Universidad de San Carlos de Guatemala

Facultad de Ingeniería

Escuela de Ciencias y Sistemas

Redes de Computadoras 2, Práctica 2

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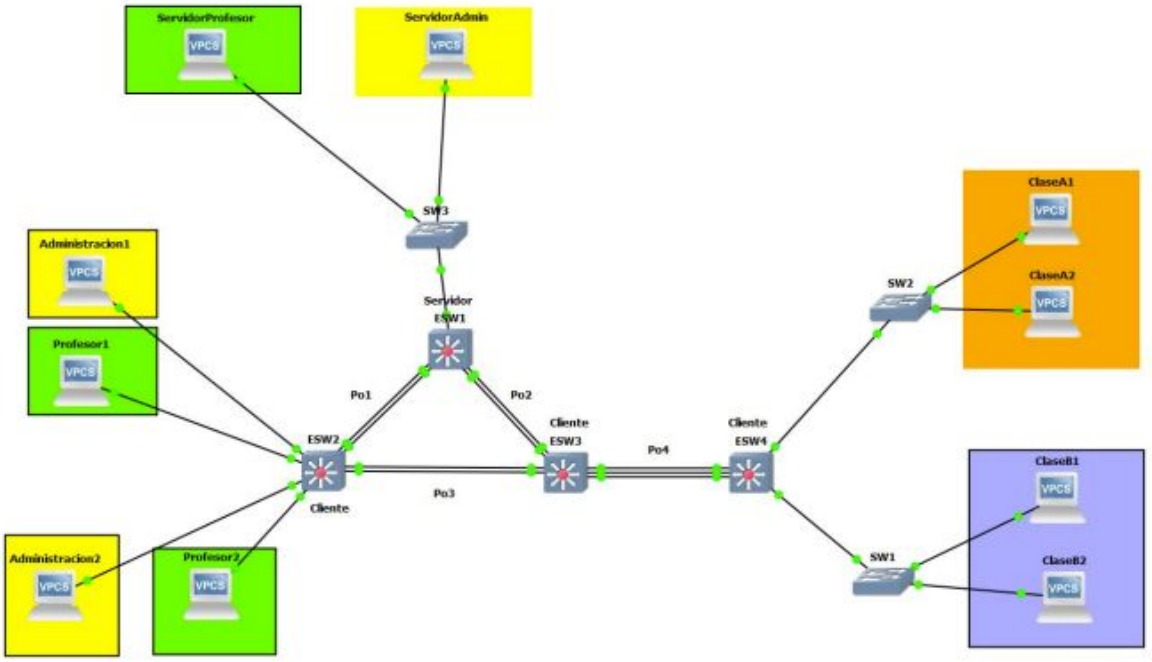
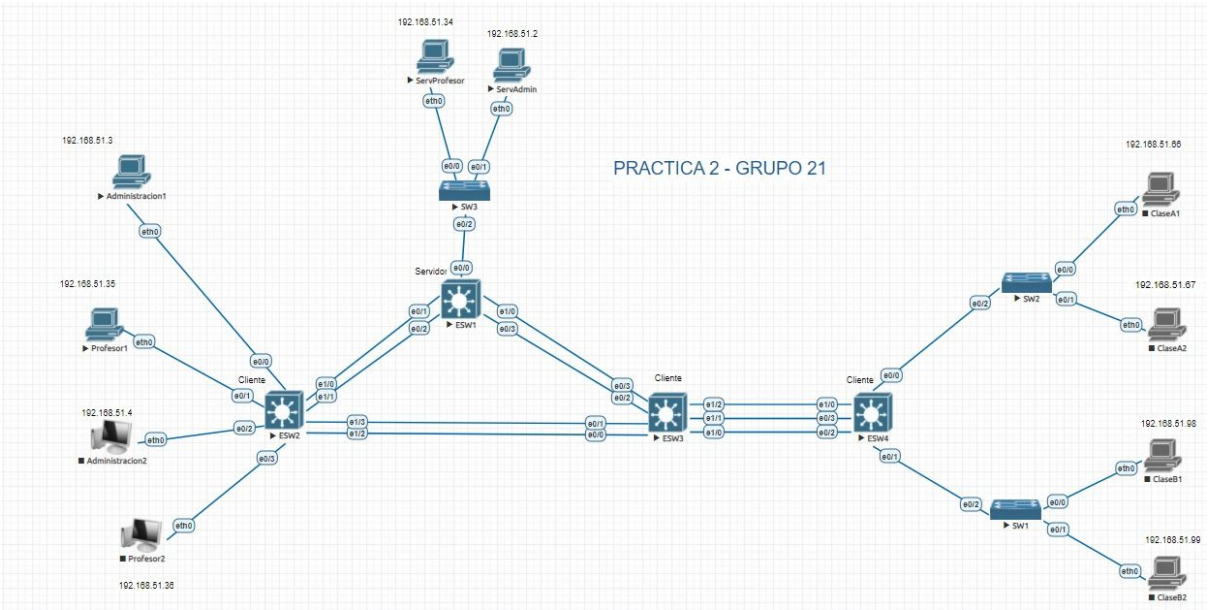
Guatemala, febrero de 2021

Topología

Topologia a implementar:



Topología implementada: A continuación se muestra la topología a ser configurada en el programa de EVE-NG.



Para esta topología se hicieron las siguientes configuraciones:

1. VTP
2. Creación de VLANS
3. Direcciones de red
4. Configuraciones STP

5. Port-channels
6. Access List

VTP

La configuración VTP se realizó en todos los ESW, con la diferencia de que el se utilizó uno como servidor y los demás como clientes:

1. **ESW1:**

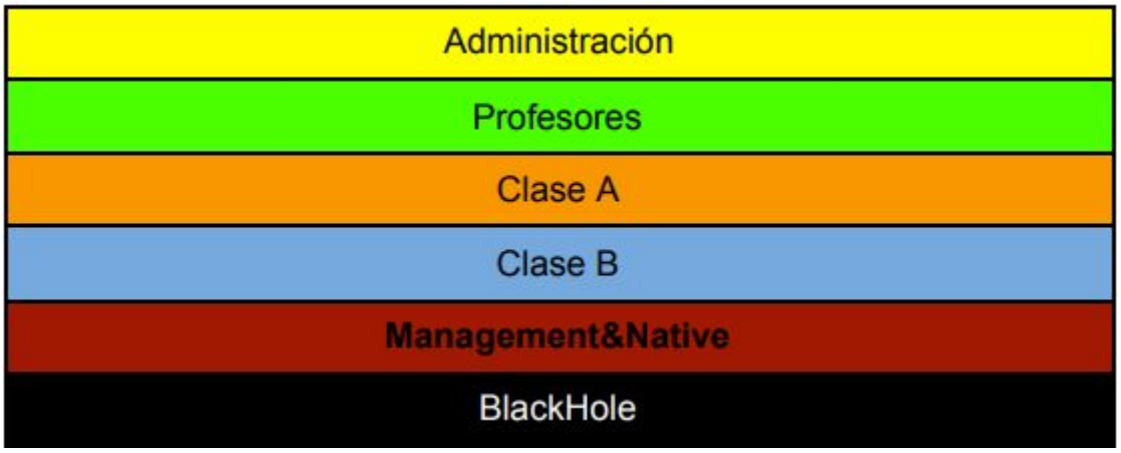
```
configure terminal
vtp domain Grupo21
vtp password Grupo21
vtp mode server
vtp version 2
exit
```

2. **ESW2, ESW3, ESW4:**

```
* ESW2, ESW3 , ESW4 y Switch
configure terminal
vtp domain Grupo21
vtp password Grupo21
vtp version 2
vtp mode client
exit
```

VLANS

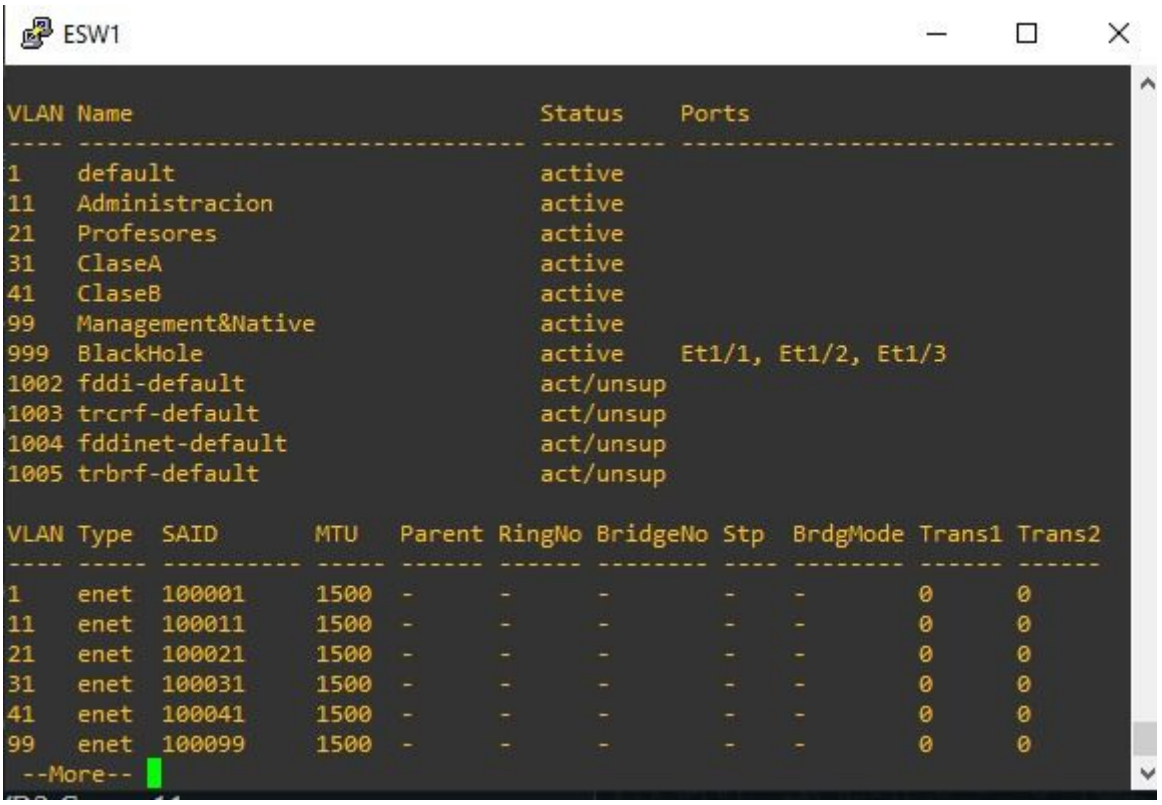
Se deben crear las siguientes VLANS para la configuración de la topología mostrada anteriormente:



El número de cada VLAN se definió de la siguiente manera:

Configuración en EVE-NG:

```
-- VLAN (ESW1)
configure terminal
vlan 11
name Administracion
exit
vlan 21
name Profesores
exit
vlan 31
name ClaseA
exit
vlan 41
name ClaseB
exit
vlan 99
name Management&Native
exit
vlan 999
name BlackHole
exit
exit
```



Direcciones de Red

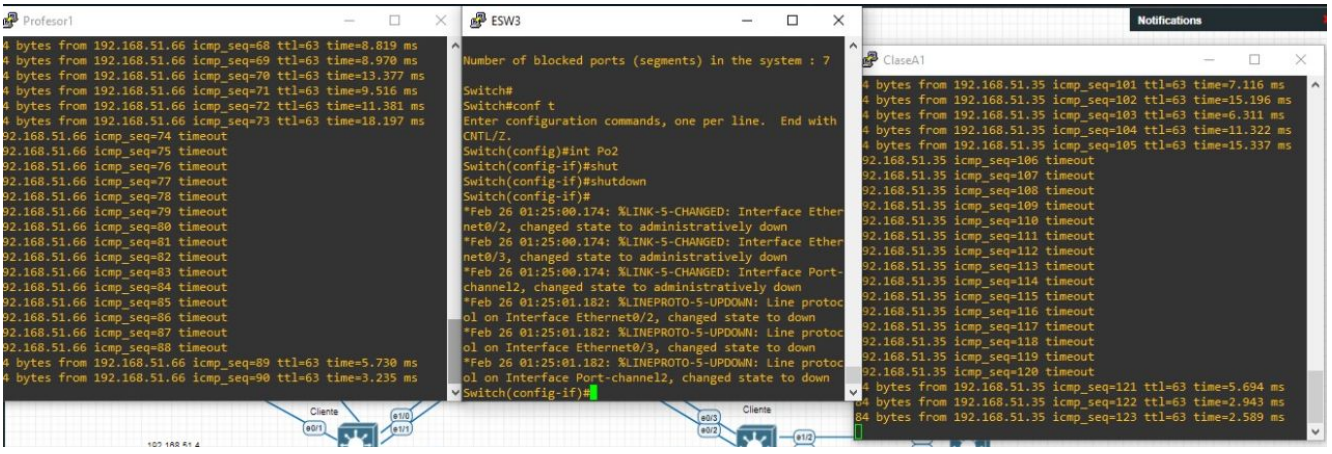
Tabla Subredes

VLAN	Dirección de Red	Primera dirección asignable	Última dirección asignable	Dirección de broadcast	Máscara de subred
11	192.168.51.0	192.168.51.1	192.168.51.30	192.168.51.31	225.255.255.224
21	192.168.51.32	192.168.51.33	192.168.51.62	192.168.51.63	225.255.255.224
31	192.168.51.64	192.168.51.65	192.168.51.94	192.168.51.95	225.255.255.224
41	192.168.51.96	192.168.51.97	192.168.51.126	192.168.51.127	225.255.255.224
99					
999					

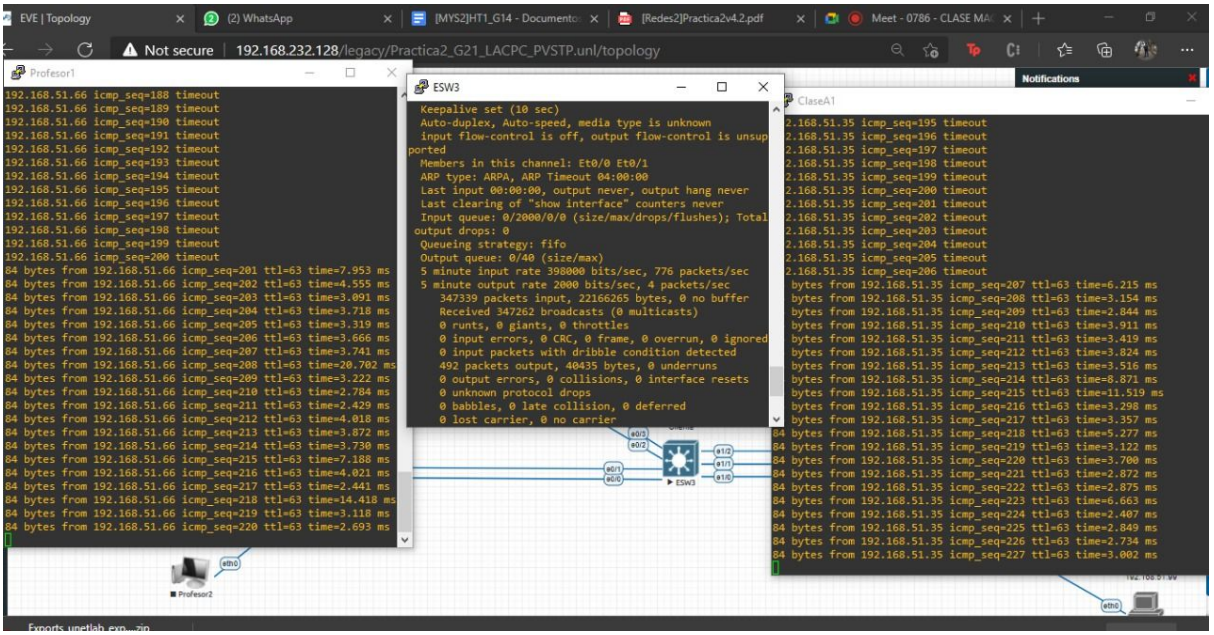
Configuración en EVE-NG

```
-- Subinterfaces VLAN (Nucleo)
configure terminal
interface vlan 11
ip address 192.168.51.1 255.255.255.224
no shu
exit
interface vlan 21
ip address 192.168.51.33 255.255.255.224
no shu
exit
interface vlan 31
ip address 192.168.51.65 255.255.255.224
no shu
exit
interface vlan 41
ip address 192.168.51.97 255.255.255.224
no shu
exit
interface vlan 99
ip address 192.168.51.129 255.255.255.224
no shu
exit
interface vlan 999
ip address 192.168.51.161 255.255.255.224
no shu
exit
exit
```

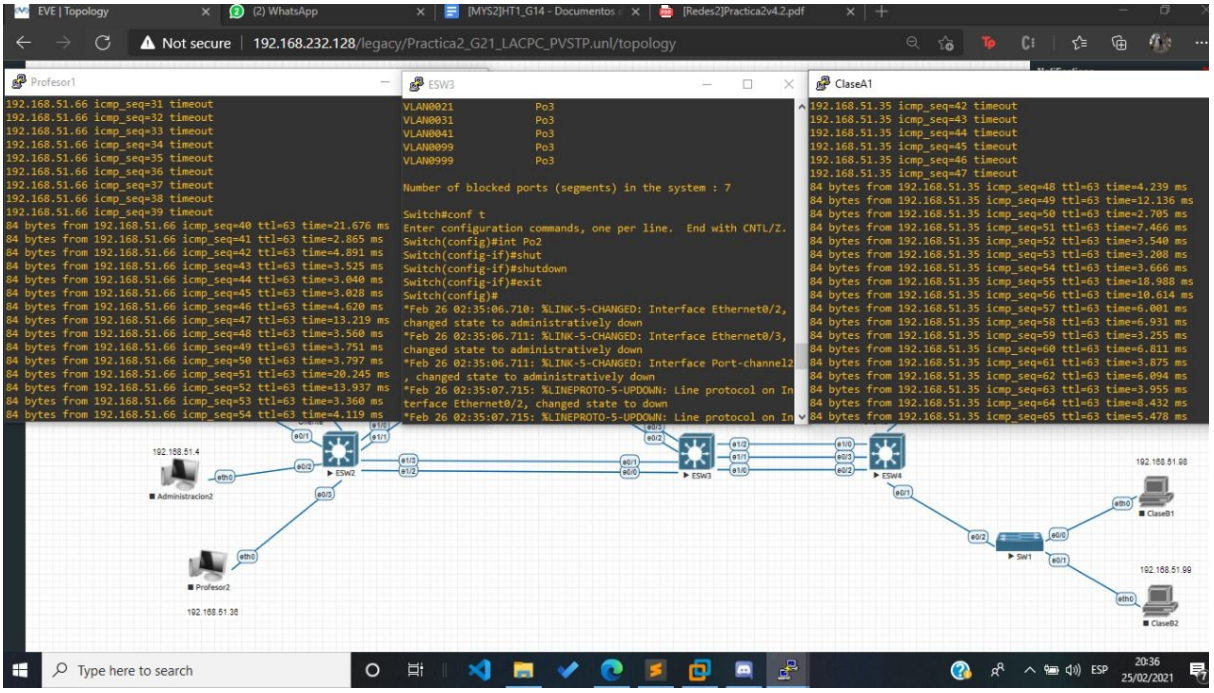
Configuraciones STP



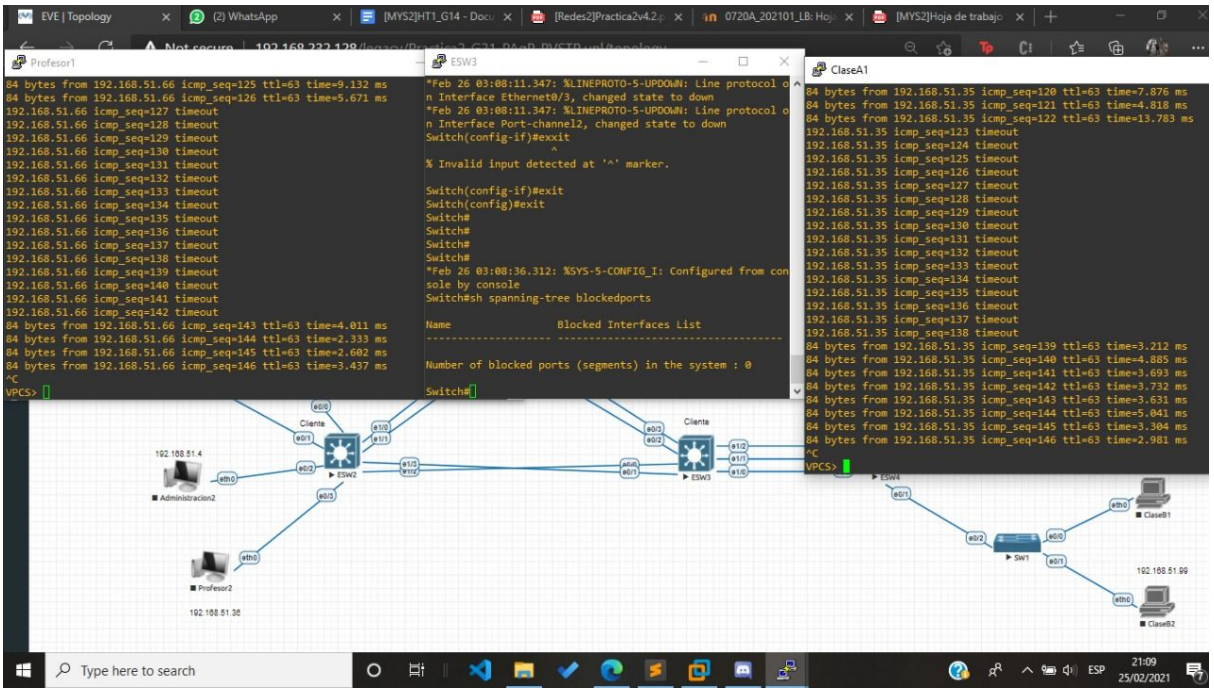
Escenario 1 - Port Channel LACP | STP



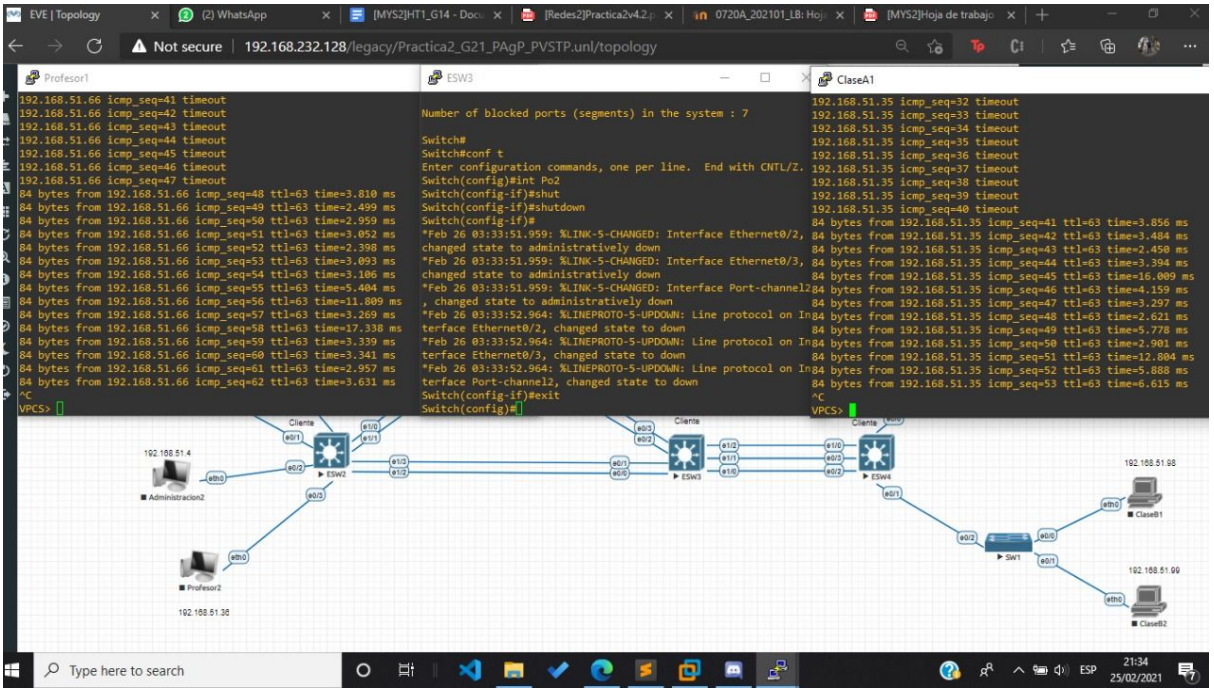
Escenario 2 - Port Channel LACP | RSTP



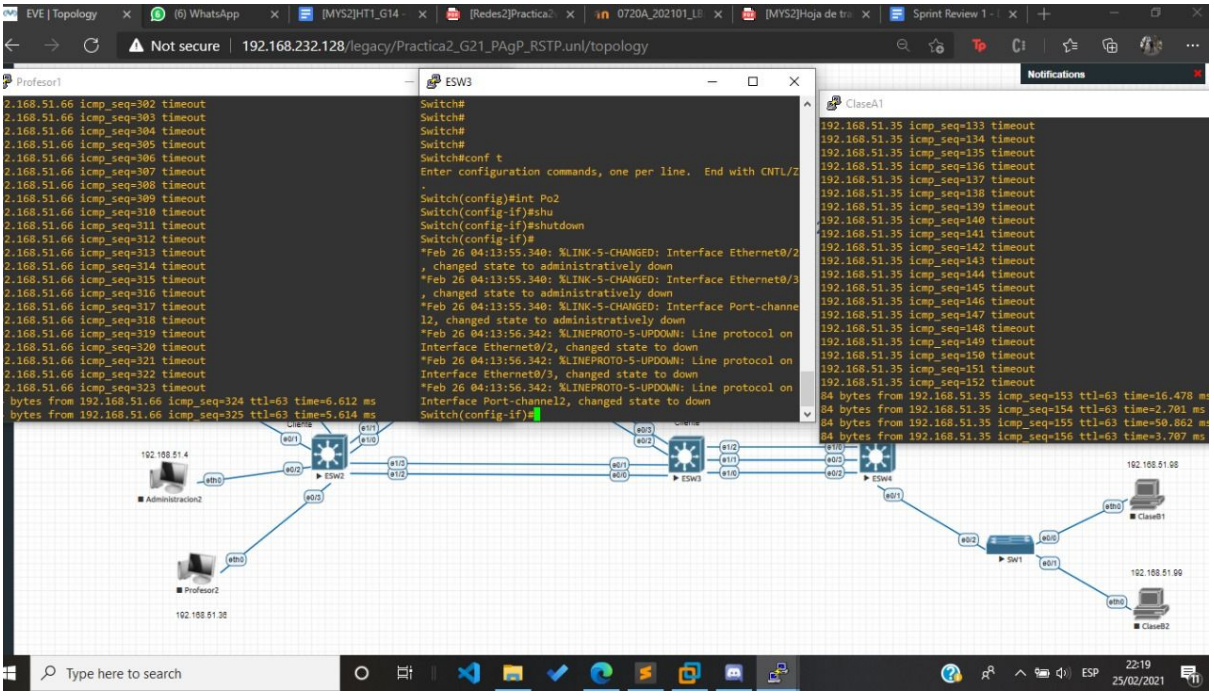
Escenario 3 - Port Channel LACP | PVSTP



Escenario 4 - Port Channel PAgP | STP



Escenario 5 - Port Channel PAgP | PVSTP

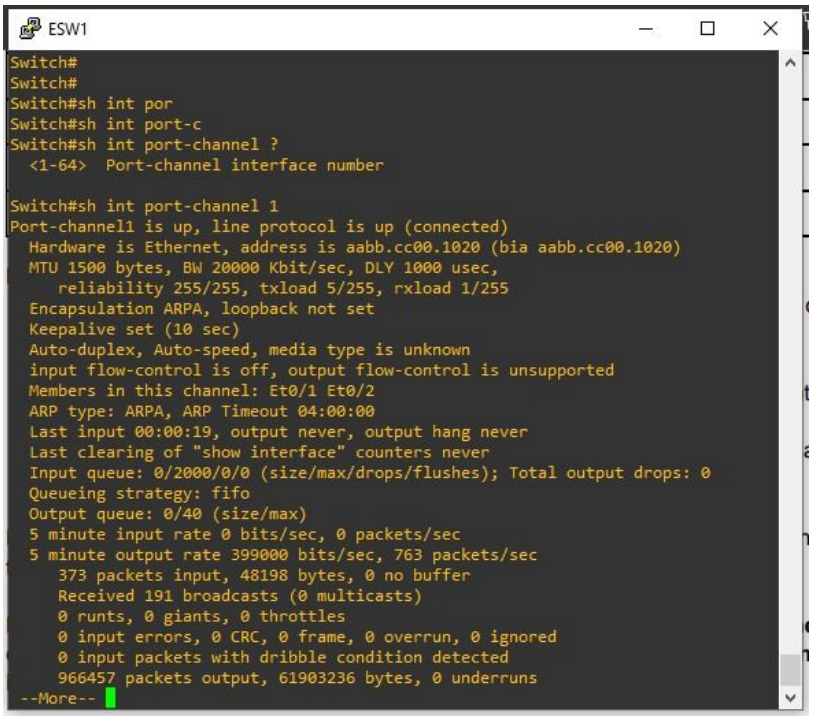


Escenario 6 - Port Channel PAgP | PVSTP

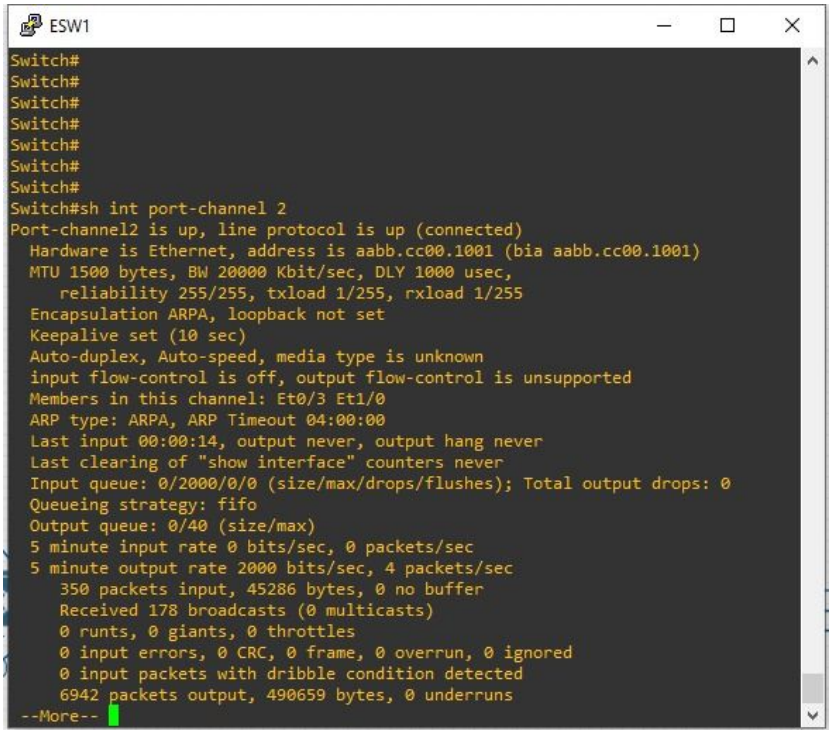
Escenario	Tipo de port channel	Protocolo spanning-tree	Tiempo de convergencia
1	LACP	STP	32s
2	LACP	RSTP	302s
3	**LACP**	**PVSTP**	**30s**
4	PAgP	STP	32s
5	PAgP	RSTP	30s
6	PAgP	PVSTP	180s

Port-Channels

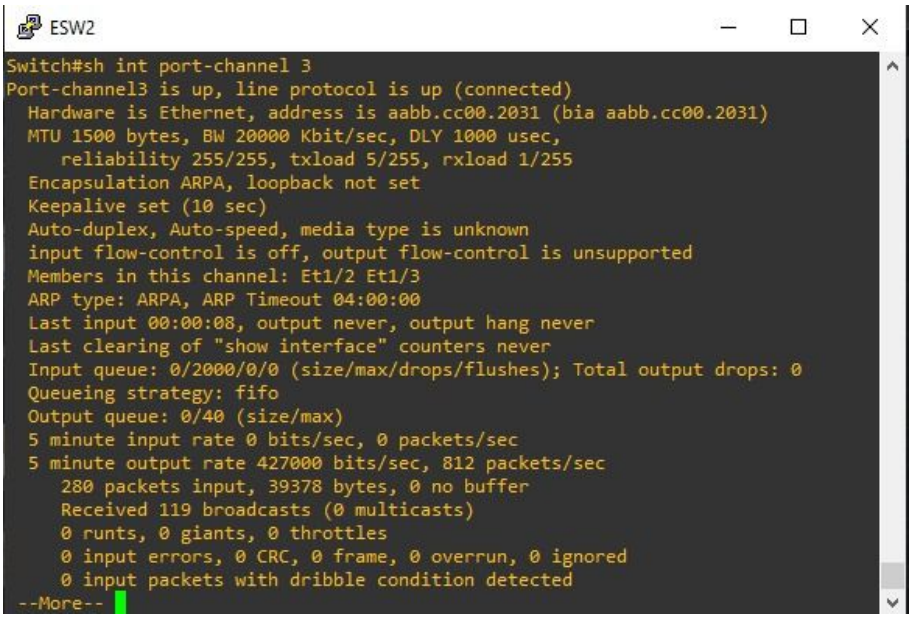
Se requiere que exista un ancho de banda considerable para poder intercambiar grandes cantidades de información entre los pcs de los profesores y los alumnos, por lo que se configuraron los siguientes port-channels



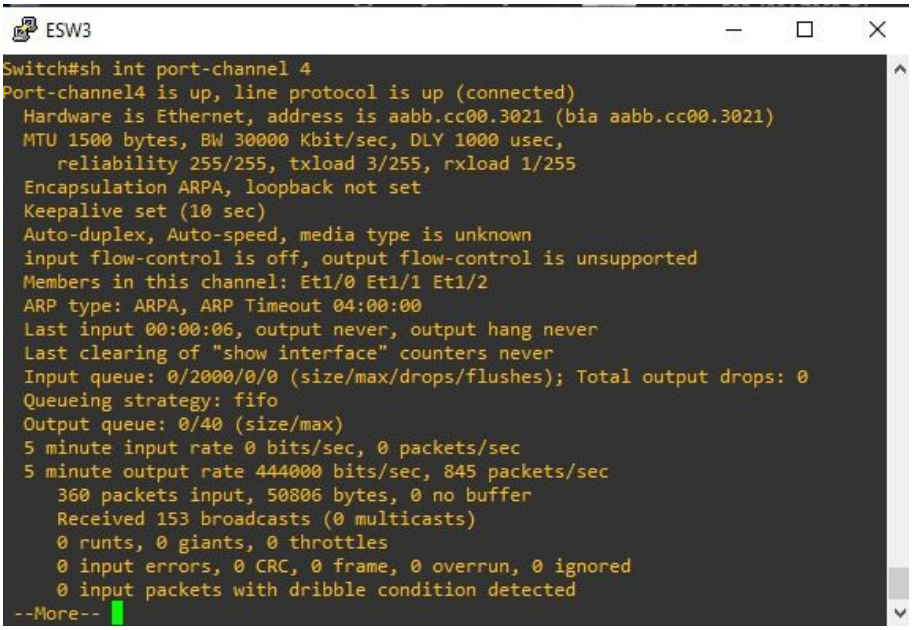
Port-Channel 1 - 2 Enlaces entre ESW1 y ESW2



Port-Channel 2 - 2 Enlaces entre ESW1 y ESW2



Port-Channel 3 - 2 Enlaces entre ESW2 y ESW3



Port-Channel 4 - 3 Enlaces entre ESW3 y ESW4

Access-Lists

```
LISTA ADMINISTRACION

configure terminal
access-list 111 permit icmp 192.168.51.0 0.0.0.31 192.168.51.0 0.0.0.31
access-list 111 permit icmp 192.168.51.0 0.0.0.31 192.168.51.32 0.0.0.31
exit

LISTA PROFESORES
configure terminal
access-list 121 permit icmp 192.168.51.32 0.0.0.31 192.168.51.0 0.0.0.31
access-list 121 permit icmp 192.168.51.32 0.0.0.31 192.168.51.32 0.0.0.31
access-list 121 permit icmp 192.168.51.32 0.0.0.31 192.168.51.64 0.0.0.31
access-list 121 permit icmp 192.168.51.32 0.0.0.31 192.168.51.96 0.0.0.31
exit


LISTA CLASE A
configure terminal
access-list 131 permit icmp 192.168.51.64 0.0.0.31 192.168.51.64 0.0.0.31
access-list 131 permit icmp 192.168.51.64 0.0.0.31 192.168.51.96 0.0.0.31
access-list 131 permit icmp 192.168.51.64 0.0.0.31 192.168.51.32 0.0.0.31
exit

LISTA CLASE B
configure terminal
access-list 141 permit icmp 192.168.51.96 0.0.0.31 192.168.51.64 0.0.0.31
access-list 141 permit icmp 192.168.51.96 0.0.0.31 192.168.51.96 0.0.0.31
access-list 141 permit icmp 192.168.51.96 0.0.0.31 192.168.51.32 0.0.0.31
exit
```

ESW1

```
Switch#
Switch#
Switch#
Switch#
Switch#sh acc
Switch#sh access-l
Switch#sh access-lists
Extended IP access list 111
    10 permit icmp 192.168.51.0 0.0.0.31 192.168.51.0 0.0.0.31
    20 permit icmp 192.168.51.0 0.0.0.31 192.168.51.32 0.0.0.31 (7 matches)
Extended IP access list 121
    10 permit icmp 192.168.51.32 0.0.0.31 192.168.51.0 0.0.0.31 (6 matches)
    20 permit icmp 192.168.51.32 0.0.0.31 192.168.51.32 0.0.0.31
    30 permit icmp 192.168.51.32 0.0.0.31 192.168.51.64 0.0.0.31 (17 matches)
    40 permit icmp 192.168.51.32 0.0.0.31 192.168.51.96 0.0.0.31
Extended IP access list 131
    10 permit icmp 192.168.51.64 0.0.0.31 192.168.51.64 0.0.0.31
    20 permit icmp 192.168.51.64 0.0.0.31 192.168.51.96 0.0.0.31
    30 permit icmp 192.168.51.64 0.0.0.31 192.168.51.32 0.0.0.31 (33 matches)
Extended IP access list 141
    10 permit icmp 192.168.51.96 0.0.0.31 192.168.51.64 0.0.0.31
    20 permit icmp 192.168.51.96 0.0.0.31 192.168.51.96 0.0.0.31
    30 permit icmp 192.168.51.96 0.0.0.31 192.168.51.32 0.0.0.31
Switch#
```