Trabajo de Grado-Diplomado De Profundización Cisco (Diseño E Implementación De Soluciones Integradas Lan / Wan)

Prueba Final De Habilidades Prácticas-CCNA 1 y 2

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Universidad Nacional Abierta Y A Distancia

Facultad de Ciencias Básicas, Tecnología e Ingeniería

Ingeniería de Sistemas

Palmira

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Trabajo De Grado Para Optar el Título de Ingeniero de Sistemas

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Resumen

El CCNA significa cisco Certified Network Associated que alude a un programa de certificación para ingenieros de redes de nivel básico que ayuda a aumentar su inversión en conocimiento de redes fundacional y aumenta el valor de la red de su empleador. Mediante la certificación CCNA, el ingeniero estará en la capacidad de instalar, configurar, operar y solucionar problemas de mediano tamaño y router de redes de conmutación, incluyendo la implementación y verificación de conexiones a sitios remotos en una WAN.

Introducción

En el presente trabajo se desarrollan las actividades propuestas en el documento "Evaluación – Prueba de habilidades prácticas CCNA" dentro del Diplomado de Profundización CCNA. El desarrollo práctico de las actividades propuestas se llevó a cabo por medio del simulador Packet Tracer, mediante la cual se identificaron los temas de switching, routing y configuración básica de redes.

1. Desarrollo Prueba Final De Habilidades Prácticas-CCNA 1 y 2

Descripción del escenario propuesto para la prueba de habilidades

Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Topología de red



Figure 1 topología de red

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



PC-A			– 🗆 X
Physical Config Deskto	P Programming	Attributes	
IP Configuration			х
IP Configuration			
DHCP		⊖ Static	
IP Address		192.168.30.31	
Subnet Mask		255.255.255.0	
Default Gateway		192,168,30.1	
DNS Server		10.10.10.11	
IPv6 Configuration			
	O Auto C	nfig 💿 Static	
IPv6 Address			1
Link Local Address		FE80::20A:F3FF:FE58:C102	
IPv6 Gateway			
IPv6 DNS Server			
Тор			
	m mod DC A		
gure 3 configuració	m rea PC-A		
C-C			

Physical Config	Desktop	Programming	Attributes
P Configuration			
IP Configuration			
OHCP			⊖ Static
IP Address			192.168.40.31
Subnet Mask			255.255.255.0
Default Gateway			192.168.40.1
DNS Server			10.10.10.11
IPv6 Configuration			
		O Auto C	Config
IPv6 Address			
Link Local Address			FE80::20A:41FF:FE43:E01A
IPv6 Gateway			
TRUC DNG COMMON			
IPV6 DNS Server			
19v6 DNS Server			
IPV6 DNS Server			
IPV6 DN5 Server			
Top			
Top			
Top <i>Ire 4 Configu</i>	ración rec	1 PC-C	

Configuration					x	
Configuration						
) DHCP		 Static 				
Address		209.165.200.230				
ubnet Mask		255.255.255.248				
efault Gateway		209.169.200.225				
NS Server		0.0.0.0				
v6 Configuration						
) DHCP	O Auto Confi	fig	Static			
v6 Address				/		
nk Local Address		FE80::2D0:BCFF:FEE5:	:AA69			
v6 Gateway						
v6 DNS Server						
₽ ure 5 Configuraciór	ו red Intrern	net-PC				-
EBSERVER				 		
EBSERVER Web Server				 		
EBSERVER Web Server	:es Desktop	Programming Att	tributes			
EBSERVER Web Server Physical Config Servic	res Desktop	Programming Att	tributes		_	X
EBSERVER Web Server Physical Config Servic P Configuration IP Configuration	ces Desktop	Programming Att	tributes			X
EBSERVER Web Server Physical Config Service P Configuration IP Configuration	ces Desktop	Programming Att	tributes			
EBSERVER Web Server Physical Config Servic P Configuration IP Configuration O DHCP	ces Desktop	Programming Att	tributes			
EBSERVER Web Server Nysical Config Servic P Configuration IP Configuration O DHCP IP Address	ces Desktop	Programming Att	tributes			
EBSERVER Web Server Physical Config Servic P Configuration IP Configuration O DHCP IP Address Subnet Mask	ces Desktop	Programming Att	tributes			
EBSERVER Web Server Physical Config Servia PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway	ces Desktop	Programming Att 	tributes			
EBSERVER Web Server Physical Config Servic PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server	ces Desktop	Programming Att	tributes			
EBSERVER Web Server Physical Config Servic Physical Config Servic PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration	ces Desktop	Programming Att Static 10.10.10.10 255.255.255. 10.10.10.1 0.0.00	tributes			
EBSERVER Web Server Physical Config Servic PConfiguration P Configuration DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration DHCP	ces Desktop	Programming Att 	tributes			
EBSERVER Web Server Physical Config Servia Physical Config Servia Physical Configuration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration O DHCP IPv6 Address	ces Desktop	Programming Att 	tributes			
EBSERVER Web Server Physical Config Servir Physical Config Servir PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration O DHCP IPv6 Address Link Local Address	ces Desktop	Programming Att 	tributes			
EBSERVER Web Server Physical Config Servic Physical Config Servic Physical Config Servic Physical Configuration DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration DHCP IPv6 Address Link Local Address IPv6 Gateway	ces Desktop	Programming Att	tributes 0 0 FF:FED1:8CA9			
EBSERVER Web Server Physical Config Servic Physical Config Servic PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration O DHCP IPv6 Address Link Local Address IPv6 Gateway Tar 6 010 Course	ces Desktop	Programming Att	tributes .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0			
EBSERVER Web Server Physical Config Servic Physical Config Servic PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration O DHCP IPv6 Address Link Local Address IPv6 Gateway IPv6 DNS Server	ces Desktop	Programming Att	tributes .0 .0 .7FF:FED1:8CA9			
EBSERVER Web Server Physical Config Servir Physical Config Servir PConfiguration IP Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration O DHCP IPv6 Address Link Local Address IPv6 Gateway IPv6 DNS Server	ces Desktop	Programming Att 	tributes .0 .0 .0 .7F:FED1:8CA9			
EBSERVER Web Server Physical Config Servir Physical Config Servir PConfiguration P Configuration O DHCP IP Address Subnet Mask Default Gateway DNS Server IPv6 Configuration O DHCP IPv6 Address Link Local Address IPv6 Gateway IPv6 DNS Server	ces Desktop	Programming Att 	tributes			

Configuración R1 Router>en Router#hostname R1 Λ % Invalid input detected at '^' marker. Router#conft Translating "conft"...domain server (255.255.255.255) % Unknown command or computer name, or unable to find computer address Router#no ip dom Router#no ip domain-lookup % Invalid input detected at '^' marker. Router#conf t Enter configuration commands, one per line. End with CNTL/Z. Router(config)#no ip domian-lookup % Invalid input detected at '/' marker. Router(config)#no ip domain-lookup Router(config)#hostname R1 R1(config)#enable secret class R1(config)#line con 0 R1(config-line)#pass cisco R1(config-line)#login R1(config-line)#line vty 0 4 R1(config-line)#pass cisco R1(config-line)#login R1(config-line)#service Λ % Invalid input detected at '^' marker. R1(config-line)#exit R1(config)#service R1(config)#service p R1(config)#service password-encryption R1(config)#int s0/1/0 R1(config-if)#description conexion con R2 R1(config-if)#ip address 172.31.21.1 255.255.255.252 R1(config-if)#clock rate 128000 R1(config-if)#no shu %LINK-5-CHANGED: Interface Serial0/1/0, changed state to down

R1(config-if)#

R1(config-if)#exit R1(config)#ip route 0.0.0.0 0.0.0.0 s0/1/0 %Default route without gateway, if not a point-to-point interface, may impact performance

Configuración router 2
Router>conf t
% Invalid input detected at '^' marker. Router>en Router#conf t Enter configuration commands, one per line. End with CNTL/Z. Router(config)#no ip domain-lookup Router(config)#hostname R2 R2(config)#enable secret class R2(config)#enable secret class R2(config!ine)#pass cisco R2(config-line)#pass cisco R2(config-line)#login R2(config-line)#line vty 0 4 R2(config-line)#pass cisco R2(config-line)#pass cisco
R2(config)#service p R2(config)#service password-encryption R2(config)#int s0/0/0 R2(config-if)#description conexion con R1 R2(config-if)#ip address 172.31.21.2 255.255.255.252 R2(config-if)#no shu
R2(config-if)# %LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R2(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up exit
R2(config)#int s0/0/1 R2(config-if)#description conexion con R3 R2(config-if)#ip address 172.31.23.1 255.255.255.252 R2(config-if)#clock rate 128000 R2(config-if)#no shu

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down R2(config-if)#int g0/0 R2(config-if)#descrip conexion a isp R2(config-if)#ip address 209.165.200.225 255.255.255.248 R2(config-if)#no shu

R2(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

R2(config-if)#int g0/1 R2(config-if)#ip address 10.10.10.1 255.255.255.0 R2(config-if)#no shu

R2(config-if)# %LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

R2(config-if)#descrip conexion a webserver R2(config-if)#exit R2(config)#ip route 0.0.0.0 0.0.0.0 g0/0 %Default route without gateway, if not a point-to-point interface, may impact performance R2(config)# R2# %SYS-5-CONFIG_I: Configured from console by console

Configuración router 3
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip damain-lookup
Λ
% Invalid input detected at '^' marker.
Router(config)#no ip domain-lookup
Router(config)#hostname R3

R3(config)#enable secret class R3(config)#line con 0 R3(config-line)#pass cisco R3(config-line)#login R3(config-line)#line vty 0 4 R3(config-line)#pass cisco R3(config-line)#login R3(config-line)#exit R3(config)#serv R3(config)#service p R3(config)#service password-encryption R3(config)# R3>en Password: R3#conf t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#int s0/1/1 R3(config-if)#descrip conexion a R2 R3(config-if)#ip address 172.31.23.2 255.255.255.252 R3(config-if)#no shu R3(config-if)# %LINK-5-CHANGED: Interface Serial0/1/1, changed state to up R3(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up R3(config-if)#int lo4 R3(config-if)# %LINK-5-CHANGED: Interface Loopback4, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up R3(config-if)#ip address 192.168.4.1 255.255.255.0 R3(config-if)#no shu R3(config-if)# R3(config-if)#int lo5 R3(config-if)# %LINK-5-CHANGED: Interface Loopback5, changed state to up

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

R3(config-if)#ip address 192.168.5.1 255.255.255.0 R3(config-if)#no shu R3(config-if)#int lo6

R3(config-if)# %LINK-5-CHANGED: Interface Loopback6, changed state to up

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

R3(config-if)#ip address 192.168.6.1 255.255.255.0 R3(config-if)#exit R3(config)#ip route 0.0.0.0 0.0.0.0 s0/1/1 %Default route without gateway, if not a point-to-point interface, may impact performance

R3(config)#

Configuración S1
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#enable secret class
S1(config)#no ip domain-lookup
S1(config)#line con 0
S1(config-line)#pass cisco
S1(config-line)#line vty 0 4
S1(config-line)#pass cisco
S1(config-line)#login
S1(config-line)#line con 0
S1(config-line)#login
S1(config-line)#ser
S1(config-line)#serv
S1(config-line)#exit
S1(config)#serv
S1(config)#service p
S1(config)#service password-encryption
S1(config)#
S1#

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

Configuración S3 Switch>EN Switch#conf t Enter configuration commands, one per line. End with CNTL/Z. Switch(config)#no ip domain-lookup Switch(config)#hostname S3 S3(config)#enable secret class S3(config)#line con 0 S3(config-line)#pass cisco S3(config-line)#login S3(config-line)#line vty 0 4 S3(config-line)#pass cisco S3(config-line)#login S3(config-line)#exit S3(config)#serv S3(config)#service p S3(config)#service password-encryption S3(config)#

1.2 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	2.2.2.2
Router ID R3	3.3.3.3
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	128 Kb/s
Ajustar el costo en la métrica de S0/0 a	7500

R1

R1#conf 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 g0/1.30
R1(config-router)#passive-interface g0/1.40
R1(config-router)#passive-interface g0/1.200
R1(config-router)#exit
R1(config)#int s0/1/0
R1(config-if)#ban
R1(config-if)#bandwidth 128
R1(config-if)#ip ospf cost 7500
R1(config-if)#

R2
R2>en
Password:
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#router id 2.2.2.2
% Invalid input detected at '^' marker.
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#
04:29:30: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/0 from
LOADING to FULL, Loading Done
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)#pas
R2(config-router)#passive-interface g0/1
R2(config-router)#int s0/0/0
R2(config-if)#band
R2(config-if)#bandwidth 128
R2(config-if)#int s0/0/1
R2(config-if)#bandwidth 128
R2(config-if)#int s0/0/0
R2(config-if)#ip ospf cost 7500
R2(config-if)#

R3 R3>en Password: R3#conf t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#router ospf 1 R3(config-router)#router-id 3.3.3.3 R3(config-router)#network 172.31.23.0 0.0.0.3 area 0 R3(config-router)# 04:39:01: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/1/1 from LOADING to FULL, Loading Done R3(config-router)#network 192.168.4.0 0.0.3.255 area 0 R3(config-router)#pa R3(config-router)#passive-interface lo4 R3(config-router)#passive-interface lo5 R3(config-router)#passive-interface lo6 R3(config-router)#exit R3(config)#int s0/1/1 R3(config-if)# R3(config-if)#ba R3(config-if)#bandwidth 128 R3(config-if)#ip ospf cost 7500 R3(config-if)#

Verificar información de OSPF

Visualizar tablas de enrutamiento y routers conectados por OSPFv2

Rl>en Password: Rl#show ip osp	of neig	hbor			
Neighbor ID	Pri	State		Dead Time	Address
Interface 2.2.2.2	0	FULL/	-	00:00:38	172.31.21.2
Serial0/1/0					

R2	R2#show ip ospf R2# <mark>show ip ospf</mark>	f n i neigh	lbor				
	Neighbor ID	Pri	State		Dead Time	Address	
	1.1.1.1	0	FULL/	-	00:00:30	172.31.21.1	
	3.3.3.3 Sorial0/0/1	0	FULL/	-	00:00:31	172.31.23.2	
	R2#						~
R3	R3#show ip ospf R3#show ip ospf	f n f neigł	nbor				
	Neighbor ID	Pri	State		Dead Time	Address	
	Interface 2.2.2.2 Serial0/1/1 R3#	0	FULL/	-	00:00:37	172.31.23.1	~

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

R1	Rl#show iP ospf interface
	Serial0/1/0 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: 7500
	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 00:00:04
	Index 1/1, flood queue length 0
	Next 0x0(0)/0x0(0)
	Last flood scan length is 1, maximum is 1
	Last flood scan time is 0 msec, maximum is 0 msec
	Neighbor Count is 1 , Adjacent neighbor count is 1
	Adjacent with neighbor 2.2.2.2
	Suppress hello for 0 neighbor(s)
	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 WAITING, Priority 1
	No designated router on this network
	No backup designated router on this network
	More

R2	R2‡show ip ospf interface	
	Serial0/0/0 is up, line protocol is up	
	Internet address is 172.31.21.2/30, Area 0	
	Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500	
	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 00:00:05	
	Index 1/1 flood queue length 0	
	Next 0x0(0)/0x0(0)	
	Last flood scan length is 1 maximum is 1	
	Last flood scan time is 0 msec maximum is 0 msec	
	Neighbor Count is 1 Adjacent neighbor count is 1	
	Adjacent with neighbor 1 1 1	
	Supress bello for 0 perchor(s)	
	Serial0/0/1 is up line protocol is up	
	Internet address is 172 31 23 123 126 Pres 0	
	Process ID 1 Douter ID 2 2 2 Network Type DOINT-TO-DOINT Cost: 781	
	Transmit Dalay is Lange State DOINT-TO-DOINT Dright 0	
	No designated router on this network	
	No designated router on this network	
	-Mora	
R3	R3#show ip ospf interface	
	Serial0/1/1 is up line protocol is up	
	Internet address is 172.31.23.2/30, Area 0	
	Process ID 1. Router ID 3.3.3.3. Network Type POINT-TO-POINT. Cost: 7500	
	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 00:00:06	
	Index 1/1, flood queue length 0	
	Next 0x0(0)/0x0(0)	
	Last flood scan length is 1, maximum is 1	
	Last riood scan time is U msec, maximum is U msec	
	Merginois counters 1, adjacent neighbor count is 1	
	Supress hello for () neighbor(s)	
	Loopback4 is up. line protocol is up	
	Internet address is 192.168.4.1/24, Area 0	
	Process ID 1, Router ID 3.3.3.3, 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 3.3.3.3, Network Type LOOPBACK, Cost: 1	
	Loopback interface is treated as a stub Host	
	Loopbackt is up, line protocol is up	
	Internet address is 192.168.6.1/24, Area U	
	FIGURES IN 1, ROUGET IN 3.3.3.3, NETWORK TYPE LOOPBACK, COST: 1	
	Doppack interface is treated as a stub nost	

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

R	Rišsnow ip protocol			
4	Posting Protocol is "ospf 1"			
	Outgoing undate filter list for all interfaces is not set			
	Untgoing update filter list for all interfaces is not set			
	Pouter TD 1 1 1 1			
	Number of space in this router is 1 1 normal 0 stub 0 nesa			
	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 00:25:25			
	2.2.2.2 110 00:15:30			
	3.3.3.3 110 00:10:08			
	Distance: (default is 110)			
	D14			
	κ			
_				
R	R2#show ip protocol			
2				
2	Routing Protocol is "ospf 1"			
	Outgoing update filter list for all interfaces is not set			
	Incoming update filter list for all interfaces is not set			
	Router ID 2.2.2.2			
	Number of areas in this router is 1. 1 normal 0 stub 0 nssa			
	Maximum path: 4			
	Routing for Networks:			
	172.31.21.0 0.0.0.3 area 0			
	172.31.23.0 0.0.0.3 area 0			
	10.10.10.0 0.0.0.255 area 0			
	Passive Interface(s):			
	GigabitEthernet0/1			
	Routing Information Sources:			
	Gateway Distance Last Indate			
	1 1 1 1 1 1 0 00-27-48			
	2 2 2 2 110 00-17-54			
	2 2 2 2 110 00.17.37			
	Distance: (default is 110)			

```
R
         R3#show ip protocol
3
         Routing Protocol is "ospf 1"
           Outgoing update filter list for all interfaces is not set
           Incoming update filter list for all interfaces is not set
           Router ID 3.3.3.3
           Number of areas in this router is 1. 1 normal 0 stub 0 nssa
           Maximum path: 4
           Routing for Networks:
             172.31.23.0 0.0.0.3 area 0
             192.168.4.0 0.0.3.255 area 0
           Passive Interface(s):
             Loopback4
             Loopback5
              Loopback6
           Routing Information Sources:

        Gateway
        Distance
        Last Update

        1.1.1.1
        110
        00:28:09

        2.2.2.2
        110
        00:18:15

        2.2.2.2
        110
        00:18:252

              2.2.2.2
              3.3.3.3
                                        110
                                                   00:12:53
           Distance: (default is 110)
         R3#
```

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

R1
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int g0/1.30
R1(config-subif)#descrip Administracion
R1(config-subif)#en
R1(config-subif)#encapsulation d
R1(config-subif)#encapsulation dot1Q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#int g0/1.40
R1(config-subif)#descrip Mercadeo
R1(config-subif)#encapsulation dot1Q 40
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
R1(config-subif)#int g0/1.200
R1(config-subif)#descorip Mantenimient
Λ
% Invalid input detected at '^' marker.
R1(config-subif)#descrip Mantenimiento
R1(config-subif)#encapsulation dot1Q 200
R1(config-subif)#ip address 192.168.200.1 255.255.255.0
R1(config-subif)#exit

R1(config)#int g0/1 R1(config-if)#no shu

R1(config-if)#

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/1.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.30, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/1.40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.40, changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/1.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.200, changed state to up

S1 S1#conf t Enter configuration commands, one per line. End with CNTL/Z. S1(config)#vlan 30 S1(config-vlan)#name Administracion S1(config-vlan)#vlan 40 S1(config-vlan)#name Mercadeo S1(config-vlan)#vlan 200 S1(config-vlan)#name Mantenimiento S1(config-vlan)# S1(config-vlan)#exit S1(config)#int vlan 30 S1(config-if)# %LINK-5-CHANGED: Interface Vlan30, changed state to up S1(config-if)#ip addres 192.168.99.2 255.255.255.0 S1(config-if)#no shu S1(config-if)#exit

S1(config)#ip default-gateway 192.168.99.1 S1(config)#

S1>en Password: Password: S1#conf t Enter configuration commands, one per line. End with CNTL/Z. S1(config)#int f0/3 S1(config-if)#switchport mode trunk

S1(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

S1(config-if)#switchport trunk native vlan 1 S1(config-if)#int f0/5 S1(config-if)#switchport mode trunk S1(config-if)#switchport trunk native vlan 1 S1(config-if)#int range fa0/1-2, fa0/4, fa0/6-24,g1/1-2 interface range not validated - command rejected S1(config)#int range fa0/1-2, fa0/4, fa0/6-24,g0/1-2 S1(config-if-range)#switchport mode access S1(config-if-range)#int f0/6 S1(config-if)#switchport mode access S1(config-if)#switchport access vlan 30

S3
S3>en
Password:
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#
S3(config)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 30
S3(config-vlan)#name Administracion

S3(config-vlan)#vlan 200 S3(config-vlan)#name Mantenimiento S3(config-vlan)#exit S3(config)#int vlan 30 S3(config-if)# %LINK-5-CHANGED: Interface Vlan30, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up S3(config-if)#ip address 192.168.99.3 255.255.255.0 S3(config-if)#no shu S3(config-if)#exit 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)#switchport trunk native vlan 1 S3(config-if)#int range f0/1-2, f0/4-24, g0/1-2

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

S3(config-if-range)#int f0/18

S3(config-if)#switchport mode access

S3(config-if)#switchport access vlan 40

1.4 En el Switch 3 deshabilitar DNS lookup

-	
	Switch>EN
	Switch#conf t
	Enter configuration commands, one per line. End with CNTL/Z.
	Switch(config)#no ip domain-lookup
	Switch(config)#hostname S3
	S3(config)#

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

SI	S1(config)#int vlan 30 S1(config-if)# %LINK-5-CHANGED: Interface
	Vlan30, changed state to up
	S1(config-if)#ip addres 192.168.99.2 255.255.255.0 S1(config-if)#no shu

	S1(config-if)#exit
	S2
S3	S3(config)#int vlan 30 S3(config-if)# %LINK-5-CHANGED: Interface Vlan30, changed state to up
	%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up
	S3(config-if)#ip address 192.168.99.3 255.255.255.0 S3(config-if)#no shu S3(config-if)#exit

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

S1
S1(config-if)#int range fa0/1-2, fa0/4, fa0/7-24,g0/1-2 S1(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/7, 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 S1(config-if-range)#

S3
S3(config-if)#int range f0/1-2, f0/4-17, f0/19-24,g0/1-2 S3(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, 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)#

- 1.7 Implement DHCP and NAT for IPv4
- 1.8 Configurar R1 como servidor DHCP para las VLANs 30 y 40.
- 1.9 Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

R1
R1>en
Password:
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp e
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#

Configurar DHCP pool para VLA 30	Name: N ADMINISTRACIO N DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
	R1(config)#ip dhcp pool ADMINISTRACION R1(dhcp-config)#dn R1(dhcp-config)#dns-server 10.10.10.11 R1(dhcp-config)#domain n R1(dhcp-config)#domain na R1(dhcp-config)#domain na R1(dhcp-config)#domain na R1(dhcp-config)#? default-router Default routers dns-server Set name server exit Exit from DHCP pool configuration mode network Network number and mask no Negate a command or set its defaults option Raw DHCP options

	Name: MERCADEO	
Configurar DHCP pool para VLAN	DNS-Server: 10.10.10.11	
40	Domain-Name: ccna-unad.com	
	Establecer default gateway.	
R1(dhcp-config)#ip dhcp pool MER0	CADEO	
R1(dhcp-config)#DN		
R1(dhcp-config)#DNs-server 10.10.	10.11	
R1(dhcp-config)#doma		
R1(dhcp-config)#domain-name		
^		
% Invalid input detected at '^' marke	r.	
R1(dhcp-config)#domain-name ccna	a-unad.com	
% Invalid input detected at '^ marke	r.	
R1(dhcp-config)#default-router 192.	168.40.1	
R1(dhcp-config)#network 192.168.4	0.0 255.255.255.0	
R1(dhcp-config)#		
	R1(dhcp-config)#	
	R1(dhcp-config)#default router 192.168.30.1	
	^ 	
	% Invalid input detected at '^' marker.	
	R1(dhcp-config)#default-router 192.168.30.1	
	R1(dhcp-config)#network 192.168.30.0	
	255.255.255.0	

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

R2
R2>en
Password:
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#user webuser privilege 15 secret cisco12345
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#int g0/0
R2(config-if)#ip nat outside
R2(config-if)#int g0/1
R2(config-if)#ip nat inside
R2(config-if)#
P2(config)#in not nool INITERNET 200 165 200 225 200 165 200 228
notmask 255 255 255 248
P2(config)#in not inside source list 1 peel INITEDNET
R2(config)#

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

R2
LISTA DE ACCESO QUE SOLO PERMITE TRAFICO DESDE LAS VLAN
CREADAS Y LAS lop
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.4.0 0.0.3.255
R2(config)#
LISTA DE ACCESO QUE SOLO PERMITE TRAFICO TELNET DE R1 A R2
R2(config)#ip access-list standard MANAGMENT
R2(config-std-nacl)#permit host 172.31.21.1
R2(config-std-nacl)#exit
R2(config)#line vty 0 4
R2(config-line)#access-class MANAGMENT in
R2(config-line)#
R3
R3(config)#access-list 1 permit any
R3(config)#
R3#

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

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

R2
LSITA DE ACCESO QUE PERMITE A LOS HOST ENTRAR AL SERVIDOR WEB A TRAVES DE WWW MEDIANTE LA NAT
R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq www
LISTA DE ACCESO PARA PREVENIR TRAFICO PING DE REDES INTERNAS MIENTRAS SE CONTINUA PERMITIENDO A LAS INTERFACES LAN PING A EL PC INTERNET
R2(config)#access-list 101 permit icmp any any echo-reply R2(config)#
R2(config)#int g0/0 R2(config-if)#ip R2(config-if)#ip ac R2(config-if)#ip access-group 101 in R2(config-if)#int s0/0/0 R2(config-if)#ip access-group 101 out R2(config-if)#int s0/0/1 R2(config-if)#ip access-group 101 out R2(config-if)#int g0/1 R2(config-if)#ip access-group 101 out R2(config-if)#ip access-group 101 out R2(config-if)#ip access-group 101 out R2(config-if)#ip access-group 101 out

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

INTERN	Reinternet PC – 🗆 🗙
ET-PC	Physical Config Desktop Programming Attributes
А	Web Browser X
WEBSE	Cisco Packat Tracar
RVER	
	Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
	Quick Links: A small page
	Copyrights Image page
	Image
	×
	Figure / Acceso PC a web Serber
R1 A R2	🥐 R1 – 🗆 X
	Physical Config CLI Attributes
	IOS Command Line Interface
	&LINV-E-CUNNCED: Interface Serial0/1/0 changed state to up
	*LINK-S-CHANGED. Interface Seriato/1/0, changed state to up
	<pre>%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up</pre>
	User Access Verification
	Password:
	R1>en
	Password: Password:
	Rl#ping 172.31.21.2
	Type escape sequence to abort.
	seconds:
	<pre>!!!!! Success rate is 100 percent (5/5), round-trip min/avg/max =</pre>
	1/30/140 ms
	R1#
	Ctrl+F6 to exit CLI focus Copy Paste
	Птор
	Figure 8 Ping R1 a R2

R2 A R3	
	Physical Config CLI Attributes
	IOS Command Line Interface
	Press RETURN to get started! User Access Verification Password: R2>en Password: R2\$ping 172.31.23.2 Type escape sequence to abort. Sending 5, 100-byte ICMP Echos to 172.31.23.2, timeout is 2 seconds: 11111 Success rate is 100 percent (5/5), round-trip min/avg/max = 3/5/11 ms R2\$ Ctrl+F6 to exit CLI focus Copy Paste
	Figure 9 Ping R2 a R3
	Ref Internet PC − □ × Physical Confin Desktop Programming Attributes
ETA	Command Prompt X
INTERN ET	Packet Tracer PC Command Line 1.0 C:\>ping 209.165.200.225 Pinging 209.165.200.225 vith 32 bytes of data: Reply from 209.165.200.225: bytes=32 time <ims ttl="255<br">Reply from 209.165.200.225: bytes=32 time<ims ttl="256<br">Ping statistics for 209.165.200.225: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 6ms, Average = 1ms C:\\= Figure 10 Ping Internet PC a internet</ims></ims>

SERVID	
OR	Physical Config Services Desktop Programming Attributes
WEB A	Command Prompt X
INTERN	Packet Tracer SERVER Command Line 1.0
ET	C:\>ping 209.165.200.225
	Reply from 209.165.200.225: bytes=32 time=lms TTL=255
	Reply from 209.165.200.225: bytes=32 time <lms ttl="255<br">Reply from 209.165.200.225: bytes=32 time<lms ttl="255</th"></lms></lms>
	Reply from 209.165.200.225: bytes=32 time <lms ttl="255</th"></lms>
	Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds:
	Minimum = Oms, Maximum = lms, Average = Oms
	C:\>
	Пор
	Figure 11 Ping Web Server a Internet
S1 al R1	🤻 s1 – 🗆 🗙
	Physical Config CLI Attributes
	IOS Command Line Interface
	User Access Verification
	oser Access verification
	Password:
	Password.
	S1>en
	S1#ping 192.168.99.2
	Type escape sequence to abort. Sending 5, 100-byte ICMP Echos to 192.168.99.2, timeout is 2
	seconds:
	<pre>!!!!! Success rate is 100 percent (5/5) round-trip min/avg/max =</pre>
	0/13/61 ms
	c14
	Ctrl+F6 to exit CLI focus Copy Paste
	Figure 12 Ping S1 a R1

PC-A	
HACIA	Physical Config Desktop Programming Attributes
PC-C	Command Prompt X
	Packet Tracer PC Command Line 1.0
	Pinging 192.168.40.31 with 32 bytes of data:
	Request timed out.
	Reply from 192.168.40.31: bytes=32 time <lms tti="127<br">Reply from 192.168.40.31: bytes=32 time<lms tti="127<br">Reply from 192.168.40.31: bytes=32 time<lms tti="127</th"></lms></lms></lms>
	Ping statistics for 192.168.40.31:
	<pre>Packets: Sent = 4, Received = 3, Lost = 1 (25% loss), Approximate round trip times in milli-seconds:</pre>
	C:\>
	Figure 13 Ping PC-A a PC-C
	Physical Config Desktop Programming Attributes
WEB-	
SERVE	Command Prompt
R	
	Packet Tracer PC Command Line 1.0
	C.(>ping 10:10:10:10
	Pinging 10.10.10.10 with 32 bytes of data:
	Reply from 10.10.10.10: bytes=32 time=1ms TTL=126
	Reply from 10.10.10.10: bytes=32 time=2ms TTL=126 Reply from 10.10.10.10: bytes=32 time=1ms TTL=126
	Reply from 10.10.10.10: bytes=32 time=2ms TTL=126
	Ping statistics for 10.10.10.10:
	<pre>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds:</pre>
	Minimum = 1ms, Maximum = 2ms, Average = 1ms
	C:\>
	Тор
	Figure 14 Ping PC-C a Web Server

TRACE	R PC-C
RT PC-	•
	Physical Coofig Desktop Programming Attributes
A	Programming Actibutes
HACIA	Command Promot
	Command Prompt
WEBSE	Reply from 10.10.10.10: bytes=32 time=1ms TTL=126
RVER	Reply from 10.10.10.10: bytes=32 time=2ms TTL=126
	Ping statistics for 10.10.10.10:
	Approximate round trip times in milli-seconds:
	Minimum = 1ms, Maximum = 2ms, Average = 1ms
	C:\>ping 209.165.200.209.230
	Ping request could not find host 209.165.200.209.230. Please check the name
	Invalid Command.
	C:\>tracertout 10.10.10.10
	Invalid Command.
	C:\>tracert 10.10.10.10
	Tracing route to 10.10.10.10 over a maximum of 30 hops:
	1 0 ms 0 ms 0 ms 192.168.40.1
	2 1 ms 0 ms 1 ms 172.31.21.2
	3 1 ms 1 ms 0 ms 10.10.10.10
	Irace complete.
	C:\>
	Figure 15 Tracert PC A a Web Server
	1'yure 15 11 ucert 1 C-A u Web Serber

Conclusiones

Respecto a los conocimientos y habilidades adquiridas durante el desarrollo del diplomado, concluyo que debo practicar mucho más los procesos básicos de configuración de las redes, con el apoyo de las herramientas de simulación, y en los conceptos fundamentales que sirven de base a la práctica.

La herramienta packet tracert es líder para la implementación y aprendizaje de todo tipo de entornos de simulación para redes, la cual la hace la aplicación aliada número uno para un estudiante que esté interesado en las redes de información.

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