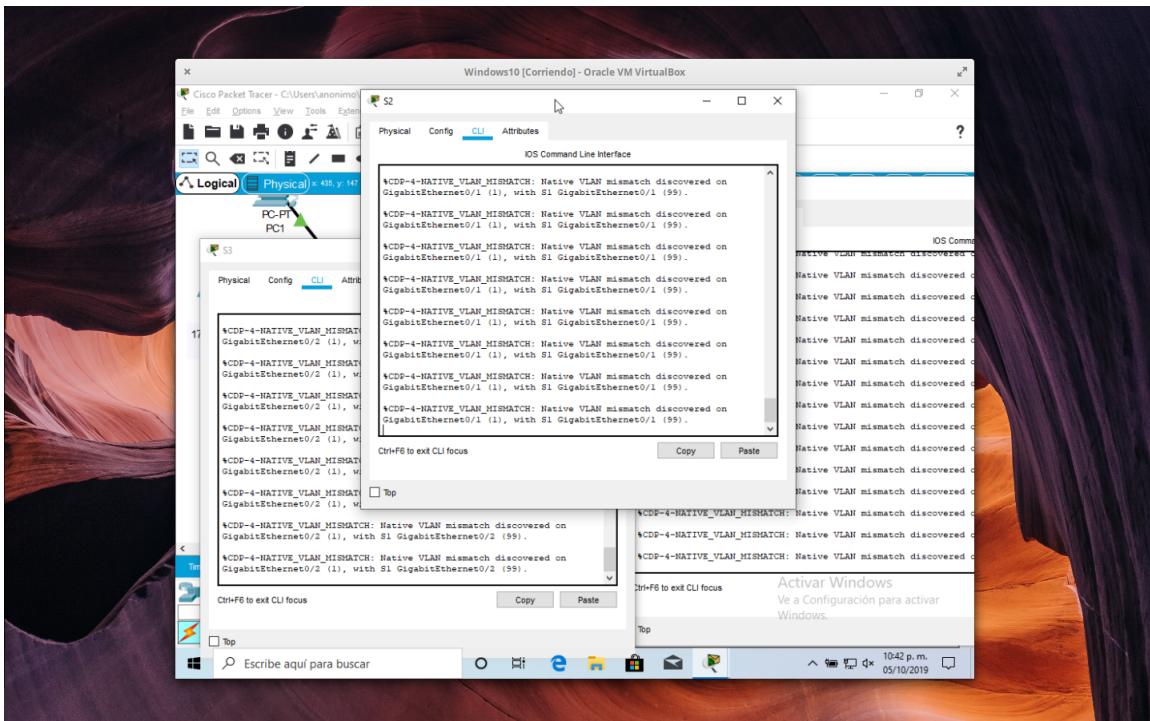


Figura 14: Mensajes

Although you have a native VLAN mismatch, pings between PCs on the same VLAN are now successful. Why?

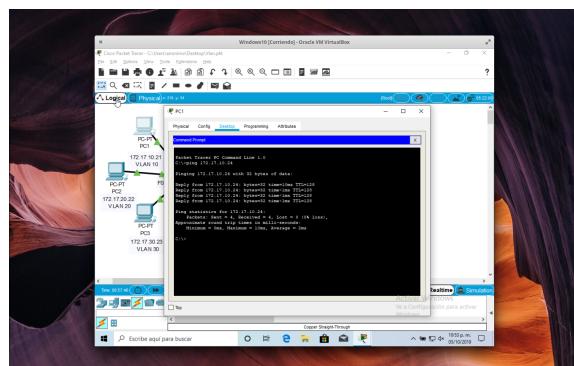


Figura 15: Prueba de conectividad entre PC1 y PC4

Porque ahora habilitamos el trunking en el S1, permitiendo de esta manera la conexión

On S2 and S3, issue the show interface trunk command to confirm that DTP has successfully negotiated trunking with S1 on S2 and S3. The output also displays information about the trunk interfaces on S2 and S3.

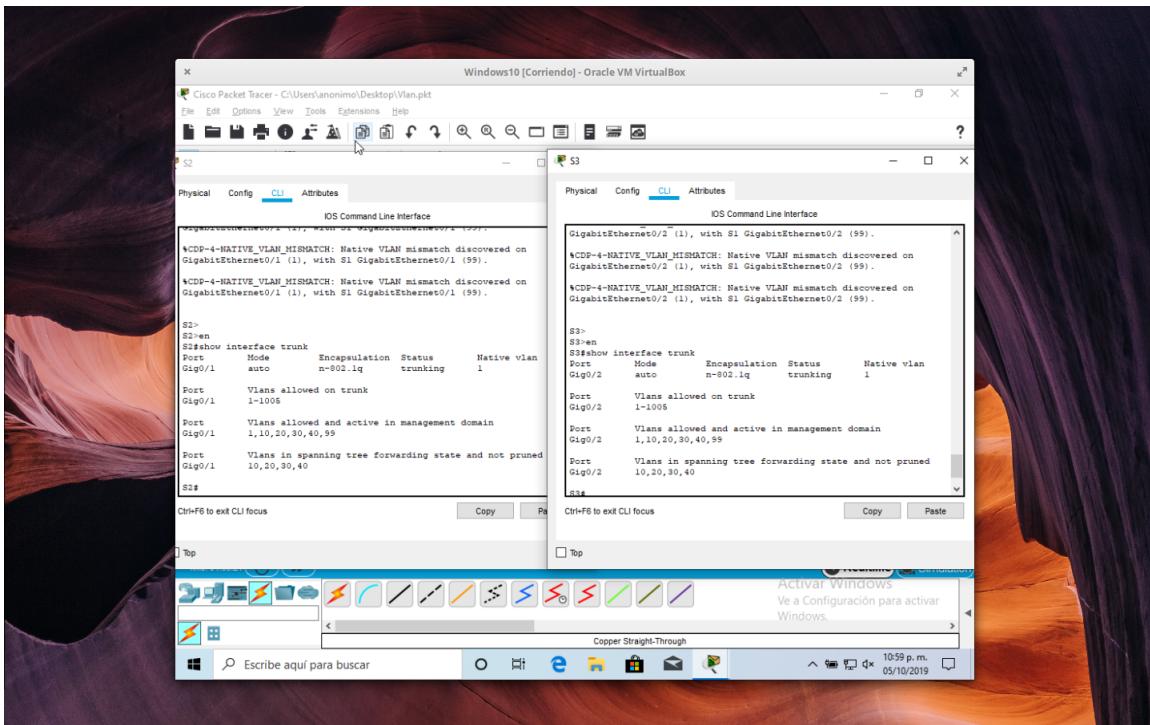


Figura 16: Aplicación del comando

Which active VLANs are allowed to cross the trunk? Tienen permitido cruzar el enlace troncal las VLAN: 1,10,20,30,40 y 99.

Configure VLAN 99 as the native VLAN for the appropriate interfaces on S2.

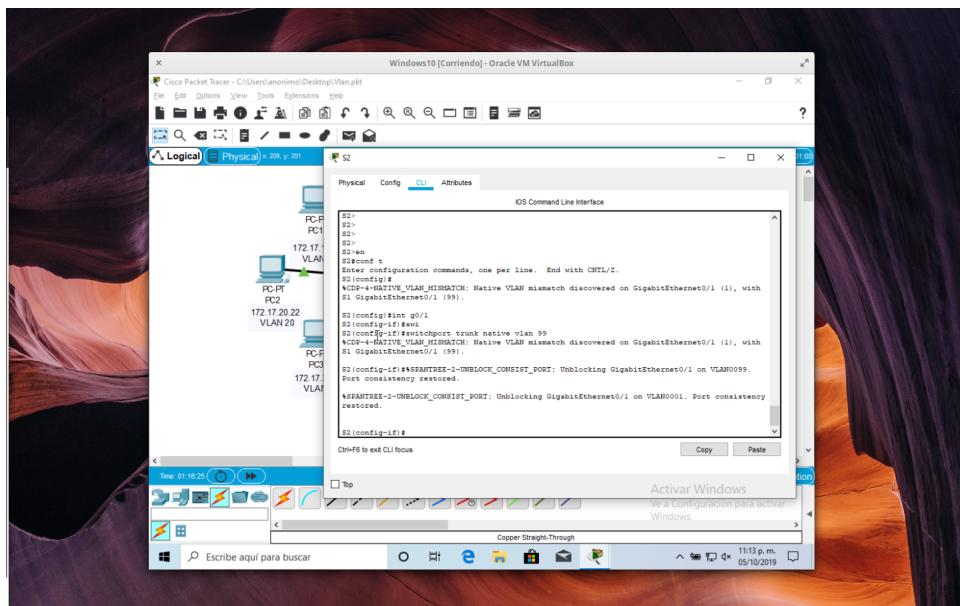


Figura 17: Configurando la VLAN 99 nativa en S2

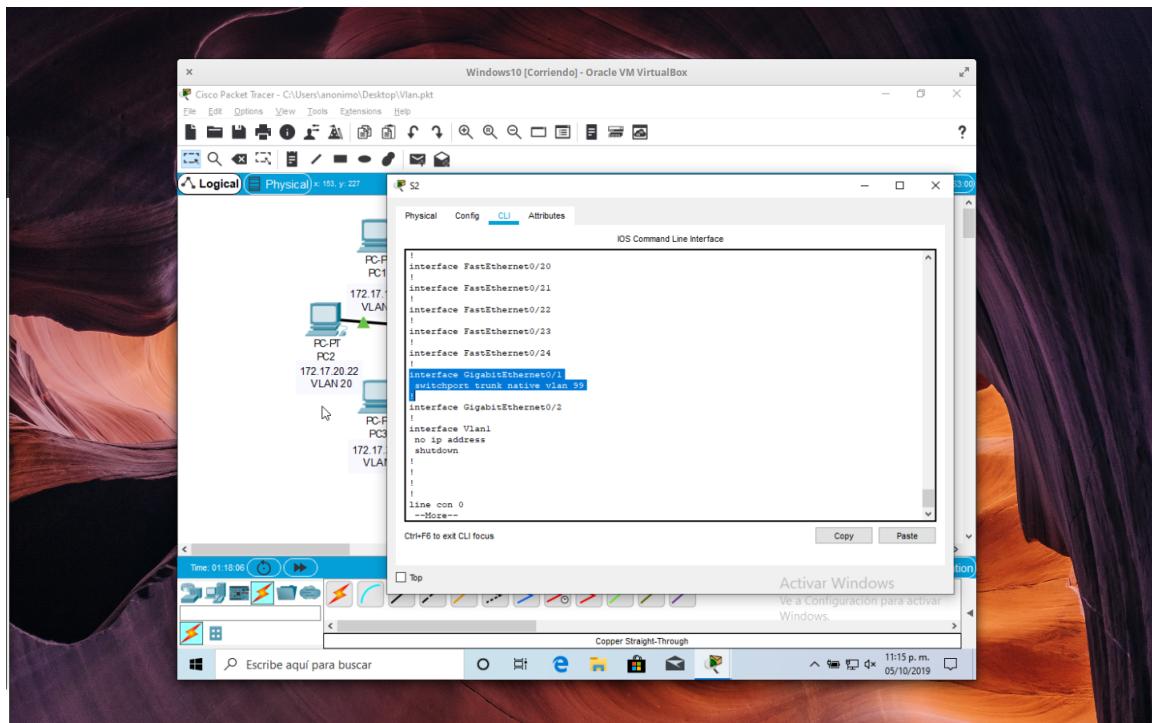


Figura 18: Visualizando la configuración en S2

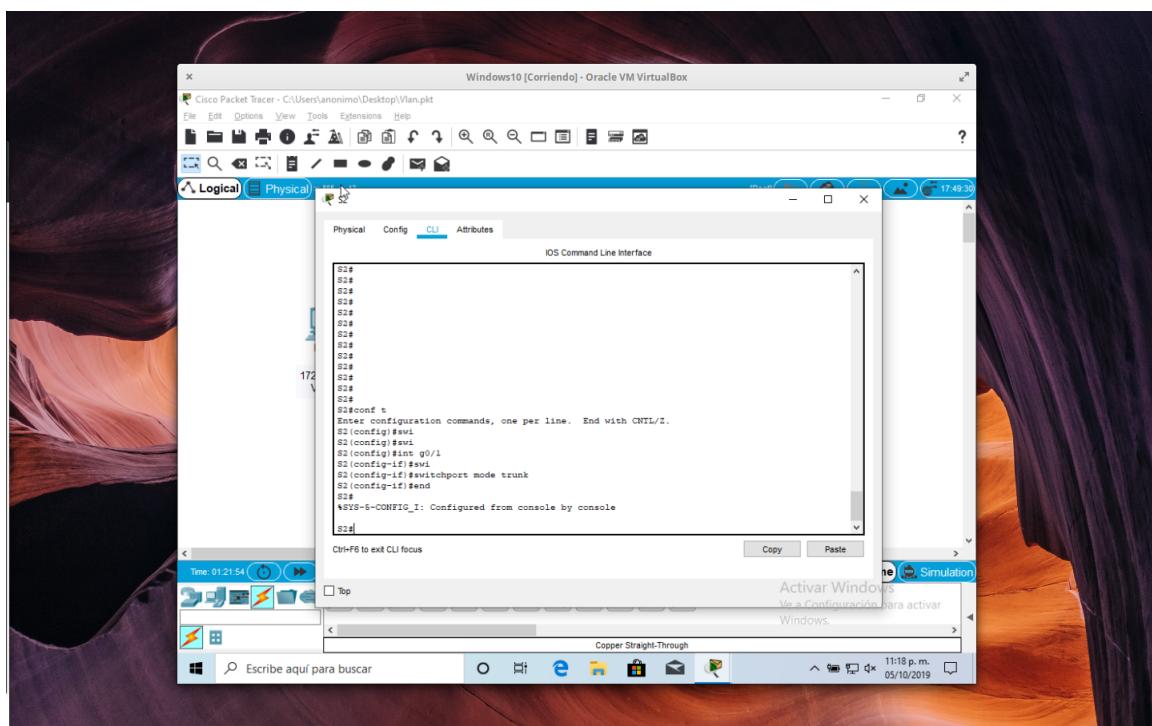


Figura 19: Comando para asegurar que la interfaz sea siempre truncal

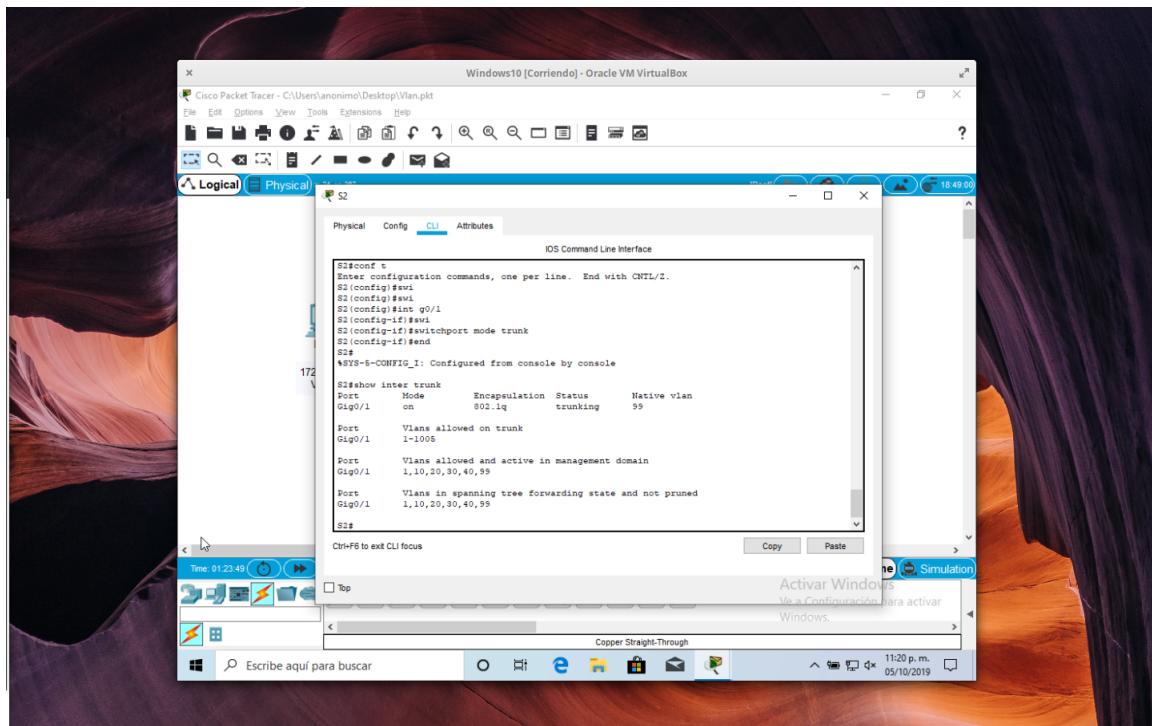


Figura 20: Ejecución del comando show inter trunk en S2

Correct the native VLAN mismatch on S3.

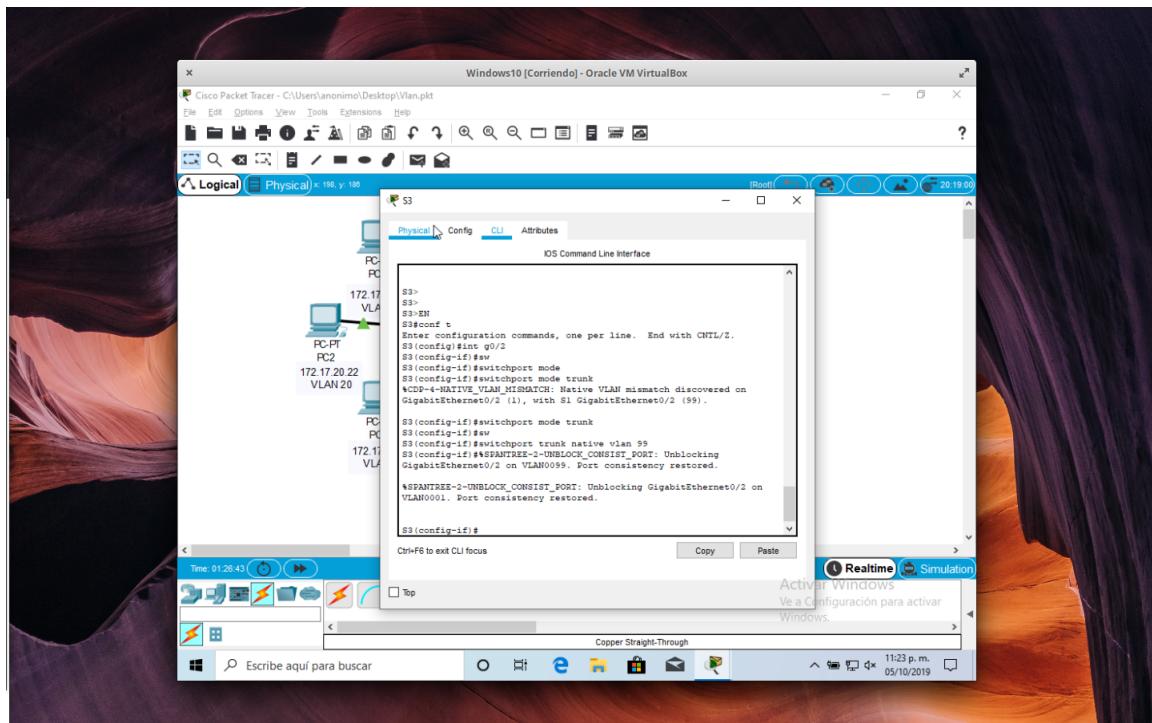


Figura 21: Configurando la VLAN 99 nativa en S3

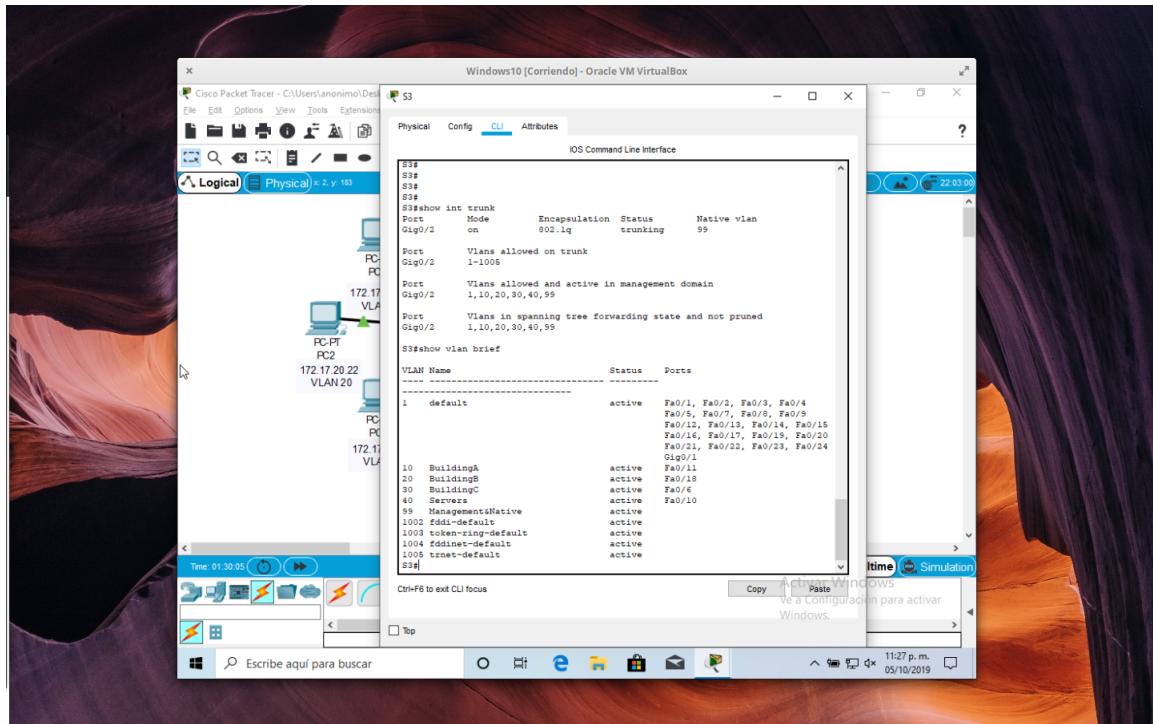


Figura 22: Verificando la configuración de S3

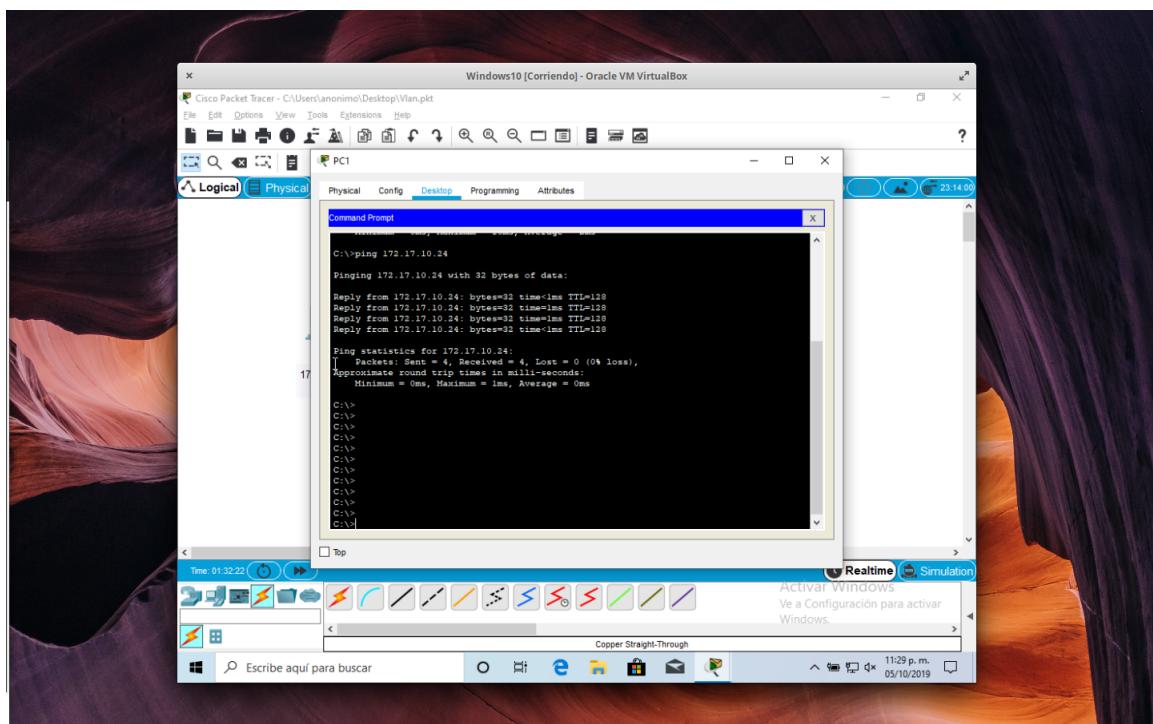


Figura 23: Prueba de conectividad entre PC1 y PC4

6. Conclusiones

Una VLAN nos da la posibilidad de gestionar a través del switch con el fin de dividir este en “varios switches virtuales”. Como se vio, las VLAN son agrupaciones lógicas, que en general se utilizan usualmente en la departamentalización de una organización.

7. Referencias

[1] Cisco Networking Academy Builds IT Skills Education For Future Careers”, Netacad.com, 2019. [Online]. Available: <https://www.netacad.com/es>. [Accessed: 27/09/19].