



# Proyecto Globalizador

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## Sitio LAN Principal

### Subneteo VLSM

Subnet Name	Needed Size	Allocated Size	Address	Mask	Dec Mask	Assignable Range	Broadcast
A	8	14	192.168.42.0	/28	255.255.255.240	192.168.42.1 - 192.168.42.14	192.168.42.15
B	8	14	192.168.42.16	/28	255.255.255.240	192.168.42.17 - 192.168.42.30	192.168.42.31
C	8	14	192.168.42.32	/28	255.255.255.240	192.168.42.33 - 192.168.42.46	192.168.42.47
D	8	14	192.168.42.48	/28	255.255.255.240	192.168.42.49 - 192.168.42.62	192.168.42.63
E	4	6	192.168.42.64	/29	255.255.255.248	192.168.42.65 - 192.168.42.70	192.168.42.71
F	4	6	192.168.42.72	/29	255.255.255.248	192.168.42.73 - 192.168.42.78	192.168.42.79
G	4	6	192.168.42.80	/29	255.255.255.248	192.168.42.81 - 192.168.42.86	192.168.42.87
H	4	6	192.168.42.88	/29	255.255.255.248	192.168.42.89 - 192.168.42.94	192.168.42.95

### PAGP

```
S02P(config)#interface range fa0/4-5
S02P(config-if-range)#channel-group 1 mode desirable

S01P(config)#interface range fa0/1-2
S01P(config-if-range)#channel-group 1 mode auto

S03P(config)#interface range fa0/4-5
S03P(config-if-range)#channel-group 2 mode desirable

S01P(config)#interface range fa0/3-4
S01P(config-if-range)#channel-group 2 mode auto
```

### Configuración enrutamiento VLANs Switch de capa 3

```
S01P(config)#vlan 10
S01P(config-vlan)#name Oficina1
S01P(config-vlan)#exit
S01P(config)#vlan 20
S01P(config-vlan)#name Oficina2
S01P(config-vlan)#exit

S01P(config)#interface vlan 10
S01P(config-if)#ip address 192.168.42.17 255.255.255.240
S01P(config-if)#no shutdown
S01P(config-if)#exit
S01P(config)#interface vlan 20
S01P(config-if)#ip address 192.168.42.33 255.255.255.240
S01P(config-if)#no shutdown
```

### Troncos

```
S02P(config)#interface port-channel 1
S02P(config-if)#switchport mode trunk
S02P(config-if)#switchport trunk allowed vlan 10,20
```

```

S01P(config)#interface port-channel 1
S01P(config-if)#switchport trunk encapsulation dot1q
S01P(config-if)#switchport mode trunk

S01P(config-if)#switchport trunk allowed vlan 10,20

S03P(config)#interface port-channel 2
S03P(config-if)#switchport mode trunk

S03P(config-if)#switchport trunk allowed vlan 10,20

S01P(config)#interface port-channel 2
S01P(config-if)#switchport trunk encapsulation dot1q
S01P(config-if)#switchport mode trunk

S01P(config-if)#switchport trunk allowed vlan 10,20

```

## DHCP Zona de Invitados

### IPv4

```

R03P#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R03P(config)#ip dhcp excluded-address 192.168.42.49
R03P(config)#ip dhcp pool INVITADOS
R03P(dhcp-config)#network 192.168.42.48 255.255.255.240
R03P(dhcp-config)#default-router 192.168.42.49

```

### IPv6 Slaac

```

R03P(config)#ipv6 unicast-routing
R03P(config)#interface fa0/0
R03P(config-if)#ipv6 address 2001:db8:c:4:42::1/64
R03P(config-if)#no ipv6 nd managed-config-flag
R03P(config-if)#no ipv6 nd other-config-flag
R03P(config-if)#no shutdown

```

## Configurar Telnet a Switch de capa 3

```

S01P(config)#vlan 99
S01P(config-vlan)#name Administracion
S01P(config-vlan)#exit
S01P(config)#interface vlan 99
S01P(config-if)#ip address 192.168.42.97 255.255.255.240
S01P(config-if)#no shutdown
S01P(config-if)#exit
S01P(config)#interface fa0/6
S01P(config-if)#switchport mode access
S01P(config-if)#switchport access vlan 99
S01P(config-if)#exit
S01P(config)#username edu password inves
S01P(config)#line vty 0 15
S01P(config-line)#transport input telnet
S01P(config-line)#login local
S01P(config-line)#exit
S01P(config)#enable password inves

```

## Acceso telnet desde PC09P

```
C:\>telnet 192.168.42.97
Trying 192.168.42.97 ...Open

User Access Verification

Username: edu

Password:
S01P>en
Password:
S01P#
```

## Configuración para poder acceder al servidor TFTP (SVI en Switchs)

```
S02P(config)#interface vlan 10
S02P(config-if)#ip address 192.168.42.18 255.255.255.240
S02P(config-if)#ip default-gateway 192.168.42.17

S03P(config)#interface vlan 20
S03P(config-if)#ip address 192.168.42.34 255.255.255.240
S03P(config-if)#ip default-gateway 192.168.42.33

S04P(config)#interface vlan 1
S04P(config-if)#ip address 192.168.42.5 255.255.255.240
S04P(config-if)#ip default-gateway 192.168.42.1
```

## Configuración de acceso mediante consola al Router R02P

```
R02P# conf t
Enter configuration commands, one per line. End with CNTL/Z.
R02P(config)#line console 0
R02P(config-line)#password inves
R02P(config-line)#login
```

## Configuración de Syslog

```
S04P(config)#logging host 192.168.42.4
S04P(config)#service timestamps log datetime msec
S04P(config)#end
S04P#
*mar. 01, 00:49:09.4949: SYS-5-CONFIG_I: Configured from console
by console
*mar. 01, 00:49:09.4949: %SYS-6-LOGGINGHOST_STARTSTOP: Logging
to host 192.168.42.4 port 514 started - CLI initiated
```

Syslog			
Service			
		<input checked="" type="radio"/> On <input type="radio"/> Off	
	Time	HostName	Message
1	03.01.1993 12:52:57.055	192.168.42.66	%SYS-5-CONFIG_I: Configured from console by console
2	03.01.1993 12:52:57.055	192.168.42.66	: %SYS-6-LOGGINGHOST_STARTSTOP: Loggin...
3	03.01.1993 12:53:46.234	192.168.42.82	%SYS-5-CONFIG_I: Configured from console by console
4	03.01.1993 12:53:46.234	192.168.42.82	: %SYS-6-LOGGINGHOST_STARTSTOP: Loggin...
5	03.01.1993 12:55:16.032	192.168.42.73	%SYS-5-CONFIG_I: Configured from console by console

## ACL's

### Denegar zona de invitados a zona corporativa

```
R02P(config)#access-list 1 remark Denegar red invitados
R02P(config)#access-list 1 deny 192.168.42.48 0.0.0.15
R02P(config)#access-list 1 permit any
R02P(config)#interface fa1/0
R02P(config-if)#ip access-group 1 in
```

### No permitir salir del Sitio Principal a PC02P

```
R02P(config)#no ip access-list standar DENEGAR_PC02P
R02P(config)#ip access-list standar DENEGAR_PC02P
R02P(config-std-nacl)#remark Denegar salida del sitio a PC02P
R02P(config-std-nacl)#deny host 192.168.42.20
R02P(config-std-nacl)#permit any
R02P(config-std-nacl)#exit
R02P(config)#interface fa1/0
R02P(config-if)#ip access-group DENEGAR_PC02P out
```

### No permitir acceder al servicio web de SR01P a PC04P

```
R01P(config)#access-list 110 remark Denegar Web Intranet a PC04P
R01P(config)#access-list 110 deny tcp host 192.168.42.22 host
192.168.42.2 eq 80
R01P(config)#access-list 110 permit ip any any
R01P(config)#interface gi0/1
R01P(config-if)#ip access-group 110 in
```

### No permitir acceder al servicio FTP de SR01P a PC06P

```
R01P(config)#ip access-list extended NOFTP_PC06P
R01P(config-ext-nacl)#remark Denegar FTP Intranet a PC06P
R01P(config-ext-nacl)#deny tcp host 192.168.42.36 host
192.168.42.2 eq ftp
R01P(config-ext-nacl)#permit ip any any
R01P(config-ext-nacl)#exit
R01P(config)#interface gi0/0
R01P(config-if)#ip access-group NOFTP_PC06P in
```

## Subsede LAN A

### Subneteo

RED	RANGO HOSTS	BROADCAST
172.16.42.0/27	172.16.42.1 – 172.16.42.30	172.16.42.31
172.16.42.32/27	172.16.42.33 – 172.16.42.62	172.16.42.63
172.16.42.64/27	172.16.42.65 – 172.16.42.94	172.16.42.95
172.16.42.96/27	172.16.42.97 – 172.16.42.126	172.16.42.127
172.16.42.128/27	172.16.42.129 – 172.16.42.158	172.16.42.159
172.16.42.160/27	172.16.42.161 – 172.16.42.190	172.16.42.191
172.16.42.192/27	172.16.42.193 – 172.16.42.222	172.16.42.223
172.16.42.224/27	172.16.42.225 – 172.16.42.254	172.16.42.255

### LACP Etherchannel entre los Switches de las Oficinas

```
S02A(config)#interface range fa0/4-5
S02A(config-if-range)#channel-group 1 mode active
S02A(config-if-range)#
Creating a port-channel interface Port-channel 1
```

```
S03A(config)#interface range fa0/4-5
S03A(config-if-range)#channel-group 1 mode active
S03A(config-if-range)#
Creating a port-channel interface Port-channel 1
```

```
S02A(config)#interface range fa0/6-7
S02A(config-if-range)#channel-group 2 mode active
S02A(config-if-range)#
Creating a port-channel interface Port-channel 2
```

```
S04A(config)#interface range fa0/1-2
S04A(config-if-range)#channel-group 2 mode active
```

```
S04A(config)#interface range fa0/3-4
S04A(config-if-range)#channel-group 3 mode active
S04A(config-if-range)#
Creating a port-channel interface Port-channel 3
```

```
S03A(config)#interface range fa0/6-7
S03A(config-if-range)#channel-group 3 mode active
S03A(config-if-range)#
Creating a port-channel interface Port-channel 3
```

### Troncos

```
S04A(config)#interface port-channel 3
S04A(config-if)#switchport mode trunk
```

```
S04A(config-if)#switchport trunk allowed vlan 30,40,99
S04A(config-if)#switchport trunk native vlan 99
```

```

S03A(config)#interface port-channel 3
S03A(config-if)#switchport mode trunk
S03A(config-if)#switchport trunk allowed vlan 30,40,99
S03A(config-if)#switchport trunk native vlan 99

```

## Enrutamiento entre VLAN

```

S04A(config)#interface fa0/5
S04A(config-if)#switchport mode access
S04A(config-if)#switchport access vlan 30
S04A(config-if)#exit
S04A(config)#interface fa0/6
S04A(config-if)#switchport mode access
S04A(config-if)#switchport access vlan 40

```

## HSRP (Redundancia de gateway predeterminado)

```

R01A#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R01A(config)#interface fa0/0
R01A(config-if)#standby version 2
R01A(config-if)#standby 1 ip 172.16.42.3
R01A(config-if)#standby priority 150
R01A(config-if)#standby 1 preempt
%HSRP-6-STATECHANGE: FastEthernet0/0 Grp 1 state Speak -> Standby

R01A(config-if)#no shutdown

R02A(config-if)#standby version 2
R02A(config-if)#standby 1 ip 172.16.42.3
R02A(config-if)#standby 1 priority 50
R02A(config-if)#no shutdo
%HSRP-6-STATECHANGE: FastEthernet0/0 Grp 1 state Speak ->
R02A(config-if)#no shutdown

R01A(config)#interface fa0/1
R01A(config-if)#standby version 2
R01A(config-if)#standby 1 ip 172.16.42.100
R01A(config-if)#
%HSRP-6-STATECHANGE: FastEthernet0/1 Grp 1 state Init -> Init

R01A(config-if)#standby 1 priority 150
R01A(config-if)#standby 1 preempt
R01A(config-if)#no shutdown

R02A(config)#interface fa0/1
R02A(config-if)#standby version 2
R02A(config-if)#standby 1 ip 172.16.42.100
R02A(config-if)#
%HSRP-6-STATECHANGE: FastEthernet0/1 Grp 1 state Init -> Init

R02A(config-if)#standby 1 priority 50
R02A(config-if)#no shutdown

```



## DHCP para las Oficinas 3 y 4 vía agentes relay

### R03A

```
Router(config)#interface fa0/0
Router(config-if)#ip helper-address 172.16.42.4
Router(config-if)#exit
Router(config)#interface fa0/1
Router(config-if)#ip helper-address 172.16.42.5
Router(config-if)#exit
```

DHCP

---

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 172.16.42.33

DNS Server: 0.0.0.0

Start IP Address : 172 16 42 34

Subnet Mask: 255 255 255 224

Maximum Number of Users : 30

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add
Save
Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	172.16.42.33	0.0.0.0	172.16.42.34	255.255.255...	30	0.0.0.0	0.0.0.0

DHCP

---

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 172.16.42.65

DNS Server: 0.0.0.0

Start IP Address : 172 16 42 66

Subnet Mask: 255 255 255 224

Maximum Number of Users : 30

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add
Save
Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	172.16.42.65	0.0.0.0	172.16.42.66	255.255.255...	30	0.0.0.0	0.0.0.0

## Seguridad de puertos Switches oficinas

```
S02A(config)#interface range fa0/1-3
S02A(config-if-range)#switchport port-security
S02A(config-if-range)#switchport port-security maximum 5
S02A(config-if-range)#switchport port-security mac-address sticky
S02A(config-if-range)#switchport port-security violation protect

S03A(config)#interface range fa0/1-3
S03A(config-if-range)#switchport port-security
S03A(config-if-range)#switchport port-security maximum 5
S03A(config-if-range)#switchport port-security violation protect
S03A(config-if-range)#switchport port-security mac-address sticky
```

## NTP en Routers (no me deja en los Switches)

```
S01A#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S01A(config)#ntp ?
% Unrecognized command

Router(config)#ntp server 172.16.42.4
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show clock
11:13:47.290 UTC Sat May 26 2018
```

## Configuración SNMP en Routers

### R03A

```
R03A>en
R03A#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R03A(config)#snmp-server community inves ro
%SNMP-5-WARMSTART: SNMP agent on host R03A is undergoing a warm
start
R03A(config)#snmp-server community inves rw
```

### R04A

```
R04A(config)#snmp-server community inves ro
R04A(config)#snmp-server community inves rw
```

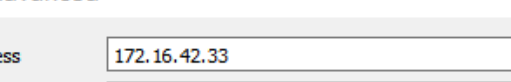
### R01A

```
R01A>en
R01A#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R01A(config)#snmp-server community inves ro
%SNMP-5-WARMSTART: SNMP agent on host R01A is undergoing a warm
start
R01A(config)#snmp-server community inves rw
```

R02A

```
R02A>en
R02A#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R02A(config)#snmp-server community inves ro
%SNMP-5-WARMSTART: SNMP agent on host R02A is undergoing a warm
start
R02A(config)#snmp-server community inves rw
```

## Servicio SNMP desde PC01A



MIB Browser

Address: 192.168.35.1

OID: 1.3.6.1.2.1.2.2.1.2

Advanced...

Operations: Get GO

SNMP MIBs

- MIB Tree
  - router\_std MIBs
    - .iso
      - .org
        - .dod
          - internet
            - .mgmt
              - .mb-2
                - > .system
                  - .interfaces
                    - .ifNumber
                      - .ifTable
                        - .ifEntry
                          - .ifIndex
                          - .ifDescr
                          - .ifType
                          - .ifSpeed
                          - .ifPhysAddress

Result Table

| Name/OID  | Value           | Type        |
|---|-----------------|-------------|
| 1.3.6.1.2.1.2.2.1.2.1<br>(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry... | Vlan1           | OctetString |
| 1.3.6.1.2.1.2.2.1.2.2<br>(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry... | FastEthernet0/0 | OctetString |
| 1.3.6.1.2.1.2.2.1.2.3<br>(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry... | FastEthernet0/1 | OctetString |
| 1.3.6.1.2.1.2.2.1.2.4<br>(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry... | FastEthernet1/0 | OctetString |

Name : .ifDescr

OID : 1.3.6.1.2.1.2.2.1.2

## SSH en Routers

```
R03A(config)#ip domain-name edu
R03A(config)#crypto key generate rsa
The name for the keys will be: R03A.edu
Choose the size of the key modulus in the range of 360 to 2048
for your
    General Purpose Keys. Choosing a key modulus greater than 512
may take
    a few minutes.

How many bits in the modulus [512]: 1204
% Generating 1204 bit RSA keys, keys will be non-exportable...
[OK]

R03A(config)#ip ssh version 2
*May 22 21:59:7.413: %SSH-5-ENABLED: SSH 1.99 has been enabled
R03A(config)#username edu password invess
R03A(config)#line vty 0 15
R03A(config-line)#transport input ssh
R03A(config-line)#login local
R03A(config-line)#exit
R03A(config)#enable secret invess
```

## Acceso desde un PC

```
Packet Tracer PC Command Line 1.0
C:\>SSH -l edu 172.16.42.33
Open
Password:

R03A>en
Password:
R03A#show run
Building configuration...
```

## Enrutamiento OSPFv3 área única

```
R01A(config)#ipv6 router ospf 10
R01A(config-rtr)#router-id 1.1.1.1
R01A(config-rtr)#interface fa0/1
R01A(config-if)#ipv6 ospf 10 area 0
R01A(config-if)#exit
R01A(config)#interface fa0/0
R01A(config-if)#ipv6 ospf 10 area 0

R02A(config)#ipv6 router ospf 10
R02A(config-rtr)#router-id 2.2.2.2
R02A(config-rtr)#interface fa0/0
R02A(config-if)#ipv6 ospf 10 area 0
R02A(config-if)#exit
R02A(config)#
22:52:30: %OSPFv3-5-ADJCHG: Process 10, Nbr 1.1.1.1 on
FastEthernet0/0 from LOADING to FULL, Loading Done
interface fa0/1
R02A(config-if)#ipv6 ospf 10 area 0
R02A(config-if)#
22:52:44: %OSPFv3-5-ADJCHG: Process 10, Nbr 1.1.1.1 on
FastEthernet0/1 from LOADING to FULL, Loading Done

R04A(config)#ipv6 router ospf 10
R04A(config-rtr)#router-id 4.4.4.4
R04A(config-rtr)#interface fa0/0
R04A(config-if)#ipv6 ospf 10 area 0
R04A(config-if)#
22:54:32: %OSPFv3-5-ADJCHG: Process 10, Nbr 2.2.2.2 on
FastEthernet0/0 from LOADING to FULL, Loading Done

22:54:34: %OSPFv3-5-ADJCHG: Process 10, Nbr 1.1.1.1 on
FastEthernet0/0 from LOADING to FULL, Loading Done
interface fa0/1
R04A(config-if)#ipv6 ospf 10 area 0
```

```

R03A(config)#ipv6 router ospf 10
R03A(config-rtr)#router-id 3.3.3.3
R03A(config-rtr)#interface fa1/0
R03A(config-if)#ipv6 ospf 10 area 0
R03A(config-if)#
22:56:41: %OSPFv3-5-ADJCHG: Process 10, Nbr 4.4.4.4 on
FastEthernet1/0 from LOADING to FULL, Loading Done
interface fa0/0
R03A(config-if)#ipv6 ospf 10 area 0
R03A(config-if)#exit
R03A(config)#interface fa0/1
R03A(config-if)#ipv6 ospf 10 area 0

```

## Subsede LAN B

Subneteo

| RED            | RANGO HOSTS                | BROADCAST   |
|----------------|----------------------------|-------------|
| 10.0.42.0/27   | 10.0.42.1 -- 10.0.42.30    | 10.0.42.31  |
| 10.0.42.32/27  | 10.0.42.33 -- 10.0.42.62   | 10.0.42.63  |
| 10.0.42.64/27  | 10.0.42.65 -- 10.0.42.94   | 10.0.42.95  |
| 10.0.42.96/27  | 10.0.42.97 -- 10.0.42.126  | 10.0.42.127 |
| 10.0.42.128/27 | 10.0.42.129 -- 10.0.42.158 | 10.0.42.159 |
| 10.0.42.160/27 | 10.0.42.161 -- 10.0.42.190 | 10.0.42.191 |
| 10.0.42.192/27 | 10.0.42.193 -- 10.0.42.222 | 10.0.42.223 |
| 10.0.42.224/27 | 10.0.42.225 -- 10.0.42.254 | 10.0.42.255 |

Troncos

```

S04B(config-if)#interface port-channel 1
S04B(config-if)#switchport mode trunk
S04B(config-if)#switchport trunk allowed vlan 50,60
S04B(config-if)#exit
S04B(config)#interface port-channel 2
S04B(config-if)#switchport mode trunk
S04B(config-if)#switchport trunk allowed vlan 50,60

```

```

S02B(config)#interface port-channel 1
S02B(config-if)#switchport mode trunk

S02B(config-if)#switchport trunk allowed vlan 50,60
S02B(config-if)#end

```

```

S03B(config)#interface port-channel 2
S03B(config-if)#switchport mode trunk

S03B(config-if)%%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking
Port-channel2 on VLAN0001. Port consistency restored.

%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking Port-channel2 on
VLAN0001. Port consistency restored.

switchport mode trunk
S03B(config-if)#switchport trunk allowed vlan 50,60

```

## Router on-a-stick

```

S04B(config)#interface fa0/1
S04B(config-if)#switchport mode trunk
S04B(config-if)#switchport trunk allowed vlan 50,60

R02B(config)#interface fa0/0
R02B(config-if)#no shutdown

R02B(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

R02B(config-if)#exit
R02B(config)#interface fa0/0.50
R02B(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.50, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.50, changed state to up

R02B(config-subif)#encapsulation dot1q 50
R02B(config-subif)#ip address 10.0.42.33 255.255.255.224
R02B(config-subif)#exit
R02B(config)#interface fa0/0.60
R02B(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.60, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.60, changed state to up

R02B(config-subif)#encapsulation dot1q 60
R02B(config-subif)#ip address 10.0.42.65 255.255.255.224
R02B(config-subif)#exit

```

## Enrutamiento EIGRPv6

```

R01B(config)#ipv6 router eigrp 1
R01B(config-rtr)#eigrp router-id 1.1.1.1
R01B(config-rtr)#no shutdown
R01B(config-rtr)#exit
R01B(config)#interface fa0/0
R01B(config-if)#ipv6 eigrp 1
R01B(config-if)#exit
R01B(config)#interface fa0/1
R01B(config-if)#ipv6 eigrp 1
R01B(config-if)#exit
R01B(config)#w

```

```

R03B(config)#ipv6 router eigrp 1
R03B(config-rtr)#eigrp router-id 2.2.2.2
R03B(config-rtr)#no shutdown
R03B(config-rtr)#exit
R03B(config)#interface fa0/0
R03B(config-if)#ipv6 eigrp 1
R03B(config-if)#exit
R03B(config)#interface fa0/1
R03B(config-if)#ipv6 eigrp 1
R03B(config-if)#
%DUAL-5-NBRCHANGE: IPv6-EIGRP 1: Neighbor
FE80::260:3EFF:FECE:D802 (FastEthernet0/1) is up: new adjacency

```

```

R02B(config)#ipv6 router eigrp 1
R02B(config-rtr)#eigrp router-id 3.3.3.3
R02B(config-rtr)#no shutdown
R02B(config-rtr)#exit
R02B(config)#interface fa1/0
R02B(config-if)#ipv6 eigrp 1
R02B(config-if)#
%DUAL-5-NBRCHANGE: IPv6-EIGRP 1: Neighbor
FE80::2D0:BAFF:FEE7:5C01 (FastEthernet1/0) is up: new adjacency

```

```

R02B(config-if)#exit
R02B(config)#interface fa0/0.50
R02B(config-subif)#ipv6 eigrp 1
R02B(config-subif)#exit
R02B(config)#interface fa0/0.60
R02B(config-subif)#ipv6 eigrp 1
R02B(config-subif)#exit
R02B(config)#interface fa0/0
R02B(config-if)#ipv6 eigrp 1
R02B(config-if)#exit

```

## LLDP

```

R01B(config)#lldp run
R01B(config)#interface fa0/0
R01B(config-if)#lldp transmit
R01B(config-if)#lldp receive
R01B(config-if)#exit
R01B(config)#interface fa0/1
R01B(config-if)#lldp transmit
R01B(config-if)#lldp receive

```

```

R03B(config)#lldp run
R03B(config)#interface fa0/0
R03B(config-if)#lldp transmit
R03B(config-if)#lldp receive
R03B(config-if)#exit
R03B(config)#interface fa0/1
R03B(config-if)#lldp transmit
R03B(config-if)#lldp receive

```

```

R02B(config)#lldp run
R02B(config)#interface fa00/0
R02B(config-if)#lldp transmit
R02B(config-if)#lldp receive
R02B(config-if)#exit
R02B(config)#interface fa00/1
R02B(config-if)#lldp transmit
R02B(config-if)#lldp receive
R02B(config-if)#exit
R02B(config)#interface fa1/0
R02B(config-if)#lldp transmit
R02B(config-if)#lldp receive

R02B#show lldp neighbors
Capability codes:
  (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable
Device
  (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
Device ID          Local Intf    Hold-time    Capability
Port ID
R03B               Fa1/0        120          R
Fa0/0
R03B               Fa1/0        120          R
Fa0/1

```

## Syslog

| Syslog  |                         |             |  |
|---------|-------------------------|-------------|--|
| Service |                         |             | <input checked="" type="radio"/> On <input type="radio"/> Off            |
|         | Time                    | HostName    | Message  |
| 1       | 03.01.1993 12:09:53.944 | 10.0.42.98  | %SYS-5-CONFIG_I: Configured from console by console                      |
| 2       | 03.01.1993 12:09:53.944 | 10.0.42.98  | : %SYS-6-LOGGINGHOST_STARTSTOP: Logging to host 10.0.42.2 port 514 st... |
| 3       | 03.01.1993 12:10:10.206 | 10.0.42.130 | %SYS-5-CONFIG_I: Configured from console by console                      |
| 4       | 03.01.1993 12:10:10.206 | 10.0.42.130 | : %SYS-6-LOGGINGHOST_STARTSTOP: Logging to host 10.0.42.2 port 514 st... |

## Configuración Router inalámbrico

|                       |   |
|-----------------------|---|
| Modo Red:             | Wireless-N Only ▼   |
| Nombre de Red (SSID): | Wifi  |
| Banda de Radio:       | Auto ▼  |
| Canal Amplio:         | Auto ▼  |
| Canal Estándar:       | 7 - 2.442GHz ▼  |
| Broadcast SSID:       | <input checked="" type="radio"/> Habilitado <input type="radio"/> Deshabilitado |



Modo Seguridad: WPA2 Personal

---

Encriptación: AES

---

Frase contraseña: inves123

---

Key Renewal: 3600 seconds

## Cliente

Link Information

Connect

Profiles

Below is a list of available wireless networks. To search for more wireless networks, click the **Refresh** button. To view more information about a network, select the wireless network name. To connect to that network, click the **Connect** button below.

| Wireless Network Name | CH | Signal |
|-----------------------|----|--------|
| Wifi                  | 7  | 74%    |

Site Information

**Wireless Mode** Infrastructure

**Network Type** Wireless-N

**Radio Band** Auto

**Security** WPA2-PSK

**MAC Address** 0001.63CE.6806

Refresh

Connect

## WPA2-Personal Needed for Connection

This wireless network has WPA2-Personal enabled. To connect to this network, enter the required passphrase in the appropriate field below. Then click the **Connect** button.

**Security** WPA2-Personal
Please select the wireless security method used by your existing wireless network.

**Pre-shared Key** inves123
Please enter a Pre-shared Key that is 8 to 63 characters in length.

## ACL's IPv6

```

R01B(config)#ipv6 access-list NOFTP
R01B(config-ipv6-acl)#remark Denegar FTP a PC04B
R01B(config-ipv6-acl)#deny tcp host 2001:DB8:B:3::2 host
2001:DB8:B:1::3 range 20 21
R01B(config-ipv6-acl)#permit ipv6 any any
R01B(config-ipv6-acl)#exit
R01B(config)#interface fa0/0
R01B(config-if)#ipv6 traffic-filter NOFTP out

```

```

R01B(config)#ipv6 access-list NOWEB
R01B(config-ipv6-acl)#remark Denegar WEB a PC02B
R01B(config-ipv6-acl)#deny tcp host 2001:DB8:B:2::2 host
2001:DB8:B:1::2 eq 80
R01B(config-ipv6-acl)#permit ipv6 any any
R01B(config-ipv6-acl)#interface fa0/1
R01B(config-if)#ipv6 traffic-filter NOWEB in

```

## Servicio de E-Mail

### Servidor

EMAIL

SMTP Service

☒ ON ☐ OFF

POP3 Service

☒ ON ☐ OFF

Domain Name:  Set

User Setup

User  Password

|         |
|---------|
| edu     |
| vicente |

+  
-

### Clientes

Configure Mail
X

**User Information**

Your Name:

Email Address:

**Server Information**

Incoming Mail Server:

Outgoing Mail Server:

**Logon Information**

User Name:

Password:

Configure Mail
X

**User Information**

Your Name:

Email Address:

**Server Information**

Incoming Mail Server:

Outgoing Mail Server:

**Logon Information**

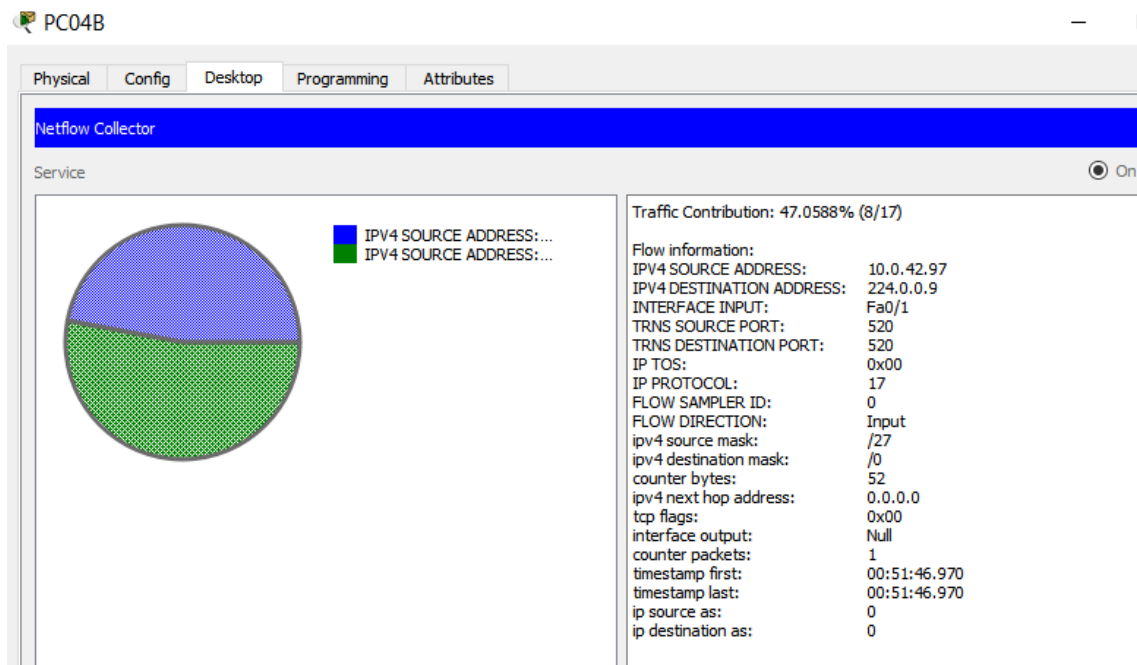
User Name:

Password:

## Configuración NetFlow en R03B

```
R03B(config)#ip flow destination 10.0.42.68 9996
R03B(config)#ip flow version ?
  9
R03B(config)#ip flow version 9
R03B(config)#interface fa0/0
R03B(config-if)#ip flow ?
  egress  Enable outbound NetFlow
  ingress Enable inbound NetFlow
  monitor Apply a Flow Monitor to this interface
R03B(config-if)#ip flow ingress
R03B(config-if)#ip flow egress
R03B(config-if)#exit
R03B(config)#interface fa0/1
R03B(config-if)#ip flow ingress
R03B(config-if)#ip flow egress
```

## Recolector NetFlow en PC04B



## Conexiones entre Subsedes

### LAN A → Internet por Frame-Relay

Router LAN A

```
R05A(config)#interface se0/2/0
R05A(config-if)#ip address 128.65.42.1 255.255.255.0
R05A(config-if)#encapsulation frame-relay
R05A(config-if)#frame-relay map ip 128.65.42.2 101
R05A(config-if)#no shutdown
```

Router de Internet

```
R01I(config)#interface se0/0/1
R01I(config-if)#ip address 128.65.42.2 255.255.255.0
R01I(config-if)#encapsulation frame-relay
R01I(config-if)#frame-relay map ip 128.65.42.1 201
R01I(config-if)#no shutdown
```

Nube Frame-Relay

| Frame Relay |           |          |           |
|-------------|-----------|----------|-----------|
| Serial0     |           | <->      | Serial0   |
| Puerto      | Subenlace | Puerto   | Subenlace |
| De Puerto   | Subenlace | A Puerto | Subenlace |
| 1 Serial0   | 201       | Serial1  | 101       |

### LAN B a LAN Principal por PPP autenticación PAP

Router LAN B

```
R04B(config)#interface Serial0/2/0
R04B(config-if)#encapsulation ppp
R04B(config-if)#ppp authentication pap
R04B(config-if)#ppp pap sent-username R05P password cisco
R04B(config-if)#no shutdown
R04B(config-if)#end
```

Router LAN Principal

```
R05P(config)#interface Serial0/2/1
R05P(config-if)#encapsulation ppp
R05P(config-if)#ppp authentication pap
R05P(config-if)#ppp pap sent-username R04B password cisco
R05P(config-if)#no shutdown
```

## LAN Principal a Internet por HDLC

### Router Internet

```
R01I(config)#interface se0/0/0
R01I(config-if)#ip address 128.67.42.1 255.255.255.0
R01I(config-if)#encapsulation hdlc
R01I(config-if)#no shutdown
```

### Router LAN Principal

```
R05P(config)#interface se0/2/0
R05P(config-if)#ip address 128.67.42.2 255.255.255.0
R05P(config-if)#encapsulation hdlc
R05P(config-if)#no shutdown
```

## Enrutamiento entre Routers frontera

### OSPFv2

```
R01I(config)#router ospf 10
R01I(config-router)#router-id 1.1.1.1
R01I(config-router)#network 128.64.42.0 0.0.255.255 area 0
R01I(config-router)#network 128.65.42.0 0.0.0.255 area 0
R01I(config-router)#network 128.67.42.0 0.0.0.255 area 0
```

```
R05P(config)#router ospf 10
R05P(config-router)#router-id 2.2.2.2
R05P(config-router)#network 128.66.42.0 0.0.0.255 area 0
R05P(config-router)#network 128.67.42.0 0.0.0.255 area 0
```

```
R05A(config-router)#router-id 3.3.3.3
R05A(config-router)#network 128.65.42.0 0.0.0.255 area 0
```

```
R04B(config)#router ospf 10
R04B(config-router)#router-id 4.4.4.4
R04B(config-router)#network 128.66.42.0 0.0.0.255 area 0
```

### OSPFv3

```
R01I(config)#interface se0/0/0
R01I(config-if)#ipv6 ospf 10 area 0
R01I(config-if)#exit
R01I(config)#interface se0/0/1
R01I(config-if)#ipv6 ospf 10 area 0
```

```
R05P(config)#interface se0/2/1
R05P(config-if)#ipv6 ospf 10 area 0
R05P(config-if)#exit
R05P(config)#interface se0/2/0
R05P(config-if)#ipv6 ospf 10 area 0
```

```

R04B(config)#interface se0/2/0
R04B(config-if)#ipv6 ospf 10 area 0
R04B(config-if)#
00:58:33: %OSPFv3-5-ADJCHG: Process 10, Nbr 192.168.42.98 on
Serial0/2/0 from LOADING to FULL, Loading Done

```

```

R05A(config)#interface se0/2/0
R05A(config-if)#ipv6 ospf 10 area 0

```

Configuración de Frame-Relay y OSPFv3 para comunicación y enrutamiento entre los sitios Internet y Subsede LAN A

#### R05A

Physical Config CLI Attributes

IOS Command Line Interface

```

!
interface Serial0/2/0
 ip address 128.65.42.1 255.255.255.0
 encapsulation frame-relay
 frame-relay map ip 128.65.42.2 101 broadcast
 frame-relay map ipv6 FE80::101 101
 frame-relay map ipv6 2001:DB8:CAFE:1::1 101 broadcast
 no frame-relay inverse-arp
 ip nat outside
 ipv6 address FE80::201 link-local
 ipv6 address 2001:DB8:CAFE:1::2/64
 ipv6 ospf 10 area 0
 clock rate 2000000

```

#### R01I

Physical Config CLI Attributes

IOS Command Line Interface

```

!
interface Serial0/0/1
 ip address 128.65.42.2 255.255.255.0
 encapsulation frame-relay
 frame-relay map ip 128.65.42.1 201 broadcast
 frame-relay map ipv6 FE80::201 201
 frame-relay map ipv6 2001:DB8:CAFE:1::2 201 broadcast
 no frame-relay inverse-arp
 ipv6 address FE80::101 link-local
 ipv6 address 2001:DB8:CAFE:1::1/64
 ipv6 ospf 10 area 0

```

## Configuración de los NAT

### LAN Principal

```
R05P(config)#access-list 1 permit 192.168.42.0 0.0.0.15
R05P(config)#access-list 1 permit 192.168.42.16 0.0.0.15
R05P(config)#access-list 1 permit 192.168.42.32 0.0.0.15
R05P(config)#access-list 1 permit 192.168.42.48 0.0.0.15
R05P(config)#ip nat inside source list 1 interface se0/2/0
overload
R05P(config)#ip nat inside source list 1 interface se0/2/1
overload
R05P(config)#interface se0/2/0
R05P(config-if)#ip nat outside
R05P(config-if)#exit
R05P(config)#interface se0/2/1
R05P(config-if)#ip nat outside
R05P(config-if)#interface fa0/0
R05P(config-if)#ip nat inside
```

### LAN A

```
R05A(config)#access-list 1 permit 172.16.42.0 0.0.0.31
R05A(config)#access-list 1 permit 172.16.42.32 0.0.0.31
R05A(config)#access-list 1 permit 172.16.42.64 0.0.0.31
R05A(config)#ip nat inside source list 1 interface se0/2/0
overload
R05A(config)#interface se0/2/0
R05A(config-if)#ip nat outside
R05A(config-if)#exit
R05A(config)#interface fa0/0
R05A(config-if)#ip nat outside
```

### LAN B

```
R04B(config)#access-list 1 permit 10.0.42.0 0.0.0.31
R04B(config)#access-list 1 permit 10.0.42.32 0.0.0.31
R04B(config)#access-list 1 permit 10.0.42.64 0.0.0.31
R04B(config)#access-list 1 permit 10.0.42.160 0.0.0.31
R04B(config)#ip nat inside source list 1 interface se0/2/0
overload
R04B(config)#interface se0/2/0
R04B(config-if)#ip nat outside
R04B(config-if)#exit
R04B(config)#interface fa0/0
R04B(config-if)#ip nat inside
```

## Reenvío de puertos

Para poder acceder al Servidor Web de la LAN Principal a través de 128.67.42.2

```
R05P>en
R05P#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R05P(config)#ip nat inside source static tcp 192.168.42.2 80
128.67.42.2 80
```

Para poder acceder al Servidor Web de la LAN A a través de 128.65.42.1

```
R05A>en
R05A#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R05A(config)#ip nat inside source static tcp 172.16.42.4 80
128.65.42.1 80
```

Para poder acceder al Servidor Web de la LAN B a través de 128.66.42.1

```
R04B>en
R04B#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R04B(config)#ip nat inside source static tcp 10.0.42.2 80
128.66.42.1 80
```