PRUEBA DE HABILIDADES PRÁCTICAS CCNA

CESAR ENRIQUE ARGUMEDO SUESCUN

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD

ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA – ECBTI

INGINIERIA DE SISTEMAS

TAME

2018

PRUEBA DE HABILIDADES PRÁCTICAS CCNA

CESAR ENRIQUE ARGUMEDO SUESCUN

Diplomado de profundización Cisco (Diseño e implementación de soluciones integradas LAN / WAN)

DIRECTOR DE CURSO

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CONTENIDO

INTRODUCCION

En el siguiente trabajo denominado examen final de habilidades prácticas, perteneciente al Diplomado de profundización CISCO, diseño e implementación de soluciones integradas LAN / WLAN. Se dará solución a una situación o ejercicio previamente distribuido, en donde se podrán a prueba las habilidades a futuros Ingenieros de Sistemas de la Universidad Nacional Abierta y a Distancia.

Se adquirieron conocimientos relacionados con diversos aspectos vistos en el diplomado los cuales pondremos en practica en el desarrollo de dos escenarios porpuestos en los cuales nos permitira reforzar mis capacidades en la implementacion de una NAT, servidor de DHCP, RIPV2 y el routing entre VLAN, en donde inclui la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces. Como tambien trabaje con el Networking, los cuales se colocaron en práctica en el desarrollo de la actividad propuesta, donde se configuro cada uno de los dispositivos de red de una empresa para interconectarlos entre sí, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

El desarrollo de los escenarios propuesto se realizaron bajo el programa Packet Tracer, en el cual se llevó a cabo cada una de las tareas propuestas, con el objetivo de demostrar las habilidades adquiridas y la aplicabilidad que tiene en el mundo laboral.

Descripción de escenarios propuestos para la prueba de habilidades

Escenario 1

Topologia:

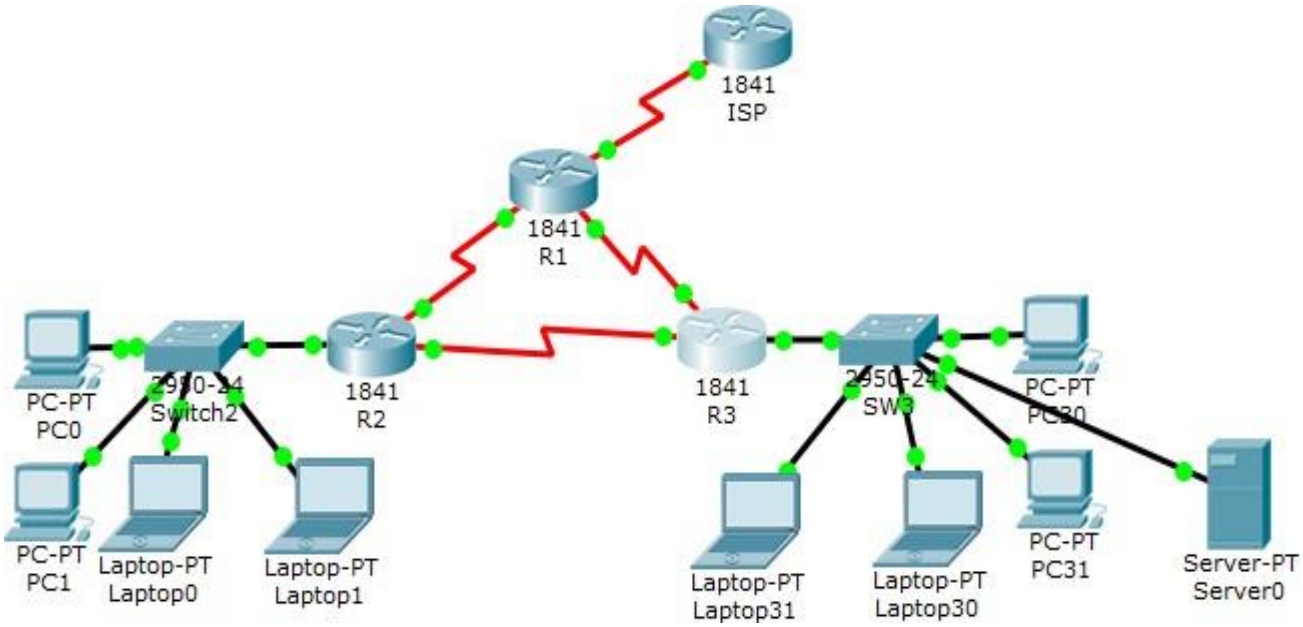


Tabla de direccionamiento

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

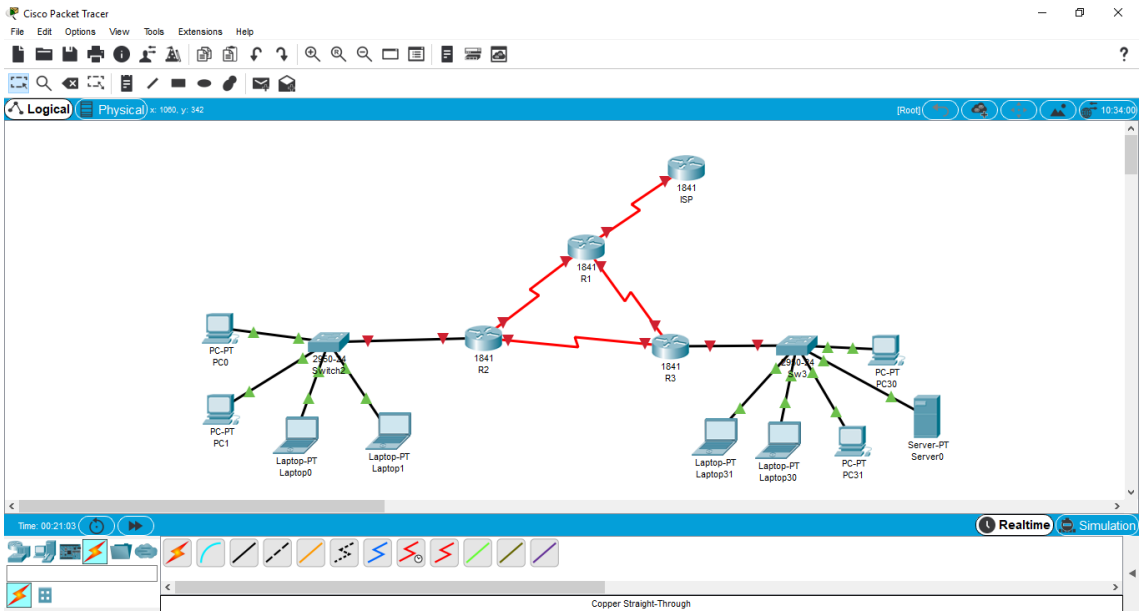
Dispositivo local	Interfaz local	Dispositivo remoto
SW2	Fa0/2-3	100

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.

Topologia:

Se procedio a realizar la topologia propuesta para el escenario 1.



Descripción de las actividades

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

  Se procedeio a configurar el SW2 y SW3:

  SW2:

  Switch>enable

  Switch#configure terminal

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

  Switch(config)#vlan 100

  Switch(config-vlan)#name LAPTOPS

  Switch(config-vlan)#int range f0/2-3

  Switch(config-if-range)#switchport mode access

  Switch(config-if-range)#switchport access vlan 100

  Switch(config-if-range)#exit

  Switch(config)#vlan 200

  Switch(config-vlan)#name DESTOPS

  Switch(config-vlan)#int range f0/4-5

  Switch(config-if-range)#switchport mode access

  Switch(config-if-range)#switchport access vlan 200

  Switch(config-if-range)#int f0/1

  Switch(config-if)#switchport mode trunk

Switch(config-if)#int range f0/6-24

Switch(config-if-range)#shutdown

%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

Switch(config-if-range)#

SW3:

Switch>enable

Switch#configure terminal

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

Switch(config)#vlan 1

Switch(config-vlan)#exit

Switch(config)#int range f0/1-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchpor access vlan 1

Switch(config-if-range)#exit

Switch(config)#exit

Switch#

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

Switch#wr

Building configuration...

[OK]

- **Los puertos de red que no se utilizan se deben deshabilitar.**
  RTA/: se desabilitan los puertos que no se van autilizar en ambos switch.

  SW2:

  Switch>enable

  Switch#configure terminal

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

  Switch(config)#int range f0/6-24

  Switch(config-if-range)#shutdown

  SW3:

  Switch#configure terminal

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

  Switch(config)#int range f0/6-23

  Switch(config-if-range)#shutdown

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

Se procede a realizar el direccionamiento ip en los diferentes routers de la topologia.

R1:

Router>enabl

Router#configure terminal

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

Router(config)#int f0/0.100

Router(config-subif)#encapsulation dot1q 100

Router(config-subif)#ip address 192.168.20.1 255.255.255.0

Router(config-subif)#exit

Router(config)#int f0/0.200

Router(config-subif)#encapsulation dot1q 200

Router(config-subif)#ip address 192.168.21.1 255.255.255.0

Router(config-subif)#exit

Router(config)#int f0/0

Router(config-if)#no shut

Router(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

%LINK-5-CHANGED: Interface FastEthernet0/0.100, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.100, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.200, changed state to up

Router(config-if)#int s0/0/0

Router(config-if)#ip address 10.0.0.2 255.255.255.252

Router(config-if)#no shut

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

Router(config-if)#int s0/0/1

Router(config-if)#ip address 10.0.0.9 255.255.255.252

Router(config-if)#no shut

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

Router(config-if)#

R2:

Router>enable

Router#configure terminal

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

Router(config)#int s0/0/0

Router(config-if)#ip address 200.123.211.2 255.255.255.0

Router(config-if)#no shut

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

Router(config-if)#int s0/1/0

Router(config-if)#ip address 10.0.0.1 255.255.255.252

Router(config-if)#no shut

Router(config-if)#

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

Router(config)#int s0/1/1

Router(config-if)#ip address 10.0.0.5 255.255.255.252

Router(config-if)#no shut

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

Router(config-if)#

R3:

Router>enable

Router#configure terminal

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

Router(config)#ipv6 unicast-routing

Router(config)#int f0/0

Router(config-if)#ip address 192.168.30.1 255.255.255.0

Router(config-if)#ipv6 address 2001:db8:130::9c0:80f:301/64

Router(config-if)#no shut

Router(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

Router(config-if)#ipv6 dhcp server vlan_1

Router(config-if)#ipv6 nd other-config-flag

Router(config-if)#no shut

Router(config-if)#int s0/0/0

Router(config-if)#ip address 10.0.0.6 255.255.255.252

Router(config-if)#no shut

Router(config-if)#

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

Router(config-if)#int s0/

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

0/1

Router(config-if)#ip address 10.0.0.10 255.255.255.252

Router(config-if)#no shut

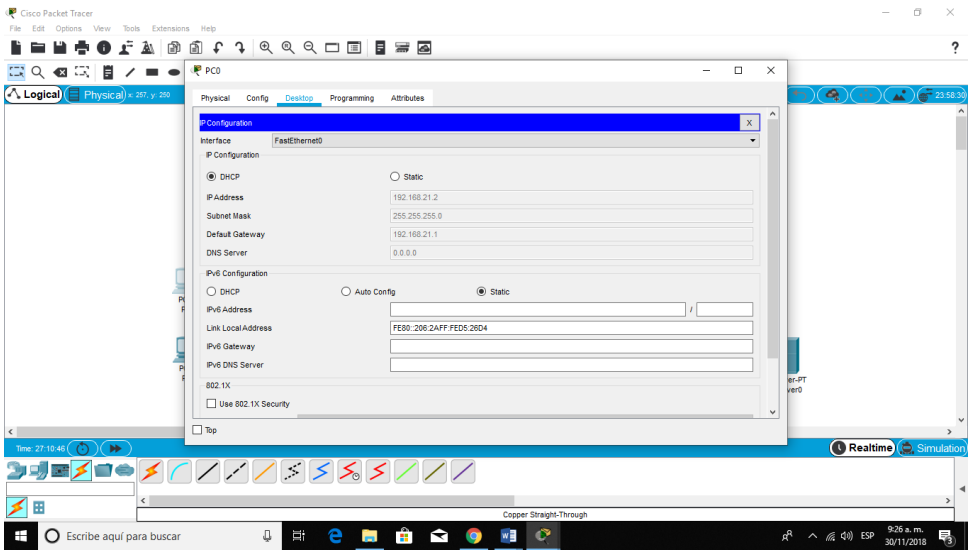
Router(config-if)#

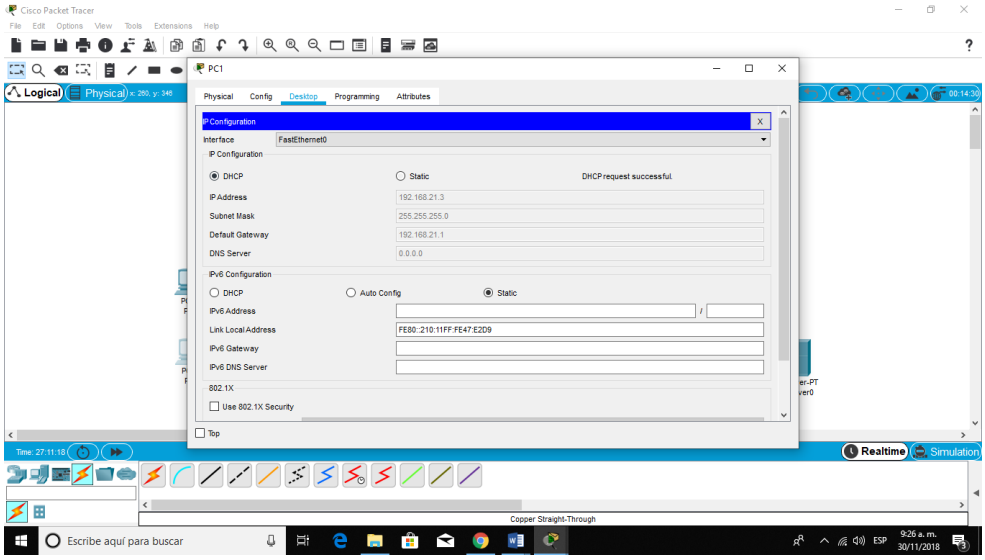
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

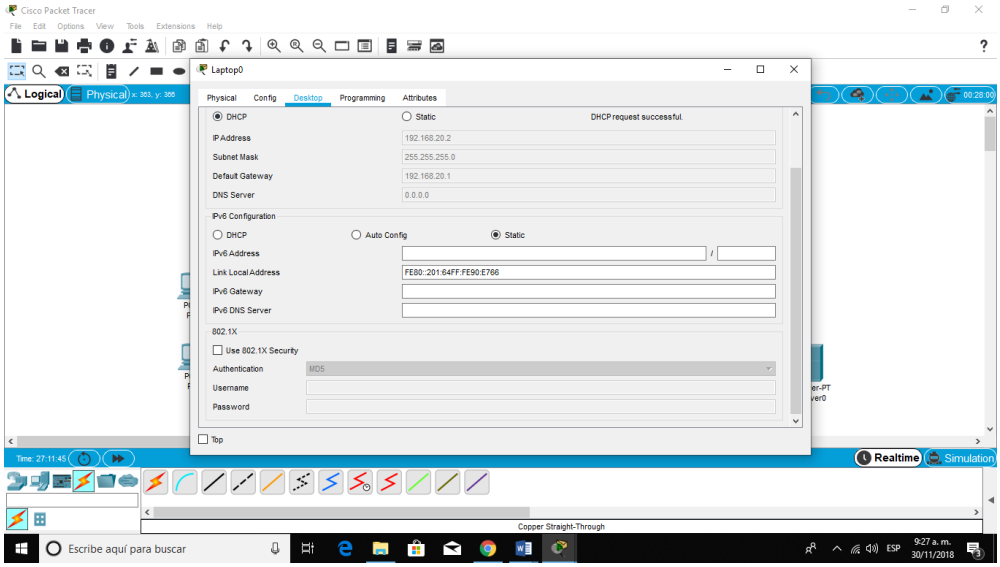
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

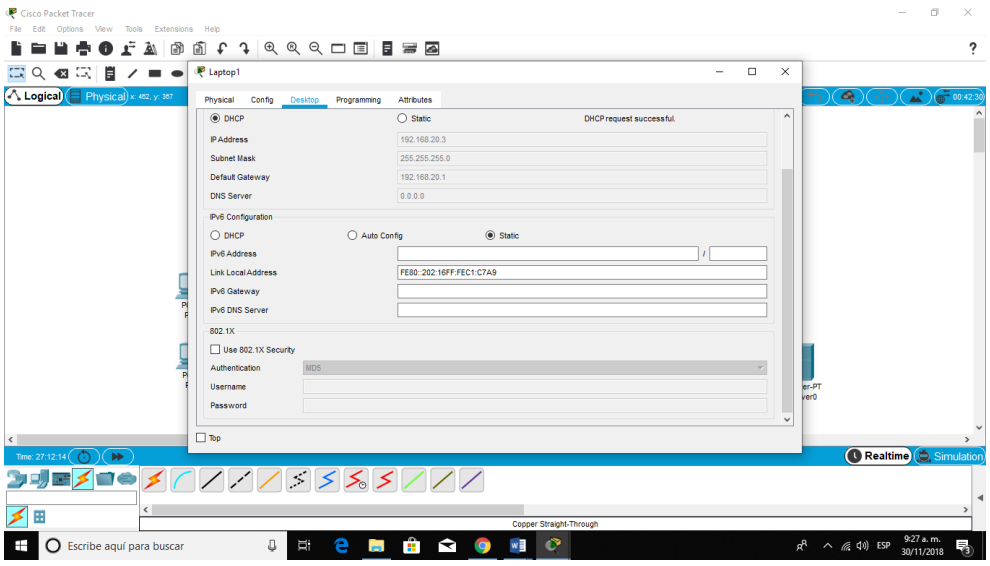
- **Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31** deben obtener información IPv4 del servidor DHCP.

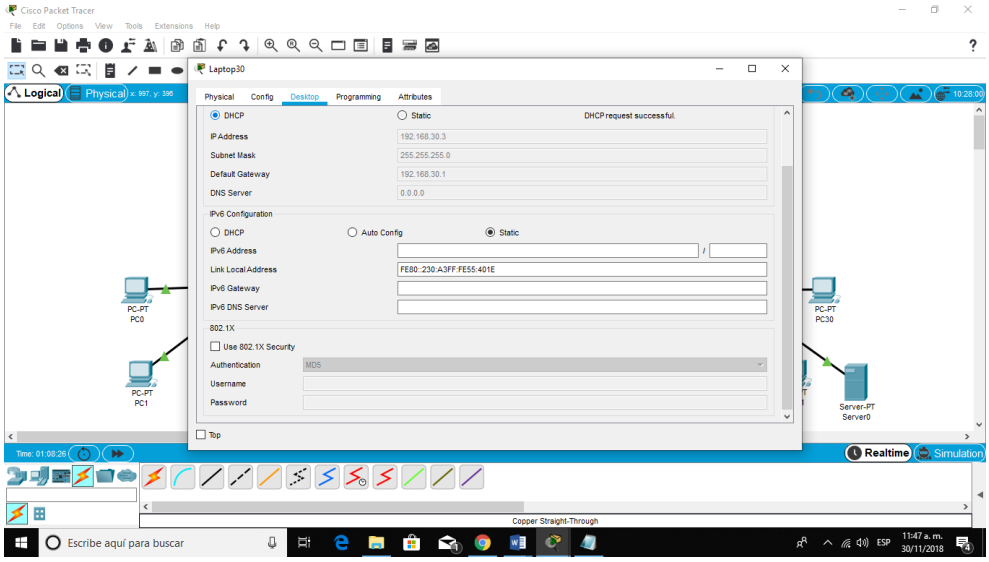
  se procede a realizar la configuracion IPV4 en los respectibos equipos host de la topologia

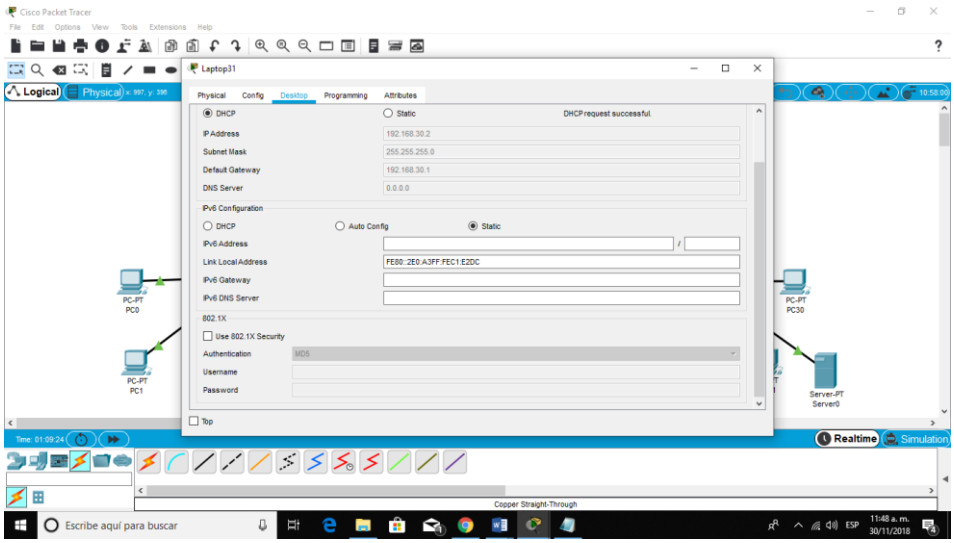


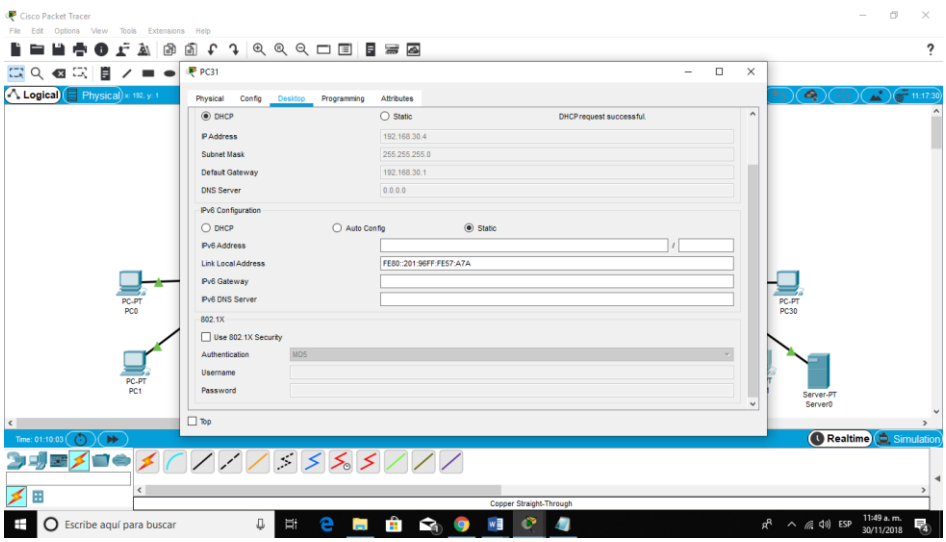

Cisco Packet Tracer
PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
DHCP
Static
DHCP request successful.
IP Address
192.168.21.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.21.1
DNS Server
0.0.0.0
IPv6 Configuration
Auto Config
IPv6 Address
Link Local Address
FE80::210:11FF:FE47:E2D9
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Top
Realtime
Simulation
Copper Straight-Through
Escribe aquí para buscar
ESP
9:26 a. m.
30/11/2018

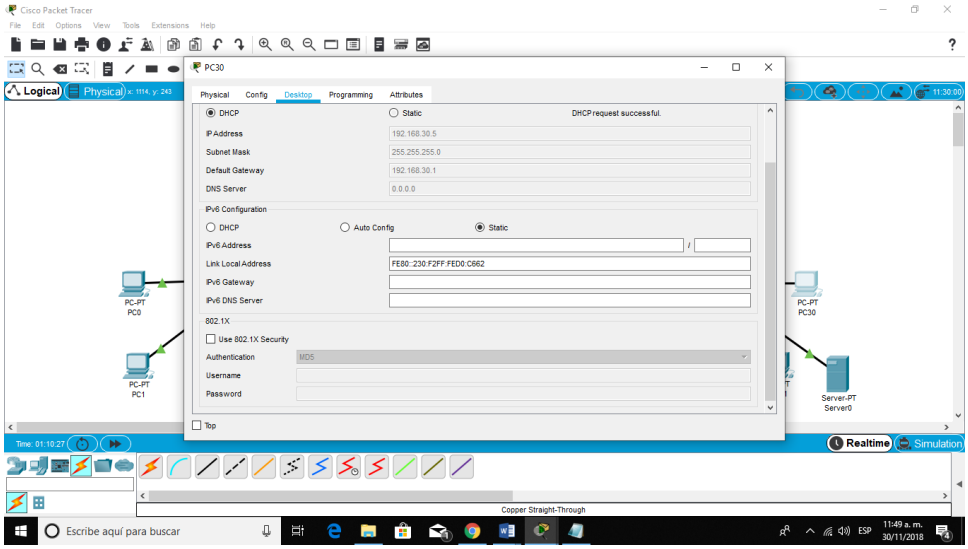

Cisco Packet Tracer
Laptop0
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP request successful.
IP Address
192.168.20.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.20.1
DNS Server
0.0.0.0
IPv6 Configuration
Auto Config
IPv6 Address
Link Local Address
FE80::201:64FF:FE90:E766
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Realtime
Simulation
Copper Straight-Through
Escribe aquí para buscar
ESP
9:27 a. m.
30/11/2018


Cisco Packet Tracer
Laptop1
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP request successful.
IP Address
192.168.20.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.20.1
DNS Server
0.0.0.0
IPv6 Configuration
Auto Config
IPv6 Address
Link Local Address
FE80::202:16FF:FEC1:C7A9
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Realtime
Simulation
Copper Straight-Through
Escribe aquí para buscar
ESP
9:27 a. m.
30/11/2018


Cisco Packet Tracer
Laptop30
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP request successful
IP Address
192.168.30.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::230:A3FF:FE55:401E
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Logical
Physical
PC-PT PC0
PC-PT PC1
PC-PT PC30
Server-PT Server0
Realtime
Simulation
Copper Straight-Through
Escribe aquí para buscar
ESP
11:47 a. m.
30/11/2018


Cisco Packet Tracer
Laptop31
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP request successful
IP Address
192.168.30.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::2E0:A3FF:FEC1:E2DC
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Logical
Physical
PC-PT PC0
PC-PT PC1
PC-PT PC30
Server-PT Server0
Realtime
Simulation
Copper Straight-Through
Escribe aquí para buscar
ESP
11:48 a. m.
30/11/2018


Cisco Packet Tracer
PC31
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP request successful
IP Address
192.168.30.4
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::201:96FF:FE57:A7A
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Logical
Physical
PC-PT PC0
PC-PT PC1
PC-PT PC30
Server-PT Server0
Realtime
Simulation
Copper Straight-Through
Escribe aquí para buscar
ESP
11:49 a. m.
30/11/2018



- **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**.

  Se procede a configura la NAT en el R1 con sobrecarga en una direccion IPV4 publica.

  Router>enable

  Router#conf t

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

  Router(config)#access-list 1 permit 192.168.0.0 0.0.255.255

  Router(config)#access-list 1 permit 10.0.0.0 0.0.0.255

  Router(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128 netmask 255.255.255.0

  Router(config)#ip nat inside source list 1 interface s0/0/0 overload

  Router(config)#int s0/1/1

  Router(config-if)#ip nat inside

  Router(config-if)#int s0/1/0

  Router(config-if)#ip nat inside

  Router(config-if)#int s0/0/0

  Router(config-if)#ip nat outside

  Router(config-if)#exit

  Router(config)#router rip

  Router(config-router)#version 2

  Router(config-router)#network 1.0.0.0

Router(config-router)#network 10.0.0.0

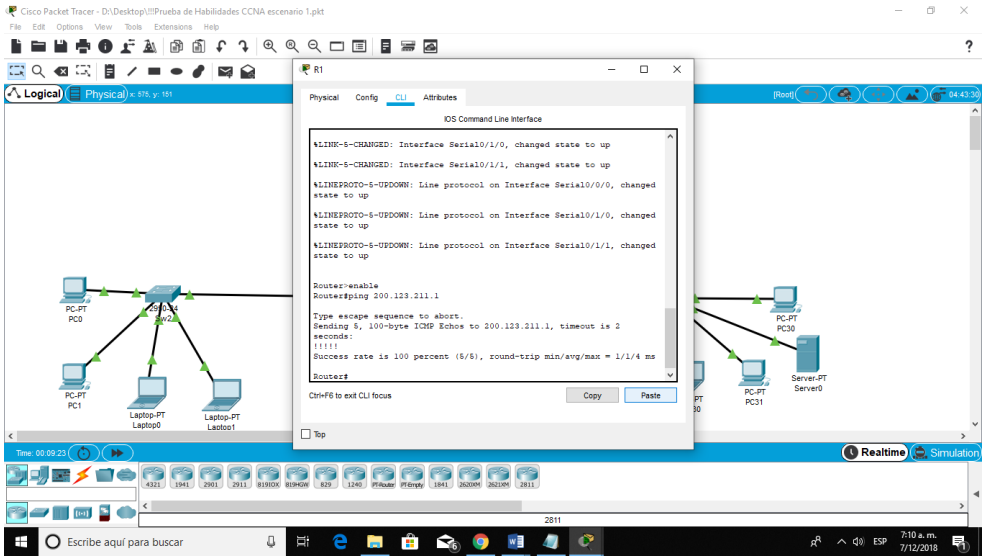
Router(config-router)#default-information originate

Router(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0

Router(config)#

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

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



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

  Se procedio desde el R1 crear una ruta estatica predeterminada al ISP.

  Router(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0

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

  Se procedio a configura el R2 como un servidor DHCP para los dispositivos conectados a la interfaz f0/0.

  Router>enable

  Router#configure terminal

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

  Router(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9

  Router(config)#ip dhcp pool INSIDE-DEVS

  Router(dhcp-config)#network 192.168.20.1 255.255.255.0

  Router(dhcp-config)#network 192.168.21.1 255.255.255.0

  Router(dhcp-config)#default-router 192.168.1.1

  Router(dhcp-config)#dns-server 0.0.0.0

  Router(dhcp-config)#exit

Router(config)#

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

  Se configuro las vlan 100 y 200 en el router 2.

  Router(config)#int vlan 100

  Router(config-if)#ip address 192.168.20.1 255.255.255.0

  % 192.168.20.0 overlaps with FastEthernet0/0.100

  Router(config-if)#exit

  Router(config)#int vlan 200

  Router(config-if)#ip address 192.168.21.1 255.255.255.0

  % 192.168.21.0 overlaps with FastEthernet0/0.200

  Router(config-if)#end

  Router#

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

  Router#wr

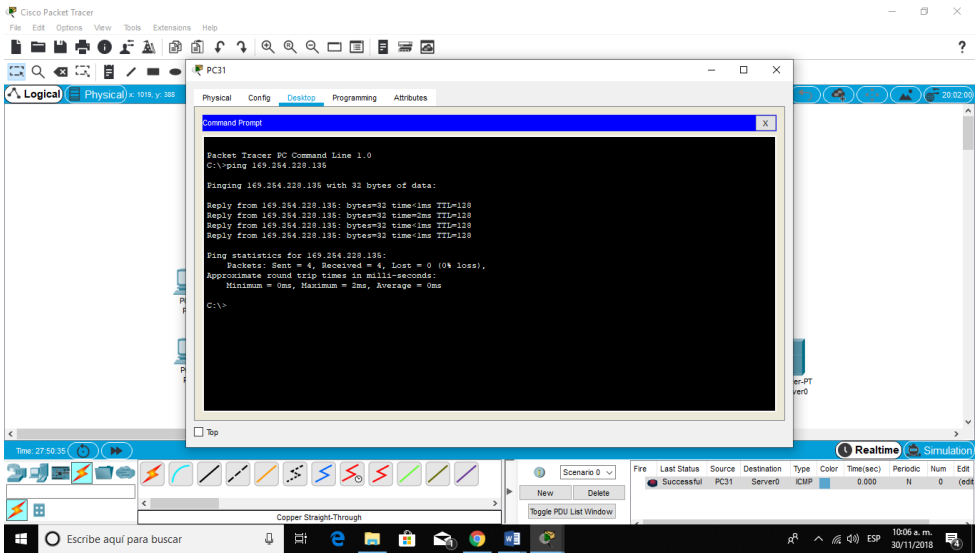
  Building configuration...

  [OK]

  Router#

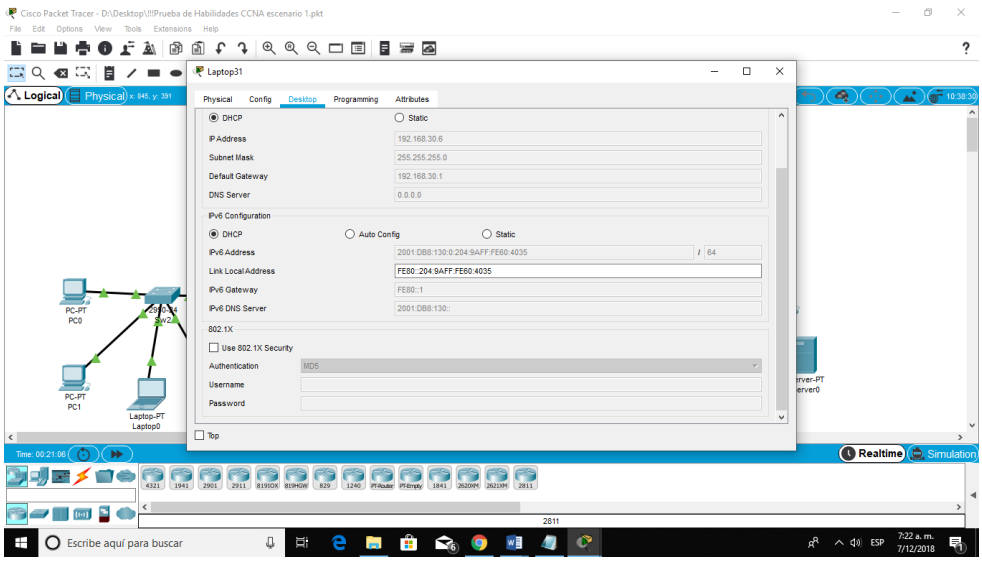
- El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivos en R3 (ping).

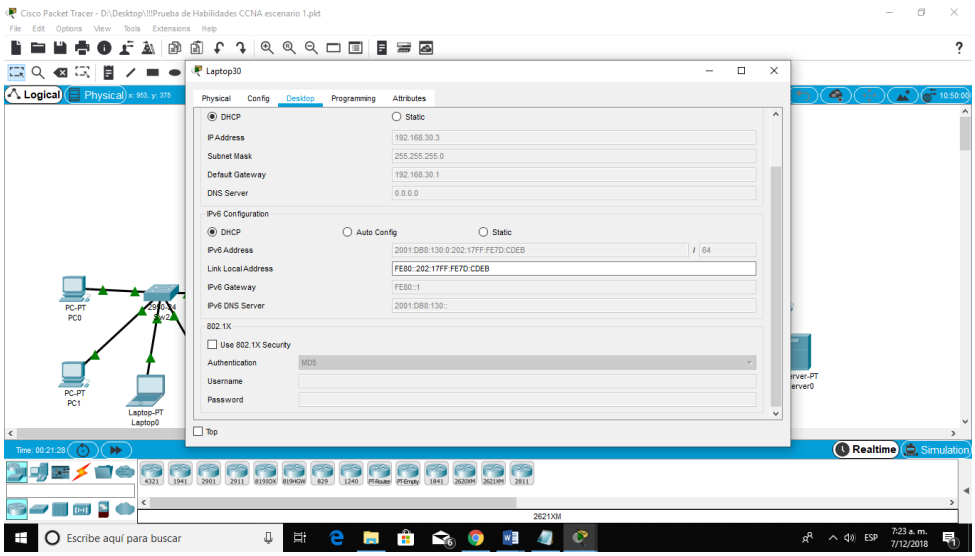
  Se configuro el servidor0 con direccionamiento para que solo puedan acceder los dipsositovos conectados al R3.

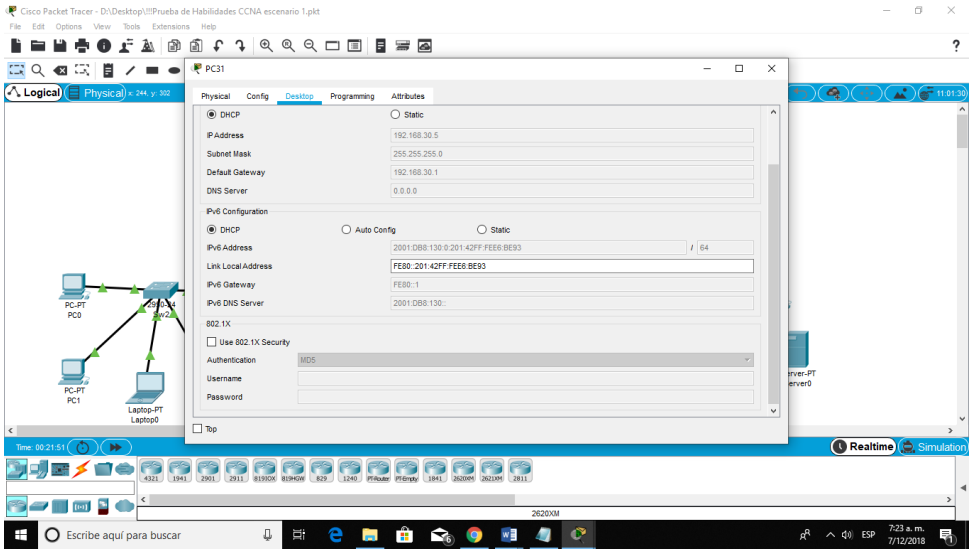


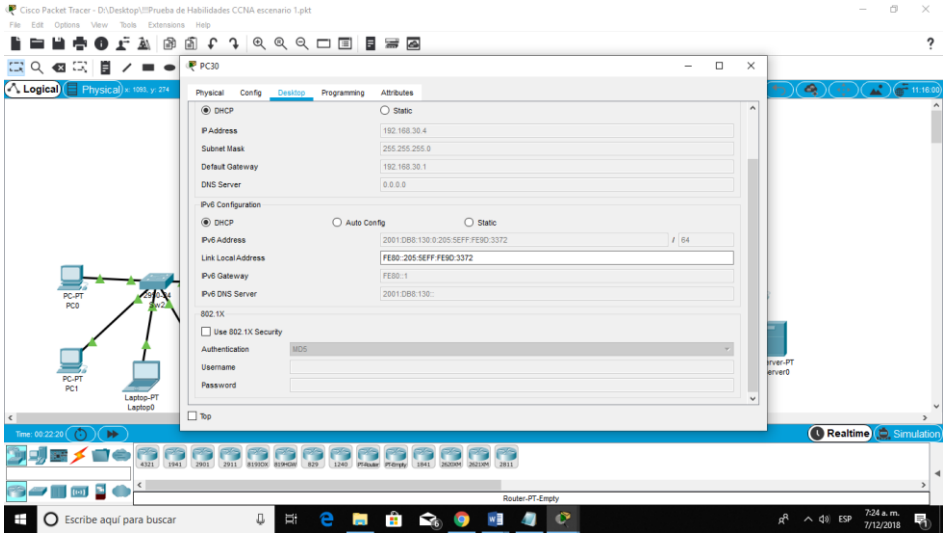
- La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop31, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6.

Se configuran las diferentes direccionamientos ipv4 y ipv6 en los host del R3.









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

  Se configuro la interfaz f0/0 del R3 con direcciones ipv4 y ipv6 dual-stack.

  Router>enable

  Router#configure terminal

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

  Router(config)#ipv6 unicast-routing

  Router(config)#int f0/0

  Router(config-if)#ipv6 enable

  Router(config-if)#ip address 192.168.30.1 255.255.255.0

  Router(config-if)#ipv6 address 2001:db8::9c0:80f:301/64

  Router(config-if)#no shutdown

  Router(config-if)#

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

  Se configuraron los router para intercambiar informacionde routing mediante RIP version 2.

  R1:

  Router>enable

  Router#configure terminal

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

  Router(config)#router rip

  Router(config-router)#version 2

  Router(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0

Router(config)#router rip
Router(config-router)#network 10.0.0.4
Router(config-router)#network 10.0.0.0
Router(config-router)#default-information originate
Router(config-router)#

R2:

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 192.168.30.0
Router(config-router)#network 192.168.20.0
Router(config-router)#network 192.168.21.0
Router(config-router)#network 10.0.0.0
Router(config-router)#network 10.0.0.8
Router(config-router)#

R3:

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 192.168.0.0
Router(config-router)#network 10.0.0.8
Router(config-router)#network 10.0.0.4
Router(config-router)#exit
Router(config)#

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

  La ruta predeterminada desde R1 es:

  Router(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0

  Rutas de cada uno de ellos:

  R1:

  Router(config-router)#network 10.0.0.4

  Router(config-router)#network 10.0.0.0

  R2:

  Router(config-router)#network 192.168.30.0

  Router(config-router)#network 192.168.20.0

Router(config-router)#network 192.168.21.0

Router(config-router)#network 10.0.0.0

Router(config-router)#network 10.0.0.8

R3:

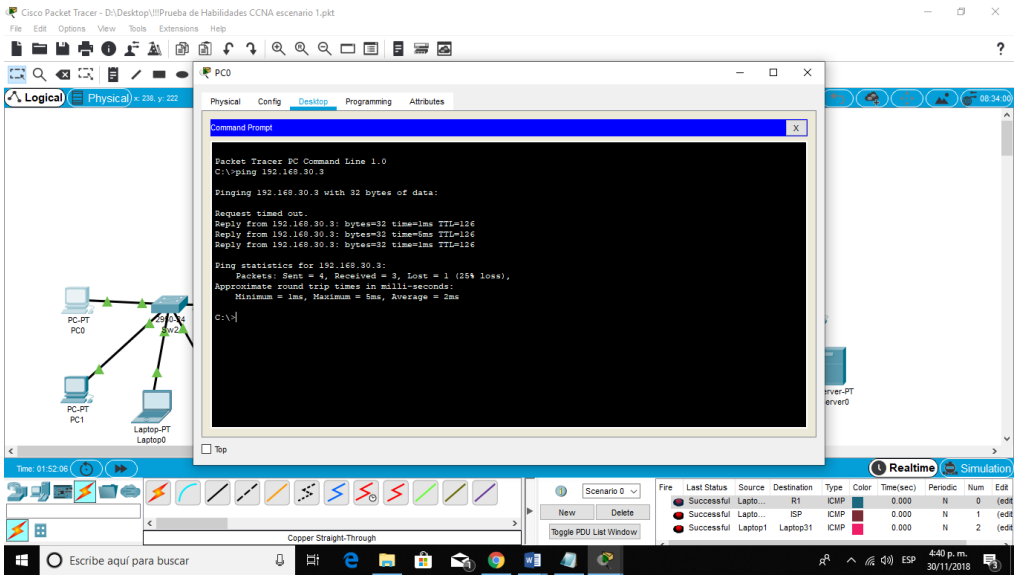
Router(config-router)#network 192.168.0.0

Router(config-router)#network 10.0.0.8

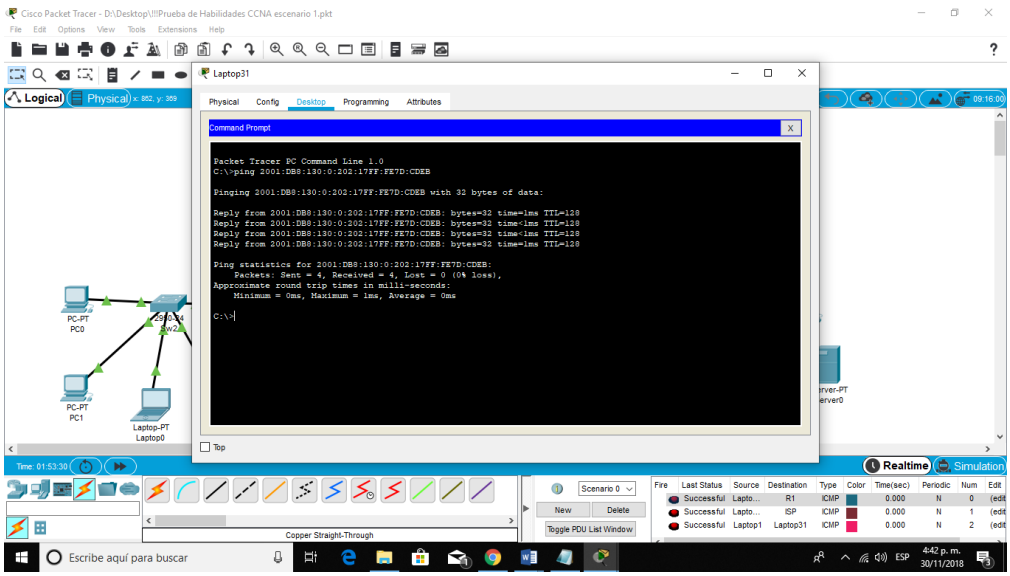
Router(config-router)#network 10.0.0.4

- 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.

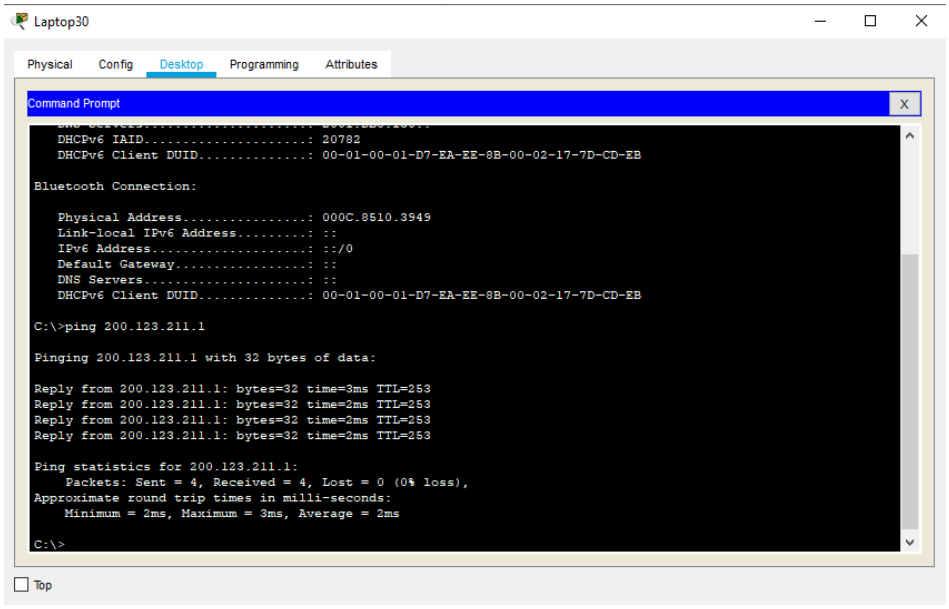
Ping de PC0 A Laptop 30:



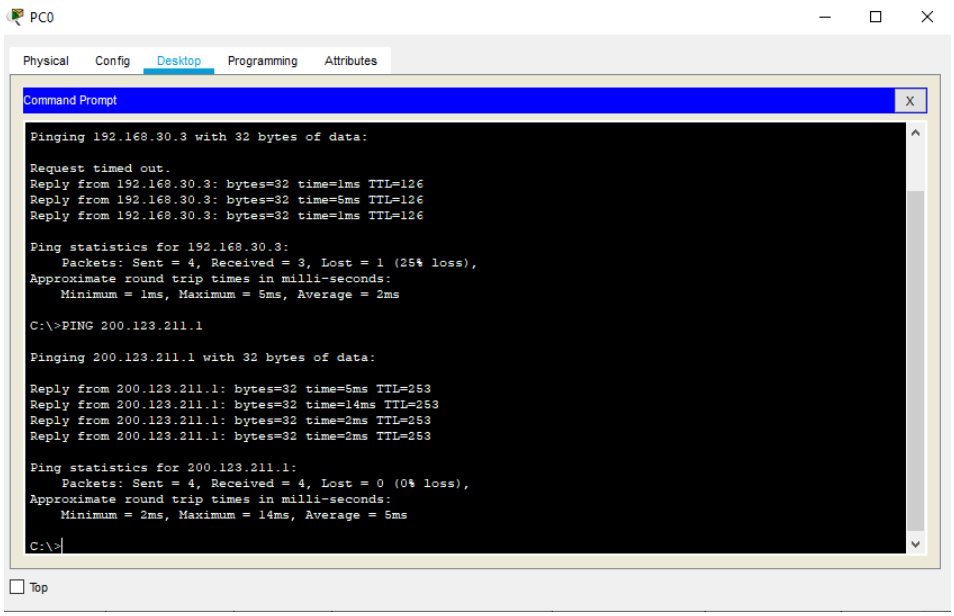
Ping de Laptop30 a Laptop 31:



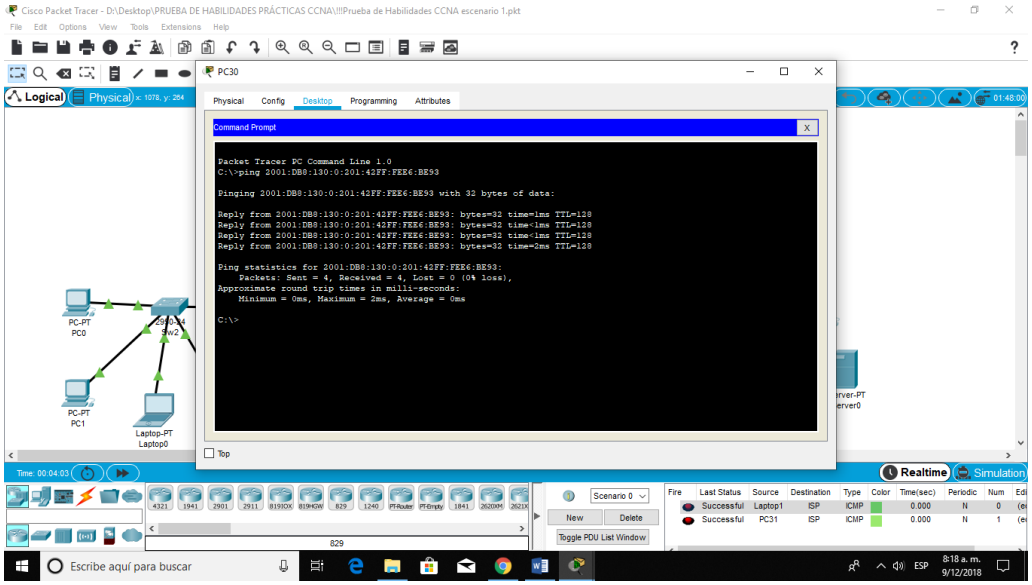
Ping de PC30 a ISP:



PC0 a ISP:

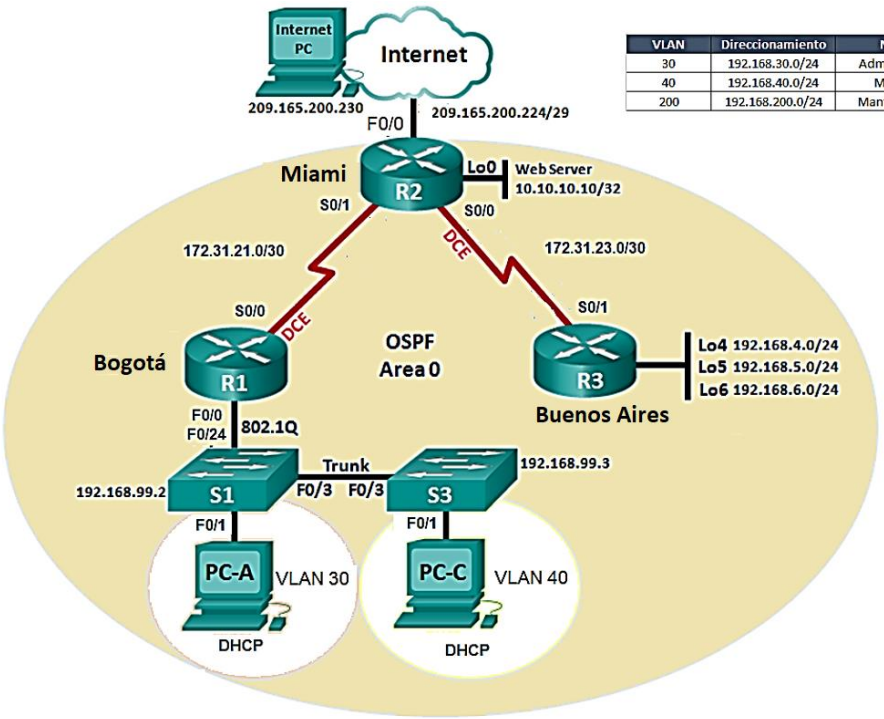


Ping de PC-30 a PC-31:



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.



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

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

Se prcedio a realizar el direccionamiento ip en los dispositivos de la topologia.

S1:

Switch>enable

Switch#configure terminal

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

Switch(config)#vlan 30

Switch(config-vlan)#name Administracion

Switch(config-vlan)#vlan 40

Switch(config-vlan)#name mercadeo

Switch(config-vlan)#vlan 200

Switch(config-vlan)#name Mantenimiento

Switch(config-vlan)#exit

Switch(config)#int f0/3

Switch(config-if)#switchport mode trunk

Switch(config-if)#

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

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

Switch(config-if)#switchport trunk native vlan 1

Switch(config-if)#int f0/24

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk native vlan 1

Switch(config-if)#no shutdown

Switch(config-if)#switchport trunk native vlan 1

Switch(config-if)#int range fa0/1-2, fa0/4-24, g0/1-2

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#exit

Switch(config)#int f0/1

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 30

Switch(config-if)#int range f0/2, f0/4-24, g0/1-2

Switch(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down

%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

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down

Switch(config-if-range)#

Switch(config-if)#ip address 192.168.99.2 255.255.255.0

Switch(config-if)#

S3:

Switch>enable

Switch#configure terminal

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

Switch(config)#vlan 30

Switch(config-vlan)#name Administracion

Switch(config-vlan)#vlan 40

Switch(config-vlan)#name Mercadeo

Switch(config-vlan)#vlan 200

Switch(config-vlan)#name Mantenimiento

Switch(config-vlan)#exit

Switch(config)#int vlan 200

Switch(config-if)#

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

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

Switch(config-if)#ip address 192.168.99.3 255.255.255.0

Switch(config-if)#exit

Switch(config)#ip default-gateway 192.168.99.1

Switch(config)#int f0/3

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk native vlan 1

Switch(config-if)#int range f0/1-2, f0/4-24, g0/1-2

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#exit

Switch(config)#int f0/1

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 40

Switch(config-if)#int range f0/2, f0/4-24, g0/1-2

Switch(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down

%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

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down

Switch(config-if-range)#

R1:

Router>enable

Router#configure terminal

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

Router(config)#int s0/0/0

Router(config-if)#ip address 172.31.21.1 255.255.255.252

Router(config-if)#clock rate 128000

Router(config-if)#no shut

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

Router(config-if)#exit

Router(config)#ip route 0.0.0.0 0.0.0.0 s0/0/0

Router(config)#

R2:

Router>enable

Router#configure terminal

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

Router(config)#int s0/0/1

Router(config-if)#ip address 172.31.21.2 255.255.255.252

Router(config-if)#no shut

Router(config-if)#

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

Router(config-if)#int s

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

0/0/0

Router(config-if)#int s0/0/0

Router(config-if)#ip address 172.31.23.1 255.255.255.252

Router(config-if)#clock rate 128000

Router(config-if)#no shut

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

Router(config-if)#int f0/0

Router(config-if)#ip address 209.165.200.225 255.255.255.248

Router(config-if)#no shut

Router(config-if)#

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

Router(config-if)#int f0/1

Router(config-if)#ip address 10.10.10.10 255.255.255.0

Router(config-if)#no shut

Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

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

R3:

Router>enable

Router#configure terminal

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

Router(config)#int s0/0/1

Router(config-if)#ip address 172.31.23.2 255.255.255.252

Router(config-if)#no shut

Router(config-if)#

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

Router(config-if)#

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

Router(config-if)#int lo4

Router(config-if)#

%LINK-5-CHANGED: Interface Loopback4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up

Router(config-if)#ip address 192.168.4.1 255.255.255.0

Router(config-if)#int lo5

Router(config-if)#

%LINK-5-CHANGED: Interface Loopback5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to up

Router(config-if)#ip address 192.168.5.1 255.255.255.0

Router(config-if)#int lo6

Router(config-if)#

%LINK-5-CHANGED: Interface Loopback6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up

Router(config-if)#ip address 192.168.6.1 255.255.255.0

Router(config-if)#

- **Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:**

Se configuro el enrutamiento OSPFv2 siguiendo los criterios de la siguiente tabla:

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:

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#router-id 1.1.1.1
Router(config-router)#network 192.168.99.0 0.0.0.255 area 0
Router(config-router)#network 172.31.21.0 0.0.0.3 area 0
Router(config-router)#passive-interface gi0/0
%Invalid interface type and number
Router(config-router)#int s0/0/0
Router(config-if)#bandwidth 256
Router(config-if)#ip ospf cost 9500
Router(config-if)#int s0/0/1
Router(config-if)#bandwidth 256
Router(config-if)#
```

R2:

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
```

Router(config-router)#router-id 5.5.5.5

Router(config-router)#network 209.165.200.224 0.0.0.7 area 0

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

Router(config-router)#network 10.10.10.10 0.0.0.3 area 0

Router(config-router)#passive-interface gi0/0

%Invalid interface type and number

Router(config-router)#int s0/0/0

Router(config-if)#bandwidth 256

Router(config-if)#ip ospf cost 9500

Router(config-if)#int s0/0/1

Router(config-if)#bandwidth 256

Router(config-if)#

01:02:46: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from LOADING to FULL, Loading Done

R3:

Router>enable

Router#config t

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

Router(config)#router ospf 1

Router(config-router)#router-id 8.8.8.8

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

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

Router(config-router)#network 192.168.5.0 0.0.0.255 area 0

Router(config-router)#network 192.168.6.0 0.0.0.255 area 0

Router(config-router)#int s0/0/0

Router(config-if)#bandwidth 256

Router(config-if)#ip ospf cost 9500

Router(config-if)#int s0/0/1

Router(config-if)#bandwidth 256

Router(config-if)#

Verificar información de OSPF

- **Visualizar tablas de enrutamiento y routers conectados por OSPFv2**

Mediante el comando show ip ospf neighbor verificamos las tablas de enrutamiento y los router conectados por ospfv2 en los router R1, R2 y R3.

R1:

Bogota#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
5.5.5.5	0	FULL/ -	00:00:36	172.31.21.2	Serial0/0/0

Bogota#

R2:

Miami#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
8.8.8.8	0	FULL/ -	00:00:35	172.31.23.2	Serial0/0/0
1.1.1.1	0	FULL/ -	00:00:36	172.31.21.1	Serial0/0/1

Miami#

R3:

BuenosAires#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
5.5.5.5	0	FULL/ -	00:00:30	172.31.23.1	Serial0/0/1

BuenosAires#

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

  Con el uso del comando show ip ospf interface se procede a ver el costo de cada interface. En los router R1, R2 y R3.

R1:

Bogota#show ip ospf interface

FastEthernet0/0.30 is up, line protocol is up

Internet address is 192.168.30.1/24, Area 0

```
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 1.1.1.1, Interface address 192.168.30.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    No Hellos (Passive interface)
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
FastEthernet0/0.40 is up, line protocol is up
  Internet address is 192.168.40.1/24, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 1.1.1.1, Interface address 192.168.40.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    No Hellos (Passive interface)
  Index 2/2, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
FastEthernet0/0.200 is up, line protocol is up
  Internet address is 192.168.200.1/24, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 1.1.1.1, Interface address 192.168.200.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    No Hellos (Passive interface)
```

Index 3/3, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

Serial0/0/0 is up, line protocol is up

Internet address is 172.31.21.1/30, Area 0

Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 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 4/4, 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)

Bogota#

R2:

Miami#show ip ospf interface

FastEthernet0/1 is up, line protocol is up

Internet address is 10.10.10.10/24, Area 0

Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 5.5.5.5, Interface address 10.10.10.10

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

No Hellos (Passive interface)

```
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
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 00:00:03
  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)
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: 64
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:00
  Index 3/3, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
```

```
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 1.1.1.1
  Suppress hello for 0 neighbor(s)
Miami#
```

R3:

```
BuenosAires#show ip ospf interface

Loopback4 is up, line protocol is up
  Internet address is 192.168.4.1/24, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
  Internet address is 192.168.5.1/24, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback6 is up, line protocol is up
  Internet address is 192.168.6.1/24, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.23.2/30, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost:
390
  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 4/4, 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)

BuenosAires#

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

  Se visualiza el ospf, process ID, Router ID entre otros procesos mediante el comando show ip protocols en los router R1, R2 y R3.

R1:

Bogota#show ip protocols

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 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

192.168.30.0 0.0.0.255 area 0

192.168.40.0 0.0.0.255 area 0

192.168.200.0 0.0.0.255 area 0

Passive Interface(s):

FastEthernet0/0.30

FastEthernet0/0.40

FastEthernet0/0.200

Routing Information Sources:

Gateway	Distance	Last Update
1.1.1.1	110	00:02:04
5.5.5.5	110	00:02:04
8.8.8.8	110	00:02:04

Distance: (default is 110)

R2:

Miami#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
10.10.10.0 0.0.0.255 area 0
Passive Interface(s):
FastEthernet0/1
Routing Information Sources:

Gateway	Distance	Last Update
1.1.1.1	110	00:00:57
5.5.5.5	110	00:00:57
8.8.8.8	110	00:00:57

Distance: (default is 110)

R3:

BuenosAires#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 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
192.168.4.0 0.0.3.255 area 0
Passive Interface(s):
Loopback4
Loopback5
Loopback6
Routing Information Sources:

Gateway	Distance	Last Update
1.1.1.1	110	00:03:18
5.5.5.5	110	00:03:18
8.8.8.8	110	00:03:18

Distance: (default is 110)

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

Se procede a configurar las respectivas vlans, como tambien los puertos troncales y de acceso, como asi mismo se realizar el encapsulamiento, inte.vlan routing, ademas la seguriad en los switches en los diferentes dispositivos conectados a la red.

S1:

S1>en

S1#conf t

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

S1(config)#hostname s1

s1(config)#enable secret class

s1(config)#line con 0

s1(config-line)#pass cisco

s1(config-line)#login

s1(config-line)#line vty 0 4

s1(config-line)#pass cisco

s1(config-line)#login

s1(config-line)#service password-encryption

s1(config)#banner motd "unauthorized acess is prohibited!"

s1(config)#no ip domain-lookup

s1(config)#

Switch>enable

Switch#en

Switch#conf term

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

Switch(config)#hostname S1

S1(config)#no ip domain-lookup

S1(config)#vlan 30

S1(config-vlan)#name Administratcion

S1(config-vlan)#vlan 40

S1(config-vlan)#name Mercadeo

S1(config-vlan)#vlan 200

S1(config-vlan)#name Mantenimiento

S1(config-vlan)#exit

S1(config)#int vlan 200

S1(config-if)#ip address 192.168.200.2 255.255.255.0

S1(config-if)#no shut

S1(config-if)#exit

S1(config)#ip default-gateway 192.168.200.1

S1(config)#interface f0/3

S1(config-if)#switchport mode trunk

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

S1(config-if)#interface f0/24

S1(config-if)#switchport mode trunk

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

S1(config-if)#interface range fa0/1-2, fa0/4-23, GigabitEthernet0/1-2

S1(config-if-range)#switchport mode access

S1(config-if-range)#interface fa0/1

S1(config-if)#switchport mode access

S1(config-if)#switchport access vlan 30

S1(config-if)#interface range fa0/2, fa0/4-23, GigabitEthernet0/1-2

S1(config-if-range)#shutdown

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to up

R1:

Router>en

Router#conf t

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

Router(config)#enable secret class

Router(config)#line con 0
Router(config-line)#pass cisco
Router(config-line)#login
Router(config-line)#line vty 0 4
Router(config-line)#pass cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#service pass
Router(config)#service password-encryption
Router(config)#banner motd $unauthorized access is prohibited!$
Router(config)#hostname R1
R1(config)#

R2:

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#enable secret class
R2(config)#line con 0
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#line vty 0 4
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#service password-encryption
R2(config)#banner motd #unauthorized access is prohibited!#
R2(config)#exit

R3:

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#enable secret class

R3(config)#line con 0
R3(config-line)#pass cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#service password-encryption
R3(config)#banner motd &unuthotized Acess is prohibited!&
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

S3:

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#no ip domain-lookup
S3(config)#enable secret class
S3(config)#line con 0
S3(config-line)#pass cisco
S3(config-line)#login
S3(config-line)#line vty 0 4
S3(config-line)#pass cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#service password-encryption
S3(config)#banner motd %unauthorized acces is probited!%
S3(config)#exit
S3#
%SYS-5-CONFIG_I: Configured from console by console
S3>enable
Password:
S3#conf term
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#hostname S3
S3(config)#no ip domain-lookup

S3(config)#vlan 30
S3(config-vlan)#name Administratcion
S3(config-vlan)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 200
S3(config-vlan)#name Mantenimiento
S3(config-vlan)#exit
S3(config)#int vlan 200
S3(config-if)#ip address 192.168.200.3 255.255.255.0
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.200.1
S3(config)#interface f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/1-2, fa0/4-24, GigabitEthernet0/1-2
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#interface range fa0/2, fa0/4-24, GigabitEthernet0/1-2
S3(config-if-range)#shutdown
S3(config-if-range)#

- **En el Switch 3 deshabilitar DNS lookup**
  Se procede a desabilitar el DNS lookup en el switch 3 de la topologia.

S3:

S3>enable
Password:
S3#conf t
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

- **Asignar direcciones IP a los Switches acorde a los lineamientos.**

  Se procede a configurar el direccionamiento ip a los switches de acuerdo a la tabla propuesta en el escenario 2.

S1:

s1#configure terminal

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

s1(config)#int vlan 200

s1(config-if)#ip address 192.168.200.2 255.255.255.0

s1(config-if)#no shut

s1(config-if)#exit

s1(config)#ip default-gateway 192.168.200.1

s1(config)#

S3:

S3#configure terminal

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

S3(config)#int vlan 200

S3(config-if)#ip address 192.168.200.3 255.255.255.0

S3(config-if)#no shut

S3(config-if)#exit

S3(config)#ip default-gateway 192.168.200.1

S3(config)#

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

Se descativan los puertos que no se estan utilizando en la topologia en los siwtches 2 y 3.

S1:

s1>enable

Password:

s1#conf term

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

s1(config)#interface range fa0/1-2, fa0/4-23, GigabitEthernet0/1-2

s1(config-if-range)#switchport mode access

s1(config-if-range)#interface fa0/1

s1(config-if)#switchport mode access

s1(config-if)#switchport access vlan 30

s1(config-if)#interface range fa0/2, fa0/4-23, GigabitEthernet0/1-2

s1(config-if-range)#shutdown

s1(config-if-range)#

S3:

S3#conf term

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

S3(config)#interface range fa0/1-2, fa0/4-24, GigabitEthernet0/1-2

S3(config-if-range)#switchport mode access

S3(config-if-range)#interface fa0/1

S3(config-if)#switchport mode access

S3(config-if)#switchport access vlan 40

S3(config-if)#interface range fa0/2, fa0/4-24, GigabitEthernet0/1-2

S3(config-if-range)#shutdown

S3(config-if-range)#

- **Implement DHCP and NAT for IPv4**

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

Se configura el R1 como un servidor DHCP para las vlans 30 y 40

R1:

R1>enable

Password:

R1#conf t

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

R1(config)#ip dhcp pool ADMINISTRACCION

R1(dhcp-config)#dns-server 10.10.10.11

R1(dhcp-config)#domain-name ccna-unad.com

R1(dhcp-config)#default-router 192.168.30.1

R1(dhcp-config)#network 192.168.30.0 255.255.255.0

R1(dhcp-config)#ip dhcp pool MERCADEO

R1(dhcp-config)#dns-server 10.10.10.11

R1(dhcp-config)#domain-name ccna-unad.com

R1(dhcp-config)#default-router 192.168.40.1

R1(dhcp-config)#network 192.168.40.0 255.255.255.0

R1(dhcp-config)#

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

  Se procedio a configurar las 30 primeras direcciones ip para las vlan 30 y 40 estaticas en el R1. Con los datos de la tabla sugerida en el escenario 2.

R1:

R1(config)#ip dhcp excluded-address 192.168.31.1 192.168.31.30

R1(config)#ip dhcp excluded-address 192.168.31.1 192.168.31.30

R1(config)#no ip dhcp excluded-address 192.168.31.1 192.168.31.30

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)#domain-name ccna-unad.com

R1(dhcp-config)#default-router 192.168.30.1

R1(dhcp-config)#network 192.168.30.0 255.255.255.0

R1(dhcp-config)#ip dhcp pool MERCADEO

R1(dhcp-config)#dns-server 10.10.10.11

R1(dhcp-config)#domain-name ccna-unad.com

R1(dhcp-config)#default-router 192.168.40.1

R1(dhcp-config)#network 192.168.40.0 255.255.255.0

R1(dhcp-config)#

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.

- **Configurar NAT en R2 para permitir que los host puedan salir a internet**

En el R2 se configura una NAT para que los host se pueda conectarsen a internet.

R2:

R2>enable

Password:

R2#conf t

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

R2(config)#access-list 1 permit 192.168.30.1 0.0.0.255

R2(config)#access-list 1 permit 192.168.40.1 0.0.0.255

R2(config)#no access-list 1 permit 192.168.30.1 0.0.0.255

R2(config)#no access-list 1 permit 192.168.40.1 0.0.0.255

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 192.168.4.0 0.0.3.255

R2(config)#ip nat inside source list 1 pool INTERNET

R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229

R2(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask 255.255.255.248

R2(config)#

- **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.**

  En el R2 se crearon dos listas de acceso de tipo estandar para permitir o restringir el trafico desde los router 1 y 3 hacia 2.

R2:

R2>enable

Password:

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)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask 255.255.255.248

R2(config)#ip nat inside source list 1 pool INTERNET

R2(config)#ip access-list standar ADMIN_S

R2(config-std-nacl)#permit host 172.31.21.1

R2(config-std-nacl)#exit

R2(config)#line vty 0 4

R2(config-line)#access-class ADMIN_S in

R2(config-line)#

- **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.**

  En el R2 se crearon dos listas de acceso de tipo extendido para permitir o restringir el trafico desde los router 1 y 3 hacia 2.

R2:

R2#conf t

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

R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq www

R2(config)#access-list 101 permit icmp any any echo-reply

R2(config)#int f0/0

R2(config-if)#ip access-group 101 in

R2(config-if)#int s0/0/0

R2(config-if)#ip access-group 101 out

R2(config-if)#int s0/0/1

R2(config-if)#ip access-group 101 out

R2(config)#int f0/1

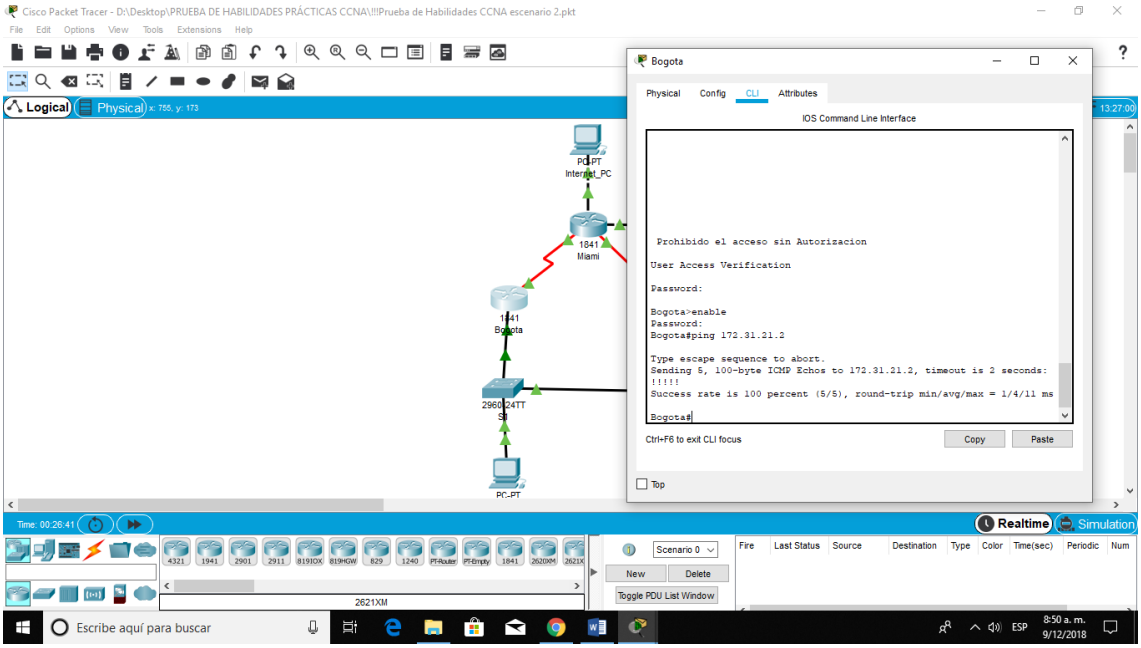
R2(config-if)#ip access-group 101 out

R2(config-if)#

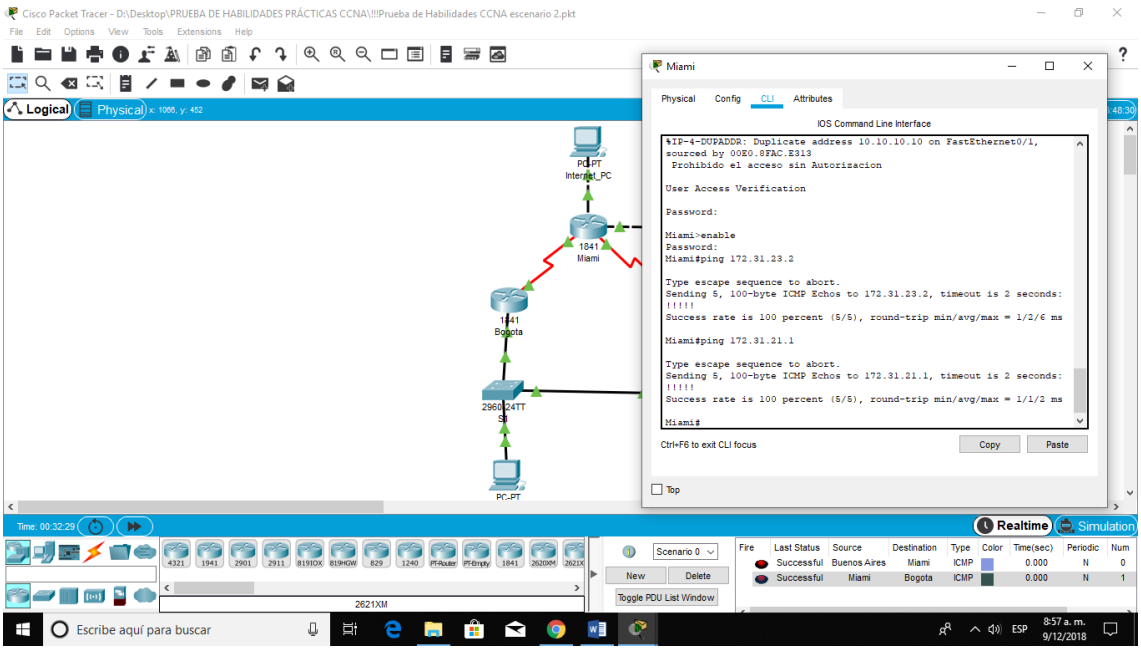
- **Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.**

  Se procedio a comprobar el funcionamiento de la topologia.

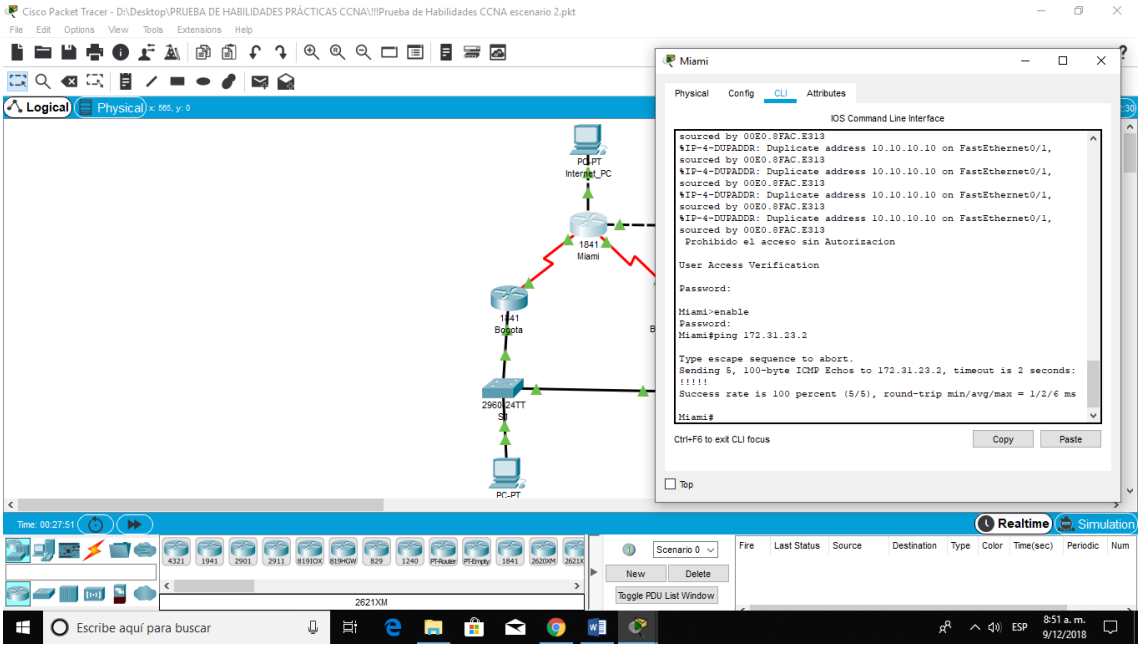
Ping de Bogota a Miami:



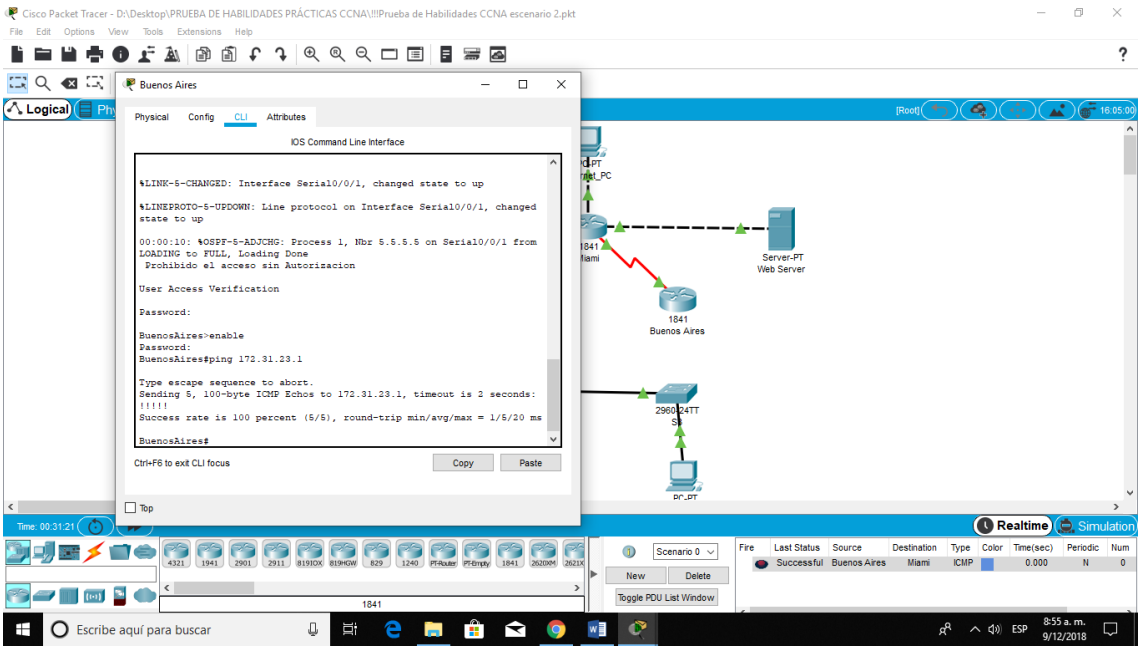
Ping de Miami a Bogota:



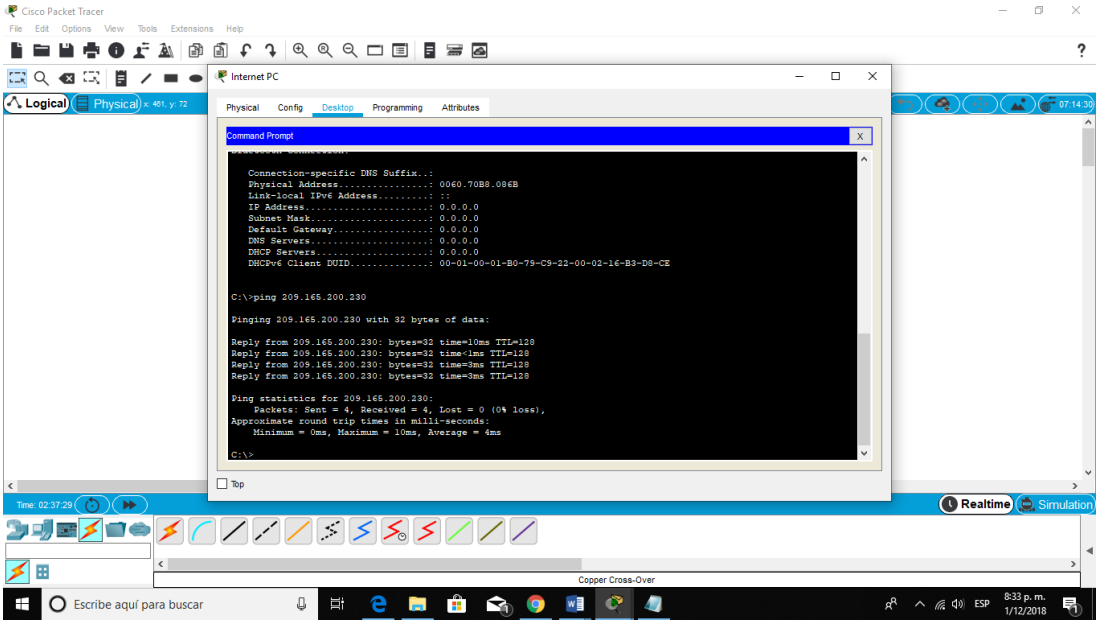
Ping de Miami A Buenos Aires:



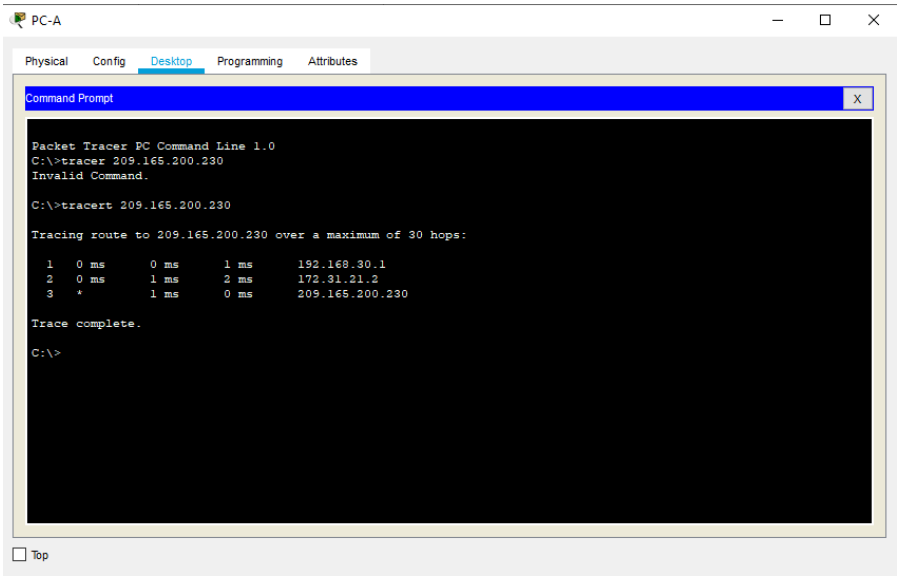
Ping de Buenos Aires a Miami:

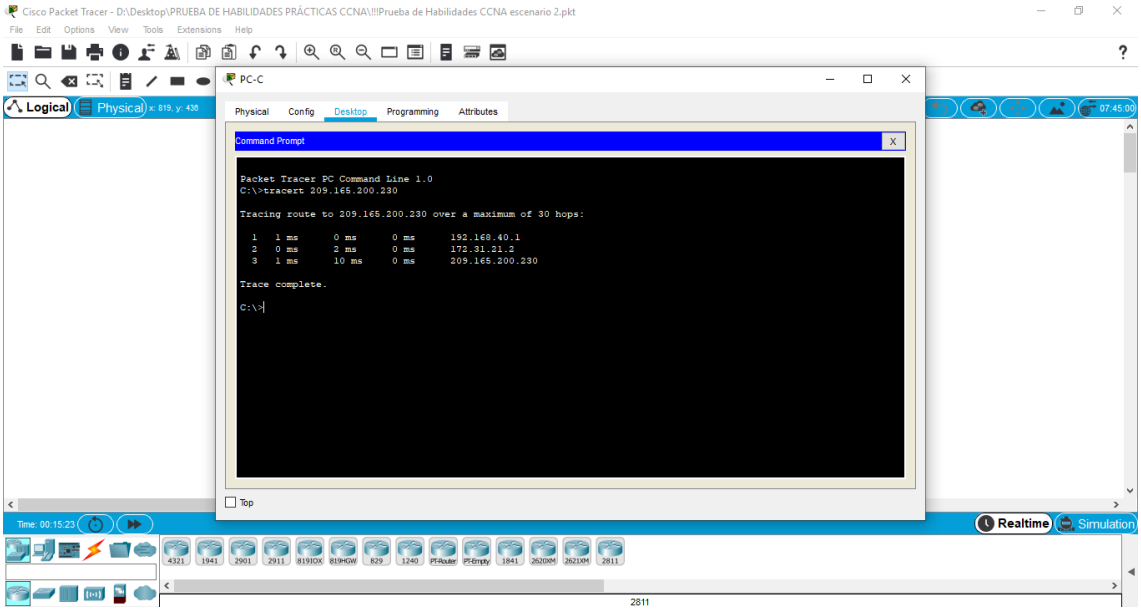


Internet Pc:



Tracer de PC-A y PC-C a Internet_PC:





Link de los escenarios propuestos:
https://drive.google.com/open?id=1KfbOTtm3G5g_TR1uXSDSYDoDsgN5_ZY5

CONCLUSIONES

Durante el desarrollo de esta actividad como trabajo final del diplomado de profundización Diseño y Solución de problemas WAN / LAN, se procedió a configurar las diferentes topologias fisicas, efectuando los diferentes direccionamiento adecuado para cada una de ellas que satisficiera las especificaciones de la problemática planteada. La cual se logro realizar a traves del programa de simulación Packet Tracer.

Mediante la realizacion de estos laboratorios se aplicaron conceptos fundamentales estudiados en el módulo CCNA2, como lo es el protocolo de Routing dinámico, OSPFv2 para el caso de ipv4 respectivamente.

Lo anterior haciendo énfasis en los conocimientos adquiridos a lo largo de este diplomado de profundización.

Con el desarrollo del presente trabajo fue posible demostrar destrezas en cuanto a la configuración de equipos de red Cisco, como Routers y Switches.

Como tambien a aplicar los diferentes comandos para verificar funcionalidad y resolver problemas presentados con las funcionalidades.

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