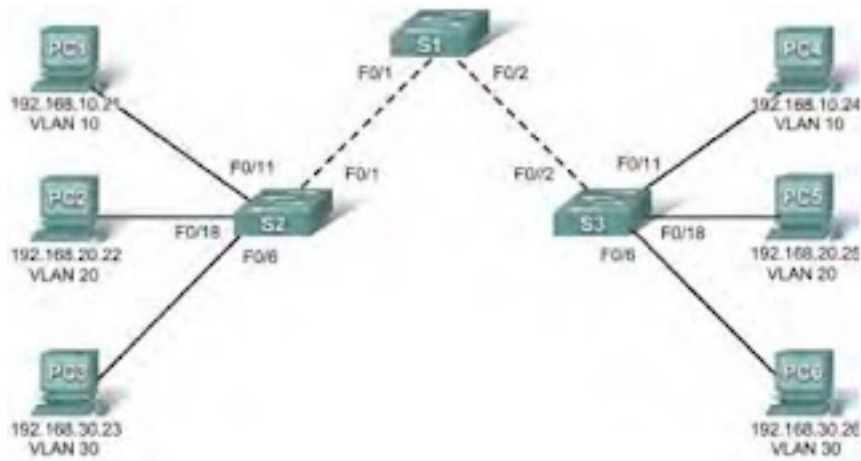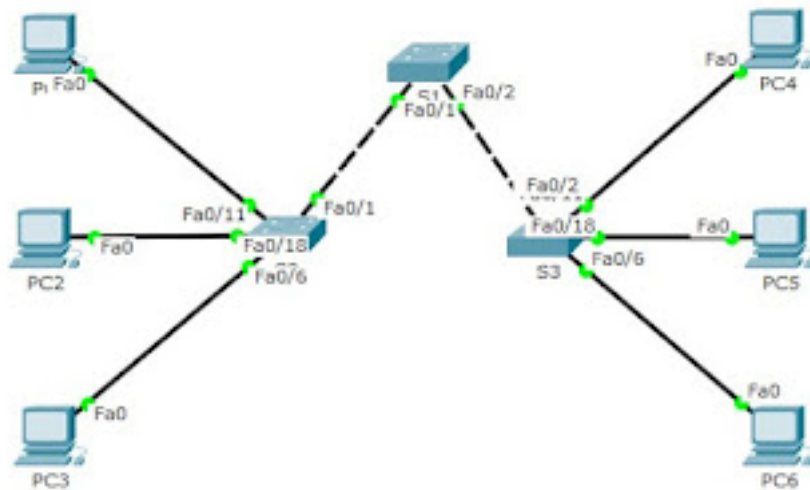En esta práctica, realizamos la configuración de 3 switch y 6 computadoras en donde utilizamos una conexión entre computadoras. El propósito de esta práctica es configurar las VLAN y el protocolo de enlaces troncales (VTP) en todos los switches por procedimiento, para su uso.

Topología

2. Conectamos cada dispositivo con sus interfaces correspondientes.

3. En cada switch utilizamos el comando show vlan para verificar que solo existan VLAN predeterminadas.

```
Switch>ena
Switch#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID      MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- --------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001    1500  -      -      -        -    -        0      0
1002 fddi  101002    1500  -      -      -        -    -        0      0
1003 tr    101003    1500  -      -      -        -    -        0      0
1004 fdnet 101004    1500  -      -      -        ieee -        0      0
1005 trnet 101005    1500  -      -      -        ibm  -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
```
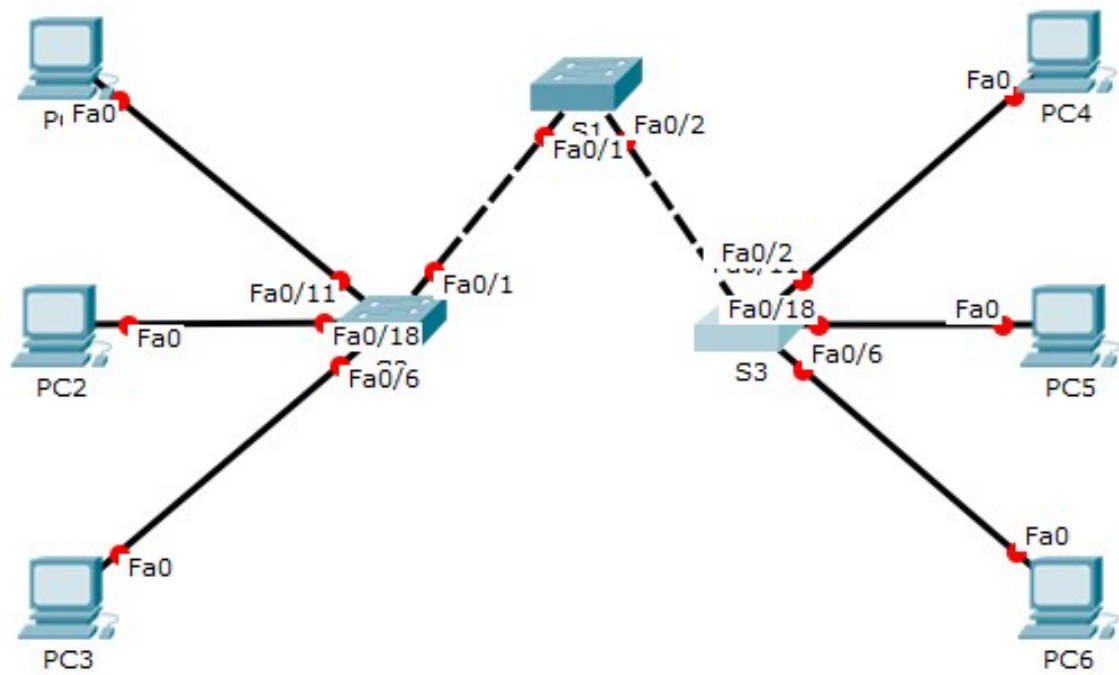
4. Deshabilitamos todos los puertos con el comando shutdown en cada uno de los switch.

```
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface range fa0/1-24
Switch(config-if-range)#shutdown
```

5. Colocamos en cada switch su hostname, contraseña consola, secreta y vty, para después guardar cambios.


```
Switch>ena
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#enable password class
S1(config)#no ip domain-lookup
S1(config)#line console 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#line vty 0 15
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#end
S1#copy running-config startup-config
%SYS-5-CONFIG_I: Configured from console by console

Destination filename [startup-config]?
Building configuration...
[OK]
```

```
Switch>ena
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#enable password class
S2(config)#no ip domain-lookup
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#end
S2#copy running-config startup-config
%SYS-5-CONFIG_I: Configured from console by console

Destination filename [startup-config]?
Building configuration...
[OK]
```

```
Switch>ena
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#enable password class
S3(config)#no ip domain-lookup
S3(config)#line console 0
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#line vty 0 15
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#end
S3#copy running-config startup-config
%SYS-5-CONFIG_I: Configured from console by console

Destination filename [startup-config]?
Building configuration...
[OK]
```

6. Volvemos a habilitar los puertos en el S2 y S3.

```
S2(config)#interface fa0/6                   S3(config)#interface fa0/6
S2(config-if)#switchport mode access         S3(config-if)#switchport mode access
S2(config-if)#no shutdown                    S3(config-if)#no shutdown

S2(config-if)#exit                           S3(config-if)#exit
S2(config)#interface fa0/11                  S3(config)#interface fa0/11
S2(config-if)#switchport mode access         S3(config-if)#switchport mode access
S2(config-if)#no shutdown                    S3(config-if)#no shutdown

S2(config-if)#exit                           S3(config-if)#exit
S2(config)#interface fa0/18                  S3(config)#interface fa0/18
S2(config-if)#switchport mode access         S3(config-if)#switchport mode access
S2(config-if)#no shutdown                    S3(config-if)#no shutdown
```

7. Volvemos a habilitar los puertos troncales del S1, S2 y S3.

```
S1(config)#interface fa0/1
S1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down
S1(config-if)#interface fa0/2
S1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to down
S1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
```

```
S2(config)#interface fa0/1
S2(config-if)#no shutdown

S2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
```

```
S3(config)#interface fa0/2
S3(config-if)#no shutdown

S3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2,
changed state to up
```

8. Configuramos las interfaces Ethernet de todas las PC con las direcciones IP y las Gateways predeterminadas.

Tabla de direccionamiento

Dispositivo Nombre de host	Interfaz	Dirección IP	Máscara de subred	Gateway predeterminada
S1	VLAN 99	172.17.99.11	255.255.255.0	N/C
S2	VLAN 99	172.17.99.12	255.255.255.0	N/C
S3	VLAN 99	172.17.99.13	255.255.255.0	N/C
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

Asignaciones de puertos (Switches 2 y 3)

Puertos	Asignación	Red
Fa0/1 – 0/5	Enlaces troncales 802.1q (VLAN 99 nativa)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Tarea 1: Preparar la red

9. Verificamos que la PC1 pueda tener conexión con la PC4, la PC2 con la PC5 y la PC3 con la PC6.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC1	PC4	ICMP		0.000	N	0	(e...
	Successful	PC2	PC5	ICMP		0.000	N	1	(e...
	Successful	PC3	PC6	ICMP		0.000	N	2	(e...

10. A continuación, utilizaremos al S1 como servidor VTP, pero primero verificamos las configuraciones VTP actuales en los tres switch.

```
S1#show vtp status
VTP Version                      : 2
Configuration Revision           : 0
Maximum VLANs supported locally  : 255
Number of existing VLANs         : 5
VTP Operating Mode               : Server
VTP Domain Name                  :
VTP Pruning Mode                 : Disabled
VTP V2 Mode                      : Disabled
VTP Traps Generation             : Disabled
MD5 digest                       : 0x7D 0x5A 0xA6 0x0E 0x9A 0x72 0xA0 0x3A
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 0.0.0.0 (no valid interface found)
```

```
S2#show vtp status
VTP Version                      : 2
Configuration Revision           : 0
Maximum VLANs supported locally  : 255
Number of existing VLANs         : 5
VTP Operating Mode               : Server
VTP Domain Name                  :
VTP Pruning Mode                 : Disabled
VTP V2 Mode                      : Disabled
VTP Traps Generation             : Disabled
MD5 digest                       : 0x7D 0x5A 0xA6 0x0E 0x9A 0x72 0xA0 0x3A
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 0.0.0.0 (no valid interface found)
```

```
S3#show vtp status
VTP Version                      : 2
Configuration Revision           : 0
Maximum VLANs supported locally  : 255
Number of existing VLANs         : 5
VTP Operating Mode               : Server
VTP Domain Name                  :
VTP Pruning Mode                 : Disabled
VTP V2 Mode                      : Disabled
VTP Traps Generation             : Disabled
MD5 digest                       : 0x7D 0x5A 0xA6 0x0E 0x9A 0x72 0xA0 0x3A
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 0.0.0.0 (no valid interface found)
```

Nos damos cuenta que los tres switches se encuentran en modo servidos, el cual es el modo VTP predeterminado para la mayoría de los switches.

11. Establecemos Lab 4 como nombre de dominio VTP y cisco como contraseña de VTP en los tres switches.

12. Configuraremos el S1 en modo servidor.

```
S1(config)#vtp mode server
Device mode already VTP SERVER.
S1(config)#vtp domain Lab4
Changing VTP domain name from NULL to Lab4
S1(config)#exit
```
```
S1(config)#vtp password cisco
Setting device VLAN database password to cisco
S1(config)#end
```

13. Configuramos el S2 en modo cliente.

```
S2(config)#vtp mode client
Setting device to VTP CLIENT mode.
S2(config)#vtp domain Lab4
Changing VTP domain name from NULL to Lab4
S2(config)#vtp password cisco
Setting device VLAN database password to cisco
S2(config)#end
```

14. Configuramos el S3 en modo transparente.

```
S3(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
S3(config)#vtp domain Lab4
Changing VTP domain name from NULL to Lab4
S3(config)#vtp password cisco
Setting device VLAN database password to cisco
S3(config)#end
```

15. Confiramos los enlaces troncales y la VLAN nativa para los puertos de enlace troncales en los tres switch.

```
S1(config)#interface range fa0/1-5
S1(config-if-range)#switchport mode trunk


S1(config-if-range)#switchport trunk native vlan 99
S1(config-if-range)#no shutdown
```
```
S2(config)#interface range fa0/1-5
S2(config-if-range)#switchport mode trunk
S2(config-if-range)#switchport trunk native vlan 99
S2(config-if-range)#no shutdown
```
```
S3(config)#interface range fa0/1-5
S3(config-if-range)#switchport mode trunk
S3(config-if-range)#switchport trunk native vlan 99
S3(config-if-range)#no shutdown
```

16. Configuramos la seguridad de Puerto en los switches de capa de acceso S2 y S3, por lo cual solo configuraremos los puertos fa0/6, fa0/11 y fa0/18 de modo tal que sólo permitan un solo host y aprendan la dirección MAC del host de manera dinámica.

```
S2(config)#interface fa0/6
S2(config-if)#switchport port-security
S2(config-if)#switchport port-security maximum 1
S2(config-if)#switchport port-security mac-address sticky
S2(config-if)#exit
S2(config)#interface fa0/11
S2(config-if)#switchport port-security
S2(config-if)#switchport port-security maximum 1
S2(config-if)#switchport port-security mac-address sticky
S2(config-if)#exit
S2(config)#interface fa0/18
S2(config-if)#switchport port-security
S2(config-if)#switchport port-security maximum 1
S2(config-if)#switchport port-security mac-address sticky
S2(config-if)#exit

S3(config)#interface fa0/6
S3(config-if)#switchport port-security
S3(config-if)#switchport port-security maximum 1
S3(config-if)#switchport port-security mac-address sticky
S3(config-if)#exit
S3(config)#interface fa0/11
S3(config-if)#switchport port-security
S3(config-if)#switchport port-security maximum 1
S3(config-if)#switchport port-security mac-address sticky
S3(config-if)#exit
S3(config)#interface fa0/18
S3(config-if)#switchport port-security
S3(config-if)#switchport port-security maximum 1
S3(config-if)#switchport port-security mac-address sticky
S3(config-if)#exit
```

17. Configuraremos las VLAN en el servidor VTP, que es el S1.

```
S1(config)#vlan 99
S1(config-vlan)#name management
S1(config-vlan)#exit
S1(config)#vlan 10
S1(config-vlan)#name faculty/staff
S1(config-vlan)#exit
S1(config)#vlan 20
S1(config-vlan)#name students
S1(config-vlan)#exit
S1(config)#vlan 30
S1(config-vlan)#name guest
S1(config-vlan)#exit
```

18. Verificamos que se hayan creado las VLAN en S1 con el comando show vlan brief.

```
S1#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/3, Fa0/4, Fa0/5, Fa0/6
                                                Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                                Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   faculty/staff                    active
20   students                         active
30   guest                            active
99   management                       active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

19. Utilizaremos el mismo comando en el S2 y S3 para determinar si el servidor VTP ha enviado su configuración VLAN a todo los switches.

```
S2#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                                Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/10, Fa0/11, Fa0/12, Fa0/13
                                                Fa0/14, Fa0/15, Fa0/16, Fa0/17
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24, Gig0/1
                                                Gig0/2
10   faculty/staff                    active
20   students                         active
30   guest                            active
99   management                       active
```

```
S3#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/3, Fa0/4, Fa0/5
                                                Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/10, Fa0/11, Fa0/12, Fa0/13
                                                Fa0/14, Fa0/15, Fa0/16, Fa0/17
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24, Gig0/1
                                                Gig0/2
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

20. Configuramos las cuatro VLAN agregadas en el S1 anteriormente en el S3.

```
S3(config)#vlan 88
S3(config-vlan)#name test
S3(config-vlan)#no vlan 88
S3(config)#vlan 99
S3(config-vlan)#name management
S3(config-vlan)#exit
S3(config)#vlan 10
S3(config-vlan)#name faculty/staff
S3(config-vlan)#exit
S3(config)#vlan 20
S3(config-vlan)#name students
S3(config-vlan)#exit
S3(config)#vlan 30
S3(config-vlan)#name guest
S3(config-vlan)#exit
```

21. Configuraremos la dirección de la interfaz de administración en los tres switches.

```
S1(config)#interface vlan 99
S1(config-if)#ip address 172.17.99.11 255.255.255.0
S1(config-if)#no shutdown
%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up
```

```
S2(config)#interface vlan 99
S2(config-if)#ip address 172.17.99.12 255.255.255.0
S2(config-if)#no shutdown
S2(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up
```

```
S3(config)#interface vlan 99
S3(config-if)#ip address 172.17.99.13 255.255.255.0
S3(config-if)#no shutdown
%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up
```

22. Hacemos conexión del S1 al S2, del S1 al S3 y del S2 al S3.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	S1	S2	ICMP		0.000	N	0	(e...
	Successful	S1	S3	ICMP		0.000	N	1	(e...
	Successful	S2	S3	ICMP		0.000	N	2	(e...

23. Asignamos puertos de switch a las VLAN en los tres switches y guardamos cambios.

```
S1(config)#interface range fa0/6-10
S1(config-if-range)#switchport access vlan 30
S1(config-if-range)#interface range fa0/11-17
S1(config-if-range)#switchport access vlan 10
S1(config-if-range)#interface range fa0/18-24
S1(config-if-range)#switchport access vlan 20
S1(config-if-range)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

```
S2(config)#interface range fa0/6-10
S2(config-if-range)#switchport access vlan 30
S2(config-if-range)#interface range fa0/11-17
S2(config-if-range)#switchport access vlan 10
S2(config-if-range)#interface range fa0/18-24
S2(config-if-range)#switchport access vlan 20
S2(config-if-range)#end
S2#copy running-config startup-config
%SYS-5-CONFIG_I: Configured from console by console

Destination filename [startup-config]?
Building configuration...
[OK]
```

```
S3(config)#interface range fa0/6-10
S3(config-if-range)#switchport access vlan 30
S3(config-if-range)#interface range fa0/11-17
S3(config-if-range)#switchport access vlan 10
S3(config-if-range)#interface range fa0/18-24
S3(config-if-range)#switchport access vlan 20
S3(config-if-range)#end
S3#copy running-config startup-config
%SYS-5-CONFIG_I: Configured from console by console

Destination filename [startup-config]?
Building configuration...
[OK]
```

24. Confirmamos nuestras conexiones.