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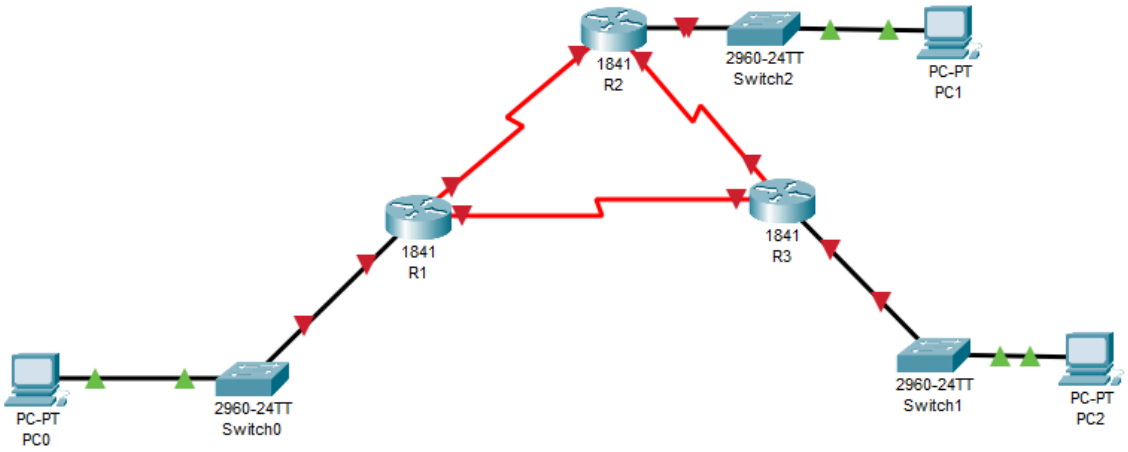
**OSPF**

**Tarea 1: Preparar la red**

Paso 1: Cablear una red que sea similar a la del Diagrama de topología.




Paso 2: Limpiar cualquier configuración existente en los routers

R1:

```
Router>enable
Router#write erase
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#
```

R2:

```
Router>enable
Router#write erase
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#
```

R3:

```
Router>enable
Router#write erase
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#
```

**Tarea 2: Realizar configuraciones básicas del enrutador.**

Realice la configuración básica de los routers R1, R2 y R3 según las siguientes pautas:

Configure el nombre de host del router
Desactive la búsqueda DNS
Configure la contraseña del modo EXEC como class
Configure la contraseña para las conexiones de consola como Cisco (distingue entre mayúsculas y minúsculas)
Configure la contraseña para las conexiones VTY como Cisco (distingue entre mayúsculas y minúsculas)

R1:

```
Router#confi
Router#configure
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

```
R1(config)#enable secret class
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#write memory
Building configuration...
[OK]
```

R2:

```
Router>
Router>enable
Router#confi
Router#configure
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#no ip domain-lookup
R2(config)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#conf
R2#configure
R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#enable secret class
R2(config)#line console 0
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#line vty 0 4
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#write memory
Building configuration...
[OK]
R2#
```

R3:

```
Router>enable
Router#con
Router#con
Router#conf
Router#configure
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#config
R3#configure
R3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#enable secret class
R3(config)#line console 0
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#line vty 0 4
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#write memory
Building configuration...
[OK]
```

**Tarea 3: Configurar y activar direcciones seriales y Ethernet**

Paso 1: Configure las interfaces en los enrutadores R1, R2 y R3 con las direcciones IP de la tabla.

Paso 2: Configure las PC con las direcciones IP de la tabla.

R1:

```
R1#config
R1#configure
R1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface Fas
R1(config)#interface FastEthernet0
R1(config)#interface FastEthernet0
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 172.16.1.17 255.255.255.240
R1(config-if)#no shutdown
```

```
R1(config)#interface Serial0/0
%Invalid interface type and number
R1(config)#interface Serial0/0/0
R1(config-if)#ip address 192.168.10.1 255.255.255.252
R1(config-if)#encapsulation ppp
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#interface Serial0/0/1
R1(config-if)#ip address 192.168.10.5 255.255.255.252
R1(config-if)#encapsulation ppp
R1(config-if)#no shutdown
```

R2:

```
R2>enable
Password:
R2#confi
R2#configure
R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interf
R2(config)#interface fa
R2(config)#interface fastEthernet0/0
R2(config-if)#ip address 10.10.10.1
% Incomplete command.
R2(config-if)#ip address 10.10.10.1 255.255.255.0
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

R2(config-if)#interface se
R2(config-if)#interface se
R2(config-if)#exit
R2(config)#interface ser
R2(config)#interface serial0/0/0
R2(config-if)#ip adress 192.168.10.2 255.255.255.252



R2(config-if)#interface se
R2(config-if)#interface se
R2(config-if)#exit
R2(config)#interface ser
R2(config)#interface serial0/0/0
R2(config-if)#ip adress 192.168.10.2 255.255.255.252
                 ^
% Invalid input detected at '^' marker.

R2(config-if)#ip address 192.168.10.2 255.255.255.252
R2(config-if)#enc
R2(config-if)#encapsulation ppp
R2(config-if)#no shut down

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

R2(config-if)#exit
R2(config)#interface serial0/0/1
R2(config-if)#ip address 192.168.10.9 255.255.255.252
R2(config-if)#encap
R2(config-if)#encapsulation ppp
R2(config-if)#no shut down
R2(config-if)#no shut down

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#
R2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

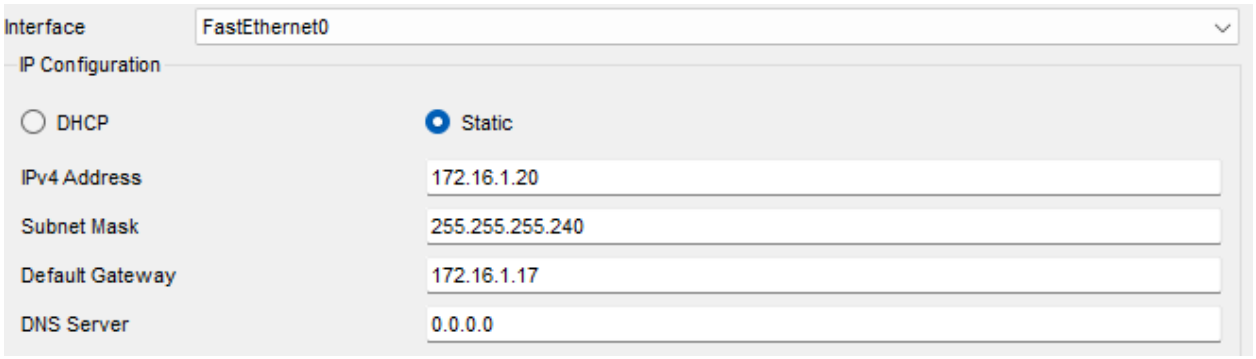
R3:

```
R3>enable
Password:
R3#confi
R3#configure
Configuring from terminal, memory, or network [terminal]? terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#interfa
R3(config)#interface fas
R3(config)#interface fastEthernet0/0
R3(config-if)#ip address 172.16.1.33
% Incomplete command.
R3(config-if)#ip address 172.16.1.33 255.255.255.248
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

R3(config-if)#exit
R3(config)#interf
R3(config)#interface ser
R3(config)#interface serial0/0/0
R3(config-if)#ip address 192.168.10.6 255.255.255.252
R3(config-if)#encap
R3(config-if)#encapsulation ppp
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

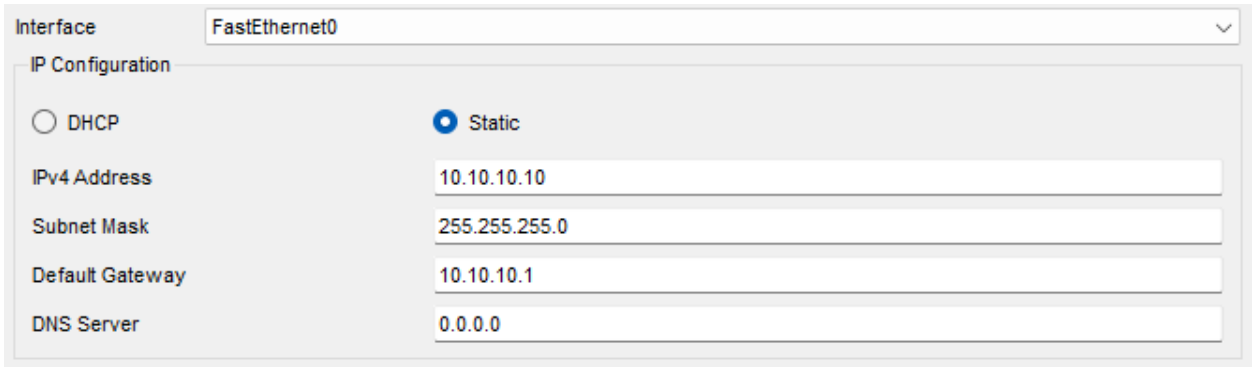
```
R3(config-if)#exit
R3(config)#inter
R3(config)#interface se
R3(config)#interface serial0/0/1
R3(config-if)#ip address 192.168.10.10 255.255.255.252
R3(config-if)#enca
R3(config-if)#encapsulation ppp
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

R3(config-if)#exit
R3(config)#
```

Paso 2: Configurar las PC’s con las IP’s de la table

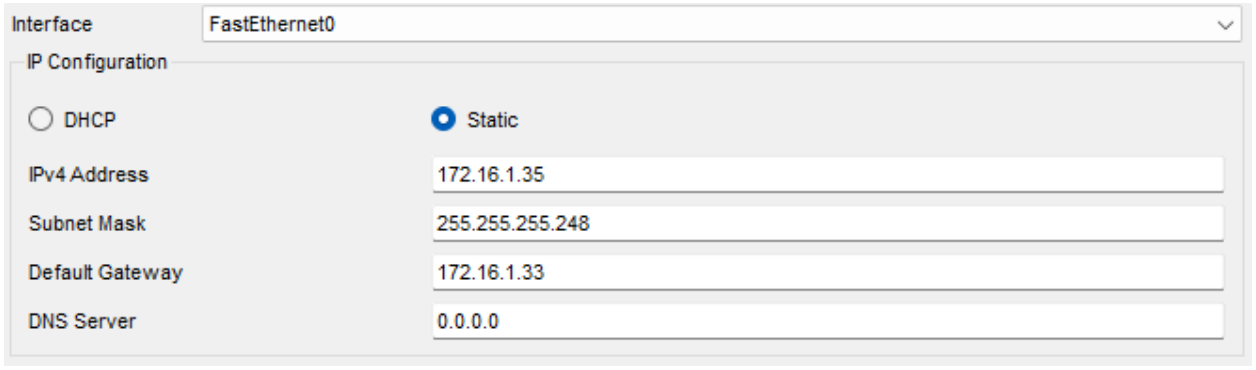
R1:




R2:




R3:




**Tarea 4: Configurar OSPF en el router R1**

Paso 1: Configure OSPF con un número de identificación de proceso de 1 y anuncie todas las redes.

```
Password:
R1>enable
Password:
Password:
R1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface FastEthernet0/0
R1(config-if)#R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#network 172.16.1.17 255.255.255.240
% Incomplete command.
R1(config-router)#network 172.16.1.17 255.255.255.240 0
                                                       ^
% Invalid input detected at '^' marker.

R1(config-router)#network 172.16.1.17 255.255.255.240 area 0
R1(config-router)#network 192.168.10.1 255.255.255.252 area 0
R1(config-router)#network 192.168.10.5 255.255.255.252 area 0
R1(config-router)#exit
R1(config)#
```

**Tarea 5: Configurar OSPF en los enrutadores R2 y R3**

Paso 1: Configure OSPF con un número de identificación de proceso de 1 y anuncie todas las redes.

R2:

```
R2>con
R2>connect
R2>enable
Password:
R2#conf
R2#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#network 10.10.10.1 255.255.255.0 area 0
R2(config-router)#network 192.168.10.2 255.255.255.252 area 0
R2(config-router)#network
00:56:26: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.10.5 on Serial0/0/0 from LOADING to
FULL, Loading Done

% Incomplete command.
R2(config-router)#network 192.168.10.9 255.255.255.252 area 0
R2(config-router)#exit
R2(config)#
```

R3:

```
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#network 172.16.1.33 255.255.255.248 area 0
R3(config-router)#network 192.168.10.6 255.255.255.252 area 0
R3(config-router)#
00:57:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.10.5 on Serial0/0/0 from LOADING to
FULL, Loading Done

R3(config-router)#network 192.168.10.10 255.255.255.252 area 0
R3(config-router)#
```

**Tarea 6: Configurar los ID de enrutador OSPF**

Paso 1: Configurar el R1 con la interfaz Loopback0 10.1.1.1 255.255.255.255.

```
R1>enable
Password:
R1#confi
R1#configure
R1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface lo
R1(config)#interface loopback0

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R1(config-if)#ip address 10.1.1.1 255.255.255.255
R1(config-if)#exit
R1(config)#write memory
          ^
% Invalid input detected at '^' marker.

R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#write memory
Building configuration...
[OK]
R1#
```

Paso 2: Configurar el R2 con la interfaz Loopback0 10.2.2.2 255.255.255.255.

```
R2(config)#interface l
R2(config)#interface loopback0

R2(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R2(config-if)#ip address 10.2.2.2 255.255.255.255
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#write memory
Building configuration...
[OK]
R2#
```

Paso 3: Configurar el R3 con la interfaz Loopback0 10.3.3.3 255.255.255.255.

```
R3(config-router)#exit
R3(config)#interface loo
R3(config)#interface loopback0

R3(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R3(config-if)#ip address 10.3.3.3 255.255.255.255+
                                  ^
% Invalid input detected at '^' marker.

R3(config-if)#ip address 10.3.3.3 255.255.255.255
R3(config-if)#exit
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console
write memory
Building configuration...
[OK]
R3#
```

Paso 4: Copiar todas las configuraciones en ejecución a la NVRAM y recargar los enrutadores.

```
[OK]
R1#copy ru
R1#copy running-config sta
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
..
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

Self decompressing the image :
############################################################################ [OK]
              Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
```

```
R2#cop
R2#copy
R2#copy r
R2#copy running-config s
R2#copy running-config st
R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
..
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

Self decompressing the image :
############################################################################ [OK]
              Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
```

```
R3#copy run
R3#copy running-config st
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
..
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

Self decompressing the image :
############################################################################ [OK]
              Restricted Rights Legend
```

**Tarea 7: Verificar el funcionamiento de OSPF**

Paso 1: Utilice el comando `show ip ospf neighbor` para verificar que se haya obtenido información sobre otros enrutadores.

R1:

```
Password:
R1#show ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
10.2.2.2          0   FULL/  -        00:00:39    192.168.10.2    Serial0/0/0
10.3.3.3          0   FULL/  -        00:00:36    192.168.10.6    Serial0/0/1
```

R2:

```
R2>enable
Password:
R2#show ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
10.1.1.1          0   FULL/  -        00:00:31    192.168.10.1    Serial0/0/0
10.3.3.3          0   FULL/  -        00:00:38    192.168.10.10   Serial0/0/1
```

R3:

```
User Access Verification

Password:

R3>enable
Password:
R3#show ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
10.2.2.2          0   FULL/  -        00:00:35    192.168.10.9    Serial0/0/1
10.1.1.1          0   FULL/  -        00:00:35    192.168.10.5    Serial0/0/0
```

Paso 2: Utilice el comando `show ip protocols` para ver información sobre el protocolo de enrutamiento.

R1:

```
R1#show ip protocols

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 10.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.16.1.16 0.0.0.15 area 0
    192.168.10.0 0.0.0.3 area 0
    192.168.10.4 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.1.1.1             110      00:03:54
    10.2.2.2             110      00:03:54
    10.3.3.3             110      00:03:54
    192.168.10.5         110      00:14:15
    192.168.10.9         110      00:05:34
    192.168.10.10        110      00:04:51
  Distance: (default is 110)

R1#
```

R2:

```
R2#show ip protocols

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 10.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.10.10.0 0.0.0.255 area 0
    192.168.10.0 0.0.0.3 area 0
    192.168.10.8 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.1.1.1             110      00:02:50
    10.2.2.2             110      00:02:50
    10.3.3.3             110      00:02:50
    192.168.10.5         110      00:13:11
    192.168.10.9         110      00:04:30
    192.168.10.10        110      00:03:47
  Distance: (default is 110)

R2#
```

R3:

```
R3#show ip protocols

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 10.3.3.3
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.16.1.32 0.0.0.7 area 0
    192.168.10.4 0.0.0.3 area 0
    192.168.10.8 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.1.1.1             110      00:03:31
    10.2.2.2             110      00:03:31
    10.3.3.3             110      00:03:31
    192.168.10.5         110      00:13:52
    192.168.10.9         110      00:05:11
    192.168.10.10        110      00:04:28
  Distance: (default is 110)

R3#
```

**Tarea 8: Examinar las rutas OSPF en las tablas de enrutamiento**

Paso 1: Utilice el comando show ip route para ver todas las redes detectadas a través de OSPF.

R1:

```
R1#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.1.1/32 is directly connected, Loopback0
O       10.10.10.0/24 [110/65] via 192.168.10.2, 00:09:13, Serial0/0/0
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.1.16/28 is directly connected, FastEthernet0/0
O       172.16.1.32/29 [110/65] via 192.168.10.6, 00:08:26, Serial0/0/1
     192.168.10.0/24 is variably subnetted, 5 subnets, 2 masks
C       192.168.10.0/30 is directly connected, Serial0/0/0
C       192.168.10.2/32 is directly connected, Serial0/0/0
C       192.168.10.4/30 is directly connected, Serial0/0/1
C       192.168.10.6/32 is directly connected, Serial0/0/1
O       192.168.10.8/30 [110/128] via 192.168.10.2, 00:08:26, Serial0/0/0
                        [110/128] via 192.168.10.6, 00:08:26, Serial0/0/1

R1#
```

R2:

```
R2#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.2.2.2/32 is directly connected, Loopback0
C       10.10.10.0/24 is directly connected, FastEthernet0/0
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
O       172.16.1.16/28 [110/65] via 192.168.10.1, 00:09:50, Serial0/0/0
O       172.16.1.32/29 [110/65] via 192.168.10.10, 00:08:48, Serial0/0/1
     192.168.10.0/24 is variably subnetted, 5 subnets, 2 masks
C       192.168.10.0/30 is directly connected, Serial0/0/0
C       192.168.10.1/32 is directly connected, Serial0/0/0
O       192.168.10.4/30 [110/128] via 192.168.10.1, 00:08:48, Serial0/0/0
                        [110/128] via 192.168.10.10, 00:08:48, Serial0/0/1
C       192.168.10.8/30 is directly connected, Serial0/0/1
C       192.168.10.10/32 is directly connected, Serial0/0/1

R2#
```

R3:

```
R3#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.3.3.3/32 is directly connected, Loopback0
O       10.10.10.0/24 [110/65] via 192.168.10.9, 00:09:33, Serial0/0/1
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
O       172.16.1.16/28 [110/65] via 192.168.10.5, 00:09:33, Serial0/0/0
C       172.16.1.32/29 is directly connected, FastEthernet0/0
     192.168.10.0/24 is variably subnetted, 5 subnets, 2 masks
O       192.168.10.0/30 [110/128] via 192.168.10.9, 00:09:33, Serial0/0/1
                        [110/128] via 192.168.10.5, 00:09:33, Serial0/0/0
C       192.168.10.4/30 is directly connected, Serial0/0/0
C       192.168.10.5/32 is directly connected, Serial0/0/0
C       192.168.10.8/30 is directly connected, Serial0/0/1
C       192.168.10.9/32 is directly connected, Serial0/0/1

R3#
```

**Tarea 9: Configurar el costo de OSPF**

Paso 1: Configure las interfaces seriales R1 con un ancho de banda de 64.

```
R1#conf
R1#configure
R1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface serial 0/0/0
R1(config-if)#bad
R1(config-if)#bad
R1(config-if)#band
R1(config-if)#bandwidth 64
R1(config-if)#exit
R1(config)#interface serial 0/0/1
R1(config-if)#bandwidth 64
R1(config-if)#exit
R1(config)#
```

Paso 2: Configure las interfaces seriales R2 con un ancho de banda de 64.

```
R2#conf
R2#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface se
R2(config)#interface serial 0/0/0
R2(config-if)#band
R2(config-if)#bandwidth 64
R2(config-if)#exit
R2(config)#interface serial 0/0/1
R2(config-if)#bandwidth 64
R2(config-if)#exit
R2(config)#
```

Paso 3: Configure las interfaces seriales R3 con un costo de 1562.

```
R3#conf
R3#configure
R3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#inter
R3(config)#interface s
R3(config)#interface serial 0/0/0
R3(config-if)#ip ospf cost 1562
R3(config-if)#exit
R3(config)#interface serial 0/0/1
R3(config-if)#ip ospf cost 1562
R3(config-if)#exit
R3(config)#
```

Tarea 10: Redistribuir una ruta predeterminada OSPF

Paso 1: Configurar una dirección loopback en el enrutador R1 para simular un enlace a un ISP.

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up

R1(config-if)#ip address 172.30.1.1 255.255.255.252
R1(config-if)#exit
R1(config)#ip route 0.0.0.0 0.0.0.0 172.30.1.1
%Invalid next hop address (it's this router)
R1(config)#
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

Paso 2: Crear el loopback 1 172.30.1.1 255.255.255.252 en el enrutador R1.

```
R1(config-if)#ip address 172.30.1.1 255.255.255.252
R1(config-if)#exit
```

Paso 3: Crear una ruta predeterminada que dirija el tráfico a la interfaz de loopback.

```
R1(config)#ip route 0.0.0.0 0.0.0.0 Loopback1
R1(config)#
R1(config)#
```

Paso 4: Redistribuir la ruta predeterminada mediante OSPF.

```
R1(config)#router ospf 1
R1(config-router)#default-information originate
R1(config-router)#
R1(config-router)#exit
R1(config)#
```

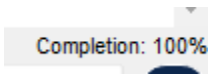
**Tarea 11: Verificación de OSPF**

Paso 1: Con el comando show ip route, verifique que se haya detectado la ruta predeterminada.

```
R1#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.1.1/32 is directly connected, Loopback0
O       10.10.10.0/24 [110/1563] via 192.168.10.2, 00:14:12, Serial0/0/0
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.1.16/28 is directly connected, FastEthernet0/0
O       172.16.1.32/29 [110/1563] via 192.168.10.6, 00:14:12, Serial0/0/1
     172.30.0.0/30 is subnetted, 1 subnets
C       172.30.1.0 is directly connected, Loopback1
     192.168.10.0/24 is variably subnetted, 5 subnets, 2 masks
C       192.168.10.0/30 is directly connected, Serial0/0/0
C       192.168.10.2/32 is directly connected, Serial0/0/0
C       192.168.10.4/30 is directly connected, Serial0/0/1
C       192.168.10.6/32 is directly connected, Serial0/0/1
O       192.168.10.8/30 [110/3124] via 192.168.10.2, 00:12:15, Serial0/0/0
                        [110/3124] via 192.168.10.6, 00:12:15, Serial0/0/1
S*   0.0.0.0/0 is directly connected, Loopback1

R1#
```

En la imagen anterior se puede observar la ruta por defecto.

**Evidencia de ejercicio completado**



Expand/Collapse All | Show Incorrect Items

| Assessment Items | Status | Points | Component(s) | Feedback |
|---|---|---|---|---|
| Network | | | | |
| PC0 | | | | |
| Default Gateway | Correct | 1 | Ip | |
| Ports | | | | |
| FastEthernet0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Subnet Mask | Correct | 1 | Ip | |
| PC1 | | | | |
| Default Gateway | Correct | 1 | Ip | |
| Ports | | | | |
| FastEthernet0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Subnet Mask | Correct | 1 | Ip | |
| PC2 | | | | |
| Default Gateway | Correct | 1 | Ip | |
| Ports | | | | |
| FastEthernet0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Subnet Mask | Correct | 1 | Ip | |
| R1 | | | | |
| Console Line | | 0 | Other | |
| Password | Correct | 1 | Other | |
| Host Name | Correct | 1 | Other | |
| OSPF | | 0 | Other | |
| Process ID 1 | | 0 | Routing | |
| Ports | | | | |
| FastEthernet0/0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| Loopback0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| Loopback1 | | | | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| Serial0/0/0 | | | | |
| Bandwidth Info | Correct | 1 | Other | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| Serial0/0/1 | | | | |
| Bandwidth Info | Correct | 1 | Other | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| VTY Lines | | | | |
| VTY Line 0 | | 0 | Other | |

Overall Feedback | Assessment Items | Connectivity Tests

Expand/Collapse All | Show Incorrect Items

| Assessment Items | Status | Points | Component(s) | Feed |
|---|---|---|---|---|
| VTY Lines | | | | |
| VTY Line 0 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 1 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 2 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 3 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 4 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| R2 | | | | |
| Console Line | | 0 | Other | |
| Password | Correct | 1 | Other | |
| Host Name | Correct | 1 | Other | |
| OSPF | | 0 | Other | |
| Process ID 1 | | 0 | Routing | |
| Ports | | | | |
| FastEthernet0/0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Subnet Mask | Correct | 1 | Ip | |
| Loopback0 | | | | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| Serial0/0/0 | | | | |
| Bandwidth Info | Correct | 1 | Other | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| Serial0/0/1 | | | | |
| Bandwidth Info | Correct | 1 | Other | |
| IP Address | Correct | 1 | Ip | |
| Port Status | Correct | 1 | Physical | |
| Subnet Mask | Correct | 1 | Ip | |
| VTY Lines | | | | |
| VTY Line 0 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 1 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 2 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 3 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| VTY Line 4 | | 0 | Other | |
| Password | Correct | 1 | Other | |
| R3 | | | | |
| Console Line | | 0 | Other | |
| Password | Correct | 1 | Other | |
| Host Name | Correct | 1 | Other | |
| OSPF | | 0 | Other | |

| Assessment Items | Status | Points | Component(s) |
|---|---|---|---|
| IP Address | Correct | 1 | Ip |
| Port Status | Correct | 1 | Physical |
| Subnet Mask | Correct | 1 | Ip |
| Serial0/0/1 | | | |
| Bandwidth Info | Correct | 1 | Other |
| IP Address | Correct | 1 | Ip |
| Port Status | Correct | 1 | Physical |
| Subnet Mask | Correct | 1 | Ip |
| VTY Lines | | | |
| VTY Line 0 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 1 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 2 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 3 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 4 | | 0 | Other |
| Password | Correct | 1 | Other |
| R3 | | | |
| Console Line | | 0 | Other |
| Password | Correct | 1 | Other |
| Host Name | Correct | 1 | Other |
| OSPF | | 0 | Other |
| Process ID 1 | | 0 | Routing |
| Ports | | | |
| FastEthernet0/0 | | | |
| IP Address | Correct | 1 | Ip |
| Port Status | Correct | 1 | Physical |
| Subnet Mask | Correct | 1 | Ip |
| Serial0/0/0 | | | |
| IP Address | Correct | 1 | Ip |
| Port Status | Correct | 1 | Physical |
| Subnet Mask | Correct | 1 | Ip |
| Serial0/0/1 | | | |
| IP Address | Correct | 1 | Ip |
| OSPF Cost | Correct | 1 | Routing |
| Port Status | Correct | 1 | Physical |
| Subnet Mask | Correct | 1 | Ip |
| VTY Lines | | | |
| VTY Line 0 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 1 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 2 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 3 | | 0 | Other |
| Password | Correct | 1 | Other |
| VTY Line 4 | | 0 | Other |
| Password | Correct | 1 | Other |