



PRUEBA DE HABILIDADES PRÁCTICAS

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**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA
(UNAD)
VICERRECTORIA ACADEMICA Y DE INVESTIGACION
(VIACI)
INGENIERIA DE TELECOMUNICACIONES (ECBTI)
MANIZALES
MARZO DE 2019**

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

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CONTENIDO

INTRODUCCION	8
DESCRIPCION DE ESCENARIOS PROPUESTOS PARA LA PRUEBA DE HABILIDADES	9
Escenario 1.....	9
SW1 VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1.	10
Los puertos de red se deben deshabilitar	12
La información de direccion IP R1, R2 y R3 deben cumplir con la tabla 1	13
Laptop20, Laptop21, PC20; PC21Laptop30, Laptop21, PC30 y PC31 deben obtener información IPV4 del servidor DHCP	15
R1 debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública. Asegúrese de que todos los terminales pueden comunicarse con Internet pública (haga ping a la dirección ISP) y la lista de acceso estándar se llama INSIDE-DEVS	18
R1 debe tener una ruta estática predeterminada al ISP que se configuró y que incluye esa ruta en el dominio RIPv2	18
R2 es un servidor DHCP para los dispositivos conectados al puerto FastEthernet 0/0	19
R2 debe, además de enrutamiento a otras partes de la red, ruta entre las vlan 100 y 200	19
El servidor0 es sólo un servidor IPv6 y solo debe ser accesible para los dispositivos R3 (ping)	20
La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop21, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6	21
La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual-stack)	21



R1, R2 y R3 intercambian información de routing mediante RIP versión 2.....22

R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1..... 23

Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo el R3 deberían poder hacer IPv6-ping entre ellos y el servidor..... 24

Escenario 2..... 30

Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario 30

Configurar el protocolo de enrutamiento OSPFv2 33

Verificar información de OSPF 35

 Visualizar tablas de enrutamiento y routers conectados por OSPFv2 35

 Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface 37

 Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.. 39

Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida..... 41

En el Switch 3 deshabilitar DNS lookup 42

Asignar direcciones IP a los Switches acorde a los lineamientos 42


Desactivar todas las interfaces que no sean utilizadas en el esquema de red 43

Implement DHCP and NAT for IPv4 45

Configurar R1 como servidor DHCP para las VLANs 30 y 40 46

Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas. 47





Configurar NAT en R2 para permitir que los host puedan salir a internet	48
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.....	48
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	48
Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.....	49
CONCLUSIONES	54
REFERENCIAS BIBLIOGRAFICAS	55



FIGURAS

Figura 1 Escenario 1 (propuesto)	9
Figura 2 PC20 Información Servidor DHCP	16
Figura 3 LAPTOP21 Información Servidor DHCP	16
Figura 4 LAPTOP30 Información Servidor DHCP	17
Figura 5 PC30 Información Servidor DHCP	17
Figura 6 Server0 Información Servidor DHCP	18
Figura 7 Server0 configuracion IPV6	20
Figura 8 Ping PC30 a Server0 (IPV6)	20
Figura 9 Ping LAPTOP31 a Server0 (IPV6)	21
Figura 10 Montaje Final Escenario 1 Packet Tracer	25
Figura 11 Ping PC21 a Server0	25
Figura 12 Ping LAPTOP21 a PC21	26
Figura 13 Ping LAPTOP21 a ISP	26
Figura 14 Ping LAPTOP31 a LAPTOP30	27
Figura 15 Ping LAPTOP31 a ISP	27
Figura 16 Ping LAPTOP30 a LAPTOP31 (IPV6)	28
Figura 17 Ping Server0 a ISP	28
Figura 18 Ping PC31 a Server0 (IPV6)	29
Figura 19 IP INTERNET PC	31
Figura 20 IP INTERNET (Server)	31
Figura 21 Enrutamiento R1	36
Figura 22 Enrutamiento R2	36
Figura 23 Enrutamiento R3	37
Figura 24 Resumen OSPF Interface R1	37
Figura 25 Resumen OSPF Interface R2	38
Figura 26 Resumen OSPF Interface R2	38
Figura 27 Resumen OSPF Interface R3	39
Figura 28 Resumen Protocolos OSPF R1	39




Figura 29 Resumen Protocolos OSPF R2	40
Figura 30 Resumen Protocolos OSPF R3	40
Figura 31 IP PC A	46
Figura 32 IP PC C	46
Figura 33 Montaje Final Escenario 2 Packet Tracer	50
Figura 34 Ping R1 a R2	50
Figura 35 Ping PC C a PC A	51
Figura 36 Ping PC A a PC C	51
Figura 37 Ping PC A a Loopback 6	52
Figura 38 Ping PC C a Loopback 5	52
Figura 39 Ping PC C a INTERNET PC	53
Figura 39 Ping PC C a INTERNET PC	53



INTRODUCCION

El presente trabajo, denominado Prueba de habilidades prácticas, es el proyecto final asociado al Diplomado de Profundización CISCO, diseño e implementación de soluciones integradas LAN/WLAN. Tiene como finalidad, dar solución a dos escenarios propuestos, en donde se pondrán a prueba los conocimientos obtenidos a los largo de las unidades temáticas que componen un aspecto muy importante en la actual evolución tecnológica; ofreciendo una mayor integración y productividad, cuando se unen para interactuar factores como la voz, la televisión y los datos.

Los conocimientos adquiridos y ahora puestos en práctica, muestran diferentes conceptos asociados como la implementación de una NAT, configuración en modo DHCP, RIPv2, Routing entre VLAN, direccionamiento IP, construcción de enlaces troncales y subinterfaces, entre otros. Las simulaciones propuestas, son una base a la realidad que actualmente y en nuestro diario vivir encontramos; ya que la inclinación hacia el área de las TIC, son el desarrollo de escenarios productivos, en cualquier topología de red y una preparación solvente ante cualquier reto que se pueda suscitar.

La actual era digital, es una clara muestra de la evolución tecnológica que actualmente vivimos, donde la recepción y el envío de información en tiempo real, se han convertido en herramienta telemática fundamental en materia de hogar, educación, interacción y fuente de negocio.

DESCRIPCION DE ESCENARIOS PROPUESTOS PARA LA PRUEBA DE HABILIDADES

Escenario 1

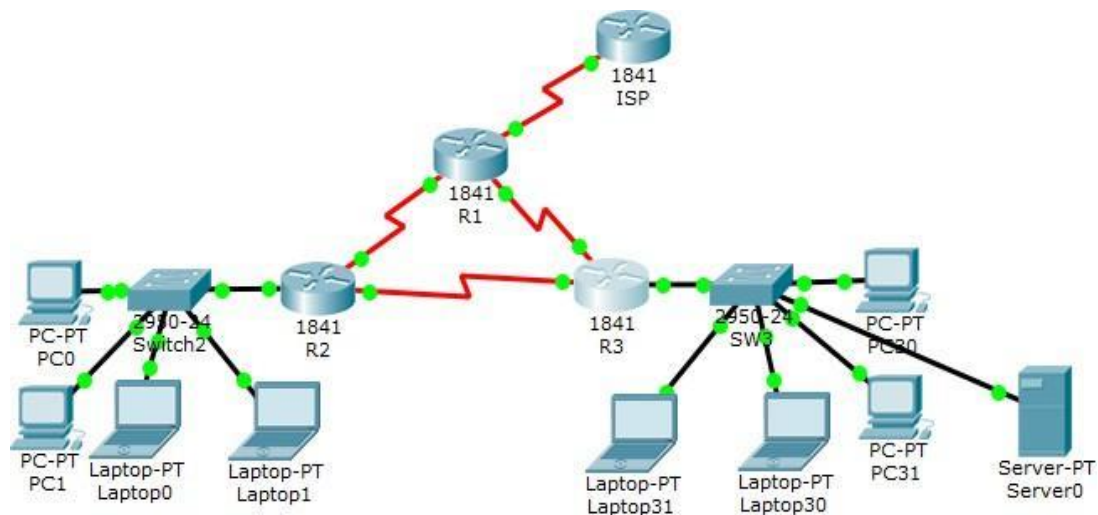


Figura 1. Escenario 1 (propuesto)

Tabla de direccionamiento

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
R1	Se0/0/0	200.123.211.2	255.255.255.0	N/D
	Se0/1/0	10.0.0.1	255.255.255.252	N/D
	Se0/1/1	10.0.0.5	255.255.255.252	N/D
R2	Fa0/0,100	192.168.20.1	255.255.255.0	N/D
	Fa0/0,200	192.168.21.1	255.255.255.0	N/D
	Se0/0/0	10.0.0.2	255.255.255.252	N/D
	Se0/0/1	10.0.0.9	255.255.255.252	N/D
R3	Fa0/0	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9C0:80F:301	/64	N/D
	Se0/0/0	10.0.0.6	255.255.255.252	N/D
	Se0/0/1	10.0.0.10	255.255.255.252	N/D
SW2	VLAN 100	N/D	N/D	N/D

	VLAN 200	N/D	N/D	N/D
SW3	VLAN1	N/D	N/D	N/D

PC20	NIC	DHCP	DHCP	DHCP
PC21	NIC	DHCP	DHCP	DHCP
PC30	NIC	DHCP	DHCP	DHCP
PC31	NIC	DHCP	DHCP	DHCP
Laptop20	NIC	DHCP	DHCP	DHCP
Laptop21	NIC	DHCP	DHCP	DHCP
Laptop30	NIC	DHCP	DHCP	DHCP
Laptop31	NIC	DHCP	DHCP	DHCP

Tabla de asignación de VLAN y de puertos

Dispositivo	VLAN	Nombre	Interfaz
SW2	100	LAPTOPS	Fa0/2-3
SW2	200	DESTOPS	Fa0/4-5
SW3	1	-	Todas las interfaces

Tabla de enlaces troncales




Dispositivo local	Interfaz local	Dispositivo remoto
SW2	Fa0/2-3	100

Situación

En esta actividad, demostrará y reforzará su capacidad para implementar NAT, servidor de DHCP, RIPV2 y el routing entre VLAN, incluida la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces. Todas las pruebas de alcance deben realizarse a través de ping únicamente.

Descripción de las actividades

- SW1 VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1.

```
Switch >
Switch >enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Sw2
Sw2(config)#vlan 100
Sw2(config-vlan)#name LAPTOPS
Sw2(config-vlan)#exit
Sw2(config)#vlan 200
Sw2(config-vlan)#name DESTOPS
Sw2(config-vlan)#exit
Sw2(config)#end
Sw2#
```

```
Sw2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Sw2(config)#int f0/1
Sw2(config-if)#switchport mode trunk
Sw2(config-if)#exit
Sw2(config)#int range f0/2-3
Sw2(config-if-range)#switchport mode access
Sw2(config-if-range)#switchport access vlan 100
Sw2(config-if-range)#exit
Sw2(config)#int range f0/4-5
Sw2(config-if-range)#switchport mode access
Sw2(config-if-range)#switchport access vlan 200
Sw2(config-if-range)#exit
Sw2(config)#end
Sw2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Sw3
Sw3(config)#
Sw3(config)#vlan 1
Sw3(config-vlan)#exit
Sw3(config)#int f0/1
Sw3(config-if)#switchport mode trunk
Sw3(config-if)#exit
Sw3(config)#interface range f0/2-24
```

```
Sw3(config-if-range)#switchport mode access
Sw3(config-if-range)#switchport access vlan 1
```




```
Sw3(config-if-range)#exit
Sw3(config)#exit
Sw3#
```

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

- Los puertos de red que no se utilizan se deben deshabilitar.

```
Sw2 >
Sw2 >enable
Sw2#configure terminal
Sw2(config)#interface FastEthernet0/6
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/7
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/8
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/9
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/10
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/11
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/12
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/13
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/14
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/15
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/16
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/17
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/18
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/19
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/20
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/21
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/22
Sw2(config-if)#shutdown
```

```
Sw2(config)#interface FastEthernet0/23
Sw2(config-if)#shutdown
Sw2(config)#interface FastEthernet0/24
Sw2(config-if)#shutdown
Sw2(config-if)#exit
```

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range f0/7-24
Sw3(config-if-range)#shutdown
Sw3(config-if-range)#exit
Sw3(config)#exit
Sw3#
%SYS-5-CONFIG_I: Configured from console by console
```

- La información de dirección IP R1, R2 y R3 debe cumplir con la tabla 1.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#
R1(config)#interface Serial0/0/0
R1(config-if)#no shutdown
R1(config-if)#no clock rate
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#exit
```

```
R1(config)#interface Serial0/1/0
R1(config-if)#no shutdown
R1(config-if)#clock rate 128000
This command applies only to DCE interfaces
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#exit
```

```
R1(config)#interface Serial0/1/1
R1(config-if)#no shutdown
R1(config-if)#no clock rate
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#exit
R1(config)#exit
R1#
```

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

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface Serial0/0/0
R2(config-if)#no shutdown
R2(config-if)#no clock rate
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#exit

R2(config)#interface Serial0/0/1
R2(config-if)#no shutdown
R2(config-if)#clock rate 128000
This command applies only to DCE interfaces
R2(config-if)#ip address 10.0.0.9 255.255.255.252
R2(config-if)#exit

R2(config)#interface FastEthernet0/0
R2(config-if)#no shutdown
R2(config-if)#exit

R2(config)#int f0/0.100
R2(config-subif)#encapsulation dot1Q 100
R2(config-subif)#ip address 192.168.20.1 255.255.255.0
R2(config-subif)#exit

R2(config)#int f0/0.200
R2(config-subif)#encapsulation dot1Q 200
R2(config-subif)#ip address 192.168.21.1 255.255.255.0
R2(config-subif)#exit
R2(config)#exit
R2#

R2(config)#ip dhcp pool LAPTOPS
R2(dhcp-config)#network 192.168.20.0 255.255.255.0
R2(dhcp-config)#defa
R2(dhcp-config)#default-router 192.168.20.1
R2(dhcp-config)#exit
R2(config)#ip dhcp pool DESTOPS
R2(dhcp-config)#network 192.168.21.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.21.1
R2(dhcp-config)#exit
R2(config)#exit

```

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

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#interface Serial0/0/0
R3(config-if)#no shutdown
R3(config-if)#no clock rate
R3(config-if)#ip address 10.0.0.10 255.255.255.252
R3(config-if)#exit
```

```
R3(config)#interface Serial0/0/1
R3(config-if)#no shutdown
R3(config-if)#clock rate 128000
This command applies only to DCE interfaces
R3(config-if)#ip address 10.0.0.6 255.255.255.252
R3(config-if)#exit
```

```
R3(config)#interface FastEthernet0/0
R3(config-if)#no shutdown
R3(config-if)# ip address 192.168.30.1 255.255.255.0
R3(config-if)#exit
R3(config)#exit
R3#
```

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

```
R3(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64
R3(config-if)#
```

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

- Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31 deben obtener información IPv4 del servidor DHCP.

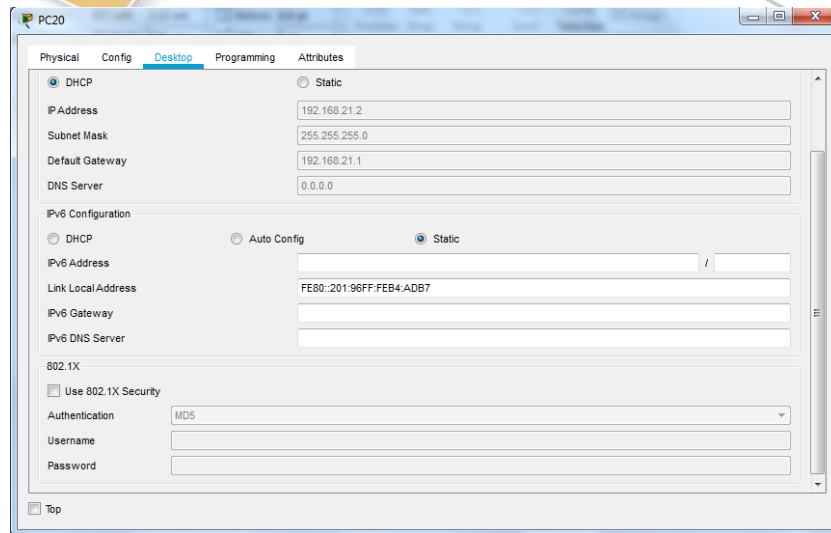


Figura 2. PC20 Información Servidor DHCP

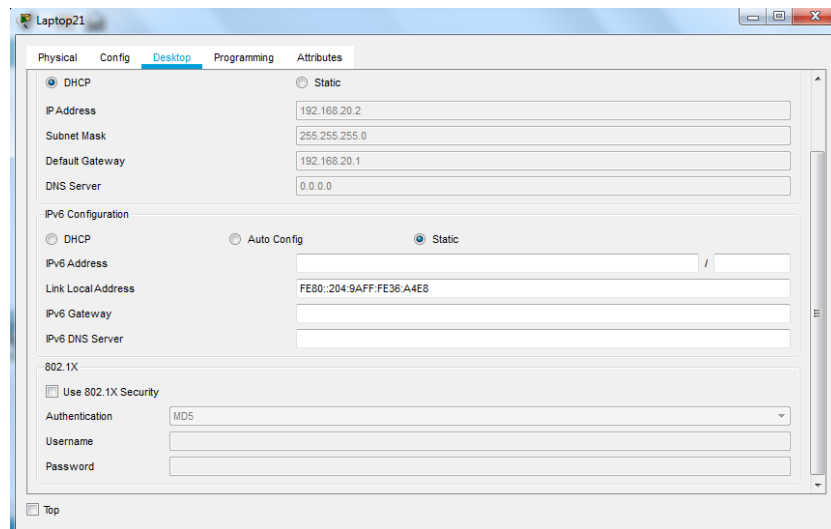


Figura 3. LAPTOP21 Información Servidor DHCP

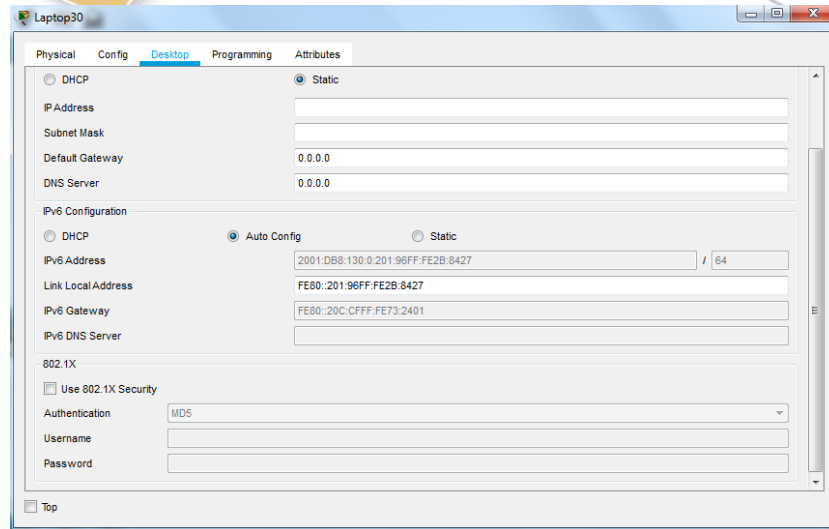


Figura 4. LAPTOP30 Información Servidor DHCP

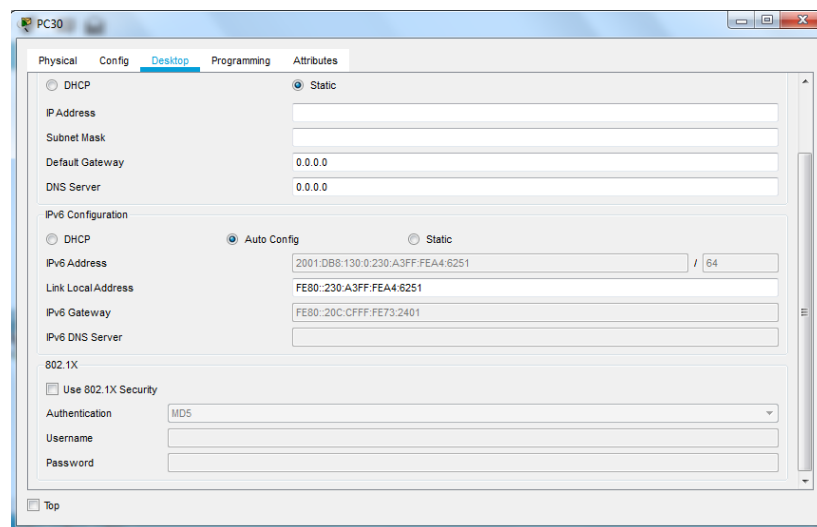


Figura 5. PC30 Información Servidor DHCP

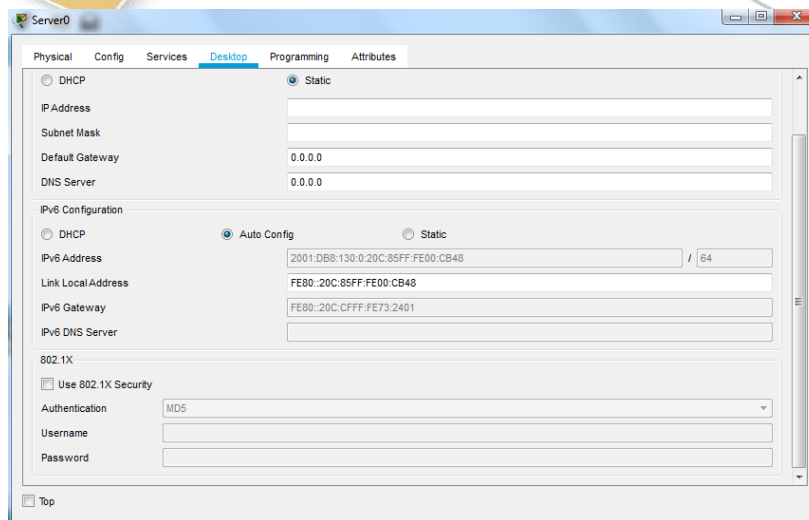


Figura 6. Server0 Información Servidor DHCP

- R1 debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública. Asegúrese de que todos los terminales pueden comunicarse con Internet pública (haga ping a la dirección ISP) y la lista de acceso estándar se llama INSIDE-DEVS.

R1>enable

R1#configure terminal

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

R1(config)#ip access-list standard INSIDE-DEVS

R1(config-std-nacl)#permit 192.168.20.0 0.0.0.255

R1(config-std-nacl)#permit 192.168.21.0 0.0.0.255

R1(config-std-nacl)#permit 192.168.30.0 0.0.0.255

R1(config-std-nacl)#exit

R1(config)#ip nat inside source list INSIDE-DEVS interface serial0/0/0 overload

R1(config)#interface serial 0/0/0

R1(config-if)#ip nat outside

R1(config-if)#exit

R1(config)#interface serial 0/1/0

R1(config-if)#ip nat inside

R1(config-if)#exit

R1(config)#interface serial 0/1/1

R1(config-if)#ip nat inside

R1(config-if)#exit

- R1 debe tener una ruta estática predeterminada al ISP que se configuró y que incluye esa ruta en el dominio RIPv2.

```
ISP>enable
ISP#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#interface serial 0/0/0
ISP(config)#ip route 0.0.0.0 0.0.0.0
ISP(config)#exit
```

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

- R2 es un servidor de DHCP para los dispositivos conectados al puerto FastEthernet0/0.

```
R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dhcp pool LAPTOPS
R2(dhcp-config)#network 192.168.20.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.20.1
R2(dhcp-config)#exit
R2(config)#ip dhcp pool DESTOPS
R2(dhcp-config)#network 192.168.21.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.21.1
R2(dhcp-config)#exit
R2(config)#exit
R2#
```

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

- R2 debe, además de enrutamiento a otras partes de la red, ruta entre las VLAN 100 y 200.

```
R2>enable
R2#vlan database
% Warning: It is recommended to configure VLAN from config mode,
as VLAN database mode is being deprecated. Please consult user
documentation for configuring VTP/VLAN in config mode.
R2(vlan)#vlan 100 name LAPTOPS
VLAN 100 modified:
Name: LAPTOPS
R2(vlan)#vlan 200 name DESTOPS
VLAN 200 modified:
Name: DESTOPS
R2(vlan)#exit
```

- El Servidor0 es sólo un servidor IPv6 y solo debe ser accesible para los dispositivos en R3 (ping).

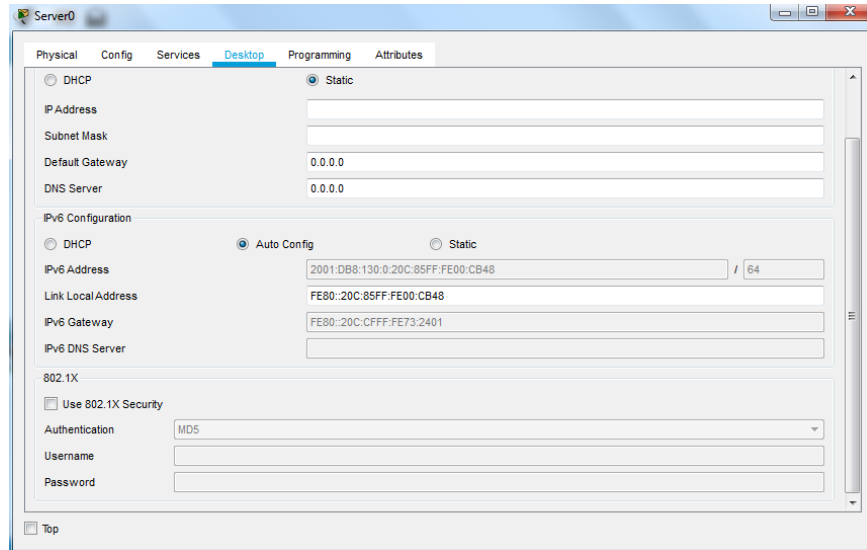


Figura 7. Server0 configuracion IPV6

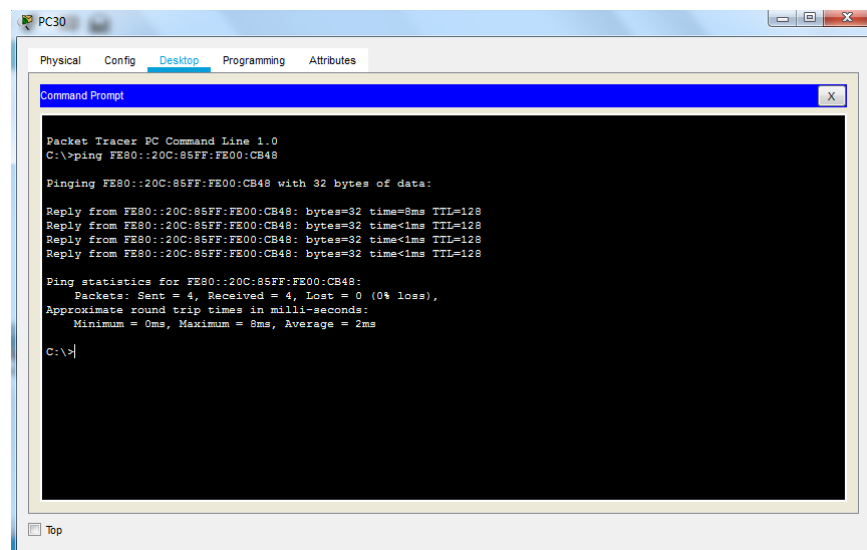


Figura 8. Ping PC30 a Server0 (IPV6)

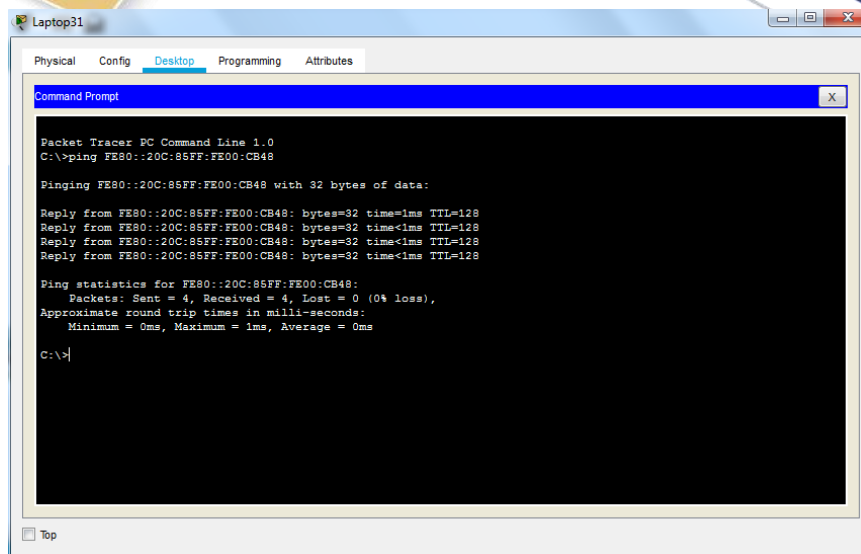


Figura 9. Ping LAPTOP31 a Server0 (IPv6)

- La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop31, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6.

```
R3>enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#Ip dhcp pool IPV4
R3(dhcp-config)#network 192.168.30.0 255.255.255.0
R3(dhcp-config)#default-router 192.168.30.1
R3(dhcp-config)#exit
R3(config)#exit
R3#
```

```
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ipv6 dhcp pool IPV6
R3(config-dhcpv6)#address prefix 2001:db8:130::9C0:80F:301/64
R3(config-dhcpv6)#exit
R3(config)#ipv6 unicast-routing
R3(config-dhcpv6)#exit
R3(config)#exit
%SYS-5-CONFIG_I: Configured from console by console
```

- La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual- stack).

```

R3>enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#interface FastEthernet0/0
R3(config-if)#ip address 192.168.30.1 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#ipv6 add
R3(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64
R3(config-if)#exit
R3(config)#exit

```

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

- R1, R2 y R3 intercambian información de routing mediante RIP versión 2.

```

R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 10.0.0.0
R1(config-router)#exit
R1(config)#exit
%SYS-5-CONFIG_I: Configured from console by console

```

```

R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#network 10.0.0.0
R2(config-router)#network 192.168.20.0
R2(config-router)#network 192.168.21.0
R2(config-router)#exit
R2(config)#exit
%SYS-5-CONFIG_I: Configured from console by console

```

```

R3>enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router rip
R3(config-router)#version 2

```

```
R3(config-router)#network 10.0.0.0
R3(config-router)#network 192.168.30.0
R3(config-router)#exit
R3(config)#exit
%SYS-5-CONFIG_I: Configured from console by console
```

- R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde 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

```
10.0.0.0/30 is subnetted, 3 subnets
C 10.0.0.0 is directly connected, Serial0/1/0
C 10.0.0.4 is directly connected, Serial0/1/1
R 10.0.0.8 [120/1] via 10.0.0.2, 00:00:22, Serial0/1/0
R 192.168.20.0/24 [120/1] via 10.0.0.2, 00:00:22, Serial0/1/0

R 192.168.21.0/24 [120/1] via 10.0.0.2, 00:00:22, Serial0/1/0
C 200.123.211.0/24 is directly connected, Serial0/0/0
```

```
R2#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

Gateway of last resort is not set

10.0.0.0/30 is subnetted, 3 subnets
 C 10.0.0.0 is directly connected, Serial0/0/0
 R 10.0.0.4 [120/1] via 10.0.0.1, 00:00:11, Serial0/0/0
 C 10.0.0.8 is directly connected, Serial0/0/1
 C 192.168.20.0/24 is directly connected, FastEthernet0/0.100
 C 192.168.21.0/24 is directly connected, FastEthernet0/0.200

R3#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
 D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
 N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
 i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
 * - candidate default, U - per-user static route, o - ODR
 P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/30 is subnetted, 3 subnets
 R 10.0.0.0 [120/1] via 10.0.0.5, 00:00:02, Serial0/0/1
 C 10.0.0.4 is directly connected, Serial0/0/1
 C 10.0.0.8 is directly connected, Serial0/0/0
 R 192.168.20.0/24 [120/1] via 10.0.0.9, 00:00:02, Serial0/0/0
 R 192.168.21.0/24 [120/1] via 10.0.0.9, 00:00:02, Serial0/0/0
 C 192.168.30.0/24 is directly connected, FastEthernet0/0

- Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo el R3 deberían poder hacer IPv6-ping entre ellos y el servidor.

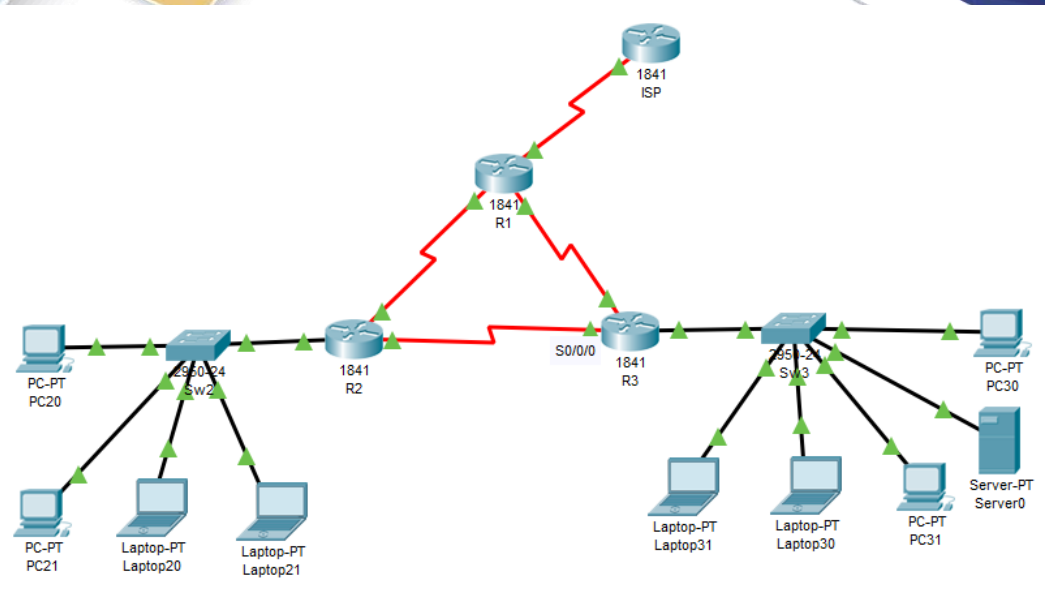


Figura 10. Montaje Final Escenario 1 Packet Tracer

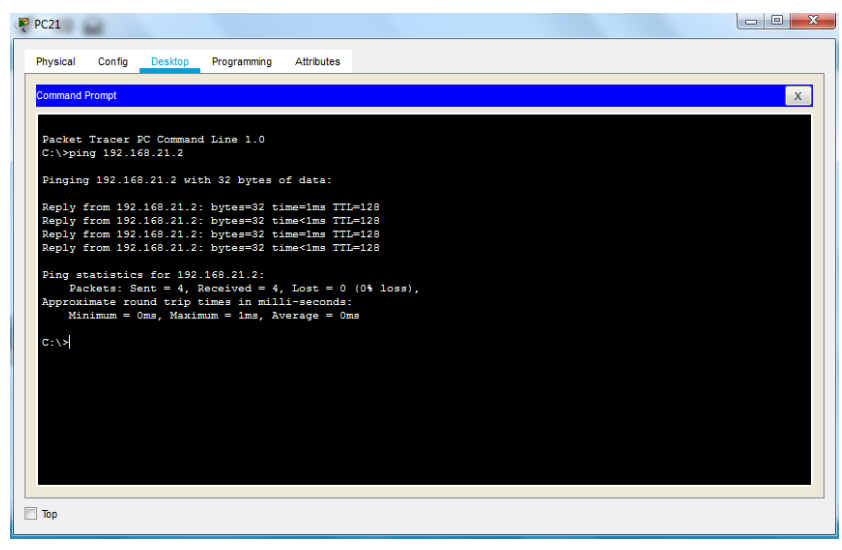


Figura 11. Ping PC21 a Server0

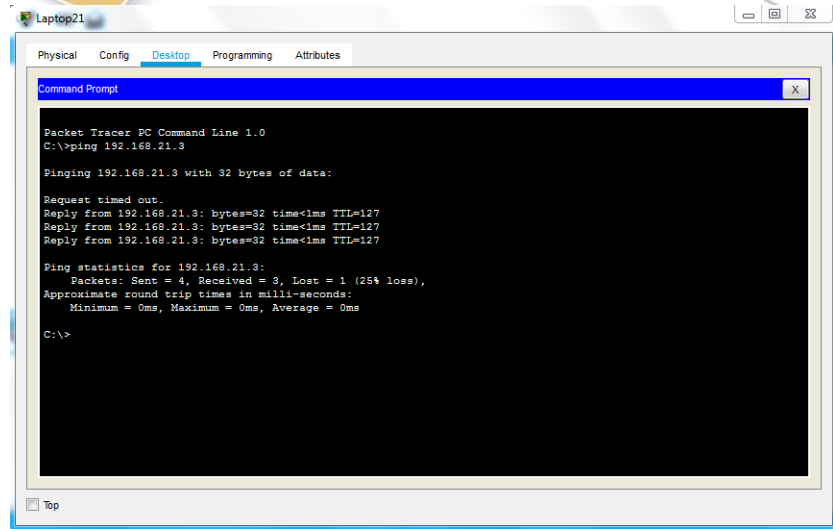


Figura 12. Ping LAPTOP21 a PC21

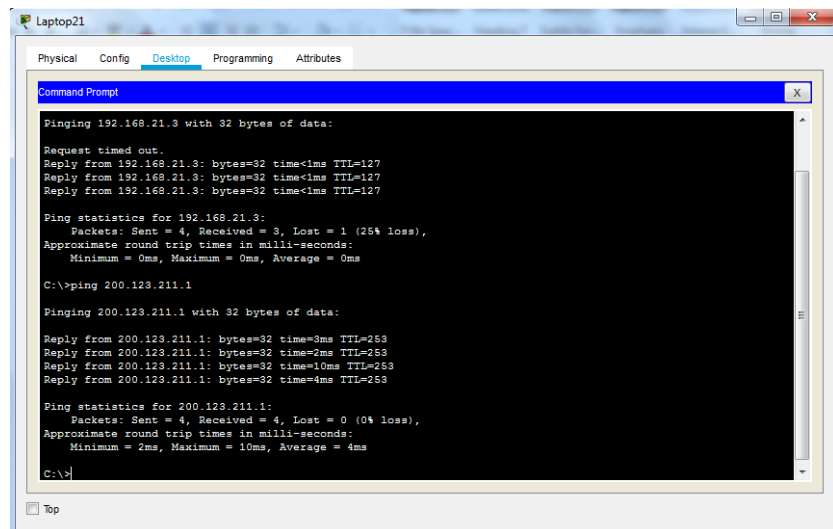


Figura 13. Ping LAPTOP21 a ISP

```

Laptop31
Physical Config Desktop Programming Attributes
Command Prompt
Pinging FE80::20C:85FF:FE00:CB48 with 32 bytes of data:
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128

Ping statistics for FE80::20C:85FF:FE00:CB48:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:
Reply from 192.168.30.2: bytes=32 time=23ms TTL=128
Reply from 192.168.30.2: bytes=32 time=16ms TTL=128
Reply from 192.168.30.2: bytes=32 time=29ms TTL=128
Reply from 192.168.30.2: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 29ms, Average = 17ms

C:\>
  
```

Figura 14. Ping LAPTOP31 a LAPTOP30

```

Laptop31
Physical Config Desktop Programming Attributes
Command Prompt
Pinging 192.168.30.2 with 32 bytes of data:
Reply from 192.168.30.2: bytes=32 time=23ms TTL=128
Reply from 192.168.30.2: bytes=32 time=16ms TTL=128
Reply from 192.168.30.2: bytes=32 time=29ms TTL=128
Reply from 192.168.30.2: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 29ms, Average = 17ms

C:\>
C:\>ping 200.123.211.1

Pinging 200.123.211.1 with 32 bytes of data:
Reply from 200.123.211.1: bytes=32 time=13ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253

Ping statistics for 200.123.211.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 13ms, Average = 4ms

C:\>
  
```

Figura 15. Ping LAPTOP31 a ISP

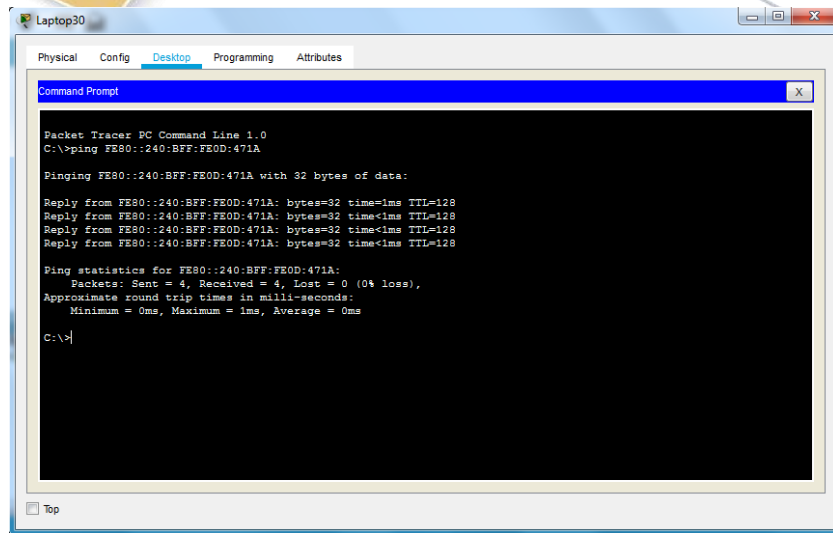


Figura 16. Ping LAPTOP30 a LAPTOP31 (IPv6)

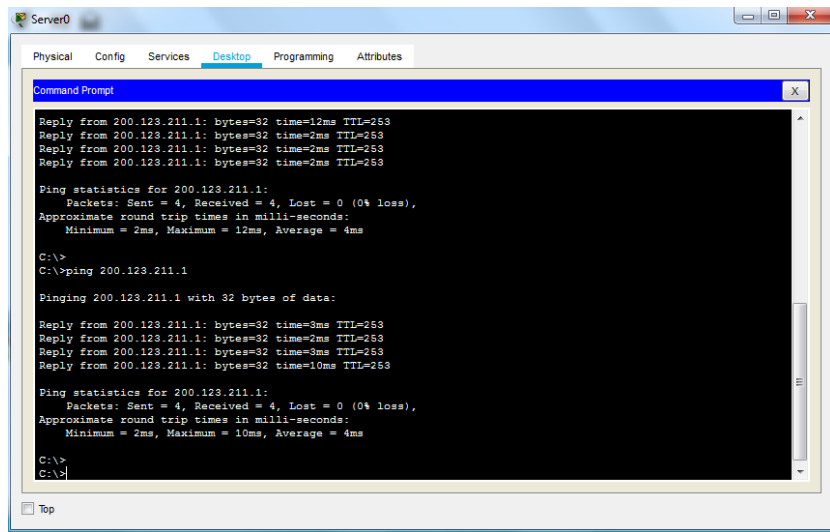
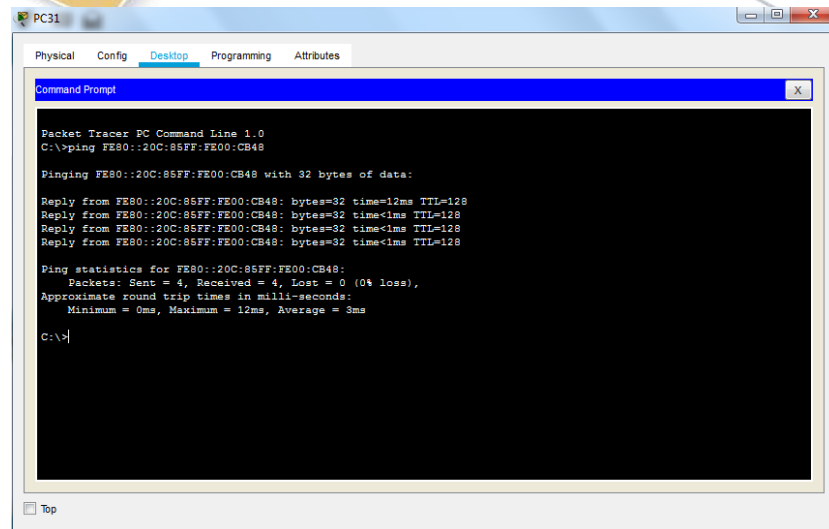


Figura 17. Ping Server0 a ISP



```
PC31
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping FE80::20C:85FF:FE00:CB48

Pinging FE80::20C:85FF:FE00:CB48 with 32 bytes of data:

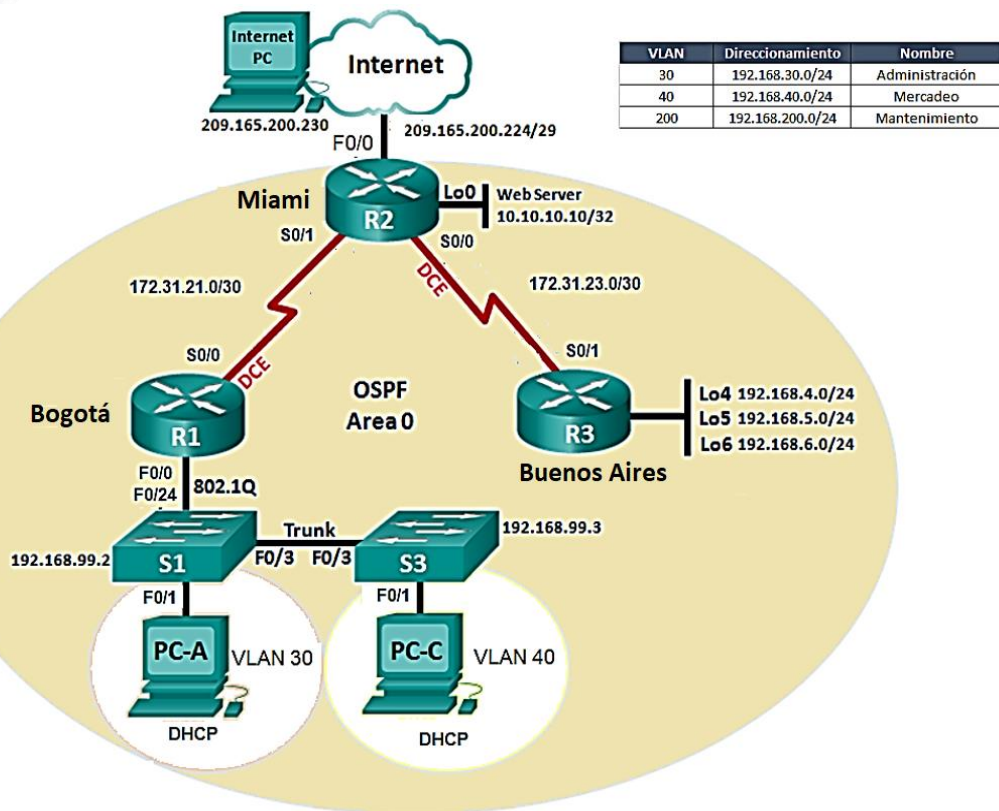
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time=12ms TTL=128
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128
Reply from FE80::20C:85FF:FE00:CB48: bytes=32 time<1ms TTL=128

Ping statistics for FE80::20C:85FF:FE00:CB48:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 12ms, Average = 3ms

C:\>
```

Figura 18. Ping PC31 a Server0 (IPV6)

Escenario 2



Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, 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.

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

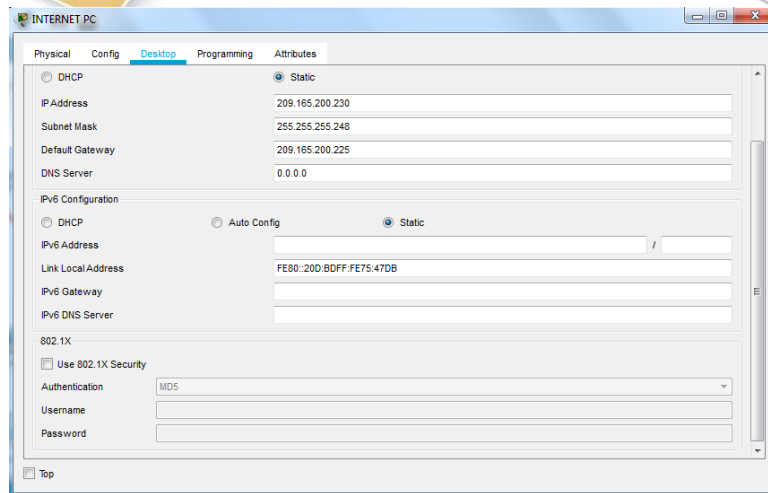


Figura 19. IP INTERNET PC

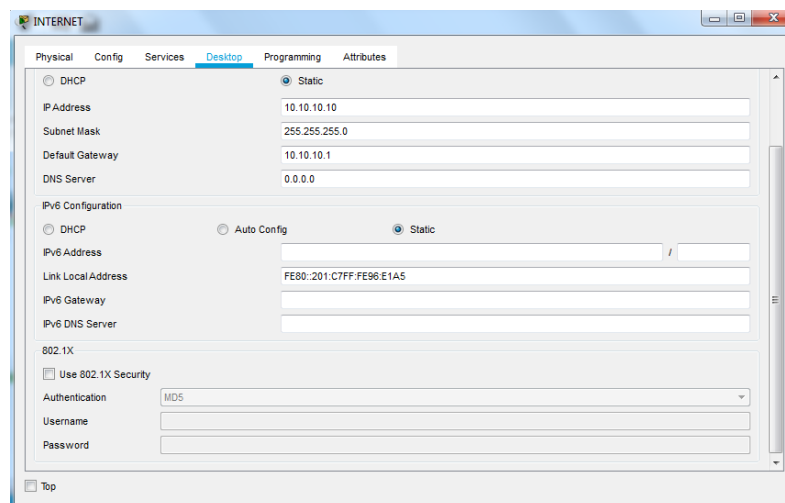


Figura 20. IP INTERNET (Server)

```

R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface Serial0/0/0
R1(config-if)#no shutdown
R1(config-if)#clock rate 128000
This command applies only to DCE interfaces
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
    
```



Destination filename [startup-config]?
 Building configuration...
 [OK]

```
R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface Serial0/0/1
R2(config-if)#no shutdown
R2(config-if)#no clock rate
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#exit
R2(config)#interface Serial0/0/0
R2(config-if)#no shutdown
R2(config-if)#clock rate 128000
This command applies only to DCE interfaces
R2(config-if)#ip address 172.31.23.2 255.255.255.252
R2(config-if)#exit
R2(config)#interface GigabitEthernet0/0
R2(config-if)#no shutdown
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#exit
R2(config)#interface GigabitEthernet0/1
R2(config-if)# no shutdown
R2(config-if)#ip address 10.10.10.1 255.255.255.0
R2(config-if)#exit
R2(config)# exit
%SYS-5-CONFIG_I: Configured from console by console
R2#
```

```
R3>enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#interface Serial0/0/1
R3(config-if)#no clock rate
R3(config-if)#no shutdown
R3(config-if)# ip address 172.31.23.1 255.255.255.252
%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
ip address
```

```
R3(config-if)# R3(config-if)#interface l04
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
```



```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state
to up
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#interface l05
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state
to up
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#interface l06
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state
to up
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#exit
%SYS-5-CONFIG_I: Configured from console by console

```

```

R3#copy run
R3#copy running-config sta
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#




```

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

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500




```
R1>enable
```

```
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)#passive-interface fastEthernet 0/0
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#exit
R1(config)#interface serial 0/0/0
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
R1(config-if)#exit
R1(config)#exit
R1#
```

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

```
R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 2
R2(config-router)#ro
R2(config-router)#router-id 5.5.5.5
R2(config-router)#pasi
R2(config-router)#pass
R2(config-router)#passive-interface gig
R2(config-router)#passive-interface gigabitEthernet 0/0
R2(config-router)#passive-interface gigabitEthernet 0/1
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
R2(config-router)#exit
R2(config)#inte
R2(config)#interface ser
R2(config)#interface serial 0/0/0
R2(config-if)#band
R2(config-if)#bandwidth 256
R2(config-if)#ip os
R2(config-if)#ip ospf co
R2(config-if)#ip ospf cost 9500
R2(config-if)#exit
R2(config)#interface serial 0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#exit
R2(config)#exit
R2#
```



%SYS-5-CONFIG_I: Configured from console by console
R2#

```
R3>enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 3
R3(config-router)#router-id 8.8.8.8
R3(config-router)#passive-interface loop
R3(config-router)#passive-interface loopback 4
R3(config-router)#passive-interface loopback 5
R3(config-router)#passive-interface loopback 6
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#exit
R3(config)#interface serial 0/0/1
R3(config-if)#band
R3(config-if)#bandwidth 256
R3(config-if)#ip ospf cost 9500
R3(config-if)#exit
R3(config)#exit
R3#
```

%SYS-5-CONFIG_I: Configured from console by console
R3#

Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2

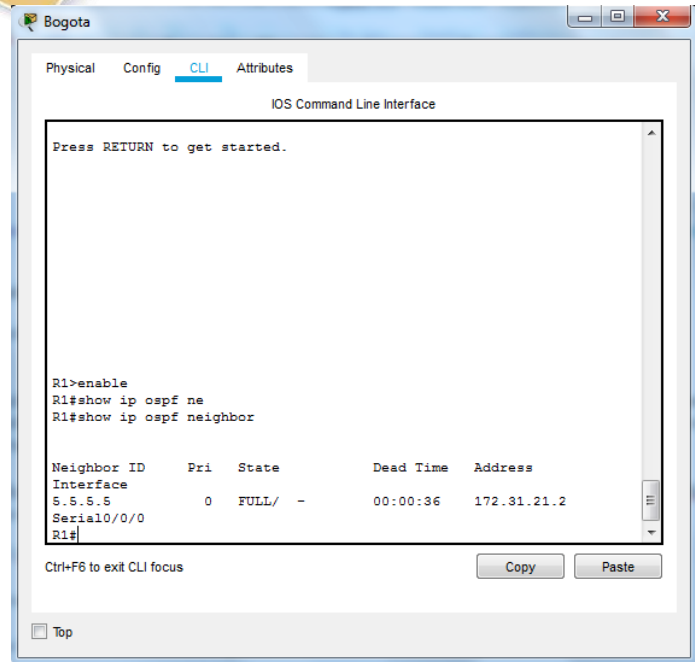


Figura 21. Enrutamiento R1

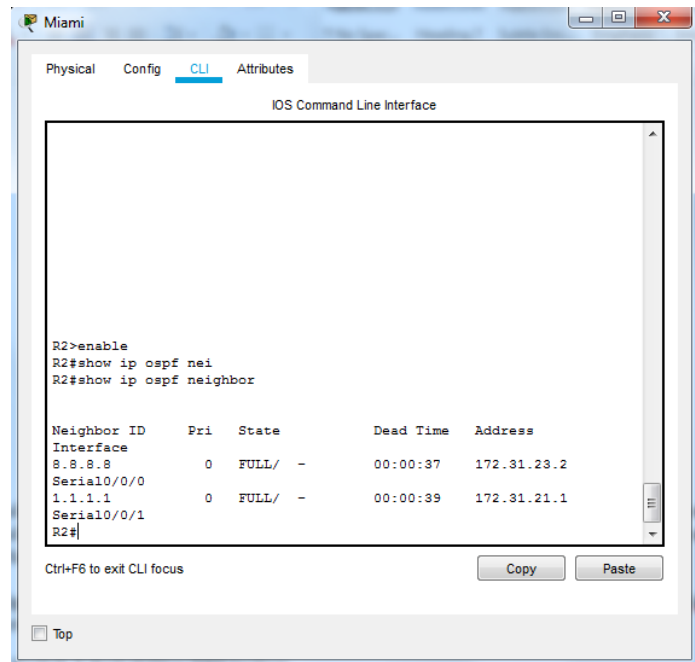


Figura 22. Enrutamiento R2

The screenshot shows a Cisco CLI window titled "Buenos Aires" with tabs for Physical, Config, CLI, and Attributes. The CLI window displays the following commands and output:

```

R3>enable
R3#show ip ospf nei
R3#show ip ospf neighbor

Neighbor ID    Pri   State           Dead Time   Address
Interface
5.5.5.5        0    FULL/ -         00:00:37   172.31.23.1
Serial0/0/1
R3#
R3#
  
```

Buttons for "Copy" and "Paste" are visible at the bottom right of the CLI window.

Figura 23. Enrutamiento R3

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

The screenshot shows a Cisco CLI window titled "Bogota" with tabs for Physical, Config, CLI, and Attributes. The CLI window displays the following commands and output:

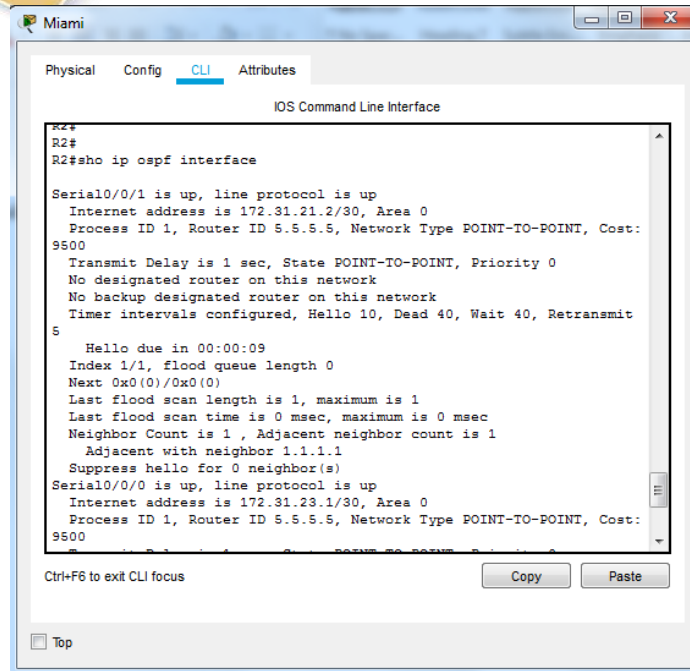
```

R1>enable
R1#show ip ospf int
R1#show ip ospf interface

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:
  9500
  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 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 5.5.5.5
  Suppress hello for 0 neighbor(s)
R1#
  
```

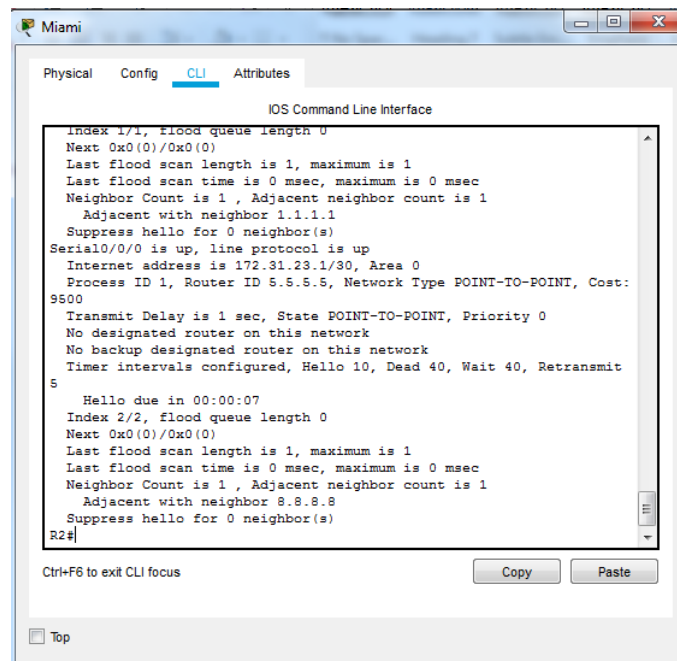
Buttons for "Copy" and "Paste" are visible at the bottom right of the CLI window.

Figura 24. Resumen OSPF Interface R1



```
R2#  
R2#  
R2#sho 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 5.5.5.5, Network Type POINT-TO-POINT, Cost:  
9500  
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 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 5.5.5.5, Network Type POINT-TO-POINT, Cost:  
9500
```

Figura 25. Resumen OSPF Interface R2



```
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 5.5.5.5, Network Type POINT-TO-POINT, Cost:  
9500  
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 8.8.8.8  
Suppress hello for 0 neighbor(s)  
R2#
```

Figura 26. Resumen OSPF Interface R2

```

Buenos Aires
Physical Config CLI Attributes
IOS Command Line Interface

R3>enable
R3#show ip ospf in
R3#show ip ospf interface

Serial0/0/1 is up, line protocol is up
Internet address is 172.31.23.2/30, Area 0
Process ID 3, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost:
9500
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 00:00:03
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 5.5.5.5
Suppress hello for 0 neighbor(s)
R3#
Ctrl+F6 to exit CLI focus
Copy Paste
Top
  
```

Figura 27. Resumen OSPF Interface R3

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

```

Bogota
Physical Config CLI Attributes
IOS Command Line Interface

R1#
R1#
R1#show ip pro
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:
 172.31.21.0 0.0.0.3 area 0
Passive Interface(s):
 FastEthernet0/0
Routing Information Sources:
Gateway Distance Last Update
1.1.1.1 110 00:02:33
5.5.5.5 110 00:26:28
8.8.8.8 110 00:26:28
Distance: (default is 110)

R1#
R1#
R1#
Ctrl+F6 to exit CLI focus
Copy Paste
Top
  
```

Figura 28. Resumen Protocolos OSPF R1

```

Miami
Physical Config CLI Attributes
IOS Command Line Interface

R2>enable
R2#show ip pr
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 5.5.5.5
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 area 0
    172.31.23.0 0.0.0.3 area 0
  Passive Interface(s):
    GigabitEthernet0/0
    GigabitEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1           110          00:03:48
    5.5.5.5           110          00:27:43
    8.8.8.8           110          00:27:43
  Distance: (default is 110)

R2#
  
```

Figura 29. Resumen Protocolos OSPF R2

```

Buenos Aires
Physical Config CLI Attributes
IOS Command Line Interface

R3#
R3#
R3#show ip pr
R3#show ip protocols

Routing Protocol is "ospf 3"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 8.8.8.8
  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
  Passive Interface(s):
    Loopback4
    Loopback5
    Loopback6
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1           110          00:05:06
    5.5.5.5           110          00:29:00
    8.8.8.8           110          00:29:00
  Distance: (default is 110)

R3#
  
```

Figura 30. Resumen Protocolos OSPF 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.

```
Switch >
Switch >enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Sw1
Sw1(config)#vlan 30
Sw1(config-vlan)#name Administracion
Sw1(config-vlan)#exit
Sw1(config)#vlan 40
Sw1(config-vlan)#name Mercadeo
Sw1(config-vlan)#exit
Sw1(config)#vlan 200
Sw1(config-vlan)#name Mantenimiento
Sw1(config-vlan)#exit
Sw1(config)#
Sw1(config)#interface FastEthernet0/1
Sw1(config-if)#switchport mode access
Sw1(config-if)#switchport access vlan 30
Sw1(config-if)#exit
Sw1(config)#interface FastEthernet0/3
Sw1(config-if)#switchport mode trunk
Sw1(config-if)#exit
Sw1(config)#interface FastEthernet0/24
Sw1(config-if)#switchport mode trunk
Sw1(config-if)#exit
```

```
Switch >
Switch >enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Sw3
Sw3(config)#vlan 30
Sw3(config-vlan)#name Administracion
Sw3(config-vlan)#exit
Sw3(config)#vlan 40
Sw3(config-vlan)#name Mercadeo
Sw3(config-vlan)#exit
Sw3(config)#vlan 200
Sw3(config-vlan)#name Mantenimiento
Sw3(config-vlan)#exit
Sw3(config)#
```

```
Sw3(config)#interface FastEthernet0/1
Sw3(config-if)#switchport mode access
Sw3(config-if)#switchport access vlan 40
Sw3(config-if)#exit
Sw3(config)#interface FastEthernet0/3
Sw3(config-if)#switchport mode trunk
Sw3(config-if)#exit
```

4. En el Switch 3 deshabilitar DNS lookup

```
Sw3 >
Sw3 >enable
Sw3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Sw3(config)#no ip domain-lookup
Sw3(config)#exit
Sw3#
%SYS-5-CONFIG_I: Configured from console by console
```

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

```
Sw1 >enable
Sw1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Sw1(config)#interface vlan 30
Sw1(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to
up
Sw1(config-if)#ip address 192.168.99.2 255.255.255.0
Sw1(config-if)#exit
Sw1(config)#ip default-gateway 192.168.99.1
Sw1(config)#exit
Sw1#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Sw3>enable
Sw3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Sw3(config)#interface vlan 40
Sw3(config-if)#
%LINK-5-CHANGED: Interface Vlan40, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan40, changed state to
up
Sw3(config-if)#ip address 192.168.99.3 255.255.255.0
```

```

Sw3(config-if)#exit
Sw3(config)#ip default-gateway 192.168.99.1
Sw3(config)#exit
Sw3#
%SYS-5-CONFIG_I: Configured from console by console

```

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

```

Sw1>enable
Sw1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Sw1(config)#interface fastEthernet 0/2
Sw1(config-if)#shutdown
Sw1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively
down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to down
Sw1(config-if)#exit
Sw1(config)#interface range fastEthernet 0/4-23
Sw1(config-if-range)#shutdonn
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down

```

```

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down
Sw1(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed
state to up
Sw1(config-if-range)#exit
Sw1(config)#exit
Sw1#
%SYS-5-CONFIG_I: Configured from console by console

Sw3>enable
Sw3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Sw3(config)#inte fastEthernet 0/2
Sw3(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively
down
Sw3(config-if)#exit
Sw3(config)#interface range fastEthernet 0/4-24
Sw3(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively
down

```

```

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to
administratively down
Sw3(config-if-range)#exit
Sw3(config)#exit
Sw3#
%SYS-5-CONFIG_I: Configured from console by console

```

7. Implement DHCP and NAT for IPv4

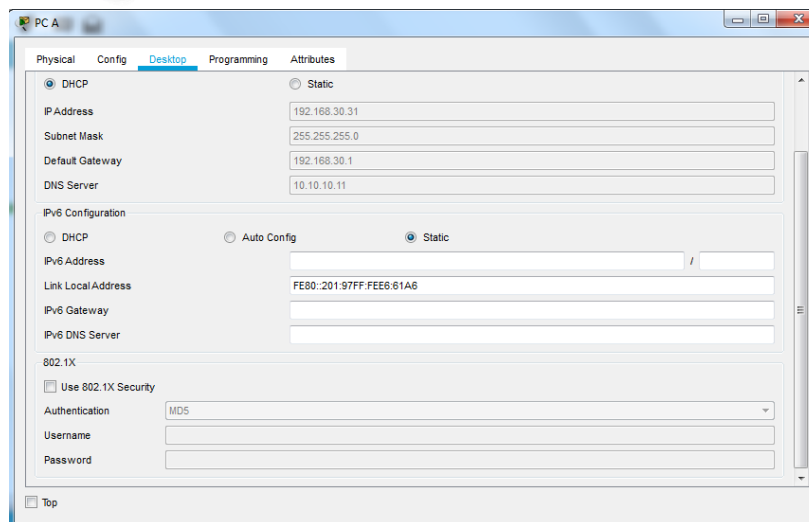


Figura 31. IP PC A

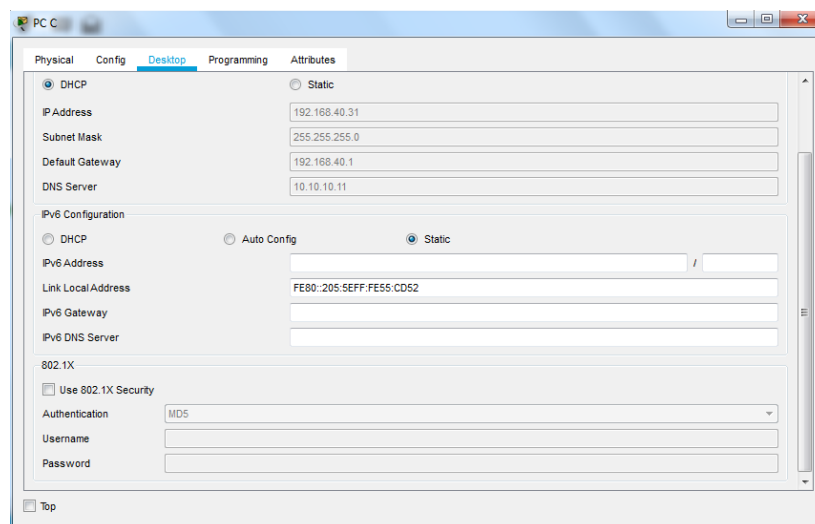


Figura 32. IP PC C

8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.

R1>enable

R1#configure terminal

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

R1(config)#interface fastEthernet 0/0.30

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
R1(config-subif)#exit
R1(config)#interface fastEthernet 0/0.40
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)#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)#exit
R1(dhcp-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)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#

```

- 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.

```

R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#ip dhcp pool Administracion
R1(dhcp-config)#dns-server 10.10.10.11

```

```

R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#ip domain-name ccna-unad.com
R1(config)#exit
R1(config)#ip dhcp pool Mercadeo
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#ip domain-name ccna-unad.com
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#

```

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

```

R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#interface gigabitEthernet 0/0
R2(config-if)#ip nat outside
R2(config-if)#exit
R2(config)#interface gigabitEthernet 0/1
R2(config-if)#ip nat outside
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#

```

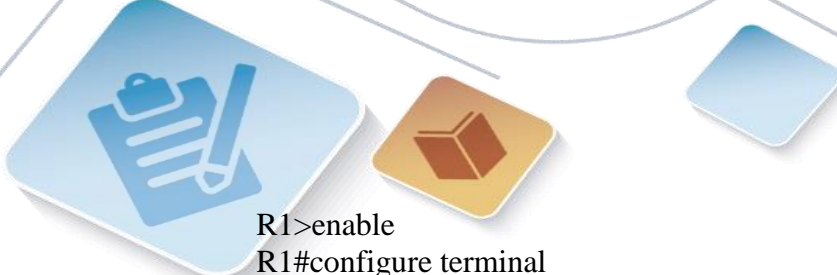
11. Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```

R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.5.0 0.0.3.255
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

```

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>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#access-list 100 permit icmp 192.168.30.0 0.0.0.255 host
209.165.200.230
R1(config)#access-list 100 permit icmp 192.168.40.0 0.0.0.255 host
209.165.200.230
R1(config)#access-list 100 permit udp any 192.168.30.0 0.0.0.255 eq domain
R1(config)#access-list 100 permit udp any 192.168.40.0 0.0.0.255 eq domain
R1(config)#access-list 100 permit udp any 192.168.30.0 0.0.0.255 eq snmp
R1(config)#access-list 100 permit udp any 192.160.40.0 0.0.0.255 eq snmp
R1(config)#access-list 100 permit icmp 192.168.30.0 0.0.0.255 192.168.4.0
0.0.0.255
R1(config)#access-list 100 permit icmp 192.168.40.0 0.0.0.255 192.168.4.0
0.0.0.255
R1(config)#access-list 100 permit icmp 192.168.40.0 0.0.0.255 192.168.5.0
0.0.0.255
R1(config)#access-list 100 permit icmp 192.168.30.0 0.0.0.255 192.168.5.0
0.0.0.255
R1(config)#access-list 100 permit icmp 192.168.30.0 0.0.0.255 192.168.6.0
0.0.0.255
R1(config)#access-list 100 permit icmp 192.168.40.0 0.0.0.255 192.168.6.0
0.0.0.255
R1(config)#interface serial 0/0/0
R1(config-if)#ip access-group 100 out
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#

```

13. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

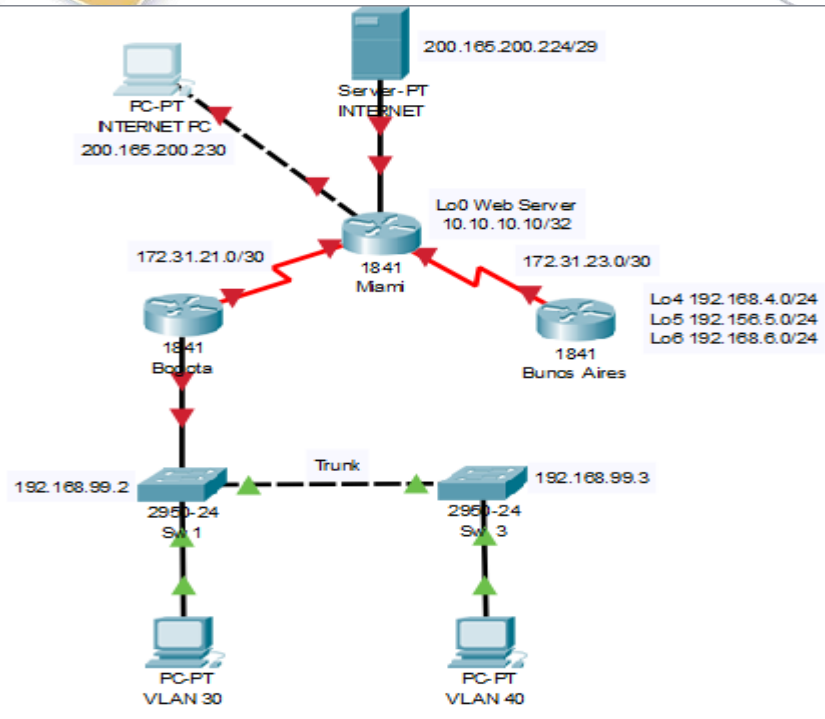


Figura 33. Montaje Final Escenario 2 Packet Tracer

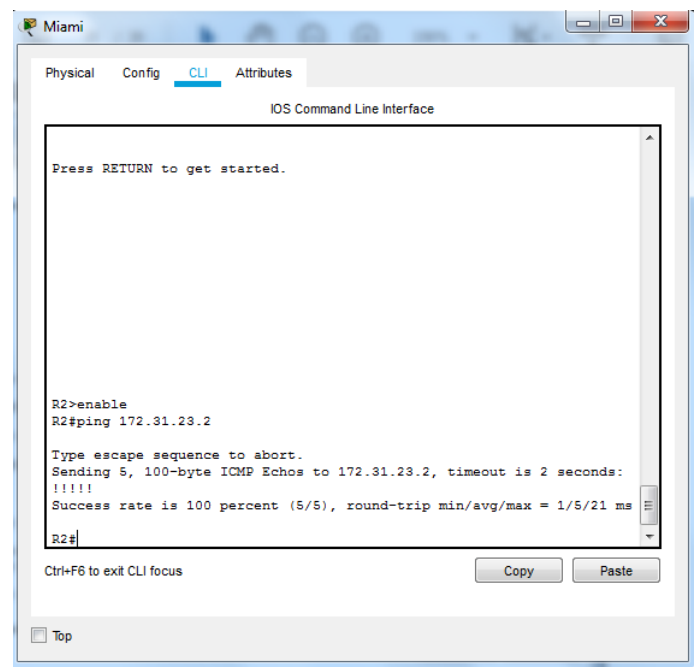
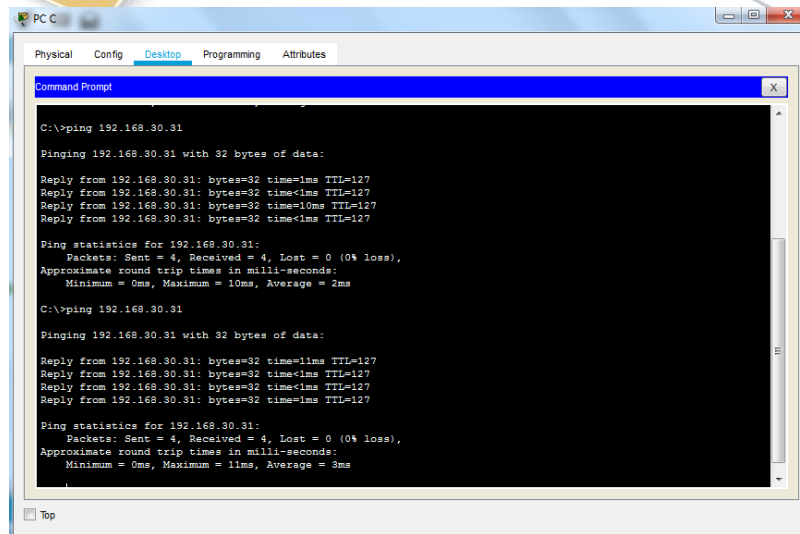
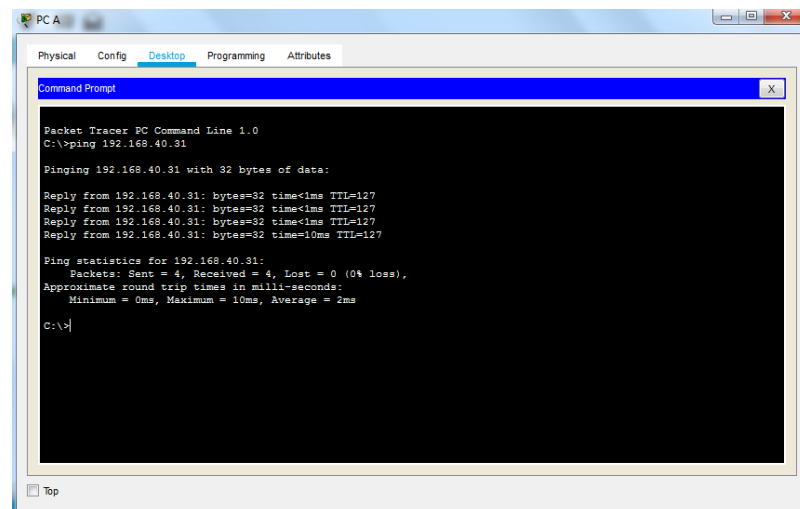


Figura 34. Ping R1 a R2



```
PC C
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.30.31
Pinging 192.168.30.31 with 32 bytes of data:
Reply from 192.168.30.31: bytes=32 time<1ms TTL=127
Reply from 192.168.30.31: bytes=32 time<1ms TTL=127
Reply from 192.168.30.31: bytes=32 time=10ms TTL=127
Reply from 192.168.30.31: bytes=32 time<1ms TTL=127
Ping statistics for 192.168.30.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms
C:\>ping 192.168.30.31
Pinging 192.168.30.31 with 32 bytes of data:
Reply from 192.168.30.31: bytes=32 time=11ms TTL=127
Reply from 192.168.30.31: bytes=32 time<1ms TTL=127
Reply from 192.168.30.31: bytes=32 time<1ms TTL=127
Reply from 192.168.30.31: bytes=32 time=1ms TTL=127
Ping statistics for 192.168.30.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 3ms
```

Figura 35. Ping PC C a PC A



```
PC A
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.40.31
Pinging 192.168.40.31 with 32 bytes of data:
Reply from 192.168.40.31: bytes=32 time<1ms TTL=127
Reply from 192.168.40.31: bytes=32 time<1ms TTL=127
Reply from 192.168.40.31: bytes=32 time<1ms TTL=127
Reply from 192.168.40.31: bytes=32 time=10ms TTL=127
Ping statistics for 192.168.40.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms
C:\>
```

Figura 36. Ping PC A a PC C

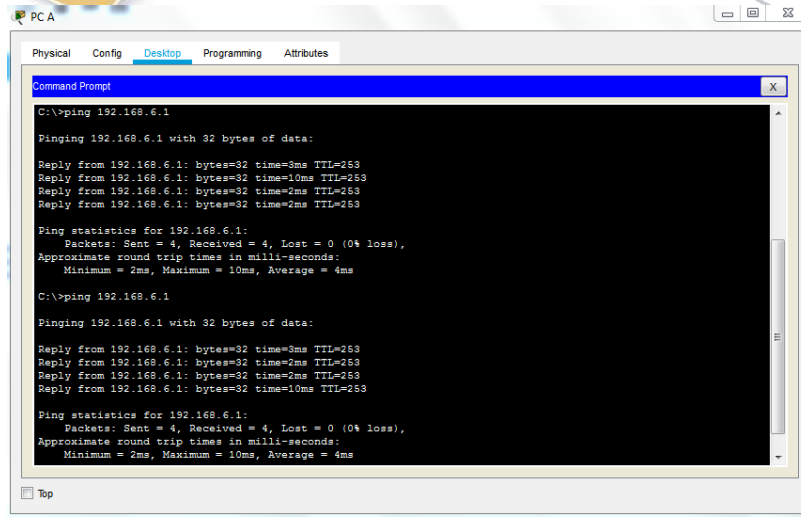


Figura 37. Ping PC A a Loopback 6

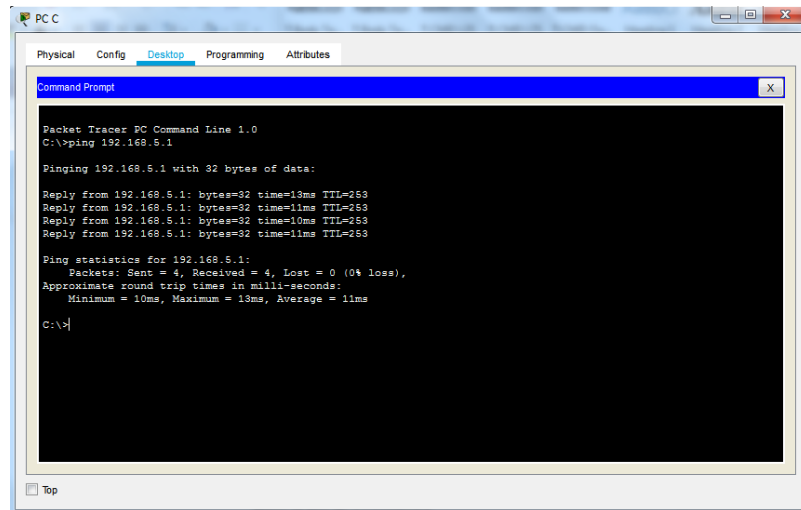


Figura 38. Ping PC C a Loopback 5

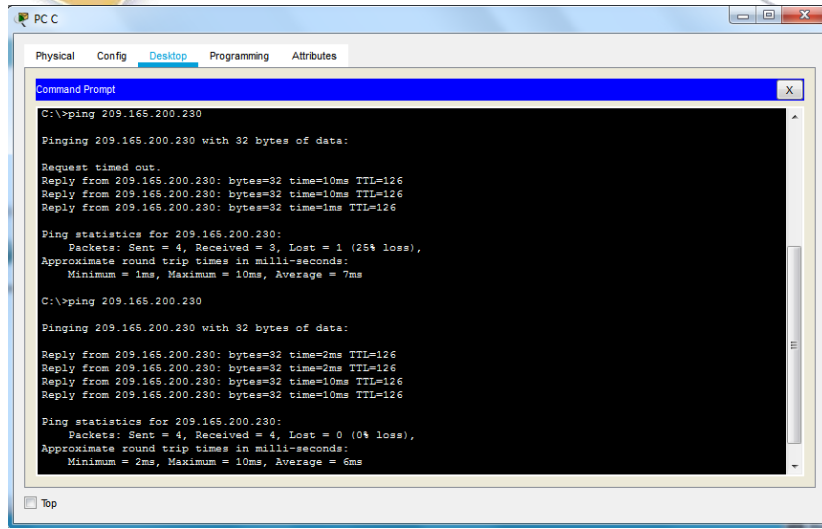


Figura 39. Ping PC C a INTERNET PC

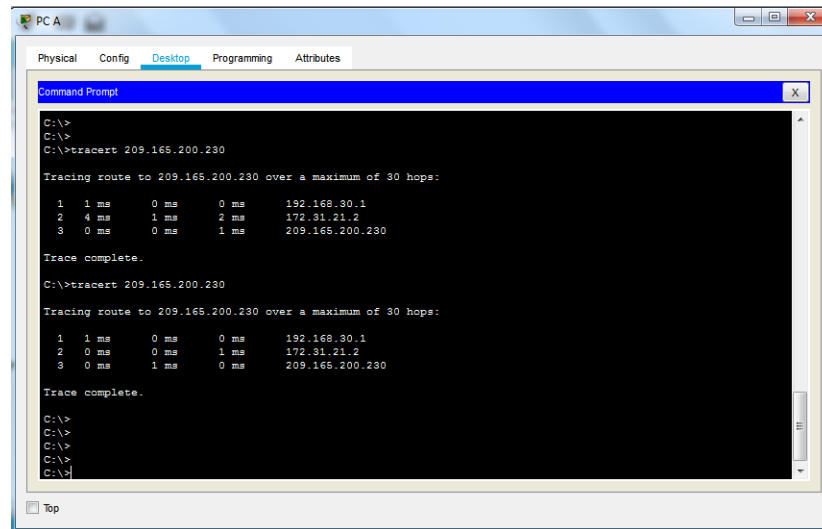


Figura 40. Tracert PC A a INTERNET PC



CONCLUSIONES

- El desarrollo de los escenarios propuestos, permitió la configuración de los dispositivos y topologías físicas, generando el direccionamiento apropiado y el cumplimiento de los requerimientos propuestos.
- Se efectuó de manera práctica, la implementación de los conceptos aprendidos en el módulo CCNA2, propuesto como protocolo para el cumplimiento de la temática del curso
- La configuración efectuada en DHCP, es un ahorro de recurso y de tiempo; toda vez, que al hacerlo de manera apropiada, contribuyó a la asignación automática de direcciones IP
- El énfasis en conceptos como DHCP, Routing, direccionamiento, OSPF; fueron el punto de partida, para enseñar las destrezas adquiridas, en cuanto a la configuración de dispositivos de la red CISCO
- Los comandos propios de los equipos CISCO (Router, Switch, Server), integraron la funcionalidad de las especificaciones planteadas, dando respuesta a factores condicionales como listas de acceso, pruebas ping, tracer, entre otros
- La herramienta de simulación CISCO Packet Tracer, fue el mejor medio para el desarrollo y ejecución de las habilidades propuestas, ya que es el método más aproximado a la ejecución de un proyecto de nuestra realidad



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