

**DIPLOMADO DE PROFUNDIZACIÓN CISCO (DISEÑO E IMPLEMENTACIÓN
DE SOLUCIONES INTEGRADAS LAN / WAN)**

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INTRODUCCION

Esta prueba de habilidades comprende protocolos de routing dinámico (RIPv2, OSPF), configuración de servers DHCP, Network Address Translation (NAT), Listas de control de acceso (ACL). Estas pueden implementarse en routers para aumentar la seguridad de una red o implementar políticas de entrada y salida de paquetes para ciertos equipos específicos.

Se configuran servidores DHCP, el cual es un protocolo de difusión que trabaja de forma predeterminada en donde sus paquetes no pasan a través de enrutadores. Un agente de retransmisión DHCP recibe cualquier difusión DHCP de la subred y la reenvía a la dirección IP especificada en una subred distinta.

Se configura también el protocolo de información de enrutamiento (RIP) para permitir que el servidor intercambie información de enrutamiento con otros servidores y determine cuál es la mejor ruta para enviar paquetes salientes.

OBJETIVOS

GENERAL

Desarrollar la Evaluación – Prueba de habilidades prácticas CCNA, aplicando todos los conocimientos adquiridos durante el semestre

ESPECIFICOS

Identificar que dispositivos utilizar para la construcción de una topología de red.

Inicializar dispositivos de Networking

Realizar configuración básica a dispositivos de comunicación como Routers, Switch, Servidores.

Implementar seguridad en Switch, elaboración de Vlans e inter Vlan Routing.

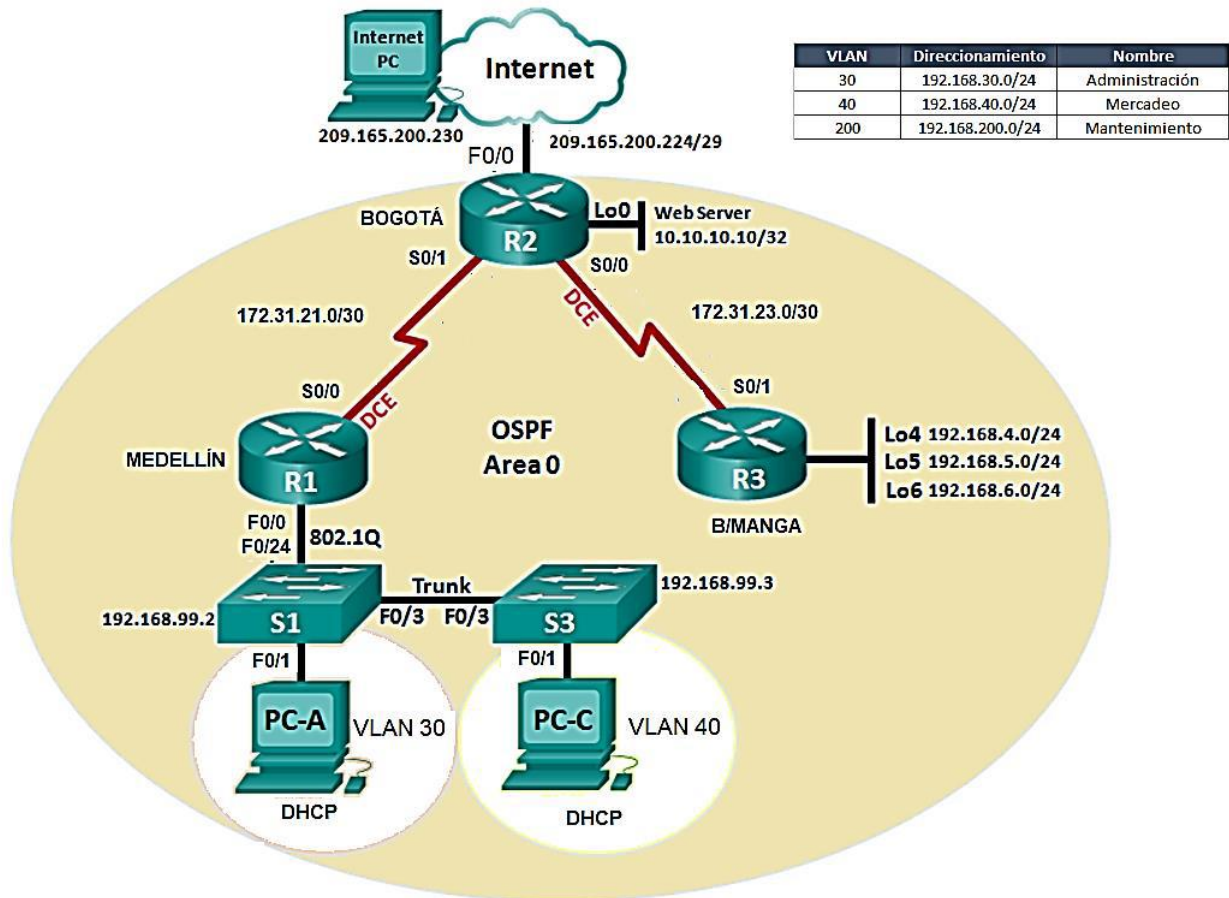
Determinar la configuración necesaria para la implementación de OPSFv2, protocolo dinámico de Routing.

Verificar conectividad entre los dispositivos de una topología.

Descripción del escenario propuesto para la prueba de habilidades

Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, 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



1. Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario
2. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 area 0

| Configuration Item or Task | Specification |
|---|---------------|
| Router ID R1 | 1.1.1.1 |
| Router ID R2 | 2.2.2.2 |
| Router ID R3 | 3.3.3.3 |
| Configurar todas las interfaces LAN como pasivas | |
| Establecer el ancho de banda para enlaces seriales en | 128 Kb/s |
| Ajustar el costo en la métrica de S0/0 a | 7500 |

Figura 1. Tabla de configuración OSPFv2, para cada Router

Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2
 - Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface
 - Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.
3. Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.
 4. En el Switch 3 deshabilitar DNS lookup
 5. Asignar direcciones IP a los Switches acorde a los lineamientos.
 6. Desactivar todas las interfaces que no sean utilizadas en el esquema de red.
 7. Implement DHCP and NAT for IPv4
 8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.
 9. 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. |
|-----------------------------------|--|

Figura 2. Información de configuración DHCP pool Vlan 30

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

Figura 3. Información de configuración DHCP pool Vlan 40

10. Configurar NAT en R2 para permitir que los hosts puedan salir a internet
11. 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.
12. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.
13. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

| | | | | | | | | |
|-------------------|-----------------|-----------------|--|--|---------|------|--------|-----------------|
| F0/0 | 209.165.200.225 | 255.255.255.248 | | | | | | |
| F0/1 | 10.10.10.1 | 255.255.255.0 | | | | | | |
| S0/0/0 | 172.31.23.1 | 255.255.255.252 | | | 128Kb/s | 7500 | 128000 | |
| s0/0/1 | 172.31.21.2 | 255.255.255.252 | | | | | | |
| NAT Pool Internet | 209.165.200.225 | 255.255.255.248 | | | | | | 209.165.200.229 |
| NAT inside | 10.10.10.10 | | | | | | | 209.165.200.229 |
| Telnet (ADMIN) | 172.31.21.1 | | | | | | | |

| R2 OSPF | | | |
|---------|-------------------|--------------|-----------|
| ID | Passive Interface | Área 0 | Interface |
| 2.2.2.2 | F0/1 | 192.168.30.0 | |
| | | 172.31.21.0 | S0/0/1 |
| | | 172.31.23.0 | S0/0/0 |

| R3 Bucaramanga | Dirección IP | Mascara |
|----------------|--------------|-----------------|
| Lo4 | 192.168.4.1 | 255.255.255.0 |
| Lo5 | 192.168.5.1 | 255.255.255.0 |
| Lo6 | 192.168.6.1 | 255.255.255.0 |
| S0/0/0 | 172.31.23.2 | 255.255.255.252 |

| R3 OPSF | | | |
|---------|-------------------|--------|-----------|
| ID | Passive Interface | Área 0 | Interface |

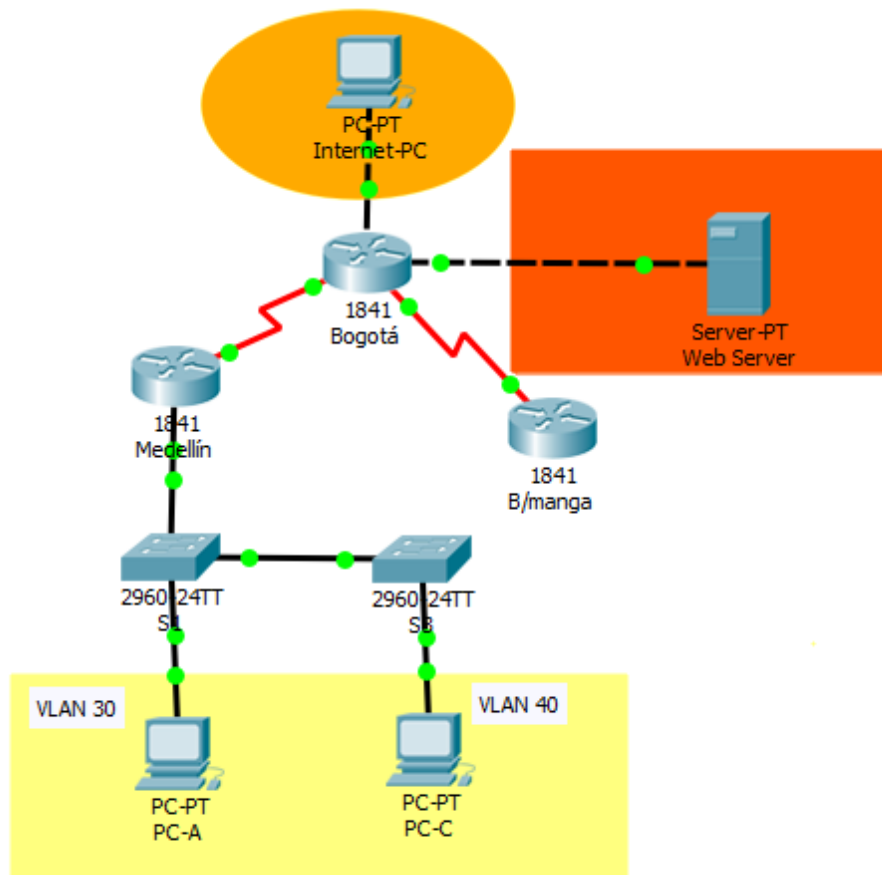
| | | | |
|---------|-----|-------------|--------|
| 3.3.3.3 | Lo4 | 192.168.4.0 | |
| | Lo5 | | |
| | Lo6 | | |
| | | 172.31.23.0 | S0/0/1 |

| S1 | Dirección IP | Mascara |
|--------------|--------------|---------------|
| F0/1 Vlan 30 | | |
| F0/3 Trunk | | |
| F0/24 Trunk | | |
| Vlan 200 | 192.168.99.2 | 255.255.255.0 |

| S3 | Dirección IP | Mascara |
|--------------|--------------|---------------|
| F0/1 Vlan 40 | | |
| F0/3 Trunk | | |
| Vlan 200 | 192.168.99.3 | 255.255.255.0 |

| PC- Internet | Dirección IP | Mascara | Gateway |
|--------------|-----------------|-----------------|-----------------|
| FastEthernet | 209.165.200.230 | 255.255.255.248 | 209.165.200.225 |

| Web Server | Dirección IP | Mascara | Gateway |
|--------------|--------------|---------------|------------|
| FastEthernet | 10.10.10.10 | 255.255.255.0 | 10.10.10.1 |



Configuración básica de dispositivos

Aplicar a cada Router y Switch de la topología, las siguientes configuraciones básicas;

R1: nombrarlo “Medellín”, R2: nombrarlo “Bogotá”, R3: nombrarlo “Bucaramanga”, S1: nombrarlo “S1”, S3: nombrarlo “S3”, Exec Password: class, Console Access Password: cisco, Telnet Access Password: cisco, Encriptar contraseñas, MOTD banner: Prohibido personal no autorizado, A cada Switch deshabilitar DNS lookup

Router 1

Medellin

Physical Config CLI Attributes

Physical Device View

Zoom In Original Size Zoom Out

MODULES

- HWIC-1GE-SFP
- HWIC-2T
- HWIC-4ESW
- HWIC-8A
- HWIC-AP-AG-B
- WIC-1AM
- WIC-1ENET
- WIC-1T

Medellin

Physical Config CLI Attributes

IOS Command Line Interface

Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!

```

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router>
Router#conf t
Router(config)#hostname Medellin
Medellin(config)#no ip domain-lookup
Medellin(config)#line con 0
Medellin(config-line)#password cisco
Medellin(config-line)#login
Medellin(config-line)#line vty 0 4
Medellin(config-line)#password cisco
Medellin(config-line)#login
Medellin(config-line)#exit
Medellin(config)#service password-encryption
Medellin(config)#banner motd $ Unauthorized Access is Prohibited $
Medellin(config)#
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

Time: 00:09:39 Power Cycle Devices Fast Forward Time

Medellin

Physical Config CLI Attributes

| Port | Link | VLAN | IP Address | IPv6 Address | MAC Address |
|---------------------|------|------|------------------|--------------|----------------|
| FastEthernet0/0 | Up | -- | <not set> | <not set> | 0090.2153.A101 |
| FastEthernet0/0.30 | Up | -- | 192.168.30.1/24 | <not set> | 0090.2153.A101 |
| FastEthernet0/0.40 | Up | -- | 192.168.40.1/24 | <not set> | 0090.2153.A101 |
| FastEthernet0/0.200 | Up | -- | 192.168.200.1/24 | <not set> | 0090.2153.A101 |
| FastEthernet0/1 | Down | -- | <not set> | <not set> | 0090.2153.A102 |
| Serial0/0/0 | Up | -- | 172.31.21.1/30 | <not set> | <not set> |
| Serial0/0/1 | Down | -- | <not set> | <not set> | <not set> |
| Vlan1 | Down | 1 | <not set> | <not set> | 0007.ECCE.8C72 |

Hostname: Medellin

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Time: 00:12:51 Power Cycle Devices Fast Forward Time

Router 2

Physical Device View

Zoom In Original Size Zoom Out

MODULES

- HWIC-1GE-SFP
- HWIC-2T
- HWIC-4ESW
- HWIC-8A
- HWIC-AP-AG-B
- WIC-1AM
- WIC-1ENET
- WIC-1T
- WIC-2AM

Logical

Back [Root]

IOS Command Line Interface

```

Press RETURN to get started!

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Bogota
Bogota(config)#no ip domain-lookup
Bogota(config)#enable secret class
Bogota(config)#line con 0
Bogota(config-line)#password cisco
Bogota(config-line)#login
Bogota(config-line)#exit
Bogota(config)#service password-encryption
Bogota(config)#banner motd $ Unauthorized Access is Prohibited $
Bogota(config)#
    
```

Ctrl+F6 to exit CLI focus Copy Paste

Logical

Back [Root] New Cluster Move Object Set Tiled Background Viewport

| Port | Link | VLAN | IP Address | IPv6 Address | MAC Address |
|-----------------|------|------|--------------------|--------------|----------------|
| FastEthernet0/0 | Up | -- | 209.165.200.225/29 | <not set> | 00E0.F937.6501 |
| FastEthernet0/1 | Up | -- | 10.10.10.1/24 | <not set> | 00E0.F937.6502 |
| Serial0/0/0 | Up | -- | 172.31.23.1/30 | <not set> | <not set> |
| Serial0/0/1 | Up | -- | 172.31.21.2/30 | <not set> | <not set> |
| Vlan1 | Down | 1 | <not set> | <not set> | 0002.4A6D.9589 |

Hostname: Bogota

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Router 3

The top image shows a network diagram with three 1841 routers: Medellín, Bogotá, and B/manga. B/manga is highlighted with a red circle. To the right, the 'Physical Device View' of the B/manga router is shown, with a red circle around the physical interface ports.

The middle image shows the network diagram expanded to include two 2960 switches (S1 and S2) connected to B/manga. S1 is connected to VLAN 30 (PC-A) and S2 to VLAN 40 (PC-C). A 'Serv Web' server is also connected to B/manga. The CLI window shows the configuration for the 'Bad passwords' feature:

```

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Bucaramanga
Bucaramanga(config)#no ip domain-lookup
Bucaramanga(config)#enable secret class
Bucaramanga(config)#line con 0
Bucaramanga(config-line)#password cisco
Bucaramanga(config-line)#login
Bucaramanga(config-line)#line vty 0 4
Bucaramanga(config-line)#password cisco
Bucaramanga(config-line)#login
Bucaramanga(config-line)#exit
Bucaramanga(config)#service password-encryption
Bucaramanga(config)#banner motd $Unauthorized Access is Prohibited
Bucaramanga(config)#
    
```

The bottom image shows the network diagram with the 'Server-PT Web Server' added to the topology. Below the diagram is a table showing the status of the router's interfaces and other details.

| Port | Link | VLAN | IP Address | IPv6 Address | MAC Address |
|-----------------|------|------|----------------|--------------|----------------|
| FastEthernet0/0 | Down | -- | <not set> | <not set> | 0030.A33A.7201 |
| FastEthernet0/1 | Down | -- | <not set> | <not set> | 0030.A33A.7202 |
| Serial0/0/0 | Down | -- | <not set> | <not set> | <not set> |
| Serial0/0/1 | Up | -- | 172.31.23.2/30 | <not set> | <not set> |
| Loopback4 | Up | -- | 192.168.4.1/24 | <not set> | 0030.F29D.D292 |
| Loopback5 | Up | -- | 192.168.5.1/24 | <not set> | 0009.7C22.B639 |
| Loopback6 | Up | -- | 192.168.6.1/24 | <not set> | 0001.6415.A076 |
| Vlan1 | Down | 1 | <not set> | <not set> | 000C.85EC.A743 |

Hostname: Bucaramanga
Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Switch 1

```

S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#no ip domain-lookup
S1(config)#enable secret class
S1(config)#line con 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#service password-encryption
S1(config)#banner motd $ Solo personal autorizado $
S1(config)#
  
```

Time: 00:28:25 | Power Cycle Devices | Fast Forward Time

| | | | | |
|--------------------|------|-----|-----------------|----------------|
| FastEthernet0/2 | Down | 1 | -- | 0090.2160.4902 |
| FastEthernet0/3 | Up | -- | -- | 0090.2160.4903 |
| FastEthernet0/4 | Down | 1 | -- | 0090.2160.4904 |
| FastEthernet0/5 | Down | 1 | -- | 0090.2160.4905 |
| FastEthernet0/6 | Down | 1 | -- | 0090.2160.4906 |
| FastEthernet0/7 | Down | 1 | -- | 0090.2160.4907 |
| FastEthernet0/8 | Down | 1 | -- | 0090.2160.4908 |
| FastEthernet0/9 | Down | 1 | -- | 0090.2160.4909 |
| FastEthernet0/10 | Down | 1 | -- | 0090.2160.490A |
| FastEthernet0/11 | Down | 1 | -- | 0090.2160.490B |
| FastEthernet0/12 | Down | 1 | -- | 0090.2160.490C |
| FastEthernet0/13 | Down | 1 | -- | 0090.2160.490D |
| FastEthernet0/14 | Down | 1 | -- | 0090.2160.490E |
| FastEthernet0/15 | Down | 1 | -- | 0090.2160.490F |
| FastEthernet0/16 | Down | 1 | -- | 0090.2160.4910 |
| FastEthernet0/17 | Down | 1 | -- | 0090.2160.4911 |
| FastEthernet0/18 | Down | 1 | -- | 0090.2160.4912 |
| FastEthernet0/19 | Down | 1 | -- | 0090.2160.4913 |
| FastEthernet0/20 | Down | 1 | -- | 0090.2160.4914 |
| FastEthernet0/21 | Down | 1 | -- | 0090.2160.4915 |
| FastEthernet0/22 | Down | 1 | -- | 0090.2160.4916 |
| FastEthernet0/23 | Down | 1 | -- | 0090.2160.4917 |
| FastEthernet0/24 | Up | -- | -- | 0090.2160.4918 |
| GigabitEthernet0/1 | Down | 1 | -- | 0090.2160.4919 |
| GigabitEthernet0/2 | Down | 1 | -- | 0090.2160.491A |
| Vlan1 | Down | 1 | <not set> | 0001.961A.8474 |
| Vlan200 | Up | 200 | 192.168.99.2/24 | 0001.961A.8401 |

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Time: 00:30:27 | Power Cycle Devices | Fast Forward Time

Switch 3

The screenshot shows a network topology in a simulator. On the left, a switch labeled 'S3' is connected to two other switches, 'S1' and 'S2'. Switch S1 is connected to a PC labeled 'PC-A' in a yellow-shaded area labeled 'VLAN 30'. Switch S2 is connected to a PC labeled 'PC-C' in a yellow-shaded area labeled 'VLAN 40'. Above the switches, there are three routers: '1841 Medellin', '1841 Bogotá', and '1841 B/manga'. The Bogotá router is connected to an 'Internet-PC' and another PC. A status bar at the bottom left shows 'Time: 00:31:39', 'Power Cycle Devices', and 'Fast Forward Time'. On the right, a window titled 'S3' shows the 'IOS Command Line Interface' with the following configuration commands:

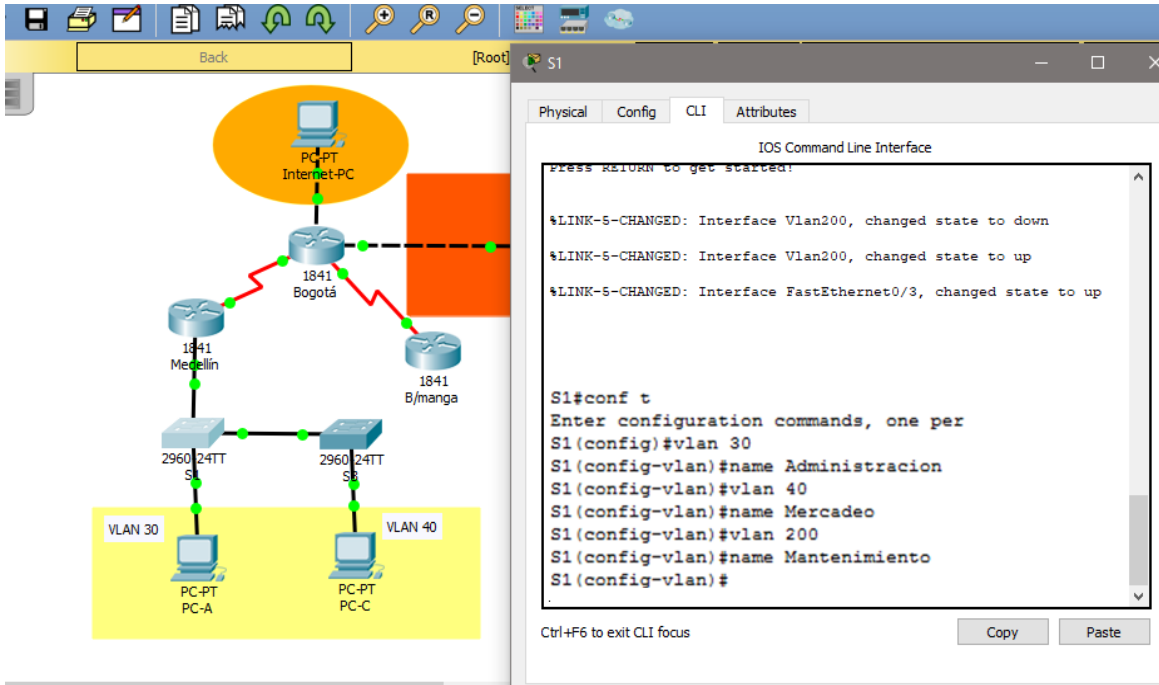
```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#no ip domain-lookup
S3(config)#enable secret class
S3(config)#line con 0
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#service password-encryption
S3(config)#banner motd $ Solo personal autorizado $
S3(config)#
```

Parea Configurar en S1 se realiza los siguientes pasos

Modo trunk el puerto F0/3 en la nativa VLAN 1, Modo trunk el puerto F0/24 en la nativa VLAN 1, Configurar “mode access” los puertos restantes, Deshabilitar los puertos que no se usaran, Asignar el puerto F0/1 a la VLAN 30, Configurar las VLANs correspondientes, Asignar la dirección 192.168.99.2 a la VLAN Mantenimiento

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

VLANS S1

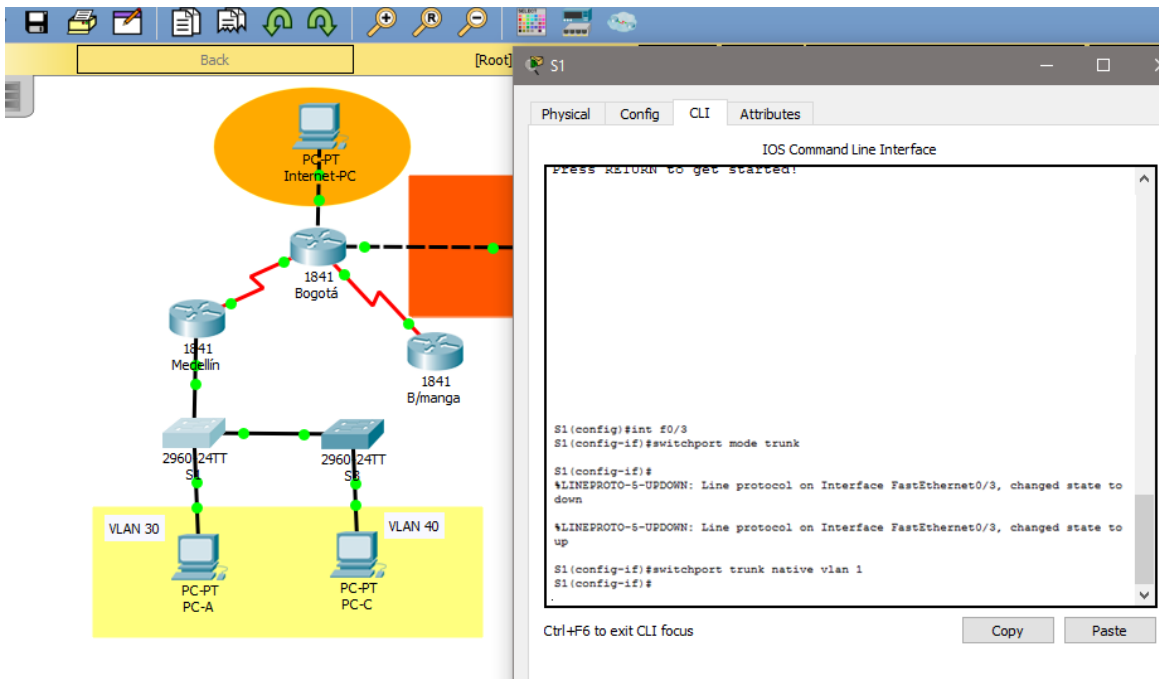


The network diagram shows a central switch S1 (2960 24TT) connected to three routers: 1841 Medellin, 1841 Bogotá, and 1841 B/manga. The 1841 Bogotá router is connected to an Internet-PC. Two PCs, PC-A and PC-C, are connected to S1. PC-A is in VLAN 30 and PC-C is in VLAN 40. The CLI window shows the configuration of S1:

```
S1#conf t
Enter configuration commands, one per
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#
```

The CLI output shows the state of interfaces:

```
%LINK-5-CHANGED: Interface Vlan200, changed state to down
%LINK-5-CHANGED: Interface Vlan200, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
```



The network diagram is identical to the one above. The CLI window shows the configuration of S1:

```
S1(config)#int f0/3
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to
down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to
up

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#
```


The network diagram shows a central 1841 Bogotá router connected to an Internet-PC. It is also connected to 1841 Medellín and 1841 B/manga routers. The Medellín router is connected to a 2960 24TT switch, which is connected to PC-A (VLAN 30). The B/manga router is connected to another 2960 24TT switch, which is connected to PC-C (VLAN 40). The CLI window shows the configuration for S1:

```

S1(config)#int f0/3
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to
down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to
up
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#

S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to
down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to
up
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#no shutdown
S1(config-if)#

```

The network diagram is identical to the one above. The CLI window shows the configuration for S1:

```

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4-24, g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#

Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#int f0/1
S1(config-if)#switchport mode access
^
% Invalid input detected at '^' marker.

S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#int range fa0/2, fa0/4-24, g0/1-2
S1(config-if-range)#shutdown

```

The screenshot displays a network simulation environment. On the left, a topology diagram shows a central router labeled '1841 Bogotá' connected to three other routers: '1841 Medellín', '1841 B/manga', and '1841 Internet-PC'. Below the Bogotá router, two switches labeled '2960 24TT S1' are connected. The left switch is connected to a PC labeled 'PC-PT PC-A' in a yellow-shaded area labeled 'VLAN 30'. The right switch is connected to a PC labeled 'PC-PT PC-C' in a yellow-shaded area labeled 'VLAN 40'. On the right side of the topology, there is a red-shaded area representing a network segment.

On the right side of the screenshot, a CLI window for S1 is open, showing the following configuration commands:

```
IOS Command Line Interface
Press RETURN to get started!

% Invalid input detected at '^' marker.

S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#int range fa0/2, fa0/4-24, g0/1-2
S1(config-if-range)#shutdown

S1(config)#int vlan 200
S1(config-if)#
%LINK-S-CHANGED: Interface Vlan200, changed state to u

%LINEPROTO-S-UPDOWN: Line protocol on Interface Vlan20

S1(config-if)#ip add
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#
```

At the bottom of the CLI window, there are buttons for 'Copy' and 'Paste', and a note that says 'Ctrl+F6 to exit CLI focus'.

Parea Configurar en S3 se realiza los siguientes pasos

Modo trunk el puerto F0/3 en la nativa VLAN 1, Configurar las VLANS correspondientes, Configurar “mode access” los puertos restantes, Deshabilitar los puertos que no se usaran, Asignar el puerto F0/1 a la VLAN 40, Configurar la dirección 192.168.99.3 a la VLAN Mantenimiento, Configurar puerta de enlace predeterminada correspondiente

VLANs - S3

The network diagram shows a central switch S3 (2960-24TT) connected to three routers: 1841 Medellín, 1841 Bogotá, and 1841 B/manga. An Internet-PC is connected to Bogotá. Two other switches, 2960-24TT S1 and S2, are connected to S3. S1 is connected to PC-A (VLAN 30) and PC-B (VLAN 40). S2 is connected to PC-C (VLAN 40). The CLI window shows the initial configuration of S3:

```
IOS Command Line Interface
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), version
12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

Press RETURN to get started!

%LINK-5-CHANGED: Interface Vlan200, changed state to down

S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#vlan 30
S3(config-vlan)#name Administracion
S3(config-vlan)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 200
S3(config-vlan)#name Mantenimiento
S3(config-vlan)#
```

The network diagram is identical to the first image. The CLI window shows the advanced configuration of S3:

```
IOS Command Line Interface
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), version
12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

Press RETURN to get started!

%LINK-5-CHANGED: Interface Vlan200, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state

S3(config-if)#ip add
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#
S3(config)#int f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#
S3(config-if)#
S3(config-if)#int range fa0/1-2, fa0/4-24, g0/1-2
S3(config-if-range)#switchport mode access
```

IOS Command Line Interface

```

Cisco IOS Software, C2960 Software (C2960-LANBASE-K), version
S3(config)#int vlan 200
S3(config-if)#
%LINK-6-CHANGED: Interface Vlan200, changed state to up
S3(config)#int f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#
S3(config-if)#int range fa0/1-2, fa0/4-24, g0/1-2
S3(config-if-range)#switchport mode access
S3(config)#int f0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#int range fa0/2, fa0/4-24, g0/1-2
S3(config-if-range)#shutdown

```

Configurar en “Medellín” la conexión hacia Bogotá

S0/0/0 – R1

IOS Command Line Interface

```

Compiled Wed 18-Jul-07 04:52 by pc_team
Press RETURN to get started!
Medellin(config)#int s0/0/0
Medellin(config-if)#description Connexion a Bogota
Medellin(config-if)#description Connexion to Bogota
Medellin(config-if)#ip add
Medellin(config-if)#ip address 172.31.21.1 255.255.255.252
Medellin(config-if)#clock rate 128000
Medellin(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Medellin(config-if)#

```

Ruta de salida S0/0/0 – R1

The screenshot shows a network simulation environment. On the left, a network diagram includes a router labeled '1841 Bogotá' connected to another router '1841 Medellín', which is connected to a switch '2960 24TT S1'. A PC labeled 'PC-PT PC-A' is connected to the switch and is highlighted with a yellow background. A 'VLAN 30' label is also present. A 'PC-PT Internet-f' is connected to the Bogotá router. A configuration window titled 'Medellin' is open, showing the CLI interface with the following commands:

```
IOS Command Line Interface
Compiled Wed 18-Jul-07 04:52 by pt_team
Press RETURN to get started!
Medellin(config)#int s0/0/0
Medellin(config-if)#description Connexion a Bogota
Medellin(config-if)#description Connexion to Bogota
Medellin(config-if)#ip add
Medellin(config-if)#ip address 172.31.21.1 255.255.255.252
Medellin(config-if)#clock rate 128000
Medellin(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Medellin(config-if)#
Medellin(config)#ip route 0.0.0.0 0.0.0.0 s0/0/0
```

At the bottom of the CLI window, there are 'Copy' and 'Paste' buttons, and a 'Ctrl+F6 to exit CLI focus' instruction. The top of the simulation interface shows a toolbar with icons for file operations and a menu bar with options like 'Back', '[Root]', 'New Cluster', 'Move Object', and 'Set Tiled Background'.

Configurar en “Bogotá” las siguientes interfaces

Configurar conexión hacia Medellín, Configurar conexión hacia Bucaramanga, Establecer conexión hacia PC-Internet, Establecer conexión hacia Web Server

Interface S0/0/1 – R2 e Interface S0/0/0 – R2

The network diagram shows a central router 'Bogotá' (1841) connected to 'Medellín' (1841) and 'B/manga' (1841). 'Medellín' is connected to a switch '2960 24TT S1', which is connected to 'PC-A' (VLAN 30). 'B/manga' is connected to a switch '2960 24TT S2', which is connected to 'PC-C' (VLAN 40). 'Bogotá' is also connected to an 'Internet-PC' (1841). The CLI window shows the following commands and output:

```

IOS Command Line Interface
Press RETURN to get started!

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#int s0/0/1
Bogota(config-if)#description connection to Medellin
Bogota(config-if)#ip add
Bogota(config-if)#ip address 172.31.21.2 255.255.255.252
Bogota(config-if)#no shutdown
Bogota(config)#int s0/0/0
Bogota(config-if)#description connection to Bucaramanga
Bogota(config-if)#ip add
Bogota(config-if)#ip address 172.31.23.1 255.255.255.252
Bogota(config-if)#clock rate 128000
Bogota(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Bogota(config-if)#
  
```

Interface F0/0 – R2 e Interface F0/1 – R2

The network diagram is identical to the first image. The CLI window shows the following commands and output:

```

IOS Command Line Interface
Press RETURN to get started!

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

Bogota(config-if)#
Bogota(config-if)#int f0/0
Bogota(config-if)#ip add
Bogota(config-if)#ip address 209.165.200.225 255.255.255.248
Bogota(config-if)#no shutdown
Bogota(config)#int f0/1
Bogota(config-if)#ip ad
Bogota(config-if)#ip address 10.10.10.10 255.255.255.0
Bogota(config-if)#no shutdown
Bogota(config-if)#
  
```


Configurar en “Bucaramanga” los siguientes parámetros:

Configurar la conexión hacia “Bogotá”, Configurar loopbacks 4 – 5 – 6

Interface S0/0/1 – R3 , Loopback 4, Loopback 5, Loopback 6

The image shows a network diagram and a CLI configuration window for a router named 'Bucaramanga'.

Network Diagram:

- Router 1841 Bogotá:** Connected to PC-PT Internet-PC and Router 1841 Bucaramanga.
- Router 1841 Bucaramanga:** Connected to Router 1841 Bogotá and Router 1841 Medellin.
- Router 1841 Medellin:** Connected to Router 1841 Bucaramanga and Router 2960 24TT S.
- Router 2960 24TT S:** Connected to Router 1841 Medellin and Router 2960 24TT SB.
- Router 2960 24TT SB:** Connected to Router 2960 24TT S and Router 1841 B/manga.
- PC-PT PC-A:** Connected to Router 2960 24TT S (VLAN 30).
- PC-PT PC-C:** Connected to Router 2960 24TT SB (VLAN 40).

CLI Configuration Window (Bucaramanga):

```
IOS Command Line Interface
Unauthorized Access is Prohibited

Bucaramanga(config)#int s0/0/1
Bucaramanga(config-if)#ip add
Bucaramanga(config-if)#description connection to Bogota
Bucaramanga(config-if)#ip address 172.31.23.2 255.255.255.252
Bucaramanga(config-if)#no shutdown
Bucaramanga(config-if)#int lo4
Bucaramanga(config-if)#ip address 192.168.4.1 255.255.255.0
Bucaramanga(config-if)#int lo5

Bucaramanga(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to down

Bucaramanga(config-if)#ip add
Bucaramanga(config-if)#ip address 192.168.5.1 255.255.255.0
Bucaramanga(config-if)#no shutdown
Bucaramanga(config-if)#
```

The network diagram shows a topology with three routers: Internet-PC (1841), Bogotá (1841), and Medellín (1841). Bogotá is connected to Medellín and B/manga (1841). Medellín is connected to two switches (2960-24TT) which are connected to PC-A (VLAN 30) and PC-C (VLAN 40). Bogotá is connected to a Server-PT Web Server. The CLI window for B/manga shows the following configuration:

```

IOS Command Line Interface
Unauthorized Access is Prohibited
Bucaramanga(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, cha
Bucaramanga(config-if)#ip add
Bucaramanga(config-if)#ip address 192.168.5.1 255.255.255.0
Bucaramanga(config-if)#no shutdown
Bucaramanga(config-if)#
Bucaramanga(config-if)#int lo6
Bucaramanga(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, cha
Bucaramanga(config-if)#ip add
Bucaramanga(config-if)#ip address 192.168.6.1 255.255.255.0
Bucaramanga(config-if)#
  
```

Direccinamiento Web Server

The network diagram is similar to the previous one, but the Web Server is now connected to Bogotá. The configuration window for the Web Server shows the following settings:

| Section | Option | Value |
|--------------------|--------------------|--|
| IP Configuration | IP Configuration | X |
| | IP Configuration | |
| | IP Configuration | <input type="radio"/> DHCP <input checked="" type="radio"/> Static |
| | IP Address | 10.10.10.10 |
| | Subnet Mask | 255.255.255.0 |
| Default Gateway | 10.10.10.1 | |
| DNS Server | 0.0.0.0 | |
| IPv6 Configuration | IPv6 Configuration | |
| | IPv6 Configuration | <input type="radio"/> DHCP <input type="radio"/> Auto Config <input checked="" type="radio"/> Static |

Configuración de seguridad Switch, VLANs, Inter-VLANs Routing

Configurar en Bogotá, lo siguiente:

- Configure 802.1Q subinterface .30 || descripción de la conexión, asignar VLAN Administración, asignación de la primera dirección viable a esta interface.
- Configure 802.1Q subinterface .40 || descripción de la conexión, asignar VLAN Mercadeo, asignación de la primera dirección viable a esta interface.
- Configure 802.1Q subinterface .200 || descripción de la conexión, asignar VLAN Mantenimiento, asignación de la primera dirección viable a esta interface.
- Activar la conexión hacia S1

802.1Q – R1

The image shows a network simulation environment. On the left, a logical topology diagram displays a central router labeled '1841 Bogotá' connected to two switches, '1841 Medellin' and '1841 B/manga'. The Medellin switch is connected to two PCs, 'PC-A' and 'PC-C', which are part of VLAN 30 and VLAN 40 respectively. The B/manga switch is connected to another PC, 'PC-C', which is part of VLAN 40. The Bogotá router is connected to an 'Internet-PC'. The right side of the image shows a CLI window for the Medellin router, displaying the following configuration:

```
IOS Command Line Interface
Completed Wed 18-Jul-07 04:52 By pt_team

Press RETURN to get started!

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Medellin(config-subif)#int f0/0.30
Medellin(config-subif)#description accounting LAN
Medellin(config-subif)#encapsulation dot1q 30
Medellin(config-subif)#ip address 192.168.30.1 255.255.255.0
Medellin(config-subif)#
Medellin(config-subif)#int f0/0.40
Medellin(config-subif)#description accounting LAN
Medellin(config-subif)#encapsulation dot1q 40
Medellin(config-subif)#ip address 192.168.40.1 255.255.255.0
Medellin(config-subif)#
Medellin(config-subif)#int f0/0.200
Medellin(config-subif)#description accounting LAN
Medellin(config-subif)#encapsulation dot1q 200
Medellin(config-subif)#ip address 192.168.200.1 255.255.255.0
Medellin(config-subif)#
```

Interface F0/0

```
Medellin(config-subif)#int f0/0
Medellin(config-if)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/0.30, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.40, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.200, changed state to up
```

Verificación de conectividad

```
S1#ping 192.168.30.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

S1#ping 192.168.40.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

S1#
```

Configuración OSPF y Protocolo Routing Dinámico

Realizar la siguiente configuración en Medellín

Crear un OSPF, Identificar R1 con ID 1.1.1.1, Usar las direcciones de red sin clase, asignarlas a todas las redes conectadas directamente al “área 0”, Configurar todas las interfaces LAN como pasivas, Establecer el ancho de banda para los enlaces seriales en 128 Kb/s, Ajustar el costo en la métrica de S0/0 a 7500

The screenshot shows a network simulator interface. On the left, a topology diagram displays several routers: Bogotá (1841), Medellin (1841), and B/manga (1841). Bogotá is connected to Medellin and B/manga. Medellin is connected to B/manga. Below Bogotá, there are two 2960 24TT switches connected to it. The left switch is connected to PC-A (VLAN 30) and the right switch is connected to PC-C (VLAN 40). An Internet-PC is connected to Bogotá. On the right, a CLI window for router Medellin shows the following configuration:

```

IOS Command Line Interface
Compiled Wed 18-Jul-07 04:52 by pt_team
Press RETURN to get started!

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

Medellin(config)#router ospf 1
Medellin(config-router)#router-id 1.1.1
%LINEPROTO-S-UPDOWN: Line protocol on Interface Serial0/0/0, ch

%LINEPROTO-S-UPDOWN: Line protocol on Interface Serial0/0/0, ch
Medellin(config-router)# no router-id 1.1.1
Medellin(config-router)#router-id 1.1.1
Medellin(config-router)#network 172.31.21.0 0.0.0.3 area 0
Medellin(config-router)#network 192.168.30.0 0.0.0.255 area 0
Medellin(config-router)#network 192.168.40.0 0.0.0.255 area 0
Medellin(config-router)#network 192.168.200.0 0.0.0.255 area 0
Medellin(config-router)#
  
```

Interfaces LAN pasivas – R1

```

medellin(config-router)#network 192.168.200.0 0.0.0
Medellin(config-router)#passive-interface f0/0.30
Medellin(config-router)#passive-interface f0/0.40
Medellin(config-router)#passive-interface f0/0.200
Medellin(config-router)#
  
```

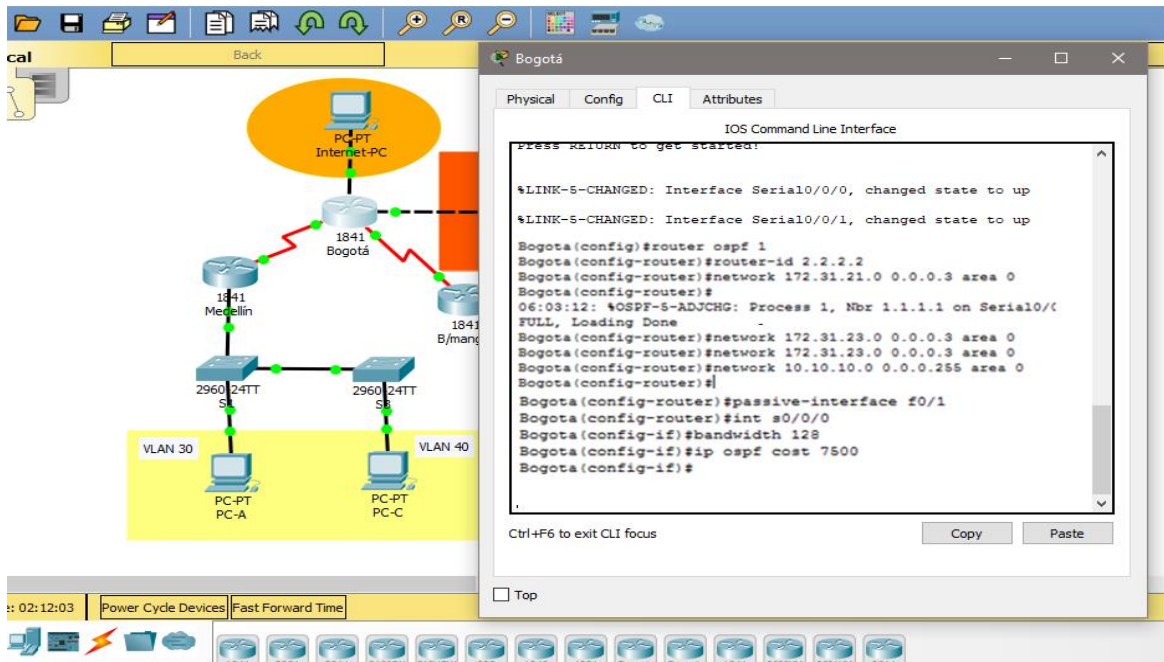
Ancho de banda y costo en la métrica – R1

```

medellin(config-router)#exit
Medellin(config)#int s0/0/0
Medellin(config-if)#bandwidth 128
Medellin(config-if)#ip ospf cost 7500
Medellin(config-if)#
  
```

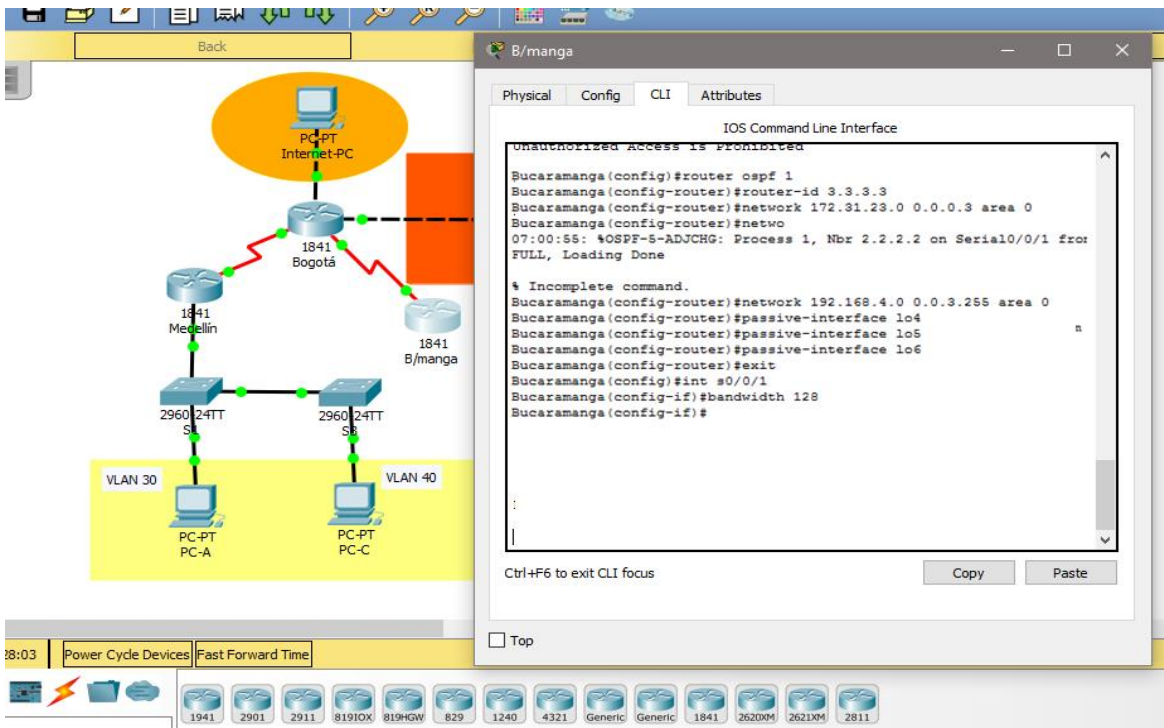
Realizar la siguiente configuración en Bogotá

Crear un OSPF, Identificar R2 con ID 2.2.2.2, Usar las direcciones de red sin clase, asignarlas a todas las redes conectadas directamente al “área 0”, con excepción la conexión hacia PC-Internet., Configurar todas las interfaces LAN como pasivas, con excepción la conexión hacia PC-Internet, Establecer el ancho de banda para los enlaces seriales en 128 Kb/s, Ajustar el costo en la métrica de S0/0 a 7500



Realizar la siguiente configuración en Bucaramanga

Crear un OSPF, Identificar R3 con ID 3.3.3.3, Usar las direcciones de red sin clase, asignarlas a todas las redes conectadas directamente al “área 0”, Configurar todas las interfaces LAN como pasivas , Establecer el ancho de banda para los enlaces seriales en 128 Kb/s, Ajustar el costo en la métrica de S0/0 a 7500



Desde Bucaramanga verificar los OPSF vecinos

```
Bogota#show ip ospf neighbor
```

| Neighbor ID | Pri | State | Dead Time | Address | Interface |
|-------------|-----|---------|-----------|-------------|-------------|
| 1.1.1.1 | 0 | FULL/ - | 00:00:39 | 172.31.21.1 | Serial0/0/1 |
| 3.3.3.3 | 0 | FULL/ - | 00:00:34 | 172.31.23.2 | Serial0/0/0 |

Bogota#

The screenshot shows a window titled "Bogotá" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The command entered is "Bogota#show ip protocols". The output shows the following configuration details:

```
Bogota#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 2.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 area 0
    172.31.23.0 0.0.0.3 area 0
    10.10.10.0 0.0.0.255 area 0
  Passive Interface(s):
    FastEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110           00:03:20
    2.2.2.2          110           00:12:20
    3.3.3.3          110           00:07:08
  Distance: (default is 110)
```

At the bottom of the CLI window, there is a "Ctrl+F6 to exit CLI focus" message, "Copy" and "Paste" buttons, and a "Top" button.

Bogotá

Physical Config CLI Attributes

IOS Command Line Interface

```

Routing Information Sources:
  Gateway         Distance      Last Update
  1.1.1.1         110          00:03:20
  2.2.2.2         110          00:12:20
  3.3.3.3         110          00:07:08
Distance: (default is 110)

Bogota#show ip route ospf
  192.168.4.0/32 is subnetted, 1 subnets
  O   192.168.4.1 [110/7501] via 172.31.23.2, 00:11:12, Serial0/0/0
  192.168.5.0/32 is subnetted, 1 subnets
  O   192.168.5.1 [110/7501] via 172.31.23.2, 00:11:02, Serial0/0/0
  192.168.6.0/32 is subnetted, 1 subnets
  O   192.168.6.1 [110/7501] via 172.31.23.2, 00:11:02, Serial0/0/0
  O   192.168.30.0 [110/65] via 172.31.21.1, 00:35:27, Serial0/0/1
  O   192.168.40.0 [110/65] via 172.31.21.1, 00:35:27, Serial0/0/1
  O   192.168.200.0 [110/65] via 172.31.21.1, 00:35:27, Serial0/0/1
Bogota#

```

Ctrl+F6 to exit CLI focus

Copy Paste

```

interface FastEthernet0/1
  description connection to Webserver
  ip address 10.10.10.1 255.255.255.0
  duplex auto
  speed auto
!
interface Serial0/0/0
  description connection to Bucaramanga
  bandwidth 128
  ip address 172.31.23.1 255.255.255.252
  ip ospf cost 7500
  clock rate 128000
!
interface Serial0/0/1
  description connection to Medellin
  ip address 172.31.21.2 255.255.255.252
!
interface Vlan1
  no ip address
  shutdown
!
router ospf 1
  router-id 2.2.2.2
  log-adjacency-changes
  passive-interface FastEthernet0/1
  network 172.31.21.0 0.0.0.3 area 0
  network 172.31.23.0 0.0.0.3 area 0
  network 10.10.10.0 0.0.0.255 area 0

```


Simulation Panel

Event List

| Vis. | Time(sec) | Last Device | At Device | Type | Info |
|--------------------------|-----------|-------------|-------------|------|------|
| <input type="checkbox"/> | 0.000 | -- | PC-A | ICMP | |
| <input type="checkbox"/> | 0.000 | -- | Web Server | ICMP | |
| <input type="checkbox"/> | 0.000 | -- | Internet-PC | ICMP | |

Reset Simulation Constant Delay Captured to: 0.000 s

Play Controls: Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events
 ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All/None

26:56:53.759 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward Event List Sim

Simulation Panel

Event List

| Vis. | Time(sec) | Last Device | At Device | Type | Info |
|--------------------------|-----------|-------------|-------------|------|------|
| <input type="checkbox"/> | 0.005 | Medellin | S1 | ICMP | |
| <input type="checkbox"/> | 0.005 | S1 | S3 | ICMP | |
| <input type="checkbox"/> | 0.005 | S3 | PC-C | ICMP | |
| <input type="checkbox"/> | 0.005 | Bogotá | Internet-PC | ICMP | |
| <input type="checkbox"/> | 0.006 | Medellin | S1 | ICMP | |
| <input type="checkbox"/> | 0.006 | S1 | S3 | ICMP | |
| <input type="checkbox"/> | 0.006 | S3 | PC-C | ICMP | |
| <input type="checkbox"/> | 0.006 | PC-C | S3 | ICMP | |
| <input type="checkbox"/> | 0.006 | Internet-PC | Bogotá | ICMP | |

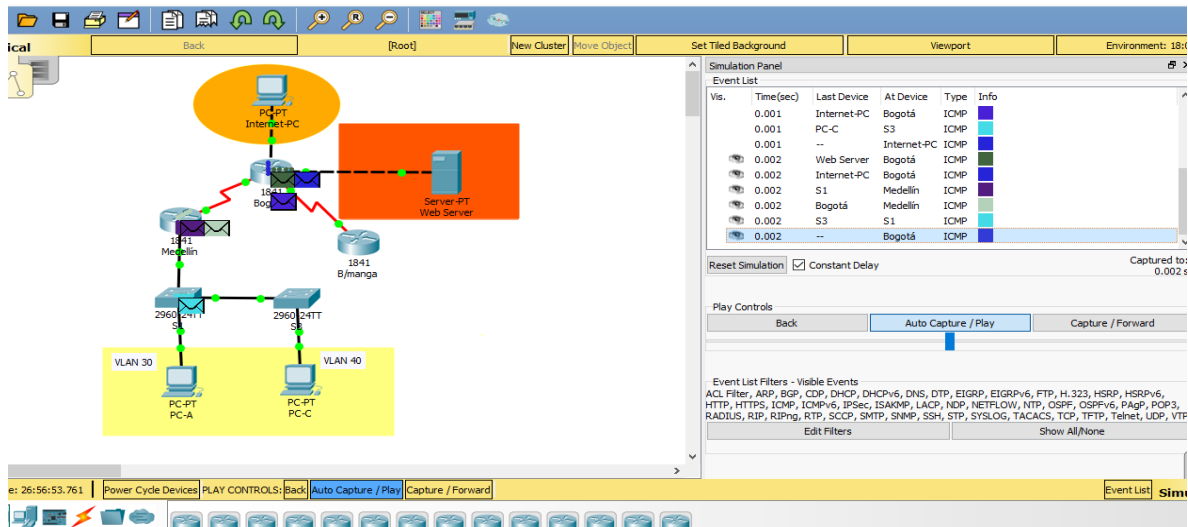
Reset Simulation Constant Delay Captured to: 0.006 s

Play Controls: Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events
 ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All/None

26:56:53.765 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward Event List Sim



NAT y DHCP en R1

Realizar las siguientes conexiones en R1: Reservar las primeras 30 direcciones en la VLAN 30 y la VLAN 40, Crear un DHCP pool VLAN 30, Crear un DHCP pool VLAN 40

Reservar VLAN 30 y VLAN 40 las primeras 30 direcciones

```

Medellin
-----
Physical  Config  CLI  Attributes
-----
IOS Command Line Interface

Medellin#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Medellin(config)#ip dhcp exc
Medellin(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Medellin(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Medellin(config)#
Medellin(config)#ip dhcp pool ADMINISTRACION
Medellin(dhcp-config)#dns-server 10.10.10.11
Medellin(dhcp-config)#domain-name ccna-unad.com
^
% Invalid input detected at '^' marker.
Medellin(dhcp-config)#default-router 192.168.30.1
Medellin(dhcp-config)#network 192.168.30.0 255.255.255.0
Medellin(dhcp-config)#
Medellin(dhcp-config)#ip dhcp pool MERCADEO
Medellin(dhcp-config)#dns-server 10.10.10.11
Medellin(dhcp-config)#default-router 192.168.40.1
Medellin(dhcp-config)#network 192.168.40.0 255.255.255.0
Medellin(dhcp-config)#
  
```

Ctrl+F6 to exit CLI focus

Configurar NAT en Bogotá

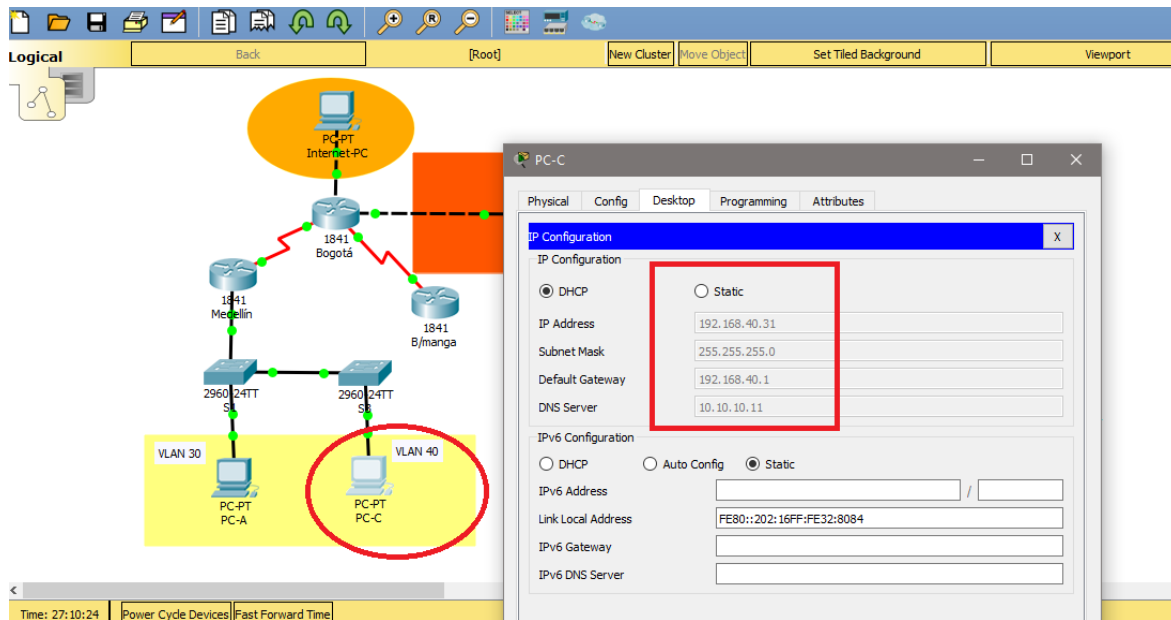
```
Password:
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#user webuser privilege 15 secret cisco12345
Bogota(config)#ip http server
      ^
% Invalid input detected at '^' marker.

Bogota(config)#ip http authentication local
      ^
% Invalid input detected at '^' marker.

Bogota(config)#ip nat inside source static 10.10.10.10 209.165.200.229
Bogota(config)#int f0/0
Bogota(config-if)#ip nat outside
Bogota(config-if)#int f0/1
Bogota(config-if)#ip nat inside
Bogota(config-if)#
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#access-list 1 permit 192.168.30.0 0.0.0.255
Bogota(config)#access-list 1 permit 192.168.40.0 0.0.0.255
Bogota(config)#
Bogota(config)#
Bogota(config)#access-list 1 permit 192.168.4.0.0.3.255
      ^
% Invalid input detected at '^' marker.

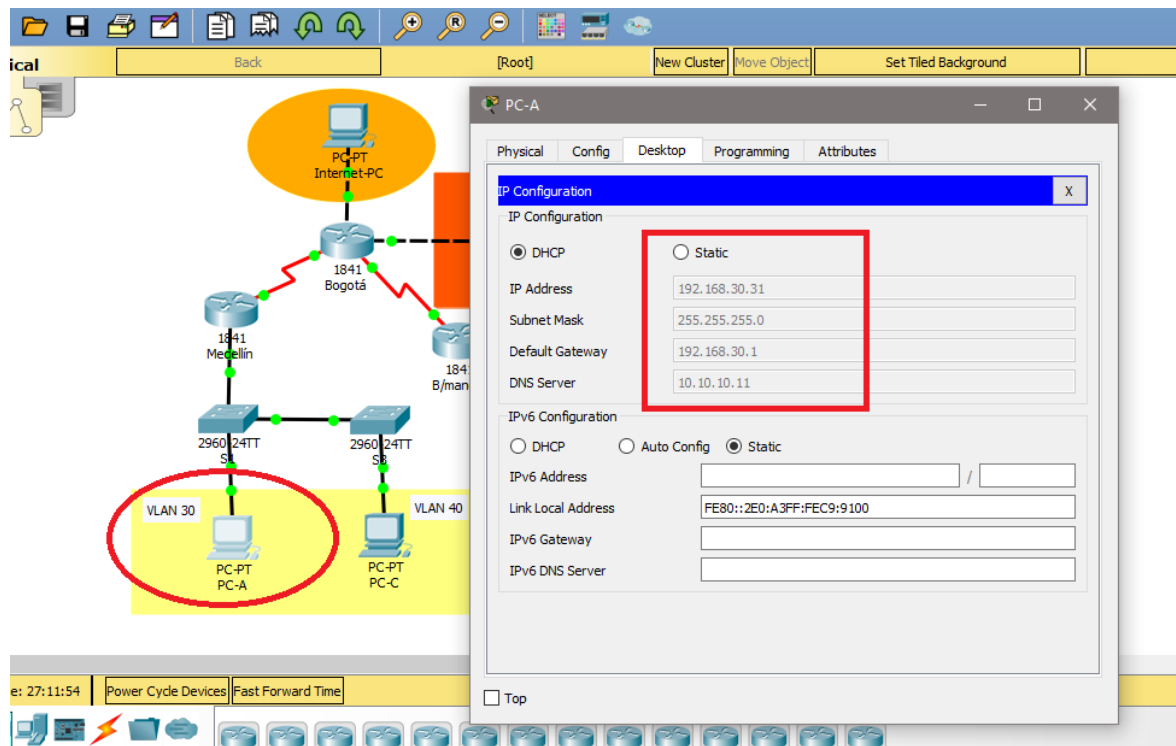
Bogota(config)#access-list 1 permit 192.168.4.0 0.0.3.255
Bogota(config)#
Bogota(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.229 netmask
255.255.255.248
Bogota(config)#
```

Verificación de asignación direccionamiento DHCP en VLANs [VLAN 40 y VLAN 30]



The top image shows a network diagram in a logical view. It features a central router (1841 Bogotá) connected to two other routers (1841 Medellín and 1841 B/manga). Below the Bogotá router are two switches (2960 24TT S) connected to two VLANs: VLAN 30 (containing PC-A) and VLAN 40 (containing PC-C). An Internet-PC is connected to the Bogotá router. A configuration window for PC-C is open, showing the IP Configuration tab. The DHCP option is selected, and the IP address is set to 192.168.40.31. The Subnet Mask is 255.255.255.0, the Default Gateway is 192.168.40.1, and the DNS Server is 10.10.10.11. The IPv6 Configuration section shows DHCP, Auto Config, and Static options, with Static selected.

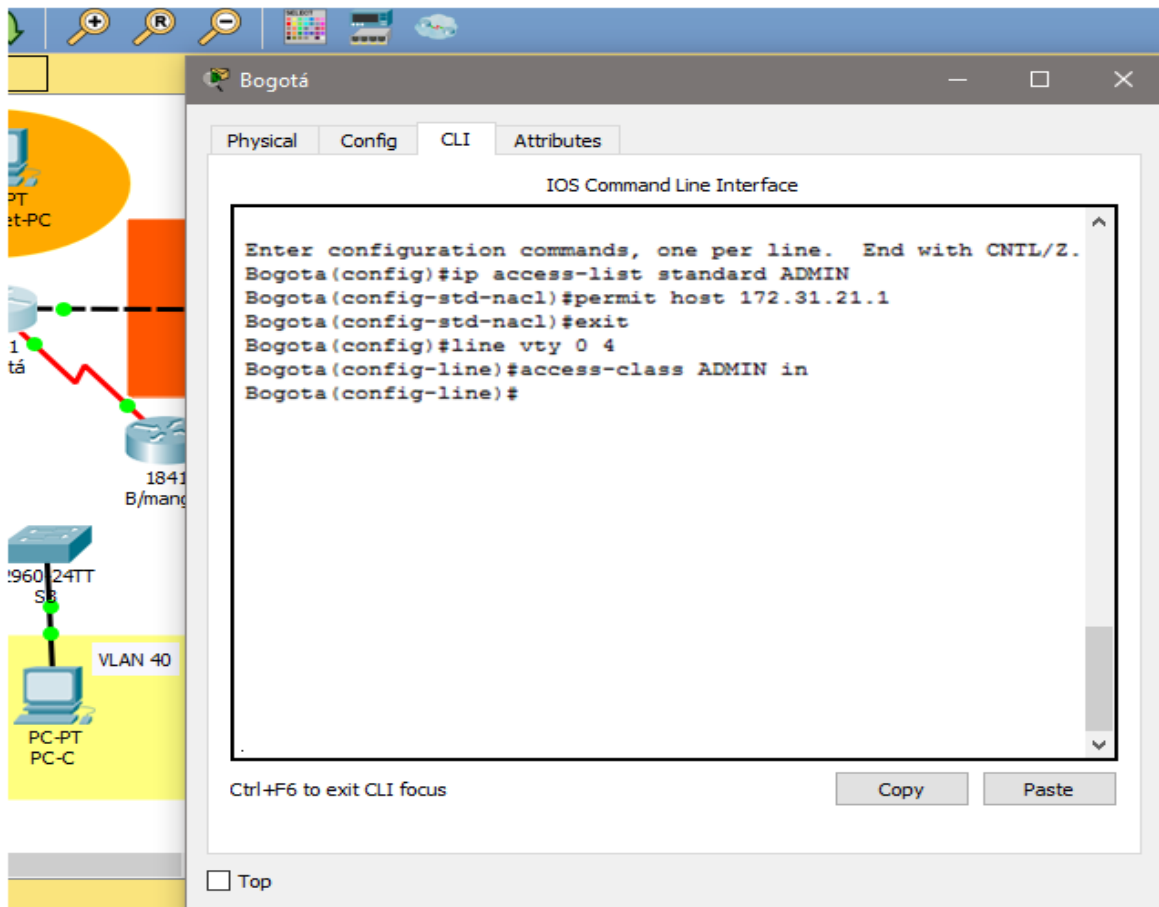
Time: 27:10:24 | Power Cycle Devices | Fast Forward Time



The bottom image shows the same network diagram as above, but with PC-A highlighted in a red circle. The configuration window for PC-A is open, showing the IP Configuration tab. The DHCP option is selected, and the IP address is set to 192.168.30.31. The Subnet Mask is 255.255.255.0, the Default Gateway is 192.168.30.1, and the DNS Server is 10.10.10.11. The IPv6 Configuration section shows DHCP, Auto Config, and Static options, with Static selected.

Time: 27:11:54 | Power Cycle Devices | Fast Forward Time

Configuración R1 solo tenga acceso a R2 Telnet y aplicarlas a las líneas VTY



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

```
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#access-list 100 permit tcp any host
209.165.200.229 eq www
Bogota(config)#access-list 100 permit icmp any any echo-reply
^
% Invalid input detected at '^' marker.

Bogota(config)#access-list 100 permit icmp any any echo-reply
Bogota(config)#
```

CONCLUSIONES

En esta prueba de habilidades se ejecutan funciones como la de verificar una conexión entre los dispositivos proporcionada en la configuración inicial de la topología, se configura la ACL de los Routers, esto con el objetivo de mitigar los ataques de forma remota y por supuesto no podrían faltar la verificación de la funcionalidad de las actividades ejecutadas con anterioridad.

(ACL) para permitir el acceso de direcciones IP específicas, lo que asegura que solo la computadora del administrador tenga permiso para acceder al router mediante telnet o SSH.

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