

PRUEBA DE HABILIDADES PRACTICAS CISCO CCNP

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD  
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INGENIERIA DE TELECOMUNICACIONES  
BOGOTA  
2019

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Diplomado de opción de grado presentado para optar el título de  
INGENIERO DE TELECOMUNICACIONES

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NOTA DE ACEPTACIÓN

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Firma del presidente del Jurado

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Firma del Jurado

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Firma del Jurado

Bogotá, 03 de julio de 2019

## **DEDICATORIA**

Se dedica los frutos de todo mi proceso de formación académica a la red de tutores de la UNAD- (universidad nacional abierta y a distancia) y a los compañeros de los diferentes cursos y principalmente a mis familiares, Que con el apoyo de todas las personas mencionadas anteriormente no sería posibles el logro que se culmina en mi vida profesional.

Para tener un presente y futuro mucho mejor a nivel monetario y en armonía en mi ambiente familiar y principalmente implementando los volares éticos y morales.

## **AGRADECIMIENTOS**

Dedicamos el desarrollo tanto práctico como teórico de los módulos de CCNP SWITCH y CCNP ROUTE al director de curso GERARDO GRANADOS y a los compañeros de grupo de la plataforma UNAD que sin su ayuda no sería posible su implementación y simulación en los laboratorios de diplomado de profundización.

Y por otra parte gracias a los espacios sincrónicos de videoconferencia para el desarrollo de cada unidad.

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## **GLOSARIO**

### **DIRECCIONAMIENTO IP**

en cada interfaz serial del router se va a implementar una dirección con su macara para la posible comunicación de las demás sucursales y él envió de información sin perdida dato un previo ping al destino.

### **PROTOCOLOS DE ENRUTAMIENTO:**

son herramientas u protocolos que se configura por medio de la consola de un router para el envío de paquetes sin tráfico ni saturación

### **VLAN:**

(red de área local virtual), es un método para crear redes lógicas independientes dentro de una misma red física.

## RESUMEN

A lo largo de este curso se ha adquirido conocimientos de diferentes tipos de enrutamiento en cada uno de los laboratorios de las unidades del curso de profundización diplomado CCNP y analizando críticamente los comandos implementados en la consola de software de redes manejado.

Sus Vlan's nos permiten tener redes dentro de dispositivos para evitar el tráfico de la información manejando una frecuencia optima a la hora de una autenticacion u versión de los equipos

**Palabras claves:** cisco, ccnp Switch y ccnp route, redes, telecomunicaciones, protocolos de enrutamiento, topologia, GNS3, Packet Tracer.

## ABSTRACT

Throughout this course we have acquired knowledge of different types of routing in each of the laboratories of the CCNP diplomatic deepening course units and critically analyzing the commands implemented in the managed network software console.

Their changes allow us to have networks within the devices to avoid the traffic of the information managing an optimal frequency when it comes to an authentication or version of the equipment.

**Keywords:** cisco, ccnp Switch and ccnp route, networks, telecommunications, routing protocols, topology, GNS3, Packet Tracer.

## INTRODUCCIÓN

En el presente documento se realiza con el fin de implementar los conocimientos adquiridos a lo largo del curso CCNP en una prueba de habilidades utilizando un software de simulación de redes para su desarrollo practico.

También se estructura e implementa protocolos de enrutamiento en las diferentes clases de direcciones ip para una comunicación eficiente y oportuna, sus diferentes dispositivos de red en un simulador instalado sus IOS de Switch y router en el software GNS3 trabajando IPV6 ya que es un protocolo de internet definido por la RFC 2460 en un conjunto Ipsec de protocolos cuya función es asegurar la comunicación en protocolos de internet por medio de la autenticacion o el cifrado de paquetes, las Vlan se implementan para crear un métodos de redes lógicas independiente dentro de una misma red física u su topologia.

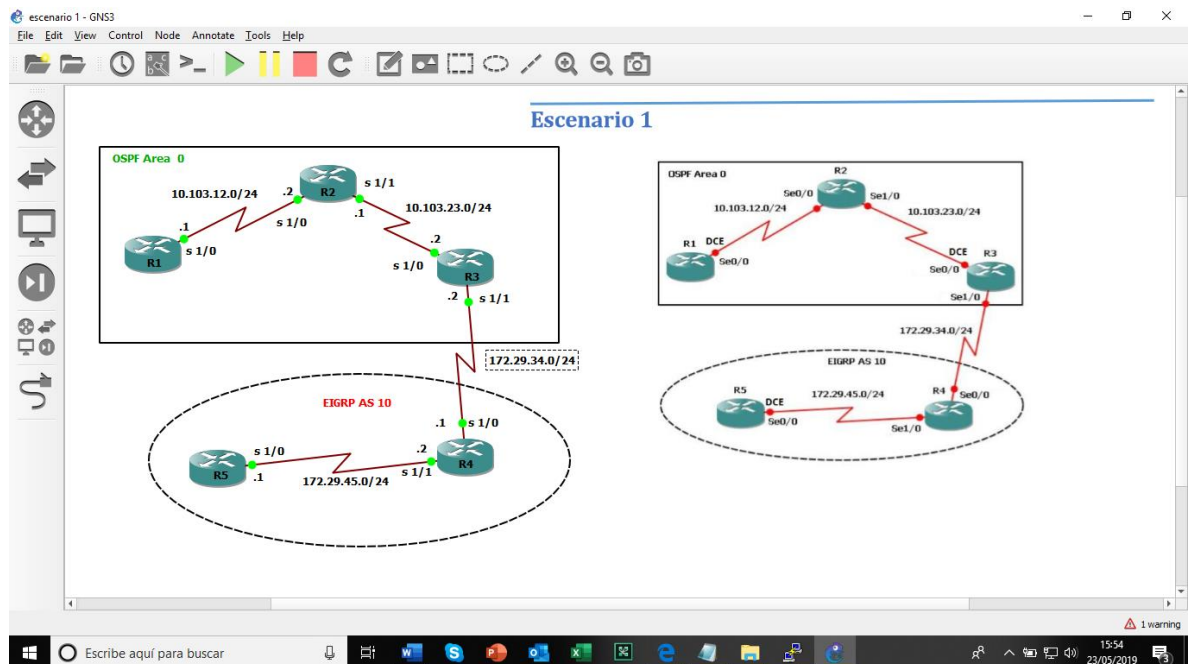
## DESARROLLO DE LA PRUEBA DE HABILIDADES PRÁCTICAS

**IMPORTANTE:** Para cada uno de los escenarios se debe describir el paso a paso de cada punto realizado y deben digitar el código de configuración aplicado (no incluir imágenes ni capturas de pantalla). Las imágenes o capturas de pantalla sólo serán usadas para evidenciar los resultados de comandos como ping, traceroute, show ip route, entre otros.

- ✓ Descripción de escenarios propuestos para la prueba de habilidades

### Escenario 1

Figura 1 Topología Escenario 1



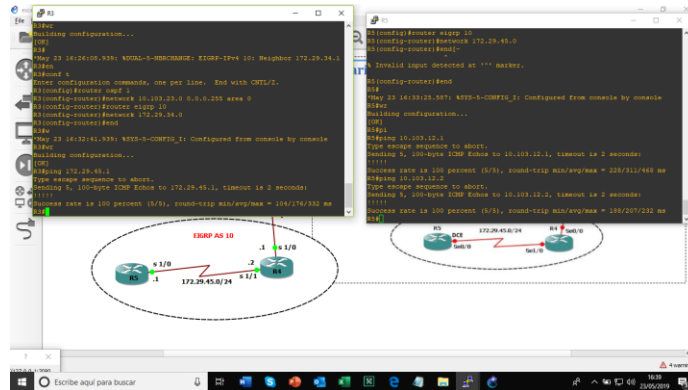
- ✓ Aplique las configuraciones iniciales y los protocolos de enrutamiento para los routers R1, R2, R3, R4 y R5 según el diagrama. No asigne password en los routers. Configurar las interfaces con las direcciones que se muestran en la topología de red.

*Tabla 1 Enrutamiento*

<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>	<b>R5</b>
int s1/0 ip address 10.103.12.1 255.255.255.0 no shut	int s1/0 ip address 10.103.12.2 255.255.255.0 no shut exit	int s1/0 ip address 10.103.23.2 255.255.255.0 no shut exit	int s1/0 ip address 172.29.34.1 255.255.255.0 no shut exit	int s1/0 ip address 172.29.45.1 255.255.255.0 no shut
router ospf 1 network 10.103.12.0 0.0.0.255 area 0	int s1/1 ip address 10.103.23.1 255.255.255.0 no shut	int s1/1 ip address 172.29.34.2 255.255.255.0 no shut	int s1/1 ip address 172.29.45.2 255.255.255.0 no shut	router eigrp 10 network 172.29.45.0
	router ospf 1 network 10.103.12.0 0.0.0.255 area 0	router ospf 1 network 10.103.23.0 0.0.0.255 area 0	router eigrp 10 network 172.29.45.0 network 172.29.34.0	
	network 10.103.23.0 0.0.0.255 area 0	router eigrp 10 network 172.29.34.0		

En la siguiente ilustración se implementan los anteriores comandos en la consola de los routers

Figura 2 Protocolo de Enrutamiento



Cree cuatro nuevas interfaces de Loopback en R1 utilizando la asignación de direcciones 10.1.0.0/22 y configure esas interfaces para participar en el área 0 de **OSPF**

Tabla 2 interfaces de Loopback

<b>R1</b> int <b>lo 4</b> ip address 10.2.2.1 255.255.252.0 exit
int <b>lo 5</b> ip address 10.2.3.1 255.255.252.0 exit
int <b>lo 6</b> ip address 10.2.4.1 255.255.252.0 exit
int <b>lo 7</b> ip address 10.2.5.1 255.255.252.0 exit

Tabla 3 área 0 de OSPF

router <b>ospf 1</b>
network 10.2.2.0 0.0.3.255 area 0
network 10.2.3.0 0.0.3.255 area 0
network 10.2.4.0 0.0.3.255 area 0
network 10.2.5.0 0.0.3.255 area 0

**Cree cuatro nuevas interfaces de Loopback en R5 utilizando la asignación de direcciones 172.5.0.0/22 y configure esas interfaces para participar en el Sistema Autónomo EIGRP 10.**

*Tabla 4 interfaces de Loopback en R5*

<pre>int lo 10 ip address 172.5.2.1 255.255.252.0 exit</pre>
<pre>int lo 11 ip address 172.5.3.1 255.255.252.0 exit</pre>
<pre>int lo 12 ip address 172.5.4.1 255.255.252.0 exit</pre>
<pre>int lo 13 ip address 172.5.5.1 255.255.252.0 exit</pre>

*Tabla 5 Sistema Autónomo EIGRP 10*

<pre>router <b>eigrp</b> 10</pre>
<pre>network 172.5.2.0</pre>
<pre>network 172.5.3.0</pre>
<pre>network 172.5.4.0</pre>
<pre>network 172.5.5.0</pre>

**Analice la tabla de enrutamiento de R3 y verifique que R3 está aprendiendo las nuevas interfaces de Loopback mediante el comando show ip route.**

Figura 3 Show ip route (Loopback)

```

R3
R3(config)#router ospf 1
R3(config-router)#network 10.103.23.0 0.0.0.255 area 0
R3(config-router)#router eigrp 10
R3(config-router)#network 172.29.34.0
R3(config-router)#end
R3#
*May 23 16:32:41.939: %SYS-5-CONFIG_I: Configured from console by console
R3#v
Building configuration...
[OK]
R3#ping 172.29.45.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.29.45.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 104/176/332 ms
R3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, IA - IS-IS level-1, I2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
e
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 7 subnets, 3 masks
R 10.2.0.0/22 [120/2] via 10.103.23.1, 00:00:19, Serial1/0
O 10.2.2.1/32 [110/129] via 10.103.23.1, 00:14:47, Serial1/0
R 10.2.4.0/22 [120/2] via 10.103.23.1, 00:00:19, Serial1/0
O 10.2.4.1/32 [110/129] via 10.103.23.1, 00:14:47, Serial1/0
O 10.103.12.0/24 [110/128] via 10.103.23.1, 01:17:42, Serial1/0
C 10.103.23.0/24 is directly connected, Serial1/0
L 10.103.23.2/32 is directly connected, Serial1/0
172.5.0.0/22 is subnetted, 2 subnets
D 172.5.0.0 [90/2809856] via 172.29.34.1, 00:05:31, Serial1/1
D 172.5.4.0 [90/2809856] via 172.29.34.1, 00:05:31, Serial1/1
172.29.0.0/16 is variably subnetted, 3 subnets, 2 masks
C 172.29.34.0/24 is directly connected, Serial1/1
L 172.29.34.2/32 is directly connected, Serial1/1
D 172.29.45.0/24 [90/2601856] via 172.29.34.1, 00:40:16, Serial1/1
R3#
  
```

**Configure R3 para redistribuir las rutas EIGRP en OSPF usando el costo de 50000 y luego redistribuya las rutas OSPF en EIGRP usando un ancho de banda T1 y 20,000 microsegundos de retardo.**

*Tabla 6 OSPF en EIGRP*

<i>router eigrp 10</i>
<i>redistribute ospf 1 metric 10000 100 255 1 1500</i>

Verifique en R1 y R5 que las rutas del sistema autónomo opuesto existen en su tabla de enrutamiento mediante el comando show ip route



Figura 4 Sistema autónomo (Show ip route)

```
R5
R5(config-router)#network 172.5.5.0
R5(config-router)#
*May 23 17:00:28.311: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback
10, changed state to up
*May 23 17:00:28.739: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback
11, changed state to up
*May 23 17:00:29.931: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback
12, changed state to up
*May 23 17:00:29.235: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback
13, changed state to up
R5(config-router)#end
R5#
*May 23 17:00:44.219: %SYS-5-CONFIG_I: Configured from console by console
R5#
Building configuration...
[OK]
R5#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 5 subnets, 3 masks
R 10.0.0.0/8 [120/2] via 172.29.45.2, 00:00:28, Serial1/0
D EX 10.2.2.1/32 [170/2707456] via 172.29.45.2, 00:04:39, Serial1/0
D EX 10.2.4.1/32 [170/2707456] via 172.29.45.2, 00:04:39, Serial1/0
D EX 10.103.12.0/24 [170/2707456] via 172.29.45.2, 00:04:39, Serial1/0
D EX 10.103.23.0/24 [170/2707456] via 172.29.45.2, 00:04:39, Serial1/0
C 172.5.0.0/16 is variably subnetted, 4 subnets, 2 masks
L 172.5.0.0/22 is directly connected, Loopback10
L 172.5.2.1/32 is directly connected, Loopback10
C 172.5.4.0/22 is directly connected, Loopback12
L 172.5.4.1/32 is directly connected, Loopback12
D 172.29.0.0/16 is variably subnetted, 3 subnets, 2 masks
C 172.29.34.0/24 [90/2681856] via 172.29.45.2, 00:56:31, Serial1/0
D 172.29.45.0/24 is directly connected, Serial1/0
L 172.29.45.1/32 is directly connected, Serial1/0
R5#
```

```
R1
R1(config)#router ospf 1
R1(config-router)#network 10.2.2.0 0.0.3.255 area 0
R1(config-router)#network 10.2.3.0 0.0.3.255 area 0
R1(config-router)#network 10.2.4.0 0.0.3.255 area 0
R1(config-router)#network 10.2.5.0 0.0.3.255 area 0
R1(config-router)#
R1(config-router)#
R1(config-router)#end
R1#
*May 23 16:51:33.511: %SYS-5-CONFIG_I: Configured from console by console
R1#
Building configuration...
[OK]
R1#
Building configuration...
[OK]
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 7 subnets, 3 masks
C 10.2.0.0/22 is directly connected, Loopback4
L 10.2.2.1/32 is directly connected, Loopback4
C 10.2.4.0/22 is directly connected, Loopback6
L 10.2.4.0/32 is directly connected, Loopback6
C 10.103.12.0/24 is directly connected, Serial1/0
L 10.103.12.1/32 is directly connected, Serial1/0
O 10.103.23.0/24 [110/128] via 10.103.12.2, 01:34:42, Serial1/0
172.5.0.0/22 is subnetted, 2 subnets
O E2 172.5.0.0 [110/50000] via 10.103.12.2, 00:04:12, Serial1/0
O E2 172.5.4.0 [110/50000] via 10.103.12.2, 00:04:12, Serial1/0
172.29.0.0/16 is variably subnetted, 3 subnets, 2 masks
R 172.29.0.0/16 [120/2] via 10.103.12.2, 00:00:16, Serial1/0
O E2 172.29.34.0/24 [110/50000] via 10.103.12.2, 00:04:12, Serial1/0
O E2 172.29.45.0/24 [110/50000] via 10.103.12.2, 00:04:12, Serial1/0
R1#
```

## Escenario #2

Figura 5 Topologia Escenario 2

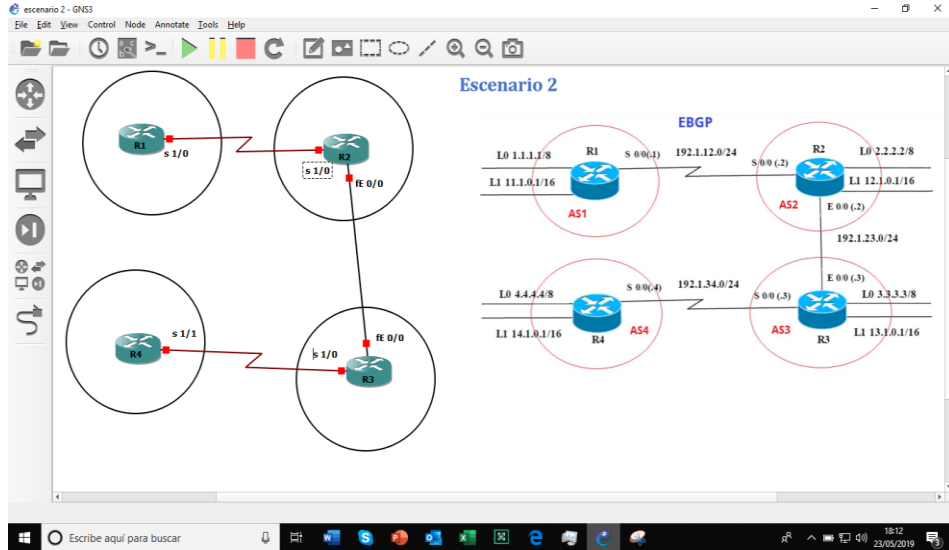


Tabla 7 Direccionamiento IP (Loopback-Serial)

	Interfaz	Dirección IP	Máscara
R1	Loopback 0	1.1.1.1	255.0.0.0
	Loopback 1	11.1.0.1	255.255.0.0
	S 0/0	192.1.12.1	255.255.255.0
R2	Loopback 0	2.2.2.2	255.0.0.0
	Loopback 1	12.1.0.1	255.255.0.0
	S 0/0	192.1.12.2	255.255.255.0
	E 0/0	192.1.23.2	255.255.255.0
	S 0/0 (2)	192.1.34.0/24	
R3	Loopback 0	3.3.3.3	255.0.0.0
	Loopback 1	13.1.0.1	255.255.0.0
	E 0/0	192.1.23.3	255.255.255.0
	S 0/0 (3)	192.1.34.0/24	
	S 0/0	192.1.34.3	255.255.255.0
R4	Loopback 0	4.4.4.4	255.0.0.0
	Loopback 1	14.1.0.1	255.255.0.0
	S 0/0	192.1.34.4	255.255.255.0

- Configure una relación de vecino BGP entre R1 y R2. R1 debe estar en AS1 y R2 debe estar en AS2. Anuncie las direcciones de Loopback en BGP. Codifique los ID para los routers BGP como 11.11.11.11 para R1 y como 22.22.22.22 para R2. Presente el paso a con los comandos utilizados y la salida del comando show ip route

Figura 6 BGP (Show ip route)

```

R1
$ Invalid input detected at '^' marker.
R1#
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router bgp 1
R1(config-router)#bgp router-id 11.11.11.11
R1(config-router)#neighbor 192.1.12.2 remote-as 2
R1(config-router)#network 1.0.0.0 mask 255.0.0.0
R1(config-router)#network 11.1.0.0 mask 255.255.0.0
R1(config-router)#
R1(config-router)#
R1(config-router)#
R1(config-router)#
May 23 18:53:15.971: %BGP-5-ADJCHANGE: neighbor 192.1.12.2 Up
R1(config-router)#end
R1#
May 23 18:54:22.755: %SYS-5-CONFIG_I: Configured from console by console
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, I - LISP
       * - replicated route, % - next hop override
Gateway of last resort is not set

1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       1.0.0.0/8 is directly connected, Loopback0
L       1.1.1.1/32 is directly connected, Loopback0
O       2.0.0.0/8 [20/0] via 192.1.12.2, 00100124
11.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       11.1.0.0/16 is directly connected, Loopback1
L       11.1.0.1/32 is directly connected, Loopback1
12.0.0.0/8 is subnetted, 1 subnet
O       12.1.0.0 [20/0] via 192.1.12.2, 00100124
192.1.12.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.1.12.0/24 is directly connected, Serial1/1
L       192.1.12.1/32 is directly connected, Serial1/1
R1#

```

```

R1#show ip bgp
BGP table version is 5, local router ID is 11.11.11.11
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop          Metric LocPrf Weight Path
*>  1.0.0.0          0.0.0.0            0         32768  i
*>  2.0.0.0          192.1.12.2         0         0 2  i
*>  11.1.0.0/16      0.0.0.0            0         32768  i
*>  12.1.0.0/16      192.1.12.2         0         0 2  i
R1#

```

Por medio del anterior comando se visualiza los ID de los routers BGP para establecer una relación entre vecinos dentro de la red, Dando a conocer el router local con su versión para establecer comunicación entre codes vecinos

Figura 7 Loopback en BGP

```
R2
R2(config-router)#END
R2#
*May 23 19:04:55.519: %SYS-5-CONFIG_I: Configured from console by console
R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, LI - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, I - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

B 1.0.0.0/8 [20/0] via 192.1.12.1, 00:11:42
C 2.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
L 2.0.0.0/8 is directly connected, Loopback0
L 2.2.2.2/32 is directly connected, Loopback0
L 11.0.0.0/16 is subnetted, 1 subnets
B 11.1.0.0 [20/0] via 192.1.12.1, 00:11:42
C 12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
L 12.1.0.0/16 is directly connected, Loopback1
L 12.1.0.1/32 is directly connected, Loopback1
C 192.1.12.0/24 is variably subnetted, 2 subnets, 2 masks
L 192.1.12.0/24 is directly connected, Serial1/0
L 192.1.12.2/32 is directly connected, Serial1/0
C 192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
L 192.1.23.0/24 is directly connected, FastEthernet0/0
L 192.1.23.2/32 is directly connected, FastEthernet0/0
R2#show ip bgp
BGP table version is 5, local router ID is 22.22.22.22
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop        Metric LocPrf Weight Path
*> 1.0.0.0           192.1.12.1         0           0 1 1
*> 2.0.0.0           0.0.0.0           0           32768 i
*> 11.1.0.0/16      192.1.12.1         0           0 1 1
*> 12.1.0.0/16      0.0.0.0           0           32768 i
R2#
```

Configure una relación de vecino BGP entre R2 y R3. R2 ya debería estar configurado en AS2 y R3 debería estar en AS3. Anuncie las direcciones de Loopback de R3 en BGP. Codifique el ID del router R3 como 33.33.33.33. Presente el paso a con los comandos utilizados y la salida del comando **show ip route**.

Figura 8 Relación vecinos (show ip route)

```
R2
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

B 1.0.0.0/8 [20/0] via 192.1.12.1, 00:20:39
B 2.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 2.0.0.0/8 is directly connected, Loopback0
L 2.2.2.2/32 is directly connected, Loopback0
B 3.0.0.0/8 [20/0] via 192.1.23.3, 00:01:08
B 11.0.0.0/16 is subnetted, 1 subnets
  11.1.0.0 [20/0] via 192.1.12.1, 00:20:39
B 12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 12.1.0.0/16 is directly connected, Loopback1
L 12.1.0.1/32 is directly connected, Loopback1
B 13.0.0.0/16 is subnetted, 1 subnets
  13.1.0.0 [20/0] via 192.1.23.3, 00:01:08
B 192.1.12.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.12.0/24 is directly connected, Serial1/0
L 192.1.12.2/32 is directly connected, Serial1/0
C 192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.23.0/24 is directly connected, FastEthernet0/0
L 192.1.23.2/32 is directly connected, FastEthernet0/0

R2#show ip bgp
BGP table version is 7, local router ID is 22.22.22.22
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop        Metric LocPrf Weight Path
*> 1.0.0.0          192.1.12.1          0             0 1 i
*> 2.0.0.0          0.0.0.0            0             0 3 1
*> 3.0.0.0          192.1.23.3          0             0 3 1
*> 11.1.0.0/16     192.1.12.1          0             0 1 i
*> 12.1.0.0/16     0.0.0.0            0             0 1 i
*> 13.1.0.0/16     192.1.23.3          0             0 3 1
R2#
```

Figura 9 R3 (vecinos)

```
R3
*May 23 19:12:37.279: %BGP-5-ADJCHANGE: neighbor 192.1.23.2 Up
R3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

B 1.0.0.0/8 [20/0] via 192.1.23.2, 00:06:35
B 2.0.0.0/8 [20/0] via 192.1.23.2, 00:06:35
B 3.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 3.0.0.0/8 is directly connected, Loopback0
L 3.3.3.3/32 is directly connected, Loopback0
B 11.0.0.0/16 is subnetted, 1 subnets
  11.1.0.0 [20/0] via 192.1.23.2, 00:06:35
B 12.0.0.0/16 is subnetted, 1 subnets
  12.1.0.0 [20/0] via 192.1.23.2, 00:06:35
B 13.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 13.1.0.0/16 is directly connected, Loopback1
L 13.1.0.1/32 is directly connected, Loopback1
C 192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.23.0/24 is directly connected, FastEthernet0/0
L 192.1.23.3/32 is directly connected, FastEthernet0/0

R3#show ip bgp
BGP table version is 7, local router ID is 33.33.33.33
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop        Metric LocPrf Weight Path
*> 1.0.0.0          192.1.23.2          0             0 2 1 i
*> 2.0.0.0          192.1.23.2          0             0 2 1 i
*> 3.0.0.0          0.0.0.0            0             0 3 1
*> 11.1.0.0/16     192.1.23.2          0             0 2 1 i
*> 12.1.0.0/16     192.1.23.2          0             0 2 1 i
*> 13.1.0.0/16     0.0.0.0            0             0 3 1
R3#
```

Configure una relación de vecino BGP entre R3 y R4. R3 ya debería estar configurado en AS3 y R4 debería estar en AS4. Anuncie las direcciones de Loopback de R4 en BGP. Codifique el ID del router R4 como 44.44.44.44. Establezca las relaciones de vecino con base en las direcciones de Loopback 0.

Cree rutas estáticas para alcanzar la Loopback 0 del otro router. No anuncie la Loopback 0 en BGP. Anuncie la red Loopback de R4 en BGP. Presente el paso a con los comandos utilizados y la salida del comando **show ip route**.

Figura 10 show ip route

```

R3
R3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       I - IS-IS, su - IS-IS summary, LI - IS-IS level-1, L2 - IS-IS level-2
       Ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       * - replicated route, % - next hop override

Gateway of last resort is not set

B    1.0.0.0/8 [20/0] via 192.1.23.2, 00109150
B    2.0.0.0/8 [20/0] via 192.1.23.2, 00109150
C    3.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
L    3.0.0.0/8 is directly connected, Loopback0
L    3.3.3.3/32 is directly connected, Loopback0
B    11.0.0.0/16 is subnetted, 1 subnets
B    11.1.0.0 [20/0] via 192.1.23.2, 00109150
B    12.0.0.0/16 is subnetted, 1 subnets
B    12.1.0.0 [20/0] via 192.1.23.2, 00109150
C    13.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    13.1.0.0/16 is directly connected, Loopback0
L    13.1.0.1/32 is directly connected, Loopback1
B    192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.1.23.0/24 is directly connected, FastEthernet0/0
L    192.1.23.3/32 is directly connected, FastEthernet0/0

R3#show ip bgp
BGP table version is 11, local router ID is 33.33.33.33
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               * best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop         Metric LocPrf Weight Path
  >> 1.0.0.0          192.1.23.2             0         0 2 1 i
  >> 2.0.0.0          192.1.23.2             0         0 2 1
  >> 3.0.0.0          0.0.0.0                0         0 32768 1
  >> 11.1.0.0/16     192.1.23.2             0         0 2 1 i
  >> 12.1.0.0/16     192.1.23.2             0         0 2 1
  >> 13.1.0.0/16     0.0.0.0                0         0 32768 1
R3#

```

```

R4
R4(config-router)#network 4.0.0.0 mask 255.0.0.0
R4(config-router)#exit
R4(config)#ip route 3.0.0.0 255.0.0.0 192.1.34.3
R4(config)#router bgp 4
R4(config-router)#no network 4.0.0.0 mask 255.0.0.0
R4(config-router)#network 4.0.0.0 mask 255.0.0.0
R4(config-router)#network 14.1.0.0 mask 255.255.0.0
R4(config-router)#end
R4#
*May 23 19:30:58.715: %SYS-5-CONFIG I: Configured from console by console
R4#sh
R4#show i
R4#show ip
R4#show ip ru
R4#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       I - IS-IS, su - IS-IS summary, LI - IS-IS level-1, L2 - IS-IS level-2
       Ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       * - replicated route, % - next hop override

Gateway of last resort is not set

   4.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    4.0.0.0/8 is directly connected, Loopback0
L    4.4.4.4/32 is directly connected, Loopback0
C    14.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    14.1.0.0/16 is directly connected, Loopback1
L    14.1.0.1/32 is directly connected, Loopback1

R4#show ip bgp
BGP table version is 1, local router ID is 44.44.44.44
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               * best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop         Metric LocPrf Weight Path
  *  4.0.0.0          0.0.0.0             0         0 32768 1
  * 14.1.0.0/16     0.0.0.0             0         0 32768 1
R4#

```

# Escenario 3

Figura 11 Topologia Escenario (GNS3)

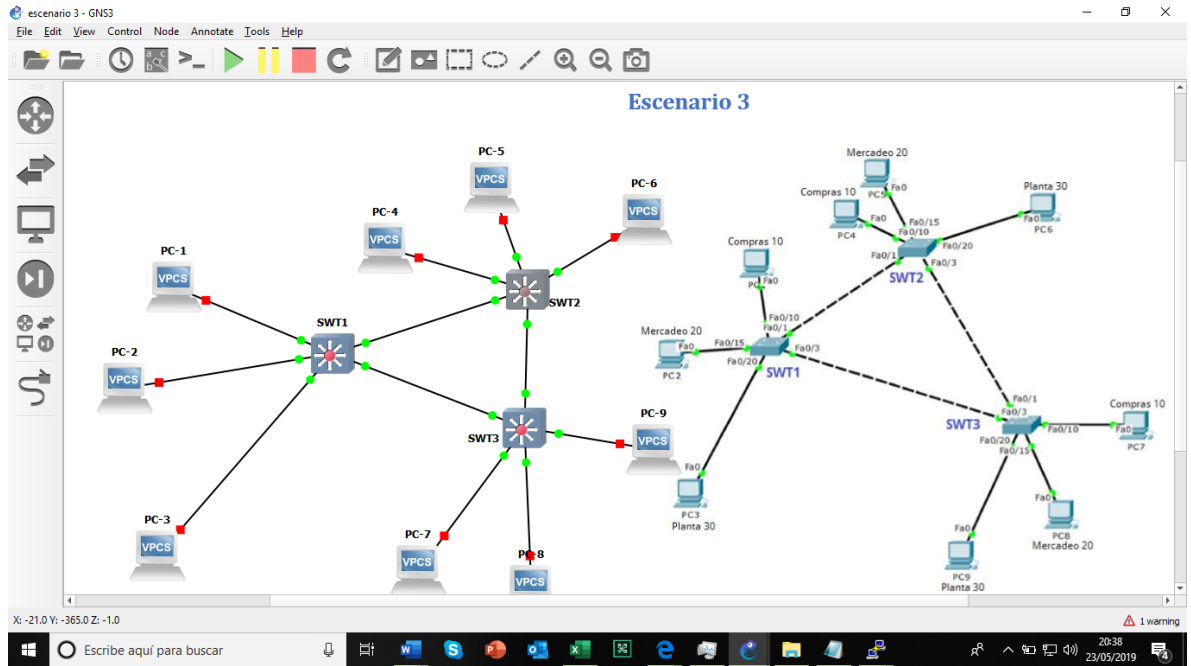


Figura 12 Esquema de Vlan y sus departamentos

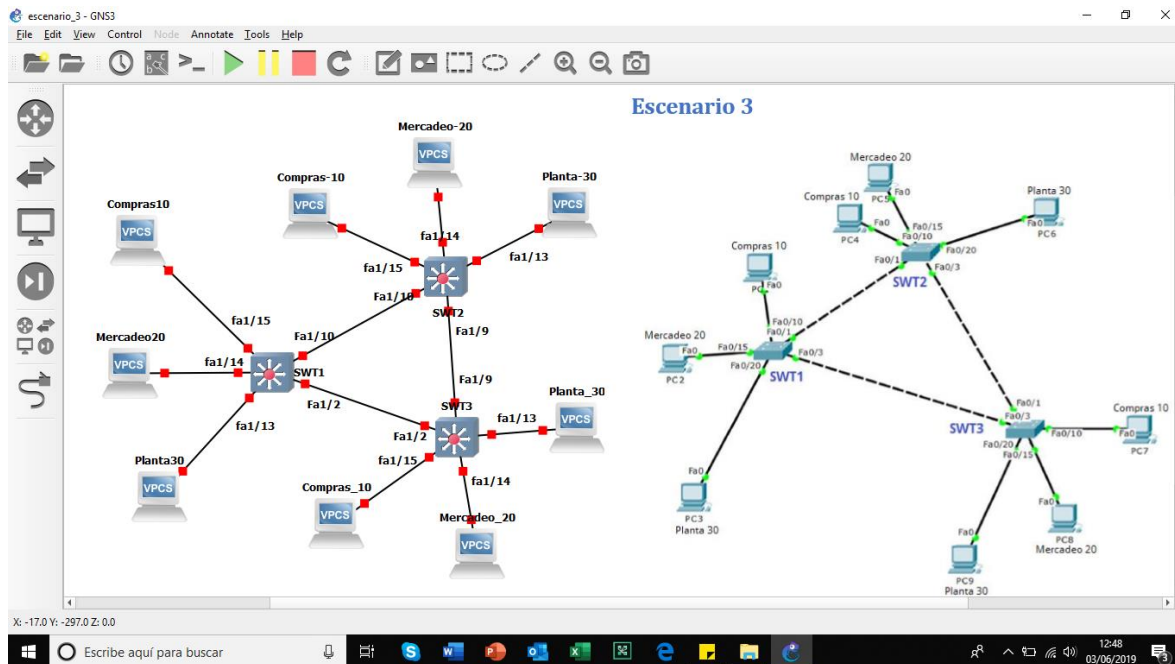
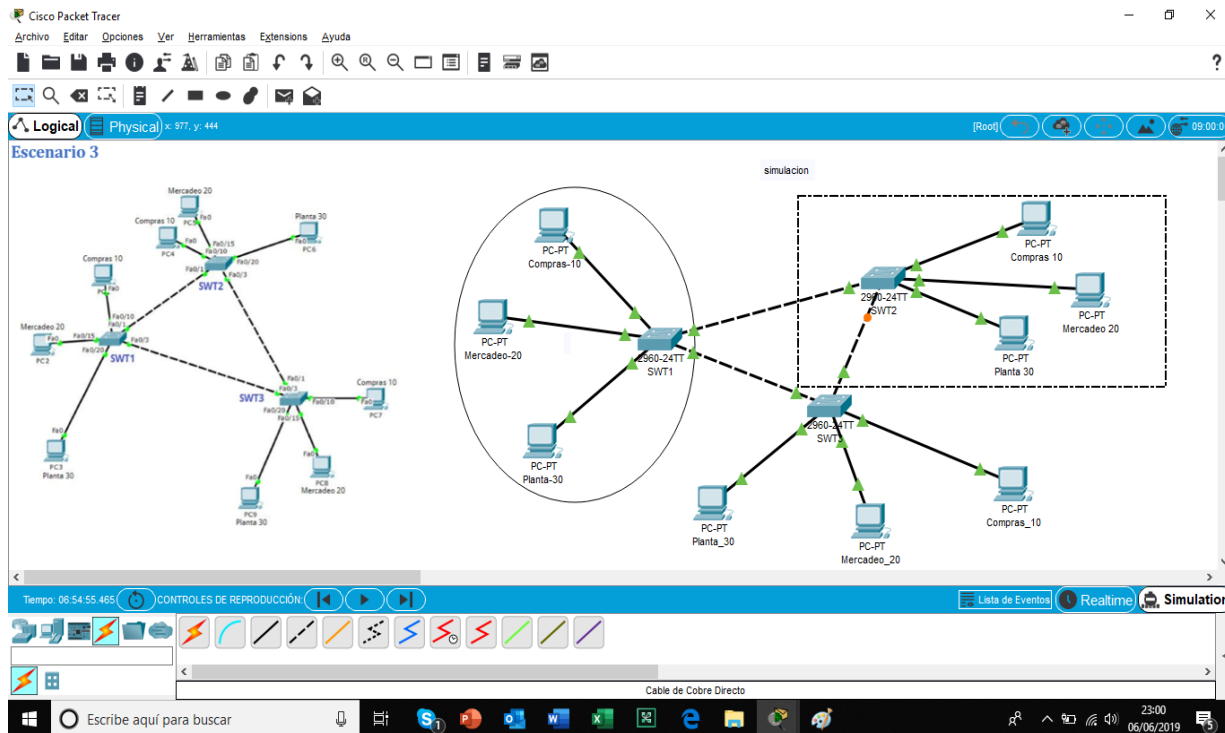


Figura 13 Simulación APK





- Configurar VTP 1. Todos los switches se configurarán para usar VTP para las actualizaciones de VLAN. El switch SWT2 se configurará como el servidor. Los switches SWT1 y SWT3 se configurarán como clientes. Los switches estarán en el dominio VPT llamado CCNP y usando la contraseña cisco.

Tabla 8 Configuración VTP

SWT1	SWT3	SWT2
vtp domain CCNP	vtp domain CCNP	vtp domain CCNP
vtp version 2	vtp version 2	vtp version 2
vtp mode client	vtp mode client	vtp mode server
vtp password cisco	vtp password cisco	vtp password cisco

En la siguiente figura vemos la configuración en consola de la Switch en modo VTP Client y server para su posible actualización de las tablas de VLAN creadas

Figura 14 Modo VTP

```

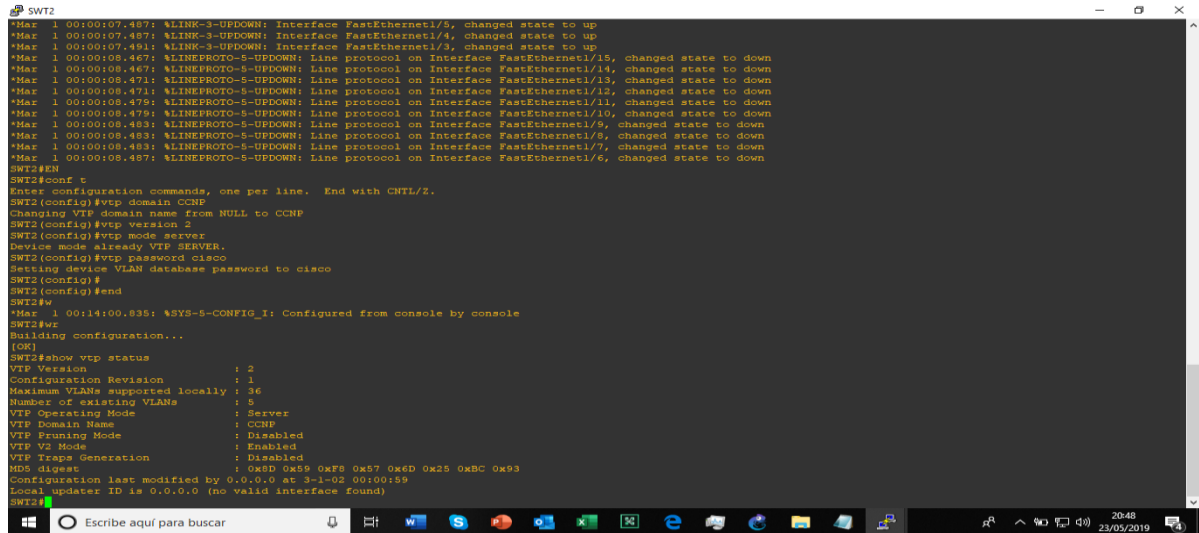
Compiled Wed 13-Aug-08 21:36 by prod_rel_team
*Mar 1 00:00:05.899: %SNMP-5-COLDSTART: SNMP agent on b
*Mar 1 00:00:05.899: %PCMCIAFS-5-DIBERR: PCMCIA disk 0
n this router is required before an image can be bootede
*Mar 1 00:00:05.963: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is
*Mar 1 00:00:05.967: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:06.735: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:07.183: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:07.467: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.467: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.471: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.471: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.475: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.475: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.475: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.475: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.483: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.483: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.487: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.487: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:07.491: %LINK-3-UPDOWN: Interface FastEth
*Mar 1 00:00:08.467: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.467: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.471: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.475: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.479: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.483: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.483: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.487: %LINEPROTO-5-UPDOWN: Line protocol
*Mar 1 00:00:08.487: %LINEPROTO-5-UPDOWN: Line protocol
SWT2#EN
SWT2#conf t
Enter configuration commands, one per line. End with CN
SWT2(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
SWT2(config)#vtp version 2
SWT2(config)#vtp mode server
Device mode already VTP SERVER.
SWT2(config)#vtp password cisco
Setting device VLAN database password to cisco
SWT2(config)#
SWT2(config)#

*Mar 1 00:00:07.967: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/14, changed state to down
*Mar 1 00:00:07.971: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/13, changed state to down
*Mar 1 00:00:07.975: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/12, changed state to down
*Mar 1 00:00:07.979: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/11, changed state to down
*Mar 1 00:00:07.983: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/10, changed state to down
*Mar 1 00:00:07.983: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/9, changed state to down
*Mar 1 00:00:07.987: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/8, changed state to down
*Mar 1 00:00:07.987: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/7, changed state to down
*Mar 1 00:00:07.995: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/6, changed state to down
SWT3#en
SWT3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SWT3(config)#
SWT3(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
SWT3(config)#vtp version 2
SWT3(config)#vtp mode client
Setting device to VTP CLIENT mode.
SWT3(config)#vtp password cisco
Setting device VLAN database password to cisco
SWT3(config)#
SWT3(config)#

*Mar 1 00:00:07.735: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/10, changed state to down
*Mar 1 00:00:07.735: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/9, changed state to down
*Mar 1 00:00:07.739: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/8, changed state to down
*Mar 1 00:00:07.739: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/7, changed state to down
*Mar 1 00:00:07.747: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/6, changed state to down
SWT1#
SWT1#
SWT1#
SWT1#EN
SWT1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SWT1(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
SWT1(config)#vtp version 2
SWT1(config)#vtp mode client
Setting device to VTP CLIENT mode.
SWT1(config)#vtp password cisco
Setting device VLAN database password to cisco
SWT1(config)#
SWT1(config)#
  
```

2. Verifique las configuraciones mediante el comando **show vtp status**.

Figura 15 show vtp status (SWT1-SWT2-SWT3)



```
SWT2
*Mar 1 00:00:07.467: %LINK-3-UPDOWN: Interface FastEthernet1/3, changed state to up
*Mar 1 00:00:07.467: %LINK-3-UPDOWN: Interface FastEthernet1/4, changed state to up
*Mar 1 00:00:07.491: %LINK-3-UPDOWN: Interface FastEthernet1/3, changed state to up
*Mar 1 00:00:08.467: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/15, changed state to down
*Mar 1 00:00:08.467: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/14, changed state to down
*Mar 1 00:00:08.471: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/13, changed state to down
*Mar 1 00:00:08.471: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/12, changed state to down
*Mar 1 00:00:08.479: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/11, changed state to down
*Mar 1 00:00:08.479: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/10, changed state to down
*Mar 1 00:00:08.483: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/9, changed state to down
*Mar 1 00:00:08.483: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/8, changed state to down
*Mar 1 00:00:08.483: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/7, changed state to down
*Mar 1 00:00:08.487: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/6, changed state to down
SWT2#
SWT2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SWT2(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
SWT2(config)#vtp version 2
SWT2(config)#vtp mode server
Device mode already VTP SERVER.
SWT2(config)#vtp password cisco
Setting device VLAN database password to cisco
SWT2(config)#
SWT2(config)#end
SWT2#
*Mar 1 00:14:00.836: %SYS-5-CONFIG_I: Configured from console by console
SWT2#
Building configuration...
[OK]
SWT2#show vtp status
VTP Version                : 2
Configuration Revision     : 1
Maximum VLANs supported locally : 36
Number of existing VLANs   : 5
VTP Operating Mode         : Server
VTP Domain Name            : CCNP
VTP Pruning Mode           : Disabled
VTP V2 Mode                : Enabled
VTP Traps Generation       : Disabled
MDS digest                  : 0x5D 0x59 0x4F 0x57 0x6D 0x25 0xBC 0x93
Configuration last modified by 0.0.0.0 at 3-1-02 00:00:59
Local updater ID is 0.0.0.0 (no valid interface found)
SWT2#
```

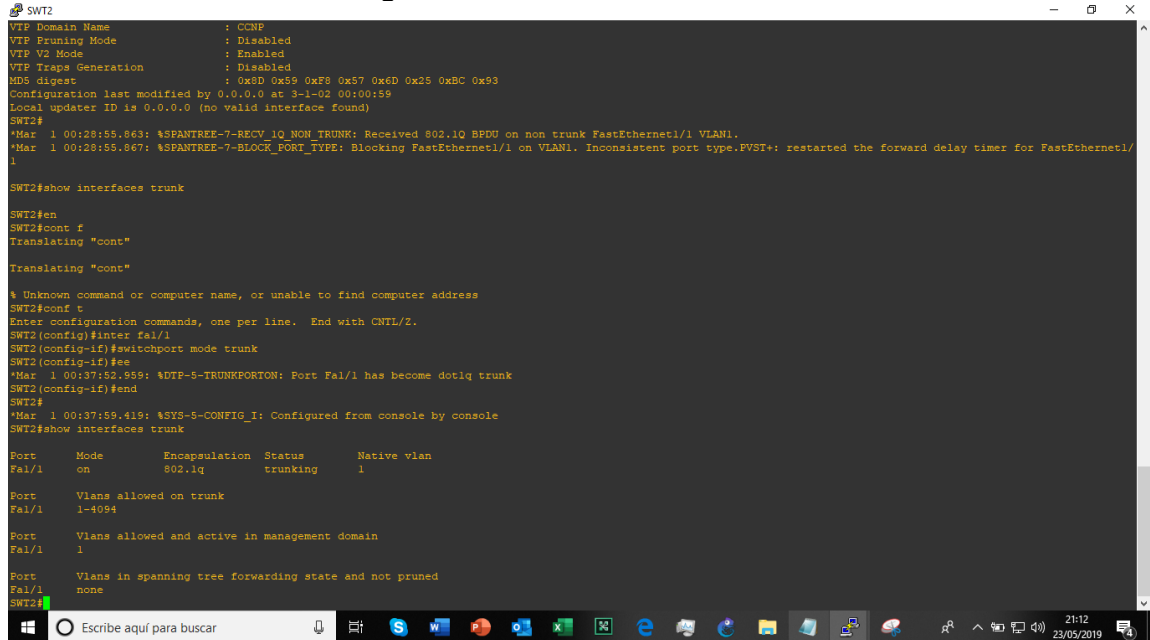
**Configurar DTP (Dynamic Trunking Protocol) 1. Configure un enlace troncal ("trunk") dinámico entre SWT1 y SWT2. Debido a que el modo por defecto es dynamic auto, solo un lado del enlace debe configurarse como dynamic desirable.**

Tabla 9 Mode trunk

inter fa1/1
switchport mode trunk

Verifique el enlace "trunk" entre SWT1 y SWT2 usando el comando **show interfaces trunk**.

Figura 16 show interfaces trunk.



```
SWT2
VTP Domain Name      : CONP
VTP Pruning Mode     : Disabled
VTP V2 Mode          : Enabled
VTP Traps Generation : Disabled
MDS digest           : 0xSD 0xSS 0xFS 0xS7 0xGD 0x25 0xBC 0x93
Configuration last modified by 0.0.0.0 at 3-1-02 00:00:59
Local updater ID is 0.0.0.0 (no valid interface found)
SWT2#
*Mar  1 00:28:55.863: %SPANTRIE-7-RECV_1Q_NON_TRUNK: Received 802.1Q BPDU on non trunk FastEthernet1/1 VLAN1.
*Mar  1 00:28:55.867: %SPANTRIE-7-BLOCK_PORT_TYPE: Blocking FastEthernet1/1 on VLAN1. Inconsistent port type.PVST+: restarted the forward delay timer for FastEthernet1/1

SWT2#show interfaces trunk

SWT2#en
SWT2#cont f
Translating "cont"

Translating "cont"

% Unknown command or computer name, or unable to find computer address
SWT2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SWT2(config)#inter fa1/1
SWT2(config-if)#switchport mode trunk
SWT2(config-if)#ex
*Mar  1 00:37:52.959: %DTP-5-TRUNKPORTON: Port Fa1/1 has become dot1q trunk
SWT2(config-if)#end
SWT2#
*Mar  1 00:37:59.419: %SYS-5-CONFIG_I: Configured from console by console
SWT2#show interfaces trunk

Port      Mode          Encapsulation  Status      Native vlan
Fa1/1     on            802.1q         trunking   1

Port      Vlans allowed on trunk
Fa1/1     1-4094

Port      Vlans allowed and active in management domain
Fa1/1     1

Port      Vlans in spanning tree forwarding state and not pruned
Fa1/1     none

SWT2#
```

Entre SWT1 y SWT3 configure un enlace "trunk" estático utilizando el comando switchport mode trunk en la interfaz F0/3 de SWT1

Tabla 10 enlace "trunk"

<b>inter fa1/2</b>
<b>switchport mode trunk</b>

Verifique el enlace "trunk" el comando show interfaces trunk en SWT1.

Figura 17 show interfaces trunk

```

SWT1
*Mar 1 00:49:28.551: %SYS-5-CONFIG_I: Configured from console by console
SWT1#show interfaces trunk

Port      Mode      Encapsulation  Status        Native vlan
Fa1/1     on        802.1q         trunking      1
Fa1/2     on        802.1q         trunking      1

Port      Vlans allowed on trunk
Fa1/1     1-4094
Fa1/2     1-4094

Port      Vlans allowed and active in management domain
Fa1/1     1
Fa1/2     1

Port      Vlans in spanning tree forwarding state and not pruned
Fa1/1     1
Fa1/2     1
SWT1#
  
```

Configure un enlace "trunk" permanente entre SWT2 y SWT3

Figura 18 show interfaces trunk

```

SWT3
SWT3(config-if)#
SWT3(config-if)#
SWT3(config-if)#end
*Mar 1 00:50:45.255: %DTP-5-TRUNKPORTON: Port Fa1/2 has become dot1q trunk
SWT3(config-if)#end
SWT3#
*Mar 1 00:50:48.127: %SYS-5-CONFIG_I: Configured from console by console
SWT3#show interfaces trunk

Port      Mode      Encapsulation  Status        Native vlan
Fa1/2     on        802.1q         trunking      1

Port      Vlans allowed on trunk
Fa1/2     1-4094

Port      Vlans allowed and active in management domain
Fa1/2     1

Port      Vlans in spanning tree forwarding state and not pruned
Fa1/2     none
SWT3#
  
```

Agregar VLANs y asignar puertos. 1. En STW1 agregue la VLAN 10. En STW2 agregue las VLANS Compras (10), Mercadeo (20), Planta (30) y Admon (99)

Tabla 11 VLAN 10

Sw1
vlan 10

Tabla 12 Vlan (server)

swt2= server si se configura	
vlan10	
name Compras	
vlan 20	
name Mercadeo	
vlan 30	
name Planta	
vlan 99	
name Admon	

Verifique que las VLANs han sido agregadas correctamente.

Tabla 13 Show Vlan brief

```

SWT2
No Virtual LANs configured.

SWT2#show vlans?
vlans

SWT2#show vlan ?
% Ambiguous command: "show vlan "
SWT2#show vlan-sw
SWT2#show vlan-sw
SWT2#show vlan-sw

VLAN Name                Status    Ports
-----
1    default                active    Fa1/0, Fa1/2, Fa1/3, Fa1/4
                                           Fa1/5, Fa1/6, Fa1/7, Fa1/8
                                           Fa1/9, Fa1/10, Fa1/11, Fa1/12
                                           Fa1/13, Fa1/14, Fa1/15

20   Mercadeo               active
30   Planta                 active
99   Admon                  active
1002 fddi-default           act/unsup
1003 trcrf-default       act/unsup
1004 fddinet-default     act/unsup
1005 trbrf-default       act/unsup

VLAN Type  SAID      MTU   Parent RingNo BridgeNo Stp    BrgdMode Trans1 Trans2
-----
1    enet  100001  1500  -     -     -     -     -     1002 1003
20   enet  100020  1500  -     -     -     -     -     0    0
30   enet  100030  1500  -     -     -     -     -     0    0
99   enet  100099  1500  -     -     -     -     -     0    0
1002 fddi  101002  1500  -     -     -     -     -     1    1003
1003 trcrf 101003  4472  1005  3276  -     -     stb   1    1002

VLAN Type  SAID      MTU   Parent RingNo BridgeNo Stp    BrgdMode Trans1 Trans2
-----
1004 fdnet 101004  1500  -     -     1     ibm   -     0    0
1005 trbrf 101005  4472  -     -     15    ibm   -     0    0

VLAN AREHops STEHops Backup CRF
-----
1003 7          7      off
SWT2#
  
```

Asocie los puertos a las VLAN y configure las direcciones IP de acuerdo con la siguiente tabla.

Interfaz	VLAN	Direcciones IP de los PCs
F0/10	VLAN 10	190.108.10.X / 24
F0/15	VLAN 20	190.108.20.X / 24
F0/20	VLAN 30	190.108.30.X / 24

X = número de cada PC particular

*Tabla 14 VLAN Switch*

<pre> <b>interface vlan 10</b> <b>ip address 190.108.10.1 255.255.255.0</b> <b>exit</b> <b>inter vlan20</b> <b>ip address 190.108.20.1 255.255.255.0</b> <b>exit</b> <b>inter vlan 30</b> <b>ip address 190.108.30.1 255.255.255.0</b> <b>exit</b> </pre>
<pre> <b>inter vlan 10</b> <b>ip address 190.108.10.2 255.255.255.0</b> <b>exit</b> <b>inter vlan 20</b> <b>ip address 190.108.20.2 255.255.255.0</b> <b>exit</b> <b>interface vlan 30</b> <b>ip address 190.108.30.2 255.255.255.0</b> <b>exit</b> </pre>
<pre> <b>inter vlan 10</b> <b>ip address 190.108.10.3 255.255.255.0</b> <b>exit</b> <b>inter vlan 20</b> <b>ip address 190.108.20.3 255.255.255.0</b> <b>exit</b> <b>inter vlan 30</b>   <b>ip address 190.108.30.3 255.255.255.0</b> <b>exit</b> </pre>

En la anterior table se crearon las VLAN dentro de cada dispositivo Switch y el direccionamiento del host en la VLAN 10 va desde la dirección 190.108.10.4 a la 190.108.10.6 y en la VLAN 20 desde 190.108.20.4 a 190.108.20.6 y la VLAN 30 desde 190.108.30.4 a 190.108.30.6

Configure el puerto F0/10 en modo de acceso para SWT1, SWT2 y SWT3 y asígnelo a la VLAN 10

*Tabla 15 modo de acceso*

inter fastEthernet 0/10
switchport mode access
switchport access vlan 10

### Configurar las direcciones IP en los Switches.

- En cada uno de los Switches asigne una dirección IP al SVI (*Switch Virtual Interface*) para VLAN 99 de acuerdo con la siguiente tabla de direccionamiento y active la interfaz.

Equipo	Interfaz	Dirección IP	Máscara
SWT1	VLAN 99	190.108.99.1	255.255.255.0
SWT2	VLAN 99	190.108.99.2	255.255.255.0
SWT3	VLAN 99	190.108.99.3	255.255.255.0

*Tabla 16 dirección IP al SVI (Switch Virtual Interface)*

<pre> SWT1 inter vlan99 ip address 190.108.99.1 255.255.255.0 exit </pre>
<pre> SWT2 inter vlan99 ip address 190.108.99.2 255.255.255.0 exit </pre>
<pre> SWT3 inter vlan99 ip address 190.108.99.3 255.255.255.0 exit </pre>

### Verificar la conectividad Extremo a Extremo

Ejecute un Ping desde cada PC a los demás. Explique por qué el ping tuvo o no tuvo éxito.

#### Redes de este en la misma Vlan (Análisis)

El ping en cada uno de los Pc's es exitoso dentro de las misma Vlan ya que son las únicas que pueden hacer intercambio de información sin tráfico alguno

Tabla 17 Departamentos de VLANs

Vlan 10=Compras
Vlan 20= Mercadeo
Vlan 30= Planta

Figura 19 Ping VLAN 10

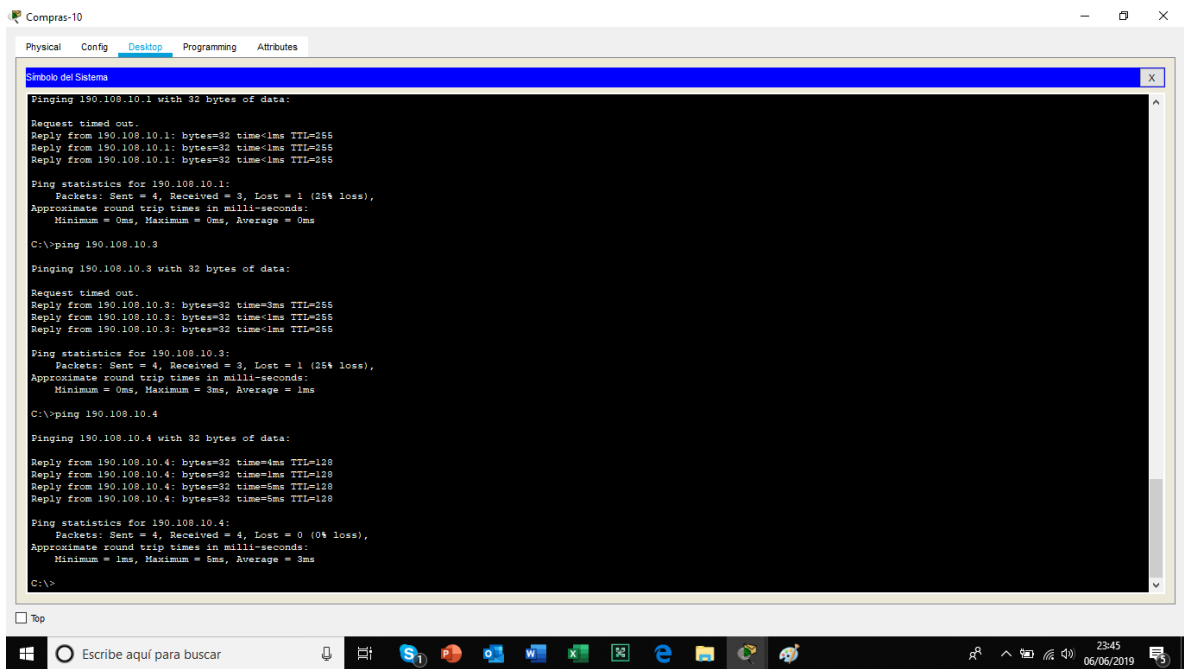
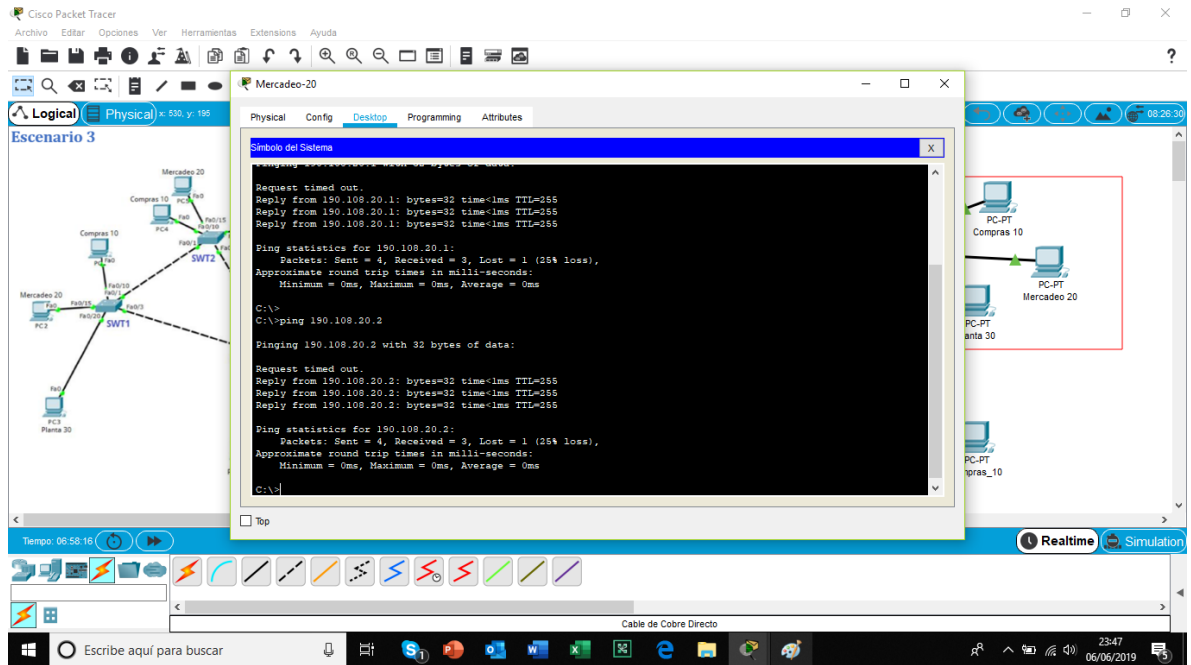




Figura 20 Ping VLAN 20



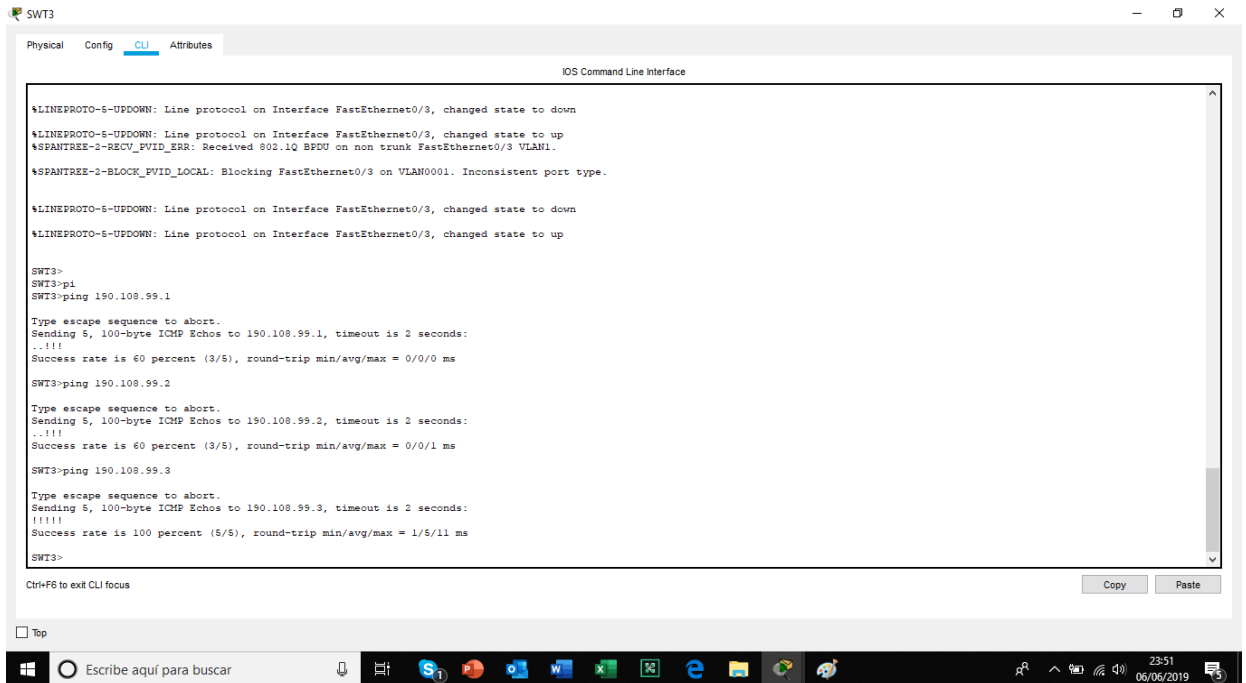
Ejecute un Ping desde cada Switch a los demás. Explique por qué el ping tuvo o no tuvo éxito.

¿Mediante el comando ping desde cada dispositivo SWT? Su envío de paquetes es exitoso ya que reconoce el direccionamiento de la Vlan 99

190.108.99.1
190.108.99.2
190.108.99.3

Tabla 18 IP Vlan 99 (Ping)

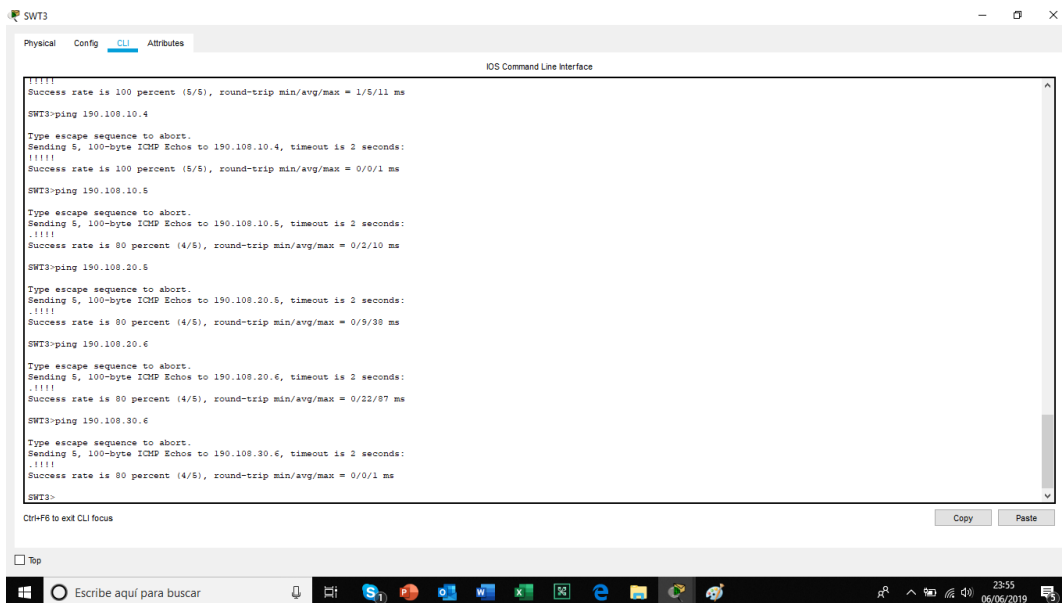
Figura 21 Ping VLAN 99



Ejecute un Ping desde cada Switch a cada PC. Explique por qué el ping tuvo o no tuvo éxito.

El destino del comando Ping a cada dispositivo es **transparente y exitoso** por medio de comando switchport mode trunk en la interfaz de salida de cada Switch a Switch y la entrada con cada Pc's

Figura 22 Ping de Switch a PC



## **Anexos**

NOTA: En el siguiente enlace encontraran los ejecutables de cada escenario en GNS3 con su respectiva plantilla de configuración y APK de escenario 3

### **Enlace**

[https://unadvirtualedu-my.sharepoint.com/:f:/g/personal/csvillamilp\\_unadvirtual\\_edu\\_co/EhnGPaNig6RNn68pwZ3eYGcBfisvGZfSsRWYgmhcuxV9bQ?e=WsRble](https://unadvirtualedu-my.sharepoint.com/:f:/g/personal/csvillamilp_unadvirtual_edu_co/EhnGPaNig6RNn68pwZ3eYGcBfisvGZfSsRWYgmhcuxV9bQ?e=WsRble)

## **CONCLUSIONES**

En el siguiente documento se implementan y analizan los conocimientos adquiridos durante el curso con ayuda de tutor y compañeros y aplicarlos a la prueba de habilidades de cisco CCNP de la plataforma de cisco.

Durante los escenarios estudiados en el presente informe implementamos VLAN y diferentes tipos de enrutamiento con su relación BGP entre vecino en la misma topología de red.

La configuración de protocolo EBGP implemente Loopback para compartir en un sistema autónomo (AS), entre ruteo entre dominio de redes TCP/IP que reestablece conexión por medio del puerto TCP 179.

OSPF protocolo de red para encaminamiento jerárquico para buscar la ruta más corta entre nodos con una métrica de ancho de banda específica.

## REFERENCIAS BIBLIOGRÁFICAS

Froom, R., Frahim, E. (2015). CISCO Press (Ed). Campus Network Design Fundamentals. Implementing Cisco IP Switched Networks (SWITCH) Foundation Learning Guide CCNP SWITCH 300-115. Recuperado de <https://1drv.ms/b/s!AmIJYei-NT1IlnWR0hoMxgBNv1CJ>

Froom, R., Frahim, E. (2015). CISCO Press (Ed). Campus Network Architecture. Implementing Cisco IP Switched Networks (SWITCH) Foundation Learning Guide CCNP SWITCH 300-115. Recuperado de <https://1drv.ms/b/s!AmIJYei-NT1IlnWR0hoMxgBNv1CJ>