UNIVERSIDAD DE SAN CARLOS DE GUATEMALA

FACULTAD DE INGENIERÍA

ESCUELA DE CIENCIAS Y SISTEMAS

REDES 2

PRIMER SEMESTRE 2023

SECCIÓN N

MANUAL PRACTICA 1

NO. GRUPO 8

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Manual de configuraciones

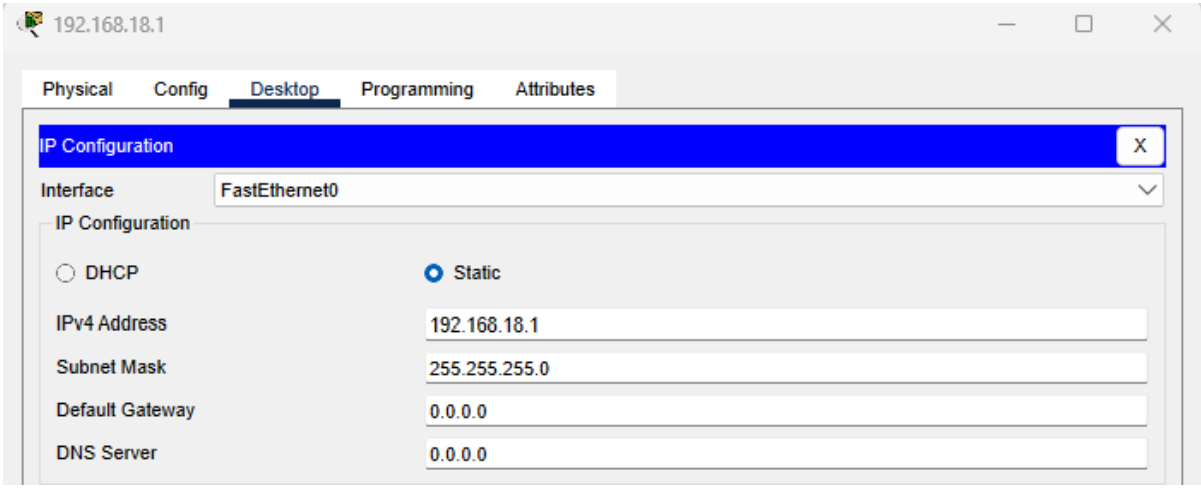
Asignación de IP

A cada maquina debemos asignarle una dirección de IP que pertenezca al departamento de su red y en el rango determinado.

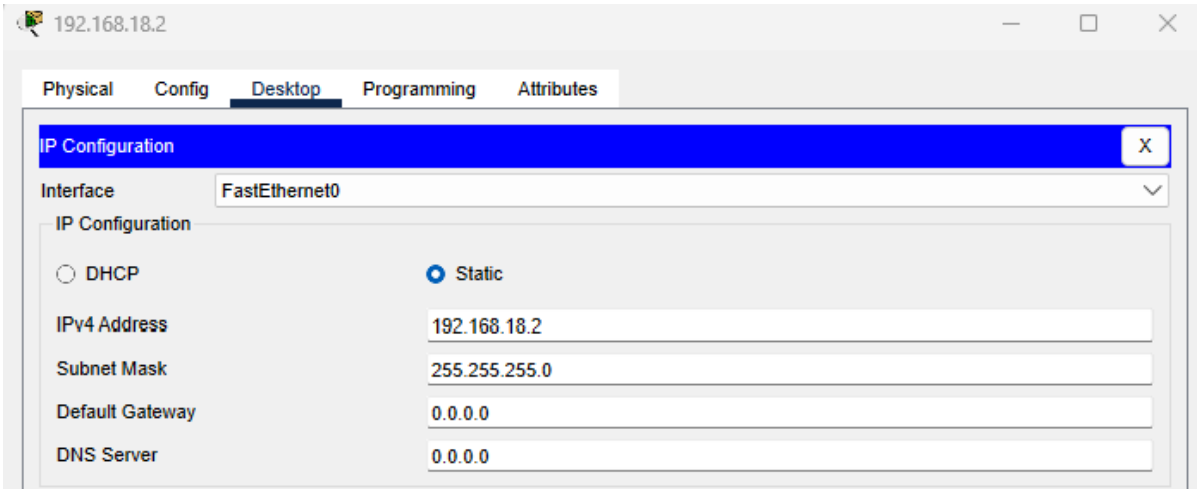
A todas las maquinas se les debe asignar una dirección IP estática.

Departamento de primaria

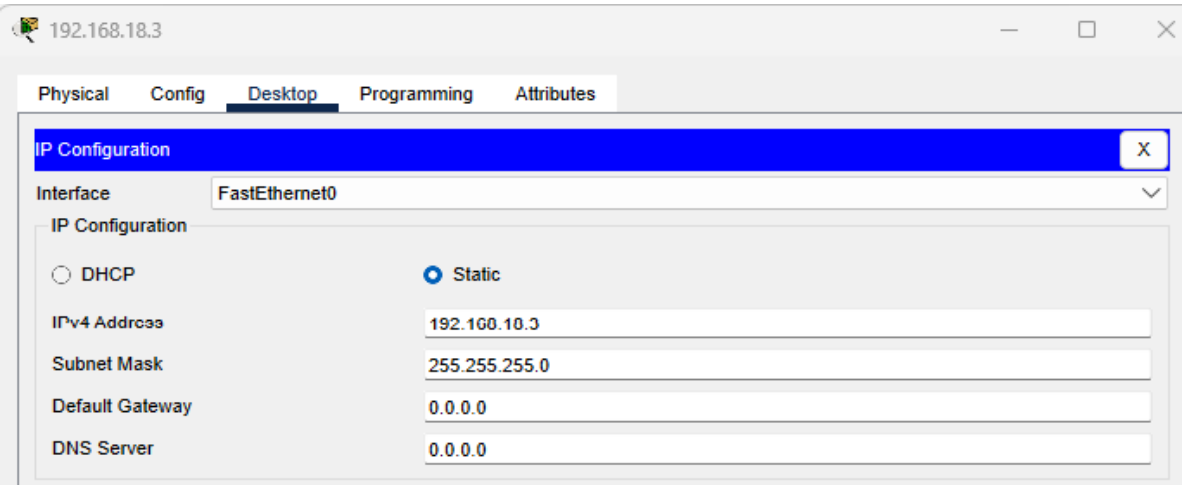
Red: 192.168.18.0/24
Host 1:



Host 2:



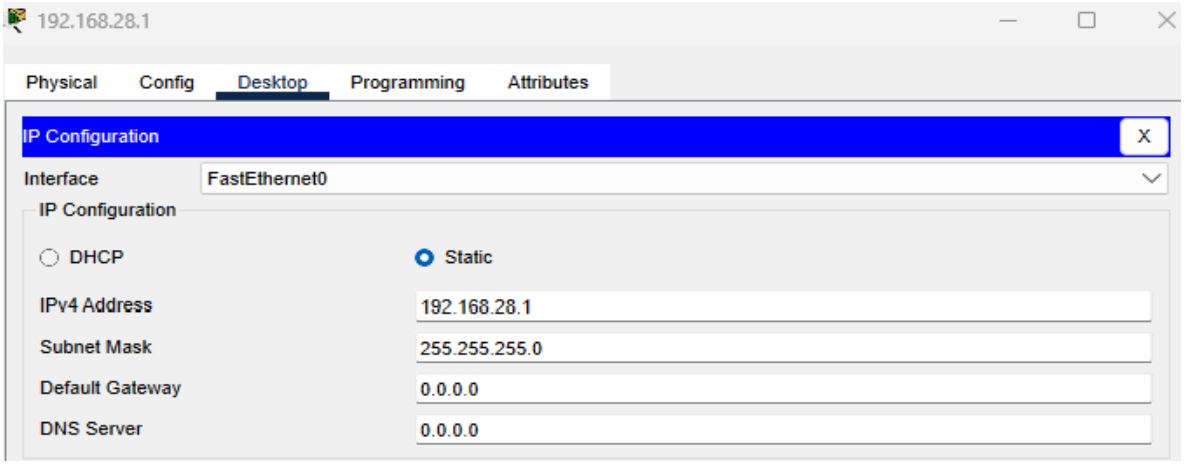
Host 3:



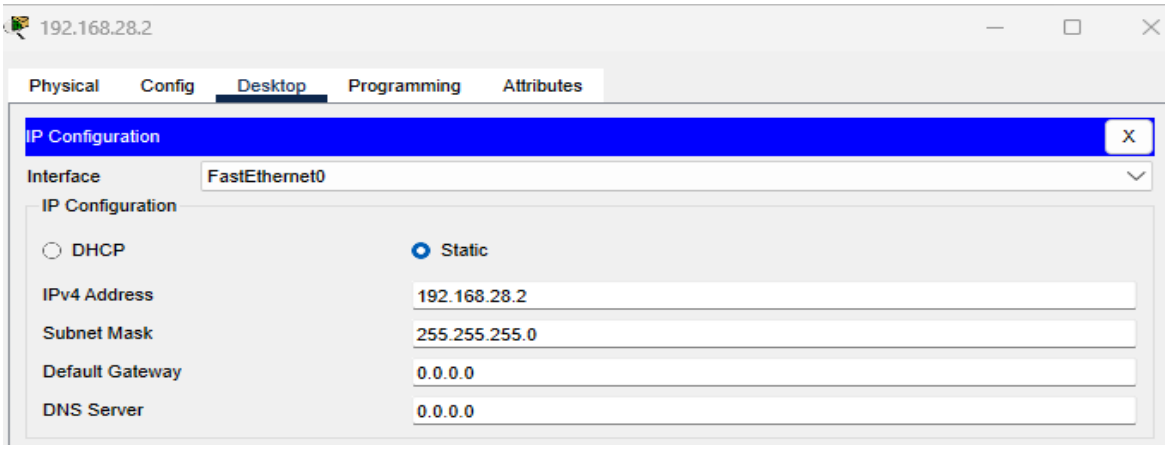
Departamento de Básicos

Red: 192.168.28.0/24

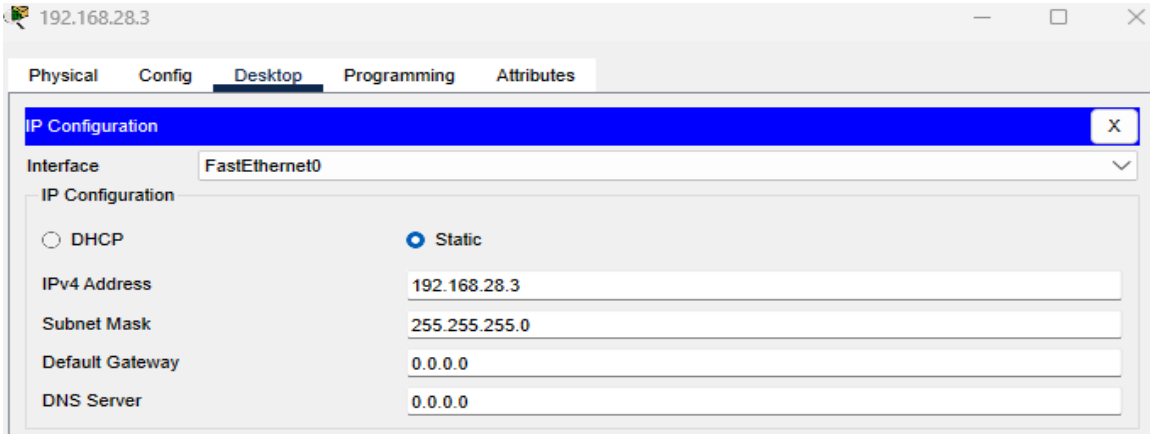
Host 1:



Host 2:



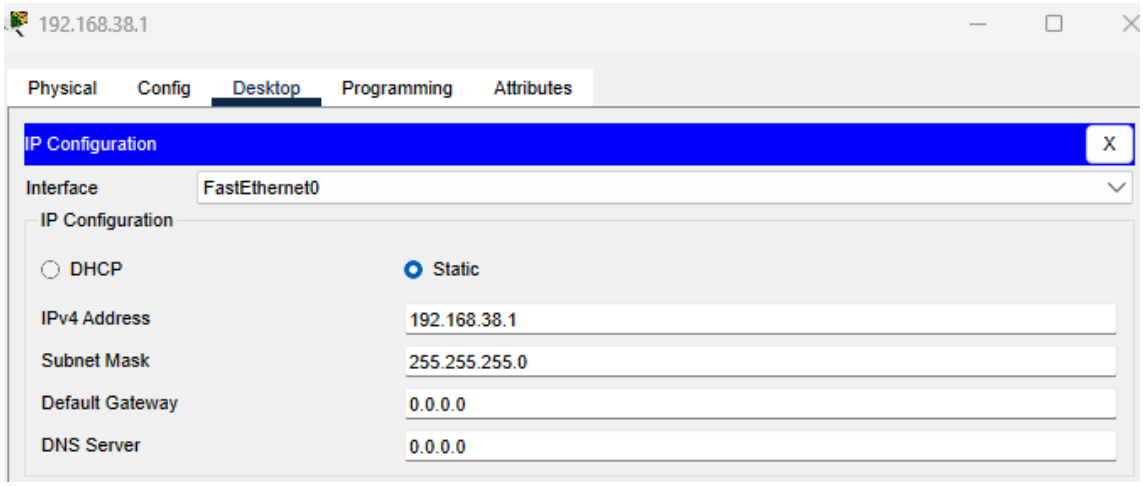
Host 3:



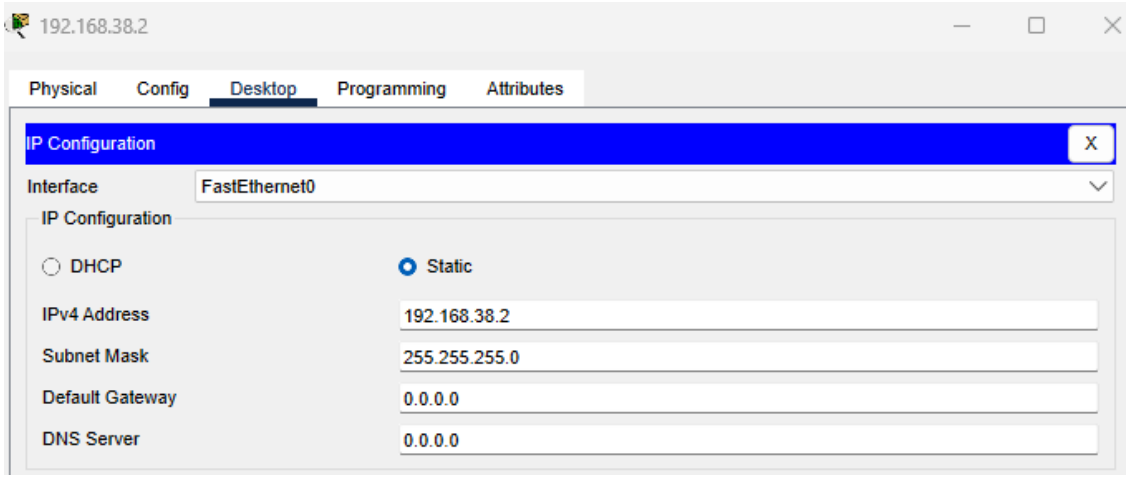
Departamento de Diversificado

Red: 192.168.38.0/24

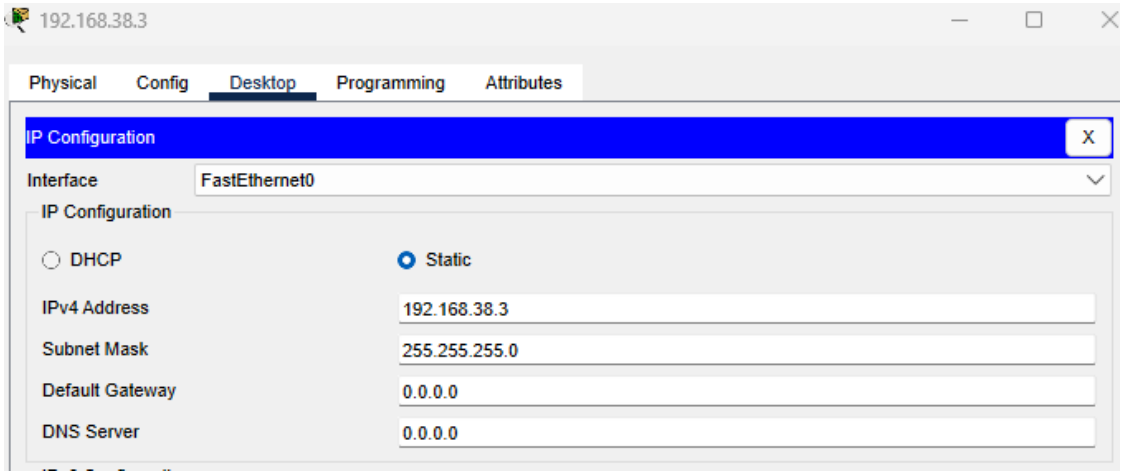
Host 1:



Host 2:



Host 3:



Colocar nombre a cada switch

Para cambiarle el nombre a un switch desde la terminal, realizamos los siguientes pasos y comandos:

1. Ingresar a la terminal del dispositivo
2. Ingresar comando enable
3. Ingresar comando configure terminal
4. Ingresar comando hostname [Nuevo nombre]

```
Switch>
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname SW3
SW3(config)#
```

Creación de VLAN y uso de VTP

Para segmentar de forma lógica la comunicación de los departamentos crearemos 3 VLAN distintas

1. VLAN Primaria: Primaria18
2. VLAN Básicos: Básicos28
3. VLAN Diversificado: Diversificado38

Estas tres VLANs hay que crearlas en cada switch, en total existen 5 switch, por lo tanto tendríamos que realizar el proceso 15 veces para que todos los switch tengan conocimiento de las tres VLAN, para evitarnos el proceso de realizarlo repetidamente, podemos utilizan el protocolo VTP (VLAN Trunking Protocol) el cual nos permite configurar las tres Vlan en un solo switch tipo servidor y los otros switch en tipo cliente sincronizan la información del switch maestro. Por ende, los pasos a seguir son los siguientes:

1. Buscar que Switch será el servidor
2. Crear las Vlan correspondientes
3. Colocar en moto Trunk las interfaces entre los Switch

Buscar el switch servidor

Para que el protocolo VTP funcione debemos seleccionar un switch como servidor. Para encontrar que switch seleccionar tenemos 2 opciones, la primera es verificar físicamente que la conexión entre los switches esté sincronizada o la segunda es usar el comando *sh spanning-tree* en cada switch, hasta encontrar el que diga *this switch is root*.

- Switch client (SW1, SW2, SW3, SW5)

```
SW3>
SW3>sh spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    32769
              Address     0001.9723.20B6
              Cost        38
              Port        1(FastEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32769  (priority 32768 sys-id-ext 1)
              Address     0060.470E.9A20
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/4            Desg FWD 19        128.4    P2p
Fa0/2            Altn BLK 19        128.2    P2p
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/5            Desg FWD 19        128.5    P2p
Fa0/1            Root FWD 19        128.1    P2p
```

- Switch Server (SW4)

```
SW4>
SW4>sh spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0001.9723.20B6
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     0001.9723.20B6
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/4            Desg FWD 19        128.4    P2p

SW4>
```

Una vez tengamos identificado el switch tipo servidor, procederemos a usar el comando VTP para indicar a cada Switch su modo de operación o rol.

Sincronizar los Switches servidor y cliente por medio de VTP

Existen dos pasos para sincronizar los Switches usando VTP, el paso uno es indicarle a cada Switch su rol y el segundo paso es colocar las conexiones de las interfaces entre switches como truncales.

El primer paso es indicarle a cada switch cual va a ser su rol en la red, los únicos roles posibles son: Server, Client y Transparent. En nuestro caso en especifico usaremos los primeros dos.

- VTP mode server

SW4

```
SW4>enable
SW4#configure ter
SW4#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SW4(config)#vtp mode server
Device mode already VTP SERVER.
SW4(config)#
```

```
SW4(config)#vtp domain g8
Domain name already set to g8.
SW4(config)#vtp password g8
Password already set to g8
SW4(config)#
```

- VTP mode client

SW1

```
SW1>enable
SW1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SW1(config)#vtp mode client
Setting device to VTP CLIENT mode.
SW1(config)#
```

```
SW5(config)#vtp domain g8
Domain name already set to g8.
SW5(config)#vtp pass
SW5(config)#vtp password g8
```

SW2

```
SW2>enable
SW2#confi
SW2#configure termin
SW2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SW2(config)#vtp mode clien
SW2(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

```
SW2(config)#vtp domain g8
Domain name already set to g8.
SW2(config)#vtp password g8
Setting device VLAN database password to g8
SW2(config)#
```

SW3

```
SW3>enable
SW3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SW3(config)#
SW3(config)#vtp mode client
Setting device to VTP CLIENT mode.
SW3(config)#
```

```
SW3(config)#vtp domain g8
Domain name already set to g8.
SW3(config)#vtp password g8
Setting device VLAN database password to g8
SW3(config)#
```

SW5

```
SW5>
SW5>enab
SW5>enable
SW5#conf
SW5#configure ter
SW5#configure terminal
Enter configuration commands, one p
SW5(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

```
SW5(config)#vtp domain g8
Domain name already set to g8.
SW5(config)#vtp password g8
Setting device VLAN database password to g8
SW5(config)#
```

El segundo paso es colocar las interfaces entre los switches como truncales.

SW1

```
SW1(config)#interface range f0/1-4
SW1(config-if-range)#swit
SW1(config-if-range)#switchport mord
SW1(config-if-range)#switchport mode trunk



SW1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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

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

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

SW1(config-if-range)#switchport trunk allowed vlan all
SW1(config-if-range)#
```

SW2

```
SW2>enable
SW2#confi
SW2#configure ter
SW2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SW2(config)#inter
SW2(config)#interface ra
SW2(config)#interface range f0/1-2
SW2(config-if-range)#switchport mode trunk


SW2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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

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

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

```
SW2(config)#interface range fastEthernet 0/1-2
SW2(config-if-range)#switchport trunk allowed vlan all
SW2(config-if-range)#exit
SW2(config)#
```

SW3

```
SW3(config)#interface range f0/1-2
SW3(config-if-range)#swit
SW3(config-if-range)#switchport mode trunk


SW3(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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

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

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


SW3(config)#interface range fastEthernet 0/1-2
SW3(config-if-range)#swi
SW3(config-if-range)#switchport trunk all
SW3(config-if-range)#switchport trunk allowed vlan all
SW3(config-if-range)#exit
SW3(config)#
```

SW4

```
SW4(config)#interface f0/1
SW4(config-if)#swit
SW4(config-if)#switchport mode trunk

SW4(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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


SW4(config-if)#
SW4(config-if)#exit
SW4(config)#interface f0/3
SW4(config-if)#switchport mode trunk

SW4(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up


SW4(config-if)#switchport trunk allowed vlan all
SW4(config-if)#exit
SW4(config)#inter
SW4(config)#interface f0/3
SW4(config-if)#switchport trunk allowed vlan all
SW4(config-if)#exit
SW4(config)#
```

SW5

```
SW5(config)#interface range f0/1-4
SW5(config-if-range)#swit
SW5(config-if-range)#switchport mode trunk

SW5(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

SW5(config-if-range)#

SW5(config)#interface range fastEthernet 0/1-4
SW5(config-if-range)#swit
SW5(config-if-range)#switchport trunk all
SW5(config-if-range)#switchport trunk allowed vlan all
SW5(config-if-range)#
```

Creación de VLAN

Ingresamos al Switch tipo Servidor que en nuestro caso sería el Switch SW4 y creamos las 3 Vlans previamente mencionadas.

1. VLAN Primaria18

```
SW4(config)#vlan 18
SW4(config-vlan)#name Primaria18
SW4(config-vlan)#
```

2. VLAN Básicos 28

```
SW4(config)#vlan 28
SW4(config-vlan)#name Basicos28
```

3. VLAN Diversificado 38

```
SW4(config)#vlan 38
SW4(config-vlan)#name Diversificado38
```

Verificamos si las VLAN si han creado correctamente en el Switch.

```
SW4#
SW4#sh 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
18   Primaria18                       active
28   Basicos28                        active
38   Diversificado38                  active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Colocar las interfaces hacia los dispositivos finales en modo acceso

Las interfaces que conectan hacia los dispositivos finales deben tener el modo acceso y permitir únicamente la vlan que tienen asignada

SW1

```
SW1(config)#interface f0/5
SW1(config-if)#swi
SW1(config-if)#switchport mode access
SW1(config-if)#swi
SW1(config-if)#switchport access vlan 18
SW1(config-if)#exit
SW1(config)#
```

SW2

```
SW2(config-if-range)#interface range fastEthernet 0/3-4
SW2(config-if-range)#swit
SW2(config-if-range)#switchport mode ac
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#swi
SW2(config-if-range)#swit
SW2(config-if-range)#switchport acc
SW2(config-if-range)#switchport access ?
  vlan  Set VLAN when interface is in access mode
SW2(config-if-range)#switchport access vlan
SW2(config-if-range)#switchport access vlan ?
  <1-4094>  VLAN ID of the VLAN when this port is in access mode
SW2(config-if-range)#switchport access vlan 38
SW2(config-if-range)#exit
SW2(config)#
```

SW3

```
SW3(config-if)#switchport mode access
SW3(config-if)#swit
SW3(config-if)#switchport access vlan 38
SW3(config-if)#exit
SW3(config)#

SW3(config)#interface f0/4
SW3(config-if)#swit
SW3(config-if)#switchport mode access
SW3(config-if)#swit
SW3(config-if)#switchport access vlan 18
SW3(config-if)#exit
SW3(config)#

SW3(config)#interface f0/5
SW3(config-if)#swi
SW3(config-if)#switchport mode access
SW3(config-if)#swi
SW3(config-if)#switchport access vlan 28
SW3(config-if)#exit
SW3(config)#
```

SW4

```
SW4(config-if)#switchport mode access
SW4(config-if)#swi
SW4(config-if)#switchport access vlan 28
SW4(config-if)#exit

SW4(config)#interface fa0/4
SW4(config-if)#switchport mode access
SW4(config-if)#switchport access vlan 28
SW4(config-if)#exit
SW4(config)#
```

SW5

```
SW5(config-if)#switchport mode access
SW5(config-if)#swi
SW5(config-if)#switchport access vlan 18
SW5(config-if)#exit
SW5(config)#
```

Creación de STP

A lo largo del desarrollo de la practica se realiza la configuración de STP en sus dos versiones PVST y RapidPVST, se realizaran las pruebas para bloquear/desbloquear puertos y medir cuanto tiempo se tarda en conectarse a otro puerto cuando uno se ve afectado.

Escenario 1 PVST

Se elegirá el escenario 1 para realizar las primeras pruebas con los switches

Verificación de protocolos PVST

Se verificará que todos los switches estén con el protocolo PVST

SW4 - Server

- Sh vtp st

```
SW4>
SW4>ena
SW4#sh vtp st
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : g8
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0001.6462.7800
Configuration last modified by 0.0.0.0 at 3-1-93 08:07:57
Local updater ID is 0.0.0.0 (no valid interface found)

Feature VLAN :
--------------
VTP Operating Mode                : Server
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 8
Configuration Revision            : 17
MD5 digest                        : 0xFD 0xF9 0x29 0xF7 0xCD 0x34 0x37 0x88
                                    0x42 0xD9 0x1B 0x4A 0xA4 0x30 0xCE 0x63
```

Mostramos las VLAN que tiene y los puertos activos/forwarding

- Sh spanning-tree

```
SW4#sh spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0001.9723.20B6
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     0001.9723.20B6
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/1            Desg FWD 19        128.1    P2p
```

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID    Priority    32786
             Address     0001.9723.20B6
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32786  (priority 32768 sys-id-ext 18)
             Address     0001.9723.20B6
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/1            Desg FWD 19        128.1    P2p
```

```
VLAN0028
  Spanning tree enabled protocol ieee
  Root ID     Priority    32796
              Address     0001.9723.20B6
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32796  (priority 32768 sys-id-ext 28)
              Address     0001.9723.20B6
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/4            Desg FWD 19        128.4    P2p
```

```
VLAN0038
  Spanning tree enabled protocol ieee
  Root ID     Priority    32806
              Address     0001.9723.20B6
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32806  (priority 32768 sys-id-ext 38)
              Address     0001.9723.20B6
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/1            Desg FWD 19        128.1    P2p
```

SW1 – Client

- Sh vtp st

```
SW1>
SW1>ena
SW1#sh vtp st
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : g8
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 00E0.A3DD.9200
Configuration last modified by 0.0.0.0 at 3-1-93 08:07:57

Feature VLAN :
--------------
VTP Operating Mode                : Client
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 8
Configuration Revision            : 17
MD5 digest                        : 0xFD 0xF9 0x29 0xF7 0xCD 0x34 0x37 0x88
                                    0x42 0xD9 0x1B 0x4A 0xA4 0x30 0xCE 0x63
```

Mostramos las VLAN que tiene y los puertos activos/forwarding

- Sh spanning-tree

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID     Priority    32786
              Address     0001.9723.20B6
              Cost        19
              Port        3(FastEthernet0/3)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32786  (priority 32768 sys-id-ext 18)
              Address     0060.4793.9643
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/5            Desg FWD 19        128.5    P2p
Fa0/3            Root FWD 19        128.3    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/4            Altn BLK 19        128.4    P2p
```

```
VLAN0028
  Spanning tree enabled protocol ieee
  Root ID     Priority    32796
              Address     0001.9723.20B6
              Cost        19
              Port        3(FastEthernet0/3)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32796  (priority 32768 sys-id-ext 28)
              Address     0060.4793.9643
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/3            Root FWD 19        128.3    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/4            Altn BLK 19        128.4    P2p
```

```
VLAN0038
  Spanning tree enabled protocol ieee
  Root ID     Priority    32806
              Address     0001.9723.20B6
              Cost        19
              Port        3(FastEthernet0/3)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32806  (priority 32768 sys-id-ext 38)
              Address     0060.4793.9643
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/3            Root FWD 19        128.3    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/4            Altn BLK 19        128.4    P2p
```

SW2 – Client

- Sh vtp st

```
SW2#sh vtp st
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : g8
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 00E0.F779.6C00
Configuration last modified by 0.0.0.0 at 3-1-93 08:07:57

Feature VLAN :
--------------
VTP Operating Mode                : Client
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 8
Configuration Revision            : 17
MD5 digest                        : 0xFD 0xF9 0x29 0xF7 0xCD 0x34 0x37 0x88
                                    0x42 0xD9 0x1B 0x4A 0xA4 0x30 0xCE 0x63
```

Mostramos las VLAN que tiene y los puertos activos/forwarding

- Sh spanning-tree

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID     Priority    32786
              Address     0001.9723.20B6
              Cost        38
              Port        2(FastEthernet0/2)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32786  (priority 32768 sys-id-ext 18)
              Address     0030.A321.A576
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Altn BLK 19        128.1    P2p
Fa0/2            Root FWD 19        128.2    P2p
```

```
VLAN0028
  Spanning tree enabled protocol ieee
  Root ID     Priority    32796
              Address     0001.9723.20B6
              Cost        38
              Port        2(FastEthernet0/2)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32796  (priority 32768 sys-id-ext 28)
              Address     0030.A321.A576
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Altn BLK 19        128.1    P2p
Fa0/2            Root FWD 19        128.2    P2p
```

```
VLAN0038
  Spanning tree enabled protocol ieee
  Root ID     Priority    32806
              Address     0001.9723.20B6
              Cost        38
              Port        2(FastEthernet0/2)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32806  (priority 32768 sys-id-ext 38)
              Address     0030.A321.A576
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Altn BLK 19        128.1    P2p
Fa0/2            Root FWD 19        128.2    P2p
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/4            Desg FWD 19        128.4    P2p
```

SW3 – Client

- Sh vtp st

```
SW3#sh vtp st
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : g8
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0009.7C84.3300
Configuration last modified by 0.0.0.0 at 3-1-93 08:07:57

Feature VLAN :
--------------
VTP Operating Mode                : Client
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 8
Configuration Revision            : 17
MD5 digest                        : 0xFD 0xF9 0x29 0xF7 0xCD 0x34 0x37 0x88
                                    0x42 0xD9 0x1B 0x4A 0xA4 0x30 0xCE 0x63
```

Mostramos las VLAN que tiene y los puertos activos/forwarding

- Sh spanning-tree

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID     Priority    32786
              Address     0001.9723.20B6
              Cost        38
              Port        1(FastEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32786  (priority 32768 sys-id-ext 18)
              Address     0060.470E.9A20
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Altn BLK 19        128.2    P2p
Fa0/1            Root FWD 19        128.1    P2p
Fa0/4            Desg FWD 19        128.4    P2p
```

```
VLAN0028
  Spanning tree enabled protocol ieee
  Root ID     Priority    32796
              Address     0001.9723.20B6
              Cost        38
              Port        1(FastEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32796  (priority 32768 sys-id-ext 28)
              Address     0060.470E.9A20
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Altn BLK 19        128.2    P2p
Fa0/1            Root FWD 19        128.1    P2p
Fa0/5            Desg FWD 19        128.5    P2p
```

```
VLAN0038
  Spanning tree enabled protocol ieee
  Root ID     Priority    32806
              Address     0001.9723.20B6
              Cost        38
              Port        1(FastEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32806  (priority 32768 sys-id-ext 38)
              Address     0060.470E.9A20
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Altn BLK 19        128.2    P2p
Fa0/1            Root FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p
```

SW5 – Client

- Sh vtp st

```
SW5>ena
SW5#sh vtp st
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : g8
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0001.6451.8200
Configuration last modified by 0.0.0.0 at 3-1-93 08:07:57

Feature VLAN :
--------------
VTP Operating Mode                : Client
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 8
Configuration Revision            : 17
MD5 digest                        : 0xFD 0xF9 0x29 0xF7 0xCD 0x34 0x37 0x88
                                    0x42 0xD9 0x1B 0x4A 0xA4 0x30 0xCE 0x63
```

Mostramos las VLAN que tiene y los puertos activos/forwarding

- Sh spanning-tree

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID     Priority    32786
              Address     0001.9723.20B6
              Cost        19
              Port        3(FastEthernet0/3)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32786  (priority 32768 sys-id-ext 18)
              Address     0002.17A6.A76D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/5            Desg FWD 19        128.5    P2p
Fa0/4            Desg FWD 19        128.4    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/3            Root FWD 19        128.3    P2p
```

```
VLAN0028
  Spanning tree enabled protocol ieee
  Root ID     Priority    32796
              Address     0001.9723.20B6
              Cost        19
              Port        3(FastEthernet0/3)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32796  (priority 32768 sys-id-ext 28)
              Address     0002.17A6.A76D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/4            Desg FWD 19        128.4    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/3            Root FWD 19        128.3    P2p
```

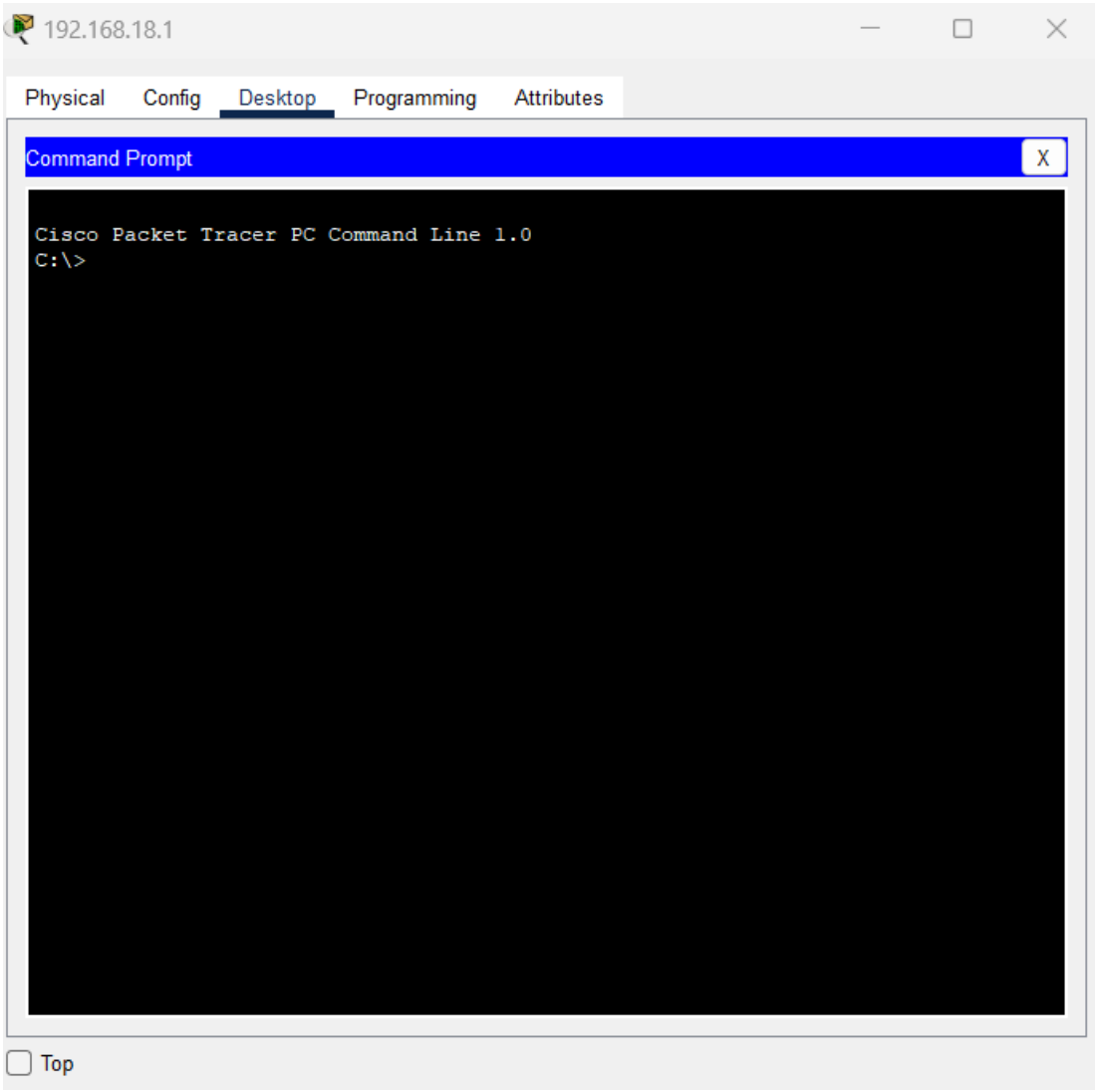
```
VLAN0038
  Spanning tree enabled protocol ieee
  Root ID     Priority    32806
              Address     0001.9723.20B6
              Cost        19
              Port        3(FastEthernet0/3)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32806  (priority 32768 sys-id-ext 38)
              Address     0002.17A6.A76D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/4            Desg FWD 19        128.4    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/3            Root FWD 19        128.3    P2p
```

Cambio de puertos o enlaces

Se procederá a crear una tabla de los puertos/enlaces que estén como principal y se bloqueara solo se hará 1 prueba con cada switch con las VLAN que tengan asignadas.

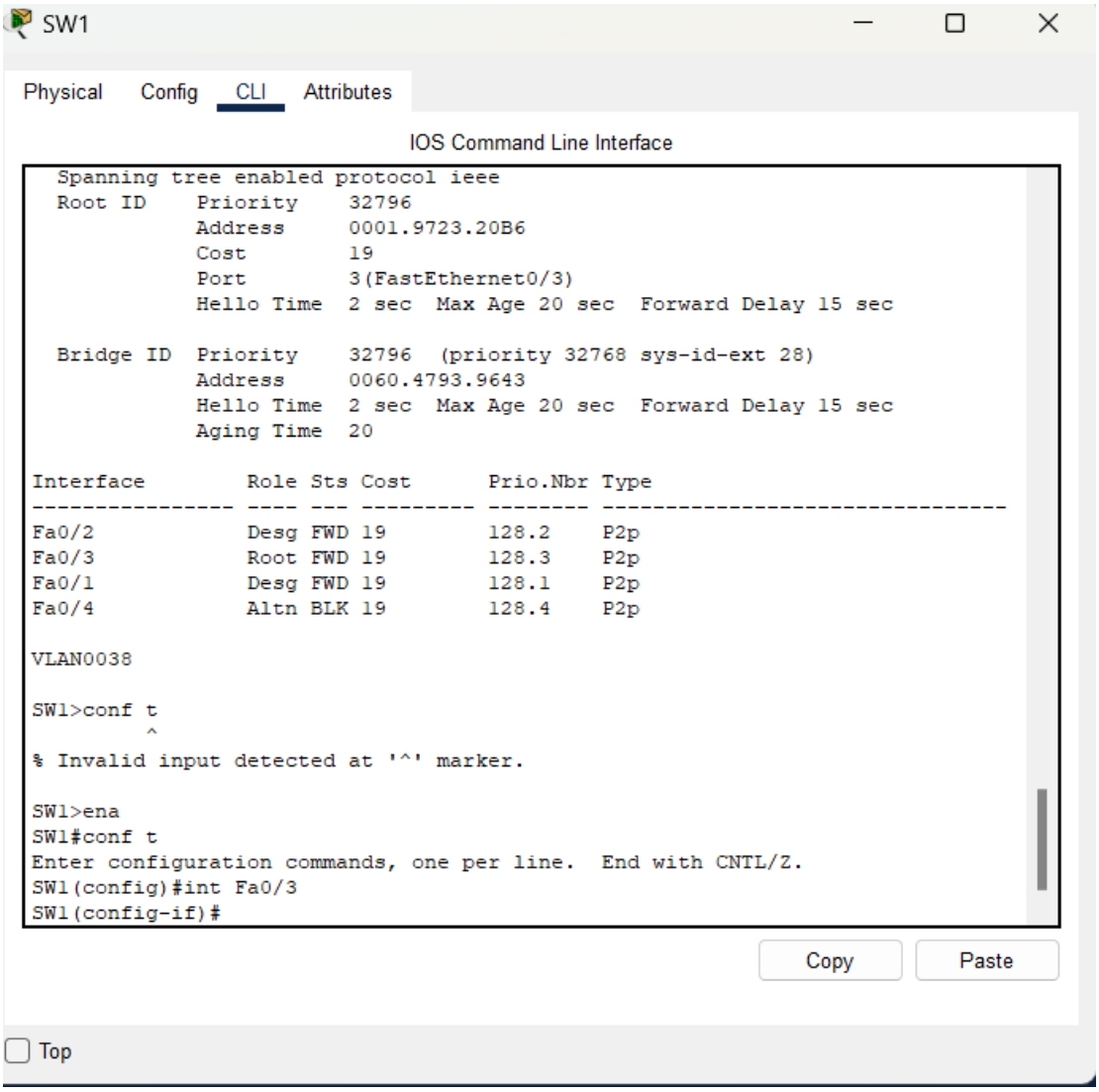
Para todas las pruebas se hará el mismo procedimiento, este es:

Ingresar al prompt de nuestro pc X.X.X.X en este caso utilice la 192.168.18.1



Ingresamos al switch que queremos bloquear lo mejor es utilizar el que está conectado a nuestro pc que vamos a hacer el ping de salida en nuestro ejemplo SW1 para el ping de salida 192.168.18.1

- Ping -t 192.168.18.3



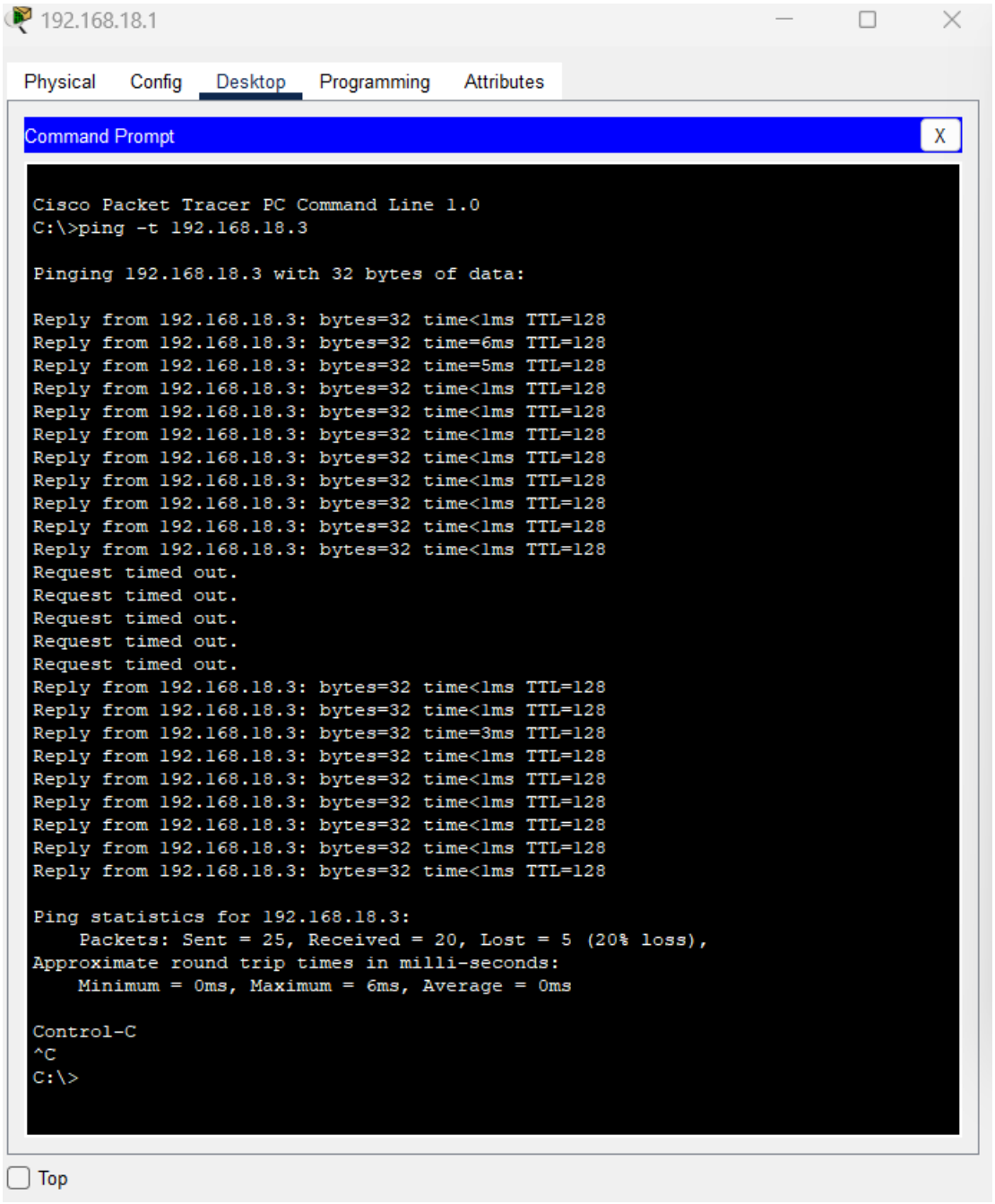
Ingresamos a nuestra interfaz que vamos a bloquear esta la sabemos por los pasos anteriores donde se observaba que para la VLAN 18 el puerto Root era Fa0/3, y mediante los comandos

- Ena
- Conf t
- Int Fa0/3
- Shutdown

Apagaremos esa interfaz y ahí es donde mediremos el tiempo que se conecte nuestro ip saliente a la ip entrante mediante el comando ping.

Por último, tendríamos algo así:

En nuestro pc



El swtich

```
SW1>ena
SW1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW1(config)#int Fa0/3
SW1(config-if)#shutdown

SW1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to down

SW1(config-if)#
SW1(config-if)#exit
SW1(config)#exit
SW1#
```

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID     Priority    32786
              Address     0001.9723.20B6
              Cost        38
              Port        4(FastEthernet0/4)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32786  (priority 32768 sys-id-ext 18)
              Address     0060.4793.9643
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Altn BLK 19        128.2    P2p
Fa0/5            Desg FWD 19        128.5    P2p
Fa0/1            Altn BLK 19        128.1    P2p
Fa0/4            Root FWD 19        128.4    P2p
```

Procedemos a llenar la tabla PVST

PING SALIENTE	PING ENTRANTE	VLAN	PUERTO ROOT A BLOQUEAR/APAGAR	TIEMPO	SWITCH
192.168.18.1	192.168.18.3	18	Fa0/3	32.5 Segundos	SW1
192.168.28.1	192.168.28.2	28	Fa0/1	57.37 segundos	SW3
192.168.38.1	192.168.38.3	38	Fa0/2	56.84 segundos	SW2

Escenario 2 RAPID-PVST

Se elegirá el escenario 2 para realizar las primeras pruebas con los switches

Verificación de protocolos Actuales

Se verificará que todos los switches estén con el protocolo PVST

SW4 - Server

- Sh spanning-tree

```
VLAN0018
  Spanning tree enabled protocol ieee
  Root ID    Priority    32786
```

```
VLAN0028
  Spanning tree enabled protocol ieee
  Root ID    Priority    32796
```

```
VLAN0038
  Spanning tree enabled protocol ieee
  Root ID    Priority    32806
```

Entonces si verificamos nos damos cuenta que todos los switches están en modo PVST y hay que cambiarlos todos a modo Rapid-PVST

- Ena
- Conf t
- Spanning-tree mode rapid-pvst
- Exit
- Sh run

```
SW4>ena
SW4#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW4(config)#spanning-tree ?
  mode      Spanning tree operating mode
  portfast  Spanning tree portfast options
  vlan      VLAN Switch Spanning Tree
SW4(config)#spanning-tree mode ?
  pvst        Per-Vlan spanning tree mode
  rapid-pvst  Per-Vlan rapid spanning tree mode
SW4(config)#spanning-tree mode rapid-pvst
SW4(config)#exit
SW4#
%SYS-5-CONFIG_I: Configured from console by console
```

```
SW4#
SW4#sh run
Building configuration...

Current configuration : 1231 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SW4
!
!
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport mode trunk
!

SW4#write memory
Building configuration...
[OK]
```

Entonces ya tendremos el switch de modo rapid-pvst, por último, miramos sus puertos root-FWD o designados

- Sh spanning-tree

```
SW4#sh spanning-tree
VLAN0001
  Spanning tree enabled protocol rstp
  Root ID     Priority    32769
              Address     0001.9723.20B6
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32769  (priority 32768 sys-id-ext 1)
              Address     0001.9723.20B6
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p
```

```
VLAN0018
  Spanning tree enabled protocol rstp
  Root ID     Priority    32786
              Address     0001.9723.20B6
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32786  (priority 32768 sys-id-ext 18)
              Address     0001.9723.20B6
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p
```

```
VLAN0028
  Spanning tree enabled protocol rstp
  Root ID     Priority    32796
              Address     0001.9723.20B6
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32796  (priority 32768 sys-id-ext 28)
              Address     0001.9723.20B6
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/4            Desg FWD 19        128.4    P2p
```

```
VLAN0038
  Spanning tree enabled protocol rstp
  Root ID     Priority    32806
              Address     0001.9723.20B6
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32806  (priority 32768 sys-id-ext 38)
              Address     0001.9723.20B6
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p
```

Como suponemos todos los switches están en PVST entonces hay que cambiarlos todos a Rapid-PVST

SW 1

```
SW1>ena
SW1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW1(config)#spanning tree mode rapid-pvst
                    ^
% Invalid input detected at '^' marker.

SW1(config)#spanning-tree mode rapid-pvst
SW1(config)#exit
SW1#
%SYS-5-CONFIG_I: Configured from console by console
```

SW2

```
SW2>
SW2>ena
SW2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW2(config)#spanning-tree mode rapid-pvst
SW2(config)#exit
SW2#
%SYS-5-CONFIG_I: Configured from console by console

SW2#sh run
Building configuration...

Current configuration : 1231 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SW2
!
!
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
```

SW3

```
SW3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW3(config)#spanning-tree mode rapid-pvst
SW3(config)#exit
SW3#
%SYS-5-CONFIG_I: Configured from console by console

SW3#sh run
Building configuration...

Current configuration : 1282 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SW3
!
!
!
!
!
!
spanning-tree mode rapid-pvst
```

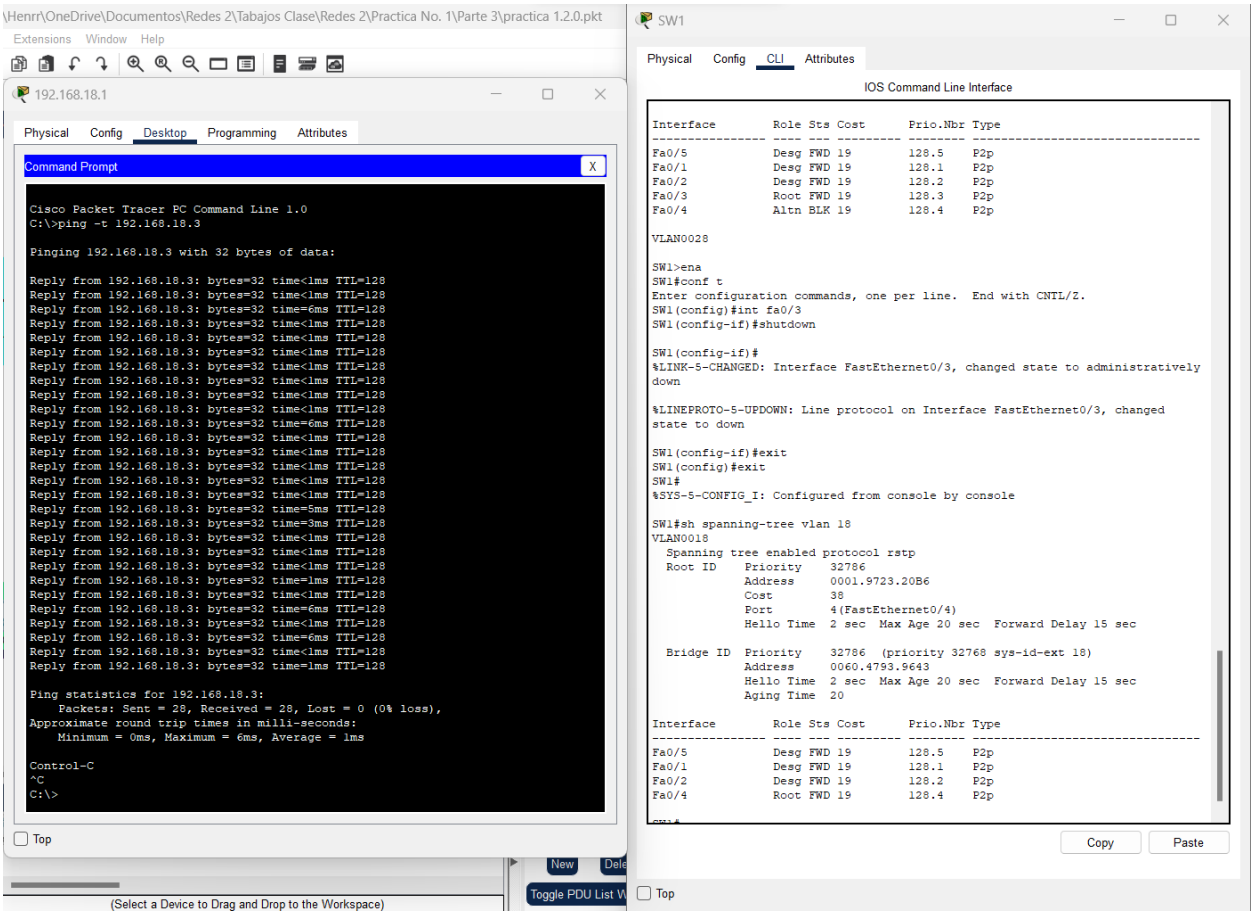
SW 5

```
SW5#CONF T
Enter configuration commands, one per line.  End with CNTL/Z.
SW5(config)#SPANNING-TREE MODE RAPID-PVST
SW5(config)#EXIT
SW5#
%SYS-5-CONFIG_I: Configured from console by console

SW5#SH RUN
Building configuration...

Current configuration : 1226 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SW5
!
!
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
!
```

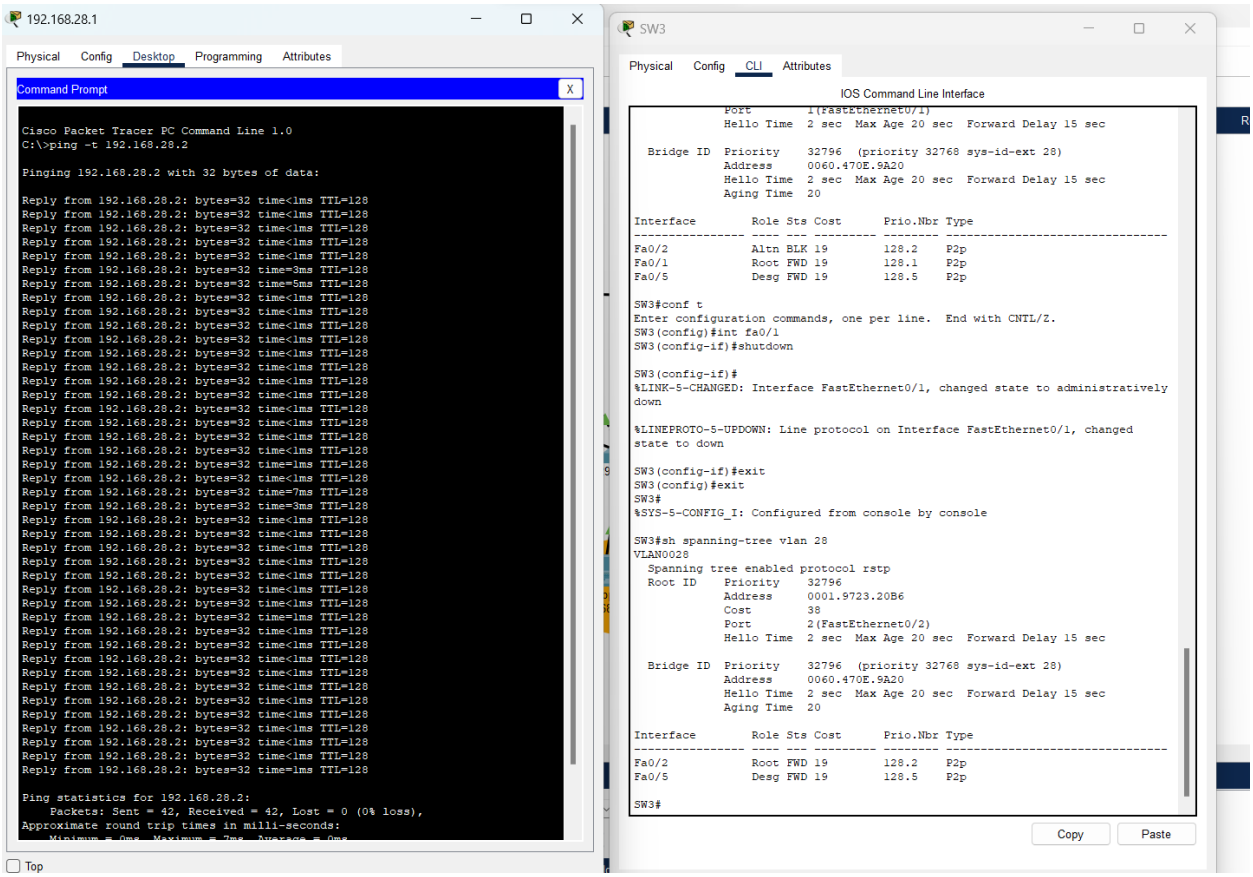
Ya cambia la configuración de todos los switches se procederá a hacer un ping como con el pvst y ver cuáles son sus enlaces root y bloquearlos/apagarlos

Procedemos a llenar la tabla RAPID-PVST

PING 1


\Henrr\OneDrive\Documentos\Redes 2\Tabajos Clase\Redes 2\Practica No. 1\Parte 3\practica 1.2.0.pkt
Extensions Window Help
192.168.18.1
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping -t 192.168.18.3
Pinging 192.168.18.3 with 32 bytes of data:
Reply from 192.168.18.3: bytes=32 time<1ms TTL=128
Reply from 192.168.18.3: bytes=32 time=6ms TTL=128
Reply from 192.168.18.3: bytes=32 time=3ms TTL=128
Reply from 192.168.18.3: bytes=32 time=1ms TTL=128
Ping statistics for 192.168.18.3:
Packets: Sent = 28, Received = 28, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 6ms, Average = 1ms
Control-C
^C
C:\>
Top
(Select a Device to Drag and Drop to the Workspace)
SW1
Physical Config CLI Attributes
IOS Command Line Interface
Interface Role Sts Cost Prio.Nbr Type
Fa0/5 Desg FWD 19 128.5 P2p
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/3 Root FWD 19 128.3 P2p
Fa0/4 Altn BLK 19 128.4 P2p
VLAN0028
SW1>ena
SW1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW1(config)#int fa0/3
SW1(config-if)#shutdown
SW1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down
SW1(config-if)#exit
SW1(config)#exit
SW1#
%SYS-5-CONFIG_I: Configured from console by console
SW1#sh spanning-tree vlan 18
VLAN0018
Spanning tree enabled protocol rstp
Root ID Priority 32786
Address 0001.9723.20B6
Cost 38
Port 4(FastEthernet0/4)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32786 (priority 32768 sys-id-ext 18)
Address 0060.4793.9643
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
Interface Role Sts Cost Prio.Nbr Type
Fa0/5 Desg FWD 19 128.5 P2p
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/4 Root FWD 19 128.4 P2p
Copy
Paste
Top

PING 2


192.168.28.1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping -t 192.168.28.2
Pinging 192.168.28.2 with 32 bytes of data:
Reply from 192.168.28.2: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.28.2:
Packets: Sent = 42, Received = 42, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Top
SW3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Port 1(FastEthernet0/1)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32796 (priority 32768 sys-id-ext 28)
Address 0060.470E.9A20
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
Interface Role Sts Cost Prio.Nbr Type
Fa0/2 Altn BLK 19 128.2 P2p
Fa0/1 Root FWD 19 128.1 P2p
Fa0/5 Desg FWD 19 128.5 P2p
SW3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW3(config)#int fa0/1
SW3(config-if)#shutdown
SW3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
SW3(config-if)#exit
SW3(config)#exit
SW3#
%SYS-5-CONFIG_I: Configured from console by console
SW3#sh spanning-tree vlan 28
VLAN0028
Spanning tree enabled protocol rstp
Root ID Priority 32796
Address 0001.9723.20B6
Cost 38
Port 2(FastEthernet0/2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32796 (priority 32768 sys-id-ext 28)
Address 0060.470E.9A20
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
Interface Role Sts Cost Prio.Nbr Type
Fa0/2 Root FWD 19 128.2 P2p
Fa0/5 Desg FWD 19 128.5 P2p
SW3#
Copy
Paste

PING 3

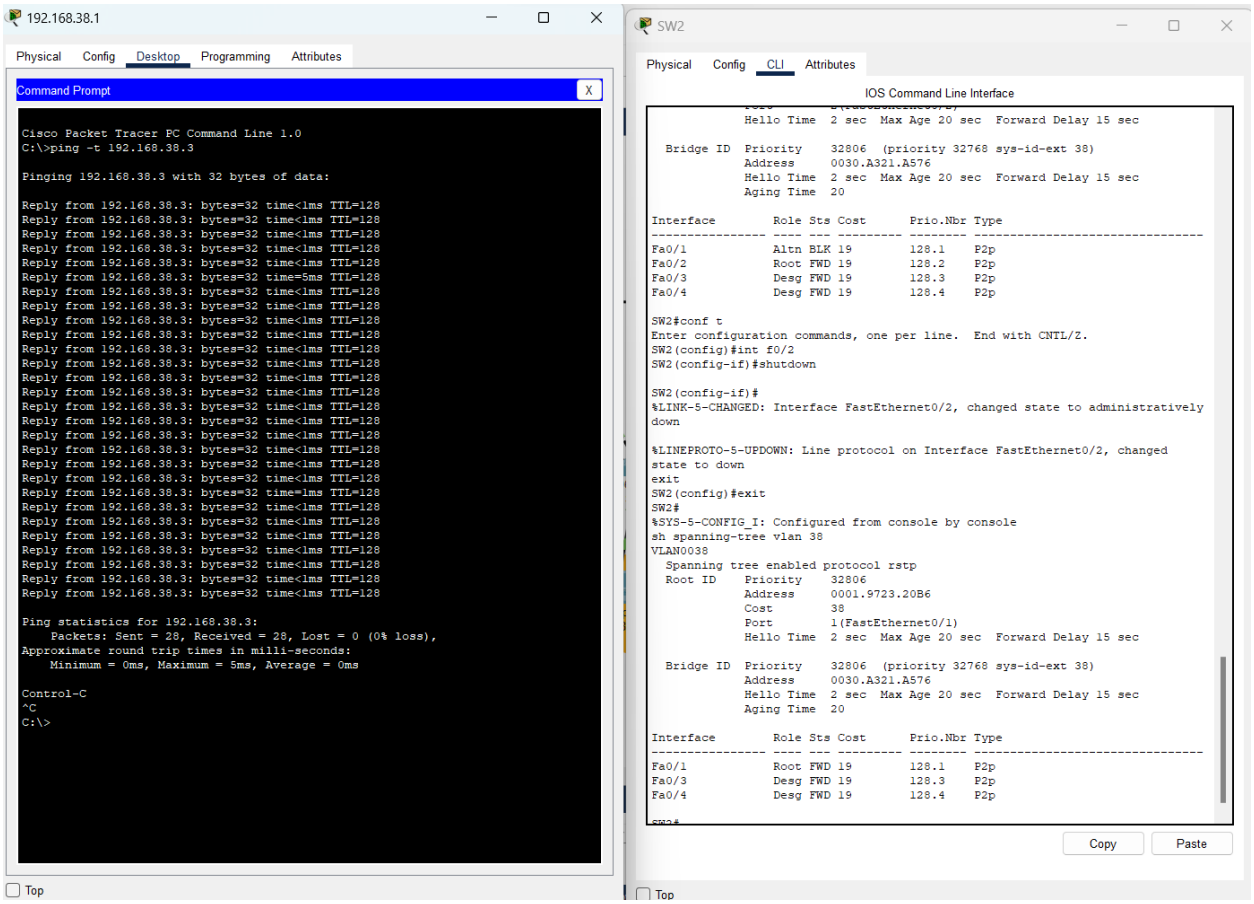


Tabla de pruebas con el escenario 2 Rapid-PVST

PING	PING SALIENTE	PING ENTRANTE	VLAN	PUERTO ROOT A BLOQUEAR/APAGAR	TIEMPO	SWITCH
1	192.168.18.1	192.168.18.3	18	Fa0/3	Ni un segundo cuando tome el tiempo ni se notó el cambio	SW1
2	192.168.28.1	192.168.28.2	28	Fa0/1	Ni se notó el cambio	SW3
3	192.168.38.1	192.168.38.3	38	Fa0/2	Igual que los anteriores ni se notó el cambio	SW2

Conclusión PVST Y RAPID-PVST

La mejor opción sería el rapid-pvst como se pude observar en las tablas se hicieron las mismas pruebas en los mismos switches y el mismo ping a las VPC y gano con gran diferencia el Rapid-PVST, tarde más tiempo en darle pausar el botón del cronometro que esa conexión se efectuará ni siquiera tuvo líneas de perdida, en conclusión, el mejor escenario sería el 2 que tuvo un menor tiempo de convergencia.

Seguridad para las interfaces asignadas a la VLAN

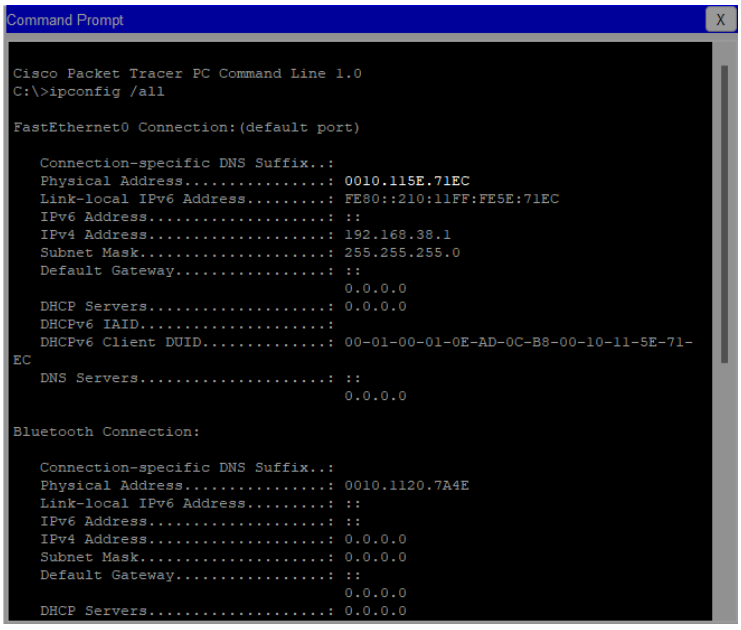
Se configuraron los puertos en modo acceso de los switches con port-security en modo MAC address, asignándoles así la MAC del dispositivo al que se encuentran conectados de manera que en caso de que se conecta algún dispositivo diferente el puerto se apagará.

MAC Address de los dispositivos

IP	**MAC**
192.168.18.1	0060.5C02.1C9D
192.168.18.2	0009.7CBD.4C80
192.168.18.3	000A.4102.53EA
192.168.28.1	0003.E4DC.A8A0
192.168.38.3	0060.47E3.3659
192.168.28.2	0040.0B97.34E5
192.168.28.3	00D0.FF05.5619
192.168.38.1	0010.115E.71EC
192.168.38.2	000C.8534.5838

Comando Utilizados para configurar el Port Security

Para configurar el port security necesitamos la MAC address del dispositivo para obtenerla entramos al command prompt de la PC y ejecutamos el siguiente comando:



Luego copiamos la MAC e ingresamos a la interfaz del switch que se encuentra conectada al dispositivo y ejecutamos el siguiente comando:

```
SW2(config-if)#sw
SW2(config-if)#switchport por
SW2(config-if)#switchport port-security
SW2(config-if)#switchport port-security ma
SW2(config-if)#switchport port-security mac
SW2(config-if)#switchport port-security mac-address 000C.8534.5838
SW2(config-if)#
SW2(config-if)#exit
SW2(config)#exit
```

Para poder ver la configuración del port security en las interfaces corremos el siguiente comando:

```
interface FastEthernet0/3
 switchport access vlan 38
 switchport mode access
 switchport port-security
 switchport port-security mac-address 0010.115E.71EC
!
interface FastEthernet0/4
 switchport access vlan 38
 switchport mode access
 switchport port-security
 switchport port-security mac-address 000C.8534.5838
!
```

De esta manera ya queda configurada el port security de la interfaz del puerto