



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

EVALUACIÓN – PRUEBA DE HABILIDADES PRÁCTICAS CCNA

GRUPO 102059_60

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*Pruebas de Habilidades Prácticas CCNA
Carlos Adrian Pacheco P.*



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INTRODUCCIÓN

El desarrollo de esta actividad de habilidades prácticas pone a prueba nuestros conocimientos adquiridos en el desarrollo del Diplomado de Profundización CCNA, buscando fortalecer las habilidades adquiridas durante este diplomado.

La solución de problemas relacionados con diferentes aspectos del Networking, sólo pueden ser posibles gracias a la comprensión de los conceptos recibidos durante el diplomado.

Los escenarios aquí planteados serán resueltos de manera detallada y especificando los comandos utilizados a través de la herramienta Packet tracer.

DESARROLLO DE LA ACTIVIDAD

Escenario 1

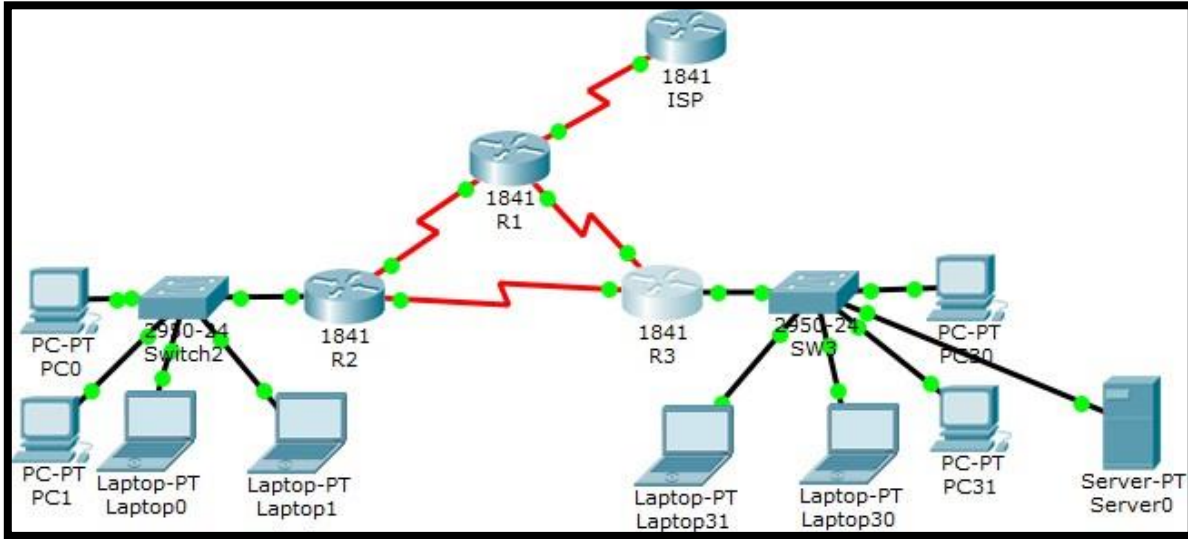


Tabla de direccionamiento

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

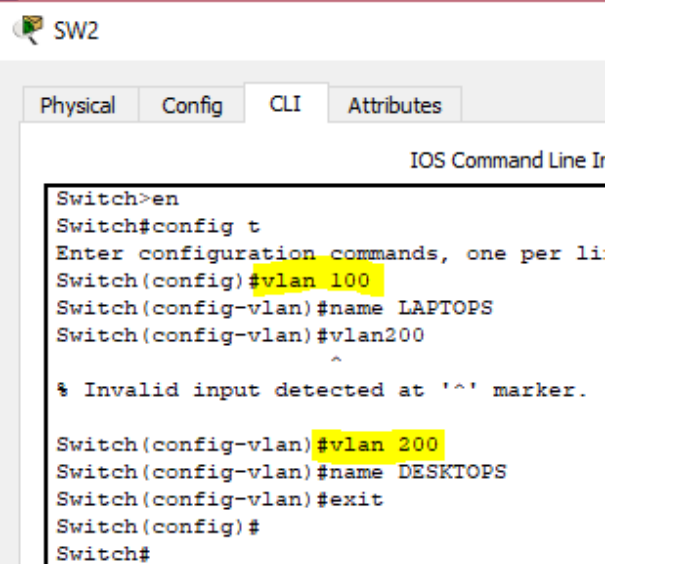
Dispositivo local	Interfaz local	Dispositivo remoto
SW2	Fa0/2-3	100

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

- SW2 VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1.

<pre>Switch>en Switch#config t Enter configuration commands, one per line. End with CNTL/Z. Switch(config)#vlan 100 Switch(config-vlan)#name LAPTOPS Switch(config-vlan)#vlan 200 Switch(config-vlan)#name DESKTOPS Switch(config-vlan)#exit Switch(config)#</pre>	 <pre>SW2 Physical Config CLI Attributes IOS Command Line Ir Switch>en Switch#config t Enter configuration commands, one per li: Switch(config)#vlan 100 Switch(config-vlan)#name LAPTOPS Switch(config-vlan)#vlan200 ^ % Invalid input detected at '^' marker. Switch(config-vlan)#vlan 200 Switch(config-vlan)#name DESKTOPS Switch(config-vlan)#exit Switch(config)# Switch#</pre>
---	--

```

Switch#config t
Switch(config)#int range fa0/2-3
Switch(config-if-range)#switch
Switch(config-if-range)#switchport
mode ac
Switch(config-if-range)#switchport
mode access
Switch(config-if-range)#swic
Switch(config-if-range)#switc
Switch(config-if-range)#switchport
acc
Switch(config-if-range)#switchport
access vlan 100
Switch(config-if-range)#int range
fa0/4-5
Switch(config-if-range)#switchport
mode access
Switch(config-if-range)#switchport
access vlan 200

```

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SW2

Physical Config CLI Attributes

IOS Command Line Interface

```

SW2#show vlan

```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/6, Fa0/9, Fa0/10, Fa0/13, Fa0/14, Fa0/17, Fa0/18, Fa0/21, Fa0/22,
100 LAPTOPS	active	Fa0/2, Fa0/3
200 DESKTOPS	active	Fa0/4, Fa0/5
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

```

SW3(config)#
SW3(config)#vlan 1
SW3(config-vlan)#exit
SW3(config)#int range f0/1-24
SW3(config-if-range)# swit
SW3(config-if-range)# switchport
mode access
SW3(config-if-range)#swit
SW3(config-if-range)#switchport
access vlan 1
SW3(config-if-range)#exit
SW3(config)#end
SW3#

```

SW3

Physical Config CLI Attributes

IOS Command Line Interface

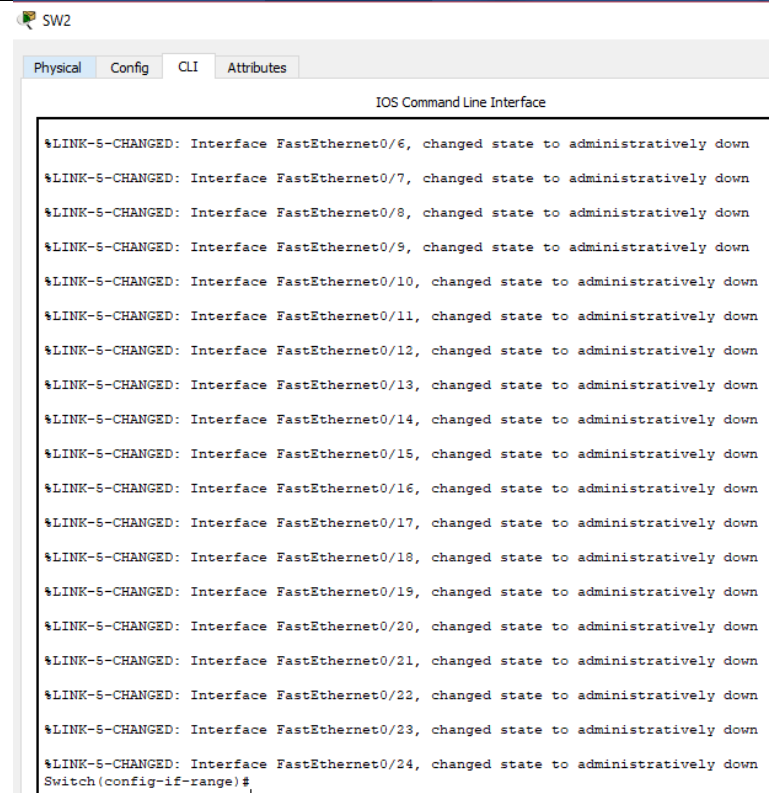
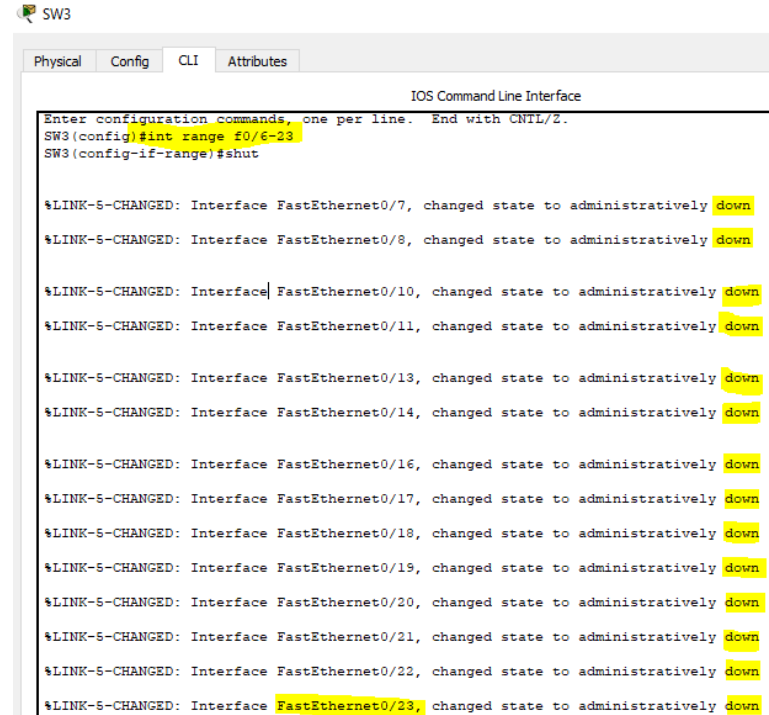
```

SW3#show vlan

```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, Fa0/9, Fa0/10, Fa0/11, Fa0/12, Fa0/13, Fa0/14, Fa0/15, Fa0/16, Fa0/17, Fa0/18, Fa0/19, Fa0/20, Fa0/21, Fa0/22, Fa0/23, Fa0/24
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

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

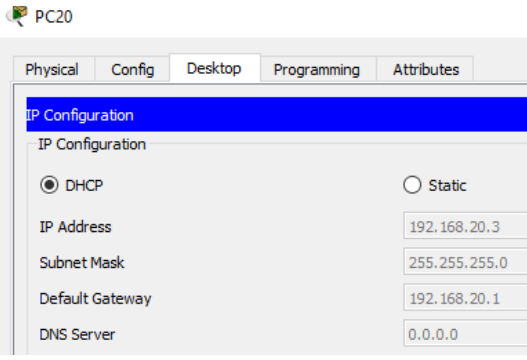
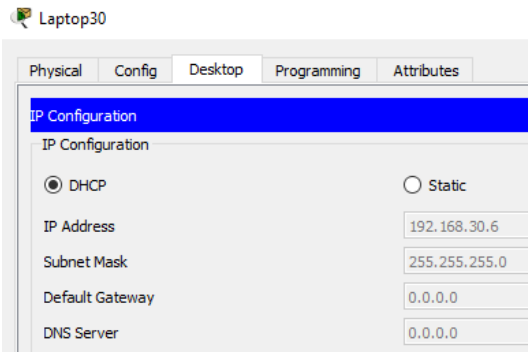
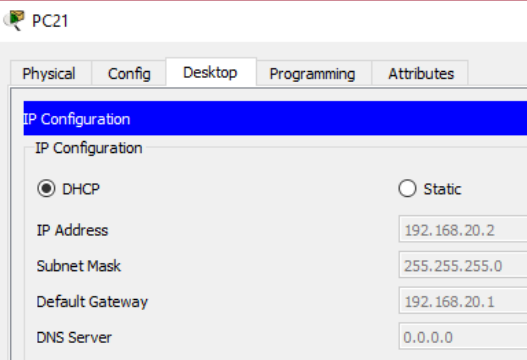
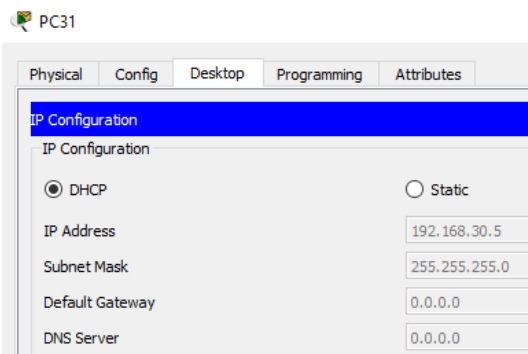
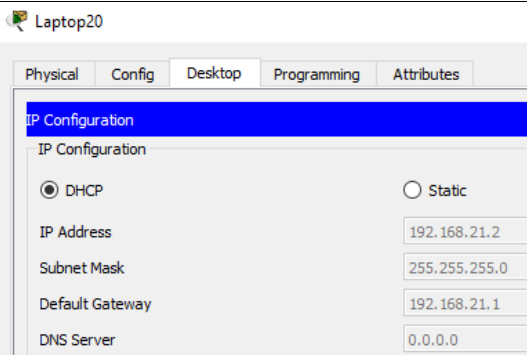
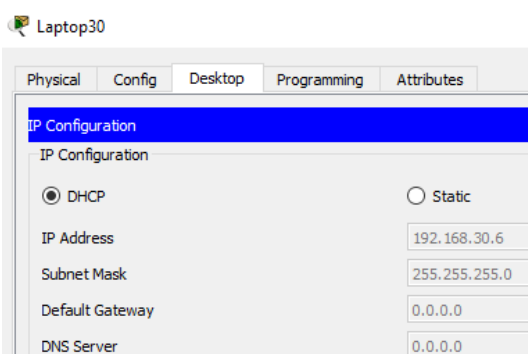
<pre>Switch(config-if-range)#int fa0/1 Switch(config-if)#switchport mode trunk Switch(config-if)#int range fa0/6- 24 Switch(config-if-range)#shut</pre>	 <pre>SW2 Physical Config CLI Attributes IOS Command Line Interface %LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down %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)#</pre>
<pre>SW3#config t Enter configuration commands, one per line. End with CNTL/Z. SW3(config)#int range f0/6-23 SW3(config-if-range)#shut</pre>	 <pre>SW3 Physical Config CLI Attributes IOS Command Line Interface Enter configuration commands, one per line. End with CNTL/Z. SW3 (config) #int range f0/6-23 SW3 (config-if-range)#shut %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 FastEthernet0/10, changed state to administratively down %LINK-5-CHANGED: Interface FastEthernet0/11, 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 FastEthernet0/16, 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</pre>

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

<pre>Router>enable Router#configure terminal Enter configuration commands, one per line. End with CNTL/Z. Router(config)#hostname R1 R1(config)# R1(config)#int s0/0/0 R1(config-if)#ip address 200.123.211.2 255.255.255.0 R1(config-if)#exit R1(config)#int s0/1/0 R1(config-if)#ip address 10.0.0.1 255.255.255.252 R1(config-if)#exit R1(config)#int s0/1/1 R1(config-if)#ip address 10.0.0.5 255.255.255.252 R1(config-if)#end R1#</pre>	<thead> <tr> <th>Interface</th> <th>IP-Address</th> <th>OK?</th> <th>Method</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>FastEthernet0/0</td> <td>unassigned</td> <td>YES</td> <td>unset</td> <td>administratively down</td> </tr> <tr> <td>FastEthernet0/1</td> <td>unassigned</td> <td>YES</td> <td>unset</td> <td>administratively down</td> </tr> <tr> <td>Serial0/0/0</td> <td>200.123.211.2</td> <td>YES</td> <td>manual</td> <td>administratively down</td> </tr> <tr> <td>Serial0/0/1</td> <td>unassigned</td> <td>YES</td> <td>unset</td> <td>administratively down</td> </tr> <tr> <td>Serial0/1/0</td> <td>10.0.0.1</td> <td>YES</td> <td>manual</td> <td>administratively down</td> </tr> <tr> <td>Serial0/1/1</td> <td>10.0.0.5</td> <td>YES</td> <td>manual</td> <td>administratively down</td> </tr> <tr> <td>Vlan1</td> <td>unassigned</td> <td>YES</td> <td>unset</td> <td>administratively down</td> </tr> </tbody>	Interface	IP-Address	OK?	Method	Status	FastEthernet0/0	unassigned	YES	unset	administratively down	FastEthernet0/1	unassigned	YES	unset	administratively down	Serial0/0/0	200.123.211.2	YES	manual	administratively down	Serial0/0/1	unassigned	YES	unset	administratively down	Serial0/1/0	10.0.0.1	YES	manual	administratively down	Serial0/1/1	10.0.0.5	YES	manual	administratively down	Vlan1	unassigned	YES	unset	administratively down
Interface	IP-Address	OK?	Method	Status																																					
FastEthernet0/0	unassigned	YES	unset	administratively down																																					
FastEthernet0/1	unassigned	YES	unset	administratively down																																					
Serial0/0/0	200.123.211.2	YES	manual	administratively down																																					
Serial0/0/1	unassigned	YES	unset	administratively down																																					
Serial0/1/0	10.0.0.1	YES	manual	administratively down																																					
Serial0/1/1	10.0.0.5	YES	manual	administratively down																																					
Vlan1	unassigned	YES	unset	administratively down																																					

| ``` R2(config)# R2(config)#int f0/0.100 R2(config-subif)#enca R2(config-subif)#encapsulation d 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)#int s0/0/0 R2(config-if)#ip address 10.0.0.2 255.255.255.252 R2(config-if)#exit R2(config)#int s0/0/1 R2(config-if)#ip address 10.0.0.9 255.255.255.252 R2(config-if)#exit R2(config)#end R2# ``` | | Interface | IP-Address | OK? | Method | Status | | --- | --- | --- | --- | --- | | FastEthernet0/0 | unassigned | YES | unset | administratively down | | FastEthernet0/0.100 | 192.168.20.1 | YES | manual | administratively down | | FastEthernet0/0.200 | 192.168.21.1 | YES | manual | administratively down | | FastEthernet0/1 | unassigned | YES | unset | administratively down | | Serial0/0/0 | 10.0.0.2 | YES | manual | administratively down | | Serial0/0/1 | 10.0.0.9 | YES | manual | administratively down | | Vlan1 | unassigned | YES | unset | administratively down | |
| ``` R3(config)# R3(config)#int f0/0 R3(config-if)#ip address 192.168.30.1 255.255.255.0 R3(config-if)#exit R3(config)#ipv6 u R3(config)#ipv6 unicast-routing R3(config)#int s0/0/0 R3(config-if)#ip address 10.0.0.6 255.255.255.252 R3(config-if)#exit R3(config)#int s0/0/1 R3(config-if)#ip address 10.0.0.10 255.255.255.252 R3(config-if)#exit R3(config)#end R3# ``` | | Interface | IP-Address | OK? | Method | Status | | --- | --- | --- | --- | --- | | FastEthernet0/0 | 192.168.30.1 | YES | manual | administratively down | | FastEthernet0/1 | unassigned | YES | unset | administratively down | | Serial0/0/0 | 10.0.0.6 | YES | manual | administratively down | | Serial0/0/1 | 10.0.0.10 | YES | manual | administratively down | | Vlan1 | unassigned | YES | unset | administratively down | |

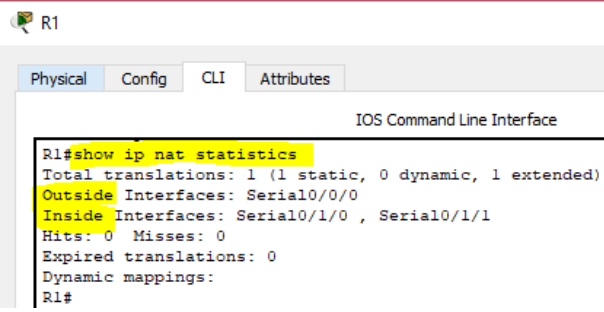
- Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31 deben obtener información IPv4 del servidor DHCP.

R2	R3
<pre>R2#config t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#ip dhcp pool vlan_100 R2(dhcp-config)#network 192.168.20.1 255.255.255.0 R2(dhcp-config)#def R2(dhcp-config)#default-router 192.168.20.1 R2(dhcp-config)#ip dhcp pool vlan_200 R2(dhcp-config)#network 192.168.21.1 255.255.255.0 R2(dhcp-config)#def R2(dhcp-config)#default-router 192.168.21.1 R2(dhcp-config)#exit R2(config)#end R2#</pre>	<pre>R3#config t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#ip dhcp pool vlan_a R3(dhcp-config)#exit R3(config)#ip dhcp pool vlan_1 R3(dhcp-config)#network 192.168.30.1 255.255.255.0 R3(dhcp-config)#network 192.168.30.1 255.255.255.0 R3(dhcp-config)#network 192.168.30.1 255.255.255.0 R3(dhcp-config)#network 192.168.30.1 255.255.255.0 R3(dhcp-config)#default-router 192.168.30.1 R3(dhcp-config)#ipv6 dhcp pool vlan_1 R3(config-dhcpv6)#dns-server 2001:db8:130:: R3(config-dhcpv6)#exit R3(config)#end R3#</pre>
	
	
	

- 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.

<pre> R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#int s0/1/1 R1(config-if)#ip nat inside R1(config-if)#exit R1(config)#int s0/1/0 R1(config-if)#ip nat inside R1(config-if)#exit R1(config)#int s0/0/0 R1(config-if)#ip nat outside R1(config-if)#exit R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128 netmask 255.255.255.0 R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255 R1(config)#access-list 1 permit 10.0.0.0 0.255.255.255 R1(config)#ip nat inside source list 1 interface s0/0/0 overload R1(config)#ip nat inside source static tcp 192.168.30.6 80 200.123.211.1 80 R1(config)#router rip R1(config-router)#version 2 R1(config-router)#network 10.0.0.0 R1(config-router)#exit R1(config)# R1(config)#end R1# </pre>	
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- R1 debe tener una ruta estática predeterminada al ISP que se configuró y que incluye esa ruta en el dominio RIPv2.

<pre>R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#int s0/1/1 R1(config-if)#ip nat inside R1(config-if)#exit R1(config)#int s0/1/0 R1(config-if)#ip nat inside R1(config-if)#exit R1(config)#int s0/0/0 R1(config-if)#ip nat outside R1(config-if)#exit R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128 netmask 255.255.255.0 R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255 R1(config)#access-list 1 permit 10.0.0.0 0.255.255.255 R1(config)#ip nat inside source list 1 interface s0/0/0 overload R1(config)#ip nat inside source static tcp 192.168.30.6 80 200.123.211.1 80 R1(config)#router rip R1(config-router)#version 2 R1(config-router)#network 10.0.0.0 R1(config-router)#exit R1(config)# R1(config)#end R1#</pre>	 <p>The screenshot shows the R1 CLI interface with the command 'show ip nat statistics' entered. The output displays NAT statistics for the router, including total translations (1 static, 0 dynamic, 1 extended), outside and inside interfaces, hits, misses, expired translations, and dynamic mappings.</p> <pre>R1#show ip nat statistics Total translations: 1 (1 static, 0 dynamic, 1 extended) Outside Interfaces: Serial0/0/0 Inside Interfaces: Serial0/1/0 , Serial0/1/1 Hits: 0 Misses: 0 Expired translations: 0 Dynamic mappings: R1#</pre>
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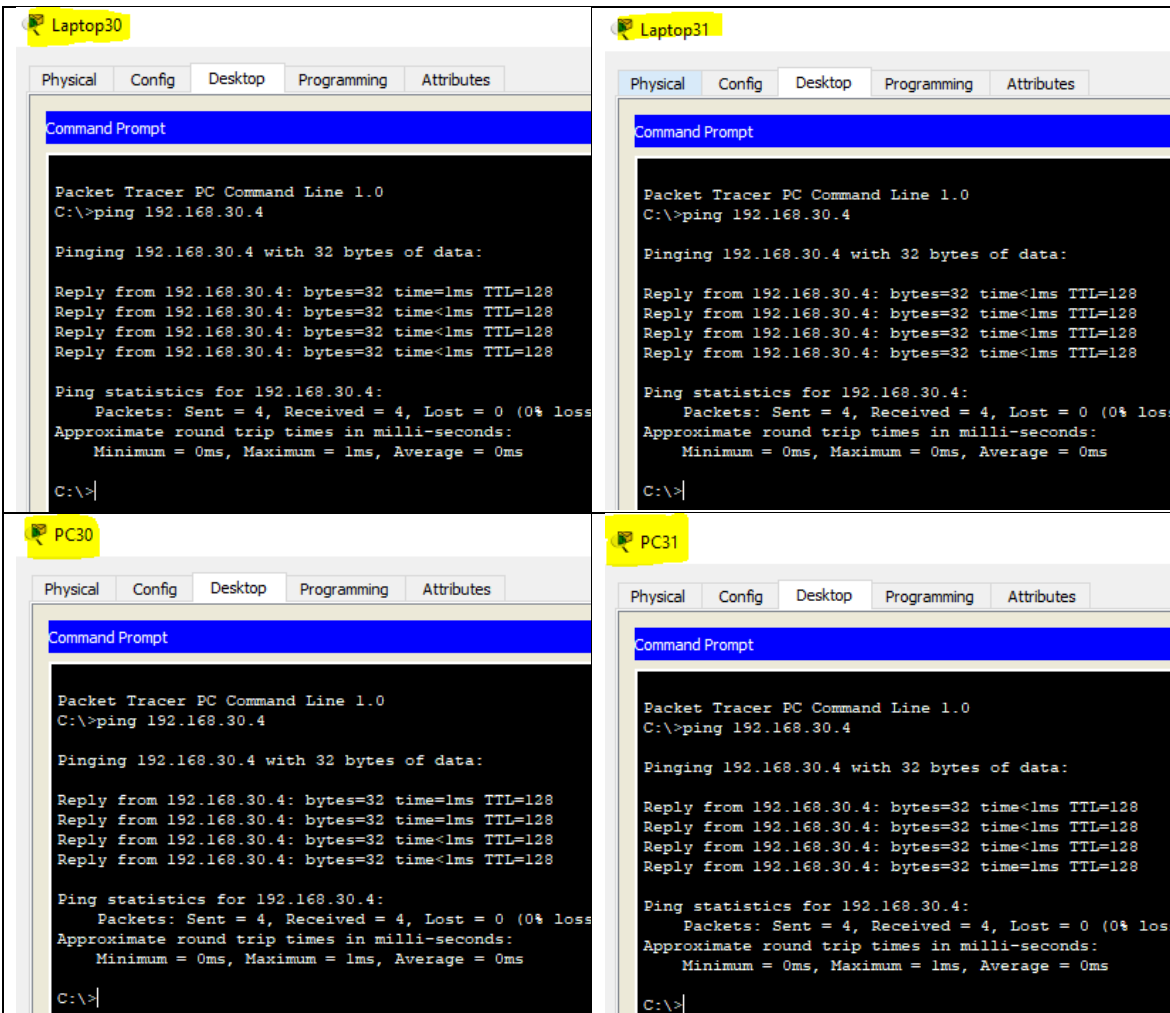
- R2 es un servidor de DHCP para los dispositivos conectados al puerto FastEthernet0/0.

<pre>R2(config)#ip dhcp % Incomplete command. R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9 R2(config)#ip dhcp pool INSIDE-DEVS R2(dhcp-config)#network 192.168.20.1 255.255.255.0 R2(dhcp-config)#network 192.168.21.1 255.255.255.0 R2(dhcp-config)#def R2(dhcp-config)#default-router 192.168.1.1 R2(dhcp-config)#dns R2(dhcp-config)#dns-server 0.0.0.0 R2(dhcp-config)#exit R2(config)#end R2#</pre>	
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- R2 debe, además de enrutamiento a otras partes de la red, ruta entre las VLAN 100 y 200.

<pre>R2#config t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#int vlan 100 R2(config-if)#ip address 192.168.20.1 255.255.255.0 % 192.168.20.0 overlaps with FastEthernet0/0.100 R2(config-if)#exit R2(config)#int vlan 200 R2(config-if)#ip address 192.168.21.1 255.255.255.0 % 192.168.21.0 overlaps with FastEthernet0/0.200 R2(config-if)#exit R2(config)#end R2#</pre>	
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- El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivos en R3 (ping).



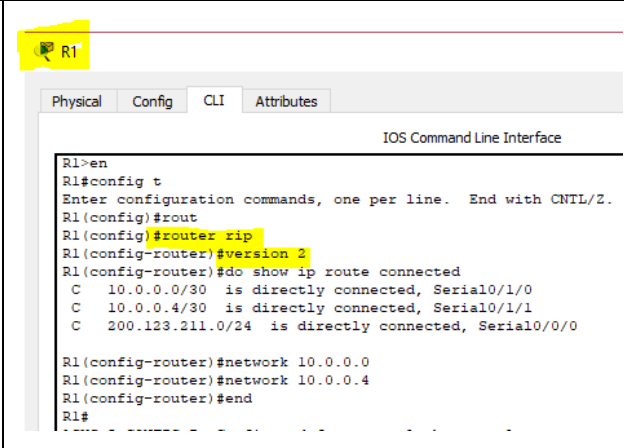
- La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop31, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6.

<p>PC30</p> <p>Physical Config Desktop Programming Attributes</p> <p>IP Configuration</p> <p>IP Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Static</p> <p>IP Address: 192.168.30.3</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 192.168.30.1</p> <p>DNS Server: 0.0.0.0</p> <p>IPv6 Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Auto Config <input type="radio"/> Static</p> <p>IPv6 Address: 2001:DB8:130:0:20A:F3FF:FE36:898C</p> <p>Link Local Address: FE80::20A:F3FF:FE36:898C</p> <p>IPv6 Gateway: FE80::20C:85FF:FEE2:6801</p> <p>IPv6 DNS Server: 2001:DB8:130::</p>	<p>PC31</p> <p>Physical Config Desktop Programming Attributes</p> <p>IP Configuration</p> <p>IP Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Static</p> <p>IP Address: 192.168.30.5</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 192.168.30.1</p> <p>DNS Server: 0.0.0.0</p> <p>IPv6 Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Auto Config <input type="radio"/> Static</p> <p>IPv6 Address: 2001:DB8:130:0:201:C7FF:FE8B:98B3</p> <p>Link Local Address: FE80::201:C7FF:FE8B:98B3</p> <p>IPv6 Gateway: FE80::20C:85FF:FEE2:6801</p> <p>IPv6 DNS Server: 2001:DB8:130::</p>
<p>Laptop30</p> <p>Physical Config Desktop Programming Attributes</p> <p>IP Configuration</p> <p>IP Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Static</p> <p>IP Address: 192.168.30.6</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 192.168.30.1</p> <p>DNS Server: 0.0.0.0</p> <p>IPv6 Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Auto Config <input type="radio"/> Static</p> <p>IPv6 Address: 2001:DB8:130:0:2D0:D3FF:FEA1:BA77</p> <p>Link Local Address: FE80::2D0:D3FF:FEA1:BA77</p> <p>IPv6 Gateway: FE80::20C:85FF:FEE2:6801</p> <p>IPv6 DNS Server: 2001:DB8:130::</p>	<p>Laptop31</p> <p>Physical Config Desktop Programming Attributes</p> <p>IP Configuration</p> <p>IP Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Static</p> <p>IP Address: 192.168.30.2</p> <p>Subnet Mask: 255.255.255.0</p> <p>Default Gateway: 192.168.30.1</p> <p>DNS Server: 0.0.0.0</p> <p>IPv6 Configuration</p> <p><input checked="" type="radio"/> DHCP <input type="radio"/> Auto Config <input type="radio"/> Static</p> <p>IPv6 Address: 2001:DB8:130:0:201:C9FF:FE80:5A67</p> <p>Link Local Address: FE80::201:C9FF:FE80:5A67</p> <p>IPv6 Gateway: FE80::20C:85FF:FEE2:6801</p> <p>IPv6 DNS Server: 2001:DB8:130::</p>

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

<pre>R3#config t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#ipv6 u R3(config)#ipv6 unicast-routing R3(config)#int f0/0 R3(config-if)#ipv6 ena R3(config-if)#ipv6 enable R3(config-if)#ip address 192.168.30.1 255.255.255.0 R3(config-if)#ipv6 address 2001:db8:130::9c0:80f:301/64 R3(config-if)#no shut R3(config-if)#exit R3(config)#end R3#</pre>	<p>R3</p> <p>Physical Config CLI Attributes</p> <p>IOS Command Line Interface</p> <pre>R3#show ipv6 interface brief FastEthernet0/0 [up/up] FE80::20C:85FF:FEE2:6801 2001:DB8:130::9C0:80F:301 FastEthernet0/1 [administratively down/down] Serial0/0/0 [up/up] Serial0/0/1 [up/up] Vlan1 [administratively down/down] R3#</pre>
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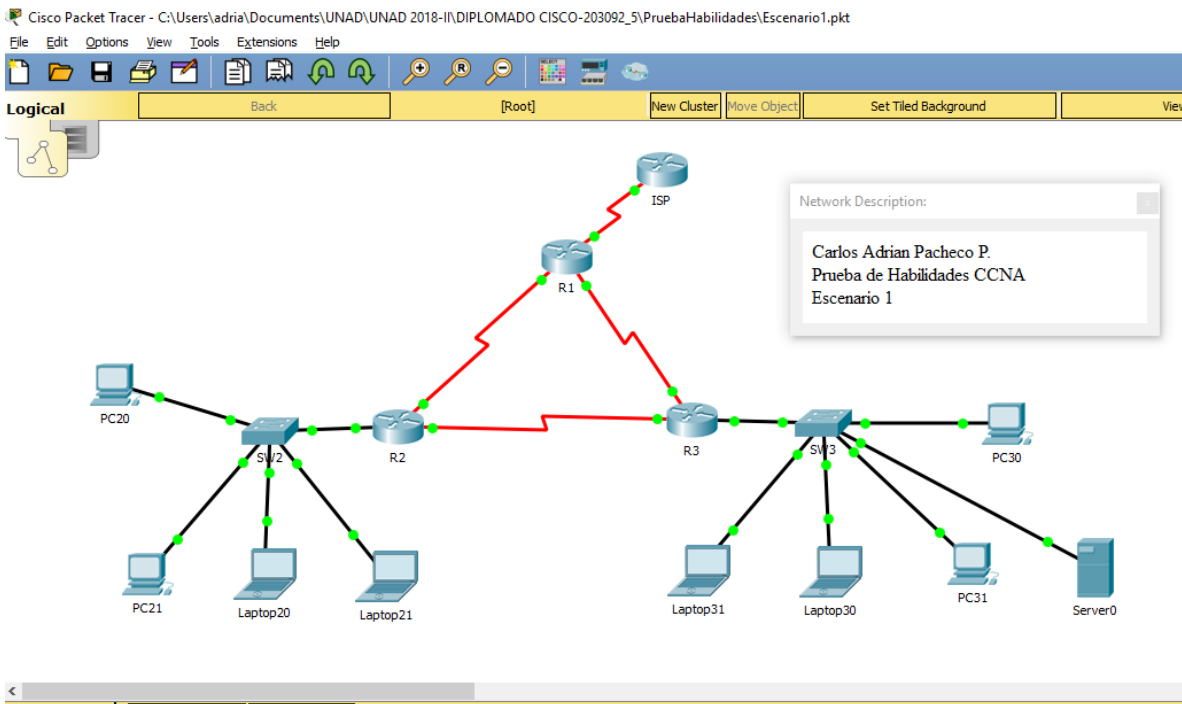
- R1, R2 y R3 intercambian información de routing mediante RIP versión 2.

<pre>R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#rout R1(config)#router rip R1(config-router)#version 2 R1(config-router)#do show ip route connected C 10.0.0.0/30 is directly connected, Serial0/1/0 C 10.0.0.4/30 is directly connected, Serial0/1/1 C 200.123.211.0/24 is directly connected, Serial0/0/0 R1(config-router)#network 10.0.0.0 R1(config-router)#network 10.0.0.4 R1(config-router)#end R1#</pre>	 <p>The screenshot shows the CLI interface for R1. The user enters 'R1>en' to enter configuration mode, followed by 'R1#config t'. The configuration commands entered are 'R1(config)#router rip', 'R1(config-router)#version 2', and 'R1(config-router)#do show ip route connected'. The output shows three directly connected routes: 10.0.0.0/30 on Serial0/1/0, 10.0.0.4/30 on Serial0/1/1, and 200.123.211.0/24 on Serial0/0/0. Finally, the user enters 'R1(config-router)#network 10.0.0.0', 'R1(config-router)#network 10.0.0.4', and 'R1(config-router)#end' to save the configuration.</p>
<pre>R2#config Configuring from terminal, memory, or network [terminal]? t 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 10.0.0.8 R2(config-router)#do show ip route connected C 10.0.0.0/30 is directly connected, Serial0/0/0 C 10.0.0.8/30 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 R2(config-router)#end R2#</pre>	 <p>The screenshot shows the CLI interface for R2. The user enters 'R2#config' and is prompted with 'Configuring from terminal, memory, or network [terminal]? t', where 't' is entered. The configuration commands entered are 'R2(config)#router rip', 'R2(config-router)#version 2', 'R2(config-router)#network 10.0.0.0', and 'R2(config-router)#network 10.0.0.8'. The output shows three directly connected routes: 10.0.0.0/30 on Serial0/0/0, 10.0.0.8/30 on Serial0/0/1, and 192.168.20.0/24 on FastEthernet0/0.100. Finally, the user enters 'R2(config-router)#do show ip route connected' and 'R2(config-router)#end' to save the configuration.</p>
<pre>R3#config t 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 10.0.0.8 R3(config-router)#do show ip route connected C 10.0.0.4/30 is directly connected, Serial0/0/0 C 10.0.0.8/30 is directly connected, Serial0/0/1 C 192.168.30.0/24 is directly connected, FastEthernet0/0 R3(config-router)#end R3#</pre>	 <p>The screenshot shows the CLI interface for R3. The user enters 'R3#config t' and is prompted with 'Enter configuration commands, one per line. End with CNTL/Z.'. The configuration commands entered are 'R3(config)#router rip', 'R3(config-router)#version 2', 'R3(config-router)#network 10.0.0.0', and 'R3(config-router)#network 10.0.0.8'. The output shows three directly connected routes: 10.0.0.4/30 on Serial0/0/0, 10.0.0.8/30 on Serial0/0/1, and 192.168.30.0/24 on FastEthernet0/0. Finally, the user enters 'R3(config-router)#do show ip route connected' and 'R3(config-router)#end' to save the configuration.</p>

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

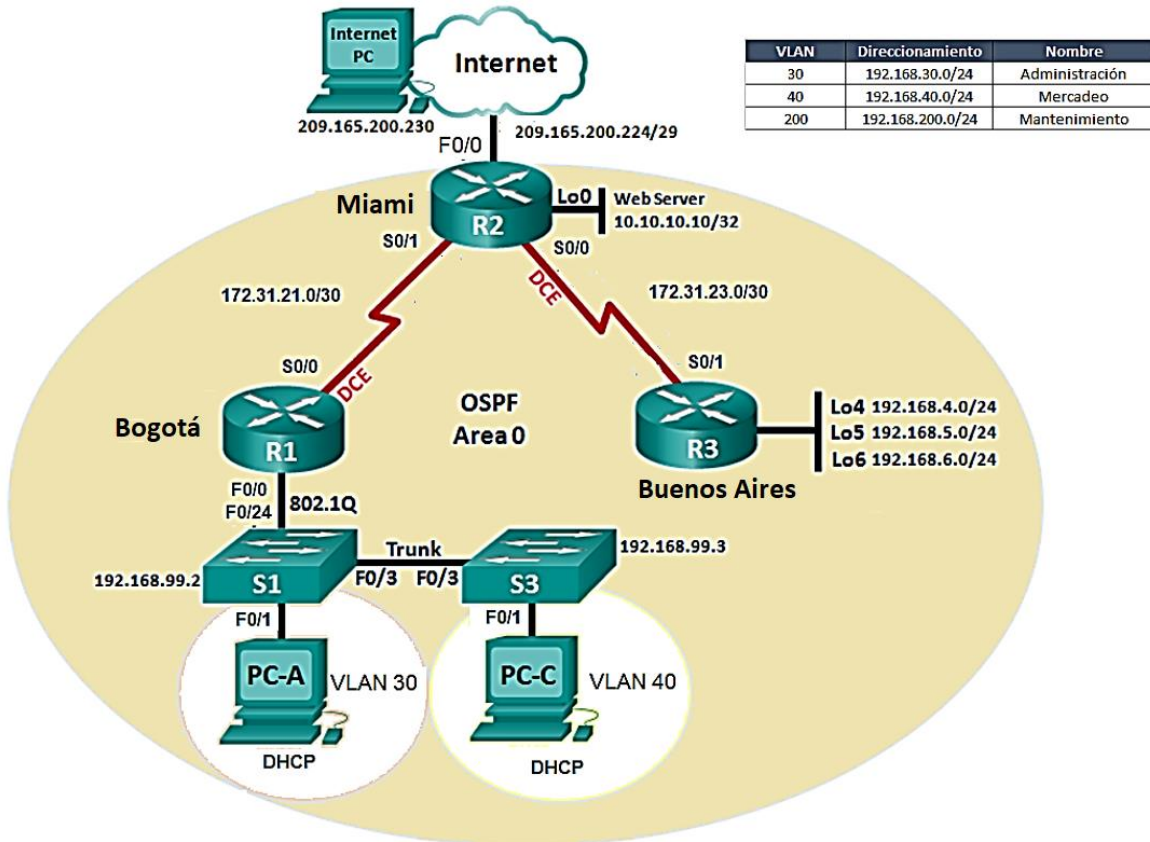
- Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo el R3 deberían poder hacer IPv6-ping entre ellos y el servidor.

R2						R3					
Last Status	Source	Destination	Type	Color		Last Status	Source	Destination	Type	Color	
Successful	PC20	ISP	ICMP	Grey		Failed	Laptop31	ISP	ICMP	Green	
Successful	PC20	PC21	ICMP	Purple		Successful	Laptop31	PC30	ICMP	Brown	
Successful	PC20	Laptop20	ICMP	Olive		Successful	Laptop31	Server0	ICMP	Red	
Successful	PC20	Laptop21	ICMP	Green		Successful	Laptop31	PC31	ICMP	Green	
Successful	PC21	ISP	ICMP	Blue		Failed	Laptop30	ISP	ICMP	Green	
Successful	PC21	PC20	ICMP	Green		Successful	Laptop30	PC30	ICMP	Purple	
Successful	PC21	Laptop20	ICMP	Blue		Successful	Laptop30	Server0	ICMP	Orange	
Successful	PC21	Laptop21	ICMP	Pink		Successful	Laptop30	PC31	ICMP	Blue	
Successful	Laptop20	ISP	ICMP	Green		Failed	PC31	ISP	ICMP	Green	
Successful	Laptop20	PC20	ICMP	Orange		Successful	PC31	PC30	ICMP	Blue	
Successful	Laptop20	PC21	ICMP	Green		Successful	PC31	Server0	ICMP	Red	
Successful	Laptop20	Laptop21	ICMP	Cyan		Successful	PC31	Laptop30	ICMP	Light Green	
Successful	Laptop21	ISP	ICMP	Grey		Successful	PC31	Laptop31	ICMP	Purple	
Successful	Laptop21	PC20	ICMP	Purple		Failed	PC30	ISP	ICMP	Green	
Successful	Laptop21	PC21	ICMP	Purple		Successful	PC30	Laptop31	ICMP	Light Green	
Successful	Laptop21	Laptop20	ICMP	Green		Successful	PC30	Laptop30	ICMP	Green	
						Successful	PC30	PC31	ICMP	Green	
						Successful	PC30	Server0	ICMP	Purple	
						Failed	Server0	ISP	ICMP	Blue	
						Successful	Server0	PC30	ICMP	Purple	
						Successful	Server0	PC31	ICMP	Light Green	
						Successful	Server0	Laptop30	ICMP	Light Green	
						Successful	Server0	Laptop31	ICMP	Purple	



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

TABLA DE DIRECCIONAMIENTO

DISPOSITIVO	INTERFAZ	DIRECCIÓN IP	MASCARA SUBRED	RANGOS HOST
PC-INTERNET	fa0/0	209.165.200.230	255.255.255.248	209.165.200.225 209.165.200.230
R1	s0/0/0	172.31.21.1	255.255.255.252	
	fa0/0	192.168.99.2		
	g0/0	192.168.30.1	255.255.255.252	192.168.30.1 192.168.30.2
	g0/0	192.168.40.1	255.255.255.252	192.168.40.1 192.168.30.126
	g0/0	192.168.200.1	255.255.255.252	192.168.200.1 192.168.200.126
R2	s0/0/0	172.31.23.1	255.255.255.252	172.31.23.1 172.31.23.2
	s0/0/1	172.31.21.2	255.255.255.252	172.31.21.1 172.31.21.2
	fa0/0	209.165.200.225	255.255.255.248	209.165.200.225 209.165.200.230
	g0/1	10.10.10.1	255.255.255.0	10.10.10.1 10.10.10.10
R3	s0/0/1	172.31.23.2	255.255.255.252	172.31.23.1 172.31.23.2
	Lo4	192.168.4.1	255.255.255.0	192.168.4.1 192.168.4.254
	Lo5	192.168.5.1	255.255.255.0	192.168.5.1 192.168.5.254
	Lo6	192.168.6.1	255.255.255.0	192.168.6.1 192.168.6.254
S1	fa0/1	VLAN 30		
	fa0/3	TRONCAL		
	fa0/24	TRONCAL		
S3	fa0/1	VLAN 40		
	fa0/3	TRONCAL		
PC-A	fa0/1	DHCP		192.168.30.1 192.168.30.2
PC-A	fa0/1	DHCP		192.168.40.1 192.168.40.126
WEB SERVER	fa0/1	10.10.10.10	255.255.255.0	10.10.10.10



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

OSPFv2 area 0

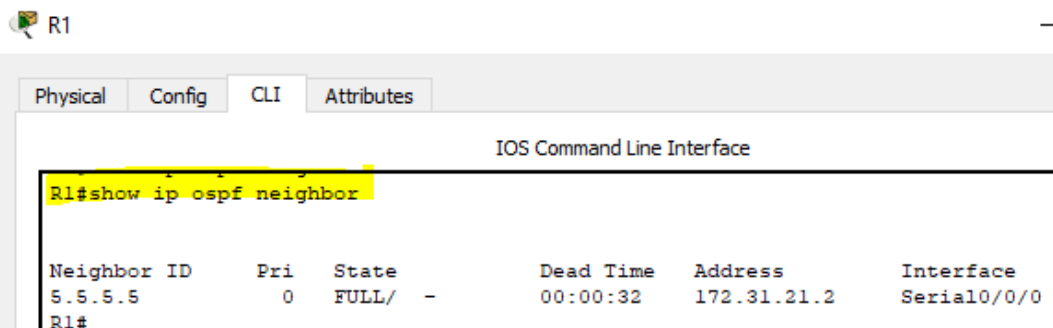
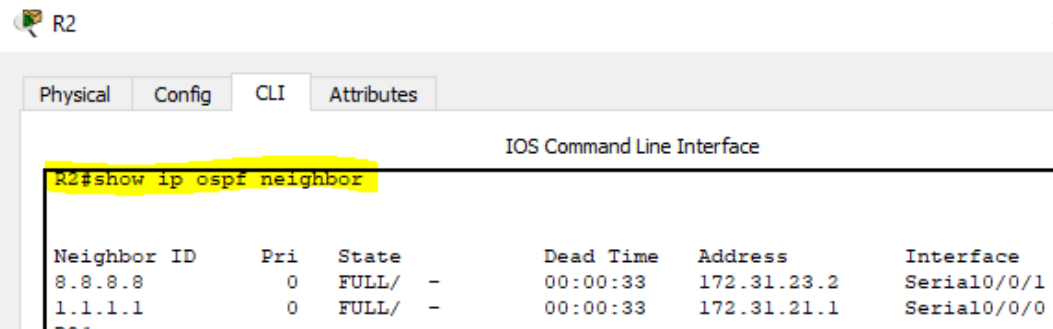
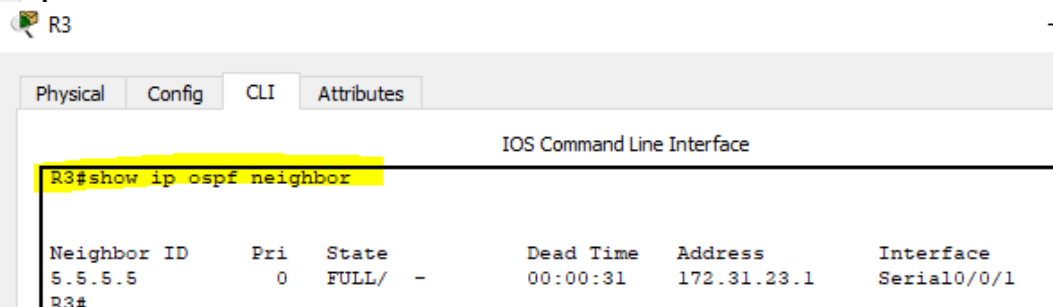
Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

R1	R2
<pre>R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#router ospf 1 R1(config-router)#router-id 1.1.1.1 R1(config-router)#network 172.31.21.0 0.0.0.3 area 0 R1(config-router)#network 192.168.30.0 0.0.0.255 area 0 R1(config-router)#network 192.168.40.0 0.0.0.255 area 0 R1(config-router)#network 192.168.200.0 0.0.0.255 area 0 R1(config-router)#passive-interface gigabitEthernet0/0.30 R1(config-router)#passive-interface gigabitEthernet 0/0.40 R1(config-router)#passive-interface gigabitEthernet 0/0.200 R1(config-router)#exit R1(config)#int s0/0/0 R1(config-if)#band R1(config-if)#bandwidth 256 R1(config-if)#ip ospf cost 9500 R1(config-if)#exit R1(config)#end R1#</pre>	<pre>R2#config t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#router ospf 1 R2(config-router)#router-id 5.5.5.5 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)#network 10.10.10.0 0.0.0.255 area 0 R2(config-router)#pass R2(config-router)#passive-interface g0/0 R2(config-router)#int s0/0/0 R2(config-if)#band R2(config-if)#bandwidth 256 R2(config-if)#ip ospf cost 9500 R2(config-if)#exit R2(config)#end R2#</pre>

R3
<pre>R3#config t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#router ospf 1 R3(config-router)#router-id 8.8.8.8 R3(config-router)#network 172.31.23.0 0.0.0.3 area 0 R3(config-router)#network 172.31.21.0 0.0.0.3 area 0 R3(config-router)#network 172.31.23.0 0.0.0.3 area 0 R3(config-router)#network 192.168.4.0 0.0.0.3 area 0 R3(config-router)#pass R3(config-router)#passive-interface lo4 R3(config-router)#passive-interface lo5 R3(config-router)#passive-interface lo6 R3(config-router)#int s0/0/1 R3(config-if)#band R3(config-if)#bandwidth 256 R3(config-if)#ip ospf cost 9500 R3(config-if)#exit R3(config)#end R3#</pre>

Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2

<p>R1</p>	 <pre> R1#show ip ospf neighbor Neighbor ID Pri State Dead Time Address Interface 5.5.5.5 0 FULL/ - 00:00:32 172.31.21.2 Serial10/0/0 R1# </pre>
<p>R2</p>	 <pre> R2#show ip ospf neighbor Neighbor ID Pri State Dead Time Address Interface 8.8.8.8 0 FULL/ - 00:00:33 172.31.23.2 Serial10/0/1 1.1.1.1 0 FULL/ - 00:00:33 172.31.21.1 Serial10/0/0 R2# </pre>
<p>R2</p>	 <pre> R3#show ip ospf neighbor Neighbor ID Pri State Dead Time Address Interface 5.5.5.5 0 FULL/ - 00:00:31 172.31.23.1 Serial10/0/1 R3# </pre>

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

R1	R2
<pre> R1#show ip ospf interface GigabitEthernet0/1.30 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) GigabitEthernet0/1.40 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) GigabitEthernet0/1.200 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 00:00:01 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 </pre>	<pre> R2#show ip ospf interface GigabitEthernet0/1 is up, line protocol is up Internet address is 10.10.10.1/24, 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 10.10.10.1 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) Serial0/0/1 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: 350 Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0 No designated router on this network Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:05 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) Serial0/0/0 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 00:00:00 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) </pre>

R3
<pre> R3#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: 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 00:00:01 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) </pre>

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

R1	R2
<pre> R1#show ip ospf interface GigabitEthernet0/1.30 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) GigabitEthernet0/1.40 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) GigabitEthernet0/1.200 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, 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 00:00:02 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 </pre>	<pre> R2#show ip ospf interface GigabitEthernet0/1 is up, line protocol is up Internet address is 10.10.10.1/24, 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 10.10.10.1 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) Serial0/0/1 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: 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 00:00:08 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) Serial0/0/0 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: 950 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 00:00:02 </pre>
<pre> 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 0 192.168.30.0 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): GigabitEthernet0/1.30 GigabitEthernet0/1.40 GigabitEthernet0/1.200 Routing Information Sources: Gateway Distance Last Update 1.1.1.1 110 00:11:09 5.5.5.5 110 00:11:14 8.8.8.8 110 00:20:55 Distance: (default is 110) R1# </pre>	<pre> 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 10.10.10.0 0.0.0.255 area 0 Passive Interface(s): GigabitEthernet0/0 GigabitEthernet0/1 Routing Information Sources: Gateway Distance Last Update 1.1.1.1 110 00:14:28 5.5.5.5 110 00:14:32 8.8.8.8 110 00:24:14 Distance: (default is 110) R2# </pre>

```

R3
R3
Physical Config CLI Attributes
IOS Command Line Interface
R3#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: 1
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 00:00:01
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)
R3#

R3
Physical Config CLI Attributes
IOS Command Line Interface
R3#show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 8.8.8.8
Number of areas in this router is 1. 1 normal 0 stub 0 n
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
172.31.21.0 0.0.0.3 area 0
192.168.4.0 0.0.0.3 area 0
Passive Interface(s):
Loopback4
Loopback5
Loopback6
Routing Information Sources:
Gateway Distance Last Update
1.1.1.1 110 00:17:10
5.5.5.5 110 00:17:15
8.8.8.8 110 00:26:56
Distance: (default is 110)
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.

TABLA VLAN

VLAN	EQUIPO	DIRECCIONAMIENTO	NOMBRE
30	PC-A	192.168.30.0/24	Administración
40	PC-C	192.168.40.0/25	Mercadeo
200	PC-A PC-C	192.168.200.0/26	Mantenimiento



ASIGNACIÓN DE PUERTO.

VLAN	EQUIPO	Puerto
Troncal	S1	Fa0/3
Troncal	S1	Fa0/24
30	S1	Fa0/1
Troncal	S3	Fa0/3
40	S3	Fa0/1

CONFIGURACIÓN S1

Asignación VLAN S1

VLAN	EQUIPO	DIRECCIONAMIENTO	NOMBRE
30	S1	192.168.30.0/24	Administración
40	S1	192.168.40.0/25	Mercadeo
200	S1	192.168.200.0/26	Mantenimiento

S1	<pre>S1#config t Enter configuration commands, one per line. End with CNTL/Z. S1(config)#vlan 30 S1(config-vlan)#name ADMINISTRACION S1(config-vlan)#exit S1(config)#vlan 40 S1(config-vlan)#name MERCADEO S1(config-vlan)#exit S1(config)#vlan 200 S1(config-vlan)#name MANTENIMIENTO S1(config-vlan)#exit S1(config)#int vlan 200 S1(config-if)# %LINK-5-CHANGED: Interface Vlan200, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to up S1(config-if)#ip address 192.168.99.2 255.255.255.0 S1(config-if)#no shut S1(config-if)#exit S1(config)#ip default-gateway 192.168.99.1 S1(config)#exit S1(config)#int f0/3 S1(config-if)#swi S1(config-if)#switchport mode trunk S1(config-if)#swi S1(config-if)#switchport trunk native vlan 1 S1(config-if)#exit S1(config)#int f0/24 S1(config-if)#swi S1(config-if)#switchport mode trunk S1(config-if)# %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</pre>
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```

S1(config-if)#sw
S1(config-if)#switchport trunk native vlan 1
S1(config)#int range f0/1-2, f0/4-23
S1(config-if-range)#sw
S1(config-if-range)#switchport mode access
S1(config-if-range)#int range f0/1-2, f0/4-23
S1(config-if-range)#swi
S1(config-if-range)#switchport mode access
S1(config-if-range)#no shut
S1(config-if-range)#exit
S1(config)#int f0/1
S1(config-if)#swi
S1(config-if)#switchport mode access
S1(config-if)#sw
S1(config-if)#switchport access vlan 30
S1(config-if)#exit
S1(config)#end
S1#

```

CONFIGURACIÓN SWITCH S3

Asignacion VLAN S3

VLAN	EQUIPO	DIRECCIONAMIENTO	NOMBRE
40	S3	192.168.40.0/25	Mercadeo
200	S3	192.168.200.0/26	Mantenimiento

```

S3 S3#config t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#vlan 3
S3(config-vlan)#exit
S3(config)#vlan 30
S3(config-vlan)#name ADMINISTRACION
S3(config-vlan)#exit
S3(config)#vlan 40
S3(config-vlan)#name MERCADEO
S3(config-vlan)#exit
S3(config)#vlan 200
S3(config-vlan)#name MANTENIMIENTO
S3(config)#int vlan 200
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#int vlan 200
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#ip def
S3(config)#ip default-gateway 192.168.99.1
S3(config)#int f0/3
S3(config-if)#sw
S3(config-if)#switchport mode trunk
S3(config-if)#sw
S3(config-if)#switchport trunk native vlan 1
S3(config)#int range f0/1-2, f0/4-24, g0/1-2

```


	<pre> S3(config-if-range)#sw S3(config-if-range)#switchport mode access S3(config-if-range)#exit S3(config)#int f0/1 S3(config-if)#sw S3(config-if)#switchport mode access S3(config-if)#sw S3(config-if)#switchport access vlan 40 S3(config-if)#exit S3(config)#end S3# </pre>
--	--

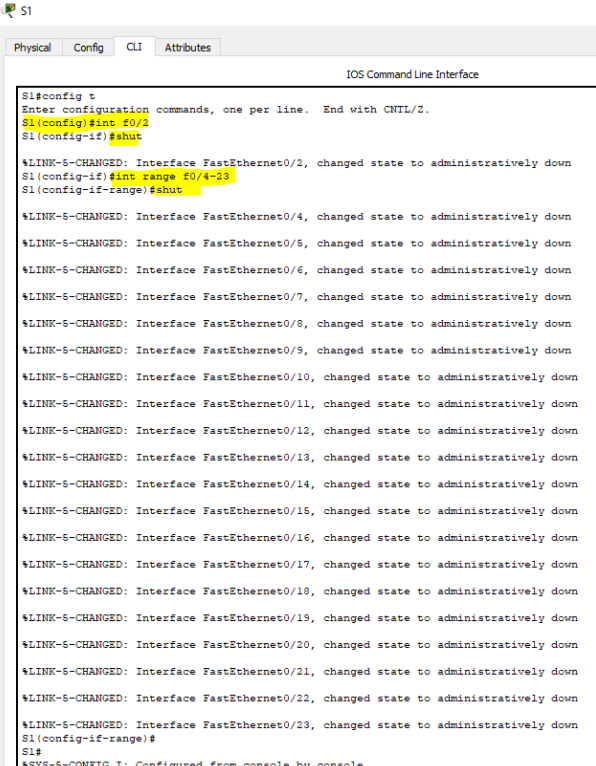
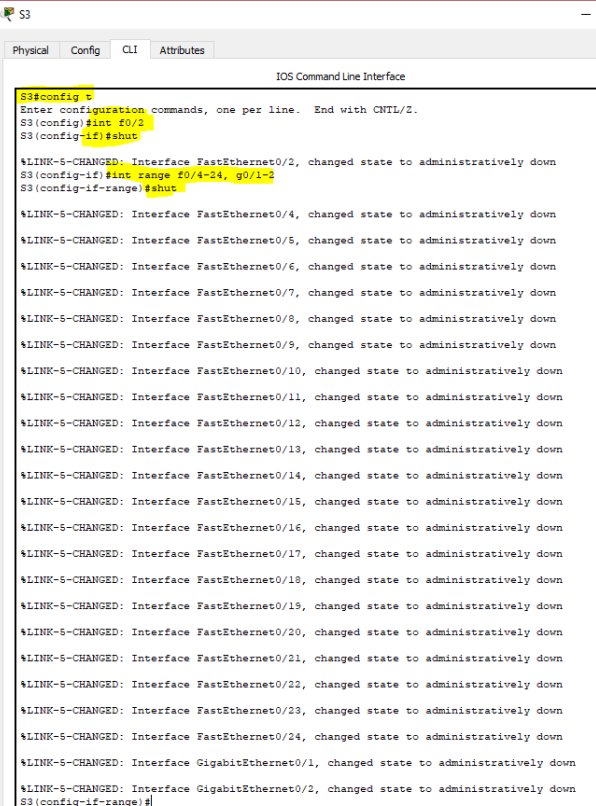
4. En el Switch 3 deshabilitar DNS lookup

S3	<pre> S3#config t Enter configuration commands, one per line. End with CNTL/Z. S3(config)#no ip domain lookup S3(config)#exit S3# </pre>
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5. Asignar direcciones IP a los Switches acorde a los lineamientos.

S1	<pre> S1#config t Enter configuration commands, one per line. End with CNTL/Z. S1(config)# S1(config)#int vlan 200 S1(config-if)#ip address 192.168.200.0 255.255.255.0 Bad mask /24 for address 192.168.200.0 S1(config-if)#no shut S1(config-if)#exit S1(config)#end S1# </pre>
S3	<pre> S3#config t 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)#end S3# </pre>

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

<p>S1</p> <pre>S1#config t Enter configuration commands, one per line. End with CNTL/Z. S1(config)#int f0/2 S1(config-if)#shut %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down S1(config-if)#int range f0/4-23 S1(config-if-range)#shut</pre>	 <pre>S1 Physical Config CLI Attributes IOS Command Line Interface S1#config t Enter configuration commands, one per line. End with CNTL/Z. S1(config)#int f0/2 S1(config-if)#shut %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down S1(config-if)#int range f0/4-23 S1(config-if-range)#shut %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 S1# *SYS-5-CONFIG_I: Configured from console by console</pre>
<p>S3</p> <pre>S3#config t Enter configuration commands, one per line. End with CNTL/Z. S3(config)#int f0/2 S3(config-if)#shut %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down S3(config-if)#int range f0/4-24, g0/1-2 S3(config-if-range)#shut</pre>	 <pre>S3 Physical Config CLI Attributes IOS Command Line Interface S3#config t Enter configuration commands, one per line. End with CNTL/Z. S3(config)#int f0/2 S3(config-if)#shut %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down S3(config-if)#int range f0/4-24, g0/1-2 S3(config-if-range)#shut %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 S3(config-if-range)#</pre>

7. Implement DHCP and NAT for IPv4

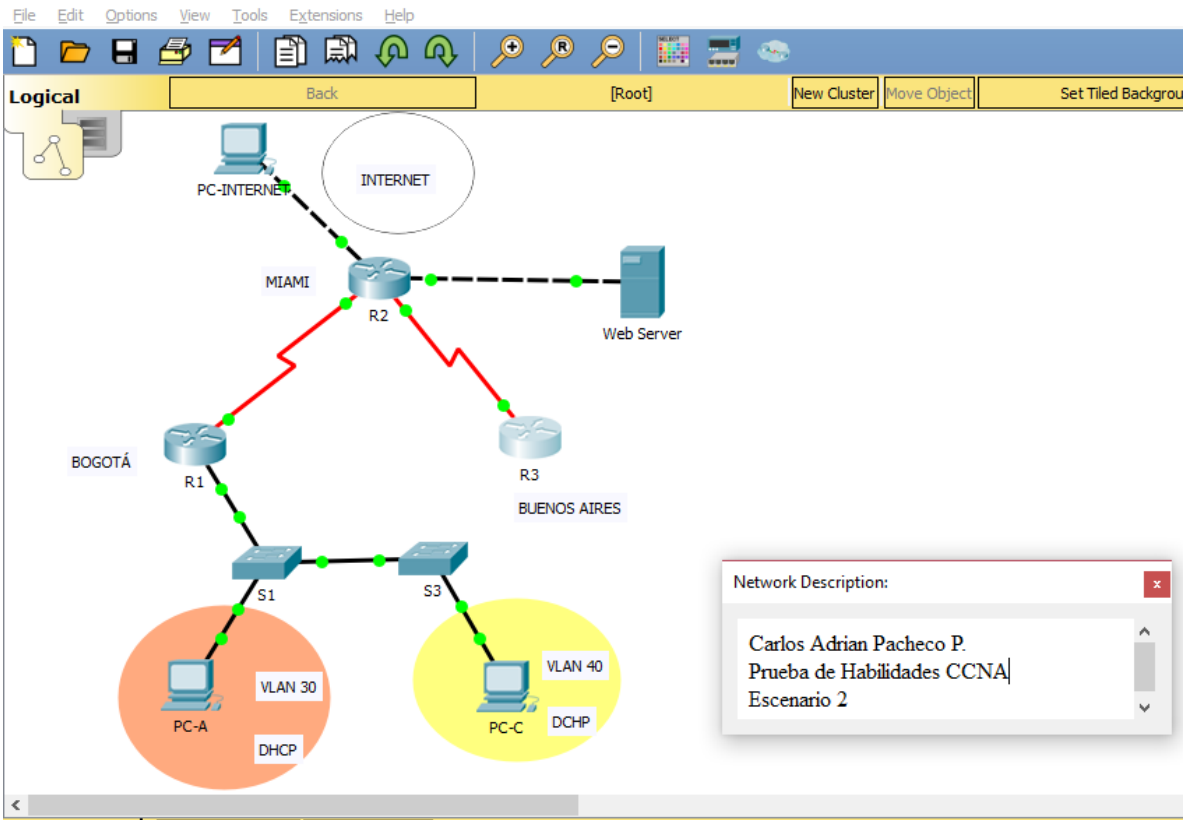
R1	<pre>R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#ip dhcp pool ADMINISTRACION R1(dhcp-config)#dns-server 10.10.10.11 R1(dhcp-config)#default-router 192.168.30.1 R1(dhcp-config)#network 192.168.30.0 255.255.255.0 R1(dhcp-config)#exit</pre>
-----------	---

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

R1	<pre>R1#config t 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 pool ADMINISTRACION R1(dhcp-config)#network 192.168.30.0 255.255.255.0 R1(dhcp-config)#default-router 192.168.30.1 R1(dhcp-config)#dns-server 10.10.10.11 R1(dhcp-config)#end R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30 R1(config)#ip dhcp pool MERCADEO R1(dhcp-config)#network 192.168.40.4 255.255.255.0 R1(dhcp-config)#def R1(dhcp-config)#default-router 192.168.40.1 R1(dhcp-config)#dns-server 10.10.10.11 R1(dhcp-config)#end R1#</pre>
-----------	---

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

R1	<pre>R1#config t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30 R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30 R1(config)#exit R1#</pre>
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ARCHIVOS .pkt

Los ejercicios fueron resueltos gracias al uso de la herramienta Packet Tracer y puedes ser consultados en la siguiente ruta:

https://drive.google.com/open?id=172mwvgHt9gnMd5VtSFXMVqMsd8aPt_N2



CONCLUSIONES

Gracias al desarrollo de esta actividad, hemos fortalecido los conocimientos y las habilidades adquiridas al llevar a cabo satisfactoriamente el DIPLOMADO DE PROFUNDIZACIÓN CISCO (DISEÑO E IMPLEMENTACIÓN DE SOLUCIONES INTEGRADAS LAN / WAN).

Encontrar las posibles soluciones a los escenarios planteados, ha permitido ampliar nuestras capacidades técnicas en lo relacionado al Networking.



BIBLIOGRAFÍA

CICO NETWORKING ACADEMY – CCNA 1

<https://static-course-assets.s3.amazonaws.com/ITN503/es/index.html>

CICO NETWORKING ACADEMY – CCNA 2

<https://static-course-assets.s3.amazonaws.com/RSE503/es/index.html>

CISCO CCNA – CONFIGURACIÓN DHCP

<http://blog.capacityacademy.com/2014/01/09/cisco-ccna-como-configurar-dhcp-en-ciscorouter/>

COMO CONFIGURAR OPSF EN ROUTER

<http://blog.capacityacademy.com/2014/06/23/cisco-ccna-como-configurar-ospf-en-ciscorouter/>

CONFIGURACIÓN TRONCAL 802.1Q

https://www.cisco.com/c/es_mx/support/docs/switches/catalyst-4000-seriesswitches/24064-171.html

CISCO. (2014). Conceptos de Routing. Principios de Enrutamiento y Conmutación.

<https://static-courseassets.s3.amazonaws.com/RSE50ES/module4/index.html#4.0.1.1>

CISCO. (2014). Configuración y conceptos básicos de Switching. Principios de Enrutamiento y Conmutación.

<https://static-courseassets.s3.amazonaws.com/RSE50ES/module2/index.html#2.0.1.1>