Evaluación – Prueba de habilidades prácticas CCNA

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INTRODUCCION

La capacidad de configurar y administrar dispositivos de Networking orientados al diseño de redes escalables y de conmutación, mediante el estudio del modelo OSI y la arquitectura TCP/IP, le dan la posibilidad al futuro ingeniero de desempeñar cargos en compañías dedicadas al desarrollo de servicios de TI, como en el caso de los ISP, así como la posibilidad de ser administrador de red de una compañía, con el fin de proporcionar soporte a la red que este implementada.

En este documento se relaciona el desarrollo de las habilidades practicas del curso de CCNA, que forma parte de la evaluación final para el curso de profundización CISCO, con el fin de verificar las habilidades que posee el estudiante en el diseño, implementación y soporte de una red especifica.

OBJETVOS

1. Desarrollar la capacidad de configurar y administrar dispositivos de Networking, verificar operaciones básicas de enrutamiento y establecer niveles de seguridad básicos.
2. Utilizar las herramientas adecuadas en el diseño y simulación de redes.
3. Adquirir las habilidades necesarias para el diseño, simulación, implementación y soporte de una red, de acuerdo a la aplicación en la que se requiera (hogar, escuela, oficina, etc.).

DESARROLLO

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.

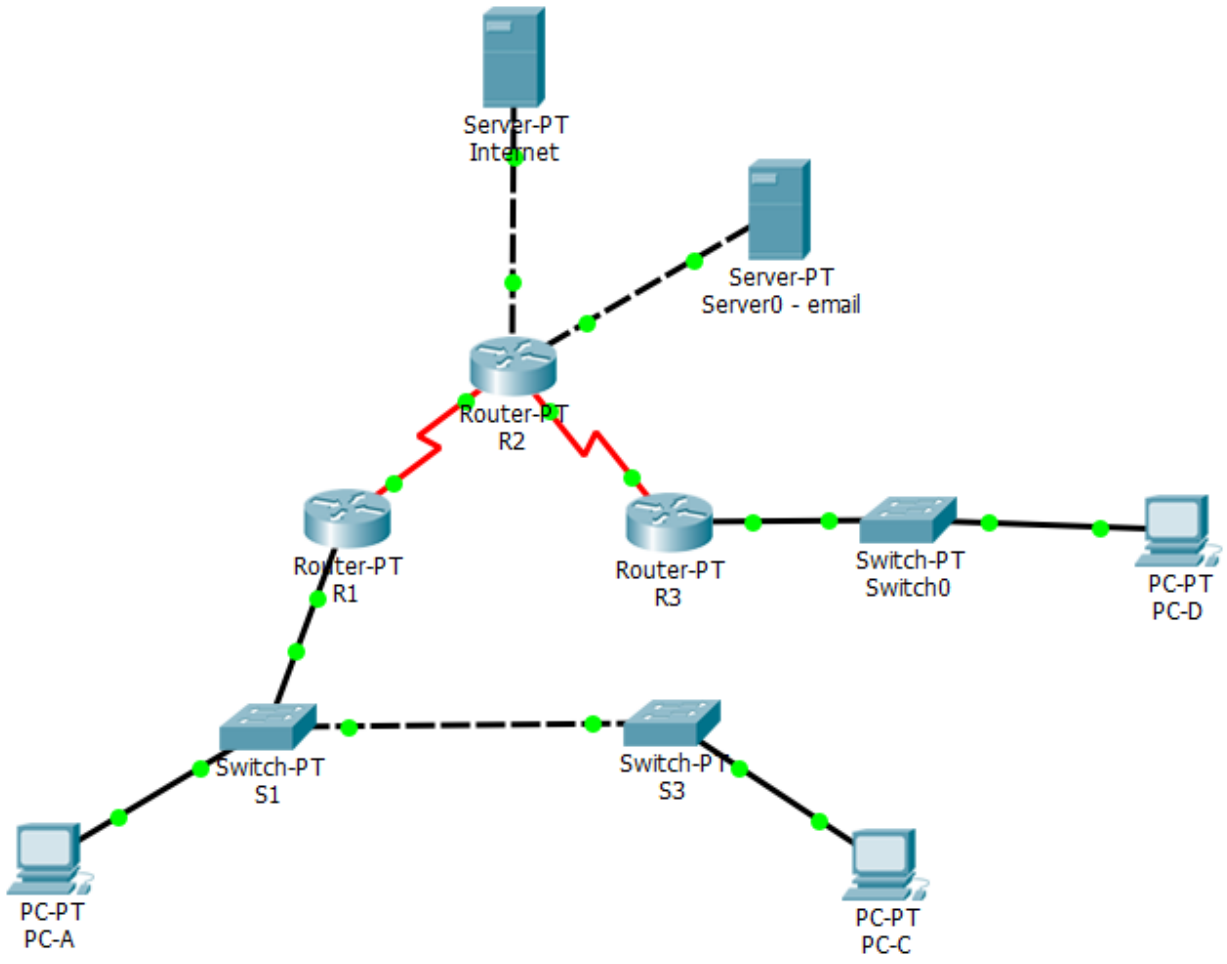
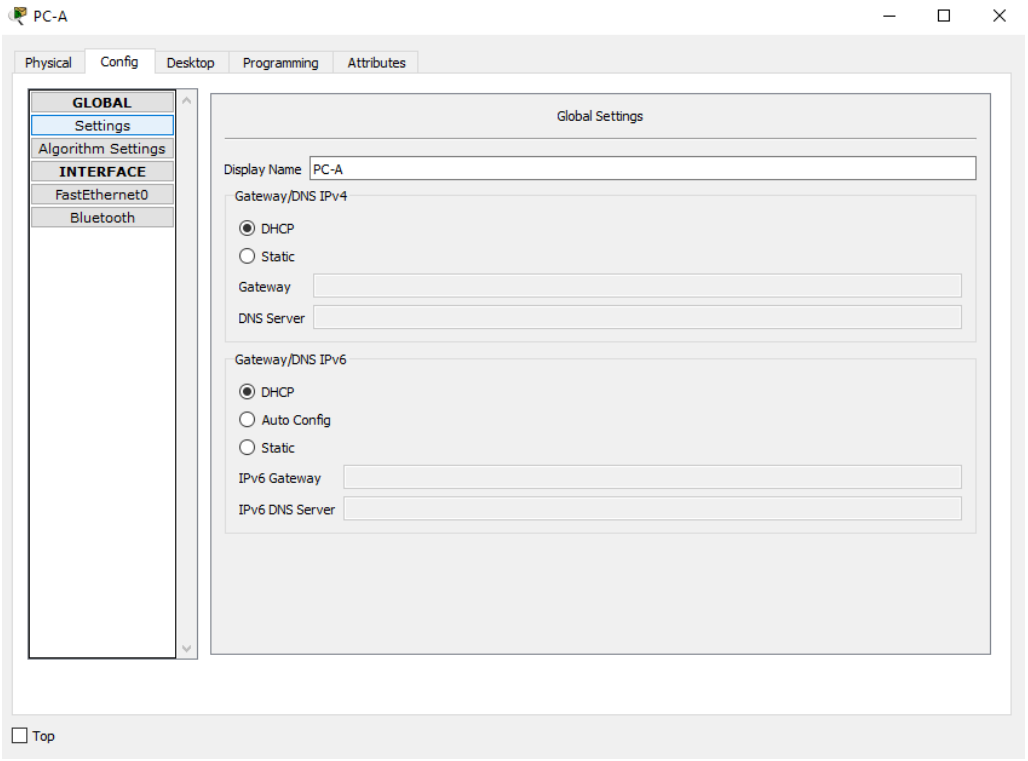
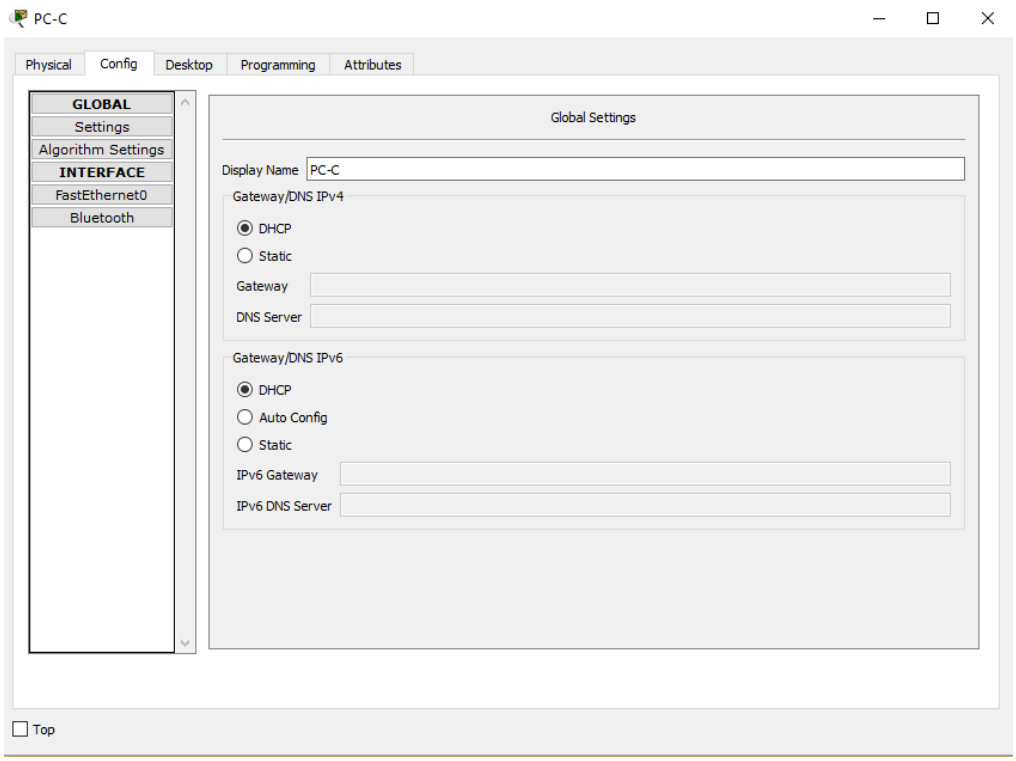
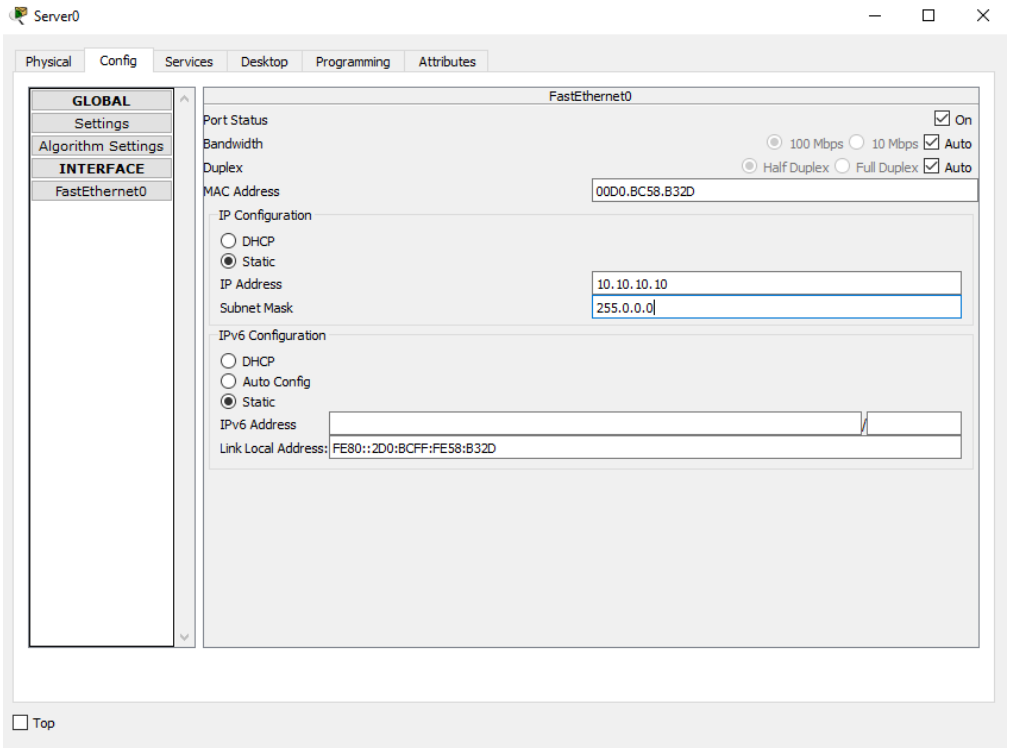


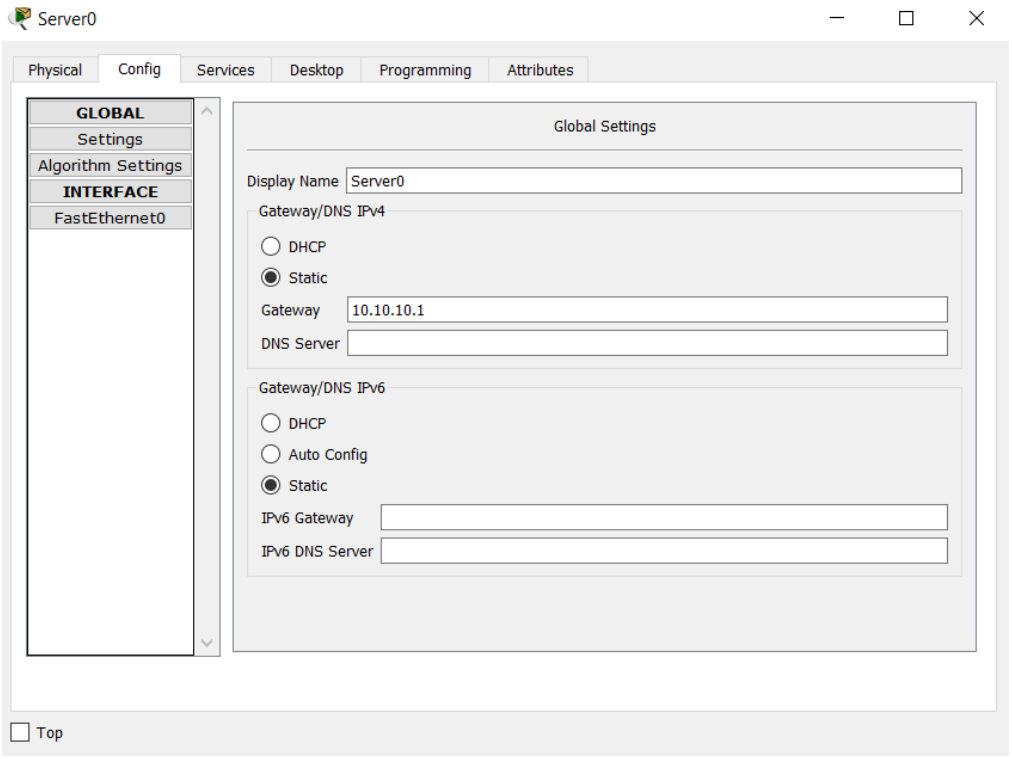
Figura 1. Topología propuesta para la prueba de habilidades, realizada en packet tracer.

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






Server0
Physical
Config
Services
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
00D0.BC58.B32D
IP Configuration
DHCP
Static
IP Address
10.10.10.10
Subnet Mask
255.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address:
FE80::2D0:BCFF:FE58:B32D
Top


Server0
Physical
Config
Services
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Global Settings
Display Name
Server0
Gateway/DNS IPv4
DHCP
Static
Gateway
10.10.10.1
DNS Server
Gateway/DNS IPv6
DHCP
Auto Config
Static
IPv6 Gateway
IPv6 DNS Server
Top

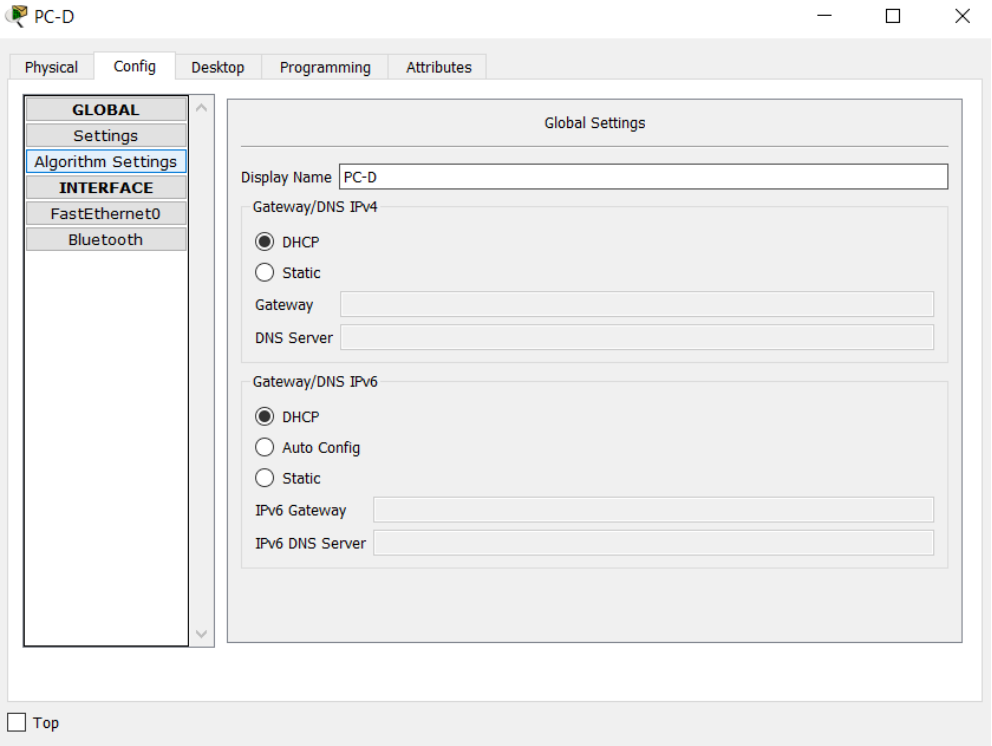


Figura 2. Configuración del direccionamiento IP de PC-A, PC-C, PC-D y Server 0.

Interfaces router R1:

R1>enable

R1#conf ter

R1#conf terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#interface fa 0/0

R1(config-if)#no shutdown

R1(config-if)#

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

R1(config-if)#exit

R1(config)#interface se 2/0

R1(config-if)#ip address 172.31.21.1 255.255.255.252

R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down

R1(config-if)#exit

R1(config)#exit

R1#

R1#show run

R1#show running-config

Building configuration...

interface FastEthernet0/0

no ip address

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

duplex auto

speed auto

shutdown

!

interface Serial2/0

ip address 172.31.21.1 255.255.255.252

clock rate 2000000

!

interface Serial3/0

no ip address

clock rate 2000000

shutdown

!

interface FastEthernet4/0

no ip address

shutdown

!

interface FastEthernet5/0

no ip address

shutdown

!

end

Interfaces router R2:

R2>enable

R2#conf

R2#configure ter

R2#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R2(config)#interface se3/0

R2(config-if)#ip address 172.31.21.2 255.255.255.252

R2(config-if)#no shutdown

R2(config-if)#exit

R2(config)#interface fa1/0

R2(config-if)#ip address 209.165.200.225 255.255.255.248

R2(config-if)#no shutdown

R2(config-if)#exit

R2(config)#interface fa0/0

R2(config-if)#ip address 10.10.10.1 255.0.0.0

R2(config-if)#no shutdown

R2(config-if)#exit

R2(config)#interface se2/0

R2(config-if)#ip address 172.31.23.1 255.255.255.252

R2(config-if)#no shutdown

R2(config-if)#exit

R2(config)#exit

R2#

%SYS-5-CONFIG_I: Configured from console by console

R2#copy run

R2#copy running-config star

R2#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R2#show run

R2#show running-config

Building configuration...

!

interface FastEthernet0/0

ip address 10.10.10.1 255.0.0.0

duplex auto

speed auto

!

interface FastEthernet1/0

ip address 209.165.200.225 255.255.255.248

duplex auto

speed auto

!

interface Serial2/0

ip address 172.31.23.1 255.255.255.252

clock rate 2000000

!

interface Serial3/0

ip address 172.31.21.2 255.255.255.252

!

interface FastEthernet4/0

no ip address

shutdown

!

interface FastEthernet5/0

no ip address

shutdown

!

!

end

R2#

Interfaces router R3:

R3>enable

R3#conf

R3#configure ter

R3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R3(config)#interface se3/0

R3(config-if)#ip address 172.31.23.2 255.255.255.252

R3(config-if)#no shutdown

R3(config-if)#

%LINK-5-CHANGED: Interface Serial3/0, changed state to up

R3(config-if)#exit

R3(config)#interface fa0/0

R3(config-if)#ip address 192.168.4.1 255.255.255.0

R3(config-if)#no shutdown

R3(config-if)#

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

R3(config-if)#exit

R3(config)#exit

R3#

R3#copy run

R3#copy running-config star

R3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R3#

R3#show running-config

Building configuration...

!

interface FastEthernet0/0

ip address 192.168.4.1 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

duplex auto

speed auto

shutdown

!

interface Serial2/0

no ip address

clock rate 2000000

shutdown

!

interface Serial3/0

ip address 172.31.23.2 255.255.255.252

!

interface FastEthernet4/0

no ip address

shutdown

!

interface FastEthernet5/0

no ip address

shutdown

!

end

R3#

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

OSPFv2 area 0

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

Configuración OSPFv2 para R1:

R1>enable

R1#conf

R1#configure ter

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#router ospf 1

R1(config-router)#router-id 1.1.1.1

R1(config-router)#network 192.168.30.0 0.0.0.255 area 0

R1(config-router)#network 192.168.40.0 0.0.0.255 area 0

R1(config-router)#network 172.31.21.0 0.0.0.3 area 0

R1(config-router)#passive-interface fa0/0

R1(config-router)#interface s2/0

R1(config-if)#bandwidth 128

R1(config-if)#ip ospf cost 7500

R1(config-if)#exit

R1(config)#exit

R1#

%SYS-5-CONFIG_I: Configured from console by console

R1#copy run

R1#copy running-config star

R1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R1#

Verificación de la configuración OSPFv2 en R1:

R1#show ip protocols

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 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

172.31.21.0 0.0.0.3 area 0

192.168.40.0 0.0.0.255 area 0

Passive Interface(s):

FastEthernet0/0

Routing Information Sources:

Gateway	***Distance***	***Last Update***
1.1.1.1	***110***	***00:23:32***
2.2.2.2	***110***	***00:13:51***
3.3.3.3	***110***	***00:13:45***

Distance: (default is 110)

R1#

En las tablas de enrutamiento se pueden observar las rutas aprendidas a través de OSPF.

Tabla de enrutamiento de R1:

R1>enable

R1#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

**** - candidate default, U - per-user static route, o - ODR***

P - periodic downloaded static route

Gateway of last resort is not set

O 10.0.0.0/8 [110/7501] via 172.31.21.2, 00:00:45, Serial2/0

172.31.0.0/30 is subnetted, 2 subnets

C 172.31.21.0 is directly connected, Serial2/0

O 172.31.23.0 [110/15000] via 172.31.21.2, 00:00:45, Serial2/0

O 192.168.4.0/24 [110/15001] via 172.31.21.2, 00:00:35, Serial2/0

C 192.168.30.0/24 is directly connected, FastEthernet0/0.30

C 192.168.40.0/24 is directly connected, FastEthernet0/0.40

R1

Configuración OSPFv2 para R2:

R2>enable

R2#conf

R2#configure ter

R2#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R2(config)#router ospf 1

R2(config-router)#router-id 2.2.2.2

R2(config-router)#network 172.31.21.0 0.0.0.3 area 0

R2(config-router)#

01:26:44: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial3/0 from LOADING to FULL, Loading Done

R2(config-router)#network 10.10.10.0 0.255.255.255 area 0

R2(config-router)#network 172.31.23.0 0.0.0.3 area 0

R2(config-router)#passive-interface fa0/0

R2(config-router)#exit

R2(config)#interface s3/0

R2(config-if)#bandwidth 128

R2(config-if)#interface s0/0

R2(config)#interface s2/0

R2(config-if)#bandwidth 128

R2(config-if)#ip ospf cost 7500

R2(config-if)#exit

R2(config)#exit

R2#

%SYS-5-CONFIG_I: Configured from console by console

R2#copy run

R2#copy running-config star

R2#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R2#

Verificación de la configuración OSPFv2 en R2:

R2#show ip protocols

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 2.2.2.2

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

172.31.21.0 0.0.0.3 area 0

10.0.0.0 0.255.255.255 area 0

172.31.23.0 0.0.0.3 area 0

Passive Interface(s):

FastEthernet0/0

Routing Information Sources:

Gateway	***Distance***	***Last Update***
1.1.1.1	***110***	***00:04:34***
2.2.2.2	***110***	***00:02:03***

Distance: (default is 110)

R2#

Tabla de enrutamiento de R2:

R2>enable

R2#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

**** - candidate default, U - per-user static route, o - ODR***

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0

172.31.0.0/30 is subnetted, 2 subnets

C 172.31.21.0 is directly connected, Serial3/0

C 172.31.23.0 is directly connected, Serial2/0

O 192.168.4.0/24 [110/7501] via 172.31.23.2, 00:05:16, Serial2/0

O 192.168.30.0/24 [110/65] via 172.31.21.1, 00:05:16, Serial3/0

O 192.168.40.0/24 [110/65] via 172.31.21.1, 00:05:16, Serial3/0

R2#

Configuración OSPFv2 para R3:

R3>enable

R3#conf

R3#configure ter

R3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R3(config)#router ospf 1

R3(config-router)#router-id 3.3.3.3

R3(config-router)#network 172.31.23.0 0.0.0.3 area 0

R3(config-router)#

01:40:13: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial3/0 from LOADING to FULL, Loading Done

R3(config-router)#network 192.168.4.0 0.0.0.255 area 0

R3(config-router)#passive-interface fa0/0

R3(config-router)#exit

R3(config)#interface s3/0

R3(config-if)#bandwidth 128

R3(config-if)#exit

R3(config)#exit

R3#

%SYS-5-CONFIG_I: Configured from console by console

R3#copy run

R3#copy running-config star

R3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R3#

Verificación de la configuración OSPFv2 en R3:

R3#show ip protocols

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 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

192.168.4.0 0.0.0.255 area 0

Passive Interface(s):

FastEthernet0/0

Routing Information Sources:

Gateway	***Distance***	***Last Update***
1.1.1.1	***110***	***00:16:45***
2.2.2.2	***110***	***00:03:18***
3.3.3.3	***110***	***00:03:12***

Distance: (default is 110)

R3#

Tabla de enrutamiento de R3:

R3>enable

R3#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

**** - candidate default, U - per-user static route, o - ODR***

P - periodic downloaded static route

Gateway of last resort is not set

O 10.0.0.0/8 [110/65] via 172.31.23.1, 00:09:36, Serial3/0

172.31.0.0/30 is subnetted, 2 subnets

O 172.31.21.0 [110/128] via 172.31.23.1, 00:09:36, Serial3/0

C 172.31.23.0 is directly connected, Serial3/0

C 192.168.4.0/24 is directly connected, FastEthernet0/0

O 192.168.30.0/24 [110/129] via 172.31.23.1, 00:09:36, Serial3/0

O 192.168.40.0/24 [110/129] via 172.31.23.1, 00:09:36, Serial3/0

R3#

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

VLAN 30 en S1:

S1>enable

S1#conf

S1#configure ter

S1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#vlan 99

S1(config-vlan)#exit

S1(config)#interface fa1/1

S1(config-if)#switchport mode access

S1(config-if)#switchport access vlan 30

S1(config-if)#exit

S1(config)#interface fa3/1

S1(config-if)#switchport mode trunk

S1(config-if)#

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet3/1 (99), with S3 FastEthernet3/1 (1).

S1(config-if)#switchport trunk native vlan 99

S1(config-if)#switchport trunk allowed vlan 30,40,99

S1(config-if)#exit

S1(config)#interface fa0/1

S1(config-if)#switchport mode trunk

S1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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

S1(config-if)#exit

S1(config)#exit

S1#

%SYS-5-CONFIG_I: Configured from console by console

S1#copy

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet3/1 (99), with S3 FastEthernet3/1 (1).

S1#copy run

S1#copy running-config star

S1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

S1#

S1#show run

S1#show running-config

Building configuration...

Current configuration : 691 bytes

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname S1

```
spanning-tree mode pvst
spanning-tree extend system-id
interface FastEthernet0/1
 switchport mode trunk
interface FastEthernet1/1
 switchport access vlan 30
 switchport mode access
interface FastEthernet2/1
 shutdown
interface FastEthernet3/1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 30,40,99
 switchport mode trunk
interface FastEthernet4/1
 shutdown
interface FastEthernet5/1
 shutdown
interface Vlan1
 no ip address
 shutdown
line con 0
line vty 0 4
 login
line vty 5 15
 login
```

end

S1#

S1#show vlan brief

VLAN Name Status Ports

---- --------------------------------- --------- -------------------------------

1 default active Fa2/1, Fa4/1, Fa5/1

30 VLAN0030 active Fa1/1

99 VLAN0099 active

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

S1#

VLAN 40 en S3:

S3>enable

S3#conf

S3#configure ter

S3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S3(config)#vlan 99

S3(config-vlan)#

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet3/1 (1), with S1 FastEthernet3/1 (99).

S3(config-vlan)#exit

S3(config)#interface fa0/1

S3(config-if)#switchport mode access

S3(config-if)#switchport access vlan 40

% Access VLAN does not exist. Creating vlan 40

S3(config-if)#exit

S3(config)#interface fa3/1

S3(config-if)#switchport mode trunk

S3(config-if)#switchport trunk native vlan 99

S3(config-if)#%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet3/1 on VLAN0099. Port consistency restored.

%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet3/1 on VLAN0001. Port consistency restored.

S3(config-if)#switchport trunk allowed vlan 30,40,99

S3(config-if)#exit

S3(config)#EXIT

S3#

%SYS-5-CONFIG_I: Configured from console by console

S3#copy run

S3#copy running-config star

S3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

S3#

S3#show vlan brief

VLAN Name Status Ports

---- --------------------------------- --------- -------------------------------

1 default active Fa1/1, Fa2/1, Fa4/1, Fa5/1

40 VLAN0040 active Fa0/1

99 VLAN0099 active

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

S3#

S3#show run

S3#show running-config

Building configuration...

Current configuration : 698 bytes

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

```
hostname S3
no ip domain-lookup
spanning-tree mode pvst
spanning-tree extend system-id
interface FastEthernet0/1
 switchport access vlan 40
 switchport mode access
interface FastEthernet1/1
 shutdown
interface FastEthernet2/1
 shutdown
interface FastEthernet3/1
 switchport trunk native vlan 99
 switchport trunk allowed vlan 30,40,99
 switchport mode trunk
interface FastEthernet4/1
 shutdown
interface FastEthernet5/1
 shutdown
interface Vlan1
 no ip address
 shutdown
line con 0
line vty 0 4
 login
```

line vty 5 15

login

end

S3#

Configuración de subinterfaces en R1:

R1>enable

R1#conf

R1#configure ter

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#interface fa0/0.30

R1(config-subif)#

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.30, changed state to up

R1(config-subif)#encapsulation dot1q 30

R1(config-subif)#ip address 192.168.30.1 255.255.255.0

% 192.168.30.0 overlaps with FastEthernet0/0

R1(config-subif)#interface fa0/0.40

R1(config-subif)#

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.40, changed state to up

R1(config-subif)#encapsulation dot1q 40

R1(config-subif)#ip address 192.168.40.1 255.255.255.0

R1(config-subif)#exit

R1(config)#interface fa0/0

R1(config-if)#no shutdown

R1(config-if)#exit

R1(config)#exit

R1#

%SYS-5-CONFIG_I: Configured from console by console

R1#copy run

R1#copy running-config star

R1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R1#

R1#show running-config

Building configuration...

Current configuration : 1139 bytes

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

```
no service password-encryption
hostname R1
ip cef
no ipv6 cef
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
interface FastEthernet0/0.30
 encapsulation dot1Q 30
 ip address 192.168.30.1 255.255.255.0
interface FastEthernet0/0.40
 encapsulation dot1Q 40
 ip address 192.168.40.1 255.255.255.0
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface Serial2/0
 ip address 172.31.21.1 255.255.255.252
 ip ospf cost 7500
 clock rate 2000000
interface Serial3/0
 no ip address
```

```
 clock rate 2000000
 shutdown
interface FastEthernet4/0
 no ip address
 shutdown
interface FastEthernet5/0
 no ip address
 shutdown
router ospf 1
 router-id 1.1.1.1
 log-adjacency-changes
 passive-interface FastEthernet0/0
 network 192.168.30.0 0.0.0.255 area 0
 network 172.31.21.0 0.0.0.3 area 0
 network 192.168.40.0 0.0.0.255 area 0
ip classless
ip flow-export version 9
line con 0
line aux 0
line vty 0 4
 login
end
R1#
```

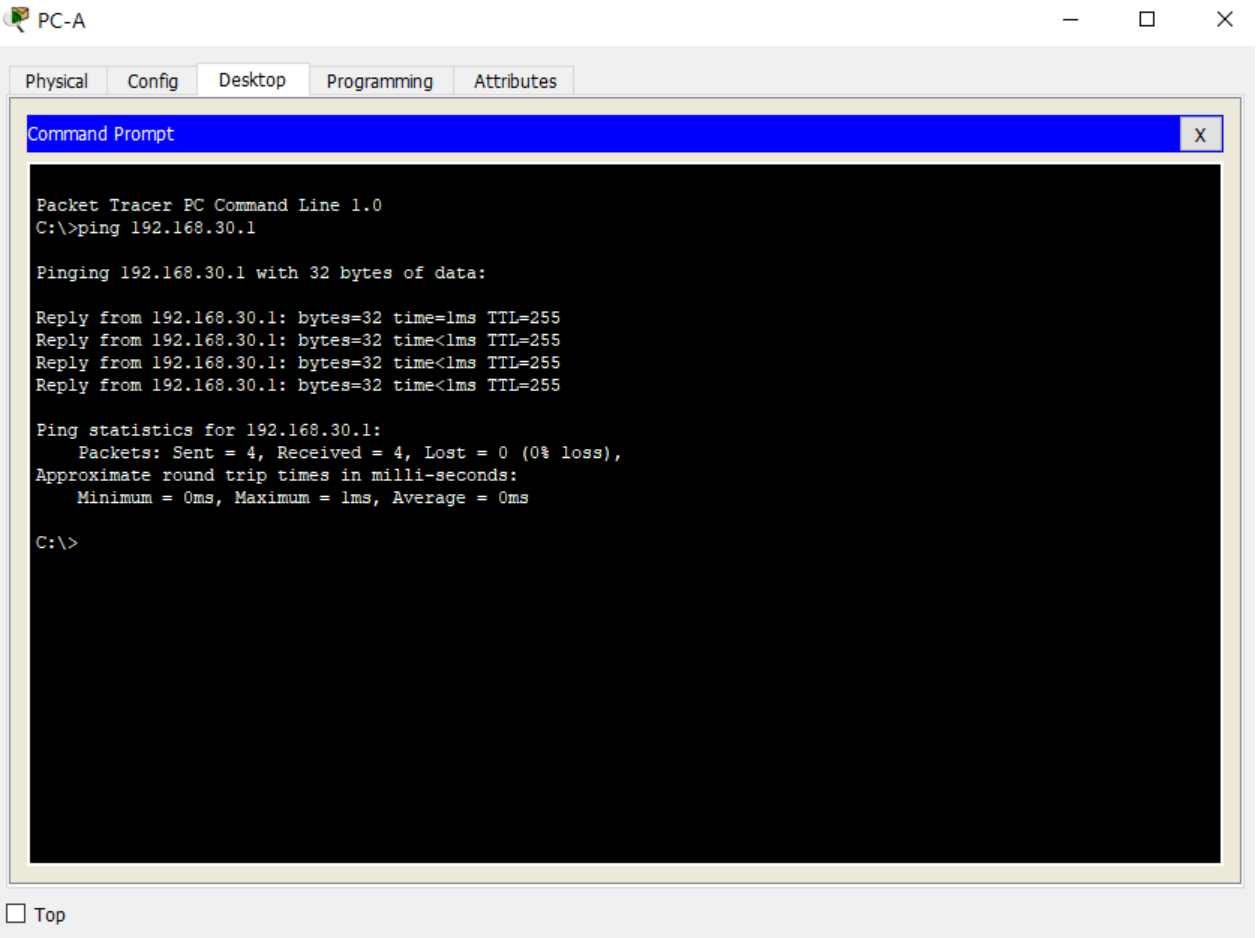


Figura 3. Prueba de conectividad entre la PC-A (vlan 30) a la subinterfaz del router fa0/0.30, la cual es el Gateway predeterminado de la vlan 30.

4. En el Switch 3 deshabilitar DNS lookup

S3>enable

S3#conf

S3#configure ter

S3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S3(config)#no ip domain-lookup

S3(config)#exit

S3#

%SYS-5-CONFIG_I: Configured from console by console

S3#copy run

S3#copy running-config start

S3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

S3#

S3#show run

S3#show running-config

Building configuration...

Current configuration : 749 bytes

!

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname S3

!

!

!

no ip domain-lookup

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

Para S1:

Para S3:

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

Para S1:

S1>enable

S1#conf

S1#configure ter

S1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#interface fa2/1

S1(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet2/1, changed state to administratively down

S1(config-if)#interface fa4/1

S1(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet4/1, changed state to administratively down

S1(config-if)#interface fa5/1

S1(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet5/1, changed state to administratively down

S1(config-if)#exit

S1(config)#exit

S1#

%SYS-5-CONFIG_I: Configured from console by console

S1#copy run

S1#copy running-config star

S1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

S1#

S1#show run

S1#show running-config

Building configuration...

Current configuration : 521 bytes

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname S1

spanning-tree mode pvst

spanning-tree extend system-id

interface FastEthernet0/1

interface FastEthernet1/1

interface FastEthernet2/1

shutdown

interface FastEthernet3/1

interface FastEthernet4/1

shutdown

interface FastEthernet5/1

shutdown

interface Vlan1

no ip address

shutdown

line con 0

line vty 0 4

login

line vty 5 15

login

end

S1#

Para S3:

S3>enable

S3#conf

S3#configure ter

S3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S3(config)#interface fa1/1

S3(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet1/1, changed state to administratively down

S3(config-if)#interface fa2/1

S3(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet2/1, changed state to administratively down

S3(config-if)#interface fa4/1

S3(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet4/1, changed state to administratively down

S3(config-if)#interface fa5/1

S3(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet5/1, changed state to administratively down

S3(config-if)#exit

S3(config)#exit

S3#

%SYS-5-CONFIG_I: Configured from console by console

S3#copy run

S3#copy running-config star

S3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

S3#

S3#show run

S3#show running-config

Building configuration...

Current configuration : 551 bytes

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname S3

no ip domain-lookup

spanning-tree mode pvst

spanning-tree extend system-id

interface FastEthernet0/1

interface FastEthernet1/1

shutdown

interface FastEthernet2/1

shutdown

interface FastEthernet3/1

interface FastEthernet4/1

shutdown

interface FastEthernet5/1

shutdown

interface Vlan1

no ip address

shutdown

line con 0

line vty 0 4

login

line vty 5 15

login

end

S3#

Para R1:

R1>enable

R1#conf

R1#configure ter

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#interface fa1/0

R1(config-if)#shutdown

R1(config-if)#

%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to administratively down

R1(config-if)#interface se3/0

R1(config-if)#shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to administratively down

R1(config-if)#interface fa4/0

R1(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet4/0, changed state to administratively down

R1(config-if)#interface fa5/0

R1(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet5/0, changed state to administratively down

R1(config-if)#exit

R1(config)#exit

R1#

%SYS-5-CONFIG_I: Configured from console by console

R1#copy run

R1#copy running-config star

R1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R1#

R1#show run

R1#show running-config

Building configuration...

Current configuration : 1139 bytes

version 12.2

no service timestamps log datetime msec

```
no service timestamps debug datetime msec
no service password-encryption
hostname R1
ip cef
no ipv6 cef
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
interface FastEthernet0/0.30
 encapsulation dot1Q 30
 ip address 192.168.30.1 255.255.255.0
interface FastEthernet0/0.40
 encapsulation dot1Q 40
 ip address 192.168.40.1 255.255.255.0
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface Serial2/0
 ip address 172.31.21.1 255.255.255.252
 ip ospf cost 7500
 clock rate 2000000
interface Serial3/0
```

no ip address

clock rate 2000000

shutdown

interface FastEthernet4/0

no ip address

shutdown

interface FastEthernet5/0

no ip address

shutdown

router ospf 1

router-id 1.1.1.1

log-adjacency-changes

passive-interface FastEthernet0/0

network 192.168.30.0 0.0.0.255 area 0

network 172.31.21.0 0.0.0.3 area 0

network 192.168.40.0 0.0.0.255 area 0

ip classless

ip flow-export version 9

line con 0

line aux 0

line vty 0 4

login

end

R1#

Para R2:

R2>enable

R2#conf

R2#configure ter

R2#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R2(config)#interface fa4/0

R2(config-if)#shutdown

R2(config-if)#interface fa5/0

R2(config-if)#shutdown

R2(config-if)#exit

R2(config)#exit

R2#

%SYS-5-CONFIG_I: Configured from console by console

R2#copy run

R2#copy running-config start

R2#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R2#

R2#show run

R2#show running-config

Building configuration...

```
Current configuration : 980 bytes
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname R2
ip cef
no ipv6 cef
interface FastEthernet0/0
 ip address 10.10.10.1 255.0.0.0
 duplex auto
 speed auto
interface FastEthernet1/0
 ip address 209.165.200.225 255.255.255.248
 duplex auto
 speed auto
interface Serial2/0
 ip address 172.31.23.1 255.255.255.252
 ip ospf cost 7500
 clock rate 2000000
interface Serial3/0
 ip address 172.31.21.2 255.255.255.252
interface FastEthernet4/0
 no ip address
 shutdown
```

interface FastEthernet5/0

no ip address

shutdown

router ospf 1

router-id 2.2.2.2

log-adjacency-changes

passive-interface FastEthernet0/0

network 172.31.21.0 0.0.0.3 area 0

network 10.0.0.0 0.255.255.255 area 0

network 172.31.23.0 0.0.0.3 area 0

ip classless

ip flow-export version 9

line con 0

line aux 0

line vty 0 4

login

end

R2#

Para R3:

R3>enable

R3#conf

R3#configure ter

R3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R3(config)#interface fa1/0

R3(config-if)#shutdown

R3(config-if)#interface se2/0

R3(config-if)#shutdown

R3(config-if)#interface fa4/0

R3(config-if)#shutdown

R3(config-if)#interface fa5/0

R3(config-if)#shutdown

R3(config-if)#exit

R3(config)#exit

R3#

%SYS-5-CONFIG_I: Configured from console by console

R3#copy run

R3#copy running-config star

R3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R3#

R3#show running-config

Building configuration...

Current configuration : 895 bytes

version 12.2

no service timestamps log datetime msec

```
no service timestamps debug datetime msec
no service password-encryption
hostname R3
ip cef
no ipv6 cef
interface FastEthernet0/0
 ip address 192.168.4.1 255.255.255.0
 duplex auto
 speed auto
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
interface Serial3/0
 ip address 172.31.23.2 255.255.255.252
interface FastEthernet4/0
 no ip address
 shutdown
interface FastEthernet5/0
 no ip address
```

shutdown

router ospf 1

router-id 3.3.3.3

log-adjacency-changes

passive-interface FastEthernet0/0

network 172.31.23.0 0.0.0.3 area 0

network 192.168.4.0 0.0.0.255 area 0

ip classless

ip flow-export version 9

line con 0

line aux 0

line vty 0 4

login

end

R3#

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.

Configuración de DHCP en R1:

R1>enable

R1#conf

R1#configure ter

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#service dhcp

R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.31

R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.31

R1(config)#ip dhcp pool ADMINISTRACION

R1(dhcp-config)#network 192.168.30.0 255.255.255.0

R1(dhcp-config)#default-router 192.168.30.1

R1(dhcp-config)#dns-server 10.10.10.11

R1(dhcp-config)#exit

R1(config)#ip dhcp pool MERCADEO

R1(dhcp-config)#network 192.168.40.0 255.255.255.0

R1(dhcp-config)#default-router 192.168.40.1

R1(dhcp-config)#dns-server 10.10.10.11

R1(dhcp-config)#exit

R1(config)#exit

R1#

%SYS-5-CONFIG_I: Configured from console by console

R1#copy run

R1#copy running-config star

R1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R1#

R1#show run

Building configuration...

Current configuration : 1471 bytes

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname R1

ip dhcp excluded-address 192.168.30.1 192.168.30.31

ip dhcp excluded-address 192.168.40.1 192.168.40.31

ip dhcp pool ADMINISTRACION

network 192.168.30.0 255.255.255.0

default-router 192.168.30.1

dns-server 10.10.10.11

ip dhcp pool MERCADEO

network 192.168.40.0 255.255.255.0

```
 default-router 192.168.40.1
 dns-server 10.10.10.11
ip cef
no ipv6 cef
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
interface FastEthernet0/0.30
 encapsulation dot1Q 30
 ip address 192.168.30.1 255.255.255.0
interface FastEthernet0/0.40
 encapsulation dot1Q 40
 ip address 192.168.40.1 255.255.255.0
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface Serial2/0
 ip address 172.31.21.1 255.255.255.252
 ip ospf cost 7500
 clock rate 2000000
interface Serial3/0
 no ip address
```

clock rate 2000000

shutdown

interface FastEthernet4/0

no ip address

shutdown

interface FastEthernet5/0

no ip address

shutdown

router ospf 1

router-id 1.1.1.1

log-adjacency-changes

passive-interface FastEthernet0/0

network 192.168.30.0 0.0.0.255 area 0

network 172.31.21.0 0.0.0.3 area 0

network 192.168.40.0 0.0.0.255 area 0

ip classless

ip flow-export version 9

line con 0

line aux 0

line vty 0 4

login

end

R1#

Configuración de DHCP en R3:

R3>enable

R3#conf

R3#configure ter

R3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R3(config)#ip dhcp excluded-address 192.168.4.1

R3(config)#ip dhcp pool Final_R3

R3(dhcp-config)#network 192.168.4.0 255.255.255.0

R3(dhcp-config)#default-router 192.168.4.1

R3(dhcp-config)#dns-server 10.10.10.11

R3(dhcp-config)#exit

R3(config)#exit

R3#

%SYS-5-CONFIG_I: Configured from console by console

R3#copy run

R3#copy running-config star

R3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R3#

R3#show run

R3#show running-config

Building configuration...

```
Current configuration : 1041 bytes
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname R3
ip dhcp excluded-address 192.168.4.1
ip dhcp pool Final_R3
 network 192.168.4.0 255.255.255.0
 default-router 192.168.4.1
 dns-server 10.10.10.11
ip cef
no ipv6 cef
interface FastEthernet0/0
 ip address 192.168.4.1 255.255.255.0
 duplex auto
 speed auto
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface Serial2/0
 no ip address
 clock rate 2000000
```

shutdown

interface Serial3/0

ip address 172.31.23.2 255.255.255.252

interface FastEthernet4/0

no ip address

shutdown

interface FastEthernet5/0

no ip address

shutdown

router ospf 1

router-id 3.3.3.3

log-adjacency-changes

passive-interface FastEthernet0/0

network 172.31.23.0 0.0.0.3 area 0

network 192.168.4.0 0.0.0.255 area 0

ip classless

ip flow-export version 9

line con 0

line aux 0

line vty 0 4

login

end

R3#show ip dhcp binding

IP address Client-ID/ Lease expiration Type

Hardware address

192.168.4.2 0060.3EB4.57ED -- Automatic

R3#

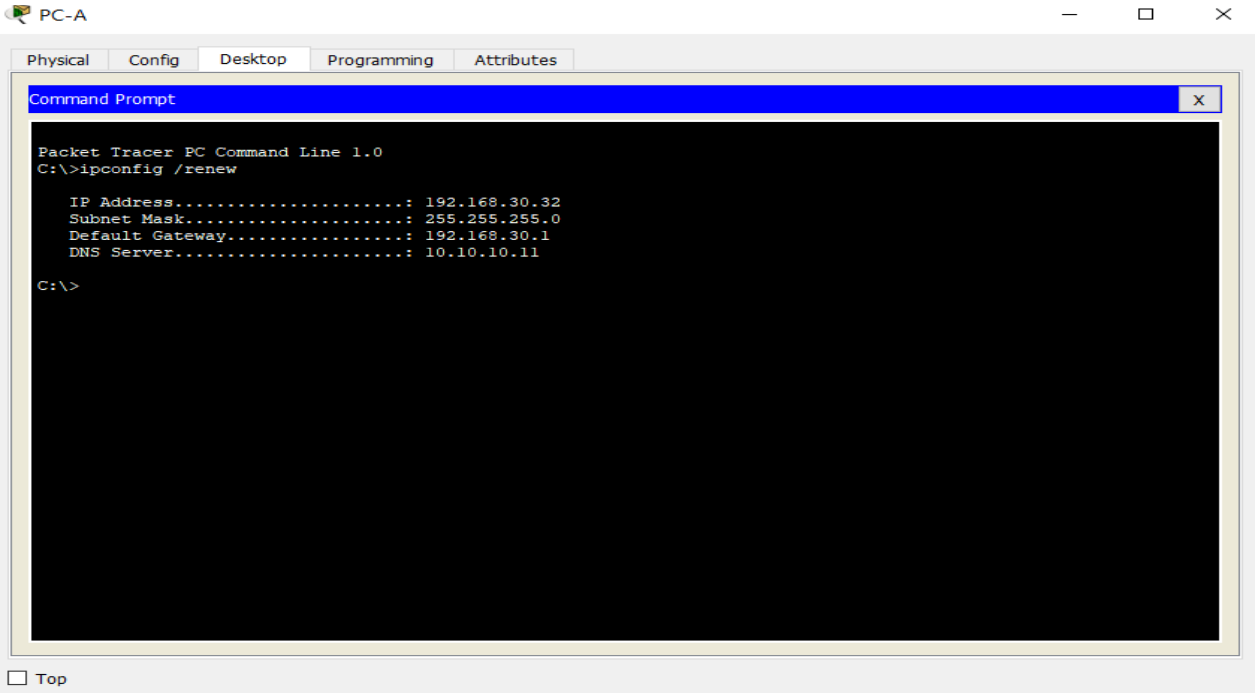


Figura 4. Direccionamiento IP asignado a PC-A por DHCP.

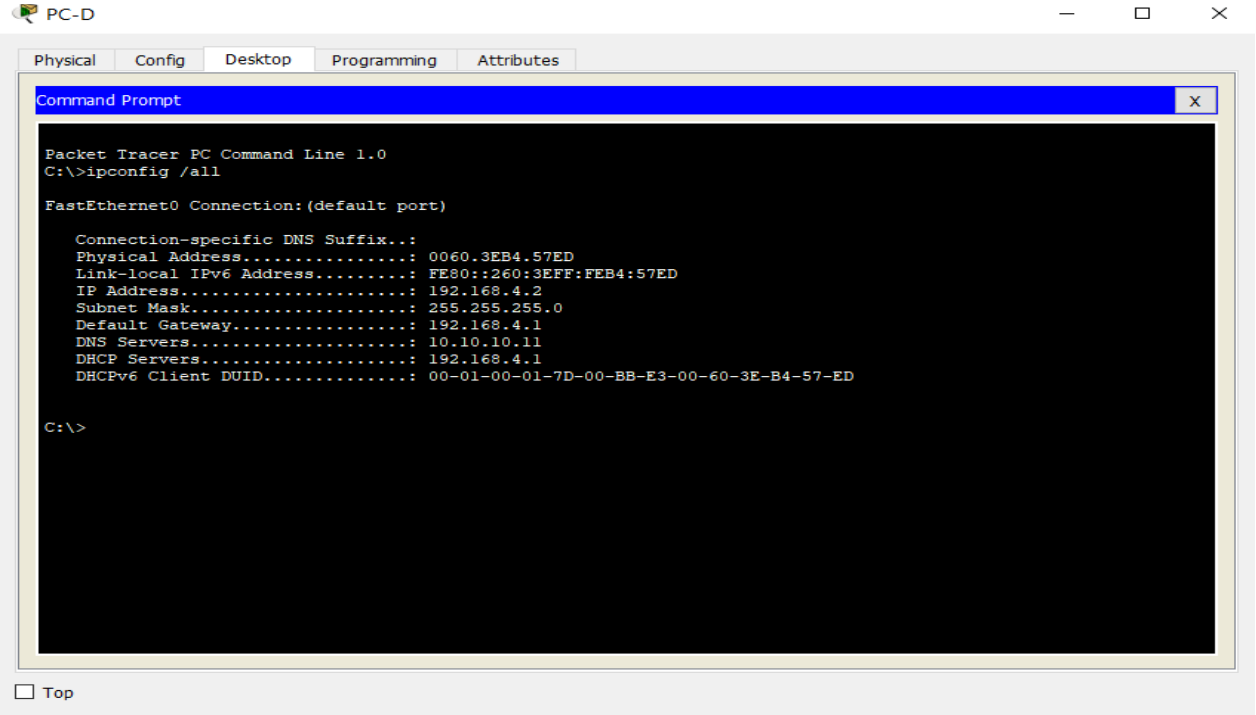


Figura 5. Direccionamiento IP asignado a PC-D por DHCP.

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

R2>enable

R2#conf

R2#configure ter

R2#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R2(config)#ip route 0.0.0.0 0.0.0.0 fa1/0

R2(config)#access-list 1 permit 198.168.0.0 0.0.255.255

R2(config)#access-list 1 permit any

R2(config)#ip nat inside source list 1 interface fa1/0 overload

R2(config)#interface se2/0

R2(config-if)#ip nat inside

R2(config-if)#exit

R2(config)#interface se3/0

R2(config-if)#ip nat inside

R2(config-if)#exit

R2(config)#interface fa1/0

R2(config-if)#ip nat outside

R2(config-if)#exit

R2(config)#exit

R2#

%SYS-5-CONFIG_I: Configured from console by console

R2#copy run

R2#copy running-config star

R2#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R2#

R2#show running-config

Building configuration...

Current configuration : 1201 bytes

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname R2

ip cef

no ipv6 cef

interface FastEthernet0/0

ip address 10.10.10.1 255.0.0.0

duplex auto

speed auto

interface FastEthernet1/0

ip address 209.165.200.225 255.255.255.248

ip nat outside

duplex auto

speed auto

```
interface Serial2/0
 ip address 172.31.23.1 255.255.255.252
 ip ospf cost 7500
 ip nat inside
 clock rate 2000000
interface Serial3/0
 ip address 172.31.21.2 255.255.255.252
 ip nat inside
interface FastEthernet4/0
 no ip address
 shutdown
interface FastEthernet5/0
 no ip address
 shutdown
router ospf 1
 router-id 2.2.2.2
 log-adjacency-changes
 passive-interface FastEthernet0/0
 network 172.31.21.0 0.0.0.3 area 0
 network 10.0.0.0 0.255.255.255 area 0
 network 172.31.23.0 0.0.0.3 area 0
ip nat inside source list 1 interface FastEthernet1/0 overload
ip classless
ip route 0.0.0.0 0.0.0.0 FastEthernet1/0
ip flow-export version 9
```

access-list 1 permit 198.168.0.0 0.0.255.255

access-list 1 permit any

line con 0

line aux 0

line vty 0 4

login

end

R2#

R2#show ip nat statistics

Total translations: 0 (0 static, 0 dynamic, 0 extended)

Outside Interfaces: FastEthernet1/0

Inside Interfaces: Serial2/0 , Serial3/0

Hits: 0 Misses: 0

Expired translations: 0

Dynamic mappings:

R2#

Se realiza ping desde PC-A y PC-D hasta el servidor de internet, y se verifica la tabla y las estadísticas de NAT para comprobar su funcionamiento, estos son los resultados:

R2#show ip nat translations

Pro Inside global Inside local Outside local Outside global

icmp 209.165.200.225:1024192.168.4.2:1 209.165.200.230:1 209.165.200.230:1024

icmp 209.165.200.225:1025192.168.4.2:2 209.165.200.230:2 209.165.200.230:1025

icmp 209.165.200.225:1026192.168.4.2:3 209.165.200.230:3 209.165.200.230:1026

icmp 209.165.200.225:1027192.168.4.2:4 209.165.200.230:4 209.165.200.230:1027

icmp 209.165.200.225:1 192.168.30.32:1 209.165.200.230:1 209.165.200.230:1

icmp 209.165.200.225:2 192.168.30.32:2 209.165.200.230:2 209.165.200.230:2

icmp 209.165.200.225:3 192.168.30.32:3 209.165.200.230:3 209.165.200.230:3

icmp 209.165.200.225:4 192.168.30.32:4 209.165.200.230:4 209.165.200.230:4

R2#show ip nat statistics

Total translations: 7 (0 static, 7 dynamic, 7 extended)

Outside Interfaces: FastEthernet1/0

Inside Interfaces: Serial2/0 , Serial3/0

Hits: 7 Misses: 8

Expired translations: 1

Dynamic mappings:

R2#

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.

Ya se configuro una lista de acceso en la configuración de la NAT en R2, se crea otra lista en donde se deniega el acceso de la red 192.168.30.0 al servicio de correo interno del servidor Server0, se configura en el trafico entrante de R1:

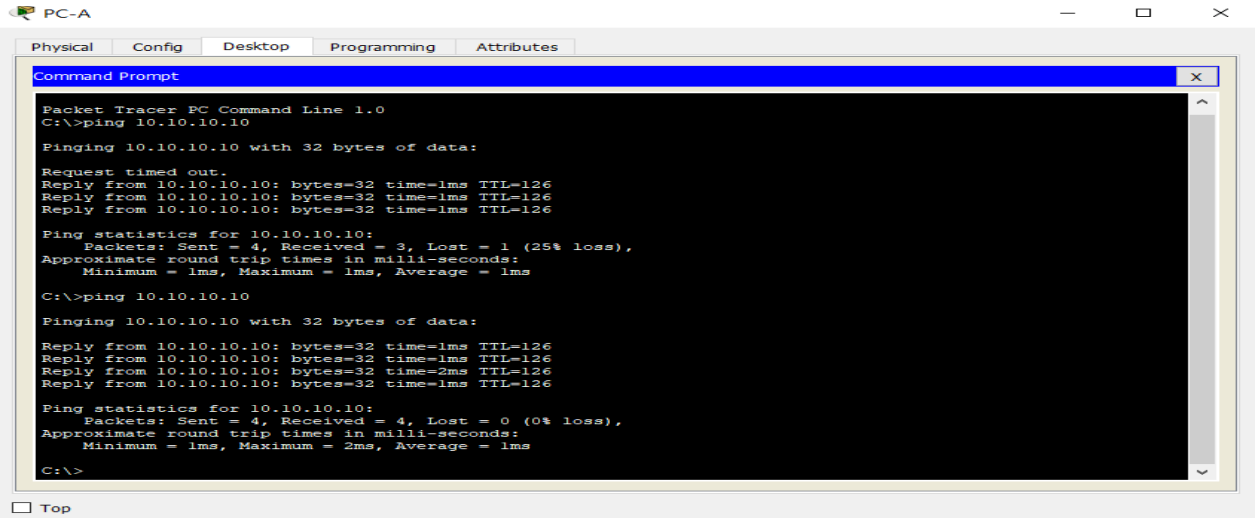


Figura 6. Conectividad desde PC-A (en la red 192.168.30.0) hacia el servidor de correo Server0, antes de configurar la ACL.

R1>enable

R1#conf

R1#configure ter

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#access-list 1 deny 10.0.0.0 0.255.255.255

R1(config)#access-list 1 permit any

R1(config)#interface fa0/0.30

R1(config-subif)#ip access-group 1 out

R1(config-subif)#exit

R1(config)#exit

R1#

%SYS-5-CONFIG_I: Configured from console by console

R1#copy run

R1#copy running-config star

R1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R1#

R1#show run

Building configuration...

Current configuration : 1597 bytes

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname R1

ip dhcp excluded-address 192.168.30.1 192.168.30.31

ip dhcp excluded-address 192.168.40.1 192.168.40.31

ip dhcp pool ADMINISTRACION

network 192.168.30.0 255.255.255.0

default-router 192.168.30.1

dns-server 10.10.10.11

ip dhcp pool MERCADEO

network 192.168.40.0 255.255.255.0

default-router 192.168.40.1

dns-server 10.10.10.11

ip cef

no ipv6 cef

interface FastEthernet0/0

no ip address

duplex auto

speed auto

interface FastEthernet0/0.30

encapsulation dot1Q 30

ip address 192.168.30.1 255.255.255.0

ip access-group 1 out

interface FastEthernet0/0.40

encapsulation dot1Q 40

ip address 192.168.40.1 255.255.255.0

interface FastEthernet1/0

no ip address

duplex auto

speed auto

shutdown

interface Serial2/0

ip address 172.31.21.1 255.255.255.252

ip ospf cost 7500

clock rate 2000000

interface Serial3/0

no ip address

clock rate 2000000

shutdown

interface FastEthernet4/0

no ip address

shutdown

interface FastEthernet5/0

no ip address

shutdown

router ospf 1

router-id 1.1.1.1

log-adjacency-changes

passive-interface FastEthernet0/0

network 192.168.30.0 0.0.0.255 area 0

network 172.31.21.0 0.0.0.3 area 0

network 192.168.40.0 0.0.0.255 area 0

ip classless

ip route 0.0.0.0 0.0.0.0 Serial2/0

ip flow-export version 9

access-list 1 deny 10.0.0.0 0.255.255.255

access-list 1 permit any

line con 0

line aux 0

line vty 0 4

login

end

R1#show access-lists

Standard IP access list 1

10 deny 10.0.0.0 0.255.255.255 (25 match(es))

20 permit any (25 match(es))

R1#

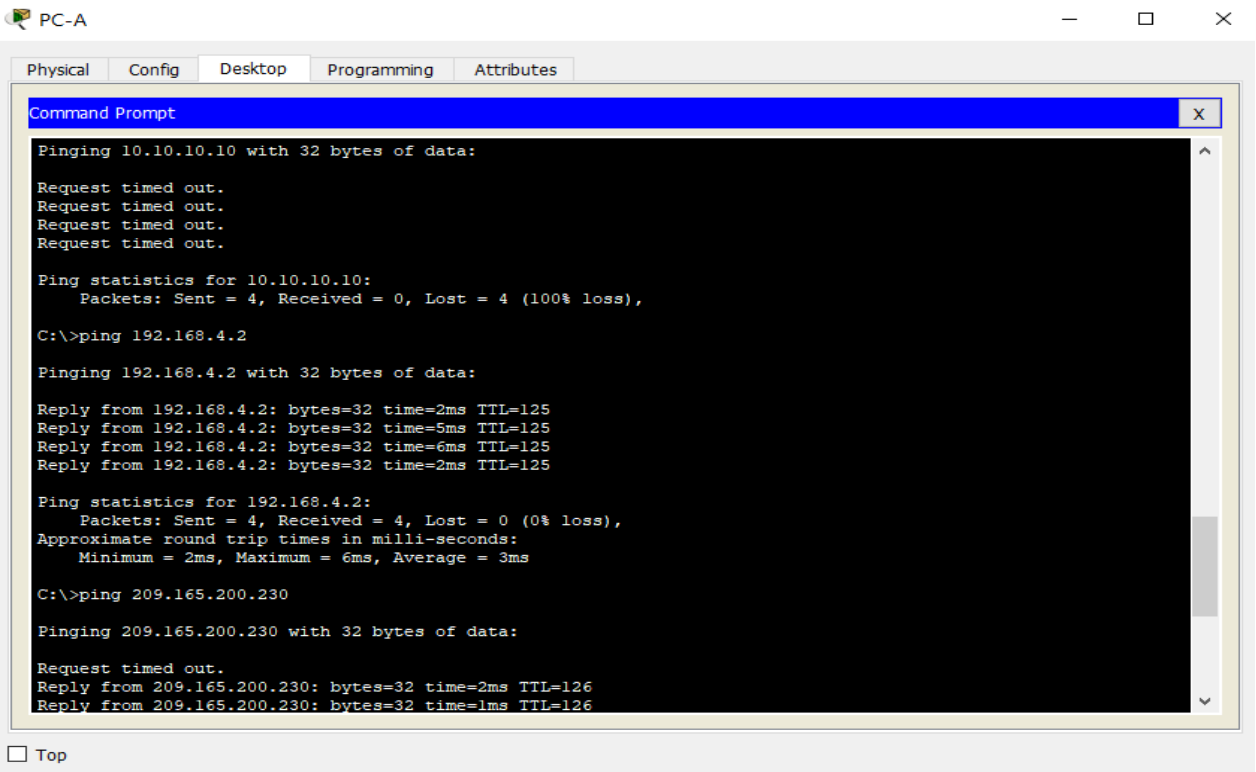


Figura 7. Conectividad de la PC-A (en la red 192.168.30.0) luego de configurar la ACL, el host se conecta sin problema a las otras redes menos a la del servidor de correo Server0 (10.0.0.0).

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.

Se configura una ACL extendida en R3 para denegarle a la red 192.168.4.0 el acceso a páginas web (http):

R3>enable

R3#conf

R3#configure ter

R3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R3(config)#access-list 101 deny tcp 192.168.4.0 0.0.0.255 any eq 80

R3(config)#access-list 101 permit ip any any

R3(config)#interface fa0/0

R3(config-if)#ip access-group 101 in

R3(config-if)#exit

R3(config)#exit

R3#

%SYS-5-CONFIG_I: Configured from console by console

R3#copy run

R3#copy running-config star

R3#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R3#

R3#show

```
R3#show run
R3#show running-config
Building configuration...

Current configuration : 1193 bytes
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname R3
ip dhcp excluded-address 192.168.4.1
ip dhcp pool Final_R3
 network 192.168.4.0 255.255.255.0
 default-router 192.168.4.1
 dns-server 10.10.10.11
ip cef
no ipv6 cef
interface FastEthernet0/0
 ip address 192.168.4.1 255.255.255.0
 ip access-group 101 in
 duplex auto
 speed auto
interface FastEthernet1/0
 no ip address
 duplex auto
```

```
 speed auto
 shutdown
interface Serial2/0
 no ip address
 clock rate 2000000
 shutdown
interface Serial3/0
 ip address 172.31.23.2 255.255.255.252
interface FastEthernet4/0
 no ip address
 shutdown
interface FastEthernet5/0
 no ip address
 shutdown
router ospf 1
 router-id 3.3.3.3
 log-adjacency-changes
 passive-interface FastEthernet0/0
 network 172.31.23.0 0.0.0.3 area 0
 network 192.168.4.0 0.0.0.255 area 0
ip classless
ip route 0.0.0.0 0.0.0.0 Serial3/0
ip flow-export version 9
access-list 101 deny tcp 192.168.4.0 0.0.0.255 any eq www
access-list 101 permit ip any any
```

line con 0

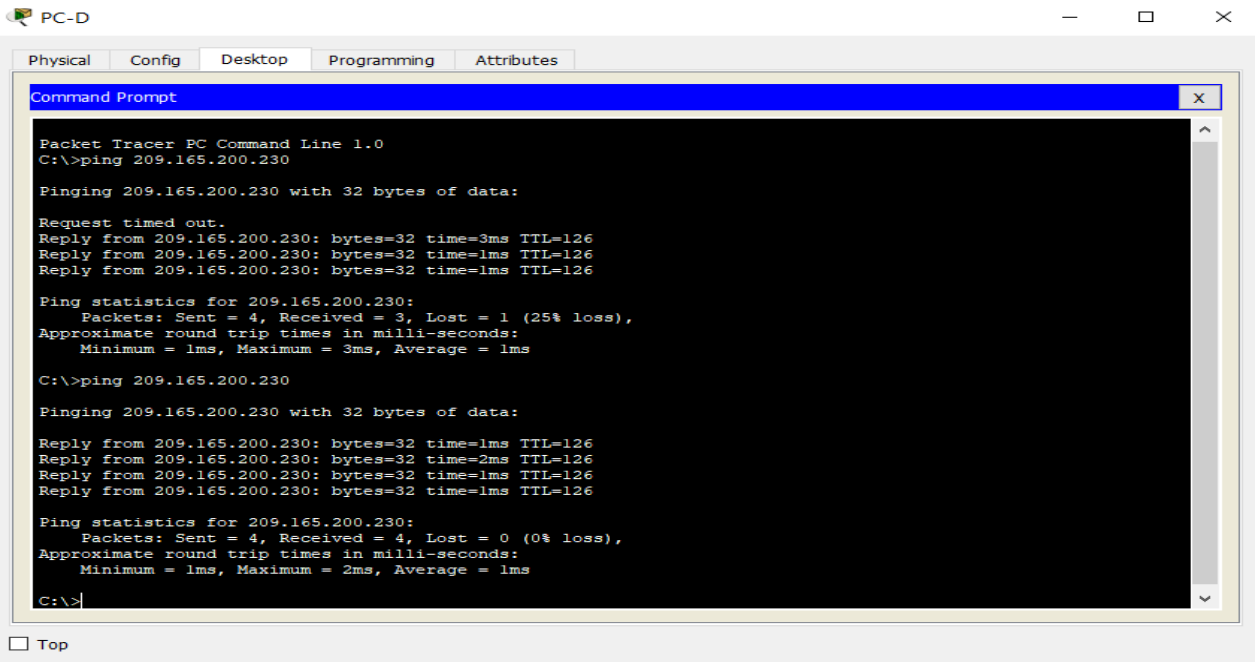
line aux 0

line vty 0 4

login

end

R3#



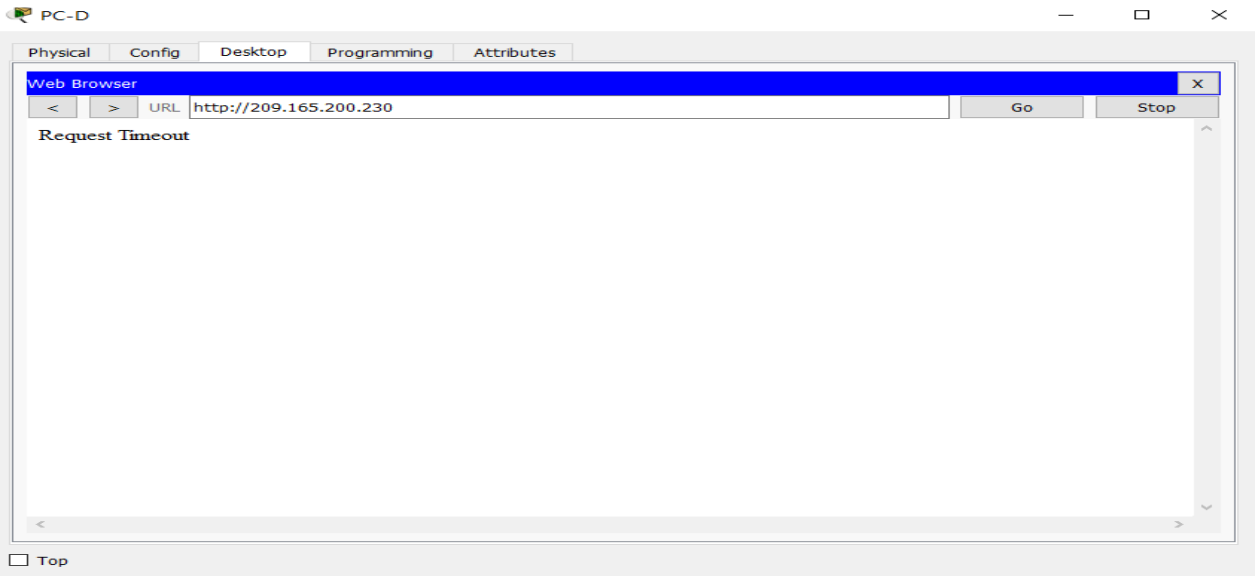


Figura 8. Prueba de ping (ICMP) hacia el servidor de internet exitosa, y vista del navegador web al intentar conectarse al servidor de internet, luego de aplicar la ACL en R3.

Se configura una ACL extendida en R1 para denegar la salida de trafico ICMP, como las pruebas de ping, desde la red 192.168.40.0:

R1>enable

R1#conf

R1#configure ter

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#access-list 102 deny tcp 192.168.40.0 0.0.0.255 any eq 40

R1(config)#access-list 102 permit ip any any

R1(config)#interface fa0/0.40

R1(config-subif)#ip access-group 102 in

R1(config-subif)#exit

R1(config)#exit

R1#

%SYS-5-CONFIG_I: Configured from console by console

R1#copy run

R1#copy running-config star

R1#copy running-config startup-config

Destination filename [startup-config]?

Building configuration...

[OK]

R1#

R1#show run

R1#show running-config

Building configuration...

Current configuration : 1713 bytes

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

hostname R1

ip dhcp excluded-address 192.168.30.1 192.168.30.31

ip dhcp excluded-address 192.168.40.1 192.168.40.31

ip dhcp pool ADMINISTRACION

network 192.168.30.0 255.255.255.0

default-router 192.168.30.1

dns-server 10.10.10.11

ip dhcp pool MERCADEO

network 192.168.40.0 255.255.255.0

default-router 192.168.40.1

dns-server 10.10.10.11

ip cef

no ipv6 cef

interface FastEthernet0/0

no ip address

duplex auto

speed auto

```
interface FastEthernet0/0.30
 encapsulation dot1Q 30
 ip address 192.168.30.1 255.255.255.0
 ip access-group 1 out
interface FastEthernet0/0.40
 encapsulation dot1Q 40
 ip address 192.168.40.1 255.255.255.0
 ip access-group 102 in
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
interface Serial2/0
 ip address 172.31.21.1 255.255.255.252
 ip ospf cost 7500
 clock rate 2000000
interface Serial3/0
 no ip address
 clock rate 2000000
 shutdown
interface FastEthernet4/0
 no ip address
 shutdown
interface FastEthernet5/0
```

no ip address

shutdown

router ospf 1

router-id 1.1.1.1

log-adjacency-changes

passive-interface FastEthernet0/0

network 192.168.30.0 0.0.0.255 area 0

network 172.31.21.0 0.0.0.3 area 0

network 192.168.40.0 0.0.0.255 area 0

ip classless

ip route 0.0.0.0 0.0.0.0 Serial2/0

ip flow-export version 9

access-list 1 deny 10.0.0.0 0.255.255.255

access-list 1 permit any

access-list 102 deny tcp 192.168.40.0 0.0.0.255 any eq 40

access-list 102 permit ip any any

line con 0

line aux 0

line vty 0 4

login

end

R1#

CONCLUSION

A través de esta actividad, se evalúan las habilidades adquiridas durante el desarrollo del curso, para el diseño, implementación y soporte de una red determinada, adaptada a las características y los requerimientos del entorno a donde se va a utilizar (hogar, oficina, campus, etc.). De esta forma el futuro ingeniero de red se prepara para el ambiente laboral que le espera, ya sea como administrador de una red real o en el diseño de una nueva red.

REFERENCIAS BIBLIOGRAFICAS

Cisco Systems. (2018). *Cisco Networking Academy*. mayo 25, 2018, de Cisco Systems Sitio web: https://www.netacad.com/