



CONFIGURACIÓN E INTERCONEXIÓN ENTRE SÍ DE CADA UNO DE LOS DISPOSITIVOS QUE FORMAN PARTE UNA EMPRESA QUE POSEE TRES SUCURSALES DISTRIBUIDAS EN LAS CIUDADES DE BOGOTÁ, MEDELLÍN Y BUCARAMANGA.

MARTIN ALEJANDRO CAMARGO MOJICA

**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD
ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA-ECBTI
2018**

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MARTIN ALEJANDRO CAMARGO MOJICA

TRABAJO PRESENTADO COMO REQUISITO PARA OBTENER EL TÍTULO DE INGENIERO DE SISTEMAS

Docente Asociado

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**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD
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2018**

Evaluación – Prueba de habilidades prácticas CCNA

Descripción general de la prueba de habilidades

La evaluación denominada “Prueba de habilidades prácticas”, forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, la cual busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado y a través de la cual se pondrá a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

Para esta actividad, el estudiante dispone de cerca de dos semanas para realizar las tareas asignadas en cada uno de los escenarios propuestos, acompañado de los respectivos procesos de documentación de la solución, correspondientes al registro de la configuración de cada uno de los dispositivos, la descripción detallada del paso a paso de cada una de las etapas realizadas durante su desarrollo, el registro de los procesos de verificación de conectividad mediante el uso de comandos ping, traceroute, show ip route, entre otros.

La prueba de habilidades podrá ser desarrollada en el **Laboratorio SmartLab** o mediante el uso de **herramientas de Simulación (Puede ser Packet Tracer o GNS3)**. El estudiante es libre de escoger bajo qué mediación tecnológica resolverá cada escenario. No obstante, es importante mencionar que **aquellos estudiantes que hagan uso del laboratorio SmartLab se les considerará un estímulo adicional a la hora de evaluar el informe, teniendo en cuenta que su trabajo fue realizado sobre equipos reales y con ello será la oportunidad poner a prueba las habilidades y competencias adquiridas durante el diplomado**. Adicionalmente, es importante considerar, que esta actividad puede ser realizada en varias sesiones sobre este entorno, teniendo en cuenta que disponen de casi 15 días para su desarrollo.

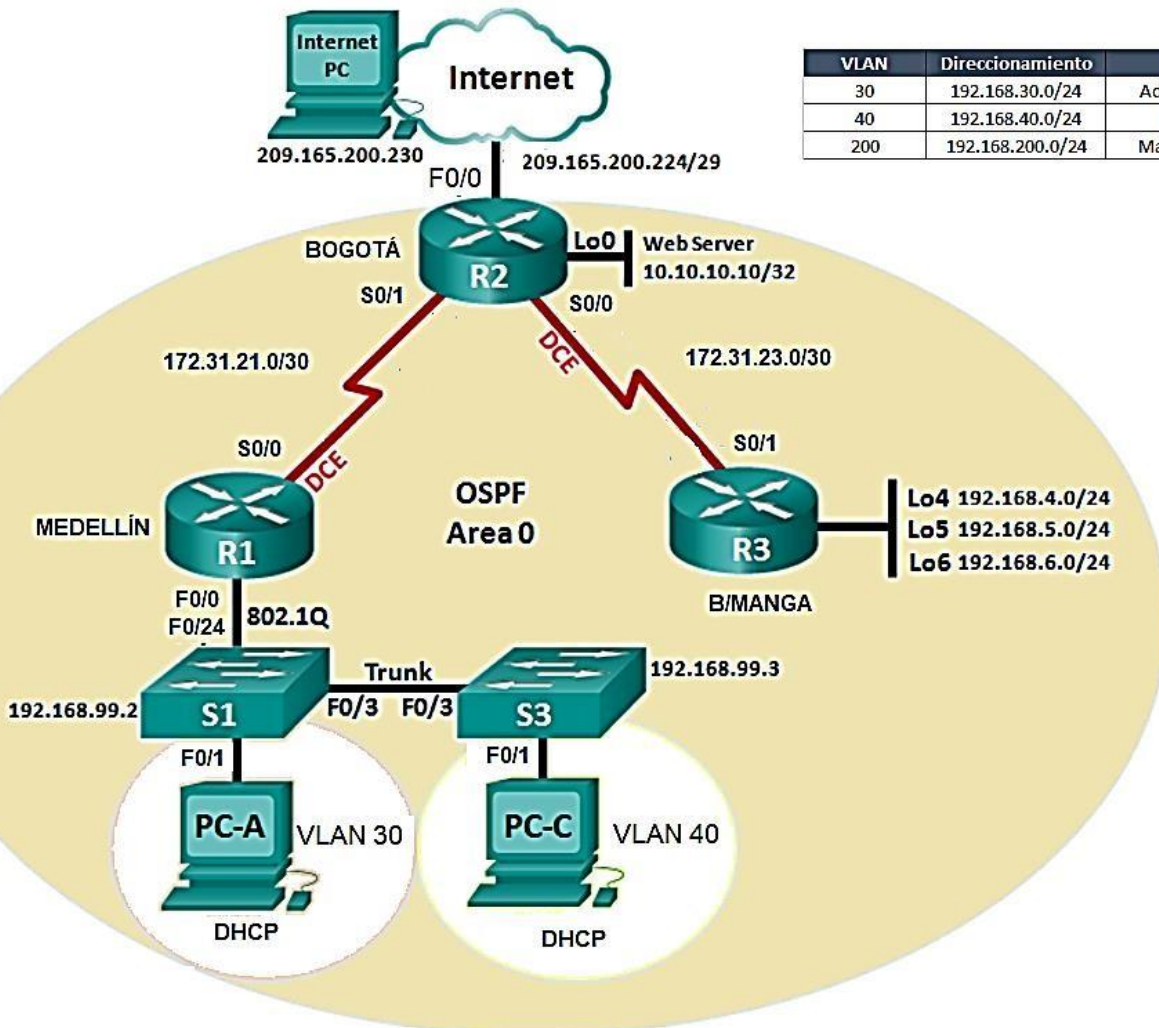
Finalmente, el informe deberá cumplir con las normas ICONTEC para la presentación de trabajos escritos, teniendo en cuenta que este documento deberá ser entregado al final del curso en el Repositorio Institucional, acorde con los lineamientos institucionales para grado. Proceso que les será socializado al finalizar el curso.

Es muy importante mencionar que esta actividad es de carácter **INDIVIDUAL**. El informe deberá estar acompañado de las respectivas evidencias de configuración de los dispositivos, las cuales generarán veracidad al trabajo realizado. **El informe deberá ser entregado en el espacio creado para tal fin en el Campus Virtual de la UNAD.**

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.

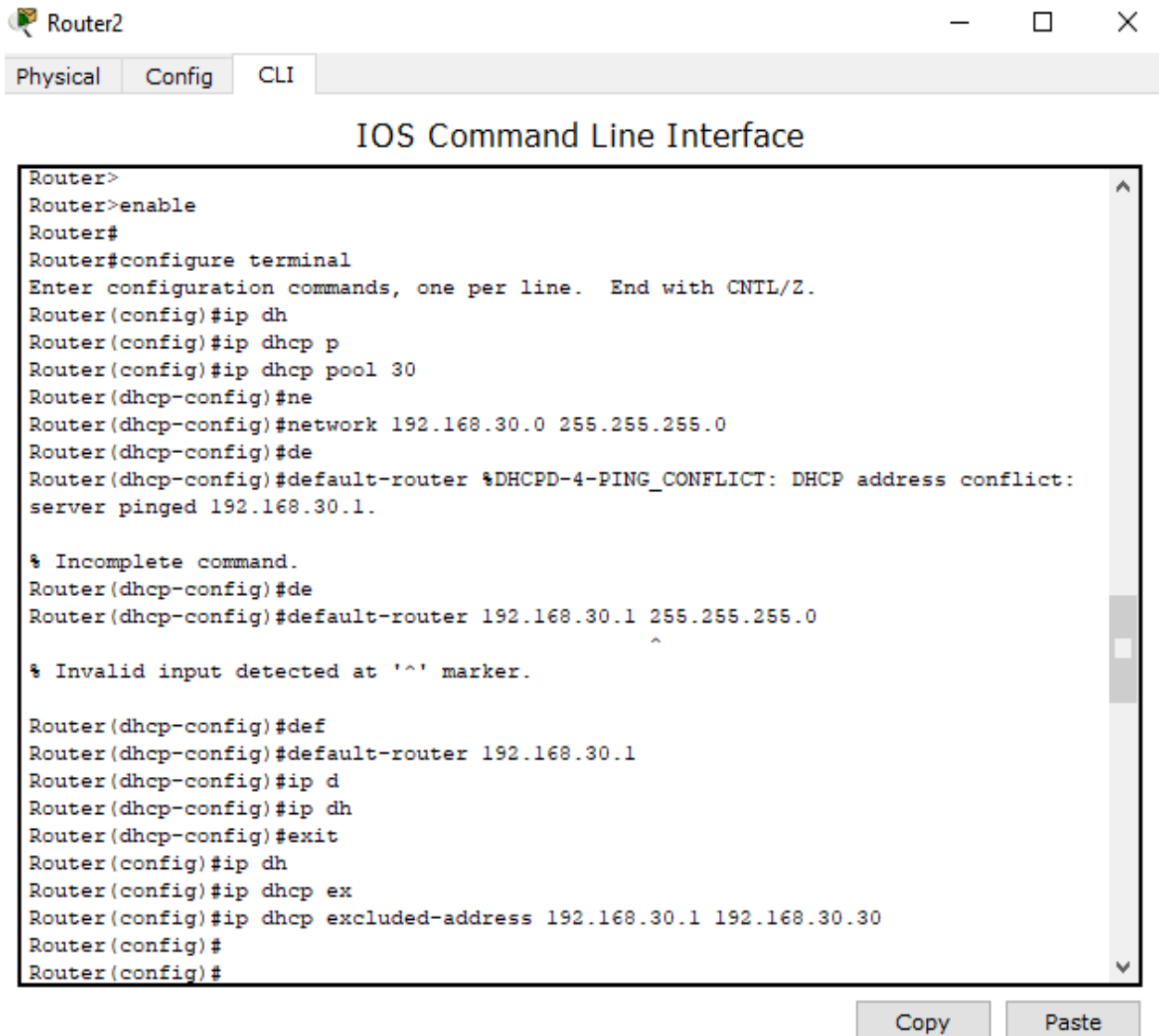
Topología de red



Configuración dirección IP DHCP pool 30 Router 2

Asignación de IP en default- Router 192.168.30.1

Exclusión de las direcciones con Excluded-address 192.168.30.1 - 192.168.30.30



```
Router2
Physical Config CLI
IOS Command Line Interface
Router>
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dh
Router(config)#ip dhcp p
Router(config)#ip dhcp pool 30
Router(dhcp-config)#ne
Router(dhcp-config)#network 192.168.30.0 255.255.255.0
Router(dhcp-config)#de
Router(dhcp-config)#default-router %DHCPD-4-PING_CONFLICT: DHCP address conflict:
server pinged 192.168.30.1.

% Incomplete command.
Router(dhcp-config)#de
Router(dhcp-config)#default-router 192.168.30.1 255.255.255.0
^
% Invalid input detected at '^' marker.

Router(dhcp-config)#def
Router(dhcp-config)#default-router 192.168.30.1
Router(dhcp-config)#ip d
Router(dhcp-config)#ip dh
Router(dhcp-config)#exit
Router(config)#ip dh
Router(config)#ip dhcp ex
Router(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Router(config)#
Router(config)#
```

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Activación de la interface FastEthernet 0/0.2

Encapsulation dot1Q

Asignación de IP 192.168.40.1 mascara de subred 255.255.255.0

Router2

Physical Config CLI

IOS Command Line Interface

```
Router(config-subif)#ip ad
Router(config-subif)#ip ad
      ^
% Invalid input detected at '^' marker.

Router(config-subif)#ip ad
Router(config-subif)#ip address 192.168.30.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/0.2
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.2, changed state
to up

Router(config-subif)#en
Router(config-subif)#encapsulation do
Router(config-subif)#encapsulation dot1Q 40
Router(config-subif)#ip add
Router(config-subif)#ip address 192.168.40.1 255.255.255.0
Router(config-subif)#
```

Router con0 is now available

Copy

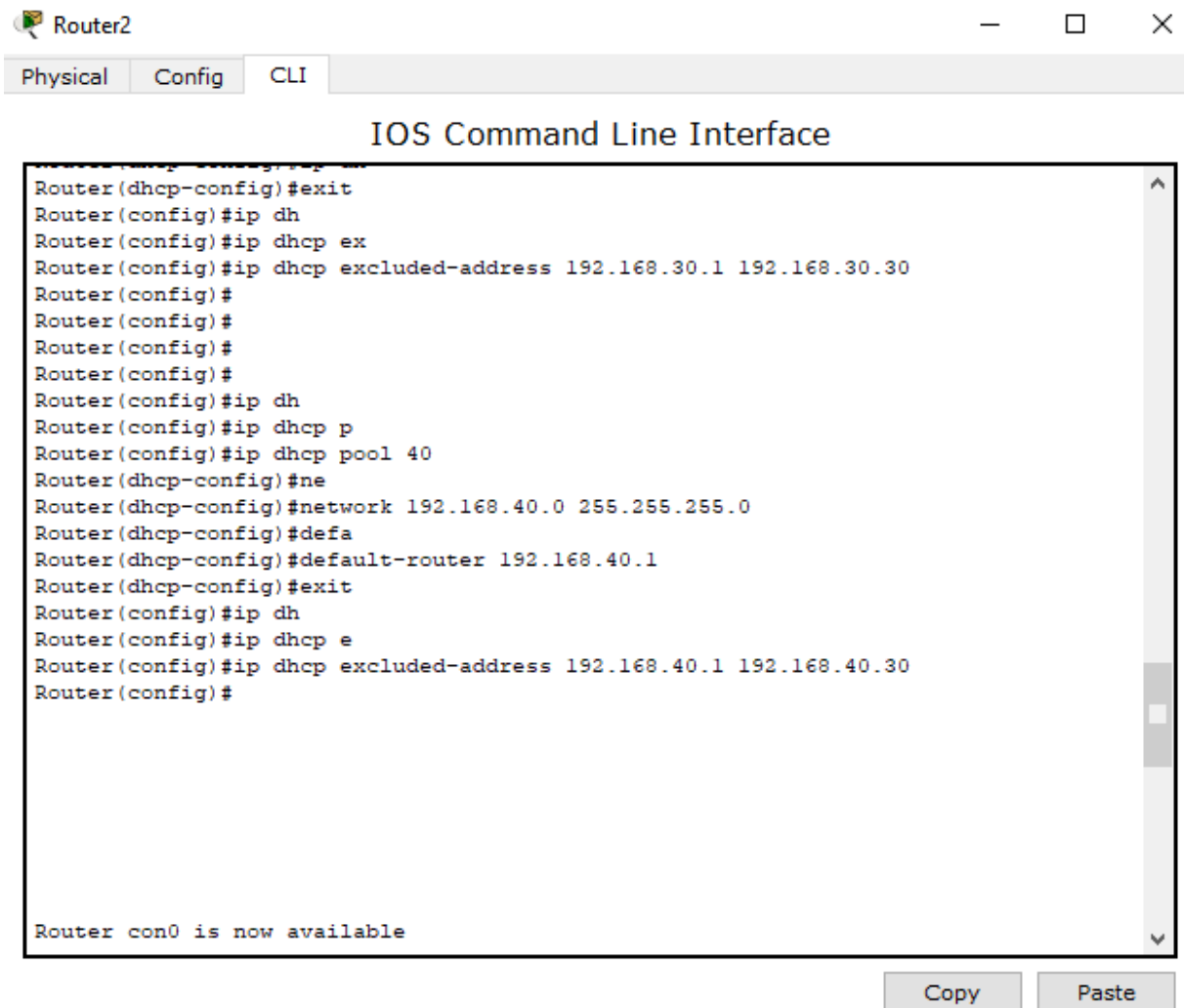
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Definición de la red en DHCP pool 40

IP 192.168.40.0 mascara de subred 255.255.255.0

Default- router 192.168.40.1

Exclusión de las direcciones 192.168.40.1 hasta la 192.168.40.30 con el comando **excluded-address**



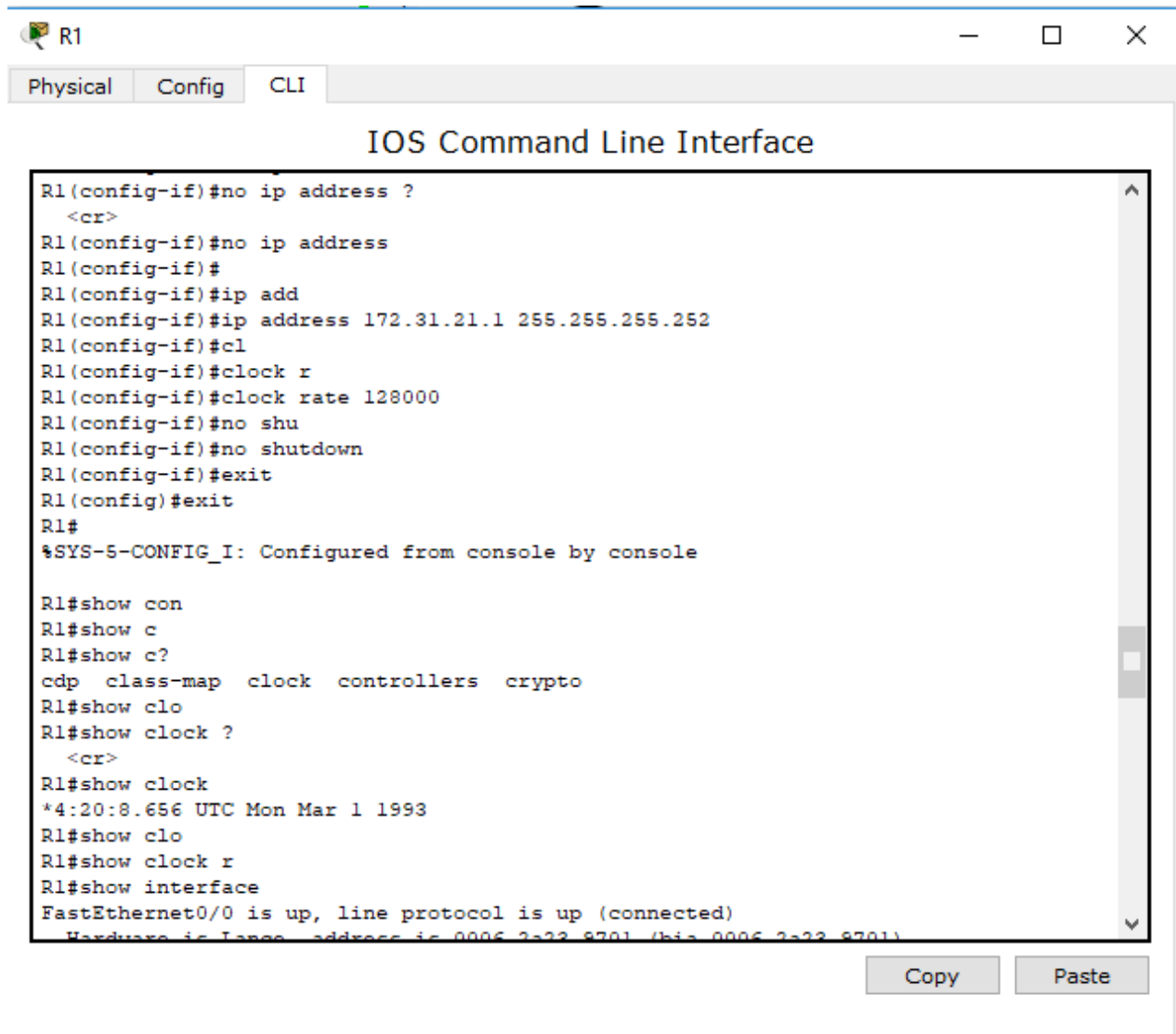
```
Router2
Physical Config CLI
IOS Command Line Interface
Router(dhcp-config)#exit
Router(config)#ip dhcp
Router(config)#ip dhcp ex
Router(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Router(config)#
Router(config)#
Router(config)#
Router(config)#ip dhcp
Router(config)#ip dhcp p
Router(config)#ip dhcp pool 40
Router(dhcp-config)#ne
Router(dhcp-config)#network 192.168.40.0 255.255.255.0
Router(dhcp-config)#defa
Router(dhcp-config)#default-router 192.168.40.1
Router(dhcp-config)#exit
Router(config)#ip dhcp
Router(config)#ip dhcp e
Router(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Router(config)#

Router con0 is now available
Copy Paste
```


Comando **NO IP ADDRESS** para eliminar una IP errónea asignada.
 Asignación IP en R1 - 172.31.21.1 mascara de subred 255.255.255.255

Asignación del **clock rate 128000**

Activación de la interface **no shutdown**

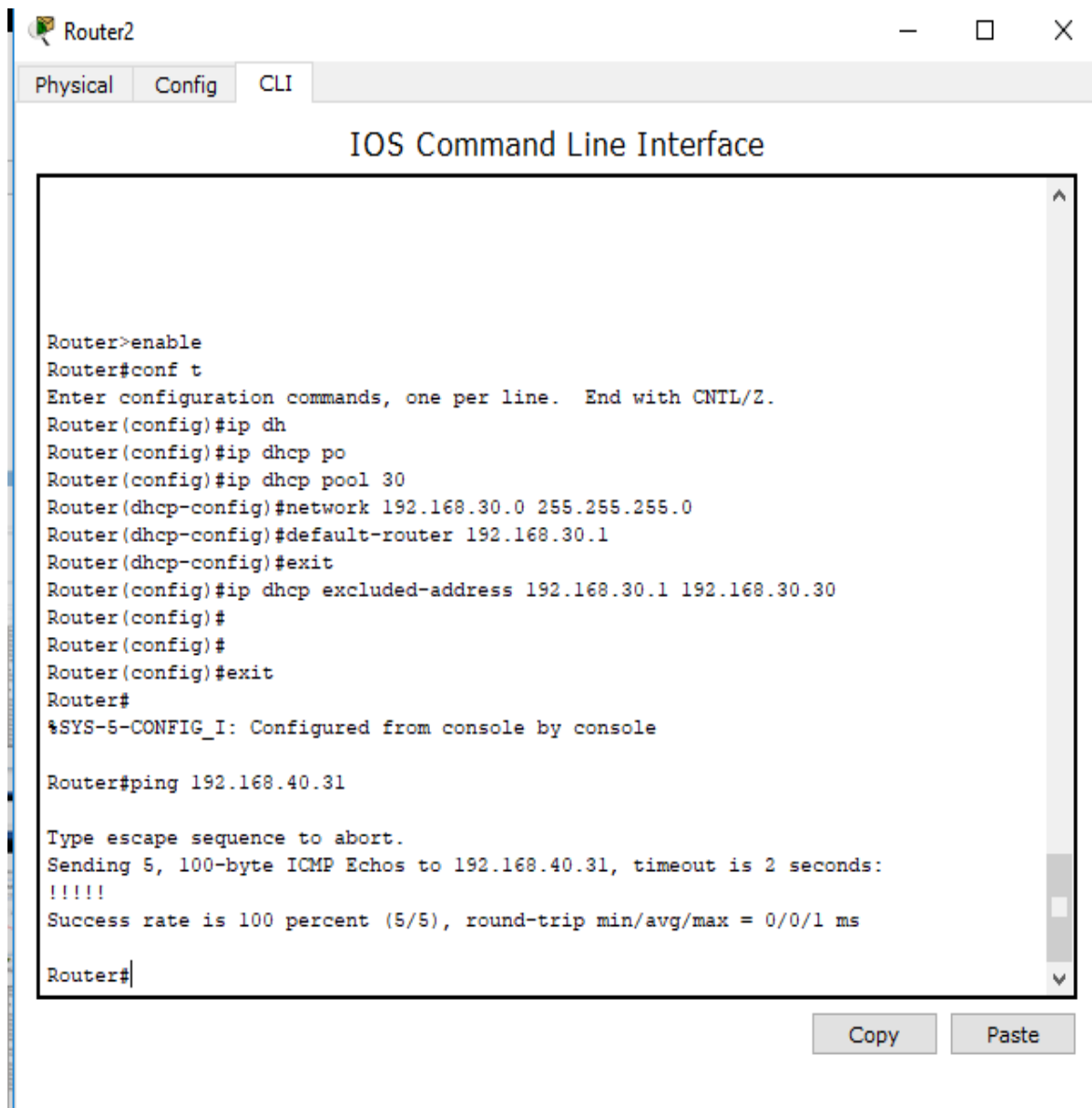


```

R1
Physical Config CLI
IOS Command Line Interface
R1(config-if)#no ip address ?
<cr>
R1(config-if)#no ip address
R1(config-if)#
R1(config-if)#ip add
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#cl
R1(config-if)#clock r
R1(config-if)#clock rate 128000
R1(config-if)#no shu
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show con
R1#show c
R1#show c?
cdp class-map clock controllers crypto
R1#show clo
R1#show clock ?
<cr>
R1#show clock
*4:20:8.656 UTC Mon Mar 1 1993
R1#show clo
R1#show clock r
R1#show interface
FastEthernet0/0 is up, line protocol is up (connected)
Hardware is Lange, address is 0006.2a22.8701 (bia 0006.2a22.8701)
Copy Paste
  
```

Prueba de conexión exitosa
Ping 192.168.40.31



```
Router2
Physical Config CLI
IOS Command Line Interface

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dh
Router(config)#ip dhcp po
Router(config)#ip dhcp pool 30
Router(dhcp-config)#network 192.168.30.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.30.1
Router(dhcp-config)#exit
Router(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Router(config)#
Router(config)#
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#ping 192.168.40.31

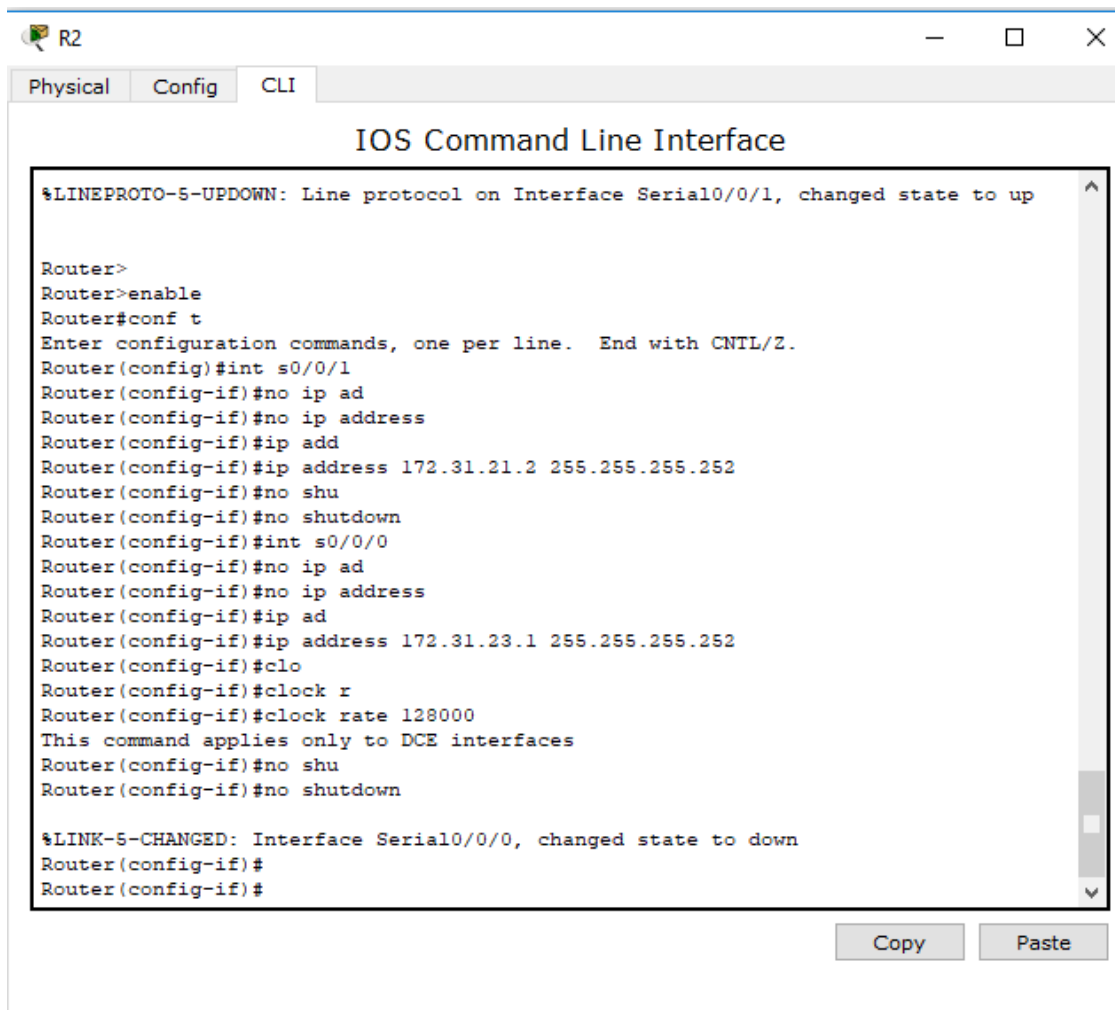
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.31, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#
```

Copy Paste

Eliminación de IP asignada por error bajo el comando **no ip address** en la interface serial s/0/0/1
 Asignación de la dirección IP en la interface serial s/0/0/1 con el comando **ip address 172.31.21.2**
 mascara de subred 255.255.255.255
 Activación de interface s/0/0/1 por medio del comando **no shutdown**
 Asignación del **clock rate 128000**

Asignación de la dirección IP en la interface serial s/0/0/0 con el comando **ip address 172.31.23.1**
 mascara de subred 255.255.255.255
 Activación de interface s/0/0/0 por medio del comando **no shutdown**
 Asignación del **clock rate 128000**



```

R2
Physical Config CLI
IOS Command Line Interface

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

Router>
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/1
Router(config-if)#no ip ad
Router(config-if)#no ip address
Router(config-if)#ip add
Router(config-if)#ip address 172.31.21.2 255.255.255.252
Router(config-if)#no shu
Router(config-if)#no shutdown
Router(config-if)#int s0/0/0
Router(config-if)#no ip ad
Router(config-if)#no ip address
Router(config-if)#ip ad
Router(config-if)#ip address 172.31.23.1 255.255.255.252
Router(config-if)#clo
Router(config-if)#clock r
Router(config-if)#clock rate 128000
This command applies only to DCE interfaces
Router(config-if)#no shu
Router(config-if)#no shutdown

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

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2. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

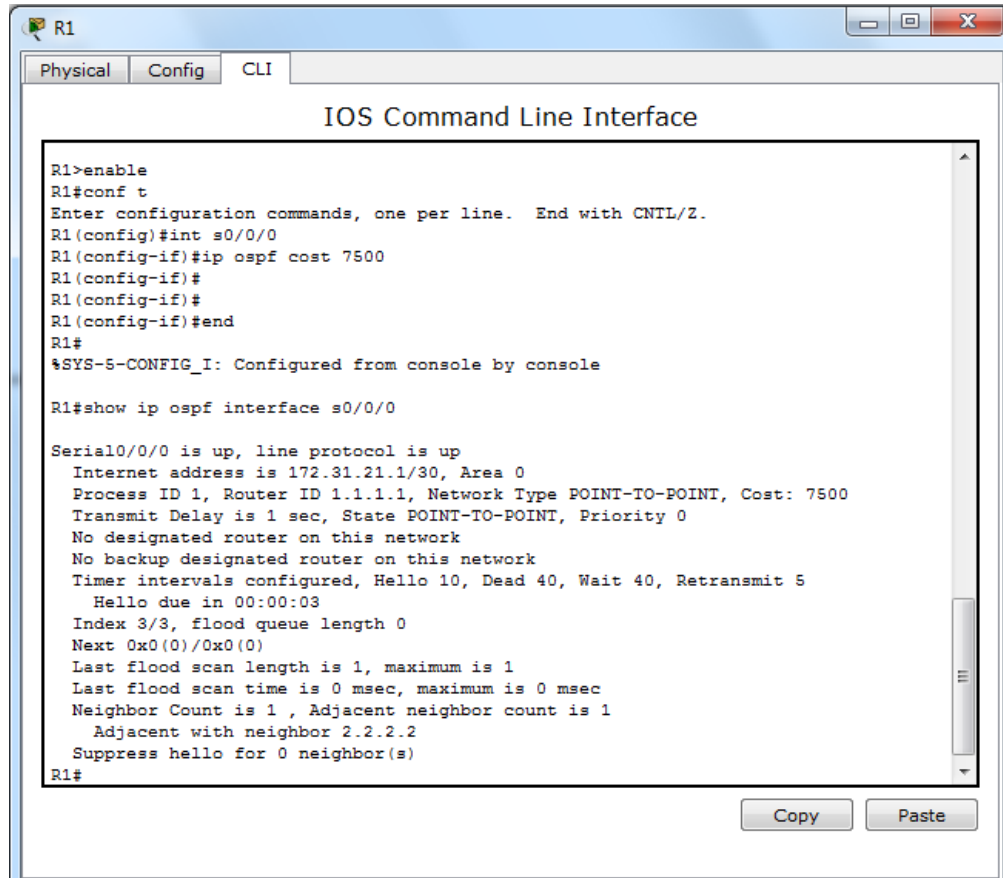
OSPFv2 área 0

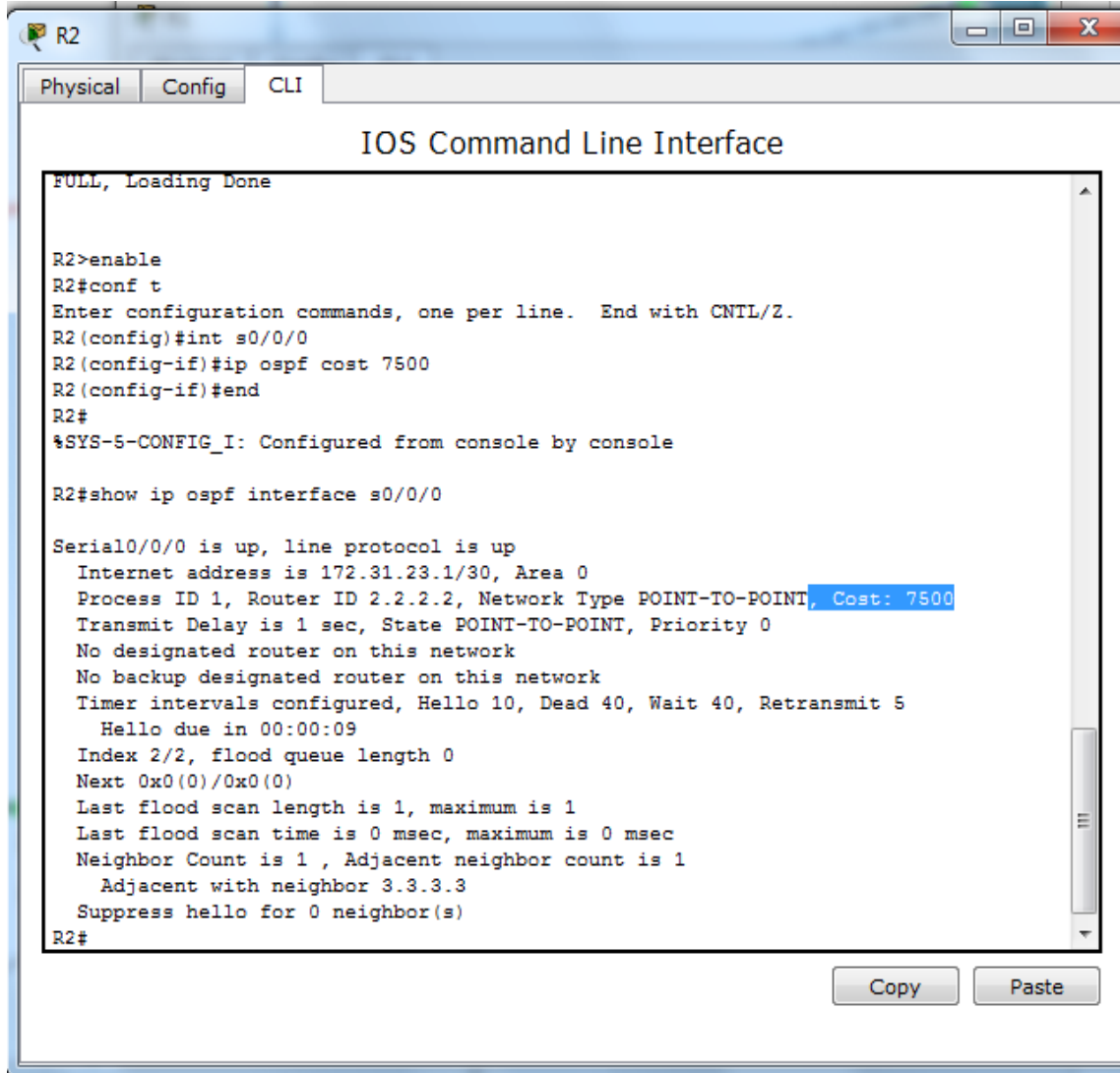
Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	2.2.2.2
Router ID R3	3.3.3.3
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	128 Kb/s
Ajustar el costo en la métrica de S0/0 a	7500

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

Ajustar el costo en la métrica de S0/0 a

Costo =7500



Confirmación de la asignación del costo en la métrica de S0/0 por medio del comando **show ip ospf**

```
R2
Physical Config CLI
IOS Command Line Interface
FULL, Loading Done

R2>enable
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int s0/0/0
R2(config-if)#ip ospf cost 7500
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip ospf interface s0/0/0

Serial0/0/0 is up, line protocol is up
 Internet address is 172.31.23.1/30, Area 0
 Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500
 Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
 No designated router on this network
 No backup designated router on this network
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
 Hello due in 00:00:09
 Index 2/2, flood queue length 0
 Next 0x0(0)/0x0(0)
 Last flood scan length is 1, maximum is 1
 Last flood scan time is 0 msec, maximum is 0 msec
 Neighbor Count is 1 , Adjacent neighbor count is 1
   Adjacent with neighbor 3.3.3.3
 Suppress hello for 0 neighbor(s)
R2#
```

Copy Paste



Configuración OSPFv2 área 0

```
R3
Physical Config CLI
IOS Command Line Interface
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
4 FastEthernet interface(s)
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

Press RETURN to get started!

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

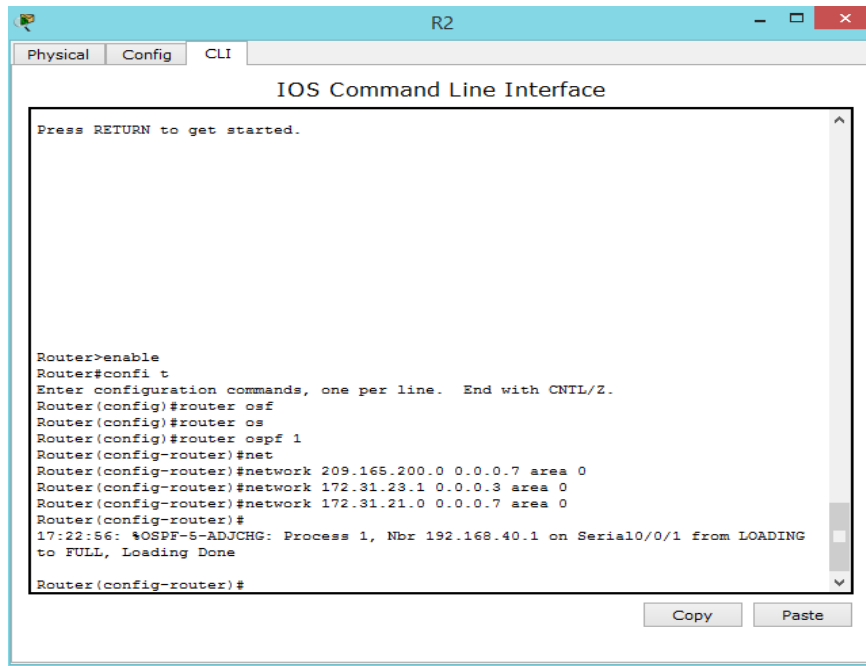
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#net
Router(config-router)#network 172.31.23.0 0.0.0.7 area 0
Router(config-router)#
00:58:35: %OSPF-5-ADJCHG: Process 1, Nbr 209.165.200.224 on Serial0/0/1 from
LOADING to FULL, Loading Done
```

```
R1
Physical Config CLI
IOS Command Line Interface
R1(config-router)#no network 172.31.21.0 0.0.0.7 area 0
R1(config-router)#
00:15:31: %OSPF-5-ADJCHG: Process 1, Nbr 209.165.200.224 on Serial0/0/0 from FULL
to DOWN, Neighbor Down: Interface down or detached

R1(config-router)#net
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#
00:15:46: %OSPF-5-ADJCHG: Process 1, Nbr 209.165.200.224 on Serial0/0/0 from
LOADING to FULL, Loading Done

R1(config-router)#do 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 192.168.40.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.30.0 0.0.0.255 area 0
    192.168.40.0 0.0.0.255 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.31.23.2      110           00:10:47
    192.168.40.1     110           00:00:10
    209.165.200.224 110           00:02:22
  Distance: (default is 110)
```

R2

Physical Config CLI

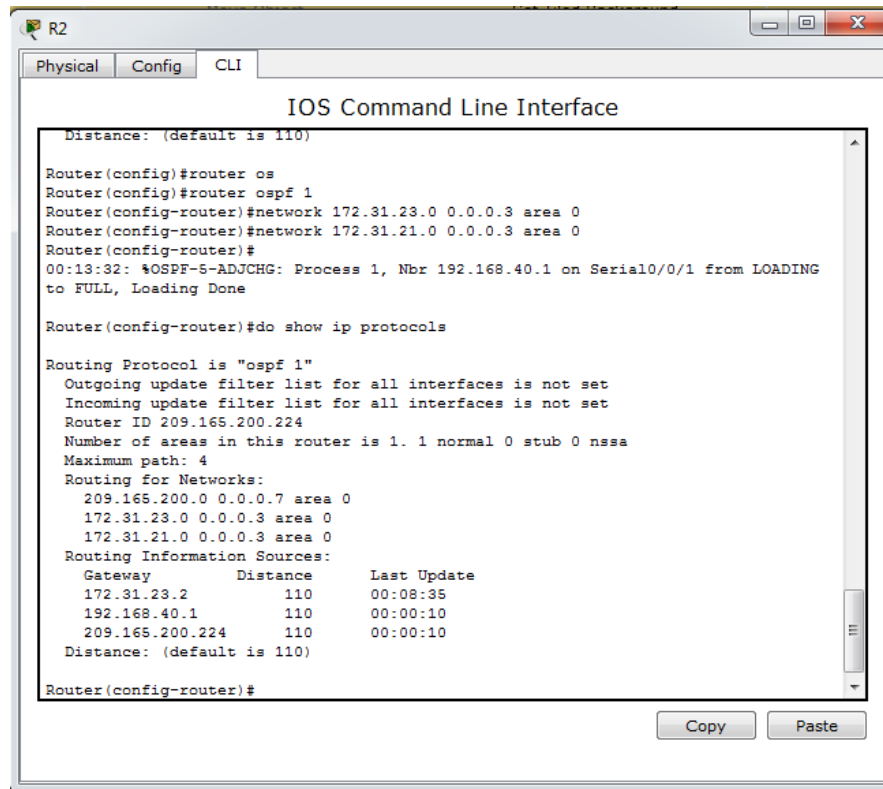
IOS Command Line Interface

```

Press RETURN to get started.

Router>enable
Router#confi t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf
Router(config)#router ospf 1
Router(config)#net
Router(config-router)#network 209.165.200.0 0.0.0.7 area 0
Router(config-router)#network 172.31.23.1 0.0.0.3 area 0
Router(config-router)#network 172.31.21.0 0.0.0.7 area 0
Router(config-router)#
17:22:56: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.40.1 on Serial0/0/1 from LOADING
to FULL, Loading Done
Router(config-router)#
    
```

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R2

Physical Config CLI

IOS Command Line Interface

```

Distance: (default is 110)

Router(config)#router ospf
Router(config)#router ospf 1
Router(config-router)#network 172.31.23.0 0.0.0.3 area 0
Router(config-router)#network 172.31.21.0 0.0.0.3 area 0
Router(config-router)#
00:13:32: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.40.1 on Serial0/0/1 from LOADING
to FULL, Loading Done

Router(config-router)#do show ip protocols

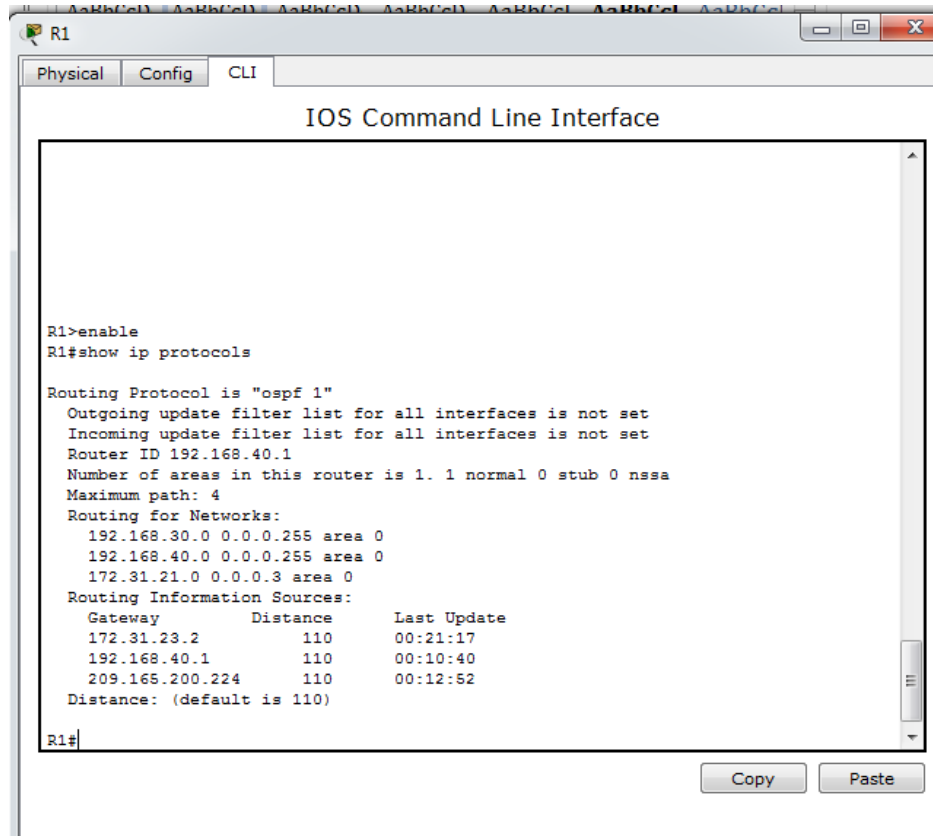
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 209.165.200.224
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    209.165.200.0 0.0.0.7 area 0
    172.31.23.0 0.0.0.3 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.31.23.2         110          00:08:35
    192.168.40.1       110          00:00:10
    209.165.200.224    110          00:00:10
  Distance: (default is 110)

Router(config-router)#
    
```

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Verificar información de OSPF

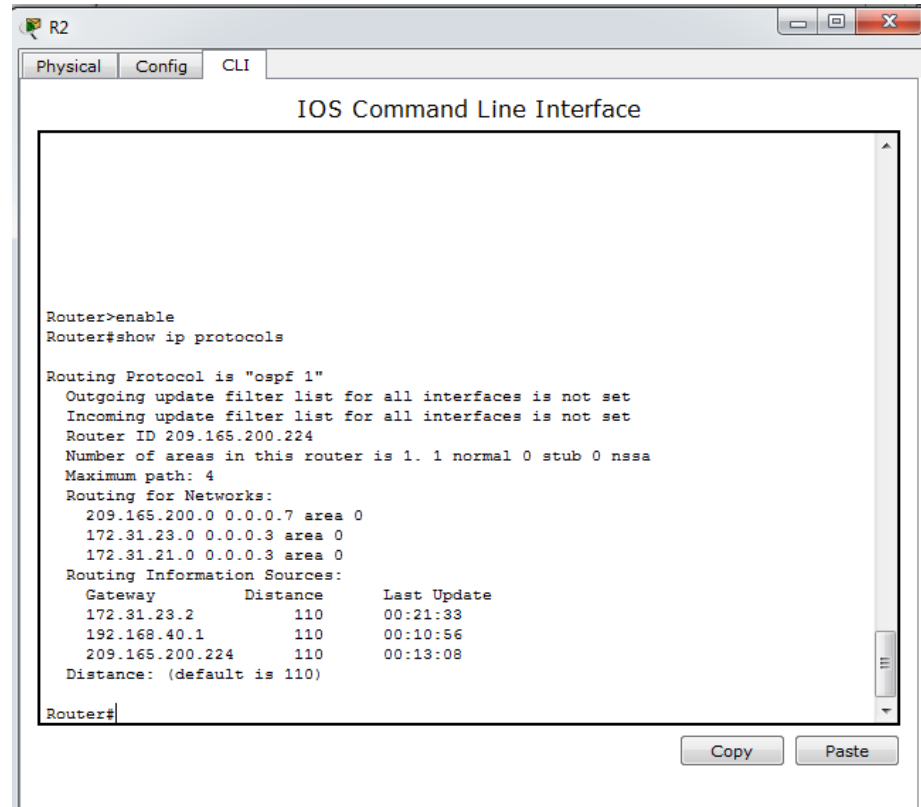
- Visualizar tablas de enrutamiento y routers conectados por OSPFv2



```
R1>enable
R1#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.168.40.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.30.0 0.0.0.255 area 0
    192.168.40.0 0.0.0.255 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.31.23.2          110          00:21:17
    192.168.40.1         110          00:10:40
    209.165.200.224     110          00:12:52
  Distance: (default is 110)

R1#
```



R2

Physical Config CLI

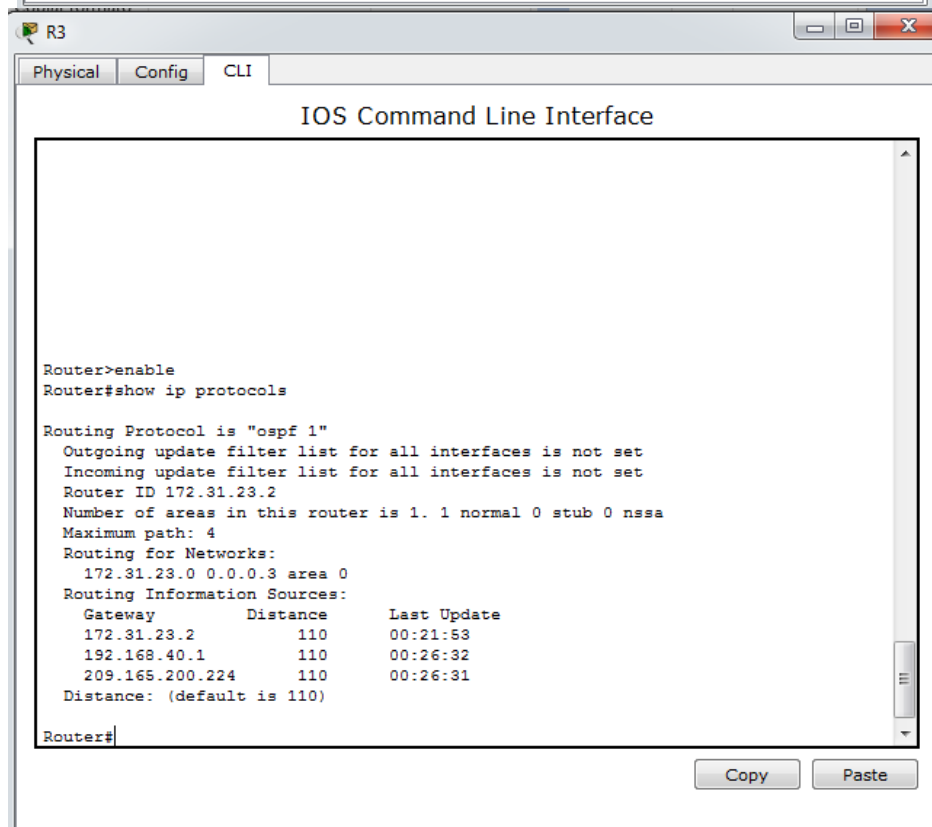
IOS Command Line Interface

```
Router>enable
Router#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 209.165.200.224
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    209.165.200.0 0.0.0.7 area 0
    172.31.23.0 0.0.0.3 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.31.23.2      110           00:21:33
    192.168.40.1     110           00:10:56
    209.165.200.224  110           00:13:08
  Distance: (default is 110)

Router#
```

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R3

Physical Config CLI

IOS Command Line Interface

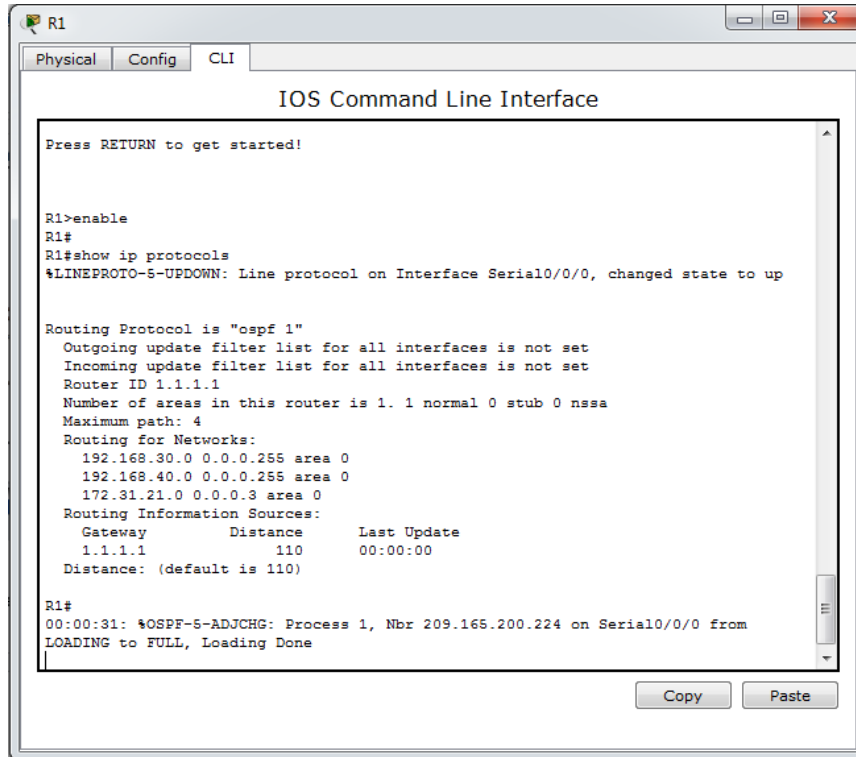
```
Router>enable
Router#show ip protocols

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 172.31.23.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.31.23.2      110           00:21:53
    192.168.40.1     110           00:26:32
    209.165.200.224  110           00:26:31
  Distance: (default is 110)

Router#
```

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Router ID R1



```
R1
Physical Config CLI
IOS Command Line Interface

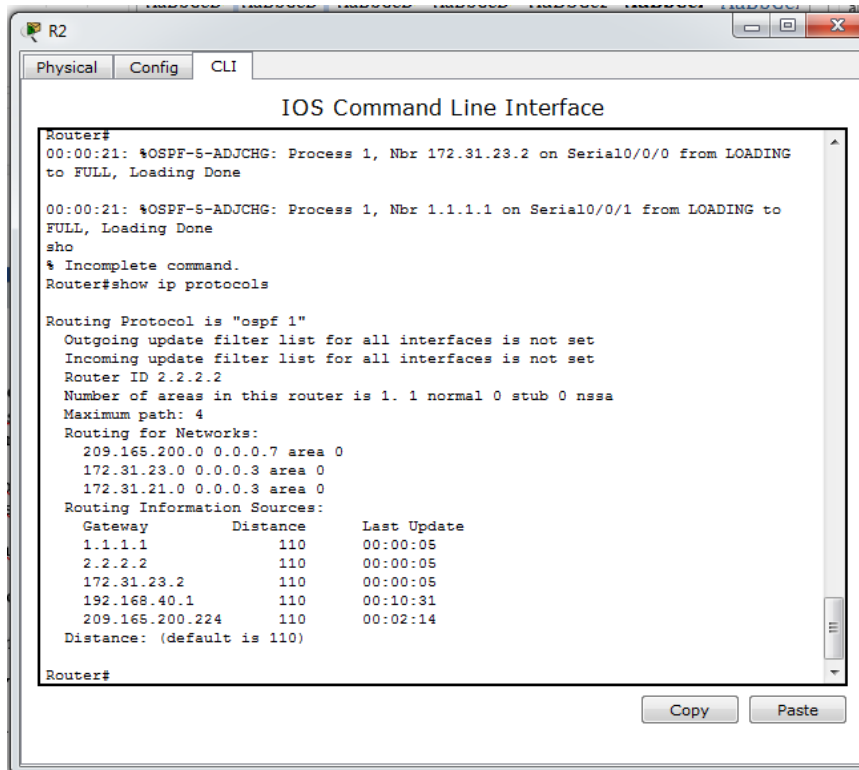
Press RETURN to get started!

R1>enable
R1#
R1#show ip protocols
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

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 1.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.30.0 0.0.0.255 area 0
    192.168.40.0 0.0.0.255 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:00:00
  Distance: (default is 110)

R1#
00:00:31: %OSPF-5-ADJCHG: Process 1, Nbr 209.165.200.224 on Serial0/0/0 from
LOADING to FULL, Loading Done
```

Router ID R2



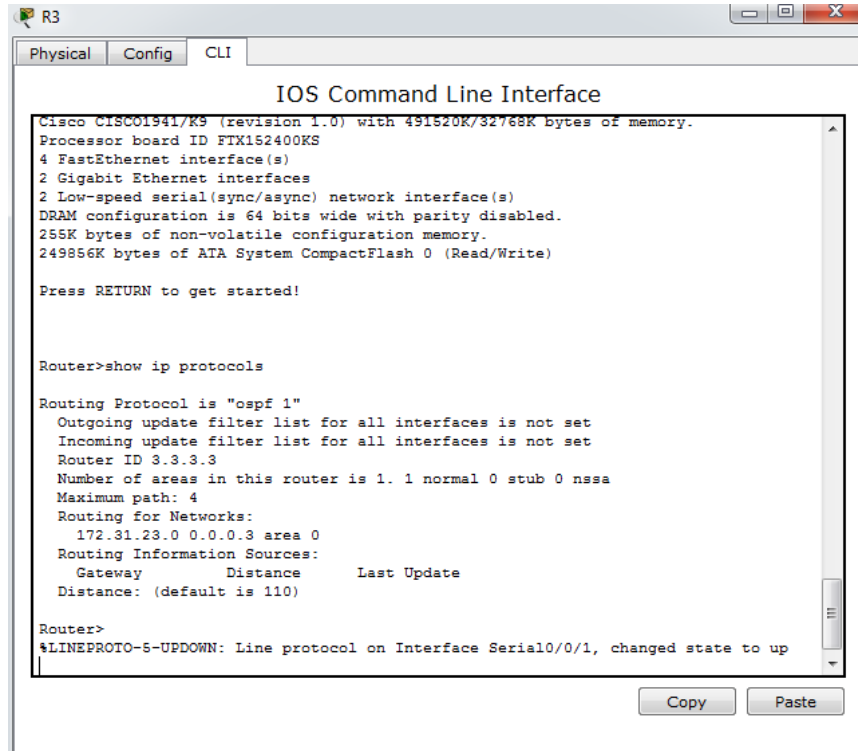
```
R2
Physical Config CLI
IOS Command Line Interface

Router#
00:00:21: %OSPF-5-ADJCHG: Process 1, Nbr 172.31.23.2 on Serial0/0/0 from LOADING
to FULL, Loading Done
00:00:21: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from LOADING to
FULL, Loading Done
sho
% Incomplete command.
Router#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:
    209.165.200.0 0.0.0.7 area 0
    172.31.23.0 0.0.0.3 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:00:05
    2.2.2.2          110          00:00:05
    172.31.23.2      110          00:00:05
    192.168.40.1     110          00:10:31
    209.165.200.224  110          00:02:14
  Distance: (default is 110)

Router#
```

Router ID R3



```

R3
Physical Config CLI
IOS Command Line Interface
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FX152400KS
4 FastEthernet interface(s)
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

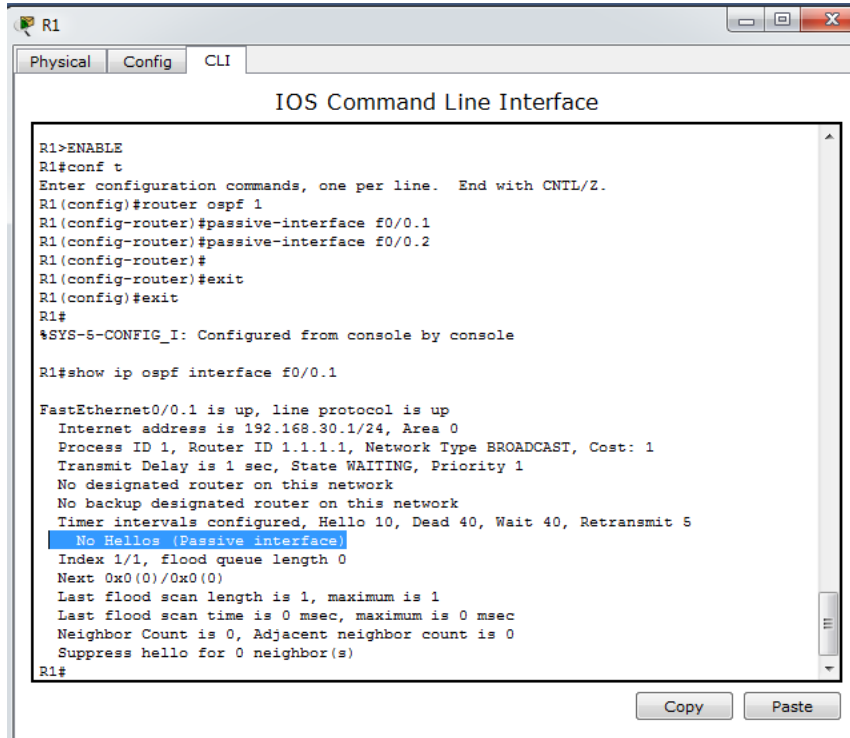
Press RETURN to get started!

Router>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 3.3.3.3
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 110)

Router>
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
Copy Paste
  
```

Interfaces pasivas



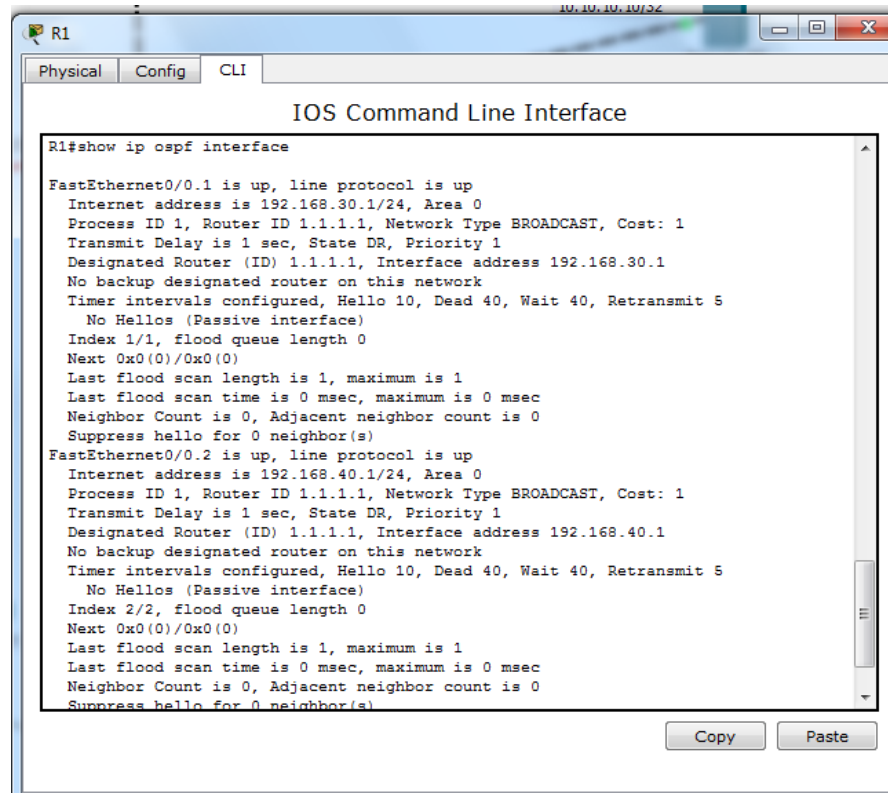
```

R1
Physical Config CLI
IOS Command Line Interface
R1>ENABLE
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#passive-interface f0/0.1
R1(config-router)#passive-interface f0/0.2
R1(config-router)#
R1(config-router)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show ip ospf interface f0/0.1

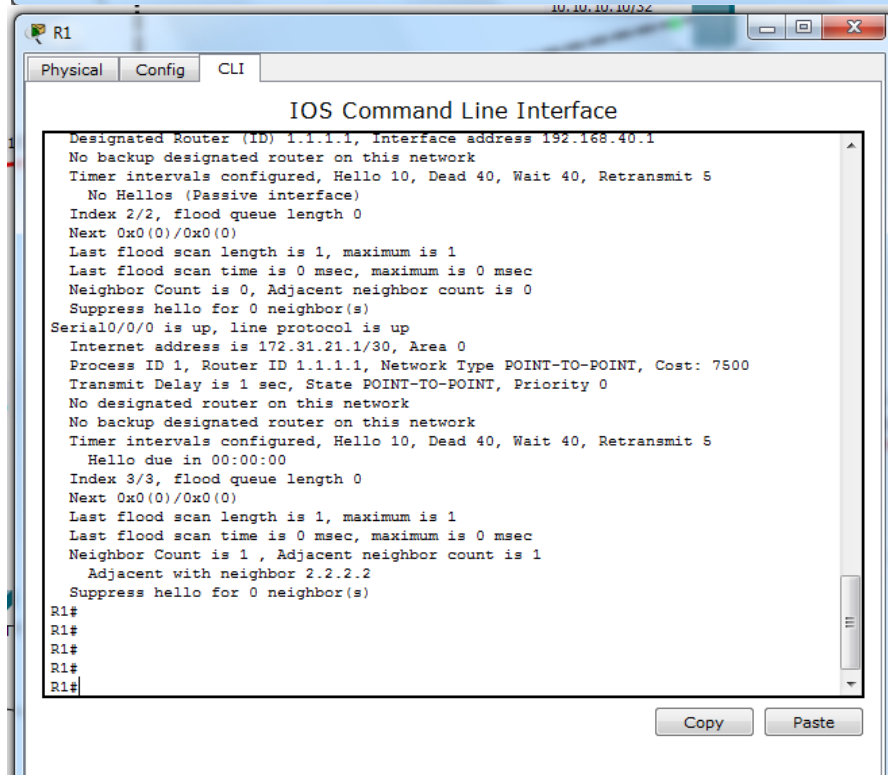
FastEthernet0/0.1 is up, line protocol is up
  Internet address is 192.168.30.1/24, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State WAITING, Priority 1
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  No Hellos (Passive interface)
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
R1#
Copy Paste
  
```

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



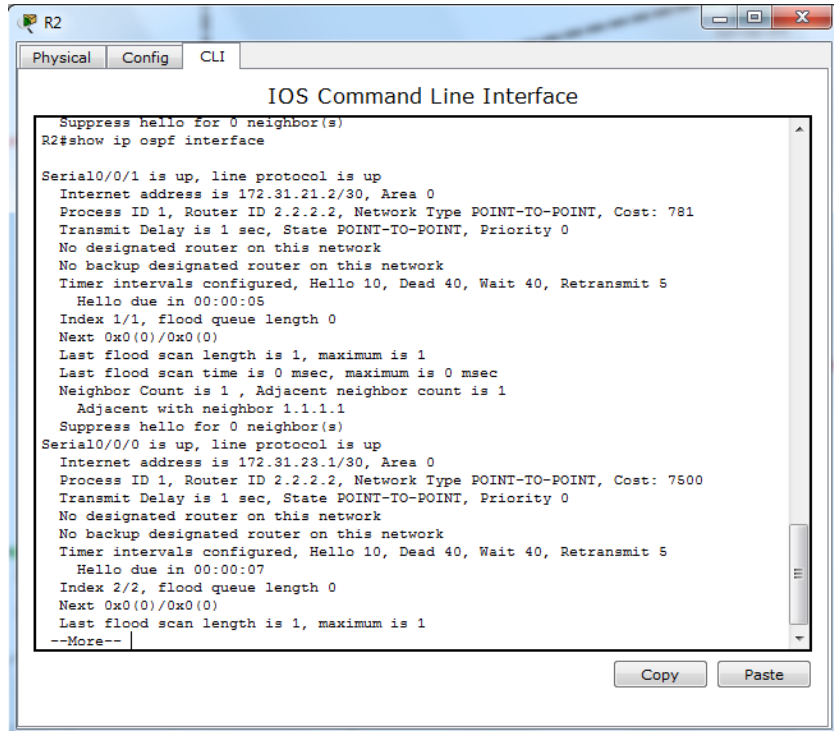
```

R1#show ip ospf interface
FastEthernet0/0.1 is up, line protocol is up
 Internet address is 192.168.30.1/24, Area 0
 Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
 Transmit Delay is 1 sec, State DR, Priority 1
 Designated Router (ID) 1.1.1.1, Interface address 192.168.30.1
 No backup designated router on this network
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  No Hellos (Passive interface)
 Index 1/1, flood queue length 0
 Next 0x0(0)/0x0(0)
 Last flood scan length is 1, maximum is 1
 Last flood scan time is 0 msec, maximum is 0 msec
 Neighbor Count is 0, Adjacent neighbor count is 0
 Suppress hello for 0 neighbor(s)
FastEthernet0/0.2 is up, line protocol is up
 Internet address is 192.168.40.1/24, Area 0
 Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
 Transmit Delay is 1 sec, State DR, Priority 1
 Designated Router (ID) 1.1.1.1, Interface address 192.168.40.1
 No backup designated router on this network
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  No Hellos (Passive interface)
 Index 2/2, flood queue length 0
 Next 0x0(0)/0x0(0)
 Last flood scan length is 1, maximum is 1
 Last flood scan time is 0 msec, maximum is 0 msec
 Neighbor Count is 0, Adjacent neighbor count is 0
 Suppress hello for 0 neighbor(s)
  
```



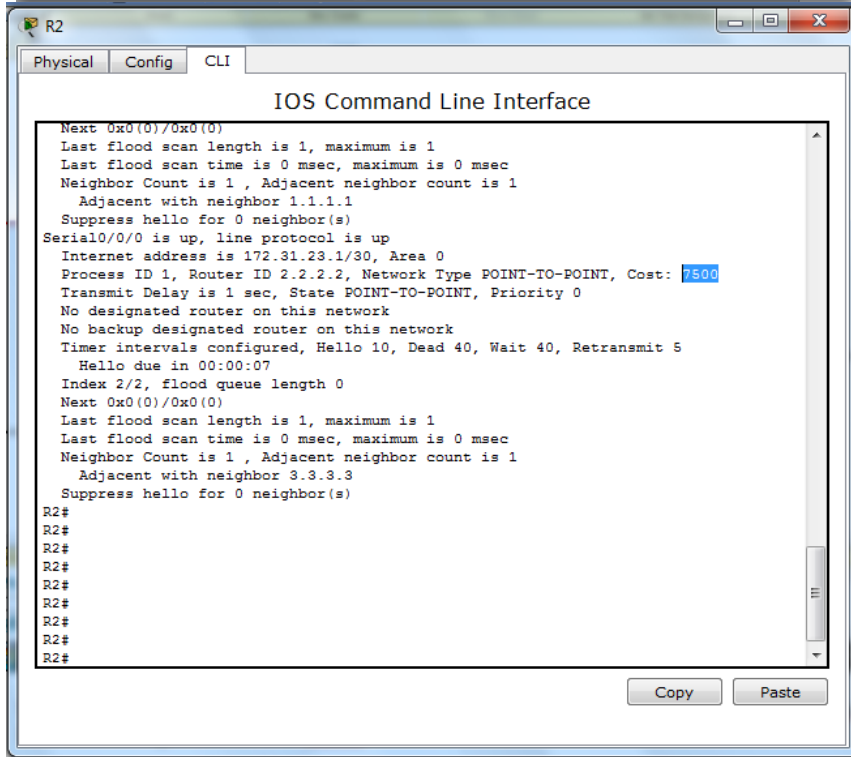
```

Designated Router (ID) 1.1.1.1, Interface address 192.168.40.1
 No backup designated router on this network
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  No Hellos (Passive interface)
 Index 2/2, flood queue length 0
 Next 0x0(0)/0x0(0)
 Last flood scan length is 1, maximum is 1
 Last flood scan time is 0 msec, maximum is 0 msec
 Neighbor Count is 0, Adjacent neighbor count is 0
 Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
 Internet address is 172.31.21.1/30, Area 0
 Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 7500
 Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
 No designated router on this network
 No backup designated router on this network
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 00:00:00
 Index 3/3, flood queue length 0
 Next 0x0(0)/0x0(0)
 Last flood scan length is 1, maximum is 1
 Last flood scan time is 0 msec, maximum is 0 msec
 Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 2.2.2.2
 Suppress hello for 0 neighbor(s)
R1#
R1#
R1#
R1#
  
```



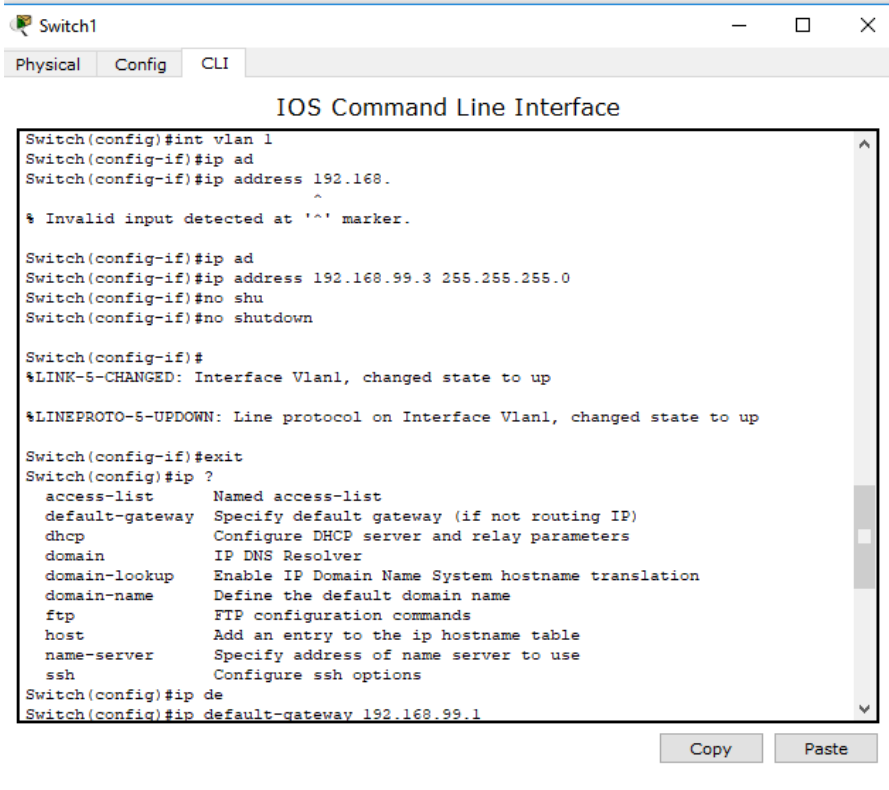
```
R2
Physical Config CLI
IOS Command Line Interface
Suppress hello for 0 neighbor(s)
R2#show ip ospf interface

Serial0/0/1 is up, line protocol is up
Internet address is 172.31.21.2/30, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 781
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:05
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 1.1.1.1
Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.23.1/30, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:07
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
--More--
Copy Paste
```



```
R2
Physical Config CLI
IOS Command Line Interface
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 1.1.1.1
Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.23.1/30, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:07
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 3.3.3.3
Suppress hello for 0 neighbor(s)
R2#
R2#
R2#
R2#
R2#
R2#
R2#
R2#
R2#
R2#
Copy Paste
```

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



```

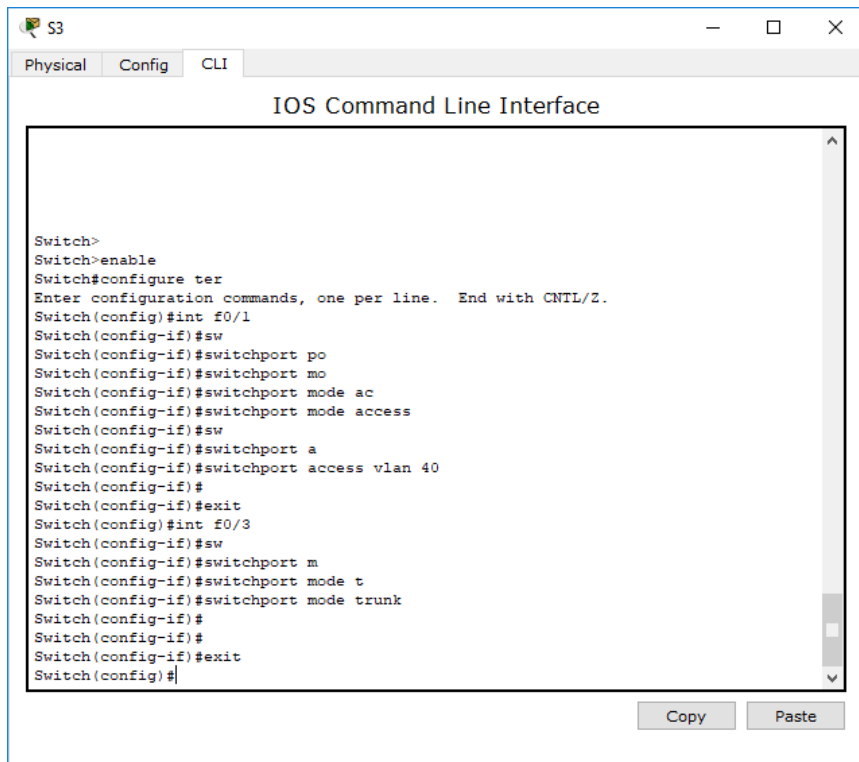
Switch1
Physical Config CLI
IOS Command Line Interface
Switch(config)#int vlan 1
Switch(config-if)#ip ad
Switch(config-if)#ip address 192.168.
^
% Invalid input detected at '^' marker.

Switch(config-if)#ip ad
Switch(config-if)#ip address 192.168.99.3 255.255.255.0
Switch(config-if)#no shu
Switch(config-if)#no shutdown

Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Switch(config-if)#exit
Switch(config)#ip ?
  access-list      Named access-list
  default-gateway  Specify default gateway (if not routing IP)
  dhcp             Configure DHCP server and relay parameters
  domain          IP DNS Resolver
  domain-lookup   Enable IP Domain Name System hostname translation
  domain-name     Define the default domain name
  ftp             FTP configuration commands
  host            Add an entry to the ip hostname table
  name-server     Specify address of name server to use
  ssh            Configure ssh options
Switch(config)#ip de
Switch(config)#ip default-gateway 192.168.99.1
Copy Paste
  
```



```

S3
Physical Config CLI
IOS Command Line Interface
Switch>
Switch>enable
Switch#configure ter
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int f0/1
Switch(config-if)#sw
Switch(config-if)#switchport po
Switch(config-if)#switchport mo
Switch(config-if)#switchport mode ac
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport a
Switch(config-if)#switchport access vlan 40
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#int f0/3
Switch(config-if)#sw
Switch(config-if)#switchport m
Switch(config-if)#switchport mode t
Switch(config-if)#switchport mode trunk
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#
Switch(config)#
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```



S3 Physical Config CLI

IOS Command Line Interface

```
Switch>enable
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 30
Switch(config-vlan)#name administracion
Switch(config-vlan)#vlan 40
Switch(config-vlan)#name mercadeo
Switch(config-vlan)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, 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, Gig0/1 Gig0/2
30 administracion	active	
40 mercadeo	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

Switch#

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Router2 Physical Config CLI

IOS Command Line Interface

```
% Configuring IP routing on a LAN subinterface is only allowed if that
subinterface is already configured as part of an IEEE 802.10, IEEE 802.1Q,
or ISL VLAN.

Router(config-subif)#en
Router(config-subif)#encapsulation d
Router(config-subif)#encapsulation dot1Q 30
Router(config-subif)#ip
Router(config-subif)#ip a
Router(config-subif)#ip a
Router(config-subif)#ip ad
Router(config-subif)#ip address 192.168.99.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/1
Router(config-if)#no shu
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

Router(config-if)#int 0/1
~
% Invalid input detected at '^' marker.

Router(config-if)#sho
Router(config-if)#shw
Router(config-if)#exit
Router(config)#in f0/1
```

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5. Asignar direcciones IP a los Switches acorde a los lineamientos.

S1

Physical Config CLI

IOS Command Line Interface

```

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>enable
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#int vlan 1
S1(config-if)#ip ad
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shu
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

S1(config-if)#exit
S1(config)#ip def
S1(config)#ip default-gateway 192.168.99.1
S1(config)#
    
```

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Switch1

Physical Config CLI

IOS Command Line Interface

```

Switch(config)#int vlan 1
Switch(config-if)#ip ad
Switch(config-if)#ip address 192.168.
^
% Invalid input detected at '^' marker.

Switch(config-if)#ip ad
Switch(config-if)#ip address 192.168.99.3 255.255.255.0
Switch(config-if)#no shu
Switch(config-if)#no shutdown

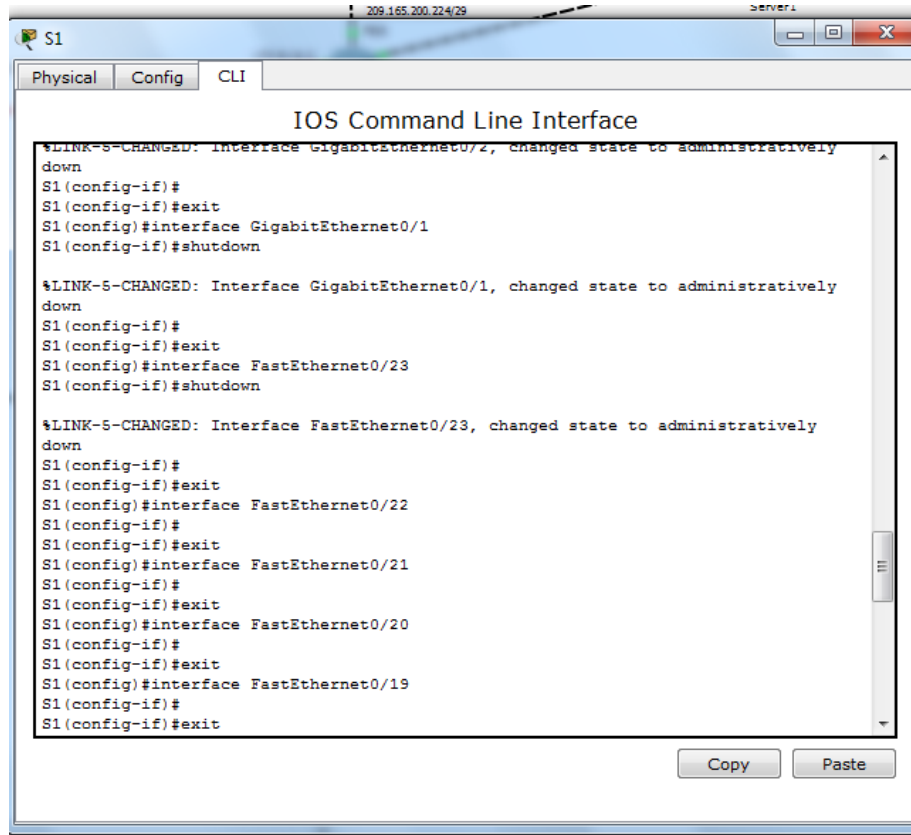
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Switch(config-if)#exit
Switch(config)#ip ?
  access-list      Named access-list
  default-gateway  Specify default gateway (if not routing IP)
  dhcp             Configure DHCP server and relay parameters
  domain          IP DNS Resolver
  domain-lookup   Enable IP Domain Name System hostname translation
  domain-name     Define the default domain name
  ftp             FTP configuration commands
  host            Add an entry to the ip hostname table
  name-server     Specify address of name server to use
  ssh            Configure ssh options

Switch(config)#ip de
Switch(config)#ip default-gateway 192.168.99.1
    
```

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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.
-----------------------------------	---



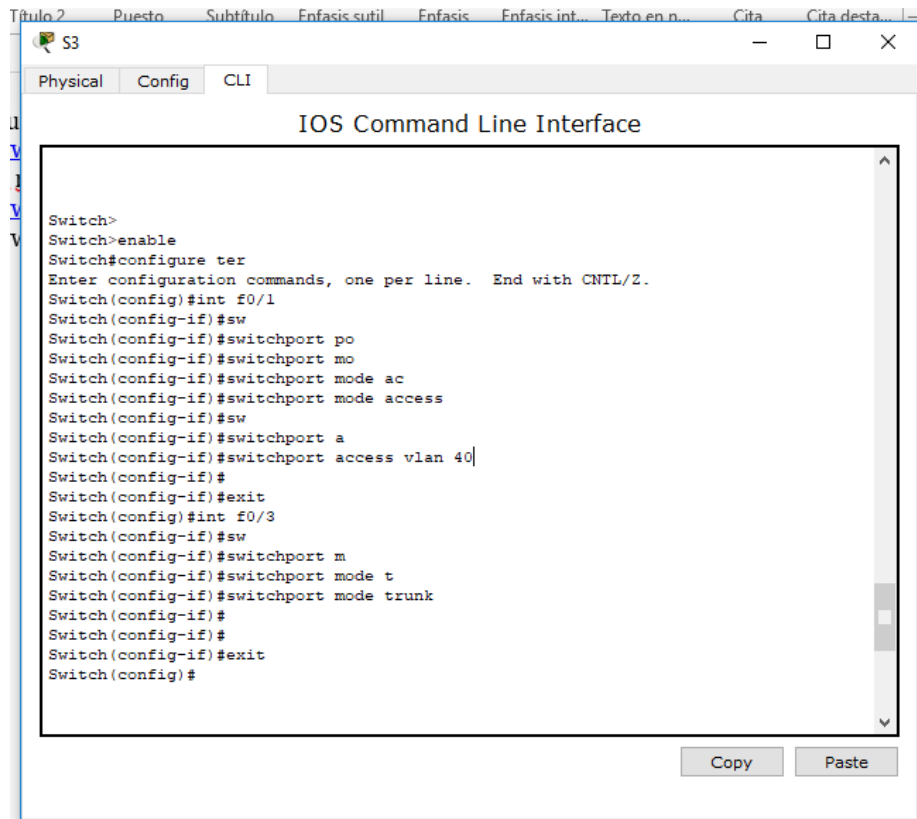
Configurar DHCP pool para VLAN 40

Name: MERCADEO
DNS-Server: 10.10.10.11
Domain-Name: ccna-unad.com
Establecer default gateway.

```
Router2
Physical Config CLI
IOS Command Line Interface

Router>
Router>enable
Router#confi t
Enter configuration commands, one per line. End with CNIL/Z.
Router(config)#ip dhcp pool ADMINISTRACION
Router(dhcp-config)#network 192.168.30.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.30.1
Router(dhcp-config)#DNS
Router(dhcp-config)#DNS-server 10.10.10.11
Router(dhcp-config)#do
Router(dhcp-config)#dom
Router(dhcp-config)#?
  default-router  Default routers
  dns-server      Set name server
  exit            Exit from DHCP pool configuration mode
  network        Network number and mask
  no             Negate a command or set its defaults
  option         Raw DHCP options
Router(dhcp-config)#exit
Router(config)#?
Configure commands:
  aaa            Authentication, Authorization and Accounting.
  access-list    Add an access list entry
  banner         Define a login banner
  boot          Modify system boot parameters
  cdp           Global CDP configuration subcommands
  class-map     Configure Class Map
  clock         Configure time-of-day clock
  config-register Define the configuration register
```

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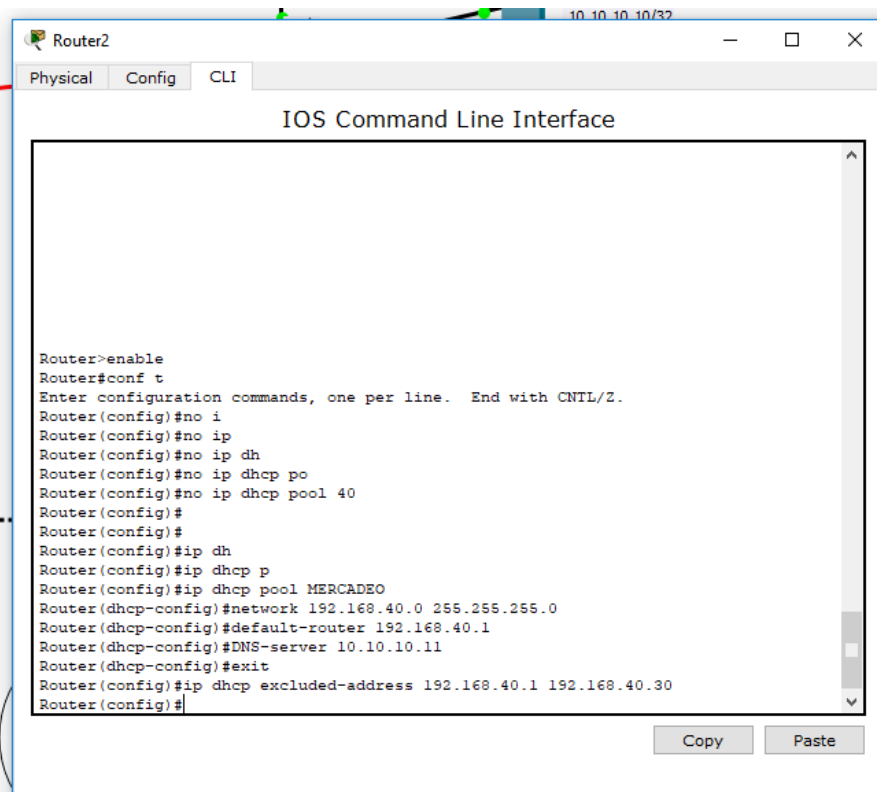


Physical Config CLI

IOS Command Line Interface

```
Switch>
Switch>enable
Switch#configure ter
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int f0/1
Switch(config-if)#sw
Switch(config-if)#switchport po
Switch(config-if)#switchport mo
Switch(config-if)#switchport mode ac
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport a
Switch(config-if)#switchport access vlan 40
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#int f0/3
Switch(config-if)#sw
Switch(config-if)#switchport m
Switch(config-if)#switchport mode t
Switch(config-if)#switchport mode trunk
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#
```

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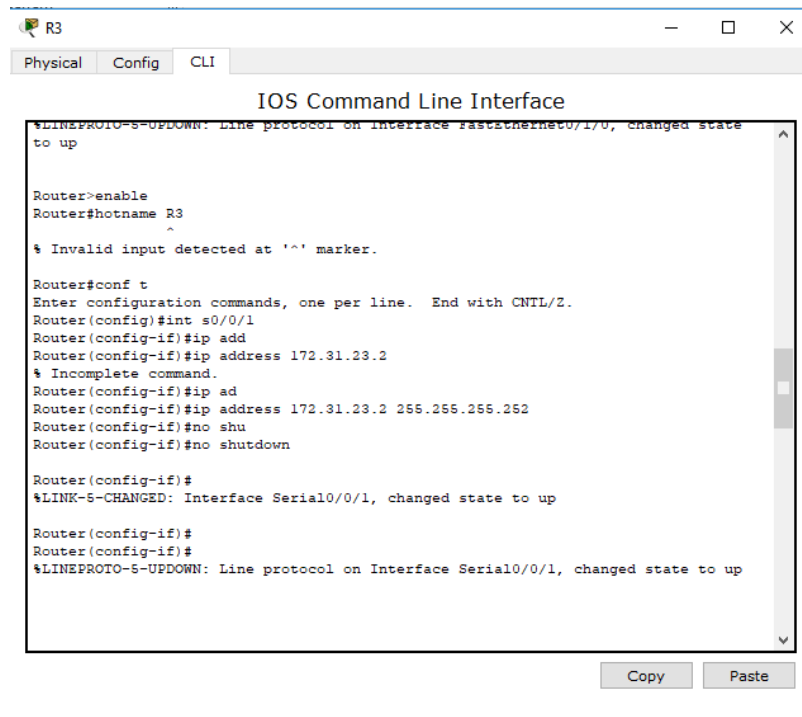


Physical Config CLI

IOS Command Line Interface

```
Router2>enable
Router2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router2(config)#no i
Router2(config)#no ip
Router2(config)#no ip dh
Router2(config)#no ip dhcp po
Router2(config)#no ip dhcp pool 40
Router2(config)#
Router2(config)#
Router2(config)#ip dh
Router2(config)#ip dhcp p
Router2(config)#ip dhcp pool MERCADEO
Router2(dhcp-config)#network 192.168.40.0 255.255.255.0
Router2(dhcp-config)#default-router 192.168.40.1
Router2(dhcp-config)#DNS-server 10.10.10.11
Router2(dhcp-config)#exit
Router2(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Router2(config)#
```

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```

R3
Physical Config CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on interface FastEthernet0/1/0, changed state to up

Router>enable
Router#hostname R3
^
% Invalid input detected at '^' marker.

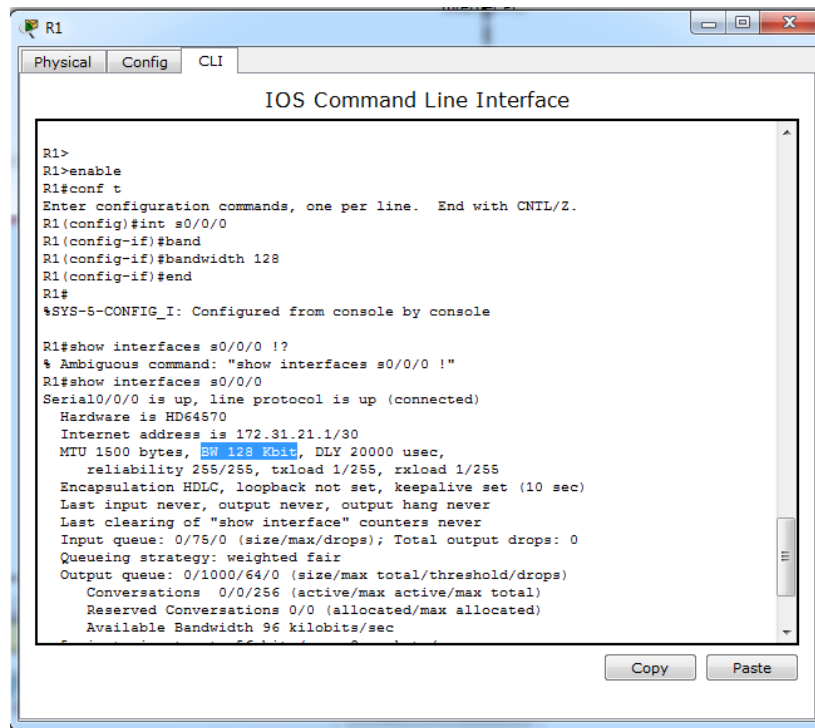
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/1
Router(config-if)#ip add
Router(config-if)#ip address 172.31.23.2
% Incomplete command.
Router(config-if)#ip ad
Router(config-if)#ip address 172.31.23.2 255.255.255.252
Router(config-if)#no shu
Router(config-if)#no shutdown

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

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

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```

Interface seriales en 128



```

R1
Physical Config CLI
IOS Command Line Interface

R1>
R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int s0/0/0
R1(config-if)#band
R1(config-if)#bandwidth 128
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show interfaces s0/0/0 !?
% Ambiguous command: "show interfaces s0/0/0 !"
R1#show interfaces s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 172.31.21.1/30
  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
  
```

```

R2
Physical Config CLI
IOS Command Line Interface
Router(config-if)#bandwidth 128
Router(config-if)#
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show 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 62 bits/sec, 0 packets/sec
5 minute output rate 62 bits/sec, 0 packets/sec
 380 packets input, 25908 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
 377 packets output, 25844 bytes, 0 underruns
 0 output errors, 0 collisions, 1 interface resets
 0 output buffer failures, 0 output buffers swapped out
--More--
Copy Paste

```

```

R2
Physical Config CLI
IOS Command Line Interface
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
 377 packets output, 25844 bytes, 0 underruns
 0 output errors, 0 collisions, 1 interface resets
 0 output buffer failures, 0 output buffers swapped out
 0 carrier transitions

Router#show interfaces s0/0/1
Serial0/0/1 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 59 bits/sec, 0 packets/sec
5 minute output rate 63 bits/sec, 0 packets/sec
 390 packets input, 26644 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
 384 packets output, 26380 bytes, 0 underruns
 0 output errors, 0 collisions, 1 interface resets
 0 output buffer failures, 0 output buffers swapped out
--More--
Copy Paste

```

```

R3
Physical Config CLI
IOS Command Line Interface
Router(config-if)#bandwidth 128
Router(config-if)#
Router(config-if)#end
Router#
*SYS-S-CONFIG_I: Configured from console by console

Router#show interfaces s0/0/1
Serial0/0/1 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 56 bits/sec, 0 packets/sec
5 minute output rate 56 bits/sec, 0 packets/sec
416 packets input, 28588 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
409 packets output, 27892 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
--More--
Copy Paste
    
```

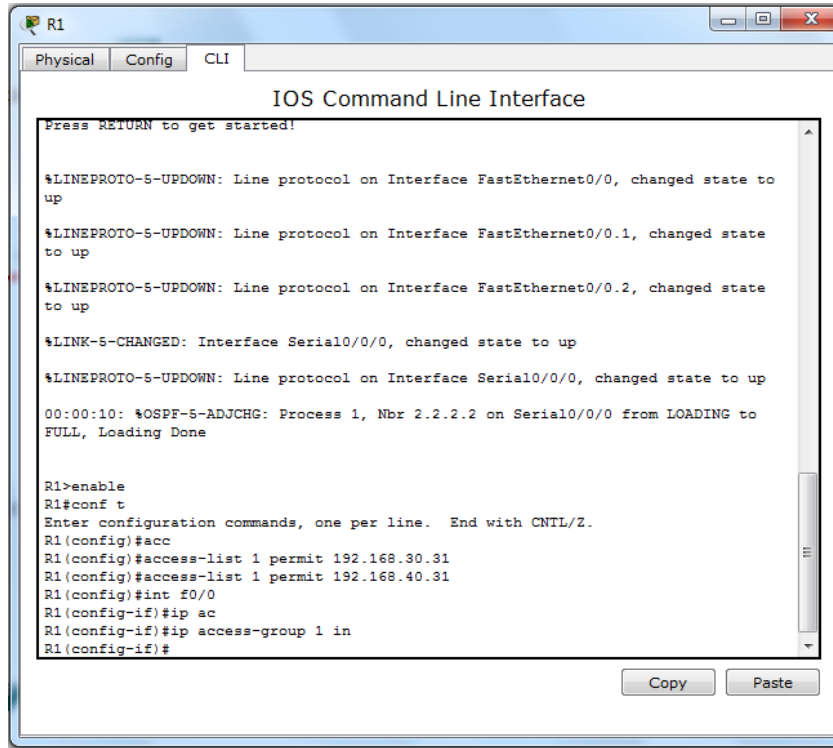
10. Configurar NAT en R2 para permitir que los host puedan salir a internet

```

R2
Physical Config CLI
IOS Command Line Interface
Press RETURN to get started.

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#acc
Router(config)#access-list 1 per
Router(config)#access-list 1 permit 172.31.21.0 0.0.0.3
Router(config)#ip nat pu
Router(config)#ip nat po
Router(config)#ip nat pool p
Router(config)#ip nat pool pu
Router(config)#ip nat pool publi
Router(config)#ip nat pool public_acces 209.165.200.242 209.165.200.254 netmask
255.255.255.224
Router(config)#ip nat inside source list 1 pool public_acces
Router(config)#
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```


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.

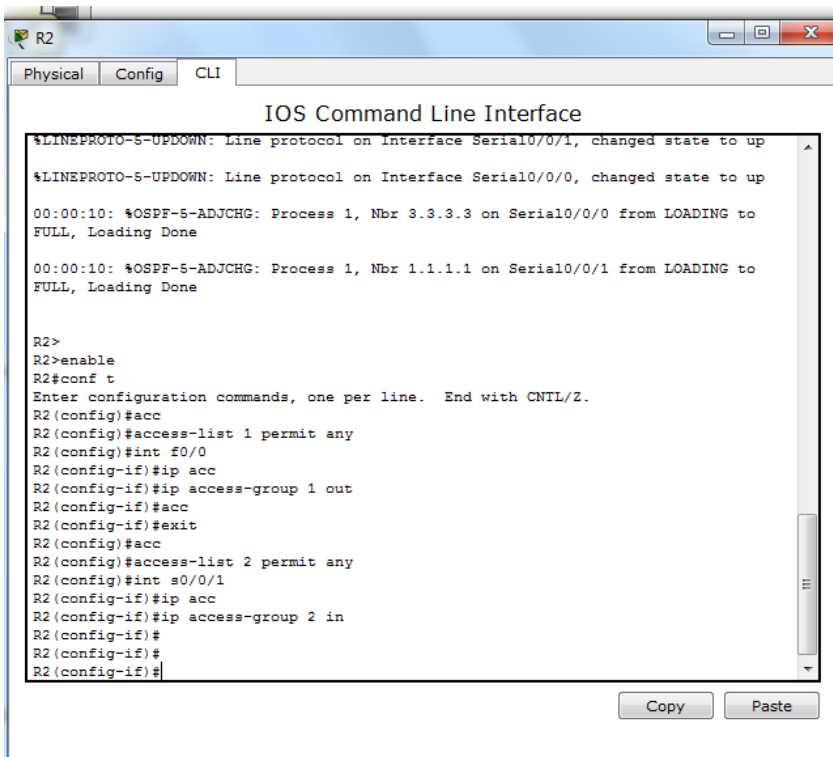


```

R1
Physical Config CLI
IOS Command Line Interface
Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.2, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0 from LOADING to FULL, Loading Done

R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#acc
R1(config)#access-list 1 permit 192.168.30.31
R1(config)#access-list 1 permit 192.168.40.31
R1(config)#int f0/0
R1(config-if)#ip ac
R1(config-if)#ip access-group 1 in
R1(config-if)#
  
```

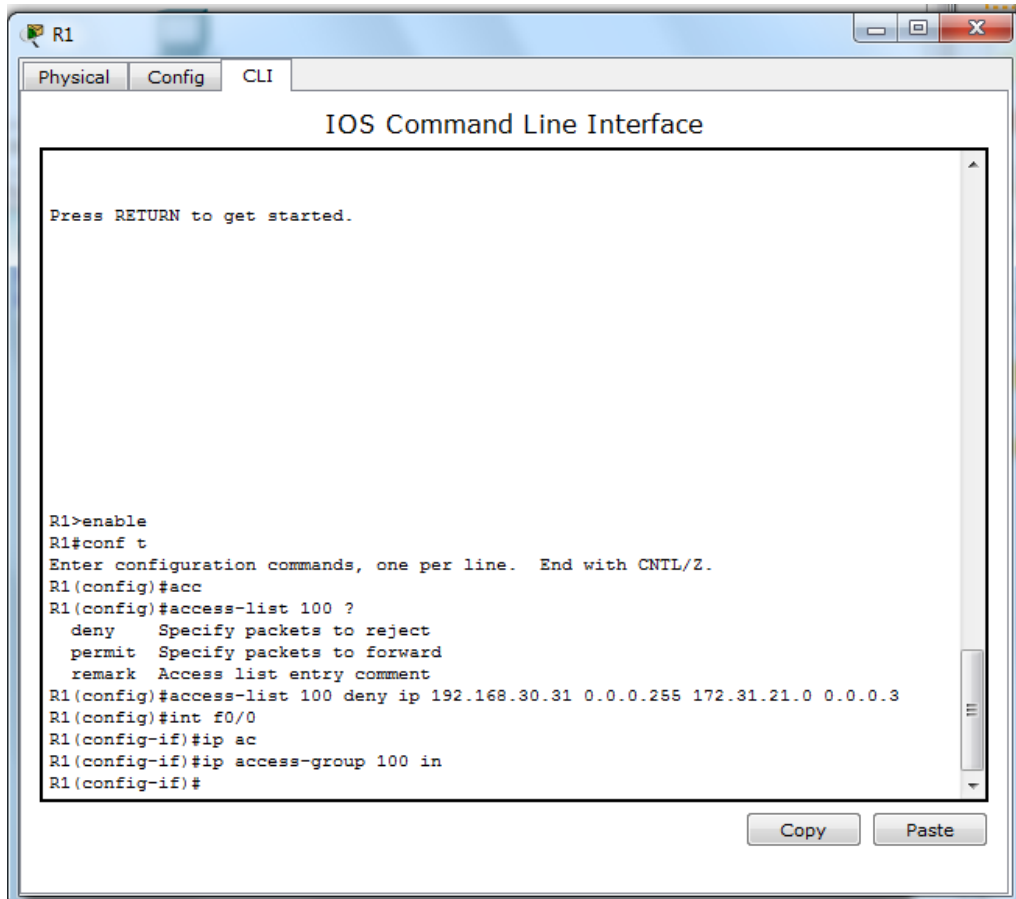


```

R2
Physical Config CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on Serial0/0/0 from LOADING to FULL, Loading Done
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from LOADING to FULL, Loading Done

R2>
R2>enable
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#acc
R2(config)#access-list 1 permit any
R2(config)#int f0/0
R2(config-if)#ip acc
R2(config-if)#ip access-group 1 out
R2(config-if)#acc
R2(config-if)#exit
R2(config)#acc
R2(config)#access-list 2 permit any
R2(config)#int s0/0/1
R2(config-if)#ip acc
R2(config-if)#ip access-group 2 in
R2(config-if)#
R2(config-if)#
R2(config-if)#
  
```

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.



```

R1
Physical Config CLI
IOS Command Line Interface

Press RETURN to get started.

R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#acc
R1(config)#access-list 100 ?
  deny    Specify packets to reject
  permit  Specify packets to forward
  remark  Access list entry comment
R1(config)#access-list 100 deny ip 192.168.30.31 0.0.0.255 172.31.21.0 0.0.0.3
R1(config)#int f0/0
R1(config-if)#ip ac
R1(config-if)#ip access-group 100 in
R1(config-if)#
  
```




ANEXOS

Desarrollo de Prueba de habilidades practicas en Packet Tracer

<https://drive.google.com/file/d/1wIw7m015un0G3IsBhR066CmZSZtuGsI9/view?usp=sharing>

CONCLUSIONES

Con la realización de esta práctica se gana experiencia y conocimiento al momento de configurar la Vlan en cada uno de los casos, asignando la Vlan correctamente a cada una de los puertos observando las posibles fallas al momento de poner en funcionamiento la Red, verificando la seguridad de puertos permitiendo restringir el tráfico de datos. También se puede afirmar que un enlace troncal es un enlace punto a punto entre dos dispositivos de red que transporta más de una VLAN. Un enlace troncal de VLAN le permite extender las VLAN a través de toda una red; también se logró controlar broadcasts de la red con segmentación de la VLAN y se ve cómo es que los enlaces troncales de la VLAN transmitieron tráfico a diferentes partes de la red configurada en una VLAN. Se armó una red confirmando que hay unos parámetros básicos para la configuración de un Switch que son muy importantes para la estructuración de una red, se adopta un conocimiento óptimo para saber que dispositivos son los necesarios y la adecuada conexión entre ellos, verificación de elementos existentes e implementar unos básicos como la dirección IP, la seguridad y nombre en los equipos, además de adquirir información suficiente que permita esclarecer que tipo de configuración automática hay hasta el momento. Se diseñó la implementación de direccionamiento IPv4 con VLSM, la cual se realiza con el fin de lograr una mejor eficiencia en el espacio de direccionamiento y así aprovechar todas las direcciones que se pueden diseñar en una red, se tuvo en cuenta el tamaño de la red desde la mayor hasta la menor, para no generalizar, sino según corresponda el espacio de direccionamiento en cada subred, se logró realizar la configuración de las interfaces de los routers con las direcciones propuestas estableciendo conectividad entre ellos, y por último se procedió a verificar que estas se hayan configurado correctamente haciendo ping entre los routers y tuvieron éxito.

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