

EVALUACION DE HABILIDADES PRACTICAS
DIPLOMADO DE PROFUNDIZACION CISCO

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA
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SOGAMOSO, BOYACA
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DEDICATORIA

En primera instancia a Dios que siempre ha estado conmigo para no dejarme desfallecer con la gran ayuda de mi madre y familiares, son el motor que impulsan mis ganas de salir adelante, pero no más que el de ver a mi hija orgullosa de su padre, a mi familia Unadista con sus directivos y excelentes docentes que siempre me brindaron lo necesario y más en todo este proceso con el fin de lograr esta meta, de ser uno de los ingenieros egresados de la UNAD.

RESUMEN

El diplomado CISCO en redes LANWAN se abordan temas de alta calidad que realmente son muy importantes y necesarios para nuestra carrera como ingenieros como la construcción de redes LANWAN, se estudia, se hace, se plasma y realizan diseños en dos escenarios con parámetros para una red que tiene una empresa con tres sedes en el país, una segunda empresa tiene conexión a internet y se adapta con la red LAN, gracias a lo aprendido este conocimiento nos permite desarrollar cualquier situación y obtener la solución.

PALABRAS CLAVES: Escenario, LAN, Redes, Routing, WAN.

ABSTRACT

The CISCO diploma in LANWAN networks addresses high quality topics that are really very important and necessary for our career as engineers such as the construction of LANWAN networks, it is studied, made, reflected and designs are made in two scenarios with parameters for a network that has a company with three offices in the country, a second company has an internet connection and adapts to the LAN network, thanks to what we have learned, this knowledge allows us to develop and situation and obtain the solution.

KEY WORDS: Scenari, LAN, Networks, Routing, WAN

INTRODUCCIÒN

Continuando con el Desarrollo del curso de CCNA de CISCO modulo I y II, Como parte del trabajo, se presenta el siguiente informe como producto de las prácticas realizadas con Packet Tracer propuestas para esta fase.

Este informe corresponde a la parte CCNA Principios básicos de Routing, Switching, OSPF, DHCP, entre otras actividades; En cada uno de los escenarios se mostrarán las destrezas y habilidades adquiridas en la que se realiza la configuración en Packet Tracer.

OBJETIVOS

Objetivos Generales:

- Mediante dos escenarios dar solución concisa y sistemática por medio de los conocimientos adquiridos en el diplomado CISCO de CCNA.

Objetivos Específicos:

- Hacer una descripción de actividades de los escenarios
- Analizar y configurar las topologías de la red
- Practicar comandos de configuración, Verificación, Enrutamiento, Conectividad, DHCP, NAT en routers Cisco.

ESCENARIO 1

Una empresa posee sucursales distribuidas en las ciudades de Bogotá, Medellín y Cali 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

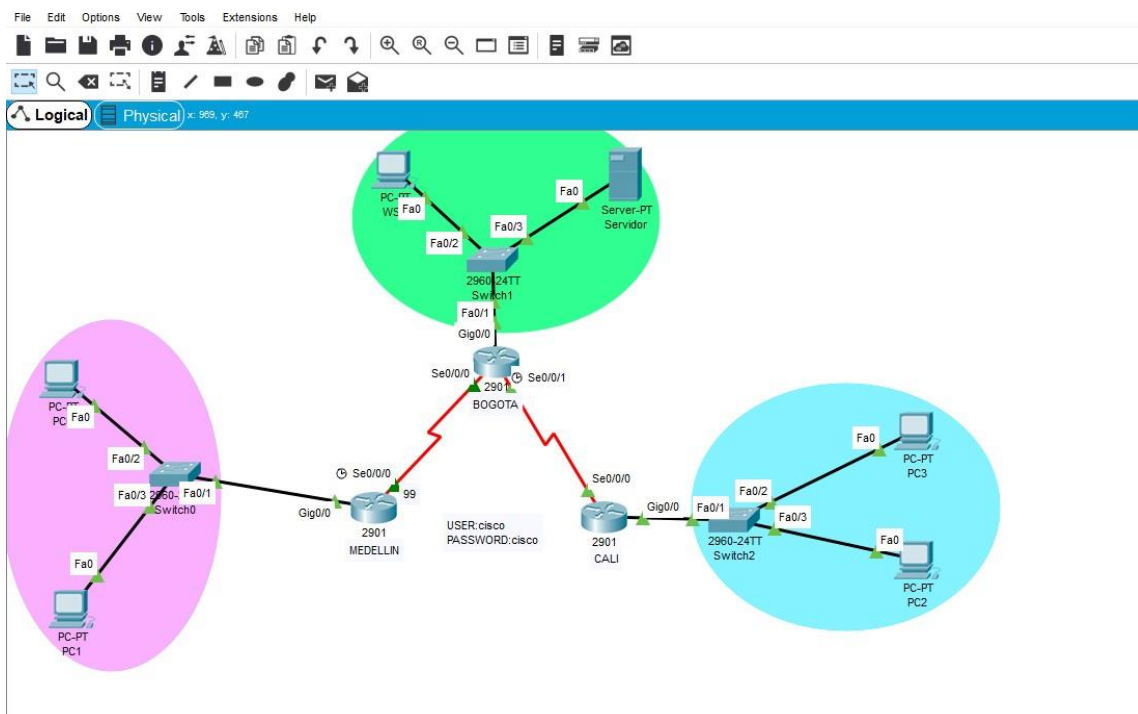


Figura 1 Topología de la red escenario 1

Configuración básica de los dispositivos

Router Bogotá

```
Bogota>  
Bogota>en  
Password:  
Bogota#sh run
```

Building configuration...

Current configuration: 956 bytes

```
!  
version 15.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname Bogota  
!  
!  
enable password cisco  
!  
!  
!  
no ip cef  
no ipv6 cef  
!  
!  
license udi pid CISCO2901/K9 sn FTX152405OP  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
interface GigabitEthernet0/0  
ip address 192.168.1.1 255.255.255.224  
duplex auto
```

```
speed auto
!  
interface GigabitEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 192.168.1.98 255.255.255.224  
!  
interface Serial0/0/1  
ip address 192.168.1.130 255.255.255.224  
clock rate 2000000  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router eigrp 200  
network 192.168.1.0 0.0.0.31  
network 192.168.1.96 0.0.0.31  
network 192.168.1.128 0.0.0.31  
  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
password cisco  
login  
transport input telnet  
!  
!  
!
```

```
end
Medellín
Medellin>en
Password:
Medellin#
Medellin#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Medellin(config)#do sh run
Building configuration...
```

Current configuration: 1076 bytes

```
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Medellin
!
!
!
enable password cisco
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
license udi pid CISCO2901/K9 sn FTX1524AUOY
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
```

```
!  
!  
!  
!  
!  
interface GigabitEthernet0/0  
ip address 192.168.1.33 255.255.255.224  
ip access-group 10 out  
duplex auto  
speed auto  
!  
interface GigabitEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 192.168.1.99 255.255.255.224  
clock rate 2000000  
!  
interface Serial0/0/1  
no ip address  
clock rate 2000000  
shutdown  
!  
interface GigabitEthernet0/1/0  
no ip address  
shutdown  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router eigrp 200  
network 192.168.1.32 0.0.0.31  
network 192.168.1.96 0.0.0.31  
  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
access-list 10 permit host 192.168.1.3  
access-list 10 deny any
```

```
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
password cisco  
login  
transport input telnet  
!  
!  
!  
end
```

Cali

```
Cali>en  
Password:  
Cali#  
Cali#sh run  
Building configuration...
```

```
Current configuration: 996 bytes  
!  
version 15.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname Cali  
!  
!  
enable password cisco  
!  
!  
!  
!  
!  
no ip cef  
no ipv6 cef  
!
```

```
!  
!  
!  
license udi pid CISCO2901/K9 sn FTX152419T0  
!  
!  
!  
!  
!  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
interface GigabitEthernet0/0  
ip address 192.168.1.65 255.255.255.224  
ip access-group 10 out  
duplex auto  
speed auto  
!  
interface GigabitEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 192.168.1.131 255.255.255.224  
!  
interface Serial0/0/1  
no ip address  
clock rate 2000000  
shutdown  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router eigrp 200
```



```
network 192.168.1.128 0.0.0.31
network 192.168.1.64 0.0.0.31
!
ip classless
!
ip flow-export version 9
!
!
access-list 10 permit host 192.168.1.3
access-list 10 deny any
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
password cisco
login
transport input telnet
!
!
!
end
```

Asignación de direcciones IP

Se utiliza la dirección IP 192.168.1.0/24 para dividir en subredes, y crear una segmentación en ocho partes, para permitir crecimiento futuro de la red corporativa:

Se divide en ocho partes, en redes /27, con la máscara de subred

255.255.255.224:

192.168.1.0/27

192.168.1.32/27

192.168.1.64/27

192.168.1.96/27

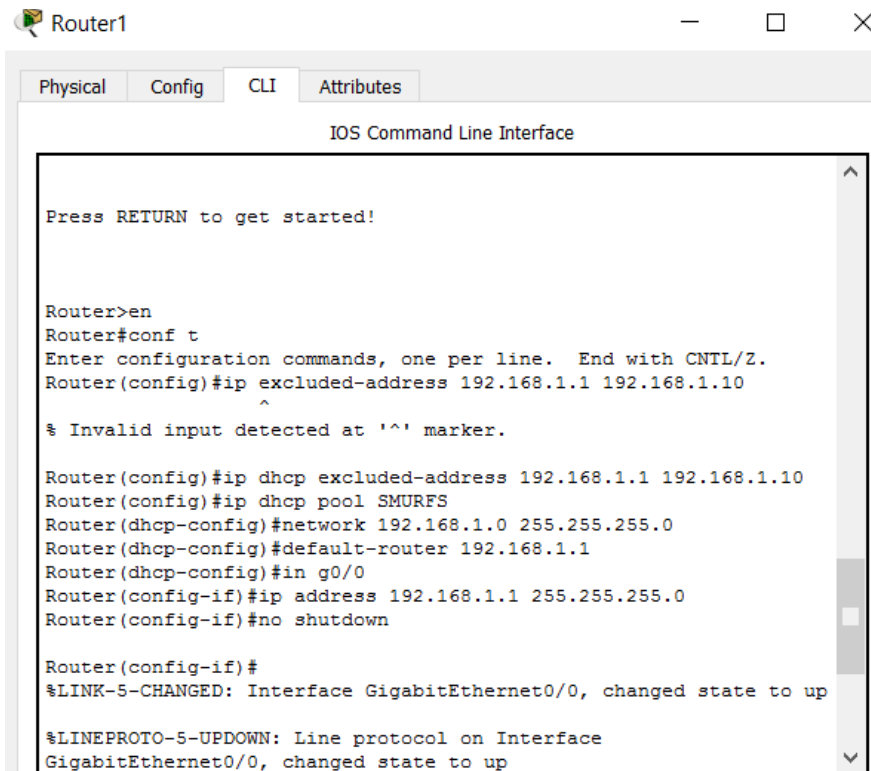
192.168.1.128/27

192.168.1.160/27

192.168.1.192/27
192.168.1.224/27

Tabla de enrutamiento

Software de Packet Tracer



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip excluded-address 192.168.1.1 192.168.1.10
^
% Invalid input detected at '^' marker.

Router(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.10
Router(config)#ip dhcp pool SMURFS
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#in g0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(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
```

Figura 2 Software de Packet Tracer

```
IOS Command Line Interface

% Invalid input detected at '^' marker.

Switch#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Switch(config)#int g0/1
Switch(config-if)#s
Switch(config-if)#sw
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to down

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

Switch(config-if)#no shut
Switch(config-if)#exit
Switch(config)#
```

Figura 3 Software de Packet Tracer

Se realiza una prueba de conectividad

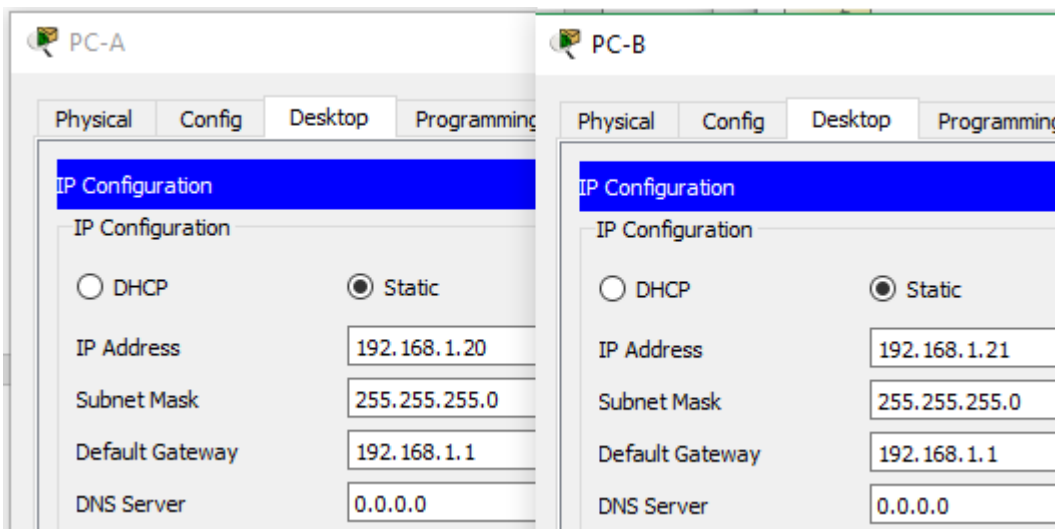
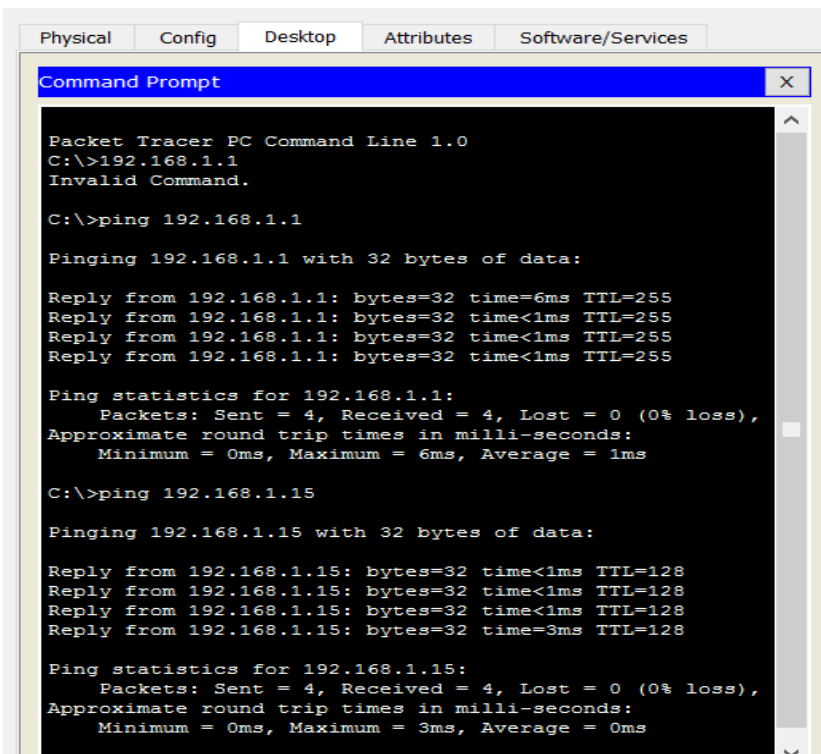


Figura 4 Conectividad

Prueba de conectividad cada tramo



```
Packet Tracer PC Command Line 1.0
C:\>192.168.1.1
Invalid Command.

C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=6ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>ping 192.168.1.15

Pinging 192.168.1.15 with 32 bytes of data:

Reply from 192.168.1.15: bytes=32 time<1ms TTL=128
Reply from 192.168.1.15: bytes=32 time<1ms TTL=128
Reply from 192.168.1.15: bytes=32 time<1ms TTL=128
Reply from 192.168.1.15: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.1.15:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 0ms
```

Figura 5 conectividad tramo

Prueba de seguridad y conectividad:

OK: Exitoso

Fail: Fallido fue bloqueado.

	ORIGEN	DESTINO	RESULTADO
TELNET	Router MEDELLIN	Router CALI	OK
	WS_1	Router BOGOTA	OK
	Servidor	Router CALI	OK
	Servidor	Router MEDELLIN	OK
TELNET	LAN del Router MEDELLIN	Router CALI	OK
	LAN del Router CALI	Router CALI	OK
	LAN del Router MEDELLIN	Router MEDELLIN	OK
	LAN del Router CALI	Router MEDELLIN	OK
PING	LAN del Router CALI	WS_1	Fail
	LAN del Router MEDELLIN	WS_1	Fail
	LAN del Router MEDELLIN	LAN del Router CALI	Fail
PING	LAN del Router CALI	Servidor	OK
	LAN del Router MEDELLIN	Servidor	OK
	Servidor	LAN del Router MEDELLIN	OK
	Servidor	LAN del Router CALI	OK
	LAN del Router CALI	LAN del Router MEDELLIN	OK
	LAN del Router MEDELLIN	LAN del Router CALI	OK

Figura 6 prueba de seguridad y conectividad

ESCENARIO 2

Una empresa tiene la conexión a internet en una red Ethernet, lo cual deben adaptarlo para facilitar que sus Routers y las redes que incluyen puedan, por esa vía, conectarse a internet, pero empleando las direcciones de la red LAN original.

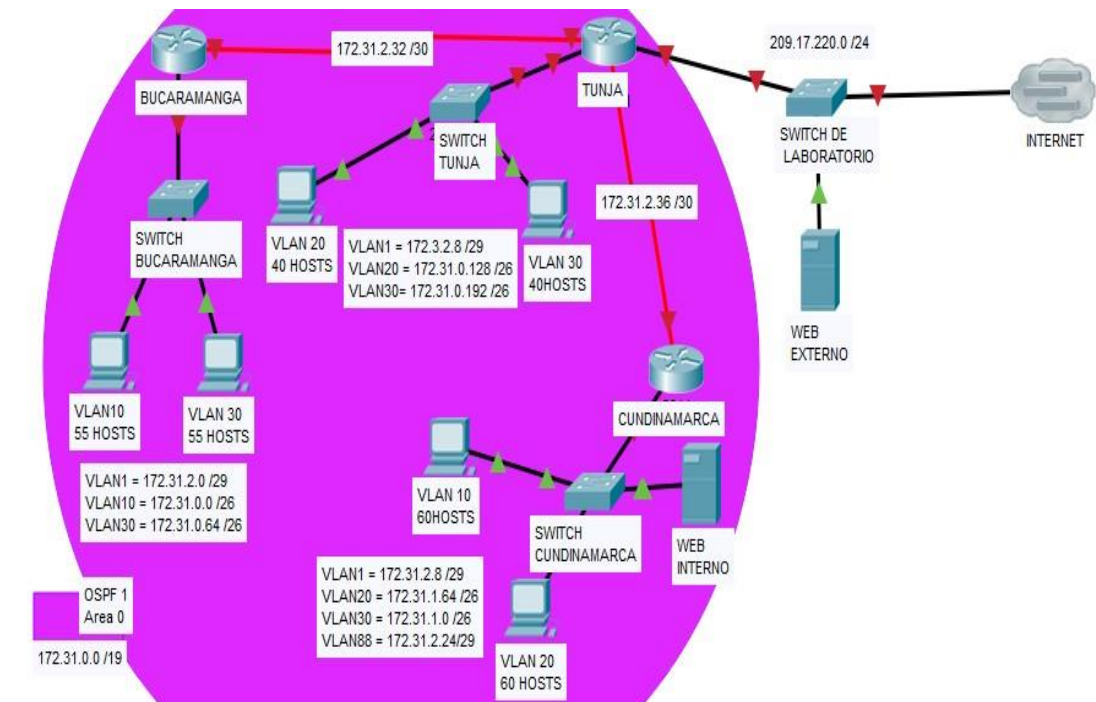


Figura 7 Escenario 2

Desarrollo

Los siguientes son los requerimientos necesarios:

1. Todos los Routers deberán tener los siguiente:
 - Configuración básica.
 - Autenticación local con AAA.
 - Cifrado de contraseñas.
 - Un máximo de internos para acceder al router.
 - Máximo tiempo de acceso al detectar ataques.
 - Establezca un servidor TFTP y almacene todos los archivos necesarios de los Routers.
2. El DHCP deberá proporcionar solo direcciones a los hosts de Bucaramanga y Cundinamarca

3. El web server deberá tener NAT estático y el resto de los equipos de la topología emplearan NAT de sobrecarga (PAT).
4. El enrutamiento deberá tener autenticación.
5. Listas de control de acceso:
 - Los hosts de VLAN 20 en Cundinamarca no acceden a internet, solo a la red interna de Tunja.
 - Los hosts de VLAN 10 en Cundinamarca si acceden a internet y no a la red interna de Tunja.
 - Los hosts de VLAN 30 en Tunja solo acceden a servidores web y ftp de internet.
 - Los hosts de VLAN 20 en Tunja solo acceden a la VLAN 20 de Cundinamarca y VLAN 10 de Bucaramanga.
 - Los hosts de VLAN 30 de Bucaramanga acceden a internet y a cualquier equipo de VLAN 10.
 - Los hosts de VLAN 10 en Bucaramanga acceden a la red de Cundinamarca (VLAN 20) y Tunja (VLAN 20), no internet.
 - Los hosts de una VLAN no pueden acceder a los de otra VLAN en una ciudad.
 - Solo los hosts de las VLAN administrativas y de la VLAN de servidores tienen acceso a los routers e internet.
6. VLSM: utilizar la dirección 172.31.0.0 /18 para el direccionamiento.

Aspectos a tener en cuenta

- Habilitar VLAN en cada switch y permitir su enrutamiento.
- Enrutamiento OSPF con autenticación en cada router.
- Servicio DHCP en el router Tunja, mediante el helper address, para los Routers Bucaramanga y Cundinamarca.
- Configuración de NAT estático y de sobrecarga.
- Establecer una lista de control de acceso de acuerdo con los criterios señalados.
- Habilitar las opciones en puerto consola y terminal virtual

Topología de red

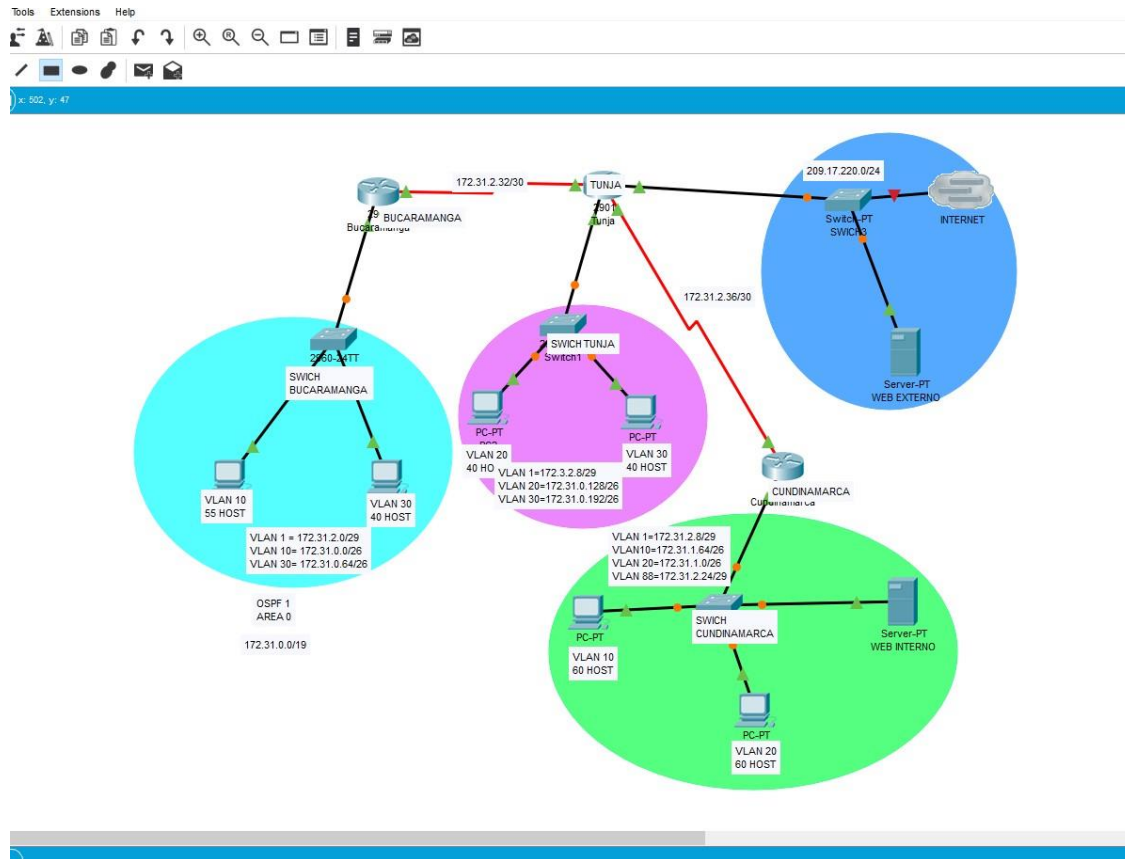


Figura 8 Topología escenario 2

Configuraciones de los Dispositivos

SWICHES

SWITCH-BUCARAMANGA>en

Building configuration...

Current configuration: 1215 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname SWITCH-BUCARAMANGA

!


```
!  
!  
!  
!  
spanning-tree mode pvst  
spanning-tree extend system-id  
!  
interface FastEthernet0/1  
  switchport access vlan 10  
  switchport mode access  
!  
interface FastEthernet0/2  
  switchport access vlan 30  
  switchport mode access  
!  
interface FastEthernet0/3  
  switchport mode trunk  
!  
interface FastEthernet0/4  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!  
interface FastEthernet0/11  
!  
interface FastEthernet0/12  
!  
interface FastEthernet0/13  
!  
interface FastEthernet0/14  
!  
interface FastEthernet0/15  
!  
interface FastEthernet0/16  
!  
interface FastEthernet0/17  
!  
interface FastEthernet0/18
```

```
!  
interface FastEthernet0/19  
!  
interface FastEthernet0/20  
!  
interface FastEthernet0/21  
!  
interface FastEthernet0/22  
!  
interface FastEthernet0/23  
!  
interface FastEthernet0/24  
!  
interface GigabitEthernet0/1  
!  
interface GigabitEthernet0/2  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
!  
!  
!  
line con 0  
!  
line vty 0 4  
  login  
line vty 5 15  
  login  
!  
!  
!  
end  
SWITCH-TUNJA>en  
Building configuration...  
  
Current configuration: 1209 bytes  
!  
version 12.2  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname SWITCH-TUNJA  
!
```

```
!  
!  
!  
!  
spanning-tree mode pvst  
spanning-tree extend system-id  
!  
interface FastEthernet0/1  
  switchport access vlan 20  
  switchport mode access  
!  
interface FastEthernet0/2  
  switchport access vlan 30  
  switchport mode access  
!  
interface FastEthernet0/3  
  switchport mode trunk  
!  
interface FastEthernet0/4  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!  
interface FastEthernet0/11  
!  
interface FastEthernet0/12  
!  
interface FastEthernet0/13  
!  
interface FastEthernet0/14  
!  
interface FastEthernet0/15  
!  
interface FastEthernet0/16  
!  
interface FastEthernet0/17  
!  
interface FastEthernet0/18
```

```
!  
interface FastEthernet0/19  
!  
interface FastEthernet0/20  
!  
interface FastEthernet0/21  
!  
interface FastEthernet0/22  
!  
interface FastEthernet0/23  
!  
interface FastEthernet0/24  
!  
interface GigabitEthernet0/1  
!  
interface GigabitEthernet0/2  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
!  
!  
!  
line con 0  
!  
line vty 0 4  
  login  
line vty 5 15  
  login  
!  
!  
!  
end  
SWITCH-CUNDINAMARCA>en  
Building configuration...
```

Current configuration: 1294 bytes

```
!  
version 12.2  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname SWITCH-CUNDINAMARCA  
!
```

```
!  
!  
!  
!  
spanning-tree mode pvst  
spanning-tree extend system-id  
!  
interface FastEthernet0/1  
switchport access vlan 10  
switchport mode access  
!  
interface FastEthernet0/2  
switchport access vlan 20  
switchport mode access  
!  
interface FastEthernet0/3  
switchport access Vlan 88  
switchport mode access  
!  
interface FastEthernet0/4  
switchport mode trunk  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!  
interface FastEthernet0/11  
!  
interface FastEthernet0/12  
switchport access vlan 20  
!  
interface FastEthernet0/13  
!  
interface FastEthernet0/14  
!  
interface FastEthernet0/15  
!  
interface FastEthernet0/16  
!
```

```
interface FastEthernet0/17
!  
interface FastEthernet0/18
!  
interface FastEthernet0/19
!  
interface FastEthernet0/20
!  
interface FastEthernet0/21
!  
interface FastEthernet0/22
!  
interface FastEthernet0/23
!  
interface FastEthernet0/24
!  
interface GigabitEthernet0/1
!  
interface GigabitEthernet0/2
!  
interface Vlan1
no ip address
shutdown
!  
!  
!  
!  
line con 0
!  
line vty 0 4
login
line vty 5 15
login
!  
!  
!  
end
```

ROUTERS

```
BUCARAMANGA(config-if) #do sh run
Building configuration...
```

```
Current configuration: 2241 bytes
```

```
!  
version 15.1
```

```
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname BUCARAMANGA
!
!
!
enable secret 5 $1$mERr$hX5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
aaa new-model
!
aaa authentication login default group radius local
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username cisco password 0 cisco
!
!
license udi pid CISCO2901/K9 sn FTX1524XZ19
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
```

```

!
!
!
!
interface GigabitEthernet0/0
no ip address
ip access-group 10, admin in
duplex auto
speed auto
!
interface GigabitEthernet0/0.1
encapsulation dot1Q 1 native
ip address 172.31.2.1 255.255.255.248
ip helper-address 172.31.2.33
!
interface GigabitEthernet0/0.10
encapsulation dot1Q 10
ip address 172.31.0.1 255.255.255.192
ip helper-address 172.31.2.33
!
interface GigabitEthernet0/0.30
encapsulation dot1Q 30
ip address 172.31.0.65 255.255.255.192
ip helper-address 172.31.2.33
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 172.31.2.34 255.255.255.252
ip ospf authentication-key CISCO123
ip access-group 140 out
clock rate 64000
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1

```



```

log-adjacency-changes
network 172.31.0.0 0.0.0.63 area 0
network 172.31.0.64 0.0.0.63 area 0
network 172.31.2.0 0.0.0.7 area 0
network 172.31.2.32 0.0.0.3 area 0
!
router rip
!
ip classless
!
ip flow-export version 9
!
!
ip access-list extended admin
permit ip 172.31.2.0 0.0.0.7 any
permit ip 172.3.2.8 0.0.0.7 any
permit ip 172.31.2.8 0.0.0.7 any
permit ip 172.31.2.24 0.0.0.7 any
deny ip any any
access-list 140 permit ip 172.31.0.64 0.0.0.63 209.17.220.0 0.0.0.255
access-list 140 permit ip 172.31.0.64 0.0.0.63 172.31.0.64 0.0.0.63
access-list 140 deny ip 172.31.0.64 0.0.0.63 any
access-list 140 permit ip 172.31.0.0 0.0.0.63 172.31.1.0 0.0.0.63
access-list 140 permit ip 172.31.0.0 0.0.0.63 172.31.0.128 0.0.0.63
access-list 140 deny ip any any
!
no cdp run
!
!
radius-server host 172.31.2.26 auth-port 1645
radius-server key cisco
!
!
!
!
line con 0
login authentication default
!
line aux 0
!
line vty 0 4
!
!
!
end

```

TUNJA

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

```
TUNJA (config)#interface Serial0/0/0
TUNJA (config-if) #do sh run
Building configuration...
```

Current configuration: 3273 bytes

```
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname TUNJA
!
!
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
ip dhcp excluded-address 172.31.2.1
ip dhcp excluded-address 172.31.0.1
ip dhcp excluded-address 172.31.0.65
ip dhcp excluded-address 172.31.2.9
ip dhcp excluded-address 172.31.1.65
ip dhcp excluded-address 172.31.1.1
ip dhcp excluded-address 172.31.2.25
!
ip dhcp pool VLAN10-BUC
network 172.31.0.0 255.255.255.192
default-router 172.31.0.1
ip dhcp pool VLAN30-BUC
network 172.31.0.64 255.255.255.192
default-router 172.31.0.65
ip dhcp pool VLAN1-BUC
network 172.31.2.0 255.255.255.248
default-router 172.31.2.1
ip dhcp pool VLAN1-CUN
network 172.31.2.8 255.255.255.248
default-router 172.31.2.9
ip dhcp pool VLAN20-CUN
network 172.31.1.64 255.255.255.192
default-router 172.31.1.65
ip dhcp pool VLAN30-CUN
network 172.31.1.0 255.255.255.192
default-router 172.31.1.1
ip dhcp pool VLAN88-CUN
network 172.31.2.24 255.255.255.248
default-router 172.31.2.25
```

```
!  
!  
aaa new-model  
!  
aaa authentication login default group radius local  
!  
!  
!  
!  
!  
no ip cef  
no ipv6 cef  
!  
!  
username cisco password 0 cisco  
!  
license udi pid CISCO2901/K9 sn FTX1524P8BO  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
interface GigabitEthernet0/0  
no ip address  
ip access-group 130, admin in  
ip nat inside  
duplex auto  
speed auto  
!  
interface GigabitEthernet0/0.1  
encapsulation dot1Q 1 native  
ip address 172.3.2.9 255.255.255.248  
!  
interface GigabitEthernet0/0.20
```

```

encapsulation dot1Q 20
ip address 172.31.0.129 255.255.255.192
!
interface GigabitEthernet0/0.30
encapsulation dot1Q 30
ip address 172.31.0.193 255.255.255.192
!
interface GigabitEthernet0/1
ip address 209.17.220.1 255.255.255.0
ip nat outside
duplex auto
speed auto
!
interface Serial0/0/0
ip address 172.31.2.37 255.255.255.252
ip ospf authentication-key CISCO123
ip nat inside
clock rate 64000
!
interface Serial0/0/1
ip address 172.31.2.33 255.255.255.252
ip ospf authentication-key CISCO123
ip nat inside
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 172.3.2.8 0.0.0.7 area 0
network 172.31.0.128 0.0.0.63 area 0
network 172.31.0.192 0.0.0.63 area 0
network 172.31.2.32 0.0.0.3 area 0
network 172.31.2.36 0.0.0.3 area 0
network 209.17.220.0 0.0.0.255 area 0
!
router rip
!
ip nat inside source list 11 interface GigabitEthernet0/1 overload
ip nat inside source static 172.31.2.26 209.17.220.1
ip classless
!
ip flow-export version 9
!
!
access-list 11 permit any

```

```

ip access-list extended admin
permit ip 172.31.2.0 0.0.0.7 any
permit ip 172.3.2.8 0.0.0.7 any
permit ip 172.31.2.8 0.0.0.7 any
permit ip 172.31.2.24 0.0.0.7 any
deny ip any any
access-list 130 permit ip 172.31.0.192 0.0.0.63 209.17.220.0 0.0.0.255
access-list 130 deny ip 172.31.0.192 0.0.0.63 any
access-list 130 permit ip 172.31.0.128 0.0.0.63 172.31.1.0 0.0.0.63
access-list 130 permit ip 172.31.0.128 0.0.0.63 172.31.0.0 0.0.0.63
access-list 130 deny ip 172.31.0.128 0.0.0.63 any
!
no cdp run
!
!
radius-server host 172.31.2.26 auth-port 1645
radius-server key cisco
!
!
!
!
line con 0
login authentication default
!
line aux 0
!
line vty 0 4
!
!
!
end

```

CUNDINAMARCA#

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

```

CUNDINAMARCA (config)#interface Serial0/0/0
CUNDINAMARCA (config-if)#
CUNDINAMARCA (config-if) #exit
CUNDINAMARCA (config)#interface Serial0/0/1
CUNDINAMARCA (config-if) #do sh run
Building configuration...

```

Current configuration: 2547 bytes

```

!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption

```

```
!  
hostname CUNDINAMARCA  
!  
!  
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0  
!  
!  
!  
!  
aaa new-model  
!  
aaa authentication login default group radius local  
!  
!  
!  
no ip cef  
no ipv6 cef  
!  
!  
username cisco password 0 cisco  
!  
license udi pid CISCO2901/K9 sn FTX15249ZV6  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
interface GigabitEthernet0/0  
no ip address  
duplex auto  
speed auto  
!
```

```
interface GigabitEthernet0/0.1
encapsulation dot1Q 1 native
ip address 172.31.2.9 255.255.255.248
ip helper-address 172.31.2.37
!
interface GigabitEthernet0/0.2
no ip address
!
interface GigabitEthernet0/0.10
encapsulation dot1Q 10
ip address 172.31.1.65 255.255.255.192
ip helper-address 172.31.2.37
!
interface GigabitEthernet0/0.20
encapsulation dot1Q 20
ip address 172.31.1.1 255.255.255.192
ip helper-address 172.31.2.37
!
interface GigabitEthernet0/0.88
encapsulation dot1Q 88
ip address 172.31.2.25 255.255.255.248
ip helper-address 172.31.2.37
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
no ip address
ip access-group 120,121,122 out
clock rate 2000000
shutdown
!
interface Serial0/0/1
ip address 172.31.2.38 255.255.255.252
ip ospf authentication-key CISCO123
ip access-group 120 out
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 172.31.1.0 0.0.0.63 area 0
```

```
network 172.31.1.64 0.0.0.63 area 0
network 172.31.2.8 0.0.0.7 area 0
network 172.31.2.24 0.0.0.7 area 0
network 172.31.2.36 0.0.0.3 area 0
!
router rip
!
ip classless
!
ip flow-export version 9
!
!
ip access-list extended admin
permit ip 172.31.2.0 0.0.0.7 any
permit ip 172.3.2.8 0.0.0.7 any
permit ip 172.31.2.8 0.0.0.7 any
permit ip 172.31.2.24 0.0.0.7 any
deny ip any any
access-list 120 deny ip 172.31.1.64 0.0.0.63 172.31.0.128 0.0.0.63
access-list 120 deny ip 172.31.1.64 0.0.0.63 172.31.0.192 0.0.0.63
access-list 120 permit ip 172.31.1.64 0.0.0.63 209.17.220.0 0.0.0.255
access-list 120 permit ip 172.31.1.0 0.0.0.63 172.31.0.128 0.0.0.63
access-list 120 permit ip 172.31.1.0 0.0.0.63 172.31.0.192 0.0.0.63
access-list 120 permit ip 172.31.0.0 0.0.0.63 172.31.1.0 0.0.0.63
access-list 120 permit ip 172.31.1.0 0.0.0.63 172.31.0.0 0.0.0.63
!
!
radius-server host 172.31.2.26 auth-port 1645
radius-server key cisco
!
!
!
!
line con 0
login authentication default
!
line aux 0
!
line vty 0 4
!
!
!
end
```


DHCP proporciona direcciones a los hosts de tunja y Cundinamarca

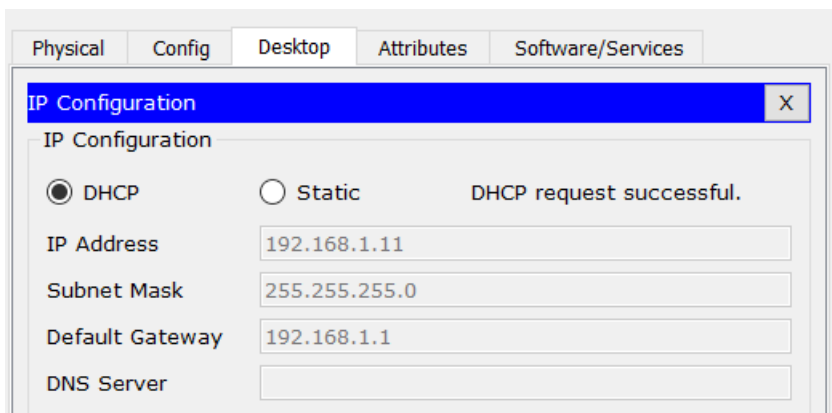


Figura 9 DHCP Tunja

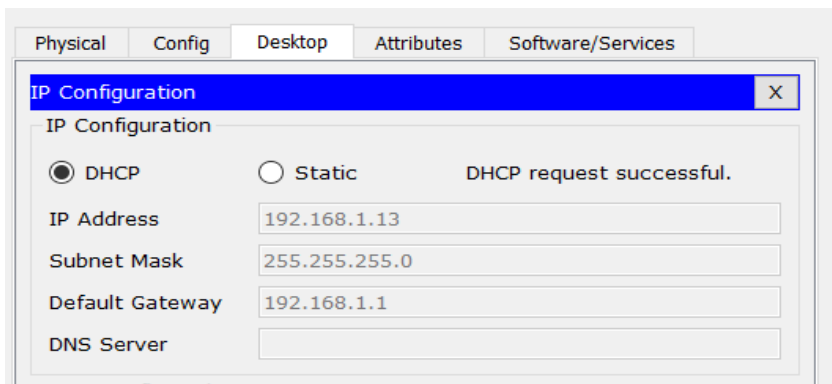
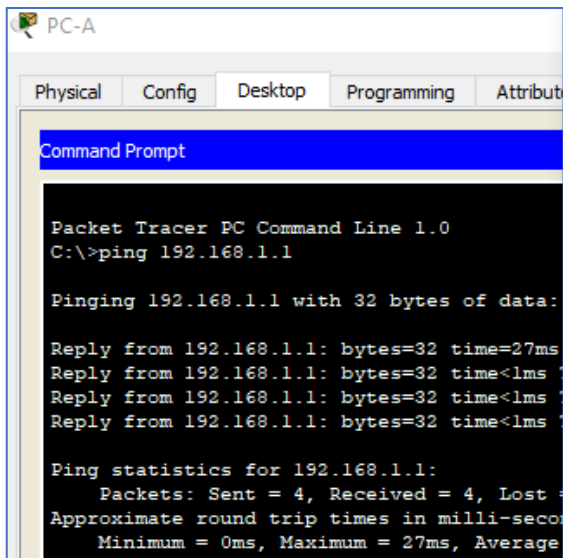


Figura 10 DHCP Cundinamarca

Verificación y respaldo

Se realizan verificaciones para conectividad y seguridad:

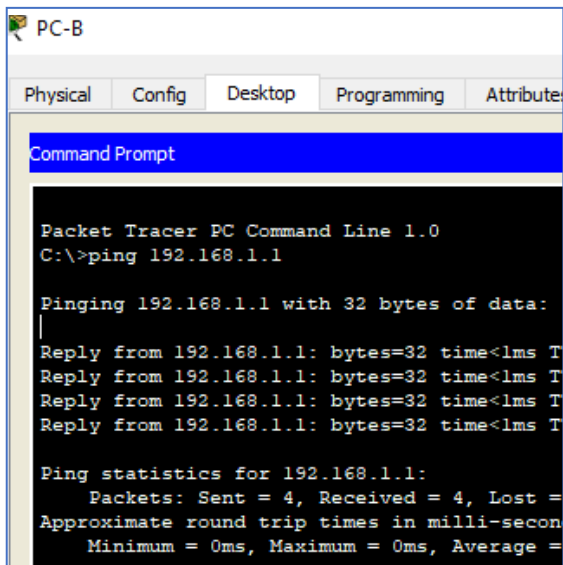


```
PC-A
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=27ms
Reply from 192.168.1.1: bytes=32 time<lms
Reply from 192.168.1.1: bytes=32 time<lms
Reply from 192.168.1.1: bytes=32 time<lms

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 27ms, Average = 11ms
```



```
PC-B
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<lms T
Reply from 192.168.1.1: bytes=32 time<lms T
Reply from 192.168.1.1: bytes=32 time<lms T
Reply from 192.168.1.1: bytes=32 time<lms T

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figura 11 Verificación y respaldo

CONCLUSIONES

En el desarrollo de los escenarios 1 y 2 de nuestra actividad se pudieron demostrar los conocimientos del diplomado de profundización CISCO, aplicando la herramienta de simulación packet tracer, protocolos de enrutamiento EIGRP, topologías, modelos OSI, NAT, VLAN etc.

DHCP es un protocolo diseñado principalmente para ahorrar tiempo gestionando direcciones IP en una red grande. muchos sistemas operativos incluyen este servicio precisamente por sus beneficios y su gran importancia.

Comprender todos los beneficios y mecanismos que se implementan en una red y comandos al configurarla y tener la mejor optimizacion

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