Packet Tracer: desafío de routing entre VLAN

Tabla de asignación de direcciones

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Gateway predeterminado
R1	G0/0	172.17.25.2	255.255.255.252	N/D
	G0/1,10	172.17.10.1	255.255.255.0	
	G0/1,20	172.17.20.1	255.255.255.0	
	G0/1,30	172.17.30.1	255.255.255.0	
	G0/1,88	172.17.88.1	255.255.255.0	
	G0/1,99	172.17.99.1	255.255.255.0	
S1	VLAN 99	172.17.99.10	255.255.255.0	172.17.99.1
PC1	NIC	172.17.10.21	255.255.255.0	172.17.10.1
PC2	NIC	172.17.20.22	255.255.255.0	172.17.20.1
PC3	NIC	172.17.30.23	255.255.255.0	172.17.30.1
Servidor	NIC	172.17.50.254	255.255.255.0	172.17.50.1

Tabla de asignación de VLAN y de puertos

VLAN	Nombre	Interfaz
10	Faculty/Staff	F0/11-17
20	Student	F0/18-24
30	Guest (Predeterminada)	F0/6-10
88	Native (Nativo)	G0/1
99	Management	VLAN 99

Situación

En esta actividad, demostrará y reforzará su capacidad para implementar el enrutamiento entre VLAN, incluida la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces.

Instrucciones

Configure los dispositivos para que cumplan los siguientes requisitos.

- Asigne el direccionamiento IP al R1 y al S1 según la tabla de direccionamiento.
- Configure el gateway predeterminado en el S1.

- Cree, nombre y asigne VLAN en S1 según la tabla de asignaciones de puertos y VLAN. Los puertos deben estar en modo de acceso. Los nombres de VLAN deben coincidir exactamente con los nombres de la tabla.

```
S1(config)#vlan 10
S1(config-vlan)#name vlan10
S1(config-vlan)#vlan 10
S1(config-vlan)#name Faculty/Sta
S1(config-vlan)#exit
S1(config)#vlan 20
S1(config-vlan)#name Student
S1(config-vlan)#exit
S1(config)#vlan 30
S1(config-vlan)#name Guest (Pred
                        ^
% Invalid input detected at '^' :

S1(config-vlan)#name Guest
S1(config-vlan)#exit
S1(config)#vlan 88
S1(config-vlan)#name Native
S1(config-vlan)#exit
S1(config)#vlan 99
S1(config-vlan)#name Management
S1(config-vlan)#exit
```

Vlan 10 asignación.

```
S1#
```
f0/11-17 a Vlan 10
```
Enter configuration commands, one per line.  En
S1(config)#interface range f0/11-17
S1(config-if-range)#s
S1(config-if-range)#sw
S1(config-if-range)#switchport m
S1(config-if-range)#switchport mode ac
S1(config-if-range)#switchport mode access
S1(config-if-range)#sw
S1(config-if-range)#switchport ac
S1(config-if-range)#switchport access vlan 10
```

Vlan 20 asignación.

```
S1(config if range)#sw
S1(config-if-range)#switchport ac
```
f0/18-24 Vlan 20
```
                      chport access vlan 10

S1(config)#interface range f0/18-24
S1(config-if-range)#sw
S1(config-if-range)#switchport m
S1(config-if-range)#switchport mode a
S1(config-if-range)#switchport mode access
S1(config-if-range)#sw
S1(config-if-range)#switchport ac
S1(config-if-range)#switchport access vlan 20
S1(config-if-range)#exit
```

Vlan 30.

```
S1(config-if-range)#switchport access vlan 20
```
F0/6-10 Vlan 30
```
S1(config)#interface range F0/6-10
S1(config-if-range)#sw
S1(config-if-range)#switchport m
S1(config-if-range)#switchport mode a
S1(config-if-range)#switchport mode access
S1(config-if-range)#sw
S1(config-if-range)#switchport ac
S1(config-if-range)#switchport access vlan 30
```

Vlan 88.

```
S1(config-if-range)#switchport access vla
                   #exit
```
G0/1 Vlan88
```
                 re ra
S1(config)#interface G0/1
S1(config-if)#sw
S1(config-if)#switchport m
S1(config-if)#switchport mode a
S1(config-if)#switchport mode access
S1(config-if)#sw
S1(config-if)#switchport
S1(config-if)#switchport a
S1(config-if)#switchport access vlan 88
```

Vlan 99.

Interface Vlan 99
```
                        at '^' marker.

S1(config)#inter
S1(config)#interface vlan 99
S1(config-if)#ip add
S1(config-if)#ip address 172.17.99.10 255.255.255.0
S1(config-if)#gate
S1(config-if)#def
S1(config-if)#default-ga
S1(config-if)#ip de
S1(config-if)#ip default-gateway 172.17.99.1
```

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

- Configure G0/1 de S1 como enlace troncal estático y asigne la VLAN nativa. Permita solo las VLAN que figuran en la tabla de asignación de VLAN y de puertos.

```
S1(config)#interface g0/1
S1(config-if)#sw
S1(config-if)#switchport m
S1(config-if)#switchport mode trun
S1(config-if)#switchport mode trunk
S1(config-if)#sw
S1(config-if)#switchport trunk native vlan 88
S1(config-if)#sw
S1(config-if)#switchport tr
S1(config-if)#switchport trunk allowed vlan 10,20,30,88,99
```

- **Todos los** puertos que no están asignados a una VLAN deben estar deshabilitados.

```
S1(config)#interface range f0/2-5
S1(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
S1(config-if-range)#exit
S1(config)#interface f0/1
S1(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
```

- Configure el routing entre VLAN en el R1 según la tabla de direccionamiento.

Configuración G0/1.10

```
R1(config)#interface g0/1.10
R1(config-subif)#encap
R1(config-subif)#encapsulation do
R1(config-subif)#encapsulation dot1Q 10
R1(config-subif)#ip address 172.17.10.1 255.255.255.0
R1(config-subif)#no sh
```

Configuración G0/1.20

```
R1(config)#interface g0/1.20
R1(config-subif)#encapsulation dot1Q 20
R1(config-subif)#ip address 172.17.20.1 255.255.255.0
R1(config-subif)#exit
```

Configuración G0/1.30

```
R1(config)#interface g0/1.30
R1(config-subif)#encapsulation dot1Q 30
R1(config-subif)#ip address 172.17.30.1 255.255.255.0
R1(config-subif)#no sh
```

Configuración G0/1.88

Hay que añadir native después del 88 en dot1Q.

```
R1(config)#interface g0/1.88
R1(config-subif)#encapsulation dot1Q 88
R1(config-subif)#ip address 172.17.88.1 255.255.255.0
R1(config-subif)#no sh
```

Importante añadir en el comando encapsulation native al final.

```
R1(config-subif)#encapsulation dot1Q 88 native
```

Configuración G0/1.99

```
R1(config-subif)#interface g0/1.99
R1(config-subif)#encapsulation dot1Q 99
R1(config-subif)#ip address 172.17.99.1 255.255.255.0
R1(config-subif)#no sh
```

Subir interfaz G0/1

```
R1(config)#interface g0/1
R1(config-if)#no shutdown
```

Show ip interface brief:

```
R1#show ip interface brief
Interface           IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0   172.17.25.2     YES manual up                    up
GigabitEthernet0/1   unassigned      YES unset  up                    up
GigabitEthernet0/1.10 172.17.10.1    YES manual up                    up
GigabitEthernet0/1.20 172.17.20.1    YES manual up                    up
GigabitEthernet0/1.30 172.17.30.1    YES manual up                    up
GigabitEthernet0/1.88 172.17.88.1    YES manual up                    up
GigabitEthernet0/1.99 172.17.99.1    YES manual up                    up
Vlan1               unassigned      YES unset  administratively down  down
```

Show vlan en S1.

```
S1#show vlan

VLAN Name                            Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Gig0/2
10   Faculty/Staff                    active    Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                                Fa0/15, Fa0/16, Fa0/17
20   Students                         active    Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24
30   Guest(Default)                   active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/10
88   Native                           active
99   Management                       active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Verificar la conectividad R1, S1 y todas las PC deben poder hacer ping entre sí y al servidor.

Pings PC1.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.17.20.0

Pinging 172.17.20.0 with 32 bytes of data:

Reply from 172.17.10.1: bytes=32 time<1ms TTL=255
Reply from 172.17.10.1: bytes=32 time=1ms TTL=255
Reply from 172.17.10.1: bytes=32 time<1ms TTL=255
Reply from 172.17.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.20.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.17.30.0

Pinging 172.17.30.0 with 32 bytes of data:

Reply from 172.17.10.1: bytes=32 time<1ms TTL=255
Reply from 172.17.10.1: bytes=32 time<1ms TTL=255
Reply from 172.17.10.1: bytes=32 time<1ms TTL=255
Reply from 172.17.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.30.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC1 a PC2

PC1 a PC3

```
C:\>ping 172.17.50.254

Pinging 172.17.50.254 with 32 bytes of data:

Reply from 172.17.50.254: bytes=32 time<1ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126
Reply from 172.17.50.254: bytes=32 time=10ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126

Ping statistics for 172.17.50.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 2ms
```

PC1 a servidor

Pings PC2.

```
Pinging 172.17.10.0 with 32 bytes of data:

Reply from 172.17.20.1: bytes=32 time<1ms TTL=255
Reply from 172.17.20.1: bytes=32 time=1ms TTL=255          PC2 a PC1
Reply from 172.17.20.1: bytes=32 time<1ms TTL=255
Reply from 172.17.20.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.10.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.17.20.0

Pinging 172.17.20.0 with 32 bytes of data:

Reply from 172.17.20.1: bytes=32 time<1ms TTL=255
Reply from 172.17.20.1: bytes=32 time<1ms TTL=255          PC2 a PC3
Reply from 172.17.20.1: bytes=32 time=20ms TTL=255
Reply from 172.17.20.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.20.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 20ms, Average = 5ms
```

```
C:\>ping 172.17.50.254

Pinging 172.17.50.254 with 32 bytes of data:

Reply from 172.17.50.254: bytes=32 time<1ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126       PC2 a servidor
Reply from 172.17.50.254: bytes=32 time=10ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126

Ping statistics for 172.17.50.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 2ms
```

Pings PC3.

```
C:\>ping 172.17.10.0

Pinging 172.17.10.0 with 32 bytes of data:

Reply from 172.17.30.1: bytes=32 time<1ms TTL=255
Reply from 172.17.30.1: bytes=32 time<1ms TTL=255
Reply from 172.17.30.1: bytes=32 time<1ms TTL=255
Reply from 172.17.30.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.10.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.17.20.0

Pinging 172.17.20.0 with 32 bytes of data:

Reply from 172.17.30.1: bytes=32 time<1ms TTL=255
Reply from 172.17.30.1: bytes=32 time<1ms TTL=255
Reply from 172.17.30.1: bytes=32 time<1ms TTL=255
Reply from 172.17.30.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.20.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC3 a PC1

PC3 a PC2

```
Pinging 172.17.50.254 with 32 bytes of data:

Reply from 172.17.50.254: bytes=32 time<1ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126
Reply from 172.17.50.254: bytes=32 time<1ms TTL=126

Ping statistics for 172.17.50.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC3 a servidor

Ping S1 a R1.

```
Success rate is 80 percent (4/5), round-trip min/avg/

S1#ping 172.17.25.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.17.25.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

Ping S1 a R1

Ping R1 a S1.

```
R1#ping 172.17.99.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.17.99.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

Ping R1 a S1