TEC | Tecnológico de Costa Rica

REDES

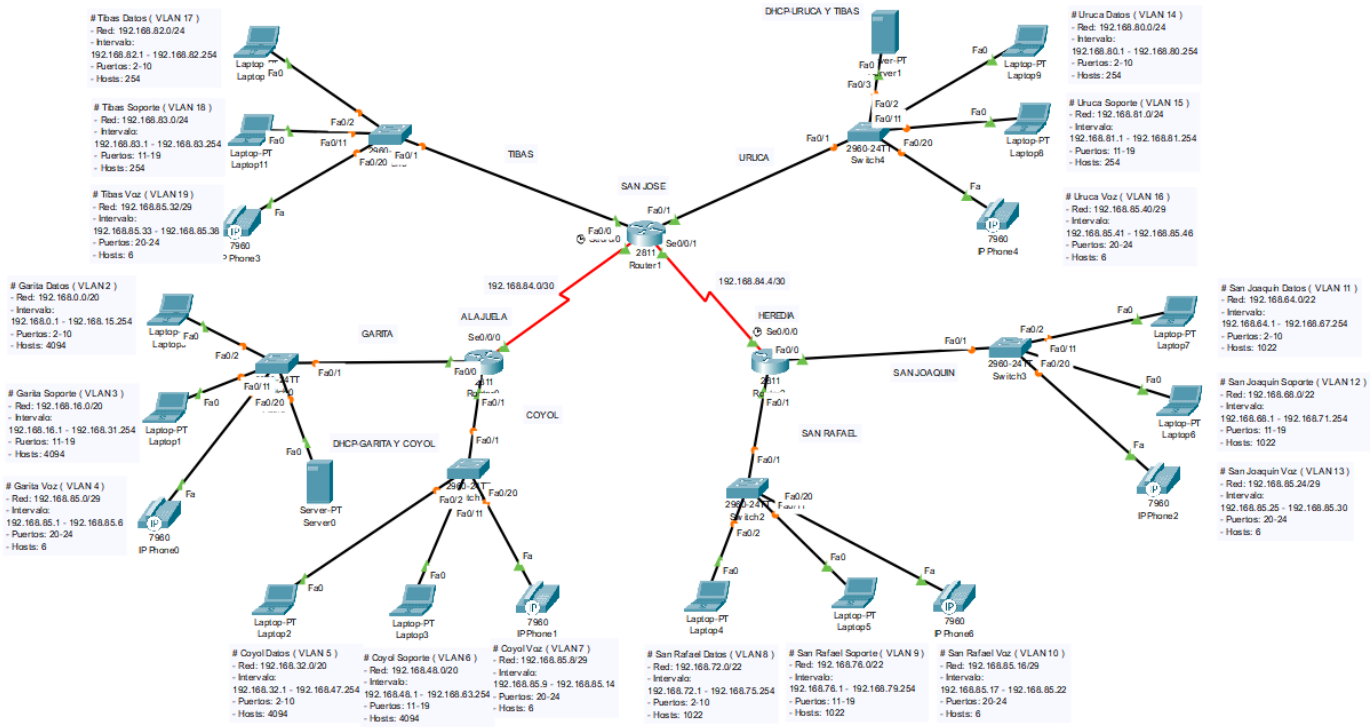
PROYECTO 2

Stasey Nerdrick Carvajal - 2017124886
Carlos Rojas Fuentes - 2015113897

I Semestre del año 2022

Tabla de Contenidos

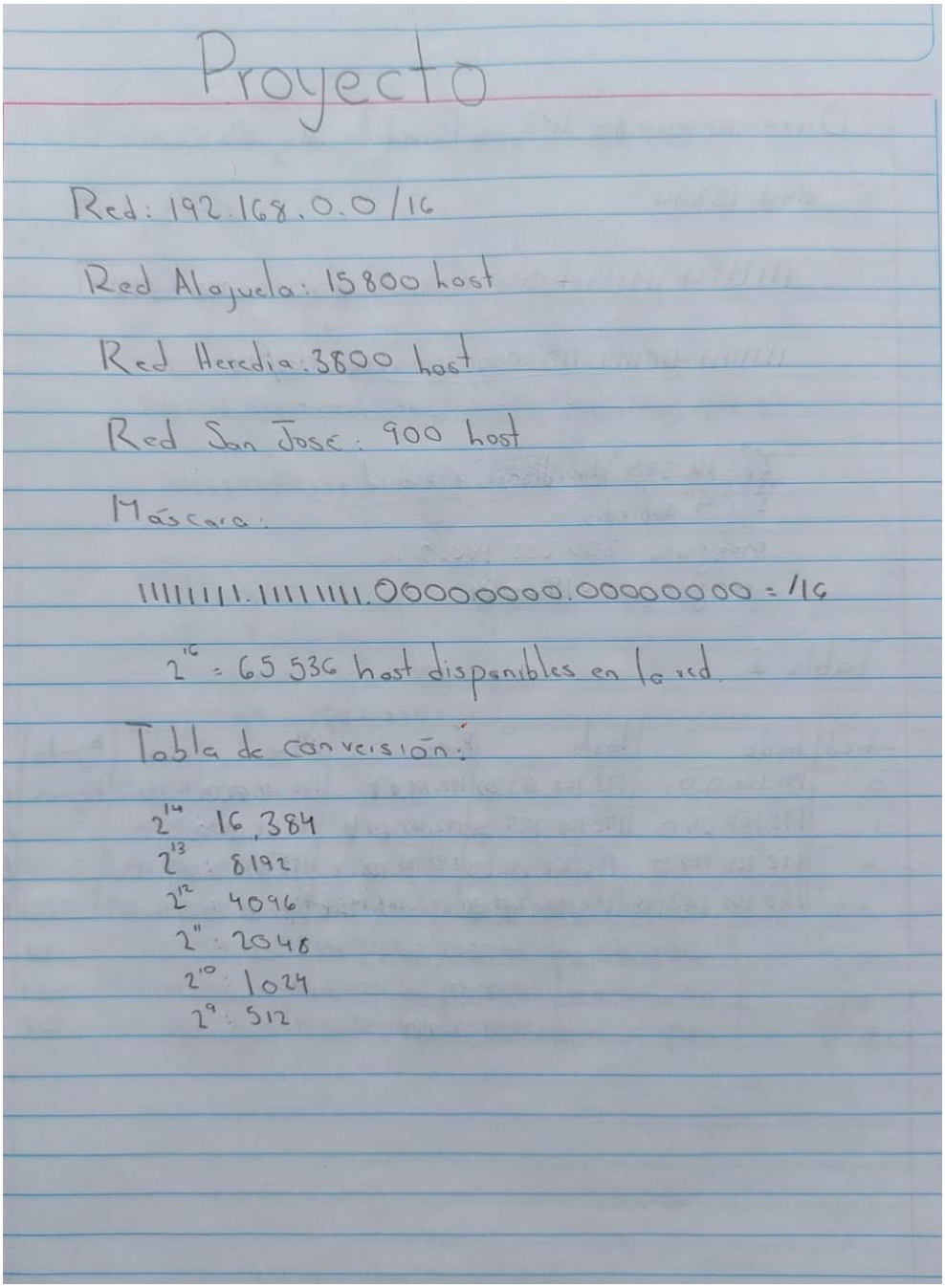
Diseño de la Red



Selección de IP

Se selecciono la ip 192.168.0.0/16 debido a que esta ip es utilizada para redes pequeñas normalmente debido a que es de clase C.

Proceso de Subneteo



Proyecto

Red: 192.168.0.0/16

Red Alajuela: 15800 host

Red Heredia: 3800 host

Red San Jose: 900 host

Máscara:

11111111.11111111.00000000.00000000 = /16

2^{16} = 65 536 host disponibles en la red

Tabla de conversión:

2^{14} 16,384
2^{13} 8192
2^{12} 4096
2^{11} 2048
2^{10} 1024
2^{9} 512

Direccionamiento IP para la red de Alajuela:

Host. 15800

11111111.11111111.00000000.00000000 = /16

11111111.11111111.11000000.00000000 = /16

2^{14}: 16,384 direcciones x subred

2^{2}: 4 subredes.

mascara: 255.255.192.0

rango: 256 - 192 = 64

Tabla I

subred	desde	hasta	Primero	Ultimo	direcciones x subred	Asignado	
0	192.168.0.0	192.168.63.255	192.168.0.1	192.168.63.254	16,384	Alajuela	/18
1	192.168.64.0	192.168.127.255	192.168.64.1	192.168.127.254	16,384	-	/18
2	192.168.128.0	192.168.191.255	192.168.128.1	192.168.191.254	16,384	-	/18
3	192.168.192.0	192.168.255.255	192.168.192.1	192.168.255.254	16,384	-	/18

Dirección IP para la red de heredia:

Host 3800

Se utilizará la subred 1 de la tabla 1:

192.168.64.0/18

11111111.11111111.11000000.00000000 = /18

12 para host

11111111.11111111.11[11]0000.00000000 = /20

2 para subred

2^{12} = 4096 direcciones x subred

2^2 = 4 subredes

mascara: 255.255.240.0

rango: 256 - 240 = 16

Tabla 2.

Subred	desde	hasta	Primero	Ultimo	direcciones x subred	Asignado	
1.0	192.168.64.0	192.168.79.255	192.168.64.1	192.168.79.254	4096	Heredia	/20
1.1	192.168.80.0	192.168.95.255	192.168.80.1	192.168.95.254	4096	-	/20
1.2	192.168.96.0	192.168.111.255	192.168.96.1	192.168.111.254	4096	-	/20
1.3	192.168.112.0	192.168.127.255	192.168.112.1	192.168.127.254	4096	-	/20

Dirección IP para la red de San José.

Host: 900

Se utilizará la subred d.1 de la tabla 2:
192.168.80.0/20

11111111.11111111.11110000.00000000 = /20

2 para subred

11111111.11111111.11110000.00000000 /22

10 para host

2^{10} = 1024 direcciones x subred

2^2 = 4 subredes

máscara = 255.255.252.0 =

rango = 256 - 252 = 4

Tabla 3.

Subred	desde	hasta	Primero	ultimo	direcciones x subred	Asignadas	
1.1.0	192.168.80.0	192.168.83.255	192.168.80.1	192.168.83.254	1024	San José	/22
1.1.1	192.168.84.0	192.168.87.255	192.168.84.1	192.168.87.254	1024	-	/22
1.1.2	192.168.88.0	192.168.91.255	192.168.88.1	192.168.91.254	1024	-	/22
1.1.3	192.168.92.0	192.168.95.255	192.168.92.1	192.168.95.254	1024	-	/22

Direcciones de enlace:

Se utilizará la subred 1.1.1 de la tabla 3:

192.168.84.0/22

11111111.11111111.111111 00.00000000 = /22

11111111.11111111.11111111.00000000 = /24

(8 para host; 2 para subred)

$2^8 = 256$ direcciones x subred

$2^2 = 4$ subredes.

máscara = 255.255.255.

rango = 256 - 255 = 1

Tabla 4

Subred	desde	hasta	Primero	ultimo	direcciones x subred	Asignada	
1.1.1.0	192.168.84.0	192.168.84.255	192.168.84.1	192.168.84.254	256	-	/24
1.1.1.1	192.168.85.0	192.168.85.255	192.168.85.1	192.168.85.254	256	-	/24
1.1.1.2	192.168.86.0	192.168.86.255	192.168.86.1	192.168.86.254	256	-	/24
1.1.1.3	192.168.87.0	192.168.87.255	192.168.87.1	192.168.87.254	256	-	/24

Se utilizará la red 192.168.84.0/24 de la tabla 4.

11111111.11111111.111111.00000000 = /24

2 para host

11111111.11111111.11111111.111111 00 = /30

6 para subred

2^2 : 4 direcciones x subred

2^6 : 64 subredes.

mascara: 255.255.255.252

range: 256 - 252 = 4

Tabla 5

subred	Desde	hasta	Primero	Ultimo	direcciones x subred	Asignada	
1.1.1.0.0	192.168.84.0	192.168.84.3	192.168.84.1	192.168.84.2	4	Enlace1	/30
1.1.1.0.1	192.168.84.4	192.168.84.7	192.168.84.5	192.168.84.6	4	Enlace2	/30
1.1.1.0.2	192.168.84.8	192.168.84.11	192.168.84.9	192.168.84.10	4	-	/30
...	...	...	...	...	...	-	/30
...	...	...	...	...	...	-	
...	...	...	...	...	...	-	
1.1.1.0.63	192.168.84.252	192.168.84.255	192.168.84.253	192.168.84.254	4	-	/30

Red Alajuela

Red: 192.168.0.0/18

Subred 1 = 4000 host → Garita Datos
Subred 2 = 4000 host → Garita Soporte
Subred 3 = 4000 host → Coyol Soporte
Subred 4 = 3800 host → Coyol Datos

Máscara:

11111111.11111111.11000000.00000000 = /18

16,384 direcciones x subred

Tabla de conversión:

$2^{12} = 4096$
$2^{11} = 2048$

Direccionamiento IP para la subred 1:

Host 4000

12 para host

11111111.11111111.1111 0000.00000000 = /20

2 para subred

$2^{12} = 4096$ direcciones x subred
$2^{2} = 4$ subred
máscara: 255.255.240.0
rango: 256 - 240 = 16

Tabla 6:

subred	desde	hasta	Primero	último	direcciones subred	Asignada	
0.0	192.168.0.0	192.168.15.255	192.168.0.1	192.168.15.254	4096	subred 1	/20
0.1	192.168.16.0	192.168.31.255	192.168.16.1	192.168.33.254	4096	subred 2	/20
0.2	192.168.32.0	192.168.47.255	192.168.32.1	192.168.47.254	4096	subred 3	/20
0.3	192.168.48.0	192.168.63.255	192.168.48.1	192.168.63.254	4096	subred 4	/20

Red Heredia.

Red: 192.168.64.0/20

subred 1: 1000 host → Datos San Joaquin
subred 2: 1000 host → Soporte SJ
subred 3: 1000 host → Datos SR
subred 4: 800 host → Soporte SR

Mascara:
11111111.11111111.11110000.00000000 = /20
4096 host

Tabla de conversión:

2^{10}: 1024
2^9: 512.

Direccionamiento IP para la subred 1:

Host 1000

10 para host

11111111.11111111.111111**00**.00000000 = /22

2 para subred

2^{10} = 1024 direcciones X subred

2^2 = 4 subredes

máscara: 255.255.252.0

Rango: 256 - 252 = 4

Tabla 7

Subred	desde	hasta	Primero	Ultimo	direcciones x subred	Asignado
1.0.0	192.168.64.0	192.168.67.255	192.168.64.1	192.168.67.254	1024	Subred 1
1.0.1	192.168.68.0	192.168.71.255	192.168.68.1	192.168.71.254	1024	Subred 2
1.0.2	192.168.72.0	192.168.75.255	192.168.72.1	192.168.75.254	1024	Subred 3
1.0.3	192.168.76.0	192.168.79.255	192.168.76.1	192.168.79.254	1024	Subred 4

Red San José:

Red. 192.168.80.0/22

Subred 1: 250 host → Datos Uruca
Subred 2: 250 host → Soporte Uruca
Subred 3: 200 host → Datos Tibás
Subred 4: 200 host → Soporte Tibás

Máscara.

11111111.11111111.11111100.00000000 = /22

1024 host

Tabla Conversión.

2^9: 512
2^8: 256

Direccionamiento IP para la subred 1:

Host: 250

11111111.11111111.111111**11**.**00000000** = /24

2 para subred

8 para host

2^8: 256 direcciones x subred
2^2: 4 subredes
máscara: 255.255.255.0
rango: 256 - 255 = 1

Tabla 8:

Subred	desde	hasta	primero	ultimo	direcciones subred	Asignada
1.1.0.0	192.168.80.0	192.168.80.255	192.168.80.1	192.168.80.254	256	Subred 1
1.1.0.1	192.168.81.0	192.168.81.255	192.168.81.1	192.168.81.254	256	Subred 2
1.1.0.2	192.168.82.0	192.168.82.255	192.168.82.1	192.168.82.254	256	Subred 3
1.1.0.3	192.168.83.0	192.168.83.255	192.168.83.1	192.168.83.254	256	Subred 4

Tabla completa

Subred	Desde	Hasta	Primero	Ultimo	Direcciones x Subred	Asignada	
0.0	192.168.0.0	192.168.15.255	192.168.0.1	192.168.15.254	4096	GaritaDatos	/20
0.1	192.168.16.0	192.168.31.255	192.168.16.1	192.168.31.254	4096	GaritaSoporte	/20
0.2	192.168.32.0	192.168.47.255	192.168.32.1	192.168.47.254	4096	CoyolSoporte	/20
0.3	192.168.48.0	192.168.63.255	192.168.48.1	192.168.63.254	4096	CoyolDatos	/20
1.0.0	192.168.64.0	192.168.67.255	192.168.64.1	192.168.67.254	1024	DatosSJ	/22
1.0.1	192.168.68.0	192.168.71.255	192.168.68.1	192.168.71.254	1024	SoporteSJ	/22
1.0.2	192.168.72.0	192.168.75.255	192.168.72.1	192.168.75.254	1024	DatosSR	/22
1.0.3	192.168.76.0	192.168.79.255	192.168.76.1	192.168.79.254	1024	SoporteSR	/22
1.1.0.0	192.168.80.0	192.168.80.255	192.168.80.1	192.168.80.254	256	DatosUruca	/24
1.1.0.1	192.168.81.0	192.168.81.255	192.168.81.1	192.168.81.254	256	SoporteUruca	/24
1.1.0.2	192.168.82.0	192.168.82.255	192.168.82.1	192.168.82.254	256	DatosTibas	/24
1.1.0.3	192.168.83.0	192.168.83.255	192.168.83.1	192.168.83.254	256	SoporteTibas	/24
1.1.1.0.0	192.168.84.0	192.168.84.3	192.168.84.1	192.168.84.2	4	Enlace 1	/30
1.1.1.0.1	192.168.84.4	192.168.84.7	192.168.84.5	192.168.84.6	4	Enlace 2	/30
1.1.1.0.2	192.168.84.8	192.168.84.11	192.168.84.9	192.168.84.10	4	Servers	/30
…	…	…	…	…	4	-	/30
1.1.1.0.63	192.168.84.252	192.168.84.255	192.168.84.253	192.168.84.254	4	-	/30
1.1.1.1.0	192.168.85.0	192.168.85.7	192.168.85.1	192.168.85.6	8	Voz Garita	/29
1.1.1.1.1	192.168.85.8	192.168.85.15	192.168.85.9	192.168.85.14	8	Voz Coyol	/29

1.1.1.1.2	192.168.85.16	192.168.85.23	192.168.85.17	192.168.85.22	8	Voz San Raf.	/29
1.1.1.1.3	192.168.85.24	192.168.85.31	192.168.85.25	192.168.85.30	8	Voz San Joa.	/29
1.1.1.1.4	192.168.85.32	192.168.85.39	192.168.85.33	192.168.85.38	8	Voz Tibás	/29
1.1.1.1.5	192.168.85.40	192.168.85.47	192.168.85.41	192.168.85.46	8	Voz Uruca	/29
…	…	…	…	…	8	-	/29
…	…	…	…	…	8	-	/29
1.1.1.1.31	192.168.85.248	192.168.85.255	192.168.85.249	192.168.85.254	8	-	/29
1.1.1.2	192.168.86.0	192.168.86.255	192.168.86.1	192.168.86.254	256	-	/24
1.1.1.3	192.168.87.0	192.168.87.255	192.168.87.1	192.168.87.254	256	-	/24
1.1.2	192.168.88.0	192.168.91.255	192.168.88.1	192.168.91.254	1024	-	/22
1.1.3	192.168.92.0	192.168.95.255	192.168.92.1	192.168.95.254	1024	-	/22
1.2	192.168.96.0	192.168.111.255	192.168.96.1	192.168.111.254	4096	-	/20
1.3	192.168.112.0	192.168.127.255	192.168.112.1	192.168.127.254	4096	-	/20
2	192.168.128.0	192.168.191.255	192.168.128.1	192.168.191.254	16,834	-	/18
3	192.168.192.0	192.168.255.255	192.168.192.1	192.168.255.254	16,834	-	/18

Show Run Router

Router Alajuela

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

ALAJUELA(config)#do sh run

Building configuration...

Current configuration : 2689 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname ALAJUELA

!

!

!

enable password cisco

!

!

!

!

!

!

no ip cef

no ipv6 cef

!

!

!

!

license udi pid CISCO2811/K9 sn FTX1017F4LK-

```
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/0.2
 encapsulation dot1Q 2
 ip address 192.168.0.1 255.255.240.0
!
interface FastEthernet0/0.3
 encapsulation dot1Q 3
 ip address 192.168.16.1 255.255.240.0
 ip helper-address 192.168.0.2
!
interface FastEthernet0/0.4
```

```
 encapsulation dot1Q 4
 ip address 192.168.85.1 255.255.255.248
 ip helper-address 192.168.0.2
!
interface FastEthernet0/0.5
 no ip address
 shutdown
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/1.5
 encapsulation dot1Q 5
 ip address 192.168.32.1 255.255.240.0
 ip helper-address 192.168.0.2
 ip access-group 101 in
!
interface FastEthernet0/1.6
 encapsulation dot1Q 6
 ip address 192.168.48.1 255.255.240.0
 ip helper-address 192.168.0.2
 ip access-group 102 in
!
interface FastEthernet0/1.7
 encapsulation dot1Q 7
 ip address 192.168.85.9 255.255.255.248
 ip helper-address 192.168.0.2
!
interface Serial0/0/0
 ip address 192.168.84.2 255.255.255.252
!
```

```
interface Serial0/0/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.168.0.0 0.0.15.255 area 0
 network 192.168.84.0 0.0.0.3 area 0
 network 192.168.16.0 0.0.15.255 area 0
 network 192.168.32.0 0.0.15.255 area 0
 network 192.168.48.0 0.0.15.255 area 0
!
ip classless
!
ip flow-export version 9
!
!
access-list 101 deny tcp 192.168.32.0 0.0.15.255 192.168.80.0 0.0.0.255 eq ftp
access-list 101 permit ip any any
access-list 102 deny tcp 192.168.48.0 0.0.15.255 192.168.80.0 0.0.0.255 eq ftp
access-list 102 permit ip any any
!
no cdp run
!
!
!
!
!
```

```
!
dial-peer voice 1 voip
 destination-pattern 50.
 session target ipv4:192.168.84.1
!
dial-peer voice 2 voip
 destination-pattern 60.
 session target ipv4:192.168.84.1
!
dial-peer voice 3 voip
 destination-pattern 30.
 session target ipv4:192.168.84.6
!
dial-peer voice 4 voip
 destination-pattern 40.
 session target ipv4:192.168.84.6
!
telephony-service
 max-ephones 10
 max-dn 10
 ip source-address 192.168.85.9 port 2000
!
ephone-dn 1
 number 100
!
ephone-dn 2
 number 200
!
ephone 1
 device-security-mode none
 mac-address 00D0.BC46.777A
 type 7960
 button 1:1
```

```
!
ephone 2
 device-security-mode none
 mac-address 0002.1621.4964
 type 7960
 button 1:2
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
End
```

Router San Jose

Current configuration : 2734 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname SANJOSE

!

!

!

enable password cisco

!

!

!

!

!

!

no ip cef

no ipv6 cef

!

!

!

!

license udi pid CISCO2811/K9 sn FTX1017K0DA-

!

!

!

!

!

!

```
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/0.17
 encapsulation dot1Q 17
 ip address 192.168.82.1 255.255.255.0
 ip helper-address 192.168.80.2
 ip access-group 101 in
!
interface FastEthernet0/0.18
 encapsulation dot1Q 18
 ip address 192.168.83.1 255.255.255.0
 ip helper-address 192.168.80.2
 ip access-group 102 in
!
interface FastEthernet0/0.19
 encapsulation dot1Q 19
 ip address 192.168.85.33 255.255.255.248
 ip helper-address 192.168.80.2
```

```
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/1.14
 encapsulation dot1Q 14
 ip address 192.168.80.1 255.255.255.0
 ip helper-address 192.168.80.2
!
interface FastEthernet0/1.15
 encapsulation dot1Q 15
 ip address 192.168.81.1 255.255.255.0
 ip helper-address 192.168.80.2
!
interface FastEthernet0/1.16
 encapsulation dot1Q 16
 ip address 192.168.85.41 255.255.255.248
 ip helper-address 192.168.80.2
!
interface Serial0/0/0
 ip address 192.168.84.1 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 ip address 192.168.84.5 255.255.255.252
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 1
```

```
 log-adjacency-changes
 network 192.168.84.0 0.0.0.3 area 0
 network 192.168.82.0 0.0.0.255 area 0
 network 192.168.83.0 0.0.0.255 area 0
 network 192.168.80.0 0.0.0.255 area 0
 network 192.168.81.0 0.0.0.255 area 0
 network 192.168.84.4 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
!
access-list 101 deny tcp 192.168.82.0 0.0.0.255 192.168.0.0 0.0.15.255 eq www
access-list 101 permit ip any any
access-list 102 deny tcp 192.168.83.0 0.0.0.255 192.168.0.0 0.0.15.255 eq www
access-list 102 permit ip any any
!
no cdp run
!
!
!
!
!
!
dial-peer voice 1 voip
 destination-pattern 30.
 session target ipv4:192.168.84.6
!
dial-peer voice 2 voip
 destination-pattern 40.
 session target ipv4:192.168.84.6
!
```

```
dial-peer voice 3 voip
 destination-pattern 10.
 session target ipv4:192.168.84.2
!
dial-peer voice 4 voip
 destination-pattern 20.
 session target ipv4:192.168.84.2
!
telephony-service
 max-ephones 10
 max-dn 10
 ip source-address 192.168.85.33 port 2000
!
ephone-dn 1
 number 500
!
ephone-dn 2
 number 600
!
ephone 1
 device-security-mode none
 mac-address 0040.0BDA.0A5A
 type 7960
 button 1:1
!
ephone 2
 device-security-mode none
 mac-address 0060.2F5B.82A6
 type 7960
 button 1:2
!
line con 0
!
```

line aux 0

!

line vty 0 4

login

!

!

!

End

Router Heredia

Current configuration : 3205 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname HEREDIA

!

!

!

enable password cisco

!

!

ip dhcp excluded-address 192.168.64.1

ip dhcp excluded-address 192.168.68.1

ip dhcp excluded-address 192.168.72.1

ip dhcp excluded-address 192.168.76.1

ip dhcp excluded-address 192.168.85.25

ip dhcp excluded-address 192.168.85.17

!

ip dhcp pool SJDATOS

```
 network 192.168.64.0 255.255.252.0
 default-router 192.168.64.1
 option 150 ip 192.168.64.1
ip dhcp pool SJSOPORTE
 network 192.168.68.0 255.255.252.0
 default-router 192.168.68.1
 option 150 ip 192.168.68.1
ip dhcp pool SFDATOS
 network 192.168.72.0 255.255.252.0
 default-router 192.168.72.1
 option 150 ip 192.168.72.1
ip dhcp pool SFSOPORTE
 network 192.168.76.0 255.255.252.0
 default-router 192.168.76.1
 option 150 ip 192.168.76.1
 domain-name wr
ip dhcp pool SJVOZ
 network 192.168.85.24 255.255.255.248
 default-router 192.168.85.25
 option 150 ip 192.168.85.25
 domain-name wr
ip dhcp pool SFVOZ
 network 192.168.85.16 255.255.255.248
 default-router 192.168.85.17
 option 150 ip 192.168.85.17
 domain-name wr
!
!
!
no ip cef
no ipv6 cef
!
!
```

```
!
!
license udi pid CISCO2811/K9 sn FTX1017A6B0-
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/0.11
 encapsulation dot1Q 11
 ip address 192.168.64.1 255.255.252.0
!
interface FastEthernet0/0.12
 encapsulation dot1Q 12
 ip address 192.168.68.1 255.255.252.0
```

```
!
interface FastEthernet0/0.13
 encapsulation dot1Q 13
 ip address 192.168.85.25 255.255.255.248
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/1.8
 encapsulation dot1Q 8
 ip address 192.168.72.1 255.255.252.0
!
interface FastEthernet0/1.9
 encapsulation dot1Q 9
 ip address 192.168.76.1 255.255.252.0
!
interface FastEthernet0/1.10
 encapsulation dot1Q 10
 ip address 192.168.85.17 255.255.255.248
!
interface Serial0/0/0
 ip address 192.168.84.6 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
```

```
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.168.84.4 0.0.0.3 area 0
 network 192.168.68.0 0.0.3.255 area 0
 network 192.168.72.0 0.0.3.255 area 0
 network 192.168.64.0 0.0.3.255 area 0
 network 192.168.76.0 0.0.3.255 area 0
!
ip classless
!
ip flow-export version 9
!
!
!
no cdp run
!
!
!
!
!
!
dial-peer voice 1 voip
 destination-pattern 60.
 session target ipv4:192.168.84.5
!
dial-peer voice 2 voip
 destination-pattern 50.
 session target ipv4:192.168.84.5
!
dial-peer voice 3 voip
 destination-pattern 10.
```

```
 session target ipv4:192.168.84.2
!
dial-peer voice 4 voip
 destination-pattern 20.
 session target ipv4:192.168.84.2
!
telephony-service
 max-ephones 10
 max-dn 10
 ip source-address 192.168.85.17 port 2000
!
ephone-dn 1
 number 400
!
ephone-dn 2
 number 300
!
ephone 1
 device-security-mode none
 mac-address 00D0.FF06.7835
 type 7960
 button 1:1
!
ephone 2
 device-security-mode none
 mac-address 0007.EC93.A019
 type 7960
 button 1:2
!
line con 0
!
line aux 0
!
```

```
line vty 0 4
 login
!
!
!
End
```

Switch Garita

```
Current configuration : 2457 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname GARITA
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 2-4
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 2
 switchport mode access
```

```
!
interface FastEthernet0/3
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 2
 switchport mode access
!
```

```
interface FastEthernet0/11
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/19
```

```
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/21
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/22
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/23
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/24
 switchport mode access
 switchport voice vlan 4
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 description GARITADATOS
```

```
 no ip address
!
interface Vlan3
 description GARITASOPORTE
 no ip address
!
interface Vlan4
 description GARITAVOZ
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
End
```

Switch Coyol

```
Current configuration : 2453 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname COYOL
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 5-7
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 5
```

```
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 5
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 6
 switchport mode access
```

```
!
interface FastEthernet0/13
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 6
 switchport mode access
!
interface FastEthernet0/20
 switchport mode access
 switchport voice vlan 7
!
```

```
interface FastEthernet0/21
 switchport mode access
 switchport voice vlan 7
!
interface FastEthernet0/22
 switchport mode access
 switchport voice vlan 7
!
interface FastEthernet0/23
 switchport mode access
 switchport voice vlan 7
!
interface FastEthernet0/24
 switchport mode access
 switchport voice vlan 7
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan5
 description COYOLDATOS
 no ip address
!
interface Vlan6
 description COYOLSOPORTE
 no ip address
!
interface Vlan7
```

```
 description COYOLVOZ
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
End
```

Swich San Rafael

```
Current configuration : 2455 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SANRAFAEL
!
!
!
!
!
```

```
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 8-10
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/8
```

```
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 8
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 9
```

```
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 9
 switchport mode access
!
interface FastEthernet0/20
 switchport mode access
 switchport voice vlan 10
!
interface FastEthernet0/21
 switchport mode access
 switchport voice vlan 10
!
interface FastEthernet0/22
 switchport mode access
 switchport voice vlan 10
!
interface FastEthernet0/23
 switchport mode access
 switchport voice vlan 10
!
interface FastEthernet0/24
 switchport mode access
 switchport voice vlan 10
```

```
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan8
 description SFDATOS
 no ip address
!
interface Vlan9
 description SRSOPORTE
 no ip address
!
interface Vlan10
 description SRVOZ
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
```

```
!
End
```

Switch San Joaquin

```
Current configuration : 2477 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SANJOAQUIN
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 11-13
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 11
 switchport mode access
```

```
!
interface FastEthernet0/4
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 11
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 12
 switchport mode access
!
```

```
interface FastEthernet0/12
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 12
 switchport mode access
!
interface FastEthernet0/20
```

```
 switchport mode access
 switchport voice vlan 13
!
interface FastEthernet0/21
 switchport mode access
 switchport voice vlan 13
!
interface FastEthernet0/22
 switchport mode access
 switchport voice vlan 13
!
interface FastEthernet0/23
 switchport mode access
 switchport voice vlan 13
!
interface FastEthernet0/24
 switchport mode access
 switchport voice vlan 13
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan11
 description SJDATOS
 no ip address
!
interface Vlan12
 description SJSOPORTE
```

```
 no ip address
!
interface Vlan13
 description SJVOZ
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
End
```

Switch Uruca

```
Current configuration : 2481 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname URUCA
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 14-16
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 14
```

```
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 14
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 15
 switchport mode access
```

```
!
interface FastEthernet0/13
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 15
 switchport mode access
!
interface FastEthernet0/20
 switchport mode access
 switchport voice vlan 16
!
```

```
interface FastEthernet0/21
 switchport mode access
 switchport voice vlan 16
!
interface FastEthernet0/22
 switchport mode access
 switchport voice vlan 16
!
interface FastEthernet0/23
 switchport mode access
 switchport voice vlan 16
!
interface FastEthernet0/24
 switchport mode access
 switchport voice vlan 16
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan14
 description URUCADATOS
 no ip address
!
interface Vlan15
 description URUCASOPORTE
 no ip address
!
interface Vlan16
```

```
 description URUCAVOZ
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
End
```

Switch Tibas

```
Current configuration : 2481 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname TIBAS
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 17-19
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 17
```

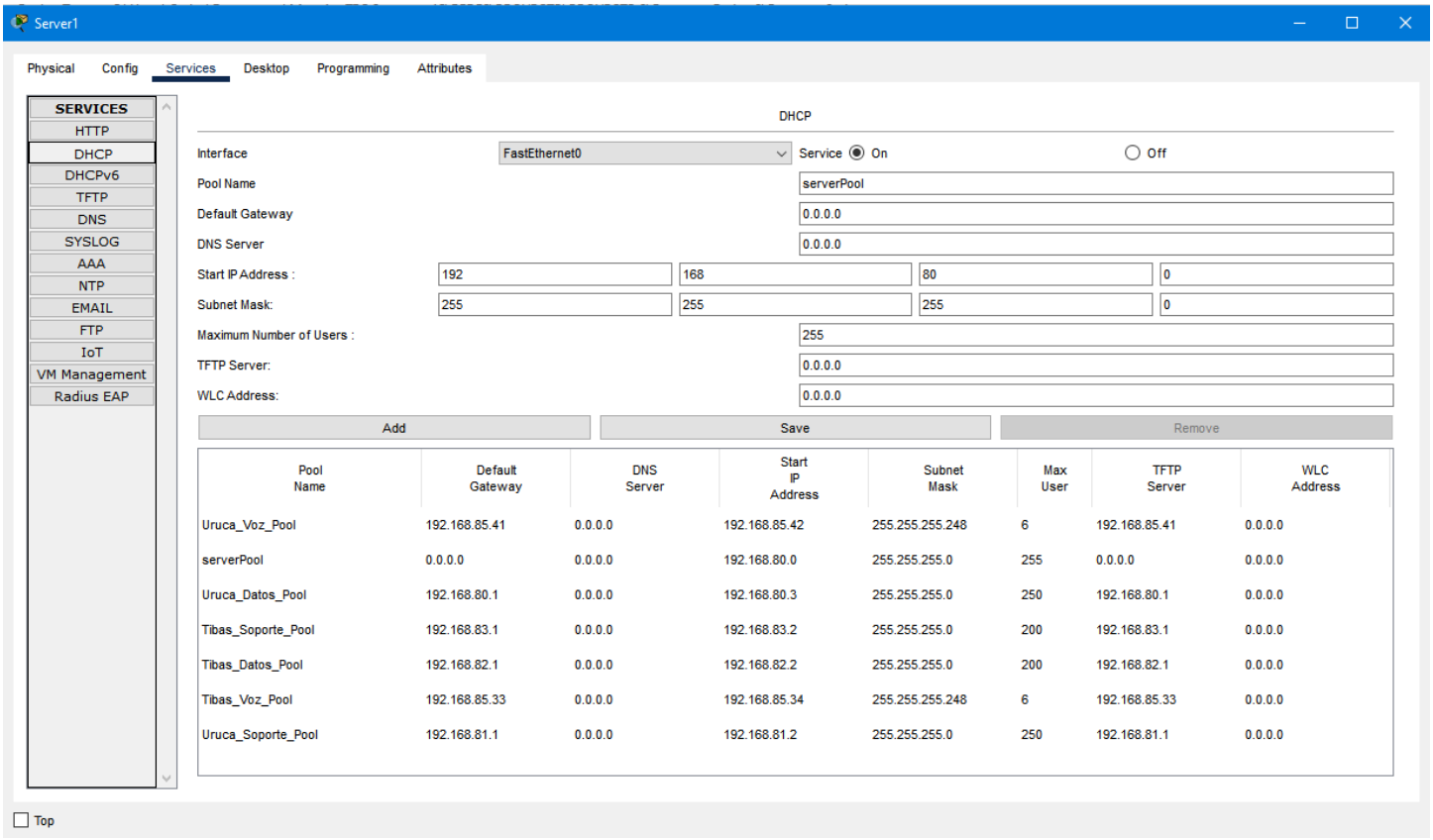
```
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 17
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 18
 switchport mode access
```

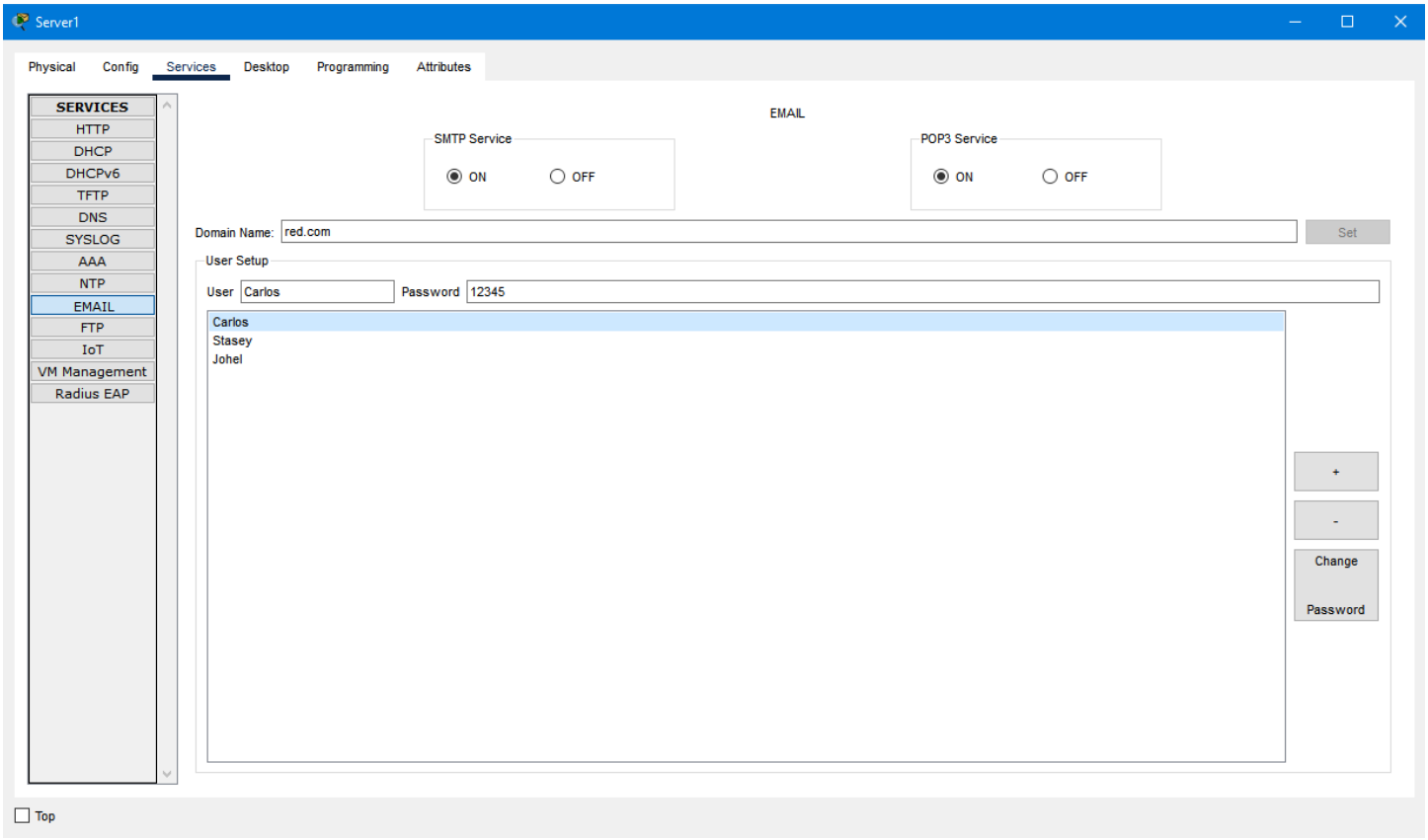
```
!
interface FastEthernet0/13
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 18
 switchport mode access
!
interface FastEthernet0/20
 switchport mode access
 switchport voice vlan 19
!
```

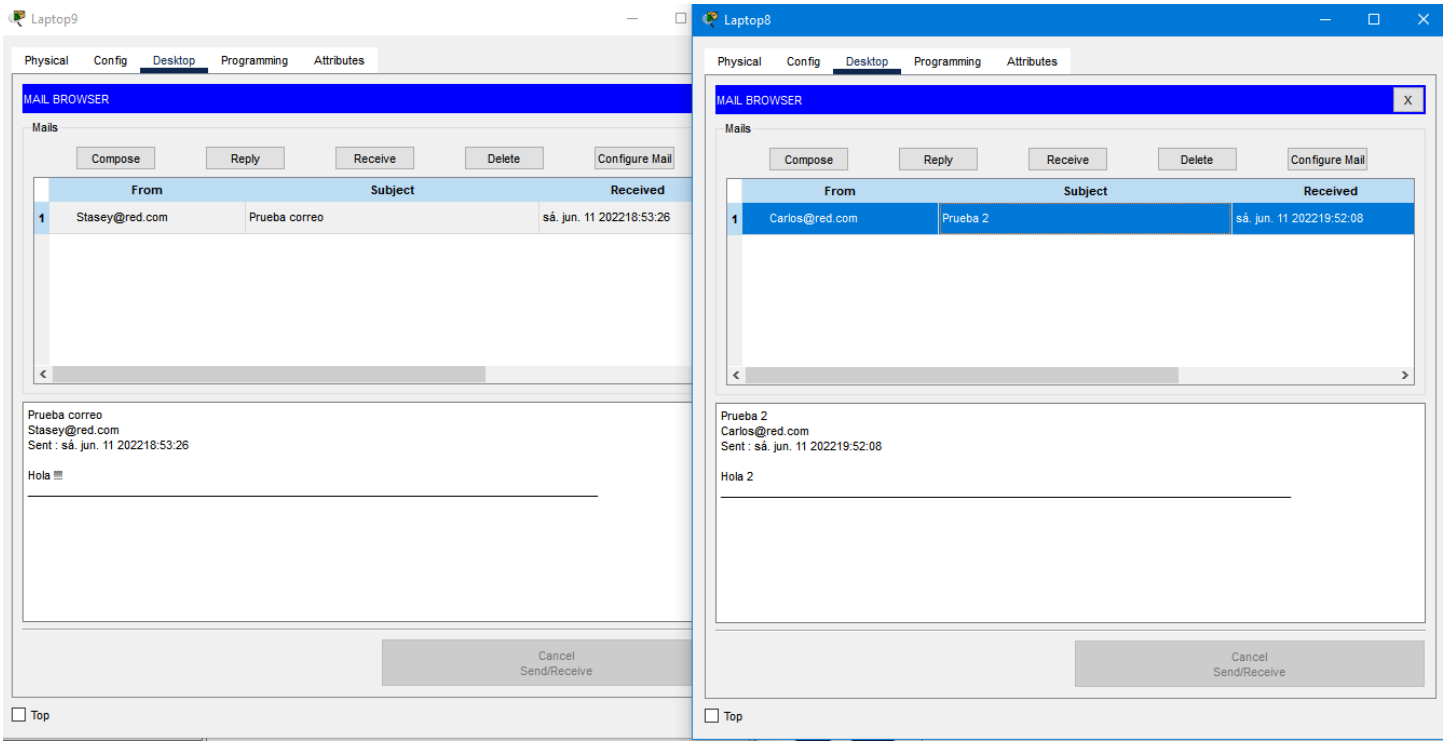
```
interface FastEthernet0/21
 switchport mode access
 switchport voice vlan 19
!
interface FastEthernet0/22
 switchport mode access
 switchport voice vlan 19
!
interface FastEthernet0/23
 switchport mode access
 switchport voice vlan 19
!
interface FastEthernet0/24
 switchport mode access
 switchport voice vlan 19
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan17
 description TIBASDATOS
 no ip address
!
interface Vlan18
 description TIBASSOPORTE
 no ip address
!
interface Vlan19
```

```
 description TIBASVOZ
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
End
```

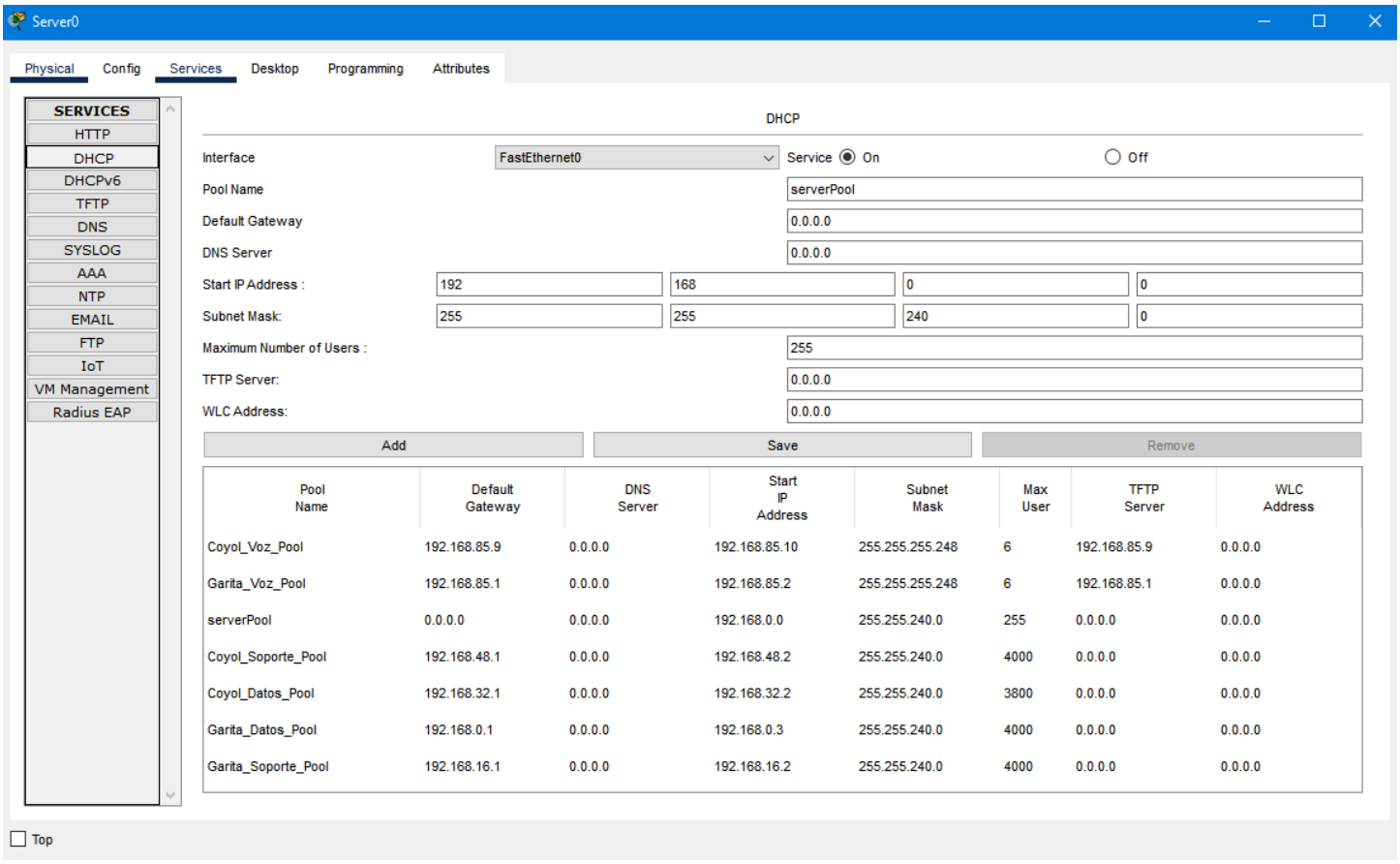
DHCP-URUCA Y TIBAS



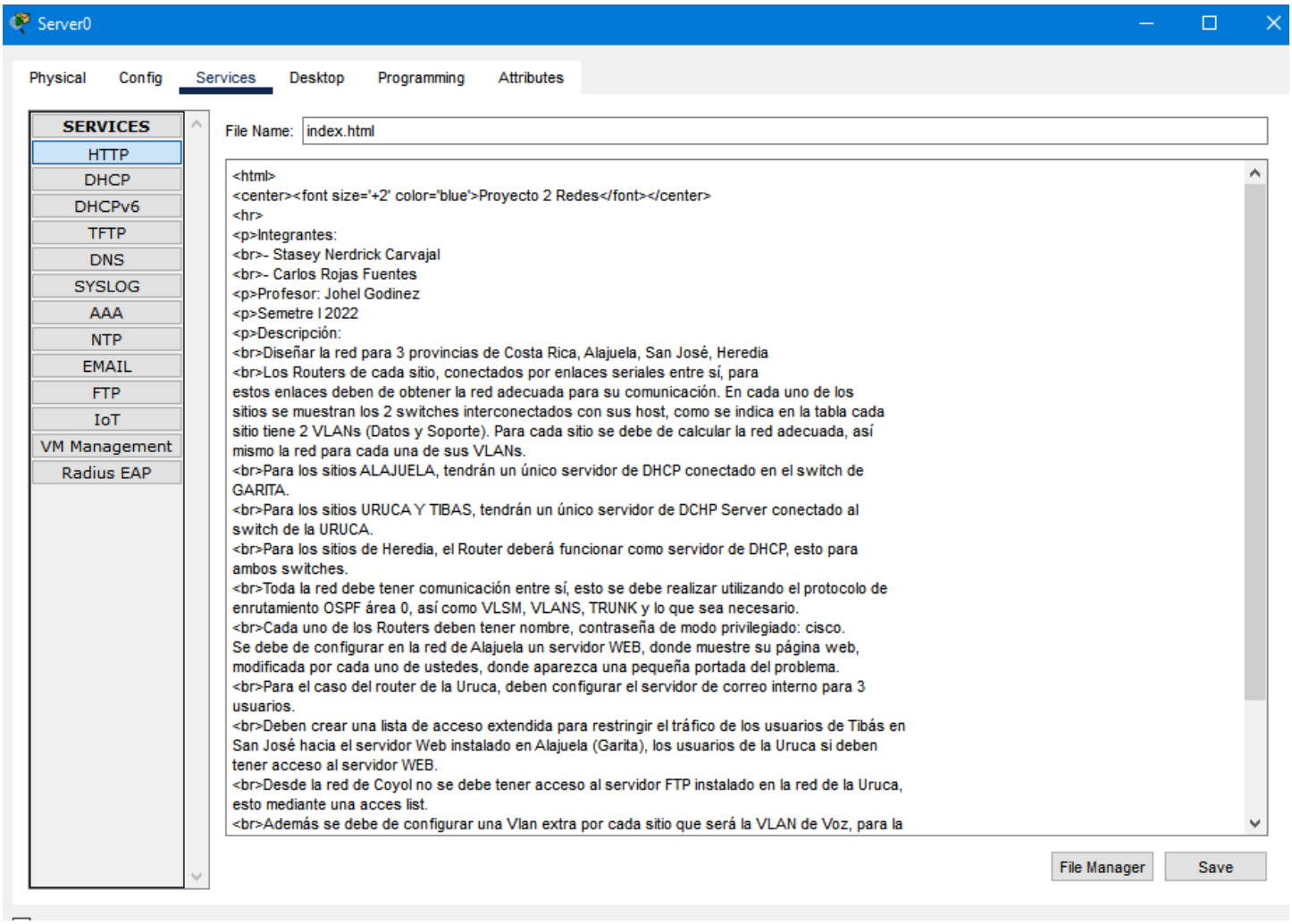



Laptop9
Physical
Config
Desktop
Programming
Attributes
MAIL BROWSER
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
1
Stasey@red.com
Prueba correo
sá. jun. 11 202218:53:26
Prueba correo
Stasey@red.com
Sent : sá. jun. 11 202218:53:26
Hola
Cancel
Send/Receive
Top
Laptop8
Physical
Config
Desktop
Programming
Attributes
MAIL BROWSER
X
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
1
Carlos@red.com
Prueba 2
sá. jun. 11 202219:52:08
Prueba 2
Carlos@red.com
Sent : sá. jun. 11 202219:52:08
Hola 2
Cancel
Send/Receive
Top

DHCP-GARITA Y COYOL



Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
Coyol_Voz_Pool	192.168.85.9	0.0.0.0	192.168.85.10	255.255.255.248	6	192.168.85.9	0.0.0.0
Garita_Voz_Pool	192.168.85.1	0.0.0.0	192.168.85.2	255.255.255.248	6	192.168.85.1	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192.168.0.0	255.255.240.0	255	0.0.0.0	0.0.0.0
Coyol_Soporte_Pool	192.168.48.1	0.0.0.0	192.168.48.2	255.255.240.0	4000	0.0.0.0	0.0.0.0
Coyol_Datos_Pool	192.168.32.1	0.0.0.0	192.168.32.2	255.255.240.0	3800	0.0.0.0	0.0.0.0
Garita_Datos_Pool	192.168.0.1	0.0.0.0	192.168.0.3	255.255.240.0	4000	0.0.0.0	0.0.0.0
Garita_Soporte_Pool	192.168.16.1	0.0.0.0	192.168.16.2	255.255.240.0	4000	0.0.0.0	0.0.0.0


Server0
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
File Name: index.html
<html>
Proyecto 2 Redes
<hr>
<p>Integrantes:

- Stasey Nerdrick Carvajal

- Carlos Rojas Fuentes
<p>Profesor: Johel Godinez
<p>Semetre I 2022
<p>Descripción:

Diseñar la red para 3 provincias de Costa Rica, Alajuela, San José, Heredia

Los Routers de cada sitio, conectados por enlaces seriales entre sí, para
estos enlaces deben de obtener la red adecuada para su comunicación. En cada uno de los
sitios se muestran los 2 switches interconectados con sus host, como se indica en la tabla cada
sitio tiene 2 VLANs (Datos y Soporte). Para cada sitio se debe de calcular la red adecuada, así
mismo la red para cada una de sus VLANs.

Para los sitios ALAJUELA, tendrán un único servidor de DHCP conectado en el switch de
GARITA.

Para los sitios URUCA Y TIBAS, tendrán un único servidor de DCHP Server conectado al
switch de la URUCA.

Para los sitios de Heredia, el Router deberá funcionar como servidor de DHCP, esto para
ambos switches.

Toda la red debe tener comunicación entre sí, esto se debe realizar utilizando el protocolo de
enrutamiento OSPF área 0, así como VLSM, VLANS, TRUNK y lo que sea necesario.

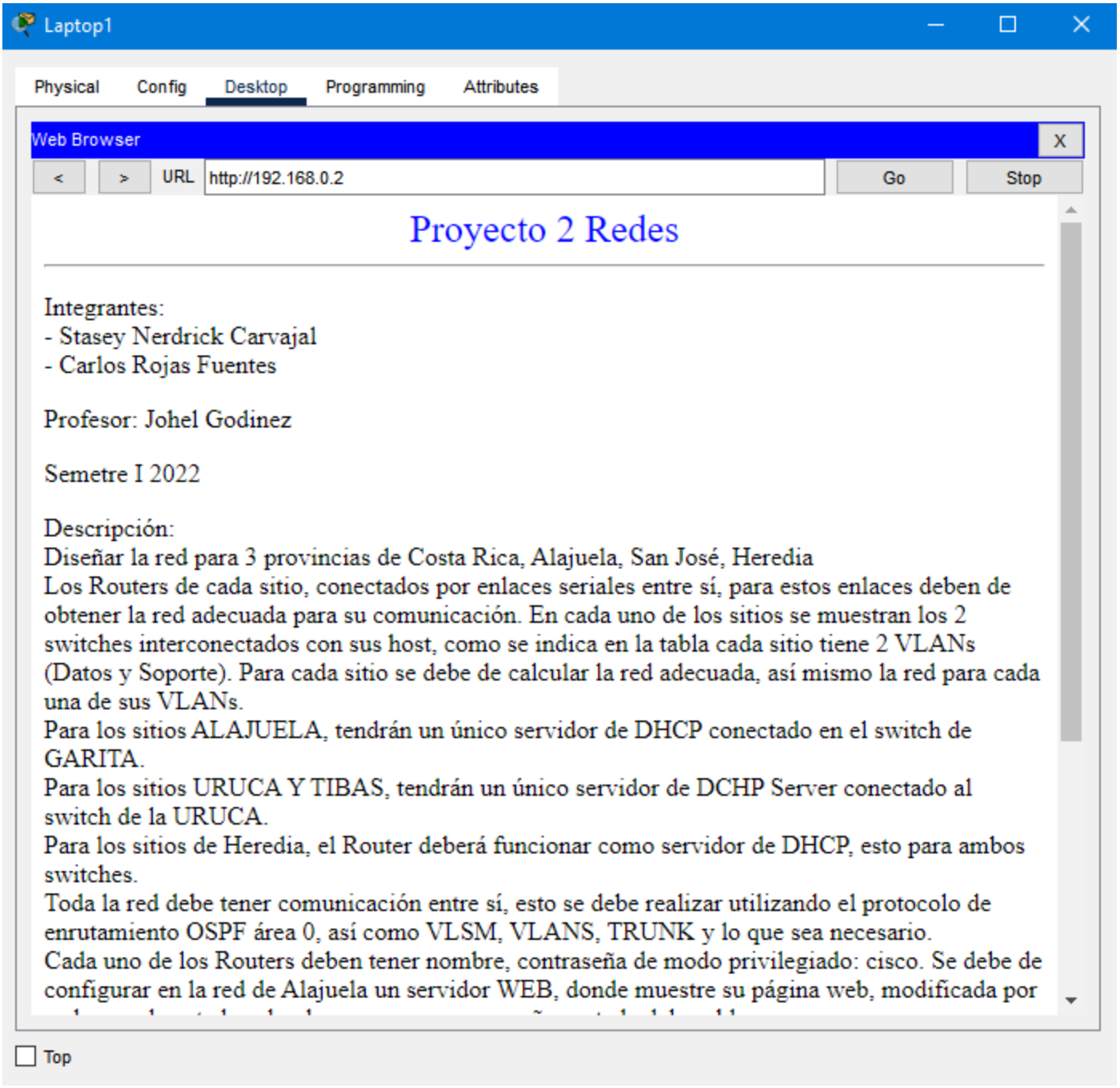
Cada uno de los Routers deben tener nombre, contraseña de modo privilegiado: cisco.
Se debe de configurar en la red de Alajuela un servidor WEB, donde muestre su página web,
modificada por cada uno de ustedes, donde aparezca una pequeña portada del problema.

Para el caso del router de la Uruca, deben configurar el servidor de correo interno para 3
usuarios.

Deben crear una lista de acceso extendida para restringir el tráfico de los usuarios de Tibás en
San José hacia el servidor Web instalado en Alajuela (Garita), los usuarios de la Uruca si deben
tener acceso al servidor WEB.

Desde la red de Coyol no se debe tener acceso al servidor FTP instalado en la red de la Uruca,
esto mediante una acces list.

Además se debe de configurar una Vlan extra por cada sitio que será la VLAN de Voz, para la
File Manager
Save


Laptop1
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://192.168.0.2
Go
Stop
Proyecto 2 Redes
Integrantes:
- Stasey Nerdrick Carvajal
- Carlos Rojas Fuentes
Profesor: Johel Godinez
Semetre I 2022
Descripción:
Diseñar la red para 3 provincias de Costa Rica, Alajuela, San José, Heredia
Los Routers de cada sitio, conectados por enlaces seriales entre sí, para estos enlaces deben de obtener la red adecuada para su comunicación. En cada uno de los sitios se muestran los 2 switches interconectados con sus host, como se indica en la tabla cada sitio tiene 2 VLANs (Datos y Soporte). Para cada sitio se debe de calcular la red adecuada, así mismo la red para cada una de sus VLANs.
Para los sitios ALAJUELA, tendrán un único servidor de DHCP conectado en el switch de GARITA.
Para los sitios URUCA Y TIBAS, tendrán un único servidor de DCHP Server conectado al switch de la URUCA.
Para los sitios de Heredia, el Router deberá funcionar como servidor de DHCP, esto para ambos switches.
Toda la red debe tener comunicación entre sí, esto se debe realizar utilizando el protocolo de enrutamiento OSPF área 0, así como VLSM, VLANS, TRUNK y lo que sea necesario.
Cada uno de los Routers deben tener nombre, contraseña de modo privilegiado: cisco. Se debe de configurar en la red de Alajuela un servidor WEB, donde muestre su página web, modificada por
Top