PASO 11 - PRUEBA DE HABILIDADES

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TABLA DE CONTENIDO

INTRODUCCION

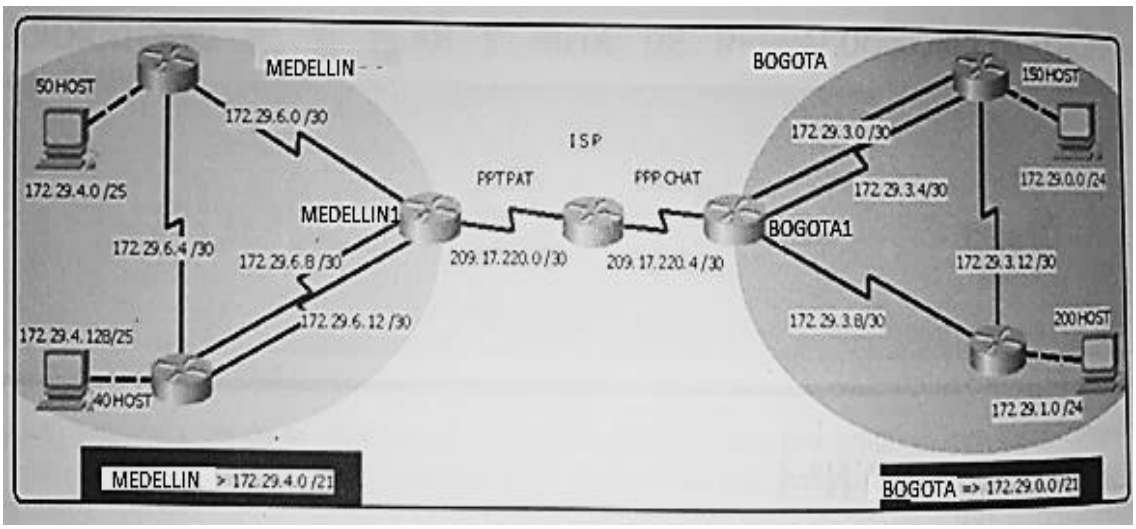
En el entorno de las redes es muy importante identificar las mejores soluciones para cada situación que podamos encontrar en nuestras carreras profesionales, el modelo OSI nos ofrece un esquema de cómo funcionan la redes y junto al protocolo TCP/IP es posible estructurar los sistemas de comunicación; durante el proceso de aprendizaje del diplomado y mediante las practicas que se realizaron en el mismo podemos dar soluciones a los escenarios planteados en este documento en donde se abarcaran la gran mayoría de conceptos aprendidos durante el curso y se buscaran las soluciones más óptimas para las situaciones que se nos plantea.

DESARROLLO DE LAS ACTIVIDADES

Escenario 1

Una empresa posee sucursales distribuidas en las ciudades de Bogotá y Medellín, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Topología de red



Este escenario plantea el uso de RIP como protocolo de enrutamiento, considerando que se tendran rutas por defecto redistribuidas; asimismo, habilitar el encapsulamiento PPP y su autenticación.

Los routers Bogota2 y medellin2 proporcionan el servicio DHCP a su propia red LAN y a los routers 3 de cada ciudad.

Debe configurar PPP en los enlaces hacia el ISP, con autenticación.

Debe habilitar NAT de sobrecarga en los routers Bogota1 y medellin1.

Desarrollo

Como trabajo inicial se debe realizar lo siguiente.

Realizar las rutinas de diagnóstico y dejar los equipos listos para su configuración (asignar nombres de equipos, asignar claves de seguridad, etc).

Realizar la conexión fisica de los equipos con base en la topología de red

Configurar la topología de red, de acuerdo con las siguientes especificaciones.

ISP

```
Router(config)#hostname ISP
ISP(config)#banner motd # Advertencia... Solo usuarios autprizados#
ISP(config)#no ip domain-lookup
ISP(config)#ip domain-name www.unad.edu.co
ISP(config)#line console 0
ISP(config-line)#password cisco
ISP(config-line)#login
ISP(config-line)#logging synchronous
ISP(config-line)#exit
ISP(config)#line vty 0 15
ISP(config-line)#password cisco
ISP(config-line)#login
ISP(config-line)#exit
ISP(config)#enable secret class
ISP(config)#service password-encryption
```

Bogota

```
Router(config)#hostname BOGOTA1
BOGOTA1(config)#banner motd # Advertencia... Solo usuarios
autprizados#
BOGOTA1(config)#no ip domain-lookup
BOGOTA1(config)#ip domain-name www.unad.edu.co
BOGOTA1(config)#line console 0
BOGOTA1(config-line)#password cisco
BOGOTA1(config-line)#login
BOGOTA1(config-line)#logging synchronous
BOGOTA1(config-line)#exit
BOGOTA1(config)#line vty 0 15
BOGOTA1(config-line)#password cisco
BOGOTA1(config-line)#login
BOGOTA1(config-line)#exit
BOGOTA1(config)#enable secret class
BOGOTA1(config)#service password-encryption
```

```
Router(config)#hostname BOGOTA2
BOGOTA2(config)#banner motd # Advertencia... Solo usuarios
autprizados#
BOGOTA2(config)#no ip domain-lookup
BOGOTA2(config)#ip domain-name www.unad.edu.co
BOGOTA2(config)#line console 0
BOGOTA2(config-line)#password cisco
BOGOTA2(config-line)#login
BOGOTA2(config-line)#logging synchronous
BOGOTA2(config-line)#exit
BOGOTA2(config)#line vty 0 15
BOGOTA2(config-line)#password cisco
BOGOTA2(config-line)#login
BOGOTA2(config-line)#exit
BOGOTA2(config)#enable secret class
BOGOTA2(config)#service password-encryption
```

```
Router(config)#hostname BOGOTA3
BOGOTA3(config)#banner motd # Advertencia... Solo usuarios
autprizados#
BOGOTA3(config)#no ip domain-lookup
BOGOTA3(config)#ip domain-name www.unad.edu.co
BOGOTA3(config)#line console 0
BOGOTA3(config-line)#password cisco
BOGOTA3(config-line)#login
BOGOTA3(config-line)#logging synchronous
BOGOTA3(config-line)#exit
BOGOTA3(config)#line vty 0 15
BOGOTA3(config-line)#password cisco
BOGOTA3(config-line)#login
BOGOTA3(config-line)#exit
BOGOTA3(config)#enable secret class
BOGOTA3(config)#service password-encryption
```

Medellin

```
Router(config)#hostname MEDELLIN1
MEDELLIN1(config)#banner motd # Advertencia... Solo usuarios
autprizados#
MEDELLIN1(config)#no ip domain-lookup
MEDELLIN1(config)#ip domain-name www.unad.edu.co
MEDELLIN1(config)#line console 0
MEDELLIN1(config-line)#password cisco
MEDELLIN1(config-line)#login
MEDELLIN1(config-line)#logging synchronous
MEDELLIN1(config-line)#exit
MEDELLIN1(config)#line vty 0 15
MEDELLIN1(config-line)#password cisco
MEDELLIN1(config-line)#login
MEDELLIN1(config-line)#exit
MEDELLIN1(config)#enable secret class
MEDELLIN1(config)#service password-encryption
```

```
Router(config)#hostname MEDELLIN2
MEDELLIN2(config)#banner motd # Advertencia... Solo usuarios
autprizados#
MEDELLIN2(config)#no ip domain-lookup
MEDELLIN2(config)#ip domain-name www.unad.edu.co
MEDELLIN2(config)#line console 0
MEDELLIN2(config-line)#password cisco
MEDELLIN2(config-line)#login
MEDELLIN2(config-line)#logging synchronous
MEDELLIN2(config-line)#exit
MEDELLIN2(config)#line vty 0 15
MEDELLIN2(config-line)#password cisco
MEDELLIN2(config-line)#login
MEDELLIN2(config-line)#exit
MEDELLIN2(config)#enable secret class
MEDELLIN2(config)#service password-encryption
```

```
Router(config)#hostname MEDELLIN3
MEDELLIN3(config)#banner motd # Advertencia... Solo usuarios
autprizados#
MEDELLIN3(config)#no ip domain-lookup
MEDELLIN3(config)#ip domain-name www.unad.edu.co
MEDELLIN3(config)#line console 0
MEDELLIN3(config-line)#password cisco
MEDELLIN3(config-line)#login
MEDELLIN3(config-line)#logging synchronous
MEDELLIN3(config-line)#exit
MEDELLIN3(config)#line vty 0 15
MEDELLIN3(config-line)#password cisco
MEDELLIN3(config-line)#login
MEDELLIN3(config-line)#exit
MEDELLIN3(config)#enable secret class
MEDELLIN3(config)#service password-encryption
```

Parte 1: Configuración del enrutamiento

Routing ISP

```
ISP(config)#int s0/0/0
ISP(config-if)#ip address 209.17.220.1 255.255.255.252
ISP(config-if)#clock rate 4000000
ISP(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
ISP(config-if)#int s0/0/1
ISP(config-if)#ip address 209.17.220.5 255.255.255.252
ISP(config-if)#clock rate 4000000
ISP(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

Routing Bogota1

```
BOGOTA1(config)#int s0/0/0
BOGOTA1(config-if)#ip address 209.17.220.6 255.255.255.252
BOGOTA1(config-if)#no shut

BOGOTA1(config-if)#int s0/0/1
BOGOTA1(config-if)#ip address 172.29.3.9 255.255.255.252
BOGOTA1(config-if)#clock rate 4000000
BOGOTA1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
BOGOTA1(config-if)#int s0/1/0
BOGOTA1(config-if)#ip address 172.29.3.1 255.255.255.252
BOGOTA1(config-if)#clock rate 4000000
BOGOTA1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
BOGOTA1(config-if)#int s0/1/1
BOGOTA1(config-if)#ip address 172.29.3.5 255.255.255.252
BOGOTA1(config-if)#clock rate 4000000
BOGOTA1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
BOGOTA1(config-if)#exit
BOGOTA1(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

BOGOTA1(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
```

Routing Bogota2

```
BOGOTA2(config)#int s0/0/0
BOGOTA2(config-if)#ip address 172.29.3.10 255.255.255.252
BOGOTA2(config-if)#no shut

BOGOTA2(config-if)#int s0/0/1
BOGOTA2(config-if)#ip address 172.29.3.13 255.255.255.252
BOGOTA2(config-if)#clock rate 4000000
BOGOTA2(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
BOGOTA2(config-if)#int g0/0
BOGOTA2(config-if)#ip address 172.29.1.1 255.255.255.0
BOGOTA2(config-if)#no shut

BOGOTA2(config-if)#exit
BOGOTA2(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
```

Routing Bogota3

```
BOGOTA3(config)#int s0/0/0
BOGOTA3(config-if)#ip address 172.29.3.2 255.255.255.252
BOGOTA3(config-if)#no shut

BOGOTA3(config-if)#int s0/0/1
BOGOTA3(config-if)#ip address 172.29.3.6 255.255.255.252
BOGOTA3(config-if)#no shut

BOGOTA3(config-if)#int s0/1/0
BOGOTA3(config-if)#ip address 172.29.3.14 255.255.255.252
BOGOTA3(config-if)#no shut

BOGOTA3(config-if)#int g0/0
BOGOTA3(config-if)#ip address 172.29.0.1 255.255.255.0
BOGOTA3(config-if)#no shut

BOGOTA3(config-if)#exit
BOGOTA3(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up

BOGOTA3(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to up

BOGOTA3(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up

BOGOTA3(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
```

Routing Medellin1

```
MEDELLIN1(config)#int s0/0/0
MEDELLIN1(config-if)#ip address 209.17.220.2 255.255.255.252
MEDELLIN1(config-if)#no shut

MEDELLIN1(config-if)#int s0/0/1
MEDELLIN1(config-if)#ip address 172.29.6.1 255.255.255.252
MEDELLIN1(config-if)#clock rate 4000000
MEDELLIN1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
MEDELLIN1(config-if)#int s0/1/0
MEDELLIN1(config-if)#ip address 172.29.6.9 255.255.255.252
MEDELLIN1(config-if)#clock rate 4000000
MEDELLIN1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
MEDELLIN1(config-if)#int s0/1/1
MEDELLIN1(config-if)#ip address 172.29.6.13 255.255.255.252
MEDELLIN1(config-if)#clock rate 4000000
MEDELLIN1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
MEDELLIN1(config-if)#exit
MEDELLIN1(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

MEDELLIN1(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
```

Routing Medellin2

```
MEDELLIN2(config)#int s0/0/0
MEDELLIN2(config-if)#ip address 172.29.6.2 255.255.255.252
MEDELLIN2(config-if)#no shut

MEDELLIN2(config-if)#int s0/0/1
MEDELLIN2(config-if)#ip address 172.29.6.5 255.255.255.252
MEDELLIN2(config-if)#clock rate 4000000
MEDELLIN2(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
MEDELLIN2(config-if)#int g0/0
MEDELLIN2(config-if)#ip address 172.29.4.1 255.255.255.128
MEDELLIN2(config-if)#no shut

MEDELLIN2(config-if)#exit
MEDELLIN2(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
```

Routing Medellin3

```
MEDELLIN3(config)#int s0/0/0
MEDELLIN3(config-if)#ip address 172.29.6.10 255.255.255.252
MEDELLIN3(config-if)#no shut

MEDELLIN3(config-if)#int s0/0/1
MEDELLIN3(config-if)#ip address 172.29.6.14 255.255.255.252
MEDELLIN3(config-if)#no shut

MEDELLIN3(config-if)#int s0/1/0
MEDELLIN3(config-if)#ip address 172.29.6.6 255.255.255.252
MEDELLIN3(config-if)#no shut

MEDELLIN3(config-if)#int g0/0
MEDELLIN3(config-if)#ip address 172.29.4.129 255.255.255.128
MEDELLIN3(config-if)#no shut

MEDELLIN3(config-if)#exit
MEDELLIN3(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up

MEDELLIN3(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up

MEDELLIN3(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
```

Configurar el enrutamiento en la red usando el protocolo RIP versión 2, declare la red principal, desactive la sumarización automática.

RIP BOGOTA

```
BOGOTA1(config)#router rip
BOGOTA1(config-router)#version 2
BOGOTA1(config-router)#no auto-summary
BOGOTA1(config-router)#network 172.29.3.0
BOGOTA1(config-router)#network 172.29.3.4
BOGOTA1(config-router)#network 172.29.3.8
BOGOTA1(config-router)#passive-interface s0/0/0
```

RIP MEDELLIN

```
MEDELLIN1(config)#router rip
MEDELLIN1(config-router)#version 2
MEDELLIN1(config-router)#no auto-summary
MEDELLIN1(config-router)#network 172.29.6.0
MEDELLIN1(config-router)#network 172.29.6.8
MEDELLIN1(config-router)#network 172.29.6.12
MEDELLIN1(config-router)#passive-interface s0/0/0
```

Los routers Bogota1 y Medellín deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP.

BOGOTA

```
BOGOTA1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.5
BOGOTA1(config)#router rip
BOGOTA1(config-router)#default-information originate
```

MEDELLIN

```
MEDELLIN1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.1
MEDELLIN1(config)#router rip
MEDELLIN1(config-router)#default-information originate
```

El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se sumarizan las subredes de cada uno a /22.

```
ISP(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
ISP(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6
```

Parte 2: Tabla de Enrutamiento.

Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

Bogota1

```
Gateway of last resort is 209.17.220.5 to network 0.0.0.0

     172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks
C       172.29.3.0/30 is directly connected, Serial0/1/0
L       172.29.3.1/32 is directly connected, Serial0/1/0
C       172.29.3.4/30 is directly connected, Serial0/1/1
L       172.29.3.5/32 is directly connected, Serial0/1/1
C       172.29.3.8/30 is directly connected, Serial0/0/1
L       172.29.3.9/32 is directly connected, Serial0/0/1
     209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.17.220.4/30 is directly connected, Serial0/0/0
L       209.17.220.6/32 is directly connected, Serial0/0/0
S*   0.0.0.0/0 [1/0] via 209.17.220.5
```

Bogota2

```
Gateway of last resort is not set

     172.29.0.0/16 is variably subnetted, 6 subnets, 3 masks
C       172.29.1.0/24 is directly connected, GigabitEthernet0/0
L       172.29.1.1/32 is directly connected, GigabitEthernet0/0
C       172.29.3.8/30 is directly connected, Serial0/0/0
L       172.29.3.10/32 is directly connected, Serial0/0/0
C       172.29.3.12/30 is directly connected, Serial0/0/1
L       172.29.3.13/32 is directly connected, Serial0/0/1
```

Bogota3

```
Gateway of last resort is not set

     172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks
C       172.29.0.0/24 is directly connected, GigabitEthernet0/0
L       172.29.0.1/32 is directly connected, GigabitEthernet0/0
C       172.29.3.0/30 is directly connected, Serial0/0/0
L       172.29.3.2/32 is directly connected, Serial0/0/0
C       172.29.3.4/30 is directly connected, Serial0/0/1
L       172.29.3.6/32 is directly connected, Serial0/0/1
C       172.29.3.12/30 is directly connected, Serial0/1/0
L       172.29.3.14/32 is directly connected, Serial0/1/0
```

Medellin1

```
Gateway of last resort is 209.17.220.1 to network 0.0.0.0

     172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks
C       172.29.6.0/30 is directly connected, Serial0/0/1
L       172.29.6.1/32 is directly connected, Serial0/0/1
C       172.29.6.8/30 is directly connected, Serial0/1/0
L       172.29.6.9/32 is directly connected, Serial0/1/0
C       172.29.6.12/30 is directly connected, Serial0/1/1
L       172.29.6.13/32 is directly connected, Serial0/1/1
     209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.17.220.0/30 is directly connected, Serial0/0/0
L       209.17.220.2/32 is directly connected, Serial0/0/0
S*   0.0.0.0/0 [1/0] via 209.17.220.1
```

Medellin2

```
Gateway of last resort is not set

     172.29.0.0/16 is variably subnetted, 6 subnets, 3 masks
C       172.29.4.0/25 is directly connected, GigabitEthernet0/0
L       172.29.4.1/32 is directly connected, GigabitEthernet0/0
C       172.29.6.0/30 is directly connected, Serial0/0/0
L       172.29.6.2/32 is directly connected, Serial0/0/0
C       172.29.6.4/30 is directly connected, Serial0/0/1
L       172.29.6.5/32 is directly connected, Serial0/0/1
```

Medellin3

```
Gateway of last resort is not set

     172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks
C       172.29.4.128/25 is directly connected, GigabitEthernet0/0
L       172.29.4.129/32 is directly connected, GigabitEthernet0/0
C       172.29.6.4/30 is directly connected, Serial0/1/0
L       172.29.6.6/32 is directly connected, Serial0/1/0
C       172.29.6.8/30 is directly connected, Serial0/0/0
L       172.29.6.10/32 is directly connected, Serial0/0/0
C       172.29.6.12/30 is directly connected, Serial0/0/1
L       172.29.6.14/32 is directly connected, Serial0/0/1
```

Verificar el balanceo de carga que presentan los routers.

Bogota1

```
R       172.29.0.0/24 [120/1] via 172.29.3.6, 00:00:22, Serial0/1/1
                      [120/1] via 172.29.3.2, 00:00:22, Serial0/1/0
R       172.29.1.0/24 [120/1] via 172.29.3.10, 00:00:09, Serial0/0/1
```

Bogota2

```
R*   0.0.0.0/0 [120/1] via 172.29.3.9, 00:00:03, Serial0/0/0
```

Bogota3

```
    R       172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:23, Serial0/0/1
                          [120/1] via 172.29.3.1, 00:00:23, Serial0/0/0
    R       172.29.3.12/30 [120/2] via 172.29.3.5, 00:00:23, Serial0/0/1
                           [120/2] via 172.29.3.1, 00:00:23, Serial0/0/0
    R*   0.0.0.0/0 [120/1] via 172.29.3.5, 00:00:23, Serial0/0/1
                  [120/1] via 172.29.3.1, 00:00:23, Serial0/0/0
```

Medellin1

```
 R       172.29.6.4/30 [120/1] via 172.29.6.2, 00:00:01, Serial0/0/1
                       [120/1] via 172.29.6.14, 00:00:08, Serial0/1/1
                       [120/1] via 172.29.6.10, 00:00:08, Serial0/1/0
```

Medellin2

```
R       172.29.6.8/30 [120/1] via 172.29.6.1, 00:00:05, Serial0/0/0
                      [120/1] via 172.29.6.6, 00:00:15, Serial0/0/1
R       172.29.6.12/30 [120/1] via 172.29.6.1, 00:00:05, Serial0/0/0
                       [120/1] via 172.29.6.6, 00:00:15, Serial0/0/1
R*   0.0.0.0/0 [120/1] via 172.29.6.1, 00:00:05, Serial0/0/0
```

Medellin3

```
   R*   0.0.0.0/0 [120/1] via 172.29.6.13, 00:00:07, Serial0/0/1
                  [120/1] via 172.29.6.9, 00:00:07, Serial0/0/0
```

Obsérvese en los routers Bogotá1 y Medellín1 cierta similitud por su ubicación, por tener dos enlaces de conexión hacia otro router y por la ruta por defecto que manejan.

Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.

Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.

El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.

```
          172.29.0.0/22 is subnetted, 2 subnets
      S       172.29.0.0/22 [1/0] via 209.17.220.6
      S       172.29.4.0/22 [1/0] via 209.17.220.2
          209.17.220.0/24 is variably subnetted, 4 subnets, 2 masks
      C       209.17.220.0/30 is directly connected, Serial0/0/0
      L       209.17.220.1/32 is directly connected, Serial0/0/0
      C       209.17.220.4/30 is directly connected, Serial0/0/1
      L       209.17.220.5/32 is directly connected, Serial0/0/1
```

Parte 3: Deshabilitar la propagación del protocolo RIP.

Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP, en la siguiente tabla se indican las interfaces de cada Router que no necesitan desactivación.

ROUTER	INTERFAZ
Bogota1	SERIAL0/0/1; SERIAL0/1/0; SERIAL0/1/1
Bogota2	SERIAL0/0/0; SERIAL0/0/1
Bogota3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
Medellín1	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/1
Medellín2	SERIAL0/0/0; SERIAL0/0/1
Medellín3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
ISP	No lo requiere

Parte 4: Verificación del protocolo RIP.

Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el passive interface para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.
Verificar y documentar la base de datos de RIP de cada Router, donde se informa de manera detallada de todas las rutas hacia cada red.

Bogota1

```
BOGOTA1#sh ip rip database
0.0.0.0/0    is possibly down
0.0.0.0/0    is possibly down
172.29.0.0/24    auto-summary
172.29.0.0/24
    [1] via 172.29.3.6, 00:00:11, Serial0/1/1    [1] via 172.29.3.2,
00:00:11, Serial0/1/0
172.29.1.0/24    auto-summary
172.29.1.0/24
    [1] via 172.29.3.10, 00:00:00, Serial0/0/1
172.29.3.0/30    auto-summary
172.29.3.0/30    directly connected, Serial0/1/0
172.29.3.4/30    auto-summary
172.29.3.4/30    directly connected, Serial0/1/1
172.29.3.8/30    auto-summary
172.29.3.8/30    directly connected, Serial0/0/1
172.29.3.12/30    auto-summary
172.29.3.12/30
    [1] via 172.29.3.10, 00:00:00, Serial0/0/1
```

Medellin1

```
MEDELLIN1#sh ip rip database
172.29.4.0/25    auto-summary
172.29.4.0/25
    [1] via 172.29.6.2, 00:00:09, Serial0/0/1
172.29.4.128/25    auto-summary
172.29.4.128/25
    [1] via 172.29.6.14, 00:00:01, Serial0/1/1    [1] via
172.29.6.10, 00:00:01, Serial0/1/0
172.29.6.0/30    auto-summary
172.29.6.0/30    directly connected, Serial0/0/1
172.29.6.4/30    auto-summary
172.29.6.4/30
    [1] via 172.29.6.2, 00:00:09, Serial0/0/1    [1] via 172.29.6.14,
00:00:01, Serial0/1/1    [1] via 172.29.6.10, 00:00:01, Serial0/1/0
172.29.6.8/30    auto-summary
172.29.6.8/30    directly connected, Serial0/1/0
172.29.6.12/30    auto-summary
172.29.6.12/30    directly connected, Serial0/1/1
```

Parte 5: Configurar encapsulamiento y autenticación PPP.

Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAP.

```
MEDELLIN1(config)#username ISP password cisco
MEDELLIN1(config)#int s0/0/0
MEDELLIN1(config-if)#encapsulation ppp
MEDELLIN1(config-if)#ppp authentication pap
MEDELLIN1(config-if)#ppp pap sent-username Medellin1 password cisco
MEDELLIN1(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
```

El enlace Bogotá1 con ISP se debe configurar con autenticación CHAP.

```
BOGOTA1(config)#username ISP password cisco
BOGOTA1(config)#int s0/0/0
BOGOTA1(config-if)#encapsulation ppp
BOGOTA1(config-if)#ppp authentication chap
BOGOTA1(config-if)#exit
BOGOTA1(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
```

Parte 6: Configuración de PAT.

En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.
Bogota1

Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el Router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del Router Medellín1, cómo diferente puerto.

Medellin1

```
MEDELLIN1(config)#ip nat inside source list 1 interface s0/0/0
overload
MEDELLIN1(config)#access-list 1 permit 172.29.4.0 0.0.3.255
MEDELLIN1(config)#int s0/0/0
MEDELLIN1(config-if)#ip nat outside
MEDELLIN1(config-if)#int s0/0/1
MEDELLIN1(config-if)#ip nat inside
MEDELLIN1(config-if)#int s0/1/0
MEDELLIN1(config-if)#ip nat inside
MEDELLIN1(config-if)#int s0/1/1
MEDELLIN1(config-if)#ip nat inside
```

Proceda a configurar el NAT en el Router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del Router Bogotá1, cómo diferente puerto.

Bogota1

```
BOGOTA1(config)#ip nat inside source list 1 interface s0/0/0 overload
BOGOTA1(config)#access-list 1 permit 172.29.0.0 0.0.3.255
BOGOTA1(config)#int s0/0/0
BOGOTA1(config-if)#ip nat outside
BOGOTA1(config-if)#int s0/0/1
BOGOTA1(config-if)#ip nat inside
BOGOTA1(config-if)#int s0/1/0
BOGOTA1(config-if)#ip nat inside
BOGOTA1(config-if)#int s0/1/1
BOGOTA1(config-if)#ip nat inside
```

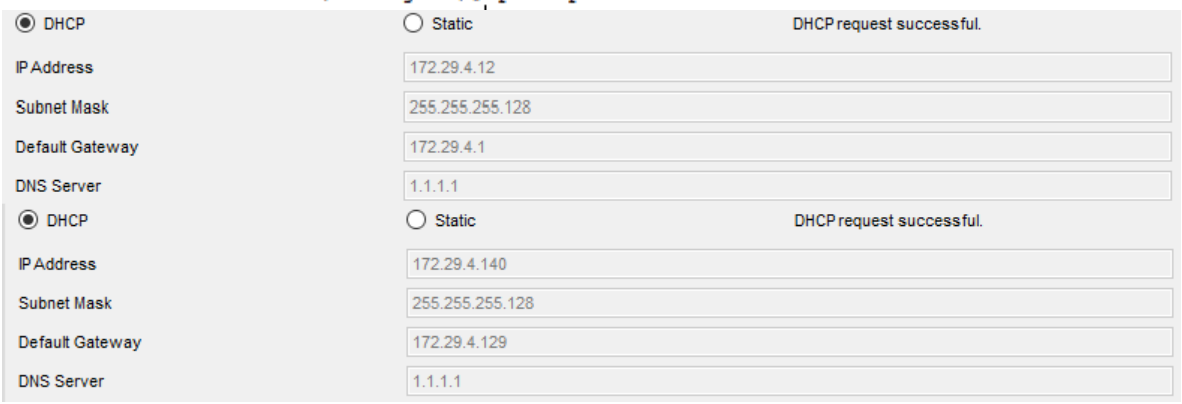
Parte 7: Configuración del servicio DHCP.

Configurar la red Medellín2 y Medellín3 donde el Router Medellín 2 debe ser el servidor DHCP para ambas redes LAN.

```
MEDELLIN2(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.11
MEDELLIN2(config)#ip dhcp excluded-address 172.29.4.129 172.29.4.139
MEDELLIN2(config)#ip dhcp pool Medl2
MEDELLIN2(dhcp-config)#network 172.29.4.0 255.255.255.128
MEDELLIN2(dhcp-config)#default-router 172.29.4.1
MEDELLIN2(dhcp-config)#dns-server 1.1.1.1
MEDELLIN2(dhcp-config)#exit
MEDELLIN2(config)#ip dhcp pool Medl3
MEDELLIN2(dhcp-config)#network 172.29.4.128 255.255.255.128
MEDELLIN2(dhcp-config)#default-router 172.29.4.129
MEDELLIN2(dhcp-config)#dns-server 1.1.1.1
```

El Router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del Router Medellín2.

```
MEDELLIN3(config)#int g0/0
MEDELLIN3(config-if)#ip helper-address 172.29.6.5
```

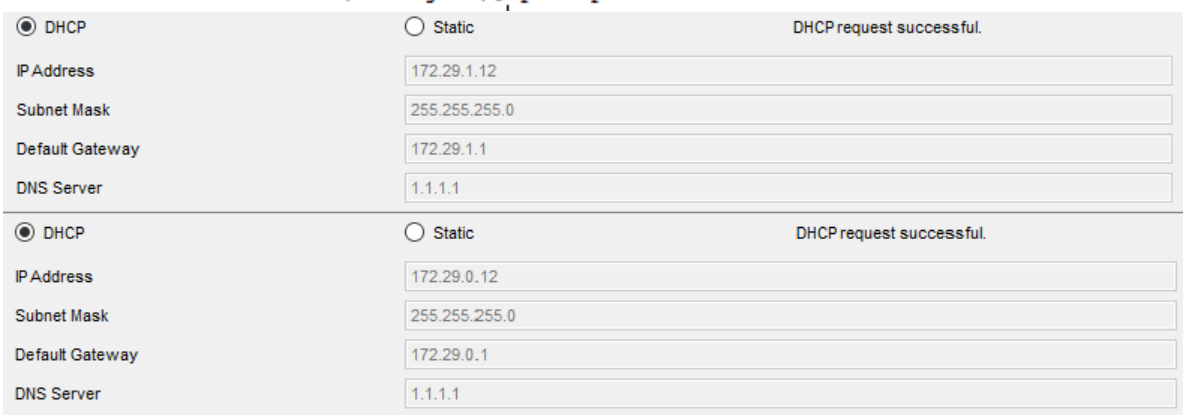


Configurar la red Bogotá2 y Bogotá3 donde el Router Bogota2 debe ser el servidor DHCP para ambas redes LAN.

```
BOGOTA2(config)#ip dhcp excluded-address 172.29.0.1 172.29.0.11
BOGOTA2(config)#ip dhcp excluded-address 172.29.1.1 172.29.1.11
BOGOTA2(config)#ip dhcp pool Bogt2
BOGOTA2(dhcp-config)#network 172.29.0.0 255.255.255.0
BOGOTA2(dhcp-config)#default-router 172.29.0.1
BOGOTA2(dhcp-config)#dns-server 1.1.1.1
BOGOTA2(dhcp-config)#exit
BOGOTA2(config)#ip dhcp pool Bogt3
BOGOTA2(dhcp-config)#network 172.29.1.0 255.255.255.0
BOGOTA2(dhcp-config)#default-router 172.29.1.1
BOGOTA2(dhcp-config)#dns-server 1.1.1.1
```

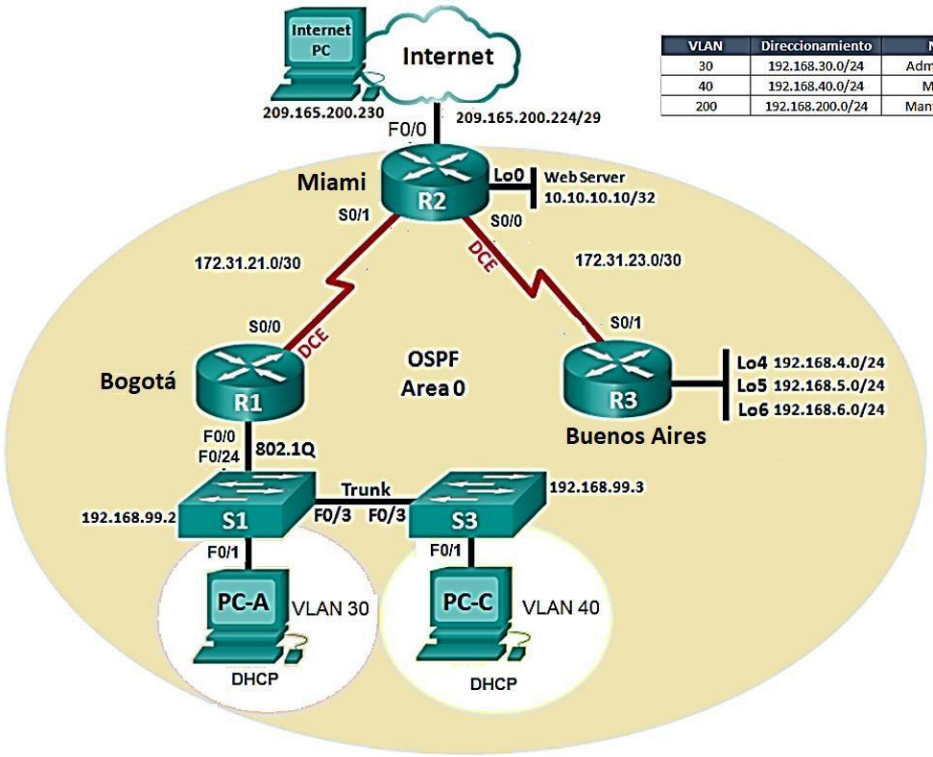
Configure el Router Bogotá3 para que habilite el paso de los mensajes Broadcast hacia la IP del Router Bogotá2.

```
BOGOTA3(config)#int g0/0
BOGOTA3(config-if)#ip helper-address 172.29.3.13
```



Escenario 2

Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.



VLAN	Direccionamiento	Nombre
30	192.168.30.0/24	Administración
40	192.168.40.0/24	Mercadeo
200	192.168.200.0/24	Mantenimiento

Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario

```
R1(config)#int g0/0
R1(config-if)#ip address 172.31.21.0 255.255.0.0
R1(config-if)#
R1(config-if)#no shutdown
```

```
R3(config)#int g0/0
R3(config-if)#ip address 172.31.23.0 255.255.0.0
R3(config-if)#no shutdown
```

Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

```
R1(config-if)#int s0/0/0
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#ip address 1.1.1.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown
R1(config-if)#no shut
```

OSPFv2 área 0

Configuración Ítem o Tarea	Especificación
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

```
      R1(config)#int s0/0/0
      R1(config-if)#ip address 1.1.1.1 255.255.255.252
      R1(config-if)#clock rate 250000
      R1(config-if)#no shut
R2(config)#int s0/0/1
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
     R2(config)#int s0/0/0
     R2(config-if)#ip address 172.31.23.1 255.255.255.252
     R2(config-if)#clock rate 250000
     R2(config-if)#no shut
R3(config)#int s0/0/1
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shut
```

OSPF

```
R1(config)#router ospf 1
R1(config-router)#network 172.31.21.0 0.0.0.255 area 0
```

```
R2(config)#router ospf 1
OSPF process 1 cannot start. There must be at least one "up" IP interface
R2(config-router)#network 172.31.22.0 0.0.0.255 area 0
```

```
R3(config)#router ospf 1
R3(config-router)#network 172.31.23.0 0.0.0.255 area 0
```

Loopback

```
R2(config)#interface lo0
R2(config-if)#ip address 10.10.10.10 255.255.255.255
```

```
R3(config)#interface lo4
R3(config-if)#ip address 192.168.4.0 255.255.255.255
R3(config-if)#ip address 192.168.5.0 255.255.255.255
R3(config-if)#ip address 192.168.6.0 255.255.255.255
```

IP en los switches

```
S1(config)#int vlan 30
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.1.1
```

```
S3(config)#int vlan 40
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.1.3
```

LAN pasivas

```
R1(config)#router ospf 10
R1(config-router)#passive-interface default
```

```
R2(config)#router ospf 10
R2(config-router)#passive-interface default
```

```
R3(config)#router ospf 10
R3(config-router)#passive-interface default
```

Verificar información de OSPF

a. Visualizar tablas de enrutamiento y Router conectados por OSPFv2

R1

```
     1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       1.1.1.0/30 is directly connected, Serial0/0/0
L       1.1.1.1/32 is directly connected, Serial0/0/0
     172.31.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.31.0.0/16 is directly connected, GigabitEthernet0/0
L       172.31.21.0/32 is directly connected, GigabitEthernet0/0
```

R2

```
     10.0.0.0/32 is subnetted, 1 subnets
C       10.10.10.10/32 is directly connected, Loopback0
     172.31.0.0/16 is variably subnetted, 4 subnets, 2 masks
C       172.31.21.0/30 is directly connected, Serial0/0/1
L       172.31.21.2/32 is directly connected, Serial0/0/1
C       172.31.23.0/30 is directly connected, Serial0/0/0
L       172.31.23.1/32 is directly connected, Serial0/0/0
     209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.165.200.224/29 is directly connected, GigabitEthernet0/0
L       209.165.200.225/32 is directly connected, GigabitEthernet0/0
```

R3

```
     172.31.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.31.23.0/30 is directly connected, Serial0/0/1
L       172.31.23.2/32 is directly connected, Serial0/0/1
     192.168.6.0/32 is subnetted, 1 subnets
C       192.168.6.0/32 is directly connected, Loopback4
```

a. Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface

"**show ip ospf interface brief**" no está disponible en Packet Tracer

b. Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada Router.

R1

```
Routing Protocol is "ospf 10"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.168.1.1
  Number of areas in this router is 0. 0 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
  Passive Interface(s):
    Vlan1
    GigabitEthernet0/0
    GigabitEthernet0/1
    Serial0/0/0
    Serial0/0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 110)

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.158.30.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.255 area 0
    1.1.1.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.158.30.0         110      00:00:55
  Distance: (default is 110)
```

R2

```
Routing Protocol is "ospf 10"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 10.10.10.10
  Number of areas in this router is 0. 0 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
  Passive Interface(s):
    Vlan1
    GigabitEthernet0/0
    GigabitEthernet0/1
    Serial0/0/0
    Serial0/0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 110)

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 209.165.200.225
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.22.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 110)
```

R3

```
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.168.1.3
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.168.1.3           110      00:03:01
  Distance: (default is 110)
```

Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.

VLAN

```
S1(config)#vlan 30
S1(config-vlan)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up

S3(config)#vlan 40
S3(config-vlan)#
%LINK-5-CHANGED: Interface Vlan40, changed state to up
```

Troncales

```
S1(config)#interface f0/1
S1(config-if)#switchport mode dynamic desirable
S1(config)#int f0/3
S1(config-if)#switchport mode dynamic desirable
S3(config)#int f0/3
S3(config-if)#switchport mode dynamic desirabl
S3(config)#int f0/1
S3(config-if)#switchport mode dynamic desirabl
```

```
S1#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/3       desirable    n-802.1q       trunking      1

Port        Vlans allowed on trunk
Fa0/3       1-1005

Port        Vlans allowed and active in management domain
Fa0/3       1,30

Port        Vlans in spanning tree forwarding state and not
pruned
Fa0/3       1,30
S3#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/3       desirable    n-802.1q       trunking      1

Port        Vlans allowed on trunk
Fa0/3       1-1005

Port        Vlans allowed and active in management domain
Fa0/3       1,40

Port        Vlans in spanning tree forwarding state and not
pruned
Fa0/3       1,40
```

Enlaces

```
S1(config)#interface f0/1
S1(config-if)#switchport access vlan 30
S1(config-if)#interface f0/3
S1(config-if)#switchport access vlan 30
S3(config-if)#switchport access vlan 40
S3(config-if)#interface f0/1
S3(config-if)#switchport access vlan 40
```

Inter-VLAN

```
R1(config)#interface g0/1.1
R1(config-subif)#
R1(config-subif)#encapsulation dot1Q 1
R1(config-subif)#
R1(config-subif)#ip address 192.168.1.1 255.255.255.0
```

```
R2(config)#interface g0/1.1
R2(config-subif)#encapsulation dot1Q 1
R2(config-subif)#ip address 192.168.1.2 255.255.255.0
```

```
R3(config)#interface g0/1.2
R3(config-subif)#encapsulation dot1Q 1
R3(config-subif)#ip address 192.168.1.3
% Incomplete command.
R3(config-subif)#ip address 192.168.1.3 255.255.255.0
```

Seguridad

```
S1(config)#ip domain-name CCNA-lab.com
S1(config)#username admin privilege 15 secret sshadmin
S1(config)#line vty 0 15
S1(config-line)#transport input ssh
S1(config-line)#login local
S1(config-line)#exit
S1(config)#
S1(config)#crypto key generate rsa
The name for the keys will be: S1.CCNA-lab.com
Choose the size of the key modulus in the range of 360 to 2048
for your
  General Purpose Keys. Choosing a key modulus greater than 512
may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...
[OK]
```

```
S3(config)#ip domain-name CCNA-Lab.com
S3(config)#username admin privilege 15 secret sshadmin
S3(config)#line vty 0 15
S3(config-line)#transport input ssh
S3(config-line)#login local
S3(config-line)#exit
S3(config)#
S3(config)#crypto key generate rsa
The name for the keys will be: S3.CCNA-Lab.com
Choose the size of the key modulus in the range of 360 to 2048
for your
  General Purpose Keys. Choosing a key modulus greater than 512
may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...
[OK]
```

Deshabilitar DNS lookup

```
S3(config)#no ip domain-lookup
```

Asignar direcciones IP a los Switches acorde a los lineamientos.

```
S1(config)#int vlan 30
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.1.1

S3(config)#int vlan 40
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.1.3
```

Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

```
S1>en
S1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#interface range fasEthernet 0/2
                           ^
% Invalid input detected at '^' marker.

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

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
S1(config-if-range)#interface range f0/4-23
S1(config-if-range)#shutdown

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

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

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
S1(config-if-range)#
```

```
S3(config)#interface range f0/2
S3(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
S3(config-if-range)#interface range f0/4-24
S3(config-if-range)#shutdown

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

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

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
```

DHCP y NAT para IPv4

EIGRP

```
R1(config)#router eigrp 1
R1(config-router)#network 172.31.21.0 0.0.0.255
R1(config-router)#network 1.1.1.1 0.0.0.255
R1(config-router)#no auto-sumary
                              ^
% Invalid input detected at '^' marker.

R1(config-router)#no auto-summary
R1(config-router)#network 172.31.21.9 0.0.0.3
R1(config-router)#no auto-summary
```

```
R2(config)#router eigrp 1
R2(config-router)#network 172.31.21.9 0.0.0.3
R2(config-router)#
R2(config-router)#redistribute static
R2(config-router)#exit
R2(config)#ip route 0.0.0.0 0.0.0.0 209.165.200.225
R3(config)#ip route 172.31.0.0 255.255.252.0 209.165.200.226
```

Para asignar automáticamente la información de dirección en la red, configure el R2 como servidor de DHCPv4 y el R1 como agente de retransmisión DHCP

```
R2(config)#router eigrp 1
R2(config-router)#network 172.31.21.9 0.0.0.3
R2(config-router)#
R2(config-router)#redistribute static
R2(config-router)#exit
R2(config)#ip route 0.0.0.0 0.0.0.0 209.165.200.225
R2(config)#
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip dhcp excluded-address 172.31.21.0 192.168.0.9
R2(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.9
R2(config)#ip dhcp pool R1G1
R2(dhcp-config)#network 192.168.1.0 255.255.255.0
R2(dhcp-config)#default-reouter 192.168.1.1
                            ^
% Invalid input detected at '^' marker.

R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 209.165.200.225
R2(dhcp-config)#domain-name ccna-lab.com
                           -
R2(config)#ip dhcp pool R1G0
R2(dhcp-config)#network 192.168.0.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.0.1
R2(dhcp-config)#dns-server 209.165.200.225
```

Configurar R1 como servidor DHCP para las VLANs 30 y 40.

Agregamos las VLANs 30 y 40 en el Router 1

```
R1(config)#ip dhcp pool DHCP-AB
R1(dhcp-config)#?
  default-router  Default routers
  dns-server      Set name server
  exit            Exit from DHCP pool configuration mode
  network         Network number and mask
  no              Negate a command or set its defaults
  option          Raw DHCP options
R1(dhcp-config)#network 192.168.0.0 255.255.255.0
R1(dhcp-config)#default
% Incomplete command.
R1(dhcp-config)#default-router 172.31.21.0
R1(dhcp-config)#dns-server 8.8.8.8
R1(dhcp-config)#exit
R1(config)#do wr
Building configuration...
[OK]
```

Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.

```
R1(config)#ip dhcp pool administracion
R1(dhcp-config)#network 192.158.30.0 255.255.255.0
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#domain-name ccna-unad.com
                ^
% Invalid input detected at '^' marker.

R1(dhcp-config)#default-router 172.31.21.0
R1(dhcp-config)#domain-name ccna-unad.com
```

```
R1(config)#ip dhcp pool mercadeo
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#defaul-router 172.31.21.0
                      ^
% Invalid input detected at '^' marker.

R1(dhcp-config)#defaul-router 192.168.1.1
                      ^
% Invalid input detected at '^' marker.

R1(dhcp-config)#default-router 172.31.21.0
R1(dhcp-config)#domain-name ccna-unad.com
                ^
% Invalid input detected at '^' marker.
```

Configurar NAT en R2 para permitir que los hosts puedan salir a internet

```
R2(config)#interface g0/0
R2(config-if)#ip nat inside
R2(config-if)#interface s0/0
%Invalid interface type and number
R2(config)#interface s0/0/1
R2(config-if)#ip nat outside
R2(config-if)#interface s0/0/0
R2(config-if)#ip nat outside
```

Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```
R1(config)#access-list 1 deny 172.31.21.0 0.0.0.255
R1(config)#access-list 1 permit any
R1(config)#int g0/0
R1(config-if)#ip access-group 1 out

 R2(config)#access-list 1 deny 192.168.1.2 0.0.0.255
 R2(config)#access-list 1 permit any
 R2(config)#int g0/1.1
 R2(config-subif)#ip access-group 1 out

R3(config)#access-list 1 deny 172.31.23.0 0.0.0.255
R3(config)#access-list 1 permit any
R3(config)#int g0/0
R3(config-if)#ip access-group 1 out
```

CONCLUSIONES

Las redes deben funcionar de forma muy precisa y eficiente, la escalabilidad es otro factor que se debe tener muy en cuenta para tener el performance más óptimo en la mayor cantidad de tiempo posible, por su parte la seguridad es sin duda uno de los pilares más importantes a la hora de realizar una implementación puesto que la privacidad de los usuarios como de las empresas estaría comprometida a un sin número de atacantes que quieren aprovechar la información que es transportada.

Al realizar las practicas hemos hecho uso de la gran mayoría de los conceptos adquiridos durante el curso y nos permite como estudiantes y futuros profesionales ofrecer soluciones que abarquen la eficiencia, la escalabilidad, la seguridad y la durabilidad a situaciones que podemos encontrar en el ámbito laboral.

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