

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA – UNAD
Escuela de Ciencias Básicas, Tecnología e Ingeniería

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

Actividad Individual Final

Evaluación – Prueba de habilidades prácticas CCNA

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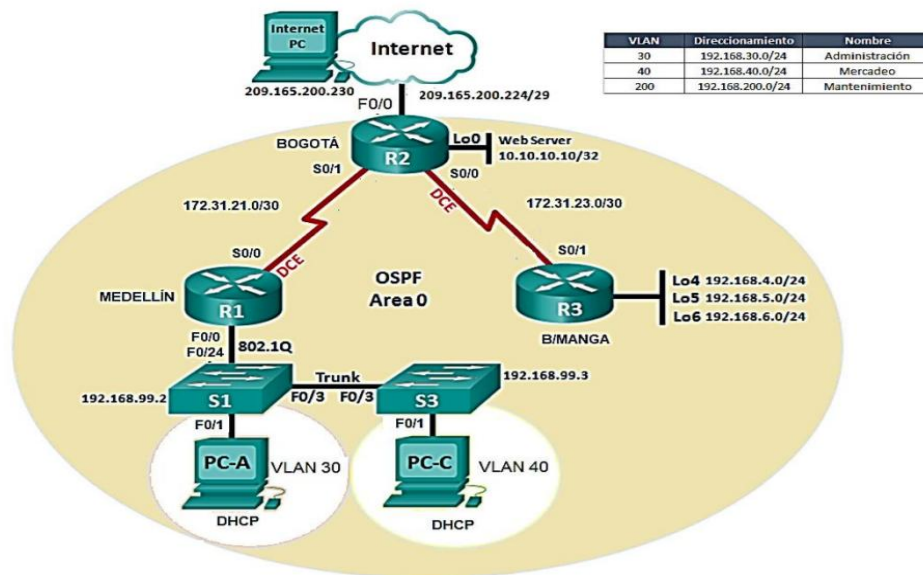
INTRODUCCION

Para dar inicio a la presentación de la prueba de habilidad practica del diplomado de profundización cisco (diseño e implementación de soluciones integradas lan / wan) (opci) la cual busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del curso y a través de la cual se pondrá a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking. Donde daremos como evidencia el desarrollo y solución a una empresa de Tecnología que posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde desempeñaremos el rol 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.

Descripción del escenario propuesto para la prueba de habilidades

Escenario: 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 de red



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

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

10. Configurar NAT en R2 para permitir que los host 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.

SOLUCION:

VISUALIZAR TABLAS DE ENRUTAMIENTO Y ROUTERS CONECTADOS POR OSPFV2

	MEDELLIN	BOGOTA	BUCARAMANGA																																																												
TABLAS DE ENRUTAMIENTO	<p>MEDELLIN#ship 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 externaltype 1, E2 - OSPF externaltype 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</p> <p>Gateway of last resort is not set</p> <p>172.31.0.0/30 is subnetted, 2 subnets C 172.31.21.0 is directly connected, Serial0/0/0 O 172.31.23.0 [110/15000] via 172.31.21.2, 00:00:25, Serial0/0/0 C 192.168.30.0/24 is directly connected, FastEthernet0/0.30 C 192.168.40.0/24 is directly connected, FastEthernet0/0.40 C 192.168.99.0/24 is directly connected, FastEthernet0/0.99 C 192.168.200.0/24 is directly connected, FastEthernet0/0.200 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/7501] via 172.31.21.2, 00:00:25, Serial0/0/0</p>	<p>BOGOTA#ship 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 externaltype 1, E2 - OSPF externaltype 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</p> <p>Gateway of last resort is not set</p> <p>10.0.0.0/32 is subnetted, 1 subnets C 10.10.10.10 is directly connected, Loopback0 172.31.0.0/30 is subnetted, 2 subnets C 172.31.21.0 is directly connected, Serial0/1/0 C 172.31.23.0 is directly connected, Serial0/0/0 O 192.168.30.0/24 [110/65] via 172.31.21.1, 00:00:10, Serial0/1/0 O 192.168.40.0/24 [110/65] via 172.31.21.1, 00:00:10, Serial0/1/0 209.165.200.0/29 is subnetted, 1 subnets C 209.165.200.224 is directly connected, FastEthernet0/0 BOGOTA#</p>	<p>BUCARAMANGA#ship 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 externaltype 1, E2 - OSPF externaltype 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</p> <p>Gateway of last resort is not set</p> <p>172.31.0.0/30 is subnetted, 2 subnets O 172.31.21.0 [110/128] via 172.31.23.1, 00:01:23, Serial0/1/0 C 172.31.23.0 is directly connected, Serial0/1/0 C 192.168.4.0/24 is directly connected, Loopback4 C 192.168.5.0/24 is directly connected, Loopback5 C 192.168.6.0/24 is directly connected, Loopback6 O 192.168.30.0/24 [110/129] via 172.31.23.1, 00:01:23, Serial0/1/0 O 192.168.40.0/24 [110/129] via 172.31.23.1, 00:01:23, Serial0/1/0 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/65] via 172.31.23.1, 00:01:23, Serial0/1/0 BUCARAMANGA#</p>																																																												
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Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router

OSPFv2 es la versión del protocolo OSPF que actualmente utilizamos en redes IPv4.

En este caso, el formato del router ID coincide con el formato de las direcciones IP utilizadas en las interfaces por lo que es posible utilizar la dirección IP de una interfaz como router ID, de manera tal que no es obligatorio configurar un router-id y el sistema operativo puede tomar la dirección IP de una interfaz para ser utilizada en esta función.

Por este motivo, al momento de levantar el proceso de OSPF la definición del router ID sigue esta secuencia:

Si hay router-id configurado, se utiliza ese router ID.

Si no hay router-id configurado se utiliza la dirección IP más alta de las interfaces de loopback configuradas.

Si no hay interfaces de loopback configuradas, se toma la IP más alta de las interfaces físicas que se encuentren operativas (up) al momento de levantar el proceso.

Si no hay interfaces físicas operativas, el proceso de OSPF no se inicia.

OSPF Process ID, Router ID	<p>MEDELLIN#shospf database OSPF Router with ID (1.1.1.1) (Process ID 1)</p> <p>Router Link States (Area 0)</p> <table border="1"> <thead> <tr> <th>Link ID</th> <th>ADV Router</th> <th>Age</th> <th>Seq#</th> <th>Checksum</th> <th>Link count</th> </tr> </thead> <tbody> <tr> <td>1.1.1.1</td> <td>1.1.1.1</td> <td>1543</td> <td>0x80000005</td> <td>0x008ada 4</td> <td></td> </tr> <tr> <td>2.2.2.2</td> <td>2.2.2.2</td> <td>1543</td> <td>0x80000006</td> <td>0x00d828 5</td> <td></td> </tr> <tr> <td>3.3.3.3</td> <td>3.3.3.3</td> <td>1543</td> <td>0x80000002</td> <td>0x00a23e 2</td> <td></td> </tr> </tbody> </table>	Link ID	ADV Router	Age	Seq#	Checksum	Link count	1.1.1.1	1.1.1.1	1543	0x80000005	0x008ada 4		2.2.2.2	2.2.2.2	1543	0x80000006	0x00d828 5		3.3.3.3	3.3.3.3	1543	0x80000002	0x00a23e 2		<p>BOGOTA#shospf database OSPF Router with ID (2.2.2.2) (Process ID 1)</p> <p>Router Link States (Area 0)</p> <table border="1"> <thead> <tr> <th>Link ID</th> <th>ADV Router</th> <th>Age</th> <th>Seq#</th> <th>Checksum</th> <th>Link count</th> </tr> </thead> <tbody> <tr> <td>3.3.3.3</td> <td>3.3.3.3</td> <td>1484</td> <td>0x80000002</td> <td>0x00a23e 2</td> <td></td> </tr> <tr> <td>1.1.1.1</td> <td>1.1.1.1</td> <td>1484</td> <td>0x80000005</td> <td>0x008ada 4</td> <td></td> </tr> <tr> <td></td> <td>2.2.2.2</td> <td>2.2.2.2</td> <td>1484</td> <td>0x80000006</td> <td>0x00d828 5</td> </tr> </tbody> </table>	Link ID	ADV Router	Age	Seq#	Checksum	Link count	3.3.3.3	3.3.3.3	1484	0x80000002	0x00a23e 2		1.1.1.1	1.1.1.1	1484	0x80000005	0x008ada 4			2.2.2.2	2.2.2.2	1484	0x80000006	0x00d828 5	<p>BUCARAMANGA(config)#do shospf data OSPF Router with ID (3.3.3.3) (Process ID 1)</p> <p>Router Link States (Area 0)</p> <table border="1"> <thead> <tr> <th>Link ID</th> <th>ADV Router</th> <th>Age</th> <th>Seq#</th> <th>Checksum</th> <th>Link count</th> </tr> </thead> <tbody> <tr> <td>3.3.3.3</td> <td>3.3.3.3</td> <td>1581</td> <td>0x80000002</td> <td>0x00a23e 2</td> <td></td> </tr> <tr> <td>1.1.1.1</td> <td>1.1.1.1</td> <td>1581</td> <td>0x80000005</td> <td>0x008ada 4</td> <td></td> </tr> <tr> <td>2.2.2.2</td> <td>2.2.2.2</td> <td>1581</td> <td>0x80000006</td> <td>0x00d828 5</td> <td></td> </tr> </tbody> </table>	Link ID	ADV Router	Age	Seq#	Checksum	Link count	3.3.3.3	3.3.3.3	1581	0x80000002	0x00a23e 2		1.1.1.1	1.1.1.1	1581	0x80000005	0x008ada 4		2.2.2.2	2.2.2.2	1581	0x80000006	0x00d828 5	
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1.1.1.1	1.1.1.1	1581	0x80000005	0x008ada 4																																																																							
2.2.2.2	2.2.2.2	1581	0x80000006	0x00d828 5																																																																							
Address summarizations, Routing Networks	<p>MEDELLIN#ship 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</p> <p>Gateway of last resort is not set</p> <p>172.31.0.0/30 is subnetted, 2 subnets C 172.31.21.0 is directly connected, Serial0/0/0 O 172.31.23.0 [110/15000] via 172.31.21.2, 00:29:23, Serial0/0/0 C 192.168.30.0/24 is directly connected, FastEthernet0/0.30 C 192.168.40.0/24 is directly connected, FastEthernet0/0.40 C 192.168.99.0/24 is directly connected, FastEthernet0/0.99 C 192.168.200.0/24 is directly connected, FastEthernet0/0.200 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/7501] via 172.31.21.2, 00:29:23, Serial0/0/0</p> <p>MEDELLIN#ship route ospf 172.31.0.0/30 is subnetted, 2 subnets O 172.31.23.0 [110/15000] via 172.31.21.2, 00:29:52, Serial0/0/0 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/7501] via 172.31.21.2, 00:29:52, Serial0/0/0 MEDELLIN#</p>	<p>BOGOTA#ship 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</p> <p>Gateway of last resort is not set</p> <p>10.0.0.0/32 is subnetted, 1 subnets C 10.10.10.10 is directly connected, Loopback0 172.31.0.0/30 is subnetted, 2 subnets C 172.31.21.0 is directly connected, Serial0/1/0 C 172.31.23.0 is directly connected, Serial0/0/0 O 192.168.30.0/24 [110/65] via 172.31.21.1, 00:30:23, Serial0/1/0 O 192.168.40.0/24 [110/65] via 172.31.21.1, 00:30:23, Serial0/1/0 209.165.200.0/29 is subnetted, 1 subnets C 209.165.200.224 is directly connected, FastEthernet0/0</p> <p>BOGOTA#shiprouteospf O 192.168.30.0 [110/65] via 172.31.21.1, 00:30:18, Serial0/1/0 O 192.168.40.0 [110/65] via 172.31.21.1, 00:30:18, Serial0/1/0</p>	<p>BUCARAMANGA#ship 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</p> <p>Gateway of last resort is not set</p> <p>172.31.0.0/30 is subnetted, 2 subnets O 172.31.21.0 [110/128] via 172.31.23.1, 00:30:55, Serial0/1/0 C 172.31.23.0 is directly connected, Serial0/1/0 C 192.168.4.0/24 is directly connected, Loopback4 C 192.168.5.0/24 is directly connected, Loopback5 C 192.168.6.0/24 is directly connected, Loopback6 O 192.168.30.0/24 [110/129] via 172.31.23.1, 00:30:55, Serial0/1/0 O 192.168.40.0/24 [110/129] via 172.31.23.1, 00:30:55, Serial0/1/0 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/65] via 172.31.23.1, 00:30:55, Serial0/1/0</p> <p>BUCARAMANGA#shiprouteospf 172.31.0.0/30 is subnetted, 2 subnets O 172.31.21.0 [110/128] via 172.31.23.1, 00:31:07, Serial0/1/0 O 192.168.30.0 [110/129] via 172.31.23.1, 00:31:07, Serial0/1/0 O 192.168.40.0 [110/129] via 172.31.23.1, 00:31:07, Serial0/1/0 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/65] via 172.31.23.1, 00:31:07, Serial0/1/0</p>																																																																								
passive interfaces configuradas	<p>router ospf 1 router-id 1.1.1.1 log-adjacency-changes passive-interface FastEthernet0/0 network 172.31.21.0 0.0.0.3 area 0 network 192.168.30.0 0.0.0.255 area 0 network 192.168.40.0 0.0.0.255 area 0</p> <p>MEDELLIN#ship route ospf 172.31.0.0/30 is subnetted, 2 subnets O 172.31.23.0 [110/15000] via 172.31.21.2, 00:35:47, Serial0/0/0 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/7501] via 172.31.21.2, 00:35:47, Serial0/0/0</p>	<p>! router ospf 1 router-id 2.2.2.2 log-adjacency-changes network 172.31.21.0 0.0.0.3 area 0 network 172.31.23.0 0.0.0.3 area 0 network 209.165.200.224 0.0.0.7 area 0 !</p> <p>BOGOTA#shiprouteospf O 192.168.30.0 [110/65] via 172.31.21.1, 00:03:09, Serial0/1/0 O 192.168.40.0 [110/65] via 172.31.21.1, 00:03:09, Serial0/1/0</p>	<p>! router ospf 1 router-id 3.3.3.3 log-adjacency-changes network 172.31.23.0 0.0.0.3 area 0</p> <p>BUCARAMANGA#ship route ospf 172.31.0.0/30 is subnetted, 2 subnets O 172.31.21.0 [110/128] via 172.31.23.1, 00:04:03, Serial0/1/0 O 192.168.30.0 [110/129] via 172.31.23.1, 00:03:53, Serial0/1/0 O 192.168.40.0 [110/129] via 172.31.23.1, 00:03:53, Serial0/1/0 209.165.200.0/29 is subnetted, 1 subnets O 209.165.200.224 [110/65] via 172.31.23.1, 00:04:03, Serial0/1/0</p>																																																																								
<p>Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.</p> <p>Se configurar como subinterfaces a nivel de capa</p>																																																																											

VLANS

```
MEDELLIN#sh interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 unassigned YES unset up
FastEthernet0/0.30 192.168.30.1 YES manual up
FastEthernet0/0.40 192.168.40.1 YES manual up
FastEthernet0/0.99 192.168.99.1 YES manual up
FastEthernet0/0.200 192.168.200.1 YES manual up
FastEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 172.31.21.1 YES manual up
Serial0/1/0 unassigned YES unset administratively down down
Vlan1 unassigned YES unset administratively down down
```

S1#sh vlan brief

```
VLAN Name Status Ports
-----
1 default active Fa0/4, Fa0/5, Fa0/6, Fa0/7
Fa0/8, Fa0/9, Fa0/10, Fa0/11
Fa0/12, Fa0/13, Fa0/14, Fa0/15
Fa0/16, Fa0/17, Fa0/18, Fa0/19
Fa0/20, Fa0/21, Fa0/22, Fa0/23
30 ADMINISTRACION active Fa0/1, Fa0/2
40 MERCADEO active
99 GESTION active
200 MANTENIMIENTO active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
S1#
```

S3#sh vlan brief

```
VLAN Name Status Ports
-----
1 default active Fa0/4, Fa0/5, Fa0/6, Fa0/7
Fa0/8, Fa0/9, Fa0/10, Fa0/11
Fa0/12, Fa0/13, Fa0/14, Fa0/15
Fa0/16, Fa0/17, Fa0/18, Fa0/19
Fa0/20, Fa0/21, Fa0/22, Fa0/23
Fa0/24
40 MERCADEO active Fa0/1, Fa0/2
99 GESTION active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
```

<p style="text-align: center; color: red; font-weight: bold;">puertos de acceso</p>	<pre> S1#sh running-config Building configuration... Current configuration : 1189 bytes ! version 12.1 no service timestamps log datetimemsec no service timestamps debug datetimemsec no service password-encryption ! hostname S1 ! enable password cisco ! ! spanning-tree mode pvst ! interface FastEthernet0/1 switchport access vlan 30 switchport mode access ! interface FastEthernet0/2 switchport access vlan 30 S3#sh running-config Building configuration... Current configuration : 1103 bytes ! version 12.1 no service timestamps log datetimemsec no service timestamps debug datetimemsec no service password-encryption ! hostname S3 ! ! spanning-tree mode pvst ! interface FastEthernet0/1 switchport access vlan 40 switchport mode access ! interface FastEthernet0/2 switchport access vlan 40 </pre>		
<p style="text-align: center; color: red; font-weight: bold;">Inter-VLAN Routing</p>	<pre> MEDELLIN#ship interface brief Interface IP-Address OK? Method Status Protocol FastEthernet0/0 unassigned YES unset up up FastEthernet0/0.30 192.168.30.1 YES manual up up FastEthernet0/0.40 192.168.40.1 YES manual up up FastEthernet0/0.99 192.168.99.1 YES manual up up FastEthernet0/0.200 192.168.200.1 YES manual up up FastEthernet0/1 unassigned YES unset administratively down down Serial0/0/0 172.31.21.1 YES manual up up Serial0/1/0 unassigned YES unset administratively down down Vlan1 unassigned YES unset administratively down down </pre>		

Seguridad en los Switches	<pre>enable password cisco ! ! line vty 0 4 password cisco login</pre>	<pre>enable password cisco ! ! line vty 0 4 password cisco login</pre>	<pre>enable password cisco ! ! line vty 0 4 password cisco login</pre>
1. En el Switch 3 deshabilitar DNSlookup			
	<pre>no ipdomain-lookup</pre>		
1. Asignar direcciones IP a los Switches acorde a los lineamientos.			
	<pre>Sw1 # interface Vlan99 ip address 192.168.99.2 255.255.255.0 ! ! Sw3# interface Vlan99 ip address 192.168.99.3 255.255.255.0 !</pre>		
1. Desactivar todas las interfaces que no se usan en el esquema de red.			

```
S1(config)#interface range fastEthernet 0/4-23
S1(config-if-range)#no shutdown
```

```
S1(config-if-range)#do shipintbri
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	up	up
FastEthernet0/2	unassigned	YES	manual	up	up
FastEthernet0/3	unassigned	YES	manual	up	up
FastEthernet0/4	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	down	down
FastEthernet0/6	unassigned	YES	manual	down	down
FastEthernet0/7	unassigned	YES	manual	down	down
FastEthernet0/8	unassigned	YES	manual	down	down
FastEthernet0/9	unassigned	YES	manual	down	down
FastEthernet0/10	unassigned	YES	manual	down	down
FastEthernet0/11	unassigned	YES	manual	down	down
FastEthernet0/12	unassigned	YES	manual	down	down
FastEthernet0/13	unassigned	YES	manual	down	down
FastEthernet0/14	unassigned	YES	manual	down	down
FastEthernet0/15	unassigned	YES	manual	down	down
FastEthernet0/16	unassigned	YES	manual	down	down
FastEthernet0/17	unassigned	YES	manual	down	down
FastEthernet0/18	unassigned	YES	manual	down	down
FastEthernet0/19	unassigned	YES	manual	down	down
FastEthernet0/20	unassigned	YES	manual	down	down
FastEthernet0/21	unassigned	YES	manual	down	down
FastEthernet0/22	unassigned	YES	manual	down	down
FastEthernet0/23	unassigned	YES	manual	down	down
FastEthernet0/24	unassigned	YES	manual	up	up
Vlan1	unassigned	YES	manual	administratively down	down
Vlan99	192.168.99.2	YES	manual	up	up

```
S3#sh ipint brie
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	up	up
FastEthernet0/2	unassigned	YES	manual	up	up
FastEthernet0/3	unassigned	YES	manual	up	up
FastEthernet0/4	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	down	down
FastEthernet0/6	unassigned	YES	manual	down	down
FastEthernet0/7	unassigned	YES	manual	down	down
FastEthernet0/8	unassigned	YES	manual	down	down

1. Implement DHCP and NAT for IPv4		
1. Configurar R1 como servidor DHCP para las VLANs 3 y 40.		
	<pre> ipdhcp pool ADMINISTRACION network 192.168.30.0 255.255.255.0 default-router 192.168.30.1 dns-server 10.10.10.11 ipdhcp pool MERCADEO network 192.168.40.0 255.255.255.0 default-router 192.168.40.1 dns-server 10.10.10.11 </pre>	
1. Reservar las primeras 30 direcciones IP de las VLAN 3 y 40 para configuraciones estáticas.		
	<pre> ipdhcp excluded-address 192.168.30.1 192.168.30.30 ipdhcp excluded-address 192.168.40.1 192.168.40.30 </pre>	
1. Configurar NAT en R2 para permitir que los hosts puedan salir a internet		
2. 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.		
3. 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.		
4. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.		

30 hasta router de Bucaramanga.

The screenshot shows a network diagram in Packet Tracer. The network consists of several routers and PCs. Router BUCARAMANGA (1941) is highlighted with a yellow circle. A Command Prompt window is open on PC 30-static, showing the following output:

```
Packet Tracer PC Command Line 1.0
PC>ping 172.31.23.2

Pinging 172.31.23.2 with 32 bytes of data:

Reply from 172.31.23.2: bytes=32 time=126ms TTL=253
Reply from 172.31.23.2: bytes=32 time=93ms TTL=253
Reply from 172.31.23.2: bytes=32 time=166ms TTL=253
Reply from 172.31.23.2: bytes=32 time=125ms TTL=253

Ping statistics for 172.31.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 93ms, Maximum = 166ms, Average = 124ms

PC>
```

The Realtime console at the bottom shows a successful ping event:

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Nur
●	Successful	30-static	BUCARAMANGA	ICMP	Green	0.000	N	0

Ping desde equipo de la vlan 40 hasta router de Bucaramanga.

The screenshot shows the same network diagram as above, but with PC 40 dhcp selected. The Command Prompt window shows the following output:

```
Packet Tracer PC Command Line 1.0
PC>PING 172.31.23.2

Pinging 172.31.23.2 with 32 bytes of data:

Reply from 172.31.23.2: bytes=32 time=166ms TTL=253
Reply from 172.31.23.2: bytes=32 time=141ms TTL=253
Reply from 172.31.23.2: bytes=32 time=166ms TTL=253
Reply from 172.31.23.2: bytes=32 time=166ms TTL=253

Ping statistics for 172.31.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 141ms, Maximum = 166ms, Average = 152ms

PC>
```

The Realtime console at the bottom shows a successful ping event:

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Nur
●	Successful	40 dhcp	BUCARAMANGA	ICMP	Purple	0.000	N	0

Telnet denegado desde las vlan 30 y 40 hacia el router de Bucaramanga.

The screenshot displays a Packet Tracer network simulation. The network topology shows a central router BOGOTA (1941) connected to two other routers: MEDELLIN (1941) and BUCARAMANGA (1941). MEDELLIN is connected to two PCs: 40-dhcp (129.168.99.2) and 30-static (129.168.99.3). BUCARAMANGA is connected to a PC: 40-dhcp (129.168.99.3). The Command Prompt window shows the following output:

```
Packet Tracer PC Command Line 1.0
PC>PING 172.31.23.2

Pinging 172.31.23.2 with 32 bytes of data:

Reply from 172.31.23.2: bytes=32 time=165ms TTL=253
Reply from 172.31.23.2: bytes=32 time=141ms TTL=253
Reply from 172.31.23.2: bytes=32 time=156ms TTL=253
Reply from 172.31.23.2: bytes=32 time=158ms TTL=253

Ping statistics for 172.31.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 141ms, Maximum = 165ms, Average = 152ms

PC>TELNET 172.31.23.2
Trying 172.31.23.2 ...
* Connection timed out: remote host not responding
PC>
```

Ping y tracer hacia el router de Bogotá que permite la conectividad hacia él.

The screenshot displays the same Packet Tracer network simulation. The Command Prompt window shows the following output:

```
PC>
PC>ping 172.31.21.2

Pinging 172.31.21.2 with 32 bytes of data:

Reply from 172.31.21.2: bytes=32 time=98ms TTL=254
Reply from 172.31.21.2: bytes=32 time=94ms TTL=254
Reply from 172.31.21.2: bytes=32 time=78ms TTL=254
Reply from 172.31.21.2: bytes=32 time=94ms TTL=254

Ping statistics for 172.31.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 78ms, Maximum = 94ms, Average = 89ms

PC>tracert 172.31.21.2

Tracing route to 172.31.21.2 over a maximum of 30 hops:

  0  49 ms  63 ms  62 ms  192.168.30.1
  1  93 ms  94 ms  94 ms  172.31.21.2

Trace complete.

PC>
```

Ping desde un equipo de la vlan 30 que no es el 192.168.30.37 y está denegando los paquetes ICMP debido a una lista de control de acceso chai Bucaramanga.

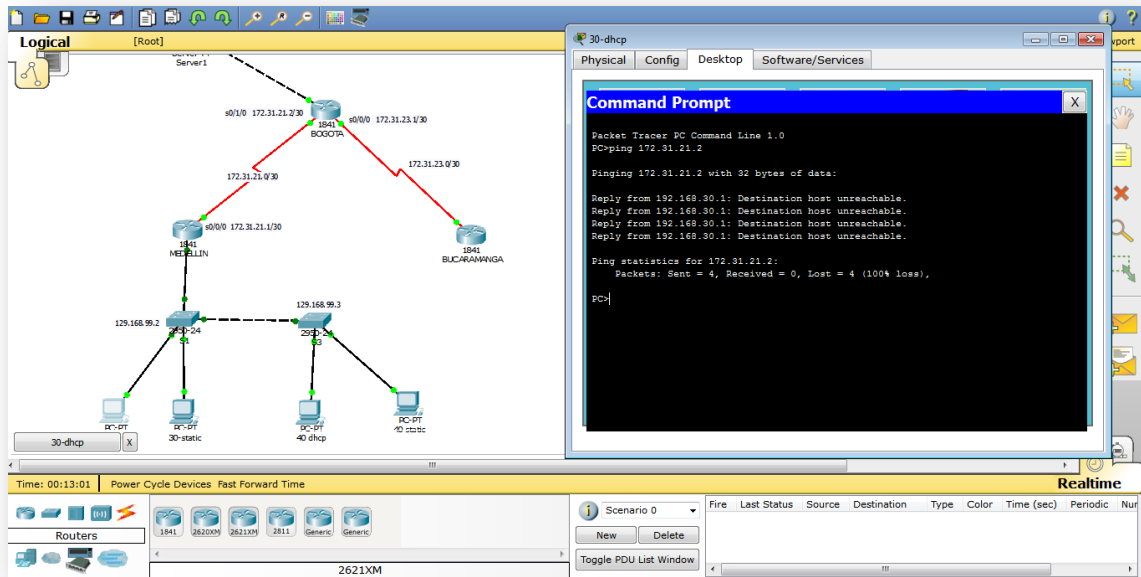


Tabla de enrutamiento OSPF del router de Medellín.

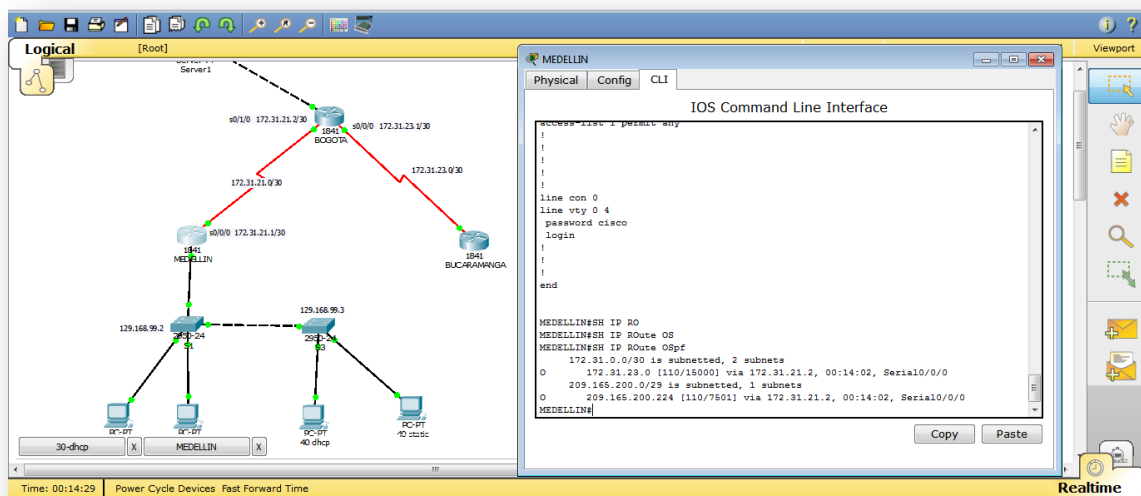


Tabla de enrutamiento completa de Medellín.

```
MEDELLIN#
MEDELLIN#
MEDELLIN#SH IP ROU
MEDELLIN#SH 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

    172.31.0.0/30 is subnetted, 2 subnets
C       172.31.21.0 is directly connected, Serial0/0/0
O       172.31.23.0 [110/15000] via 172.31.21.2, 00:16:20, Serial0/0/0
C     192.168.30.0/24 is directly connected, FastEthernet0/0.30
C     192.168.40.0/24 is directly connected, FastEthernet0/0.40
C     192.168.99.0/24 is directly connected, FastEthernet0/0.99
C     192.168.200.0/24 is directly connected, FastEthernet0/0.200
    209.165.200.0/29 is subnetted, 1 subnets
O       209.165.200.224 [110/7501] via 172.31.21.2, 00:16:20, Serial0/0/0
MEDELLIN#
```

Tabla de enrutamiento de Bogotá.

```
BOGOTA#
BOGOTA#
BOGOTA#sh ip rou
BOGOTA#sh 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

    10.0.0.0/32 is subnetted, 1 subnets
C       10.10.10.10 is directly connected, Loopback0
    172.31.0.0/30 is subnetted, 2 subnets
C       172.31.21.0 is directly connected, Serial0/1/0
C       172.31.23.0 is directly connected, Serial0/0/0
O     192.168.30.0/24 [110/65] via 172.31.21.1, 00:17:16, Serial0/1/0
O     192.168.40.0/24 [110/65] via 172.31.21.1, 00:17:16, Serial0/1/0
    209.165.200.0/29 is subnetted, 1 subnets
C       209.165.200.224 is directly connected, FastEthernet0/0
BOGOTA#
```

Tabla de enrutamiento de Bucaramanga.

```

BUCARAMANGA#sh ip ro
BUCARAMANGA#sh 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

    172.31.0.0/30 is subnetted, 2 subnets
O       172.31.21.0 [110/128] via 172.31.23.1, 00:17:41, Serial0/1/0
C       172.31.23.0 is directly connected, Serial0/1/0
C       192.168.4.0/24 is directly connected, Loopback4
C       192.168.5.0/24 is directly connected, Loopback5
C       192.168.6.0/24 is directly connected, Loopback6
O       192.168.30.0/24 [110/129] via 172.31.23.1, 00:17:41, Serial0/1/0
O       192.168.40.0/24 [110/129] via 172.31.23.1, 00:17:41, Serial0/1/0
O       209.165.200.0/29 is subnetted, 1 subnets
O       209.165.200.224 [110/65] via 172.31.23.1, 00:17:41, Serial0/1/0
BUCARAMANGA#
    
```

Interfaces del router de Medellín.

```

MEDELLIN#sh ip intu
MEDELLIN#sh ip interface br
MEDELLIN#sh ip interface brief
Interface                IP-Address      OK? Method Status        Protocol

FastEthernet0/0          unassigned      YES unset  up            up
FastEthernet0/0.30       192.168.30.1    YES manual  up            up
FastEthernet0/0.40       192.168.40.1    YES manual  up            up
FastEthernet0/0.99       192.168.99.1    YES manual  up            up
FastEthernet0/0.200      192.168.200.1   YES manual  up            up
FastEthernet0/1          unassigned      YES unset  administratively down down
Serial0/0/0              172.31.21.1     YES manual  up            up
Serial0/1/0              unassigned      YES unset  administratively down down
Vlan1                    unassigned      YES unset  administratively down down
MEDELLIN#
    
```

Interfaces del router de Bogotá.

```
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#SH IP INT BRIEF
Interface          IP-Address      OK? Method Status          Protocol

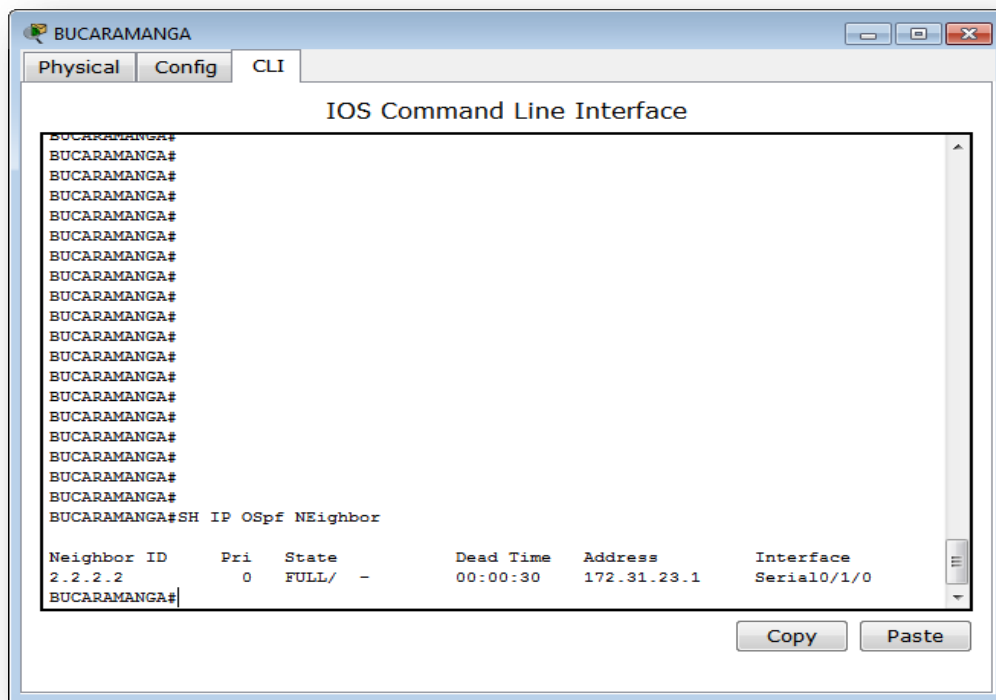
FastEthernet0/0    209.165.200.225 YES manual up              up
FastEthernet0/1    unassigned      YES unset  administratively down down
Serial0/0/0         172.31.23.1     YES manual up              up
Serial0/1/0         172.31.21.2     YES manual up              up
Loopback0          10.10.10.10     YES manual up              up
Vlan1              unassigned      YES unset  administratively down down
BOGOTA#
```

Interfaces del router de Bucaramanga.

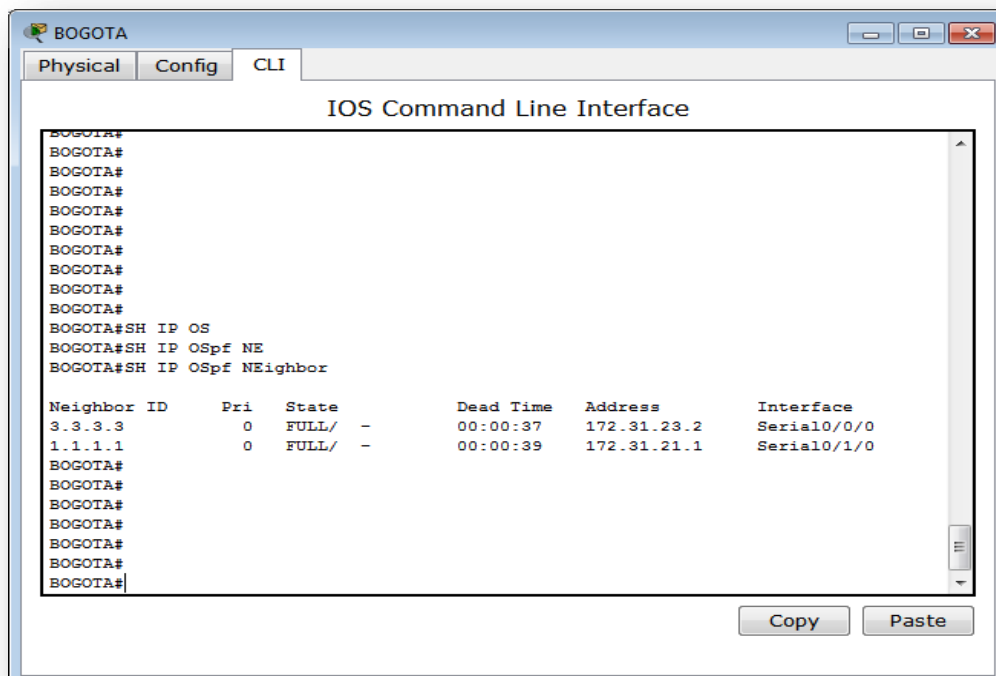
```
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#SH IP INT BRI
BUCARAMANGA#SH IP INT BRIEF
Interface          IP-Address      OK? Method Status          Protocol

FastEthernet0/0    unassigned      YES unset  administratively down down
FastEthernet0/1    unassigned      YES unset  administratively down down
Serial0/0/0         unassigned      YES unset  administratively down down
Serial0/1/0         172.31.23.2     YES manual up              up
Loopback4          192.168.4.1     YES manual up              up
Loopback5          192.168.5.1     YES manual up              up
Loopback6          192.168.6.1     YES manual up              up
Vlan1              unassigned      YES unset  administratively down down
BUCARAMANGA#
```

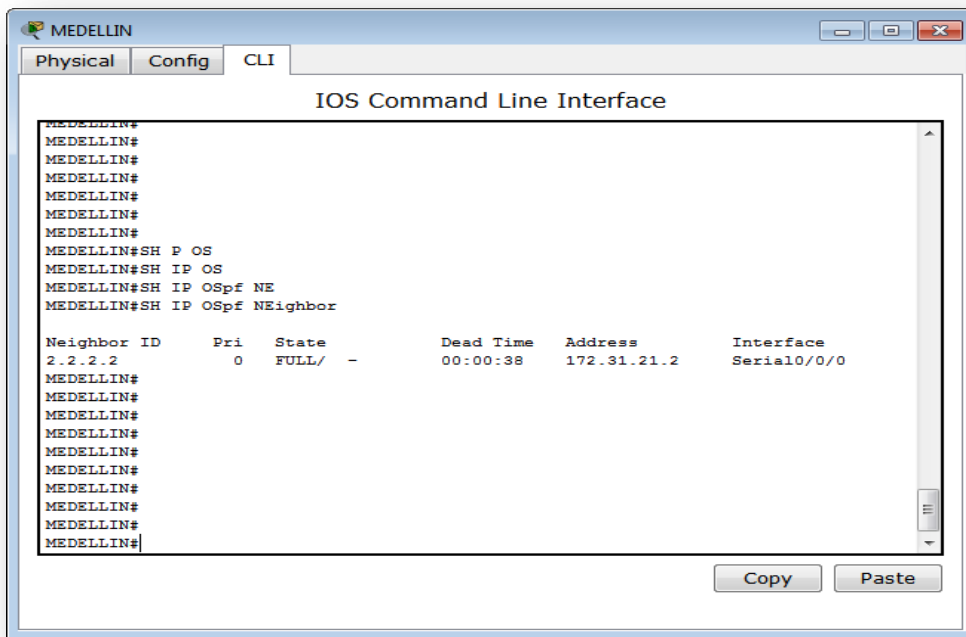
Vecinos del router Bucaramanga.



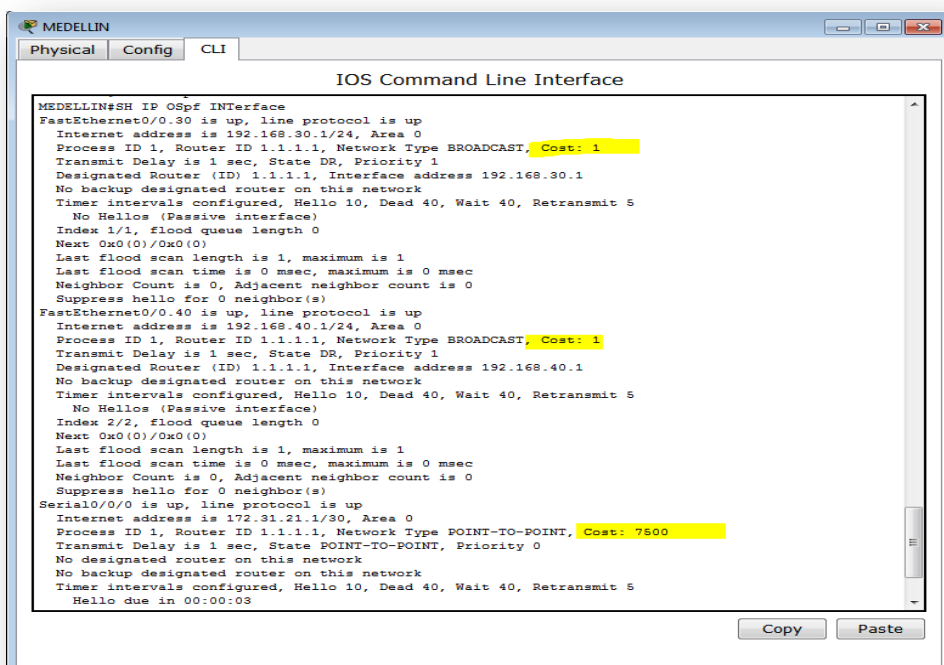
Vecinos del router de Bogotá.



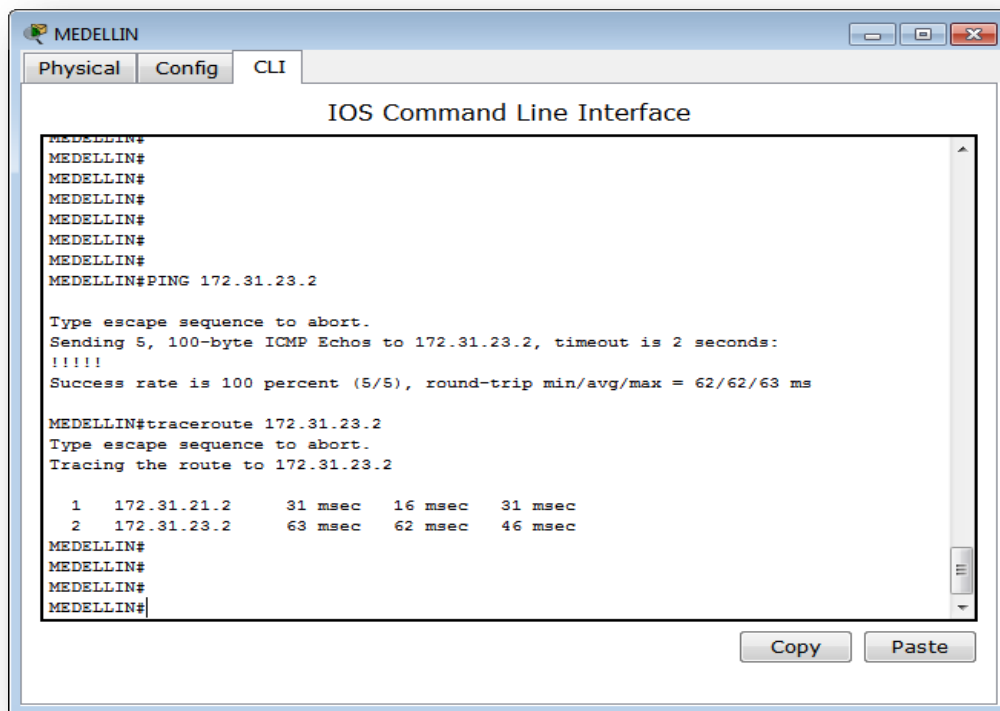
Vecinos del router de Medellín.



Costo del router de Medellín.



Ping Y Tracert desde el router de Medellín hacia Bucaramanga.



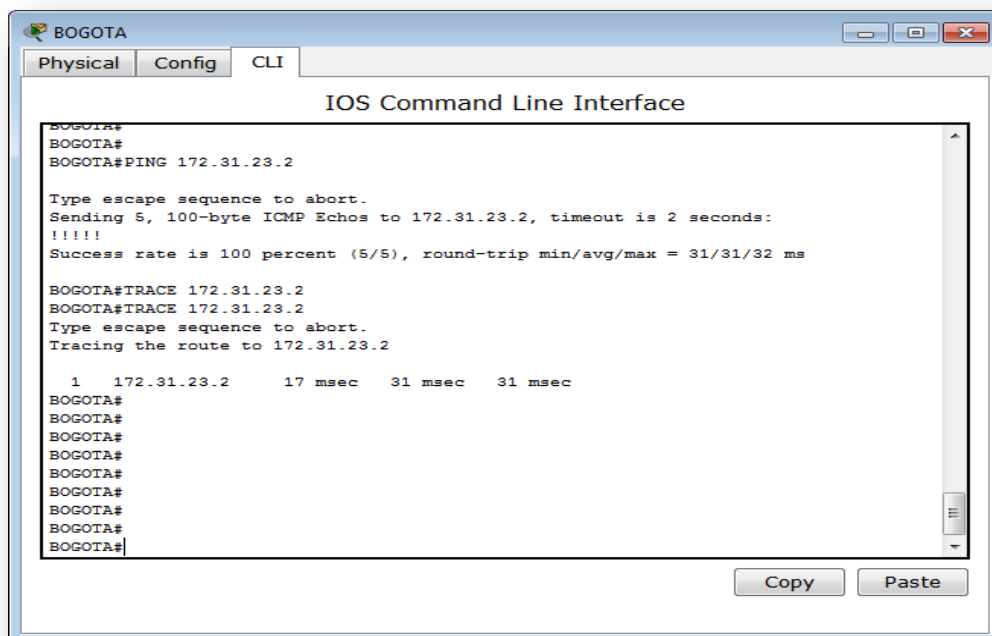
```
MEDELLIN#
MEDELLIN#
MEDELLIN#
MEDELLIN#
MEDELLIN#
MEDELLIN#PING 172.31.23.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 62/62/63 ms

MEDELLIN#traceroute 172.31.23.2
Type escape sequence to abort.
Tracing the route to 172.31.23.2

  1  172.31.21.2      31 msec  16 msec  31 msec
  2  172.31.23.2      63 msec  62 msec  46 msec
MEDELLIN#
MEDELLIN#
MEDELLIN#
MEDELLIN#
```

Ping y Tracert desde el router de Bogotá hacia Bucaramanga.



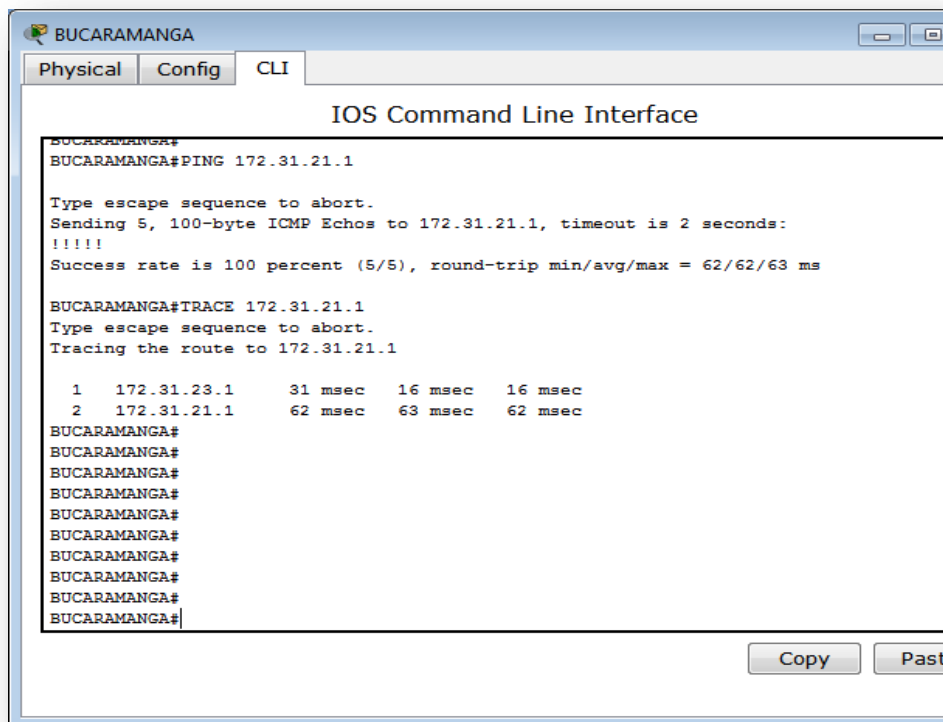
```
BOGOTA#
BOGOTA#
BOGOTA#PING 172.31.23.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 31/31/32 ms

BOGOTA#TRACE 172.31.23.2
BOGOTA#TRACE 172.31.23.2
Type escape sequence to abort.
Tracing the route to 172.31.23.2

  1  172.31.23.2      17 msec  31 msec  31 msec
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
BOGOTA#
```

Ping y Tracer desde el router de Bucaramanga hacia Medellín.

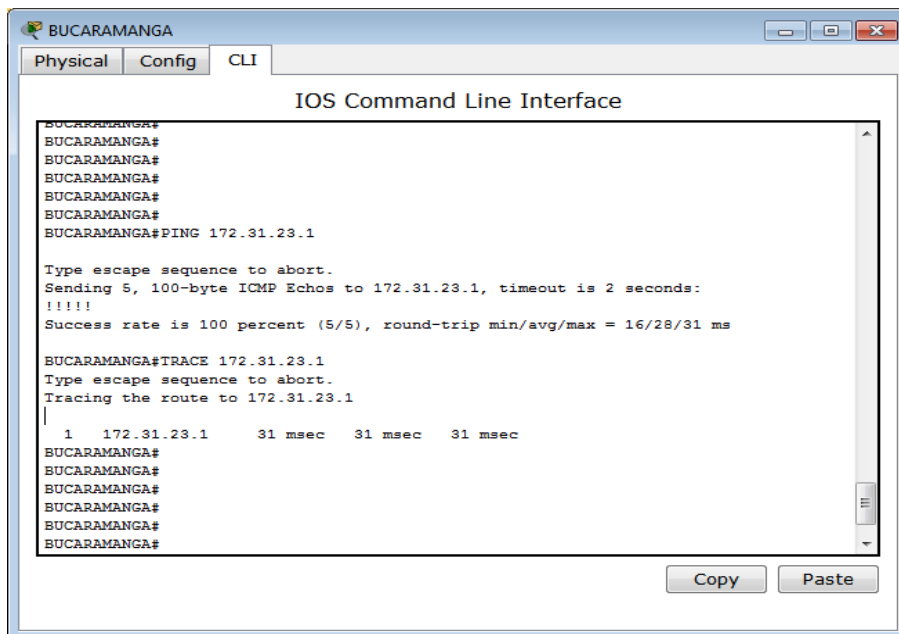


```
BUCARAMANGA
Physical Config CLI
IOS Command Line Interface
BUCARAMANGA#
BUCARAMANGA#PING 172.31.21.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.21.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 62/62/63 ms

BUCARAMANGA#TRACE 172.31.21.1
Type escape sequence to abort.
Tracing the route to 172.31.21.1

  1  172.31.23.1      31 msec   16 msec   16 msec
  2  172.31.21.1      62 msec   63 msec   62 msec
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
```

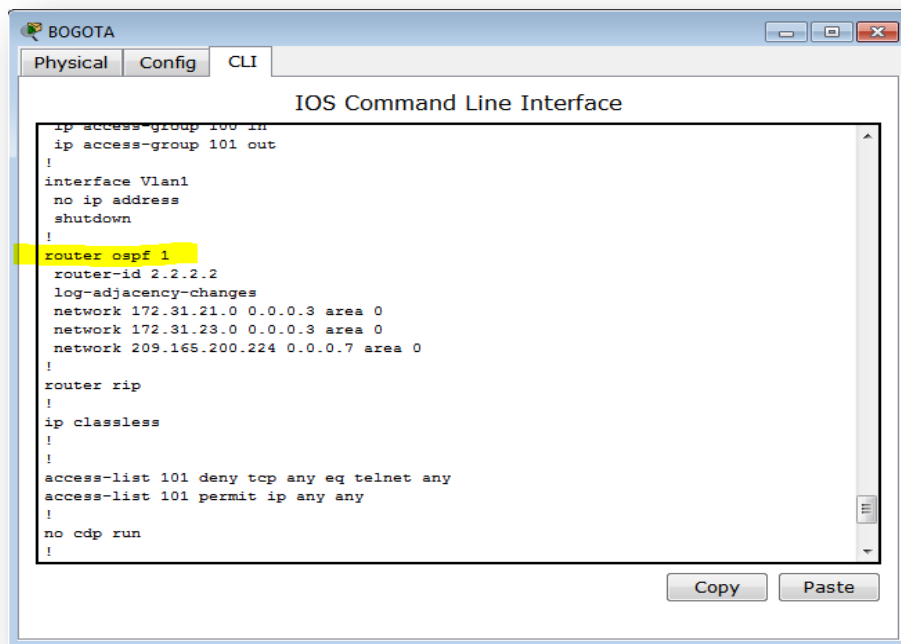
Ping y Tracer desde el router de Bucaramanga hacia Medellín.



```
BUCARAMANGA
Physical Config CLI
IOS Command Line Interface
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#PING 172.31.23.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 16/28/31 ms

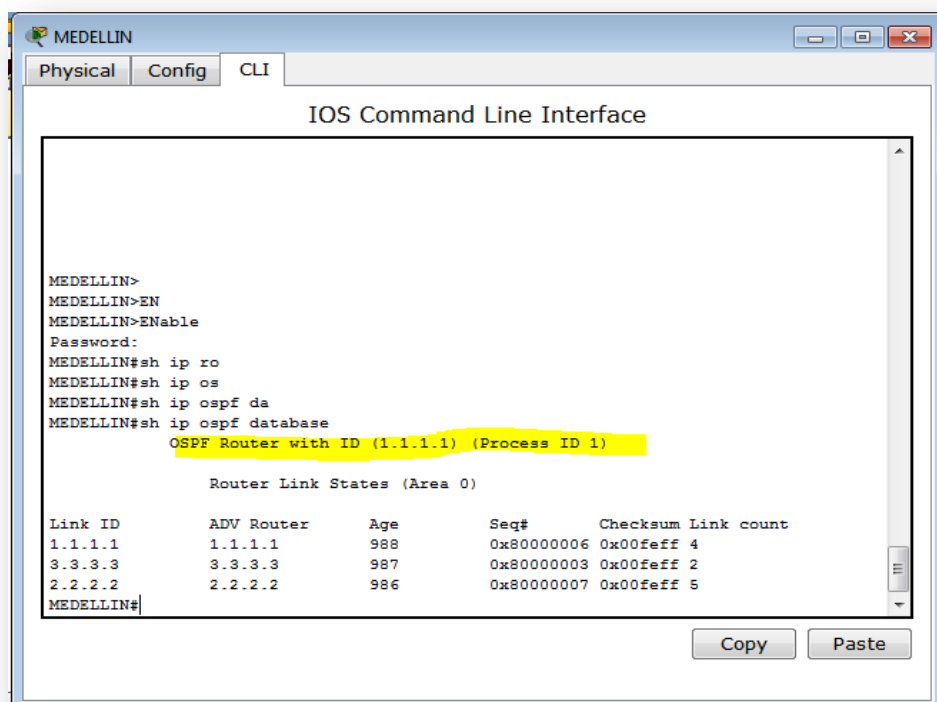
BUCARAMANGA#TRACE 172.31.23.1
Type escape sequence to abort.
Tracing the route to 172.31.23.1
|
  1  172.31.23.1      31 msec   31 msec   31 msec
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
BUCARAMANGA#
```

Sistema autónomo de Medellín OSPF 1.

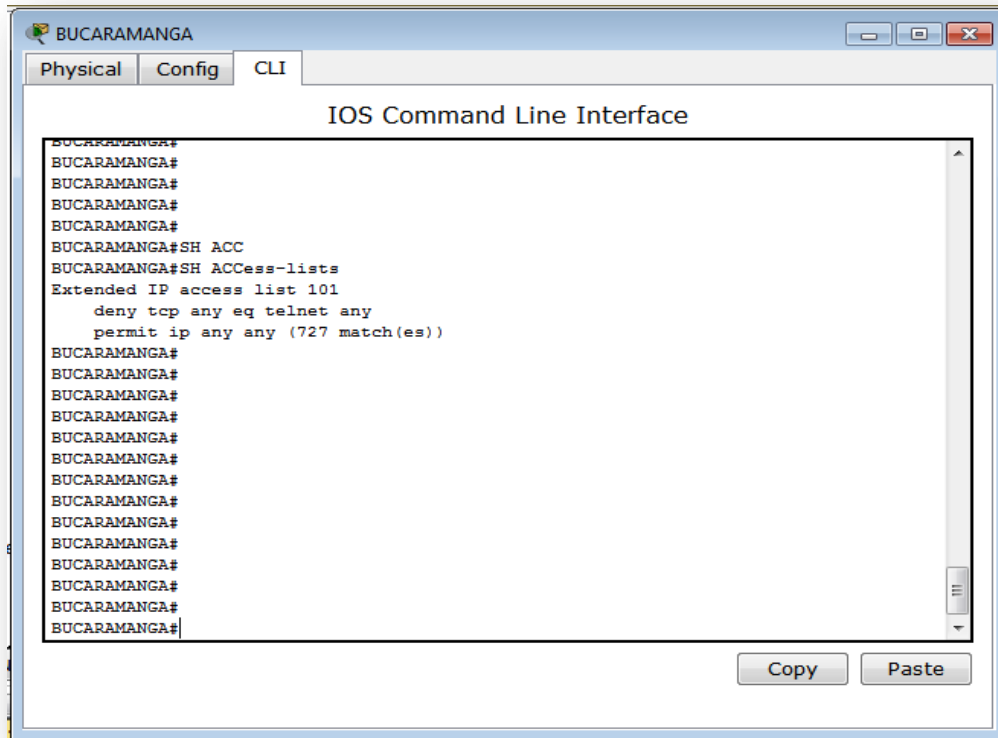


```
BOGOTA
Physical Config CLI
IOS Command Line Interface
ip access-group 100 in
ip access-group 101 out
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
router-id 2.2.2.2
log-adjacency-changes
network 172.31.21.0 0.0.0.3 area 0
network 172.31.23.0 0.0.0.3 area 0
network 209.165.200.224 0.0.0.7 area 0
!
router rip
!
ip classless
!
!
access-list 101 deny tcp any eq telnet any
access-list 101 permit ip any any
!
no cdp run
!
```

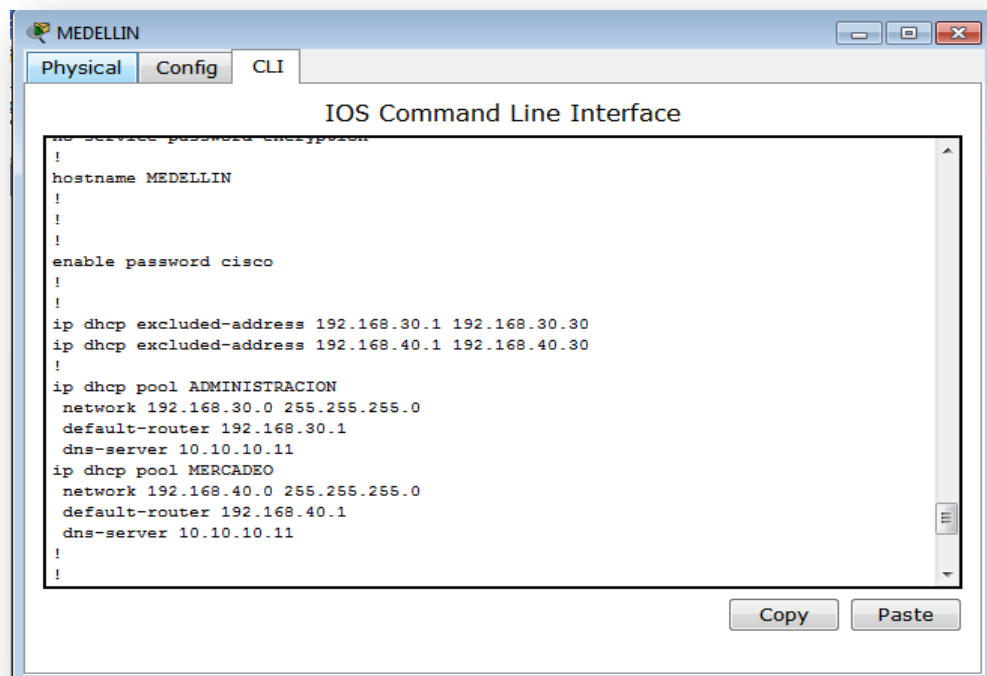
Process id del router de Medellín.



```
MEDELLIN
Physical Config CLI
IOS Command Line Interface
MEDELLIN>
MEDELLIN>EN
MEDELLIN>ENable
Password:
MEDELLIN#sh ip ro
MEDELLIN#sh ip os
MEDELLIN#sh ip ospf da
MEDELLIN#sh ip ospf database
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0)
Link ID      ADV Router   Age         Seq#         Checksum Link count
1.1.1.1      1.1.1.1      988        0x80000006  0x00feff  4
3.3.3.3      3.3.3.3      987        0x80000003  0x00feff  2
2.2.2.2      2.2.2.2      986        0x80000007  0x00feff  5
MEDELLIN#
```

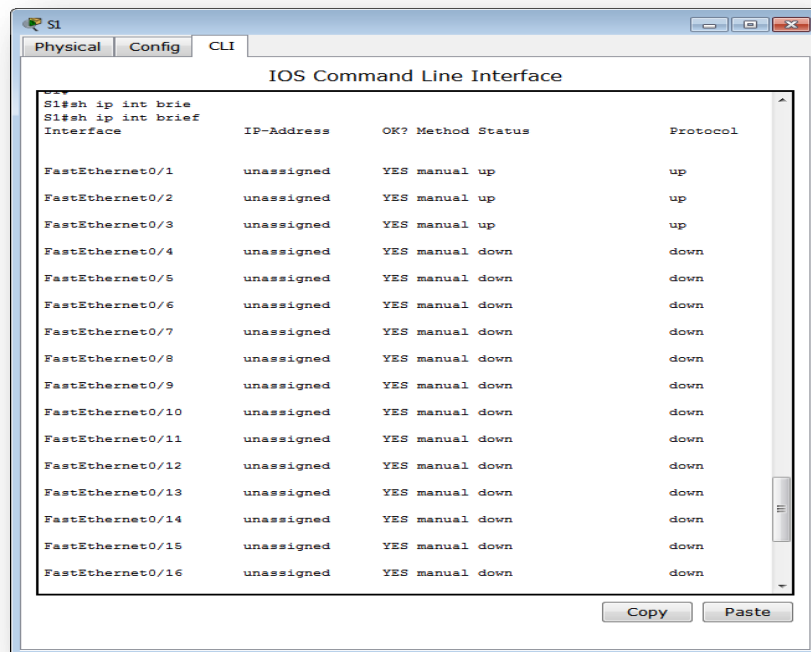
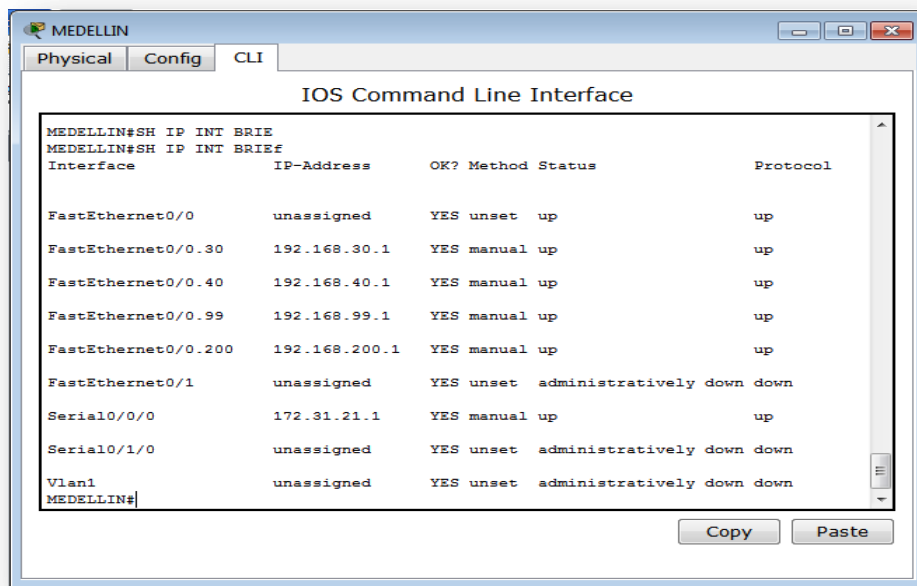



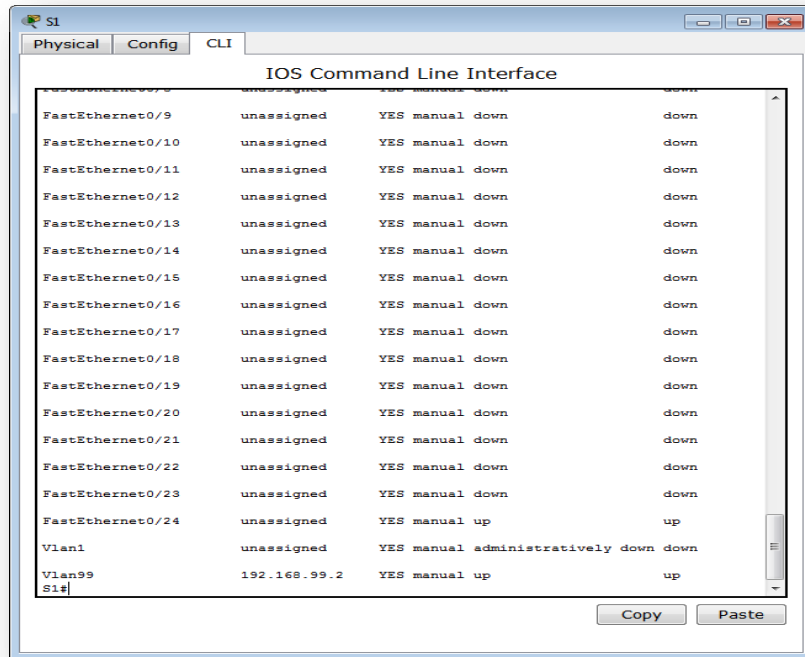
Configurar R1 como servidor



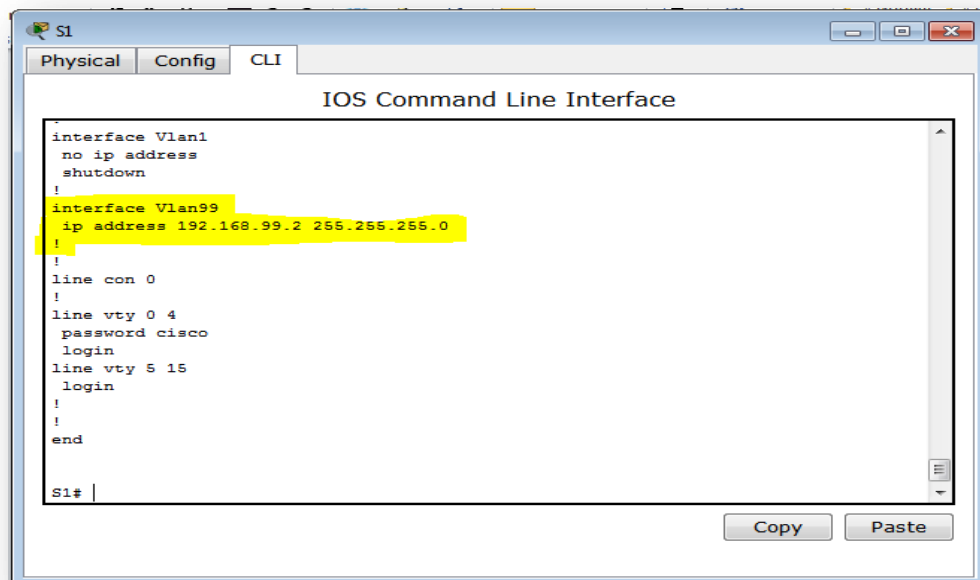
DHCP para las VLANs 30 y 40

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





Asignar direcciones IP a los Switches acorde a los lineamientos.



S3
Physical Config CLI
IOS Command Line Interface

```
!
interface FastEthernet0/24
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
ip address 192.168.99.3 255.255.255.0
!
!
line con 0
!
line vty 0 4
password cisco
login
line vty 5 15
login
!
!
end
S3(config-line)#
```

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vlan del switch 3

S1
Physical Config CLI
IOS Command Line Interface

```
S1# SH VL
S1# SH Vlan A
S1# SH Vlan BR
S1# SH Vlan BRief
```

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7 Fa0/8, Fa0/9, Fa0/10, Fa0/11 Fa0/12, Fa0/13, Fa0/14, Fa0/15 Fa0/16, Fa0/17, Fa0/18, Fa0/19 Fa0/20, Fa0/21, Fa0/22, Fa0/23
30 ADMINISTRACION	active	Fa0/1, Fa0/2
40 MERCADEO	active	
99 GESTION	active	
200 MANTENIMIENTO	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

```
S1#
```

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```
S3#  
S3#  
S3#SH VL  
S3#SH Vlan BR  
S3#SH Vlan Brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7 Fa0/8, Fa0/9, Fa0/10, Fa0/11 Fa0/12, Fa0/13, Fa0/14, Fa0/15 Fa0/16, Fa0/17, Fa0/18, Fa0/19 Fa0/20, Fa0/21, Fa0/22, Fa0/23 Fa0/24
40 MERCADEO	active	Fa0/1, Fa0/2
99 GESTION	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

S3#

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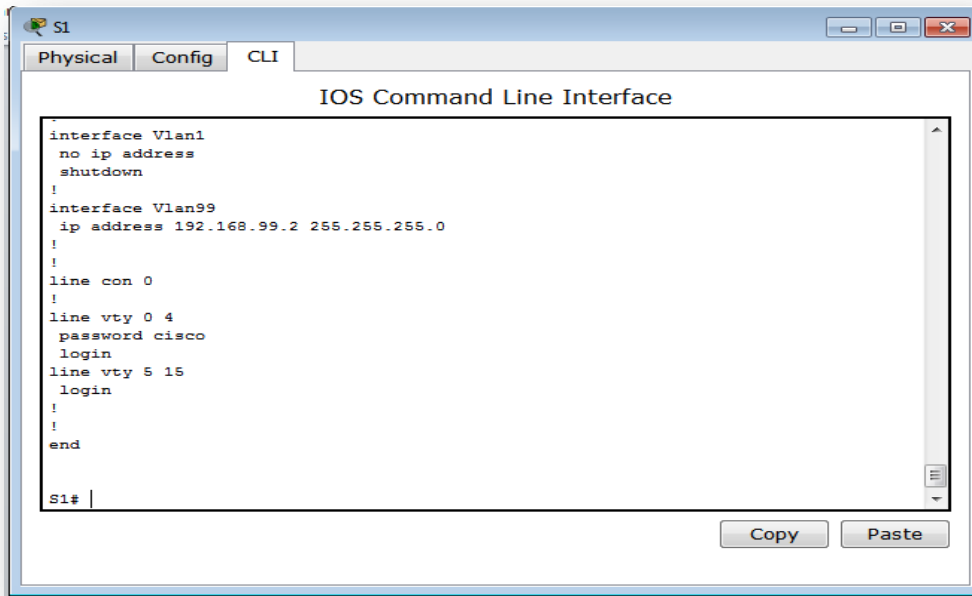
En el Switch 3 deshabilitar DNS lookup

```
S3  
Physical Config CLI  
IOS Command Line Interface
```

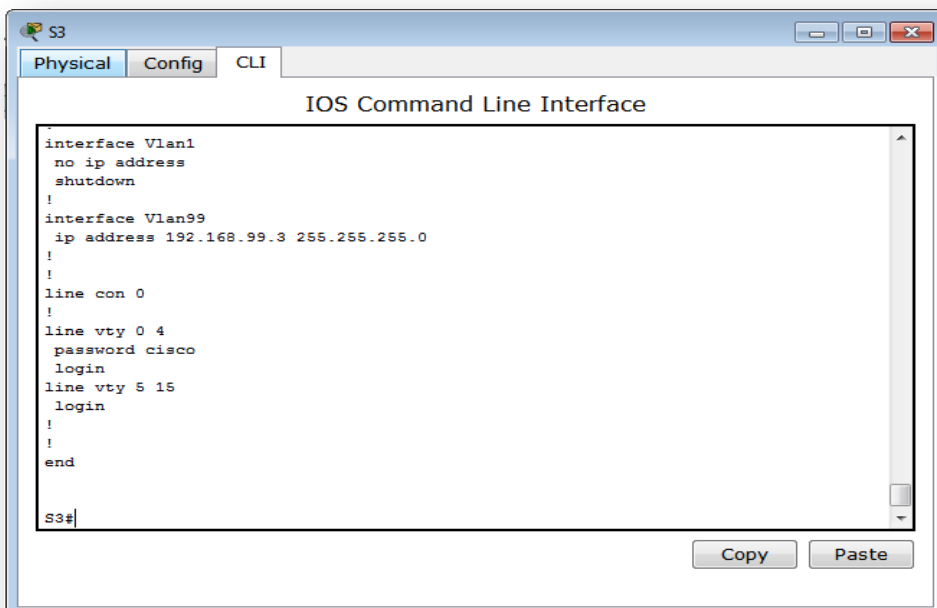
```
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname S3  
!  
enable password cisco  
!  
no ip domain-lookup  
!  
spanning-tree mode pvst  
!  
interface FastEthernet0/1  
 switchport access vlan 40  
 switchport mode access  
!  
interface FastEthernet0/2  
 switchport access vlan 40  
!  
interface FastEthernet0/3  
 switchport mode trunk
```

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Seguridad en los switch

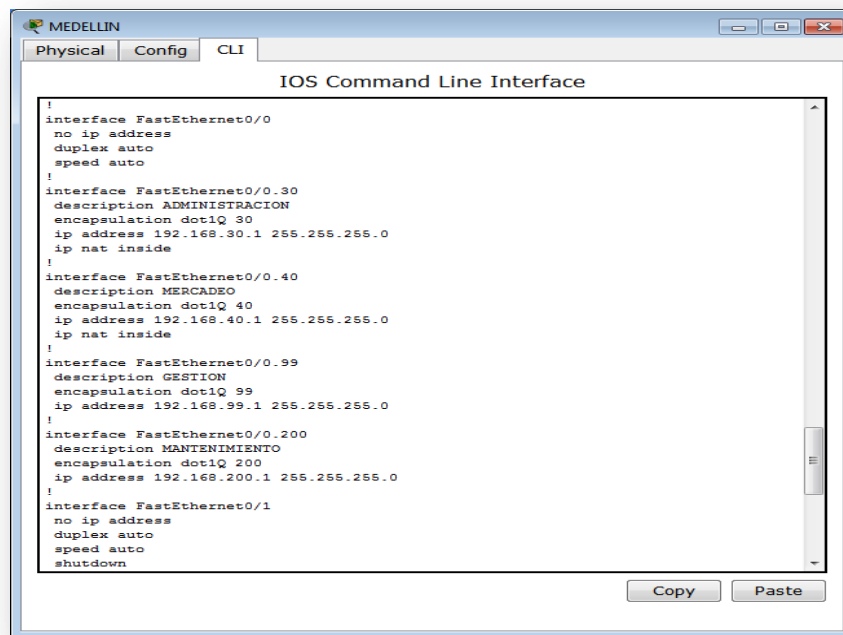


```
interface Vlan1
no ip address
shutdown
!
interface Vlan99
ip address 192.168.99.2 255.255.255.0
!
!
line con 0
!
line vty 0 4
password cisco
login
line vty 5 15
login
!
!
end
S1#
```



```
interface Vlan1
no ip address
shutdown
!
interface Vlan99
ip address 192.168.99.3 255.255.255.0
!
!
line con 0
!
line vty 0 4
password cisco
login
line vty 5 15
login
!
!
end
S3#
```

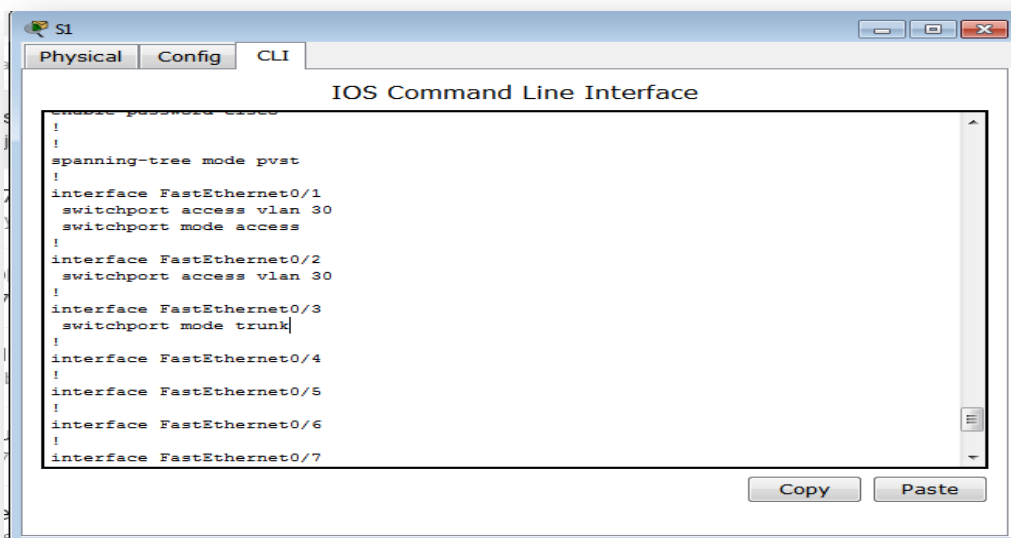
Inter-vlanrouting



```
MEDELLIN
Physical Config CLI
IOS Command Line Interface

!
interface FastEthernet0/0
no ip address
duplex auto
speed auto
!
interface FastEthernet0/0.30
description ADMINISTRACION
encapsulation dot1Q 30
ip address 192.168.30.1 255.255.255.0
ip nat inside
!
interface FastEthernet0/0.40
description MERCADEO
encapsulation dot1Q 40
ip address 192.168.40.1 255.255.255.0
ip nat inside
!
interface FastEthernet0/0.99
description GESTION
encapsulation dot1Q 99
ip address 192.168.99.1 255.255.255.0
!
interface FastEthernet0/0.200
description MANTENIMIENTO
encapsulation dot1Q 200
ip address 192.168.200.1 255.255.255.0
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
```

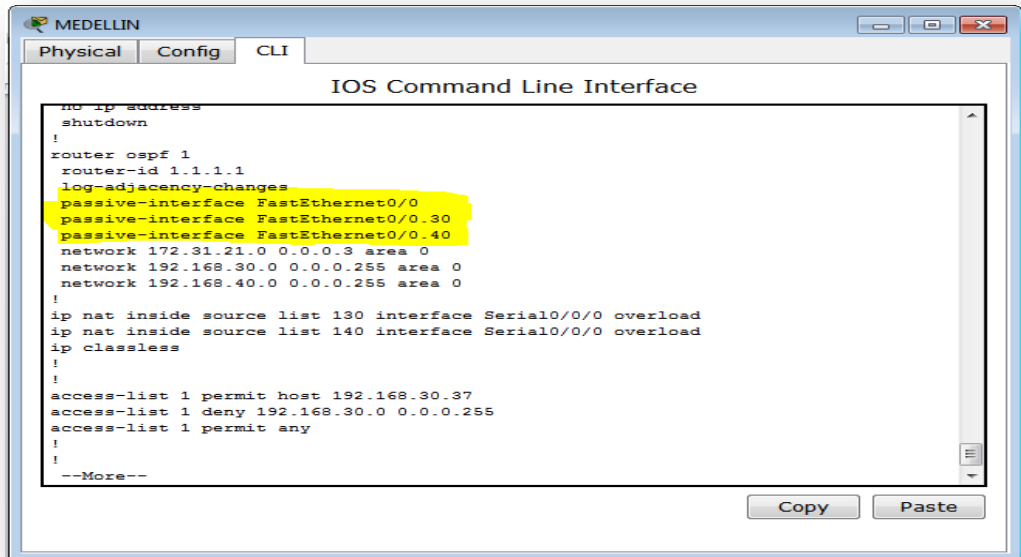
Puertos de acceso



```
S1
Physical Config CLI
IOS Command Line Interface

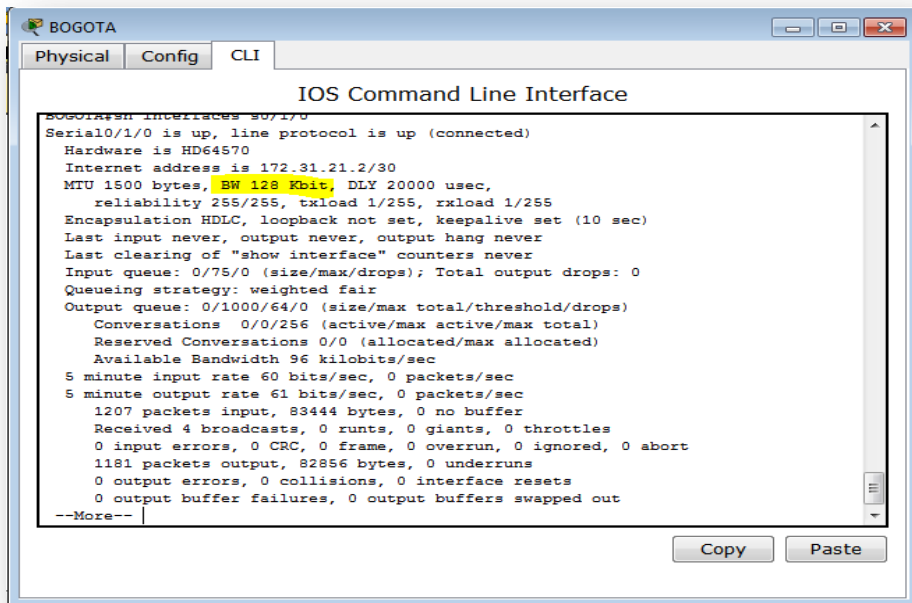
enable password cisco
!
spanning-tree mode pvst
!
interface FastEthernet0/1
switchport access vlan 30
switchport mode access
!
interface FastEthernet0/2
switchport access vlan 30
!
interface FastEthernet0/3
switchport mode trunk
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
```


Passive interfaces configurada



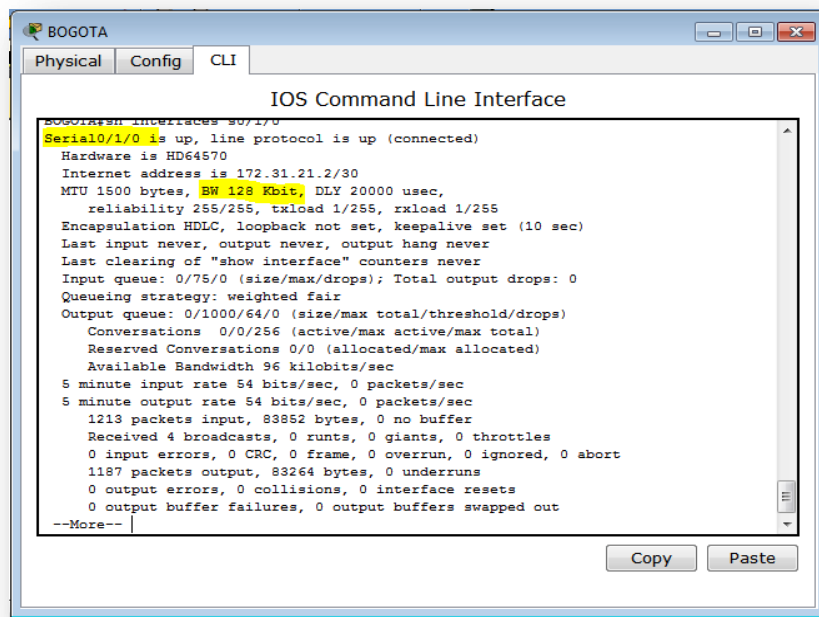
```
MEDELLIN
Physical Config CLI
IOS Command Line Interface
no ip address
shutdown
!
router ospf 1
router-id 1.1.1.1
log-adjacency-changes
passive-interface FastEthernet0/0
passive-interface FastEthernet0/0.30
passive-interface FastEthernet0/0.40
network 172.31.21.0 0.0.0.3 area 0
network 192.168.30.0 0.0.0.255 area 0
network 192.168.40.0 0.0.0.255 area 0
!
ip nat inside source list 130 interface Serial0/0/0 overload
ip nat inside source list 140 interface Serial0/0/0 overload
ip classless
!
!
access-list 1 permit host 192.168.30.37
access-list 1 deny 192.168.30.0 0.0.0.255
access-list 1 permit any
!
!
--More--
Copy Paste
```

Ancho de banda para interfaces seriales a 128 kb Medellín



```
BOGOTA
Physical Config CLI
IOS Command Line Interface
show interfaces serial0/1/0
Serial0/1/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 172.31.21.2/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 60 bits/sec, 0 packets/sec
5 minute output rate 61 bits/sec, 0 packets/sec
1207 packets input, 83444 bytes, 0 no buffer
Received 4 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1181 packets output, 82856 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffer failures, 0 output buffers swapped out
--More--
Copy Paste
```

Ancho de banda para interfaces seriales a 128 kb Bogotá



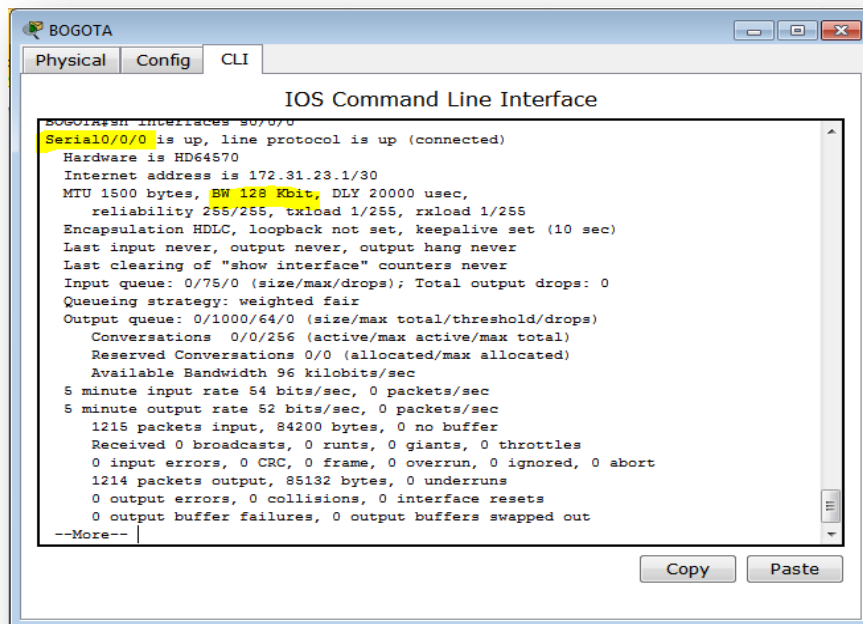
BOGOTA

Physical Config CLI

IOS Command Line Interface

```
BOGOTA#sh interfaces s0/1/0
Serial0/1/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 172.31.21.2/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
  Conversations 0/0/256 (active/max active/max total)
  Reserved Conversations 0/0 (allocated/max allocated)
  Available Bandwidth 96 kilobits/sec
5 minute input rate 54 bits/sec, 0 packets/sec
5 minute output rate 54 bits/sec, 0 packets/sec
  1213 packets input, 83852 bytes, 0 no buffer
  Received 4 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  1187 packets output, 83264 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
--More--
```

Copy Paste



BOGOTA

Physical Config CLI

IOS Command Line Interface

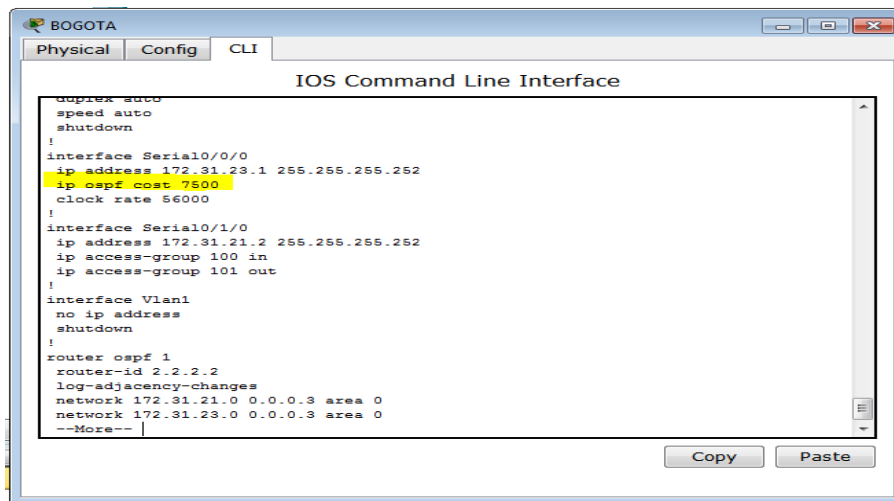
```
BOGOTA#sh interfaces s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 172.31.23.1/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
  Conversations 0/0/256 (active/max active/max total)
  Reserved Conversations 0/0 (allocated/max allocated)
  Available Bandwidth 96 kilobits/sec
5 minute input rate 54 bits/sec, 0 packets/sec
5 minute output rate 52 bits/sec, 0 packets/sec
  1215 packets input, 84200 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  1214 packets output, 85132 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
--More--
```

Copy Paste

BUCARAMANGA#sh interfaces s0/1/0
Serial0/1/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 172.31.23.2/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 59 bits/sec, 0 packets/sec
5 minute output rate 57 bits/sec, 0 packets/sec
1263 packets input, 89036 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1222 packets output, 84568 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffer failures, 0 output buffers swapped out
--More--

Ajustar el costo en la métrica de S0/0 a

MEDELLIN#sh conf t
encapsulation dot1q 200
ip address 192.168.200.1 255.255.255.0
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 172.31.21.1 255.255.255.252
ip ospf cost 7500
ip access-group 1 out
clock rate 56000
!
interface Serial0/1/0
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
--More--



CONCLUSIONES

Podemos realizar conclusiones después de lograr analizar, diseñar, elaborar y desarrollar cada uno de los ítems propuestos en la actividad de la prueba de habilidad práctica del diplomado de profundización Cisco (diseño e implementación de soluciones integradas LAN / WAN) (opción) donde se logra establecer una empresa de Tecnología la cual posee tres sucursales distribuidas en las siguientes ciudades de Bogotá, Medellín y Bucaramanga, logrando configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario antes mencionado, además de proporcionar el protocolo de enrutamiento OSPFv2 teniendo en cuenta ciertos criterios.

Se realizaron tablas de enrutamiento y routers conectados por OSPFv2, interfaces por OSPF en donde se ilustra el costo de cada interfaz.

Se configuraron VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red, asignando direcciones IP a los Switches acorde a los lineamientos.

Es de gran importancia resaltar el maravilloso mundo explorado a través de las redes y destacar lo aprendido, lo cual nos orienta hacia una vida profesional con un énfasis específico impulsándonos a formar parte de la tecnología establecida a nuestro alrededor.

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