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Interconexión de redes

Evaluación de Competencias

Direcciones IP y VLANs

ACC – Departamento de Contabilidad con capacidad para 100 usuarios simultáneos									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
29	10	.	0	.	0	.	0		Network address
	255	.	255	.	255	.	128	(/25)	Subnet
							1		Subnets
						2	=	2	
					7				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	126	
			256	-	128	=		128	Valid subnets
	0	.	0	.	0	.		127	Wildcard
	10	.	0	.	0	.		0	Subnet
	10	.	0	.	0	.		1	First usable address
	10	.	0	.	0	.		126	Last usable address
	10	.	0	.	0	.		127	Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

RH – Departamento de Recursos Humanos con capacidad para 15 usuarios simultáneos									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
28	10	.	0	.	0	.	160		Network address
	255	.	255	.	255	.	224	(/27)	Subnet
							3		Subnets
						2	=	8	
					5				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	30	
			256	-	224	=		32	Valid subnets: 0,32,64,96,128,160,192 ,&224
	0	.	0	.	0	.		31	Wildcard
	10	.	0	.	0	.		160	Subnet
	10	.	0	.	0	.		161	First usable address
	10	.	0	.	0	.		190	Last usable address
	10	.	0	.	0	.		191	Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

TI – Departamento de Tecnologías de Información con capacidad para 5 usuarios simultáneos									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
27	10	.	0	.	0	.	192		Network address
	255	.	255	.	255	.	248	(/29)	Subnet
							5		Subnets
						2	=	32	
					3				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	6	
			256	-	248	=		8	Valid subnets: 0,8,16,24,32,40,48,56,64,72,80,88,96104,112,120,128,136,144,152,160,168,176,184,192,200,208,216,232,240,248
	0	.	0	.	0	.		7	Wildcard
	10	.	0	.	0	.		192	Subnet
	10	.	0	.	0	.		193	First usable address
	10	.	0	.	0	.		198	Last usable address
	10	.	0	.	0	.		199	Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

GUEST – Visitantes que no pertenecen a XYZ Inc. con capacidad para 30 usuarios simultáneos									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
26	10	.	0	.	0	.	128		Network address
	255	.	255	.	255	.	224	(/27)	Subnet
							3		Subnets
						2	=	8	
					5				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	30	
			256	-	224	=	32		Valid subnets: 0,32,64,96,128,160,192 ,&224
	0	.	0	.	0	.	31		Wildcard
	10	.	0	.	0	.	128		Subnet
	10	.	0	.	0	.	129		First usable address
	10	.	0	.	0	.	158		Last usable address
	10	.	0	.	0	.	159		Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

DC-Externo – Para servidores de XYZ Inc. con capacidad para 2 servidores de uso externo									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
25	10	.	0	.	0	.	200		Network address
	255	.	255	.	255	.	252	(/30)	Subnet
							6		Subnets
						2	=	64	
					2				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	2	
			256	-	252	=	4		Valid subnets: 0,4.....up to 252
	0	.	0	.	0	.	3		Wildcard
	10	.	0	.	0	.	200		Subnet
	10	.	0	.	0	.	201		First usable address/MyServer-1
	10	.	0	.	0	.	202		Last usable address
	10	.	0	.	0	.	203		Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

DC-Interno – Para servidores de XYZ Inc. con capacidad para 2 servidores de uso interno									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
24	10	.	10	.	0	.	204		Network address
	255	.	255	.	255	.	252	(/30)	Subnet
							6		Subnets
						2	=	64	
					2				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	2	
			256	-	252	=	4		Valid subnets: 0,4.....up to 252
	0	.	0	.	0	.	3		Wildcard
	10	.	0	.	0	.	204		Subnet
	10	.	0	.	0	.	205		First usable address/MyServer-2
	10	.	0	.	0	.	206		Last usable address
	10	.	0	.	0	.	207		Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

VLAN de administración solo hay 6 equipos de redes									
Se elige Subnet clase C, por la cantidad tan pequeña de direcciones IP que se requieren									
VLAN ID	IP address							Bits	
23	10	.	0	.	0	.	216		Network address
	255	.	255	.	255	.	248	(/29)	Subnet
							5		Subnets
						2	=	32	
					3				Valid Hosts =Hosts- Bradcast address-Network address
				2	-	2	=	6	
			256	-	248	=	8		Valid subnets: 0,8.....up to 248
	0	.	0	.	0	.	7		Wildcard
	10	.	0	.	0	.	216		Subnet
	10	.	0	.	0	.	217		First usable address
	10	.	0	.	0	.	222		Last usable address
	10	.	0	.	0	.	223		Broadcast address for this subnet

TABLE 3.5 Reserved IP address space

Address Class	Reserved Address Space
Class A	10.0.0.0 through 10.255.255.255
Class B	172.16.0.0 through 172.31.255.255
Class C	192.168.0.0 through 192.168.255.255

Configuraciones en cada equipo

SW-ST-A	SW-DC
SW-ST-A#show running-config Building configuration... Current configuration : 2539 bytes ! version 12.2 no service timestamps log datetime msec no service timestamps debug datetime msec no service password-encryption ! hostname SW-ST-A ! enable secret 5 1mERr$NK8mve7aY79HRdsS779Mw. ! ! ip dhcp excluded-address 10.0.0.1 ip dhcp excluded-address 10.0.0.161 ip dhcp excluded-address 10.0.0.193 ip dhcp excluded-address 10.0.0.129 ! ip dhcp pool ACC network 10.0.0.0 255.255.255.128 default-router 10.0.0.1 dns-server 8.8.8.8 ip dhcp pool RH network 10.0.0.160 255.255.255.224 default-router 10.0.0.161 ip dhcp pool TI network 10.0.0.192 255.255.255.248 default-router 10.0.0.193 dns-server 8.8.8.8 ip dhcp pool GUEST network 10.0.0.128 255.255.255.224 default-router 10.0.0.129 dns-server 8.8.8.8 ip ssh version 2 ip domain-name cisco.com ! username cisco privilege 1 password 0 cisco ! ! spanning-tree mode pvst spanning-tree extend system-id ! interface FastEthernet0/1 description TI switchport access vlan 27 switchport mode access	SW-DC#show running-config Building configuration... Current configuration : 2055 bytes ! version 12.2 no service timestamps log datetime msec no service timestamps debug datetime msec no service password-encryption ! hostname SW-DC ! enable secret 5 1mERr$hx5rVt7rPNoS4wqbXKX7m0 ! ! ! ip ssh version 2 ip domain-name cisco.com ! username cisco privilege 1 password 0 cisco ! ! spanning-tree mode pvst spanning-tree extend system-id ! interface FastEthernet0/1 description MyServer1 switchport access vlan 25 switchport mode access ! interface FastEthernet0/2 description MyServer2 switchport access vlan 24 switchport mode access ! interface FastEthernet0/3 ! interface FastEthernet0/4 ! interface FastEthernet0/5 ! interface FastEthernet0/6 ! interface FastEthernet0/7 ! interface FastEthernet0/8 ! interface FastEthernet0/9

```
!
interface FastEthernet0/2
description GUEST
switchport access vlan 26
!
interface FastEthernet0/3
description ACC
switchport access vlan 29
switchport mode access
!
interface FastEthernet0/4
description RHH
switchport access vlan 28
switchport mode access
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
description trunk port to RTSTA
```

```
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
description trunk port to EDGE
switchport trunk native vlan 23
switchport trunk allowed vlan 23-29
switchport mode trunk
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan23
description management vlan
mac-address 0001.6338.3201
ip address 10.0.0.217
255.255.255.248
!
!
!
access-list 10 deny 10.0.0.0
0.0.0.127
access-list 10 deny 10.0.0.160
0.0.0.31
access-list 10 deny 10.0.0.128
```

```
switchport trunk native vlan 23
switchport trunk allowed vlan 23-29
!
interface GigabitEthernet0/2
!
interface Vlan1
ip address 10.1.1.1 255.255.255.0
shutdown
!
interface Vlan26
mac-address 0009.7c62.a101
ip address 10.0.0.129
255.255.255.224
!
interface Vlan27
mac-address 0009.7c62.a102
ip address 10.0.0.193
255.255.255.248
!
interface Vlan28
mac-address 0009.7c62.a103
ip address 10.0.0.161
255.255.255.224
!
interface Vlan29
mac-address 0009.7c62.a104
ip address 10.0.0.1 255.255.255.128
!
banner motd ^C Plis no entrar ^C
!
!
!
line con 0
password cisco
login
!
line vty 0 4
password cisco
login
transport input ssh
line vty 5 15
login
!
!
!
!
end
```

RT-ST-A

```
RT-ST-A#show run
Building configuration...

Current configuration : 1229 bytes
!
version 15.1
no service timestamps log datetime
```

```
0.0.0.31
access-list 10 permit 10.0.0.192
0.0.0.7
access-list 10 permit any
access-list 11 permit 10.0.0.0
0.0.0.127
access-list 11 permit 10.0.0.160
0.0.0.31
access-list 11 permit 10.0.0.128
0.0.0.31
access-list 11 permit 10.0.0.192
0.0.0.7
access-list 40 permit 10.0.0.192
0.0.0.7
line con 0
password cisco
login
!
line vty 0 4
password cisco
login
transport input ssh
line vty 5 15
login
!
!
!
!
end
```

EDGE-ROUTER

```
EDGE-ROUTER#show run
Building configuration...

Current configuration : 1264 bytes
!
version 15.1
no service timestamps log datetime
```

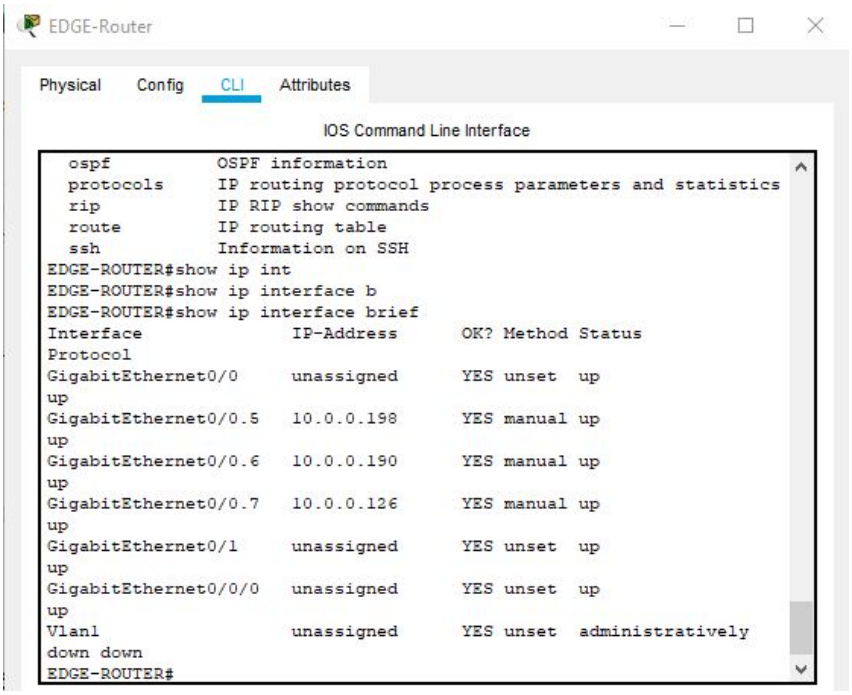
```
msec
no service timestamps debug datetime
msec
no service password-encryption
!
hostname RT-ST-A
!
!
!
enable secret 5
$1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
username cisco password 0 cisco
!
!
license udi pid CISCO2911/K9 sn
FTX15241I3J-
!
!
!
!
!
!
!
!
!
ip ssh version 2
ip domain-name cisco.com
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
description trunk port
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/1
description trunk port
no ip address
```

```
msec
no service timestamps debug datetime
msec
no service password-encryption
!
hostname EDGE-ROUTER
!
!
!
enable secret 5
$1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username cisco password 0 cisco
!
!
license udi pid CISCO2901/K9 sn
FTX15248LU8-
!
!
!
!
!
!
!
!
!
ip ssh version 2
ip domain-name cisco.com
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/0.5
encapsulation dot1Q 23
ip address 10.0.0.198
255.255.255.224
!
```

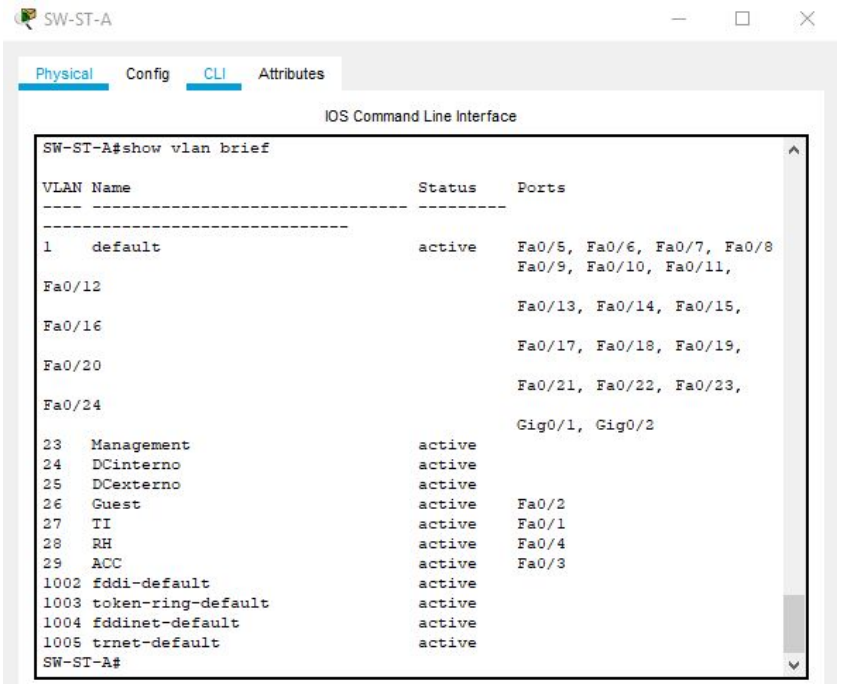
```
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
interface Vlan23
description management vlan
mac-address 0090.0ce7.3d01
ip address 10.0.0.220
255.255.255.248
!
router rip
version 2
network 10.0.0.0
default-information originate
no auto-summary
!
ip classless
ip route 0.0.0.0 0.0.0.0
GigabitEthernet0/0
!
ip flow-export version 9
!
!
access-list 40 permit 10.0.0.192
0.0.0.7
!
no cdp run
!
!
!
!
!
!
line con 0
password cisco
login
!
line aux 0
!
line vty 0 4
password cisco
login
transport input ssh
!
!
!
end
```

```
interface GigabitEthernet0/0.6
encapsulation dot1Q 24
ip address 10.0.0.190
255.255.255.224
!
interface GigabitEthernet0/0.7
encapsulation dot1Q 25
ip address 10.0.0.126
255.255.255.128
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/0/0
no ip address
ip nat outside
shutdown
!
interface Vlan1
no ip address
shutdown
!
ip nat pool cisco 148.242.69.1
148.242.69.6 netmask 255.255.255.248
ip nat inside source list 180 pool
cisco
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
password cisco
login
!
line aux 0
!
line vty 0 4
password cisco
login
transport input ssh
!
!
!
end
```

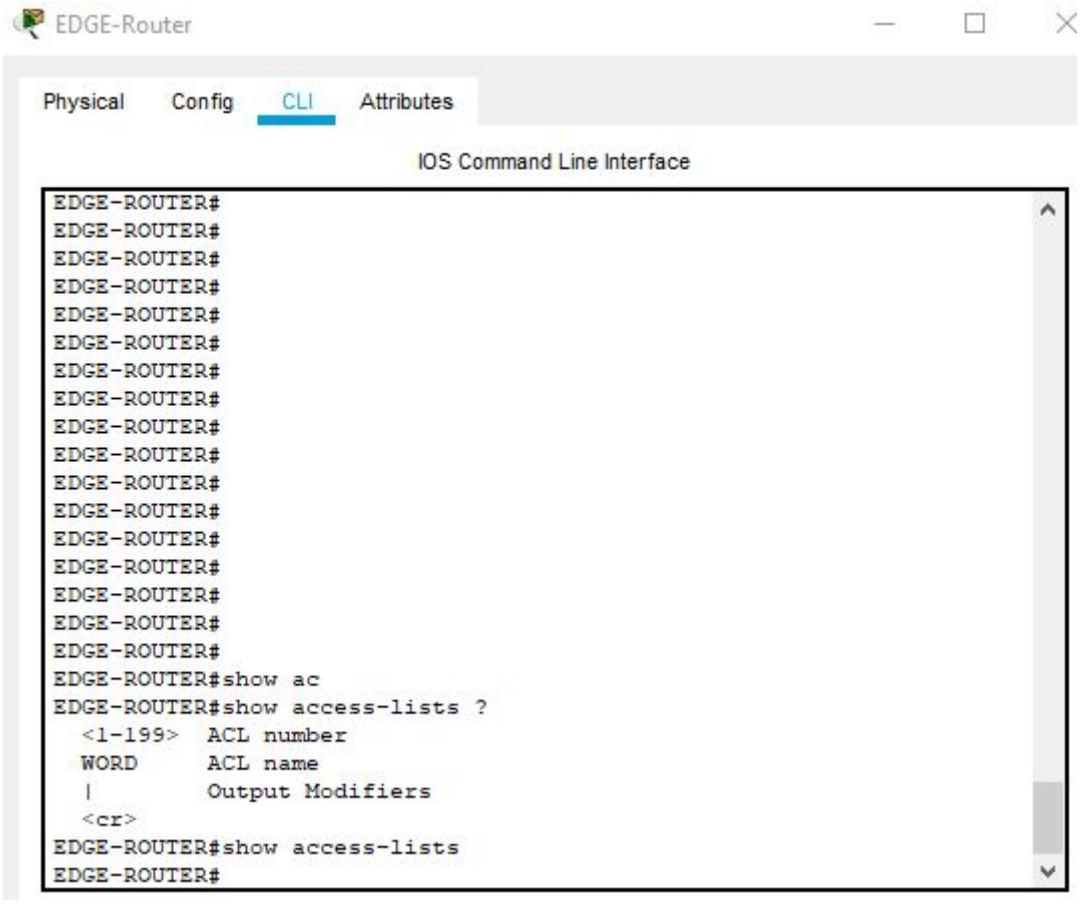
Verificación de la configuración



show ip interface brief



show vlan brief



show access-lists