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

Tarea 9

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA – UNAD ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI INGENIERIA DE SISTEMAS BOGOTA 2019

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INFORME

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA – UNAD ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI INGENIERIA DE SISTEMAS BOGOTA 2019

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1. RESUMEN

Con el desarrollo de esta actividad podemos realizar las actividades correspondientes para resolver los casos de estudio para el curso CCNA nivel 1 denominado Introduction to Networks y para el curso CCNA nivel 2 denominado Routing and Switching Essentials. Con el desarrollo de estos escenarios se fortalecerá nuestra comprensión de aprendizaje de las temáticas con el fin de apropiarse del conocimiento de tan importante área de formación como lo son las redes de computadores y las telecomunicaciones que convive con nosotros en el día a día.

2. ABSTRAC

With the development of this activity we can carry out the corresponding activities to solve the case studies for the CCNA level 1 course called Introduction to networks and for the CCNA level 2 course called Routing and Switching Essentials. With the development of these developments, our understanding of learning topics will be strengthened in order to appropriate the knowledge of such an important area of training such as computer networks and telecommunications that lives with us on a day-to-day basis.

3. INTRODUCCIÓN

La tecnología ha influido hoy en día en cada una de las áreas de desarrollo del ser humano y el internet se ha convertido en el medio de comunicación más grande del mundo es por esto que las redes son una necesidad básica para el desarrollo de cada entorno para realizar comunicaciones en tiempo real independientemente del sitio, lo que ha permitido la globalización de la información y el aumento del conocimiento requerido para entender el funcionamiento de estos sistemas.

En el siguiente documento se realiza una prueba práctica de configuración apoyándose en el material el cual se ha desarrollado durante este diplomado en cisco logrando la implementación de los conocimientos adquiridos.

4. OBJETIVOS

Al realizar el desarrollo de los distintos ejercicios de las unidades vistas en este diplomado y con el desarrollo de esta actividad final se busca fundamentar y aplicar los conocimientos vistos, realizando la prueba de habilidades prácticas para el diseño e implementación de soluciones integradas LAN / WAN en para conocer los beneficios de los Router en los enrutamientos dinámicos del tráfico. Desarrollar habilidades para configuras adecuadamente los dispositivos Router y Switch para optimizar las métricas.

5. DESARROLLO DE LOS DOS ESCENARIOS

5.1 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

Los requerimientos solicitados son los siguientes:

Parte 1: Para el direccionamiento IP debe definirse una dirección de acuerdo con el número de hosts requeridos.

Parte 2: Considerar la asignación de los parámetros básicos y la detección de vecinos directamente conectados.

Parte 3: La red y subred establecidas deberán tener una interconexión total, todos los hosts deberán ser visibles y poder comunicarse entre ellos sin restricciones.

Parte 4: Implementar la seguridad en la red, se debe restringir el acceso y comunicación entre hosts de acuerdo con los requerimientos del administrador de red.

Parte 5: Comprobación total de los dispositivos y su funcionamiento en la red.

Parte 6: Configuración final.





Desarrollo

Como trabajo inicial se debe realizar lo siguiente.

- Realizar las rutinas de diagnóstico y dejar los equipos listos para su configuración (asignar nombres de equipos, asignar claves de seguridad, etc).
- Realizar la conexión fisica de los equipos con base en la topología de red

Configurar la topología de red, de acuerdo con las siguientes especificaciones.

Parte 1: Asignación de direcciones IP:

a. Se debe dividir (subnetear) la red creando una segmentación en ocho partes, para permitir creciemiento futuro de la red corporativa.b. Asignar una dirección IP a la red.

Solucion de las subredes ipv4

Teniendo la red 192.168.1.0/27

192.168.1.0 sabemos que pertenece a una red clase C con mascara 255.255.255.224, podemos tener un total de 8 subredes y 30 host , en la siguiente tabla se describe como puede quedar configurado.

El diseño de esta topologia

Dir	Host	BoadCast
192.168.1.0/27	192.168.1.1-192.168.130	192.168.1.31
192.168.1.32/27	192.168.1.33-192.168.1.62	192.168.1.63
192.168.1.64/27	192.168.1.65-192.168.1.94	192.168.1.95
192.168.1.96/27	192.168.1.97-192.168.1.126	192.168.1.127
192.168.1.128/27	192.168.1.129-192.168.1.158	192.168.1.159
192.168.1.160/27	192.168.1.161-192.168.1.190	192.168.1.191
192.168.1.192/27	192.168.1.193-192.168.1.222	192.168.1.223
192.168.1.224/27	192.168.1.225-192.168.1.254	192.168.1.255

Parte 2: Configuración Básica.

Completar la siguiente tabla con la configuración básica de los routers, teniendo en cuenta las subredes diseñadas.

	R1	R2	R3
Nombre de Host	MEDELLIN	BOGOTA	CALI
Dirección de lp en interfaz Serial 0/0	192.168.1.99	192.168.1.98	192.168.1.131
Dirección de lp en interfaz Serial 0/1		192.168.1.130	
Dirección de lp en interfaz FA 0/0	192.168.1.33	192.168.1.1	192.168.1.65
Protocolo de enrutamiento	Eigrp	Eigrp	Eigrp
Sistema Autónomo	200	200	200
Afirmaciones de red	192.168.1.0	192.168.1.0	192.168.1.0

a. Después de cargada la configuración en los dispositivos, verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

Router: MEDELLIN

```
Router>enable
Password:
Router#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                 S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
          Local Intrfce Holdtme Capability Platform Port ID
Ser 0/0/0 140 R C1841 Ser 0/0/0
Device ID
           Ser 0/0/0 140
Fas 0/0 140
                                       R
Router
SW Medellin Fas 0/0
                                           S
                                                   2960
                                                              Fas 0/1
Router#exit
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) #line vty 0 4
Router(config-line) #password 123
Router(config-line) #login
Router(config-line) #exit
Router(config) #enable secret
% Incomplete command.
Router(config) #enable secret 123
Router (config) #exit
Router#
SYS-5-CONFIG I: Configured from console by console
Router#exit
Router>enable
Password:
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
     192.168.1.0/27 is subnetted, 5 subnets
D
       192.168.1.0 [90/2172416] via 192.168.1.98, 02:49:37, Serial0/0/0
С
        192.168.1.32 is directly connected, FastEthernet0/0
D
        192.168.1.64 [90/2684416] via 192.168.1.98, 02:49:37, Serial0/0/0
С
        192.168.1.96 is directly connected, Serial0/0/0
D
        192.168.1.128 [90/2681856] via 192.168.1.98, 02:49:37, Serial0/0/0
Router#exit
```

```
Router: BOGOTA
```

```
Router>enable
Password:
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
     192.168.1.0/27 is subnetted, 5 subnets
С
       192.168.1.0 is directly connected, FastEthernet0/0
D
       192.168.1.32 [90/2172416] via 192.168.1.99, 02:46:37, Serial0/0/0
D
        192.168.1.64 [90/2172416] via 192.168.1.131, 02:46:37, Serial0/1/0
С
        192.168.1.96 is directly connected, Serial0/0/0
С
        192.168.1.128 is directly connected, Serial0/1/0
Router#exit
```

Router: CALI

```
Router>enable
Password:
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
     192.168.1.0/27 is subnetted, 5 subnets
D
        192.168.1.0 [90/2172416] via 192.168.1.130, 02:42:26, Serial0/1/0
D
        192.168.1.32 [90/2684416] via 192.168.1.130, 02:42:26, Serial0/1/0
С
        192.168.1.64 is directly connected, FastEthernet0/0
D
        192.168.1.96 [90/2681856] via 192.168.1.130, 02:42:26, Serial0/1/0
С
        192.168.1.128 is directly connected, Serial0/1/0
Router#exit
```

b. Verificar el balanceo de carga que presentan los routers.

Router : Medellín

```
Router#
Router#show ip route 192.168.1.96
Routing entry for 192.168.1.96/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:

    directly connected, via Serial0/0/0

     Route metric is 0, traffic share count is 1
Router#show ip route 192.168.1.32
Routing entry for 192.168.1.32/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:
  * directly connected, via FastEthernet0/0
     Route metric is 0, traffic share count is 1
Router#
```

Router: Bogotá

```
Router>enable
Password:
Router#show ip route 192.168.1.96
Routing entry for 192.168.1.96/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:
  * directly connected, via Serial0/0/0
     Route metric is 0, traffic share count is 1
Router#show ip route 192.168.1.0
Routing entry for 192.168.1.0/27, 5 known subnets
 Attached (3 connections)
 Redistributing via eigrp 123, eigrp 123, eigrp 123, eigrp 123, eigrp 123
С
       192.168.1.0 is directly connected, FastEthernet0/0
       192.168.1.32 [90/2172416] via 192.168.1.99, 03:03:28, Serial0/0/0
D
D
       192.168.1.64 [90/2172416] via 192.168.1.131, 03:03:28, Serial0/1/0
       192.168.1.96 is directly connected, Serial0/0/0
С
       192.168.1.128 is directly connected, Serial0/1/0
С
Router#show ip route 192.168.1.128
Routing entry for 192.168.1.128/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:
  * directly connected, via Serial0/1/0
     Route metric is 0, traffic share count is 1
Router#
```

Router: Cali

```
Router>enable
Password:
Router#show ip route 192.168.1.64
Routing entry for 192.168.1.64/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:
  * directly connected, via FastEthernet0/0
     Route metric is 0, traffic share count is 1
Router#show ip route 192.168.1.65
Routing entry for 192.168.1.64/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:
  * directly connected, via FastEthernet0/0
     Route metric is 0, traffic share count is 1
Router#show ip route 192.168.1.128
Routing entry for 192.168.1.128/27
Known via "connected", distance 0, metric 0 (connected, via interface)
 Redistributing via eigrp 123
 Routing Descriptor Blocks:
  * directly connected, via Serial0/1/0
     Route metric is 0, traffic share count is 1
Router#
```

c. Realizar un diagnóstico de vecinos uando el comando cdp.

Router Medellín

```
Router>enable
Router#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
               S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID
         Local Intrfce Holdtme Capability Platform Port ID
                                                        Ser 0/0/0
          Ser 0/0/0
                                             C1841
                         126
Router
                                     R
SW_Medellin Fas 0/0
                          126
                                        S
                                              2960
                                                         Fas 0/1
Router#
```

Router Bogotá

🞯 Bogota_R2						
Physical Co	onfig CLI					
	1	OS Comma	and Line Ir	iterface		
Router>enab Password:	le					
Router#show	cdp neighbors					
Capability	Codes: R - Rout	er, T - Trans	Bridge, B -	Source Rou	te Bridge	
	S - Swit	ch, H - Host,	I - IGMP, r	- Repeater	, P - Phone	
Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID	
Switch	Fas 0/0	135	S	2950	Fas 0/1	
Router	Ser 0/1/0	135	R	C1841	Ser 0/1/0	
Router	Ser 0/0/0	135	R	C1841	Ser 0/0/0	
Router#exit	:					

Router Cali

Router>enable Password: Router#show cd	lp neighbors				
Capability Cod	les: R - Router, S - Switch,	T - Trans H - Host,	Bridge, B - I - IGMP, r	Source Route - Repeater, H	Bridge 9 - Phone
Device ID L	ocal Intrfce H	Holdtme	Capability	Platform	Port ID
Switch F	as 0/0	168	S	2950	Fas 0/1
Router S Router#exit	er 0/1/0	169	R	C1841	Ser 0/1/0

d. Realizar una prueba de conectividad en cada tramo de la ruta usando Ping.

Parte 3: Configuración de Enrutamiento.

a. Asignar el protocolo de enrutamiento EIGRP a los routers considerando el direccionamiento diseñado.

b. Verificar si existe vecindad con los routers configurados con EIGRP.

c. Realizar la comprobación de las tablas de enrutamiento en cada uno de los routers para verificar cada una de las rutas establecidas.

d. Realizar un diagnóstico para comprobar que cada uno de los puntos de la red se puedan ver y tengan conectividad entre sí. Realizar esta prueba desde un host de la red LAN del router CALI, primero a la red de MEDELLIN y luego al servidor.

Medellin_R1 _ 🗆 × Physical Config CLI **IOS** Command Line Interface ٠ Router>ena Router#config t Enter configuration commands, one per line. End with CNTL/Z. Router (config) # Router# SYS-5-CONFIG_I: Configured from console by console config t Enter configuration commands, one per line. End with CNTL/Z. Router(config) #interface % Incomplete command. Router(config) #interface fas Router(config) #interface fastEthernet 0/0 Router(config-if) #ip address 192.168.1.33 255.255.255.224 Router(config-if) #interface Se0/0/0 Router(config-if) #ip address 192.168.1.99 255.255.255.224 Router(config-if) #clock rate 2000000 Router(config-if) #no shut %LINK-5-CHANGED: Interface Serial0/0/0, changed state to down Router(config-if) #exit Router(config) #interface fastEthernet 0/0 Router(config-if) #ip address 192.168.1.33 255.255.255.224 Router(config-if) #no shut Router(config-if) # %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up Router(config-if) #exit Router(config) #router eigrp 123 Router(config-router) #network 192.168.1.32 Router(config-router) #network 192.168.1.96 Router(config-router) #no auto-summary Router(config-router) #exit Router (config) #exit Router# SYS-5-CONFIG_I: Configured from console by console Router#

ኛ Bogota_R2	
Physical Config CLI	
IOS Command Line Interface	
Router#config t Enter configuration commands, one per line. End with CNTL/Z. Router(config)#interface fas	-
Router(config)#interface fastEthernet 0/0 Router(config-if)#ip address 192.168.1.1 255.255.255.224 Router(config-if)#no shut	
Router(config-if)# %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up	
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to	up
Router(config-if) #exit Router(config) #interface Se0/0/0 Router(config-if) #ip address 192.168.1.98 255.255.255.224 Router(config-if) #no shut	
Router(config-if)# %LINK-5-CHANGED: Interface Serial0/0/0, changed state to up	
Router(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up	
Router(config-if) #exit Router(config) #interface Se0/1/0 Router(config-if) #ip address 192.168.1.130 255.255.255.224 Router(config-if) #clock rate 2000000 Router(config-if) #no shut	
<pre>%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down Router(config-if)#exit Router(config)#router eigrp 123 Router(config-router)#network 192.168.1.0 Router(config-router)# %DUAL-5-NBRCHANGE: IP-EIGRP 123: Neighbor 192.168.1.99 (Serial0/0/0) is up: new adjacency</pre>	
Router(config-router)#network 192.168.1.128 Router(config-router)#network 192.168.1.96 Router(config-router)#network 192.168.1.0 Router(config-router)#no auto-summary	
Сору	Paste

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Parte 4: Configuración de las listas de Control de Acceso.

En este momento cualquier usuario de la red tiene acceso a todos sus dispositivos y estaciones de trabajo. El jefe de redes le solicita implementar seguridad en la red. Para esta labor se decide configurar listas de control de acceso (ACL) a los routers.

Las condiciones para crear las ACL son las siguientes:

Cada router debe estar habilitado para establecer conexiones Telnet con los demás routers y tener acceso a cualquier dispositivo en la red.

е	Last Status	Source	Destination	Туре	Color	Time(sec)	Periodic	Num	Edit	Delete
•	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	
•	Successful	PC0	PC1	ICMP		0.000	N	1	(edit)	
	Failed	PC0	PC2	ICMP		0.000	N	2	(edit)	
	Failed	PC1	PC2	ICMP		0.000	N	3	(edit)	
	Failed	PC0	Server0	ICMP		0.000	N	4	(edit)	
	Successful	PC2	Server0	ICMP		0.000	N	5	(edit)	
	Successful	PC3	PC4	ICMP		0.000	N	6	(edit)	
	Failed	PC3	Server0	ICMP		0.000	N	7	(edit)	
	Failed	PC4	PC2	ICMP		0.000	N	8	(edit)	
	Failed	PC4	PC1	ICMP		0.000	N	9	(edit)	
•	Failed	PC3	PC0	ICMP		0.000	N	10	(edit)	

•	Last Status	Source	Destination	Туре	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	
•	Successful	PC0	PC1	ICMP		0.000	N	1	(edit)	
	Failed	PC0	PC2	ICMP		0.000	N	2	(edit)	
	Failed	PC1	PC2	ICMP		0.000	N	3	(edit)	
•	Failed	PC0	Server0	ICMP		0.000	N	4	(edit)	
•	Successful	PC2	Server0	ICMP		0.000	N	5	(edit)	
•	Successful	PC3	PC4	ICMP		0.000	N	6	(edit)	
•	Failed	PC3	Server0	ICMP		0.000	N	7	(edit)	
•	Failed	PC4	PC2	ICMP		0.000	N	8	(edit)	
	Failed	PC4	PC1	ICMP		0.000	N	9	(edit)	
- •	Failed	PC3	PC0	ICMP		0.000	N	10	(edit)	
•	Successful	PC0	PC1	ICMP		0.000	N	11	(edit)	
•	Successful	PC0	Medellin_R1	ICMP		0.000	N	12	(edit)	
	Failed	PC0	Bogota_R2	ICMP		0.000	N	13	(edit)	
. •	Failed	PC0	PC2	ICMP		0.000	N	14	(edit)	
	Failed	PC0	Server0	ICMP		0.000	N	15	(edit)	
	Failed	PC0	PC3	ICMP		0.000	N	16	(edit)	
•	Failed	PC4	PC1	ICMP		0.000	N	17	(edit)	
•	Failed	PC0	Cali_R3	ICMP		0.000	N	18	(edit)	

a. El equipo WS1 y el servidor se encuentran en la subred de administración. Solo el servidor de la subred de administración debe tener acceso a cualquier otro dispositivo en cualquier parte de la red.

b. Las estaciones de trabajo en las LAN de MEDELLIN y CALI no deben tener acceso a ningún dispositivo fuera de su subred, excepto para interconectar con el servidor.

```
Router medellin
```

```
Router‡configure terminal
Enter configuration commands, one per line. End with CNTL/2.
Router(config) #line vty 0 4
Router(config-line) #password 123
Router(config-line) #login
Router(config-line) #exit
Router(config) #enable secret
% Incomplete command.
Router(config) #enable secret 123
Router(config) #enable secret 123
Router(config) #exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#exit
```

SW_R medellin

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config) #hostname SW_Medellin
SW_Medellin(config) #exit
SW Medellin#
SYS-5-CONFIG_I: Configured from console by console
SW Medellin#write
Building configuration ...
[OK]
SW_Medellin#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SW_Medellin(config) #enable password 123
SW_Medellin(config) #line VTY 0 4
SW_Medellin(config-line)#login
% Login disabled on line 1, until 'password' is set
% Login disabled on line 2, until 'password' is set
% Login disabled on line 3, until 'password' is set
% Login disabled on line 4, until 'password' is set
% Login disabled on line 5, until 'password' is set
SW_Medellin(config-line) #password 123
SW_Medellin(config-line) #exit
SW Medellin(config) #
```

Router Bogota

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#line vty 0 4
Router(config-line)#password 123
Router(config-line)#login
Router(config-line)#exit
Router(config)#enable secret 123
Router(config)#enable secret 123
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#exit
```

SW_R Bogota

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config) #hostname SW1_Bogota
SW1_Bogota(config) #exit
SW1 Bogota#
SYS-5-CONFIG_I: Configured from console by console
SW1 Bogota#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SW1 Bogota(config) #enable password 123
SW1_Bogota(config) #line vty 0 4
SW1 Bogota(config-line) #login
% Login disabled on line 1, until 'password' is set
% Login disabled on line 2, until 'password' is set
% Login disabled on line 3, until 'password' is set
% Login disabled on line 4, until 'password' is set
% Login disabled on line 5, until 'password' is set
SW1 Bogota(config-line) #password 123
SW1 Bogota(config-line) #exit
SW1_Bogota(config) #exit
SW1 Bogota#
SYS-5-CONFIG I: Configured from console by console
SW1 Bogota#enable
SW1 Bogota#exit
```

Router Cali

```
Router>enable

Router#configure terminal

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

Router(config)#line vty 0 4

Router(config-line)#password 123

Router(config-line)#login

Router(config-line)#exit

Router(config)#enable secret 123

Router(config)#exit

Router#

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

Router#exit
```

SW_R Cali

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config) #hostname SW Cali
SW_Cali(config) #exit
SW Cali#
%SYS-5-CONFIG_I: Configured from console by console
SW_Cali#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SW_Cali(config) #enable password 123
SW_Cali(config) #line vty 0 4
SW_Cali(config-line) #login
% Login disabled on line 1, until 'password' is set
% Login disabled on line 2, until 'password' is set
% Login disabled on line 3, until 'password' is set
% Login disabled on line 4, until 'password' is set
% Login disabled on line 5, until 'password' is set
SW_Cali(config-line) #password 123
SW_Cali(config-line) #exit
SW_Cali(config) #exit
SW Cali#
SYS-5-CONFIG_I: Configured from console by console
SW_Cali#exit
SW_Cali con0 is now available
```

Parte 5: Comprobación de la red instalada.

a. Se debe probar que la configuración de las listas de acceso fue exitosa.

b. Comprobar y Completar la siguiente tabla de condiciones de prueba para confirmar el óptimo funcionamiento de la red e.

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

SW_Medellin≻enable Password: SW_Medellin≢exit

SW_Medellin con0 is now available

Press RETURN to get started.

SW1_Bogota>enable Password: SW1_Bogota#exit

SW1_Bogota con0 is now available

Press RETURN to get started.

SW_Cali>enable Password: SW_Cali‡exit

SW_Cali con0 is now available

Press RETURN to get started.

Router>enable Password: Router\$show cdp neighbors Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone Device ID Local Intrfce Holdtme Capability Platform Port ID Router Ser 0/0/0 140 R C1841 Ser 0/0/0 SW_Medellin Fas 0/0 140 S 2960 Fas 0/1 Router\$exit

5.2 Escenario 2

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.





Desarrollo

Los siguientes son los requerimientos necesarios:

- 1. Todos los routers deberán tener los siguiente:
 - Configuración básica.
 - Autenticación local con AAA.

BUCARAMANGA	_		\times
Physical Config <u>CLI</u> Attributes			
IOS Command Line Interface			
User Access Verification			^
Password:			
Bucaramanga>			
Bucaramanga>en			
Password:			
Password:			
Password:			
% Bad secrets			
Bucaramanga>en			
Password:			
Bucaramanga#conf t			
Enter configuration commands, one per line. J	End with CNT	L/Z.	
Bucaramanga(config)#Line console 0			
Bucaramanga(config-line)#username admi secret	class12		
Bucaramanga(config)#aa new-model			
Bucaramanga(config)#aaa new-model			
Bucaramanga(config)#aaa authentication login 1	LOGIN local		
Bucaramanga(config)#line console 0			
Bucaramanga(config-line)#login authentication	LOGIN		
Bucaramanga(config-line)#line vty 0 15			
Bucaramanga(config-line)#login authentication	LOGIN		
Bucaramanga(config-line)#			\sim
Ctrl+F6 to exit CLI focus	Сору	Paste	

RUNJA \Box \times Physical Config CLI Attributes IOS Command Line Interface Serial0/0/0 from LOADING to FULL, Loading Done ~ 00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 172.31.2.38 on Serial0/0/1 from LOADING to FULL, Loading Done Cuidado Acceso Restringido User Access Verification Password: Password: Password: Tunja>en Password: Tunja#conf t Enter configuration commands, one per line. End with CNTL/Z. Tunja(config)#username admi secret class12 Tunja(config)#aaa new-model Tunja(config) #aaa authentication login LOGIN local Tunja(config)#line console 0 Tunja(config-line) #login authentication LOGIN Tunja(config-line)#line vty 0 15 Tunja(config-line)#login authentication LOGIN Tunja(config-line)#

Reference Cundinamarca	—		×
Physical Config CLI Attributes			
IOS Command Line Interface			
			^
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 209.165 Serial0/0/0 from LOADING to FULL, Loading Done	.220.1 on		
Cuidado Acceso Restringido			
User Access Verification			
Password:			
Cundinamarca>en Password: Password:			
Password:			
Cundinamarca#conf t			
Enter configuration commands, one per line. End	with CNTI	L/Z.	
Cundinamarca (config) #username admi secret classl	2		
Cundinamarca (config) #aaa new-model	CTN Logal		
Cundinamarca (config) #aaa authentication login Lo	GIN IOCAI		
Cundinamarca (config-line) #login_authentication_L	OGIN		
Cundinamarca (config-line) #line vtv 0 15			
Cundinamarca (config-line) #login authentication L	OGIN		
Cundinamarca(config-line)#			\sim

Switch Cundinamarca

S_BUCARAMANGA	_		×
Physical Config CLI Attributes			
IOS Command Line Interface			
<pre>Switch>enable Switch#conf t Enter configuration commands, one per line. End Switch(config)#hostname S_Bucaramanga S_Bucaramanga(config-vlan)#vlan 10 S_Bucaramanga(config-vlan)#vlan 30 S_Bucaramanga(config-in)#witchport mode access S_Bucaramanga(config-if)#switchport mode trunk S_Bucaramanga(config-if)#switchport mode trunk S_Bucaramanga(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface changed state to up S_Bucaramanga(config-if)#int vlan 1 S_Bucaramanga(config-if)#in shutdown S_Bucaramanga(config-if)# %LINK-5-CHANGED: Interface Vlan1, changed state %LINEPROTO-5-UPDOWN: Line protocol on Interface state to up S_Bucaramanga(config-if)# %LINEPROTO-5-UPDOWN: Line protocol on Interface %LINEPROTO-5-UPDOWN: Line protocol on Interfa</pre>	10 30 FastEthern FastEthern 255.255.255 to up Vlanl, cha 31.2.1	L/Z. net0/1, net0/1, 5.248 anged	<
Ctrl+F6 to exit CLI focus	Сору	Paste	
] Тор			

Switch>enable

Switch#conf t

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

Switch(config)#hostname S_Bucaramanga

S_Bucaramanga(config)#vlan 1

- S_Bucaramanga(config-vlan)#vlan 10
- S_Bucaramanga(config-vlan)#vlan 30
- S_Bucaramanga(config-vlan)#int f0/20
- S_Bucaramanga(config-if)#switchport mode access
- S_Bucaramanga(config-if)#switchport access vlan 10
- S_Bucaramanga(config-if)#int f0/24
- S_Bucaramanga(config-if)#switchport mode access
- S_Bucaramanga(config-if)#switchport access vlan 30
- S_Bucaramanga(config-if)#int f0/1
- S_Bucaramanga(config-if)#switchport mode trunk
- S_Bucaramanga(config-if)#

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

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

- S_Bucaramanga(config-if)#int vlan 1
- S_Bucaramanga(config-if)#ip address 172.31.2.3 255.255.255.248
- S_Bucaramanga(config-if)#no shutdown
- S_Bucaramanga(config-if)#

%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

S_Bucaramanga(config-if)#ip default-gateway 172.31.2.1

S_Bucaramanga(config)#

Switch Tunja

I S_TUNJA − □	×
Physical Config CLI Attributes	
IOS Command Line Interface	
<pre>Switch>End State to up Switch>End State to up Switchfconf t Enter configuration commands, one per line. End with CNTL/2. Switch(config-vlan)#vlan 20 Switch(config-vlan)#vlan 30 Switch(config-vlan)#vlan 30 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 20 Switch(config-if)#switchport access vlan 30 Switch(config-if)#switchport access vlan 30 Switch(config-if)#switchport mode access Switch(config-if)#switchport mode trunk Switch(config-if)#switchport mode trunk Switch(config-if)#spint vlan 1 Switch(config-if)#spint vlan 1 Switch(config-if)#spint vlan 1 Switch(config-if)#spint vlan 1 Switch(config-if)#spint vlan 1, changed state to up %LINEFROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up Switch(config-if)#ip default-gateway 172.3.2.9 Switch(config)#</pre>	~
Ctrl+F6 to exit CLI focus Copy Paste	
Пор	

Switch>EN

Switch#conf t

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

Switch(config)#vlan 1

Switch(config-vlan)#vlan 20 Switch(config-vlan)#vlan 30 Switch(config-vlan)#int f0/20 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 20 Switch(config-if)#int f0/24 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 30 Switch(config-if)#int f0/1 Switch(config-if)#switchport mode trunk

Switch(config-if)#

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

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

Switch(config-if)#int vlan 1

Switch(config-if)#ip address 172.3.2.11 255.255.255.248

Switch(config-if)#no shutdown

Switch(config-if)#

%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Switch(config-if)#ip default-gateway 172.3.2.9 Switch(config)#

- 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.

BUCARAMANGA		_		\times
Physical Config CLI Att	tributes			
	IOS Command Line Interfa	ce		
Username: admi Password: Bucaramanga>en Password: Password: Bucaramanga‡conf t Enter configuration comm Bucaramanga(config) #serr Bucaramanga(config) #serr Bucaramanga(config) #line Bucaramanga(config) #line Bucaramanga(config) #line	mands, one per line. vice password-encryp vice password-encryp e console 0)#login block-for 5 attem	End with CNTL tion tion attempts 4 with pts 4 within 60	./Z. hin 60	~

R TUNJA	_		×
Physical Config CLI Attributes			
IOS Command Line Interface			
Press RETURN to get started!			^
Cuidado Acceso Restringido			
User Access Verification			
Username: admi Password: Tunja> en Password: Tunja#conf t Enter configuration commands, one per line. H Tunja(config)#service password-encryption Tunja(config)#Line console 0 Tunja(config)#Line console 0 Tunja(config)#login block-for 5 attempts Tunja(config)#login block-for 5 attempts 4 wit Tunja(config)#	End with CNTI 4 within 60 thin 60	./2.	~
Ctrl+F6 to exit CLI focus	Сору	Paste	

Real CUNDINAMARCA	_		\times
Physical Config CLI Attributes			
IOS Command Line Interface			
Username: admi Password: Cundinamarca>en Password: Cundinamarca#en Cundinamarca#conf t Enter configuration commands, one per line. E Cundinamarca(config)#service password-encrypti	nd with CNT) on	L/Z.	~
Cundinamarca(config) #login block-for 5 attempt Cundinamarca(config) #login block-for 5 attempt Cundinamarca(config) #	s 4 within (s 4 within (60 60	~
Ctrl+F6 to exit CLI focus	Сору	Paste	9

Servidor TFTP

WEB EXTERNO		- 🗆 ×
hysical Config	Services Desktop Programming Attributes	
SERVICES	^ TFTP	
нттр		0.0#
DHCP		
DHCPv6	File	^
TETP	asa842-k8.bin	
SYSLOG	asa923-k8 bin	
AAA	c1841-advinsen/cesk9-mz 124-15 T1 hin	
NTP	a1841 inbase mt 122 14 TZ bin	
EMAIL		
FTP	c 184 1-ipbasek5-mz. 124-12. bin	
IoT	c1900-universalk9-mz.SPA.155-3.M4a.bin	
VM Managemen	t c2600-advipservicesk9-mz.124-15.T1.bin	
Radius EAP	c2600-i-mz.122-28.bin	
	c2600-ipbasek9-mz.124-8.bin	
	c2800nm-advipservicesk9-mz.124-15.T1.bin	
	c2800nm-advipservicesk9-mz.151-4.M4.bin	
	c2800nm-ipbase-mz.123-14.T7.bin	
	c2800nm-ipbasek9-mz.124-8.bin	
	c2900-universalk9-mz.SPA.155-3.M4a.bin	
	c2950-i6q4l2-mz.121-22.EA4.bin	
	c2950-i6q4l2-mz.121-22.EA8.bin	
	c2960-lanbase-mz.122-25.FX.bin	
	2960 Janhaco mz 122 25 SEE1 hin	¥
		Remove File

Router Bucaramanga

```
🖗 BUCARAMANGA
                                                               Х
          Config _CLI Attributes
 Physical
                          IOS Command Line Interface
 Router>EN
 Router#Hostname Bucaramanga
 Router#conf t
 Enter configuration commands, one per line. End with CNTL/Z.
 Router(config) #Hostname Bucaramanga
 Bucaramanga(config)#no ip domain-lookup
 Bucaramanga(config) #banner motd #Cuidado Acceso Restringido#
 Bucaramanga (config) #enable secret class123
 Bucaramanga(config)#line console 0
 Bucaramanga (config-line) #password ciscol23
 Bucaramanga (config-line) #login
 Bucaramanga(config-line)#logging synchronous
 Bucaramanga(config-line)#line vty 0 15
 Bucaramanga(config-line) #password ciscol23
 Bucaramanga (config-line) #login
 Bucaramanga (config-line) #logging synchronous
 Bucaramanga (config-line) #int f0/0.1
 Bucaramanga (config-subif) #encapsulation dotlq 1
 Bucaramanga(config-subif) #ip address 172.31.2.1 255.255.248
 Bucaramanga (config-subif) #int f0/0.10
 Bucaramanga (config-subif) #encapsulation dotlg 10
 Bucaramanga(config-subif) #ip address 172.31.0.1 255.255.255.192
 Bucaramanga(config-subif)#int f0/0.30
 Bucaramanga (config-subif) #encapsulation dotlg 30
 Bucaramanga (config-subif) #ip address 172.31.0.65 255.255.255.192
 Bucaramanga(config-subif)#int f0/0
 Bucaramanga(config-if) #no shutdown
 Bucaramanga (config-if) #
  Bucaramanga(config-if)#int s0/0/0
 Bucaramanga(config-if)#ip address 172.31.2.34 255.255.255.252
 Bucaramanga(config-if)#no shutdown
  %LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
 Bucaramanga (config-if) #router ospf 1
  Bucaramanga(config-router)#network 172.31.0.0 0.0.0.63 area 0
 Bucaramanga(config-router)#network 172.31.0.64 0.0.0.63 area 0
 Bucaramanga(config-router)#network 172.31.2.0 0.0.0.7 area 0
 Bucaramanga (config-router) #network 172.31.2.32 0.0.0.3 area 0
  Bucaramanga (config-router) #end
  Bucaramanga#
  %SYS-5-CONFIG I: Configured from console by console
  Bucaramanga#
```

Router>EN Router#conf t Enter configuration commands, one per line. End with CNTL/Z. Router(config)#Hostname Bucaramanga

Bucaramanga(config)#no ip domain-lookup Bucaramanga(config)#banner motd #Cuidado Acceso Restringido# Bucaramanga(config)#enable secret class123 Bucaramanga(config)#line console 0 Bucaramanga(config-line)#password cisco123 Bucaramanga(config-line)#login Bucaramanga(config-line)#logging synchronous Bucaramanga(config-line)#line vty 0 15 Bucaramanga(config-line)#password cisco123 Bucaramanga(config-line)#login Bucaramanga(config-line)#logging synchronous Bucaramanga(config-line)#int f0/0.1 Bucaramanga(config-subif)#encapsulation dot1g 1 Bucaramanga(config-subif)#ip address 172.31.2.1 255.255.255.248 Bucaramanga(config-subif)#int f0/0.10 Bucaramanga(config-subif)#encapsulation dot1q 10 Bucaramanga(config-subif)#ip address 172.31.0.1 255.255.255.192 Bucaramanga(config-subif)#int f0/0.30 Bucaramanga(config-subif)#encapsulation dot1g 30 Bucaramanga(config-subif)#ip address 172.31.0.65 255.255.255.192 Bucaramanga(config-subif)#int f0/0 Bucaramanga(config-if)#no shutdown

Bucaramanga(config-if)# %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.30, changed state to up

Bucaramanga(config-if)#int s0/0/0 Bucaramanga(config-if)#ip address 172.31.2.34 255.255.255.252 Bucaramanga(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down Bucaramanga(config-if)#router ospf 1 Bucaramanga(config-router)#network 172.31.0.0 0.0.0.63 area 0 Bucaramanga(config-router)#network 172.31.0.64 0.0.0.63 area 0 Bucaramanga(config-router)#network 172.31.2.0 0.0.0.7 area 0 Bucaramanga(config-router)#network 172.31.2.32 0.0.0.3 area 0 Bucaramanga(config-router)#end Bucaramanga# %SYS-5-CONFIG_I: Configured from console by console

Bucaramanga#

Router Tunja

🥐 TUNJA — 🗆	×
Physical Config CLI Attributes	
IOS Command Line Interface	
Router>en Router#conf t Enter configuration commands, one per line. End with CNTL/Z. Router(config)#hostname Tunja TUNJAunja(config)#no ip domain-lookup TUNJAunja(config)#banner motd #Cuidado Acceso Restringido# TUNJAunja(config)#enable secret class123 TUNJAunja(config)#line console 0 TUNJAunja(config-line)#password ciscol23 TUNJAunja(config-line)#login TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#login TUNJAunja(config-line)#login TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#loging synchronous TUNJAunja(config-line)#loging synchronous TUNJAunja(config-subif)#encapsulation dotlq 1 TUNJAunja(config-subif)#encapsulation dotlq 1 TUNJAunja(config-subif)#int f0/0.20 TUNJAunja(config-subif)#int f0/0.20 TUNJAunja(config-subif)#int f0/0.20 TUNJAunja(config-subif)#int f0/0.30 TUNJAunja(config-subif)#int f0/0.30	

cisco. Cisco Networking Academy®

```
TUNJAunja(config-if)#int s0/0/0
TUNJAunja(config-if)#ip address 172.31.2.33 255.255.255.252
TUNJAunja(config-if)#no shutdown
TUNJAunja(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
TUNJAunja(config-if)#int s0/0/1
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up
TUNJAunja(config-if)#int s0/0/1
TUNJAunja(config-if)#ip address 172.31.2.37 255.255.255.252
TUNJAunja(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
TUNJAunja(config-if)#int f0/1
TUNJAunja(config-if)#ip address 209.165.220.1 255.255.255.0
TUNJAunja(config-if)#no shutdown
TUNJAunja (config-if) #
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
TUNJAunja(config-if) #router ospf 1
TUNJAunja(config-router)#network 172.3.2.8 0.0.0.7 area 0
TUNJAunja(config-router)#network 172.31.0.128 0.0.0.63 area 0
TUNJAunja(config-router) #network 172.31.0.192 0.0.0.63 area 0
TUNJAunja(config-router)#network 172.31.2.32 0.0.0.3 area 0
TUNJAunja(config-router)#network 172.31.2.36 0.0.0.3 area 0
TUNJAunja (config-router) #
00:05:52: %OSPF-5-ADJCHG: Process 1, Nbr 172.31.2.34 on
Serial0/0/0 from LOADING to FULL, Loading Done
TUNJAunja(config-router)#end
TUNJAunja#
SYS-5-CONFIG_I: Configured from console by console
TUNJAunja#
Ctrl+F6 to exit CLI focus
                                                  Copy
                                                               Paste
```

Router>en

Router#conf t

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

Router(config)#hostname TUNJAunja

TUNJAunja(config)#no ip domain-lookup

TUNJAunja(config)#banner motd #Cuidado Acceso Restringido#

TUNJAunja(config)#enable secret class123

TUNJAunja(config)#line console 0

TUNJAunja(config-line)#password cisco123 TUNJAunja(config-line)#login TUNJAunja(config-line)#logging synchronous TUNJAunja(config-line)#line vty 0 15 TUNJAunja(config-line)#password cisco123 TUNJAunja(config-line)#login TUNJAunja(config-line)#logging synchronous TUNJAunja(config-line)#int f0/0.1 TUNJAunja(config-subif)#encapsulation dot1q 1 TUNJAunja(config-subif)#ip address 172.3.2.9 255.255.255.248 TUNJAunja(config-subif)#int f0/0.20 TUNJAunja(config-subif)#encapsulation dot1q 20 TUNJAunja(config-subif)#ip address 172.31.0.129 255.255.255.192 TUNJAunja(config-subif)#int f0/0.30 TUNJAunja(config-subif)#encapsulation dot1q 30 TUNJAunja(config-subif)#ip address 172.31.0.193 255.255.255.192 TUNJAunja(config-subif)#int f0/0 TUNJAunja(config-if)#no shutdown

TUNJAunja(config-if)#

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.30, changed state to up

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

TUNJAunja(config-if)#ip address 172.31.2.33 255.255.255.252

TUNJAunja(config-if)#no shutdown

TUNJAunja(config-if)#

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

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

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

TUNJAunja(config-if)#int s0/0/1 TUNJAunja(config-if)#ip address 172.31.2.37 255.255.255.252 TUNJAunja(config-if)#no shutdown

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

TUNJAunja(config-if)#int f0/1

TUNJAunja(config-if)#ip address 209.165.220.1 255.255.255.0

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TUNJAunja(config-if)#no shutdown

TUNJAunja(config-if)#

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

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

TUNJAunja(config-if)#router ospf 1

TUNJAunja(config-router)#network 172.3.2.8 0.0.0.7 area 0

TUNJAunja(config-router)#network 172.31.0.128 0.0.0.63 area 0

TUNJAunja(config-router)#network 172.31.0.192 0.0.0.63 area 0

TUNJAunja(config-router)#network 172.31.2.32 0.0.0.3 area 0

TUNJAunja(config-router)#network 172.31.2.36 0.0.0.3 area 0

TUNJAunja(config-router)#

00:05:52: %OSPF-5-ADJCHG: Process 1, Nbr 172.31.2.34 on Serial0/0/0 from LOADING to FULL, Loading Done

TUNJAunja(config-router)#end

TUNJAunja#

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

TUNJAunja#

TUNJAunja#configure terminal

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

TUNJAunja(config)#hostname Tunja

Tunja(config)#

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

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

Router Cundinamarca

Physical Config <u>CLI</u> Attributes			
IOS Command Line Inte	erface		
Router>EN			1
Router#conf t			
Enter configuration commands, one per lir	ne. End with CN	FL/Z.	
Router(config)#hostname Cundinamarca			
Cundinamarca(config)#no ip domain-lookup			
Cundinamarca(config)#banner motd #Cuidado	Acceso Restring	gido#	
Cundinamarca(config)#enable secret class1	123		
Cundinamarca(config)#line console 0			
Cundinamarca(config-line)#password ciscol	12		
Cundinamarca(config-line)#login			
Cundinamarca(config-line)#logging synchro	onous		
Cundinamarca(config-line)#line vty 0 15			
Cundinamarca(config-line)#password ciscol	12		
Cundinamarca(config-line)#login			
Cundinamarca(config-line)#logging synchro	onous		
Cundinamarca(config-line)#int f0/0.1			
Cundinamarca(config-subif)#encapsulation	dotlq 1		
Cundinamarca(config-subif)#ip address 172	2.31.2.9 255.255	.255.248	
Cundinamarca (config-subif) #int f0/0.20	1		
Cundinamarca (config-subif) #encapsulation	dotig 20		
Cundinamarca(config-subif)#ip address 172	2.31.1.65 255.25	5.255.192	
Cundinamarca (config-subif) #int f0/0.30	dat 1 m 20		
Cundinamarca (config-subif) #encapsulation	dorid 30	255 102	
Cundinamarca(config_subit)#ip address 1/2	2.31.1.1 233.233	.255.192	
Cundinamarca (config-subit) #int 1070.00	dotlg 88		
Cundinamarca (config-subif) #encapsulation	00010 00 2 31 2 25 255 25	5 255 249	
Cundinamarca (config-subif) #ipt f0/0			
Cundinamarca (config-if) #no_shutdown			
Cundinamarca(config-if)#			
Cundinamarca(config-router)#network 172.3	31.1.0 0.0.0.63 a	area O	
Cundinamarca(config-router)#network 172.3	31.1.64 0.0.0.63	area O	
Cundinamarca(config-router)#network 172.3	31.2.8 0.0.0.7 an	rea O	ł
Cundinamarca(config-router)#network 172.3	31.2.24 0.0.0.7 a	area O	
Cundinamarca(config-router)#network 172.3	31.2.36 0.0.0.3 a	area O	
Cundinamarca(config-router)#end			
00:04:32: %OSPF-5-ADJCHG: Process 1, Nbr	209.165.220.1 or	1	
Serial0/0/0 from LOADING to FULL, Loading	g Done		
Cundinamarca(config-router)#end			
Cundinamarca#			
<pre>%SYS-5-CONFIG_I: Configured from console</pre>	by console		
Cundinamarca#			1

Router>EN Router#conf t Enter configuration commands, one per line. End with CNTL/Z. Router(config)#hostname Cundinamarca Cundinamarca(config)#no ip domain-lookup Cundinamarca(config)#banner motd #Cuidado Acceso Restringido# Cundinamarca(config)#enable secret class123 Cundinamarca(config)#line console 0 Cundinamarca(config-line)#password cisco12 Cundinamarca(config-line)#login Cundinamarca(config-line)#logging synchronous Cundinamarca(config-line)#line vty 0 15 Cundinamarca(config-line)#password cisco12 Cundinamarca(config-line)#login Cundinamarca(config-line)#logging synchronous Cundinamarca(config-line)#int f0/0.1 Cundinamarca(config-subif)#encapsulation dot1g 1 Cundinamarca(config-subif)#ip address 172.31.2.9 255.255.255.248 Cundinamarca(config-subif)#int f0/0.20 Cundinamarca(config-subif)#encapsulation dot1q 20 Cundinamarca(config-subif)#ip address 172.31.1.65 255.255.255.192 Cundinamarca(config-subif)#int f0/0.30 Cundinamarca(config-subif)#encapsulation dot1g 30 Cundinamarca(config-subif)#ip address 172.31.1.1 255.255.255.192 Cundinamarca(config-subif)#int f0/0.88 Cundinamarca(config-subif)#encapsulation dot1q 88 Cundinamarca(config-subif)#ip address 172.31.2.25 255.255.255.248

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Cundinamarca(config-subif)#int f0/0 Cundinamarca(config-if)#no shutdown

Cundinamarca(config-if)# %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.30, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.88, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.88, changed state to up

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

Cundinamarca(config-if)#ip address 172.31.2.38 255.255.255.252 Cundinamarca(config-if)#no shutdown

Cundinamarca(config-if)#

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

Cundinamarca(config-if)#router ospf 1

Cundinamarca(config-router)#

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

Cundinamarca(config-router)#network 172.31.1.0 0.0.0.63 area 0

Cundinamarca(config-router)#network 172.31.1.64 0.0.0.63 area 0

Cundinamarca(config-router)#network 172.31.2.8 0.0.0.7 area 0

Cundinamarca(config-router)#network 172.31.2.24 0.0.0.7 area 0

Cundinamarca(config-router)#network 172.31.2.36 0.0.0.3 area 0

Cundinamarca(config-router)#end

00:04:32: %OSPF-5-ADJCHG: Process 1, Nbr 209.165.220.1 on Serial0/0/0 from LOADING to FULL, Loading Done

Cundinamarca(config-router)#end

Cundinamarca#

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

Cundinamarca#

2. El DHCP deberá proporcionar solo direcciones a los hosts de Bucaramanga y Cundinamarca

💌 TUNJA – 🗆	\times
Physical Config CLI Attributes	
IOS Command Line Interface	
SEVE E CONFIG I, Configured from concele by concele	-
<pre>%SYS-5-CONFIG_I: Configured from console by console Tunja‡conf t Enter configuration commands, one per line. End with CNTL/Z. Tunja(config) #ip dhcp excluded-address 172.31.0.1 Tunja(config) #ip dhcp excluded-address 172.31.0.65 Tunja(config) #ip dhcp excluded-address 172.31.1.65 Tunja(config) #ip dhcp pool V10B Tunja(dhcp-config) #network 172.31.0.0 255.255.255.192 Tunja(dhcp-config) #default-router 172.31.0.1 Tunja(dhcp-config) #default-router 172.31.0.1 Tunja(dhcp-config) #ip dhcp pool V30B Tunja(dhcp-config) #network 172.31.0.64 255.255.255.192 Tunja(dhcp-config) #default-router 172.31.0.65 Tunja(dhcp-config) #default-router 172.31.0.65 Tunja(dhcp-config) #ip dhcp pool V20C Tunja(dhcp-config) #default-router 172.31.1.65 Tunja(dhcp-config) #default-router 172.31.1.65 Tunja(dhcp-config) #default-router 172.31.1.65 Tunja(dhcp-config) #default-router 172.31.1.65 Tunja(dhcp-config) #default-router 172.31.1.0 Tunja(dhcp-config) #default-router 172.31.1.0 Tunja(dhcp-config) #default-router 172.31.1.0 Tunja(dhcp-config) #default-router 172.31.1.1 Tunja(dhcp-config) #default-router 172.31.1.0 Tunja(dhcp-config) #default-router 172.31.1.1</pre>	~
Regeneration Research Regeneration Research Regeneration Research Regeneration Regeneration Regeneration Regeneration Regeneration Regeneration Reginal Region Reginal Regina Reginal Reginal Reginal	×
Physical Config <u>CLI</u> Attributes	
IOS Command Line Interface	
Username: admi Password: Bucaramanga>en Password: Password: Bucaramanga‡conf t Enter configuration commands, one per line. End with CNTL/Z. Bucaramanga(config) #int f0/0.10 Bucaramanga(config-subif) #ip helper-address 172.31.2.33 Bucaramanga(config-subif) #int f0/0.30 Bucaramanga(config-subif) #ip helper-address 172.31.2.33 Bucaramanga(config-subif) #ip helper-address 172.31.2.33 Bucaramanga(config-subif) #ip helper-address 172.31.2.33	^
Bucaramanga# %SYS-5-CONFIG_I: Configured from console by console Bucaramanga#	~

Recurdinamarca	_		\times
Physical Config CLI Attributes			
IOS Command Line Interface	e		
Username: admi Password: Cundinamarca>en Password: Password: Cundinamarca#conf t Enter configuration commands, one per line. Cundinamarca(config)#int f0/0.20 Cundinamarca(config-subif)#ip helper-address Cundinamarca(config-subif)#int f0/0.30 Cundinamarca(config-subif)#int f0/0.30 Cundinamarca(config-subif)#ip helper-address Cundinamarca(config-subif)#ip helper-address Cundinamarca(config-subif)#end Cundinamarca# %SYS-5-CONFIG_I: Configured from console by Cundinamarca#	End with CN 172.31.2.37 172.31.2.37 console	TL/Z.	~
Ctrl+F6 to exit CLI focus	Сору	Paste	•
🗌 Тор			

3. El web server deberá tener NAT estático y el resto de los equipos de la topología emplearan NAT de sobrecarga (PAT).

```
💌 CUNDINAMARCA
                                                                      \times
         Config <u>CLI</u> Attributes
 Physical
                          IOS Command Line Interface
  Cundinamarca(config-subif) #ip helper-address 172.31.2.37
  Cundinamarca(config-subif)#end
  Cundinamarca
  SYS-5-CONFIG I: Configured from console by console
  Cundinamarca#show ip route
  Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile,
  B - BGP
         D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter
  area
         N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
  type 2
         E1 - OSPF external type 1, E2 - OSPF external type 2, E -
  EGP
         i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia -
  IS-IS inter area
         * - candidate default, U - per-user static route, o - ODR
         P - periodic downloaded static route
  Gateway of last resort is not set
       172.3.0.0/29 is subnetted, 1 subnets
  0
          172.3.2.8 [110/65] via 172.31.2.37, 03:53:06, Serial0/0/0
       172.31.0.0/16 is variably subnetted, 11 subnets, 3 masks
          172.31.0.0/26 [110/129] via 172.31.2.37, 03:52:56,
  0
  Serial0/0/0
          172.31.0.64/26 [110/129] via 172.31.2.37, 03:52:56,
  0
  Serial0/0/0
          172.31.0.128/26 [110/65] via 172.31.2.37, 03:53:06,
  0
  Serial0/0/0
  0
          172.31.0.192/26 [110/65] via 172.31.2.37, 03:53:06,
  Serial0/0/0
  C
         172.31.1.0/26 is directly connected, FastEthernet0/0.30
  С
          172.31.1.64/26 is directly connected, FastEthernet0/0.20
  0
          172.31.2.0/29 [110/129] via 172.31.2.37, 03:52:56,
  Serial0/0/0
  С
          172.31.2.8/29 is directly connected, FastEthernet0/0.1
  С
          172.31.2.24/29 is directly connected, FastEthernet0/0.88
 0
         172.31.2.32/30 [110/128] via 172.31.2.37, 03:53:06,
  Serial0/0/0
 С
         172.31.2.36/30 is directly connected, Serial0/0/0
```

Physical Config CLI Attributes		
IOS Command Line Inte	erface	
		/
Cuidado Acceso Restringido		
User Access Verification		
Username: admi		
Password:		
Tunja>en		
Password:		
Tunja#conf t		
Enter configuration commands, one per lin	ne. End with CNTL/Z.	
Tunja(config)#ip dhcp pool Lan_A		
Tunja(dhcp-config) #p nat inside source st	atic 172.31.2.28	
209.165.220.4		
% Ambiguous command: "p nat inside source oog los oog 4"	static 172.31.2.28	
209.165.220.4"	0 0 0 255 255 255	
Tunja (config) #access-fist 1 permit 1/2.0.	.u.u u.200.200.200	
Tunja (config) #int f0/1	Interface 10/1 Overload	•
Tunja (config-if) #ip nat outside		
Tunja(config-if) #int f0/0.1		
Tunja(config-subif) #ip nat inside		
Tunja(config-subif)#int f0/0.20		
Tunja(config-subif)#ip nat inside		
Tunja(config-subif)#int f0/0.30		
Tunja(config-subif)#ip nat inside		
Tunja(config-subif)#int s0/0/0		
Tunja(config-if)#ip nat inside		
Tunja(config-if)#int s0/0/1		
Tunja(config-if)#ip nat inside		
Tunja(config-if) #exit		
	10 165 220 2	
Tunja(config)#ip route 0.0.0.0 0.0.0.0 20	9.165.220.5	

🖗 TUNJA \times Config CLI Attributes Physical IOS Command Line Interface Tunja#show ip route Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E -EGP i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia -IS-IS inter area * - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route Gateway of last resort is 209.165.220.3 to network 0.0.0.0 172.3.0.0/29 is subnetted, 1 subnets С 172.3.2.8 is directly connected, FastEthernet0/0.1 172.31.0.0/16 is variably subnetted, 11 subnets, 3 masks 0 172.31.0.0/26 [110/65] via 172.31.2.34, 03:59:41, Serial0/0/0 0 172.31.0.64/26 [110/65] via 172.31.2.34, 03:59:41, Serial0/0/0 172.31.0.128/26 is directly connected, FastEthernet0/0.20 C С 172.31.0.192/26 is directly connected, FastEthernet0/0.30 0 172.31.1.0/26 [110/65] via 172.31.2.38, 03:59:41, Serial0/0/1 0 172.31.1.64/26 [110/65] via 172.31.2.38, 03:59:41, Serial0/0/1 172.31.2.0/29 [110/65] via 172.31.2.34, 03:59:41, 0 Serial0/0/0 172.31.2.8/29 [110/65] via 172.31.2.38, 03:59:41, 0 Serial0/0/1 172.31.2.24/29 [110/65] via 172.31.2.38, 03:59:41, 0 Serial0/0/1 --More--

Real Cundin	AMARC	4		- 🗆	\times
Physical	Config	CLI	Attributes		
			IOS Cor	nmand Line Interface	
Cundinar	narca(co	onfig) #	int s0/0/	0 f authentication meggage_digest	
Cundinar	narca(co	onfig-i	if)#ip osp	f message-digest-key 1 md5 ciscol23	
Cundinar	narca(co	onfig-i	(f)#		\sim

4. El enrutamiento deberá tener autenticación.

BUCARA	MANGA					-		>
Physical	Config	CLI	Attributes					
			100.0					
Usernam	e: admi							
Passwor	i:							
Bucarama	anga>en							
Passwor	1:							
Bucarama	anga#con	if t						
Enter co	onfigura	tion	commands,	one per line.	End with	h CNTI	L/Z.	
Bucarama	anga (con	fig)#	int s0/0/0)				
Bucarama	anga (con	fig-i	f)#ip ospf	f authenticati	on message	e-dige	est	
	anga (con	fig-i	f)#ip ospf	f message-dige	st-key l ı	nd5 c:	iscol23	
Bucarama								

TUNJA				—		\times
Physical Config CLI	Attributes					
	IOS Com	mand Line Interfa	ace			
						^
Cuidado Acceso Rest:	ringido					
User Access Verifica	ation					
Username: admi						
Password:						
Tunja>en						
Password:						
Iunja#coni t	commande o	ne ner line	End wit	b CMTT	17	
Tunia (config) #int s(0/0/0	me per rine.	. End with	II CNII	./ 2 .	
Tunja (config-if) #ip	ospf auther	tication mes	ssage-dige	st		
Tunja(config-if)#ip	ospf messad	e-digest-key	/ 1 md5 ci	scol23	3	
Tunja(config-if)#						
04:30:45: %OSPF-5-AI	DJCHG: Proce	ss 1, Nbr 17	72.31.2.34	on		
Serial0/0/0 from LOA	ADING to FUI	L, Loading I	Done			
Tunja(config-if)#int	t s0/0/1					
Tunja(config-if)#ip	ospf auther	tication mea	ssage-dige	st		
Tunia(config-if)#in	ospf messao	e-digest-key	/ 1 md5 ci	sco123	1	

- 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.

CUNDII	NAMARCA	4			_		\times
Physical	Config	CLI	Attributes				
			IOS Cor	mmand Line Interface			
Cundina Cundina 0.0.0.6 Cundina Cundina Cundina Cundina	marca(co marca(co 3 209.16 marca(co marca(co marca(co marca(co	nfig-i nfig-s 5.220. nfig) nfig) nfig-s nfig-s	lf) #int f0 subif) #acc .0 0.0.0.2 #access-li #int f0/0. subif) #ip subif) #	0/0.20 cess-list 112 pe 55 st 112 deny ip 30 access-group 11	rmit ip 172. any any 2 in	31.1.0	~

 Los hosts de VLAN 30 en Tunja solo acceden a servidores web y ftp de internet.

d	¹ TUNJA – 🗆	ı ×
	Physical Config CLI Attributes	
	IOS Command Line Interface	
	Tunja(config) #access-list 111 permit tcp 172.31.0.192 0.0.0.63	3
	Tunja(config)#access-list 111 permit tcp 172.31.0.192 0.0.0.63 209.165.220.0 0.0.0.255 eq 21	3
	Tunja(config) #access-list 111 permit tcp 172.31.0.192 0.0.0.63	3
	209.165.220.0 0.0.0.255 eq 2 Tunja(config)#int f0/0.30	
	Tunja(config-subif)#ip access-group 111 in	
	Tunja (config-subif) #	~

• 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.

R BUCAR	AMANGA	L.				_	×
Physical	Config	CLI	Attributes				
			IOS Cor	mmand Line Interfa	ace		
Bucaram Bucaram 0.0.0.6 Bucaram Bucaram Bucaram	anga (con anga (con 3 209.10 anga (con anga (con anga (con	nfig-i: nfig)# 65.220 nfig)# nfig-su	f)#exit access-lis .0 0.0.0.2 int f0/0.3 ubif)#ip a ubif)#	st 111 permit 255 30 access-group 1	ip 172.3 111 in	31.0.64	~

 Los hosts de VLAN 10 en Bucaramanga acceden a la red de Cundinamarca (VLAN 20) y Tunja (VLAN 20), no internet.

R BUCARAMANGA	—		\times			
Physical Config CLI Attributes						
IOS Command Line Interface						
IOS Command Line Interface Bucaramanga (config-subif) #ip access-group 111 in Bucaramanga (config-subif) #access-list 112 permit ip 172.31.0.0 0.0.0.63 172.31.1.64 0.0.0.63 Bucaramanga (config) #access-list 112 permit ip 172.31.0.0 0.0.0.63 Bucaramanga (config) #access-list 112 permit ip 172.31.0.0 0.0.0.63 172.31.0.128 0.0.0.63 Bucaramanga (config) #int f0/0.10 Bucaramanga (config-subif) #ip access-group 112 in Bucaramanga (config-subif) #ip						
Ctrl+F6 to exit CLI focus	Сору	Paste				

 Los hosts de una VLAN no pueden acceder a los de otra VLAN en una ciudad.



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R CUNDINAMARCA -	\times
Physical Config CLI Attributes	
IOS Command Line Interface	
Cundinamarca(config)#access-list 113 deny ip 172.31.2.8 0.0.0.7 172.31.1.64 0.0.0.63	
Cundinamarca(config)#access-list 113 deny ip 172.31.1.0 0.0.0.63 172.31.1.64 0.0.0.63	
Cundinamarca(config)#access-list 113 deny ip 172.31.2.24 0.0.0.7 172.31.1.64 0.0.0.63	
Cundinamarca(config) #access-list 113 permit ip any any Cundinamarca(config) #int f0/0.20	
Cundinamarca(config-subif)#ip access-group 113 out Cundinamarca(config-subif)#	~

 Solo los hosts de las VLAN administrativas y de la VLAN de servidores tienen accedo a los routers e internet.



RUNJA				_		\times
Physical	Config C	LI Attributes				
		IOS Cor	mmand Line Interface			
Tunja(c Tunja(c Tunja(c Tunja(c Tunja(c	onfig-subif onfig)#acce onfig)#acce onfig)#line onfig-line)	E)#access-lis ess-list 3 pe ess-list 3 pe e vty 0 15 #access-clas	st 3 permit 172.31 ermit 172.3.2.8 0. ermit 172.31.2.8 0 ss 3 in	2.0 0.0.0. 0.0.7 0.0.0.7	7	
Tunja (c	onfig-line)	#				\sim

Recurdinamarca	_		×		
Physical Config CLI Attributes					
IOS Command Line Interface					
Cundinamarca (config) #access-list 3 permit 172.3.2.8 0.0.0.7 Cundinamarca (config) #access-list 3 permit 172.31.2.8 0.0.0.7 Cundinamarca (config) #line vty 0 15 Cundinamarca (config-line) #access-class 3 in Cundinamarca (config-line) #					
Ctrl+F6 to exit CLI focus	Сору	Past	e		

6. CONCLUSIONES

Con el desarrollo de este trabajo de manera general nos permitió conocer y desarrollar cada una de las temática, resaltar la importancia que tienen las redes a nivel global y en cada ámbito específico. Se desarrollan las competencias básicas que nos permiten llevar a cabo los procesos de configuración y administración de dispositivos de Networking mediante el estudio de los modelos OSI, la arquitectura TCP/IP además, del uso de recursos y herramientas en función de los protocolos y servicios

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