

## DIPLOMADO DE PROFUNDIZACIÓN

CISCO

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## UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD

## ESCUELA DE CIENCIAS BÁSICAS TECNOLOGÍA E

## INGENIERÍA

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#### INTRODUCCION

La presente practica tutoriales presentadas en el simulador de Cisco "Packet Tracer", una herramienta en la que ejecutamos cada una de las guías propuestas para la tarea, este software muy efectivo y de gran calidad nos ha permitido apoyarnos en la solución y encuentro de errores en cuanto a crear topologías de red, configurar dispositivos, insertar paquetes y simular una red con múltiples representaciones.

Cisco ha creado un sistema operativo de red conocido como IOS, que permite configurar y programar dispositivos a fin de llevar a cabo diversas funciones de red. Estas configuraciones permiten configurar la forma en la que los paquetes viajan por una red y afectan los niveles de seguridad de la misma.

## **OBJETIVOS**

#### **Objetivos Generales**

• Determinar la configuración de los escenarios propuestos.

## **Objetivos Específicos**

- Configuración de parámetros básicos de dispositivos intermedios.
- Configuración de parámetros de interconexión de dispositivos finales.

## Descripción de escenarios propuestos para la prueba de habilidades Escenario 1



Imagen 1. Esquema de la red

#### Mind Wide Open<sup>™</sup>

## Tabla de direccionamiento

			Máscara	Gateway
El	Interfaces	Dirección IP	de subred	predeterminado
administrador				
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
	Se0/0/0	200.123.211.2	255.255.255.0	N/D
R1	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
	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
R2	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
		192.168.30.1	255.255.255.0	N/D
	Fa0/0	2001:db8:130::9C0:80F:	/64	N/D
R3		301		
	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	<b>VLAN 100</b>	N/D	N/D	N/D
	VLAN 200	N/D	N/D	N/D
SW3	VLAN1	N/D	N/D	N/D

Tabla 1

# **CISCO**. Cisco Networking Academy<sup>®</sup>

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 2

#### Tabla de enlaces troncales

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

## Tabla 3

#### Situación

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

## Descripción de las actividades

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

## **Vlans y Puertos**

#### SW2

Switch>enable Switch#config

Configuring from terminal, memory, or network [terminal]? Enter configuration

commands, one per line. End with CNTL/Z. 1(config)#HOSTNAME SW2

SW2(config)#VLAN 100 SW2(config-vlan)#name Laptops SW2(config-vlan)#vlan

200 SW2(config-vlan)#name destops SW2(config-vlan)#exit

SW2(config)#interface range fa0/2-3 SW2(config-if-range)#switchport mode access

SW2(config-if-range)#switchport access vlan 100 SW2(config-if-range)#exit

SW2(config)#interface range fa0/4-5 SW2(config-if-range)#switchport mode acces

SW2(config-if-range)#switchport access vlan 200 SW2(config-if-range)#interface

fa0/1

SW2(config-if)#switchport mode trunk SW2(config-if)#exit

#### Mind Wide Open"

## SW3

Switch>enable Switch#config

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Switch(config)#hostname SW3 SW3(config)#Vlan 1 SW3(config-vlan)#exit SW3(config)#interface range f0/1-24 SW3(config-if-range)#switchport mode access SW3(config-if-range)#switchport access vlan 1 SW3(config-if-range)#exit **SW3#show vlan brief** 

Imagen 4

#### 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 **1005et-default active SW3#** 

Imagen 5

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

SW2

SW2(config)#interface range fa0/6-24 SW2(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 FastEthernet0/10, 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 FastEthernet0/20, 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 FastEthernet0/24, changed state to administratively down

Imagen7

#### SW3

SW3#config

Configuring from terminal, memory, or network [terminal]? SW3(config)#interface range f0/7-24 SW3(config-if-range)#shutdown

%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

Imagen 8

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administr atively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
SW3(config-if-range)#

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

D	2
N	7

Router>enable Router #config

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Router(config)#hostname R2 R2(config)# R2(config)#interface f0/0.100

R2(config-subif)#encapsulation dot1q 100

R2(config-subif)#ip address 192.168.20.1 255.255.255.0 R2(config-subif)#interface 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)#interface f0/0 R2(config-if)#no shutdown

R2(config-if)#

Imagen 10

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, 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 %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 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.200, changed state to up R2(config-if)#exit R2(config)#interface s0/0/0 R2(config-if)#ip address 10.0.0.2 255.255.255.252 R2(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/0/0, changed state to down R2(config-if)#exit R2(config)#interface s0/0/1 R2(config-if)#ip address 10.0.0.9 255.255.255.252 R2(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/0/1, changed state to down R2(config-if)#ip address 10.0.0.9 255.255.255.252 R2(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/0/1, changed state to down R2(config-if)#ip address 10.0.0.9 255.255.255.252 R2(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/0/1, changed state to down R2(config-if)#ip address 10.0.0.9 255.255.255.255.255.252 R2(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

#### ...... Cisco Networking Academv<sup>®</sup> CISCO **R**1

Router>enable Router#config

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Router(config)#hostname R1 R1(config)#interface s0/0/0 R1(config-if)# ip address 200.123.211.2 255.255.255.0 R1(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/0/0, changed state to down R1(config-if)#

Imagen 11

R1(config-if)#interface s0/1/0 R1(config-if)#ip address 10.0.0.1 255.255.255.252 R1(config-if)#no shutdown R1(config-if)# %LINK-5-CHANGED: Interface Serial0/1/0, changed state to up R1(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up. R1(config-if)#interface s0/1/1 R1(config-if)#ip address 10.0.0.5 255.255.255.252 R1(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/1/1, changed state to down R1(config-if)# R1(config-if)#

Imagen 12

R3

Router>enable Router#config
Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one
per line. End with CNTL/Z. Router(config)#hostname R3
R3(config)#ipv6 unicast-routing R3(config)#interface f0/0
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)#ipv6 dhcp server vlan_1
R3(config-if)#ipv6 nd other-config-flag R3(config-if)#no shutdown
R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R3(config-if)#interface s0/0/0
R3(config-if)#ip address 10.0.0.6 255.255.255.252 R3(config-if)#no shutdown
R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R3(config-if)#i
Imagen13

#### %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,

changed state to up % Ambiguous command: ''i'' R3(configif)#interface s0/0/1 R3(config-if)#ip address 10.0.0.10 255.255.255.252 R3(config-if)#no shutdown R3(config-if)# %LINK-5-CHANGED: Interface Serial0/0/1, changed state to up R3(config-if)#exit R3(config)# %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

Imagen 14

ISP

Router>enable Router#config Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Router(config)#hostname ISP ISP(config)#interface s0/0/0 ISP(config-if)#ip address 200.123.211.1 255.255.255.0 ISP(config-if)#no shutdown ISP(config-if)# %LINK-5-CHANGED: Interface Serial0/0/0, changed state to up ISP(config-if)#exit ISP(config)#

Imagen 15

• R1 debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública.

Asegúrese de que todos los terminales pueden comunicarse con Internet pública

(haga ping a la dirección ISP) y la lista de acceso estándar se llama INSIDE-

DEVS.

#### **R1-Config Nat Ipv4**

**R1>enable R1#config** Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. R1(config)#interface s0/1/1 R1(config-if)#ip nat inside R1(config-if)#interface s0/1/1 R1(config-if)#exit R1(config)#int s0/1/0 R1(config-if)#ip nat inside R1(config-if)#exit R1(config)#interface s0/0/0 R1(config-if)#ip nat outside R1(config-if)#exit R1(config)#ip nat pool INSADE-DESV 200.123.211.2 200.213.211.50 netmask 255.0.0.0 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)#end **R1**# %SYS-5-CONFIG\_I: Configured from console by console wr **Building configuration...** [OK] **R1**#show ip nat tr Pro Inside global Inside local Outside local Outside global tcp 200.123.211.1:80 192.168.30.6:80 --- ---**R1**#show ip nat sta 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**#

• **R1** debe tener una ruta estática predeterminada al ISP que se

configuró yque incluye esa ruta en el dominio RIPv2.

R1(config-if)#interface s0/1/0 R1(config-if)#ip address 10.0.0.1 255.255.255.252 R1(config-if)#no shutdown R1(config-if)# %LINK-5-CHANGED: Interface Serial0/1/0, changed state to up R1(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up. R1(config-if)#interface s0/1/1 R1(config-if)#ip address 10.0.0.5 255.255.255.252 R1(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial0/1/1, changed state to down R1(config-if)# R1(config-if)#

Imagen17

• **R2** es un servidor de DHCP para los dispositivos conectados al puerto

FastEthernet0/0.

R2
Router>enable Router #config
Configuring from terminal, memory, or network [terminal]? Enter configuration
commands, one per line. End with CNTL/Z. Router(config)#hostname R2
R2(config)# R2(config)#interface f0/0.100
R2(config-subif)#encapsulation dot1q 100
R2(config-subif)#ip address 192.168.20.1 255.255.255.0 R2(config-subif)#interface f0/0.200
R2(config-subif)#encapsulation dot1g 200
R2(config-subif)#ip address 192.168.21.1 255.255.255.0 R2(config-subif)#exit
R2(config)#interface f0/0 R2(config-if)#no shutdown
R2(config-if)#

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

## R2

R2#enable R2#config Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. R2(config)#interface 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)#interface 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

Imagen 19

• El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivosen

R3 (ping).

Physical Config Services	Desktop Progra	imming Attributes	
IP Configuration			х
IP Configuration			
O DHCP		🔿 Static	DHCP request successful.
IP Address		192.168.30.6	
Subnet Mask		255.255.255.0	
Default Gateway		192,168,30,1	
DNS Server		0.0.0.0	
IPv6 Configuration			
O DHCP	Auto Confi	g 💿 Static	Ipv6 Autoconfig request successful.
IPv6 Address		2001:DB8:130:0:2D0:FFFF:FEA6:8C8B	/ 64
Link Local Address		FE80::2D0:FFFF:FEA6:8C8B	
IPv6 Gateway		FE80::201:C9FF:FEB4:6701	
IPv6 DNS Server		2001:DB8:130::9C0:80F:301	



Physical         Config         Desktop         Programming         Attributes             Command Prompt         X             Packet Tracer PC Command Line 1.0         X           C:\>ping 192.168.30.6         With 32 bytes of data:         X           Reply from 192.168.30.6: bytes=32 time<1ms TTI=128	PC30	
<pre>Zecket Tracer PC Command Line 1.0 C:\ping 192.168.30.6 Pinging 192.168.30.6 with 32 bytes of data: Reply from 192.168.30.6: bytes=32 time=1ms TTL=128 Reply from 192.168.30.6: bytes=32 time=1ms TTL=128 Reply from 192.168.30.6: bytes=32 time=1ms TTL=128 Ping statistics for 192.168.30.6: Packets: Sent 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli=seconds: Minimum = 0ms, Maximum = 1ms, Average = 0ms C:\&gt;</pre>	Physical Config Desktop Programming Attributes	
<pre>Packet Tracer PC Command Line 1.0 C:\&gt;ping 192.168.30.6 Pinging 192.168.30.6: bytes=32 time=1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Ping statistics for 192.168.30.6: Ping statistics for 192.168.30.6: Ping statistics for 192.168.30.6: Maproximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 1ms, Average = 0ms C:\&gt;</pre>	Command Prompt	x
<pre>Packet Tracer PC Command Line 1.0 C:\&gt;pinging 192.168.30.6 Pinging 192.168.30.6: bytes=32 time=Ims TTL=128 Reply from 192.168.30.6: bytes=32 time<ims ttl="128&lt;br">Reply from 192.168.30.6: bytes=32 time<ims ttl="128&lt;br">Ping statistics for 192.168.30.6: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli=seconds: Minimum = Oms, Maximum = 1ms, Average = Oms C:\&gt;</ims></ims></pre>		
<pre>Pinging 192.168.30.6 with 32 bytes of data: Reply from 192.168.30.6: bytes=32 time=1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Ping statistics for 192.168.30.6: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli=seconds: Minimum = 0ms, Maximum = 1ms, Average = 0ms C:\&gt;</pre>	Packet Tracer PC Command Line 1.0 C:\>ping 192.168.30.6	
<pre>Reply from 192.168.30.6: bytes=32 time=1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Ping statistics for 192.168.30.6:     Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds:     Minimum = 0ms, Maximum = 1ms, Average = 0ms C:\&gt;</pre>	Pinging 192.168.30.6 with 32 bytes of data:	
<pre>Reply from 192.168.30.6: bytes=32 time<ims (0%="" 192.168.30.6:="" approximate="" average="0ms" bytes="32" c:\="" for="" from="" in="" loss),="" lost="0" maximum="1ms," milli="seconds:" minimum="0ms," packets:="" ping="" received="4," reply="" round="" sent="4," statistics="" til="128" time<ims="" times="" trip=""> </ims></pre>	Reply from 192.168.30.6: bytes=32 time=1ms TTL=128	
<pre>Reply from 192.168.30.6: bytes=32 time&lt;1ms TTL=128 Ping statistics for 192.168.30.6:     Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds:     Minimum = 0ms, Maximum = 1ms, Average = 0ms C:\&gt; </pre>	Reply from 192.168.30.6: bytes=32 time <lms ttl="128&lt;br">Reply from 192.168.30.6: bytes=32 time<lms ttl="128&lt;/td"><td></td></lms></lms>	
<pre>Ping statistics for 192.168.30.6: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 1ms, Average = 0ms C:\&gt; Too</pre>	Reply from 192.168.30.6: bytes=32 time<1ms TTL=128	
Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Ims, Average = Oms C:∖>	<pre>Ping statistics for 192.168.30.6: Packets: Sent = 4. Received = 4. Lost = 0 (0% loss).</pre>	
	Approximate round trip times in milli-seconds:	
	C. (4	

Imagen21

Imagen Ping al servidor desde PC30

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.

IP Configuration		
· OHCP	Static	
IP Address	192.558.30.4	
Subnet Hask	255.255.258.0	
Default Gateway	(192.368.36.3	
DNS Server	0.0.0	
IPv6 Configuration		
· DHCP	🗇 Auto Config 💮 Static	
IPv6 Address		]/[]
Unit Local Address	PERC-201-63PP /PEBC-966E	
IPv6 Gateway	PERC-201-CHFF #184-6201	
Pv6 DK6 Server	2001.000.130.900.007.371	

Imagen 22

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CHCP	C Static	
IP Address	192, 168, 30, 5	
Subriet Mask	255.285.255.0	
Default Gateway	192, 398, 30, 1	
ONS Server	0.00.0	
IPv6 Configuration		
· DHCP	Auto Config	
IPv6 Address		1.
Link Local Address	PEBO:: 20 Lt6 3PF : PE6A: A 7C3	
IPv6 Gateway	FEBO: (201)/CIFF /FEB/06701	
IPv6 DNS Server	2001/008/1301/9C0/809/301	

#### Imagen 23

P Configuration		x
IP Configuration		
CHOP	State	
IP Address	192.308.30.3	
Subnet Mask	298-255-255-0	
Default Gateway	192, 368, 30, 1	
DNG Server	0.0.0.0	
IPv6 Configuration		
· DHCP	Auto Config Static	
3Pv6 Aubress		1
Link Local Address	PE80:: 20C:89FF (FE55:68D0	
IPv6 Gateway	PER0-301/CWF/PE846701	
IPv6 DN5 Server	2901:088:130:=909:00*1301	

#### Imágenes 24





• La interfaz FastEthernet 0/0 del R3 también deben tener direcciones

IPv4 e IPv6 configuradas (dual-stack).

#### **R3**

R3>enable R3#config

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. R3(config)#ipv6 u R3(config)#ipv6 unicast-routing R3(config)#interface f0/0 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 shutdown R3(config-if)#exit R3(config)#

Imagen 26

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

## R1

R1#config

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. R1(config)#router rip

R1(config-router)#version 2

R1(config-router)#network 10.0.0.0

R1(config-router)#network 10.0.0.4

R1(config-router)#do show ip route connected C 10.0.0/30 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

Imagen 27

R2
----

R2>enable R2#config . R2(config)#router rip R2(config-router)#version 2 R2(config-router)#do show ip route connected R2(config-router)#network 10.0.00 R2(config-router)#network 10.0.08 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** 

#### **R3**

R3>enable R3#config Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. R3(config)#router rip R3(config-router)#version 2 R3(config-router)#network 10.0.00 **R3(config-router)#network 10.0.08 R3(config-router)#end** 

Imagen 2

#### **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

#### Direccionamiento IP ROUTER MAIMI

**Router>enable Router#config** Router(config)#hostname MIAMI MIAMI(config)#int s0/0/1 MIAMI(config-if)#ip address 172.31.21.1 255.255.255.252 MIAMI(config-if)#no shut %LINK-5-CHANGED: Interface Serial0/0/1, changed state to down MIAMI(config-if)#int g0/0 MIAMI(config-if)#ip address 209.165.200.225 255.255.255.248 MIAMI(configif)#no shut MIAMI(config-if)# %LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up MIAMI(config-if)#int s0/0/0 MIAMI(config-if)#ip address 172.31.23.1 % Incomplete command. MIAMI(config-if)#ip addres 172.31.23.1 255.255.255.252 MIAMI(config-if)#no shut %LINK-5-CHANGED: Interface Serial0/0/0, changed state to down MIAMI(config-if)# MIAMI(config-if)#int lo0 MIAMI(config-if)# %LINK-5-CHANGED: Interface Loopback0, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up MIAMI(config-if)#ip add 10.10.10.11 255.255.255.255 MIAMI(config-if)#no shut MIAMI(config-if)#

#### **Direccionamiento IP ROUTER BOGOTA**

Router>ENABLE Router#CONFIG Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Router(config)#HOSTNAME BOGOTA BOGOTA(config)#int s0/0/0 BOGOTA(config-if)#ip address 172.31.21.2 255.255.255.252 BOGOTA(configif)#no shut BOGOTA(config-if)#int g0/0 BOGOTA(config-if)#int g0/0 BOGOTA(config-if)#ip address 192.168.30.1 255.255.255.0 BOGOTA(configif)#no shut

Imagen 3

**Direccionamiento Ip R3** 

**Router>ENABLE Router#CONFIG** Router(config)#HOSTNAME BUENOSAIRES BUENOSAIRES(config)#int s0/0/1 BUENOSAIRES(config-if)#ip address 172.31.23.2 255.255.255.252 BUENOSAIRES(config-if)#no shut BUENOSAIRES(config-if)#int 104 **BUENOSAIRES**(config-if)# %LINK-5-CHANGED: Interface Loopback4, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up BUENOSAIRES(config-if)#ip address 192.168.4.1 255.255.255.0 **BUENOSAIRES**(config-if)#int l05 **BUENOSAIRES**(config-if)# %LINK-5-CHANGED: Interface Loopback5, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to up BUENOSAIRES(config-if)#ip address 192.168.5.1 255.255.255.0 **BUENOSAIRES**(config-if)#int 106 BUENOSAIRES(config-if)# %LINK-5-CHANGED: Interface Loopback6, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up BUENOSAIRES(config-if)#ip address 192.168.6.1 255.255.255.0 BUENOSAIRES(config-if)#

#### Mind Wide Open<sup>™</sup>

## Web Server

Physical Config Services D	ktop Programming Attributes	
P Configuration		x
IP Configuration		
O DHCP	Static	
IP Address	10.10.10	
Subnet Mask	255.0.0.0	
Default Gateway	10.10.10.1	
DNS Server	0.0.0.0	
IPv6 Configuration		
O DHCP	<ul> <li>Auto Config</li> <li>Static</li> </ul>	
IPv6 Address		
Link Local Address	FE80::290:21FF:FE63:A202	
IPv6 Gateway		
IPv6 DNS Server		

Imagen 5

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

#### Verificar información de OSPF

• Visualizar tablas de enrutamiento y routers conectados por OSPFv2

#### **ROUTER BOGOTA**

BOGOTA>enable BOGOTA#config BOGOTA(config)#router ospf 1 **BOGOTA**(config-router)#router-id 1.1.1.1 BOGOTA(config-router)#network 172.31.21.0 0.0.0.3 area 0 BOGOTA(config-router)#network 192.168.30.0 0.0.0.255 area0 BOGOTA(config-router)#network 192.168.40.0 0.0.0.255 area0 BOGOTA(config-router)#network 192.168.200.0 0.0.0.255 area 0 BOGOTA(config-router)#passiveinterface g0/1.30 BOGOTA(config-router)#passive-interface g0/1.40 BOGOTA(configrouter)#passive-interface g0/1.200 BOGOTA(config-router)#exit BOGOTA(config)#int s0/0/0 BOGOTA(config-if)#bandwidth 256 BOGOTA(config-if)#ip ospf cost 9500 BOGOTA(config-if)#exit BOGOTA(config)#exit BOGOTA#show ip ospf interface serial 0/0/0 Serial0/0/0 is up, line protocol is up Internet address is 172.31.21.2/30, 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 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 Suppress hello for 0 neighbor(s) BOGOTA#

#### **ROUTER MAIMI**

MIAMI>enable MIAMI#config Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. MIAMI(config)#router ospf 1 MIAMI(config-router)#router-id 5.5.5.5 MIAMI(config-router)#network 172.32.21.0 0.0.0.3 area 0 MIAMI(config-router)#network 172.31.23.0 0.0.0.3 area 0 MIAMI(config-router)#network 10.10.10.0 0.0.0.255 area 0 MIAMI(configrouter)#passive-interface g0/1 MIAMI(config-router)#int s0/0/0 MIAMI(config-if)#bandwith 256 MIAMI(config-if)#int s0/0/1 MIAMI(config-if)#bandwith 256 MIAMI(config-if)#ip ospf cost 9500 MIAMI(config-if)#exit MIAMI(config)#exit MIAMI# MIAMI#show ip ospf interface serial 0/0/0 Serial0/0/0 is up, line protocol is up Internet address is 172.31.23.1/30, Area 0 Process ID 1, Router ID 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 00:00:03 Index 1/1, flood queue length 0 Next 0x0(0)/0x0(0) Last flood scan length is 1, maximum is 1 Last flood scan time is 0 msec, maximum is 0 msec Suppress hello for 0 neighbor(s) MIAMI#

## CISCO Cisco Networking Academy<sup>®</sup> ROUTER BUENOS AIRES

BUENOSAIRES> BUENOSAIRES>ENABLE BUENOSAIRES#CONFIG

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. BUENOSAIRES(config)#route ospf 1 BUENOSAIRES(config-router)#router-id 8.8.8.8 BUENOSAIRES(config-router)#network 172.32.23.0 0.0.0.3 area 0 BUENOSAIRES(config-router)#passive-interface l04 BUENOSAIRES(configrouter)#passive-interface l05 BUENOSAIRES(config-router)#passive-interface l06 BUENOSAIRES(config-router)#exit BUENOSAIRES(config)#int s0/0/1 BUENOSAIRES(config-if)#bandwidth 256 BUENOSAIRES(config-if)#exit BUENOSAIRES(config)# BUENOSAIRES(config)#exit BUENOSAIRES(config-if)#exit BUENOSAIRES(config)# BUENOSAIRES(config)#exit BUENOSAIRES#

Imagen 9

• Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-

VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.



Imagen 10



Imagen 11

En el Switch 3 deshabilitar DNS lookup

R S3		×	٢
Physical Config CLI Attributes			
IOS Command Line Interface			
Proce PETUPN to got storted			
Field Allow to get started.		<b>^</b>	
El Accesson no Autorizado esta Prohibido			
User Access Verification			
Pagguord			
Fassword.			
S3>enable			
Password:			
S3#config			
Configuring from terminal, memory, or network [terminal	.]?		
Enter configuration commands, one per line. End with C	NTL/Z.	=	
S3(config) #no ip domain-lookup			
S3(config)#		+	
Ctrl JEE to ovit CLI focus	Dasta		
Contro to exit cer focus	Paste		
Тор			

Imagen 12

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



(₹ S1		×
Physical Config CLI Attributes		
IOS Command Line Interface		
El Accesso no Autorizado esta Prohibido User Access Verification Password: S1>enable Password: S1>configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL S1(config)#int vlan 99 S1(config-if)#in address 192.168.99.2 255.255.255.0 S1(config-if)#in shut	/2.	<
Ctrl+F6 to exit CLI focus Copy	Paste	
Пор		

Imagen 13

R S3
Physical Config CLI Attributes
IOS Command Line Interface
·
El Accesson no Autorizado esta Prohibido
User Access Verification
Password
Password:
S3>enable Password:
S3#config Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
S3 (config-if) #ip address 192.168.99.3 255.255.0
S3(config-if)#
Ctrl+F6 to exit CLI focus Copy Paste
ПТор

User Access Verification Password: Si>enable Password: Siconfiguration commands, one per line. End with CNTL/2. Si(configuration commands, one per line. End with CNTL/2. Si(config-if-range)shutdown SiINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	-
User Access Verification Password: Sl>enable password: Slstonfig Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Sl(config) Fint range fa0/2-24 Sl(config) Fint range fabutdown %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	1
Password: S1-enable Password: Password: S1scining from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. S1(config)Sint range fac/2-24 S1(config-if-range)Shutdown %LINK-5-CHANGED: Interface FactSthernet0/2, changed state to administratively down	
Farsword: Sleenable Parsword: Sleconfig Configuration commands, one per line. End with CNTL/2. Sl(config) Fint range fa0/2-24 Sl(config) Fint range fa0/2-24 Sl(config) Fint range fastEthernet0/2, changed state to administratively down	
Slrenable Password: Password: Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Sl(config)#int range #s0/2-24 Sl(config=if=range)#shutdown %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	
<pre>Fassword: Password: Sigconfig Configuring from terminal, memory, or network [terminal]? Configurition commands, one per line. End with CNTL/Z. Sicconfig)int range fa0/2-24 Si(config-if-range)#shutdown %LINK-5-CHANGED: Interface FastEthernet0/2. changed state to administratively down</pre>	
SiFconfig Configuration terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. Si(config)Fint range fac/2-24 Si(config-if-range)Fshutdown %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	
Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. S1(config)#int range fa0/2-24 S1(config-if-range)#shutdown %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	
S1(config)\$int range fa0/2-24 S1(config)\$int range fa0/2-24 S1(config)Firerange)\$shutdown %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	
S1(config-if-range)‡shutdown %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	
LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down	
\$LINK-S-CHANGED: Interface FastEthernet0/4, changed state to administratively down	
SLINK-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	
TINK-5-CUNNERD, Teacher FortFrances() charged append to administratively down	
ALINK-S-CHANGED. Interface raststhermetors, changed state to administratively down	
\$LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down	E
\$LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down	
LINK-S-CHANGED. Interface FastEthernet0/11, changed state to administratively down	
\$LINK-S-CHANGED: Interface FastEthernet0/12, changed state to administratively down	
\$LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down	

Imagen 15

Desactivar todas las interfaces que no sean utilizadas en el esquema de red Implement DHCP and

NAT for IPv4

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

R1 (config) #ip dhcp excluded-address 192.168.40.1

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) # ip dhcp pool MERCADEO

R1 (dhcp-config) # network 192.168.40.0 255.255.255.0

R1 (dhcp-config) # default-router 192.168.40.1

R1 (dhcp-config) # dns-server 10.10.10.11

R1 (dhcp-config) # dns-server 10.10.10.11

R1 (dhcp-config) # dns-server 10.10.10.11

R1 (dhcp-config) # dns-server 10.10.10.11
```

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

• Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para

configuraciones estáticas.

	Name: ADMINISTRACION
Configurar DHCP pool para VLAN	DNS-Server: 10.10.10.11
30	Domain-Name: ccna-unad.com
	Establecer default gateway.
	Name: MERCADEO DNS-
Configurar DHCP pool para VLAN	Server: 10.10.10.11
40	Domain-Name: ccna-unad.com
	Establecer default gateway.





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

**ROUTER MAIMI** 

MIAMI>enable MIAMI#config Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. MIAMI(config)#ip nat inside source static 10.10.10.10 209.165.20.229 MIAMI(config)#int g0/1 MIAMI(config-if)#ip nat inside MIAMI(config-if)#exit MIAMI(config)#int g0/1 MIAMI(config-if)#ip nat outside MIAMI(config-if)#exit MIAMI(config)#access-list 1 permit 192.168.30.0 0.0.0.255 MIAMI(config)#access-list 1 permit 192.168.40.0 0.0.0.255 MIAMI(config)#access-list 1 permit 192.168.4.0 0.0.3.255 MIAMI(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask 255.255.255.248 MIAMI(config)#ip nat inside source list 1 pool INTERNET MIAMI(config)#do write **Building configuration...** [OK] MIAMI(config)# MIAMI(config)#exit MIAMI# %SYS-5-CONFIG\_I: Configured from console by console MIAMI#

Imagen 19

4. 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.



R3(config) #access-list 100 permit icmp 192.168.4.0 0.0.0.255 209.165.200.224 0.0.0.7 R3(config) #access-list 100 deny icmp 192.168.5.0 0.0.0.255 host 209.165.200.230

٢	R	MIAMI	
L	1	Physical Config CLI Attributes	
Į.		IOS Command Line Interface	
		MIAMI> MIAMI>enable MIAMI# config Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z. MIAMI(config)#ip access-list standard NAT2_DR3 MIAMI(config=std-nacl)#permit 192.168.4.0 0.0.0.255 MIAMI(config=std-nacl)#permit 192.168.6.0 0.0.0.255 MIAMI(config=std-nacl)#deny 192.168.6.0 0.0.0.255 MIAMI(config=std-nacl)#EXIT MIAMI(config=std-nacl)#EXIT MIAMI(config=std-nacl)#EXIT MIAMI# \$SYS-5-CONFIG_I: Configured from console by console MIAMI# Ctrl+F6 to exit CLI focus Copy Past	
	E	] Тор	

Imagen 21

- 5. 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.
- Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

C:\>172.32.23.2 tracert google.com Invalid Command. C:\>172.32.23.2 >tracert google.com Invalid Command. C:\>tracert google.com Unable to resolve target system name google.com. C:\>tracert 209.165.200.230 Tracing route to 209.165.200.230 over a maximum of 30 hops: 1 0 ms 0 ms 0 ms 192.168.40.1 2 0 ms * 0 ms 192.168.40.1 3 * 0 ms * 1 ms 192.168.40.1 5 * 0 ms * 1 ms 192.168.40.1 5 * 0 ms * 1 ms 192.168.40.1 5 * 0 ms * 0 ms 192.168.40.1 7 * 0 ms * 0 ms 192.168.40.1 9 * 0 ms * 0 ms 192.168.40.1 10 0 ms * 0 ms 192.168.40.1 11 * 0 ms 192.168.40.1 20 rtrol-C					
C:\>172.32.23.2 tracert google.com Invalid Command. C:\>172.32.23.2 > tracert google.com Invalid Command. C:\>tracert google.com Dnable to resolve target system name google.com. C:\>tracert 209.165.200.230 Tracing route to 209.165.200.230 over a maximum of 30 hops: 1 0 ms 0 ms 0 ms 192.168.40.1 2 0 ms 4 0 ms 192.168.40.1 3 4 0 ms 4 1 ms 192.168.40.1 4 0 ms 4 1 ms 192.168.40.1 5 4 0 ms 4 1 ms 192.168.40.1 5 4 0 ms 4 0 ms 192.168.40.1 6 0 ms 4 0 ms 192.168.40.1 7 4 0 ms 4 0 ms 192.168.40.1 9 4 0 ms 4 0 ms 192.168.40.1 10 0 ms 4 0 ms 192.168.40.1 11 4 0 ms 4 0 ms 192.168.40.1 2 0 ms 4 0 ms 192.168.40.1 12 0 ms 5 0 ms 192.168.40.1 13 5 0 ms 5 0 ms 192.168.40.1 14 5 0 ms 5 0 ms 192.168.40.1 15 5 0 ms 5 0 ms 192.168.40.1 16 0 ms 5 0 ms 192.168.40.1 17 5 0 ms 5 0 ms 192.168.40.1 18 0 ms 5 0 ms 192.168.40.1 19 5 0 ms 5 0 ms 192.168.40.1 10 0 ms 5 0 ms 192.168.40.1					
Invalid Command. C:\>172.32.23.2 >tracert google.com Invalid Command. C:\>tracert google.com Dhable to resolve target system name google.com. C:\>tracert 209.165.200.230 Tracing route to 209.165.200.230 over a maximum of 30 hops: 1 0 ms 0 ms 192.168.40.1 2 0 ms * 0 ms 192.168.40.1 2 0 ms * 0 ms 192.168.40.1 3 * 0 ms * 1 ms 192.168.40.1 5 * 0 ms * 1 ms 192.168.40.1 5 * 0 ms * 1 ms 192.168.40.1 5 * 0 ms * 1 ms 192.168.40.1 7 * 0 ms * 0 ms 192.168.40.1 7 * 0 ms * 0 ms 192.168.40.1 9 * 0 ms * 0 ms 192.168.40.1 10 0 ms * 0 ms 0 ms 0 ms 0 ms 0 ms 0 ms 0	C:\>1	172.32.23.	2 tracert	google.co	m de la construcción de la constru
C:\>172.32.23.2 >tracert google.com Invalid Command. C:\>tracert google.com Unable to resolve target system name google.com. C:\>tracert 209.165.200.230 Tracing route to 209.165.200.230 over a maximum of 30 hops: 1 0 ms 0 ms 0 ms 192.168.40.1 2 0 ms + 0 ms 192.168.40.1 3 + 0 ms + Request timed out. 4 0 ms + 1 ms 192.168.40.1 5 + 0 ms + Request timed out. 6 0 ms + 0 ms 192.168.40.1 7 + 0 ms + Request timed out. 8 0 ms + 0 ms 192.168.40.1 9 + 0 ms + Request timed out. 10 0 ms + 0 ms 192.168.40.1 11 + 0 ms - 0 ms 192.168.40.1 12 0 ms + 0 ms 192.168.40.1 13 + 0 ms + 0 ms 192.168.40.1 14 + 0 ms + 0 ms 192.168.40.1 15 + 0 ms + 0 ms 192.168.40.1 16 0 ms + 0 ms 192.168.40.1 17 + 0 ms + 0 ms 192.168.40.1 18 + 0 ms + 0 ms 192.168.40.1 19 + 0 ms + 0 ms 192.168.40.1 10 + 0 ms + 0 ms + 0 ms 192.168.40.1 10 + 0 ms + 0	Inval	lid Comman	ıd.		
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## **CISCO**. Cisco Networking Academy<sup>®</sup>



Imagen 23

#### CONCLUSIONES

- Las herramientas de simulación y laboratorios de acceso remoto permiten establecer escenarios LAN / WAN para realizar un análisis sobre el comportamiento de diversos protocolos y métricas de enrutamiento.
- Se identifica dentro de las PDU de salida como de llegada el comportamiento en la red según el modelo TCP/IP con relación al modelo OSI en cada una de sus capas, verificando las direcciones IP destino, direcciones MAC, DNS,IP, fuente y direcciones MAC fuente, comportamiento Ethernet.
- El emulador CISCO PACKET TRACER destinado a la simulación de conexión de computadores en una red, permite conocer más a fondo las configuraciones de red, maneras, formas en que se realiza y posterior aplicación.
- Las herramientas de simulación permiten observar comportamiento de enrutadores, mediante el uso de comandos administración de tablas de enrutamiento, bajo el uso de protocolos de vector distancia y estado enlace.
- Mediante redes simuladas es probable resolver problemas de configuración, conectividad y enrutamiento bajo el uso de herramientas y comandos de administración del IOS en contexto LAN y WAN.

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