



REDES 2

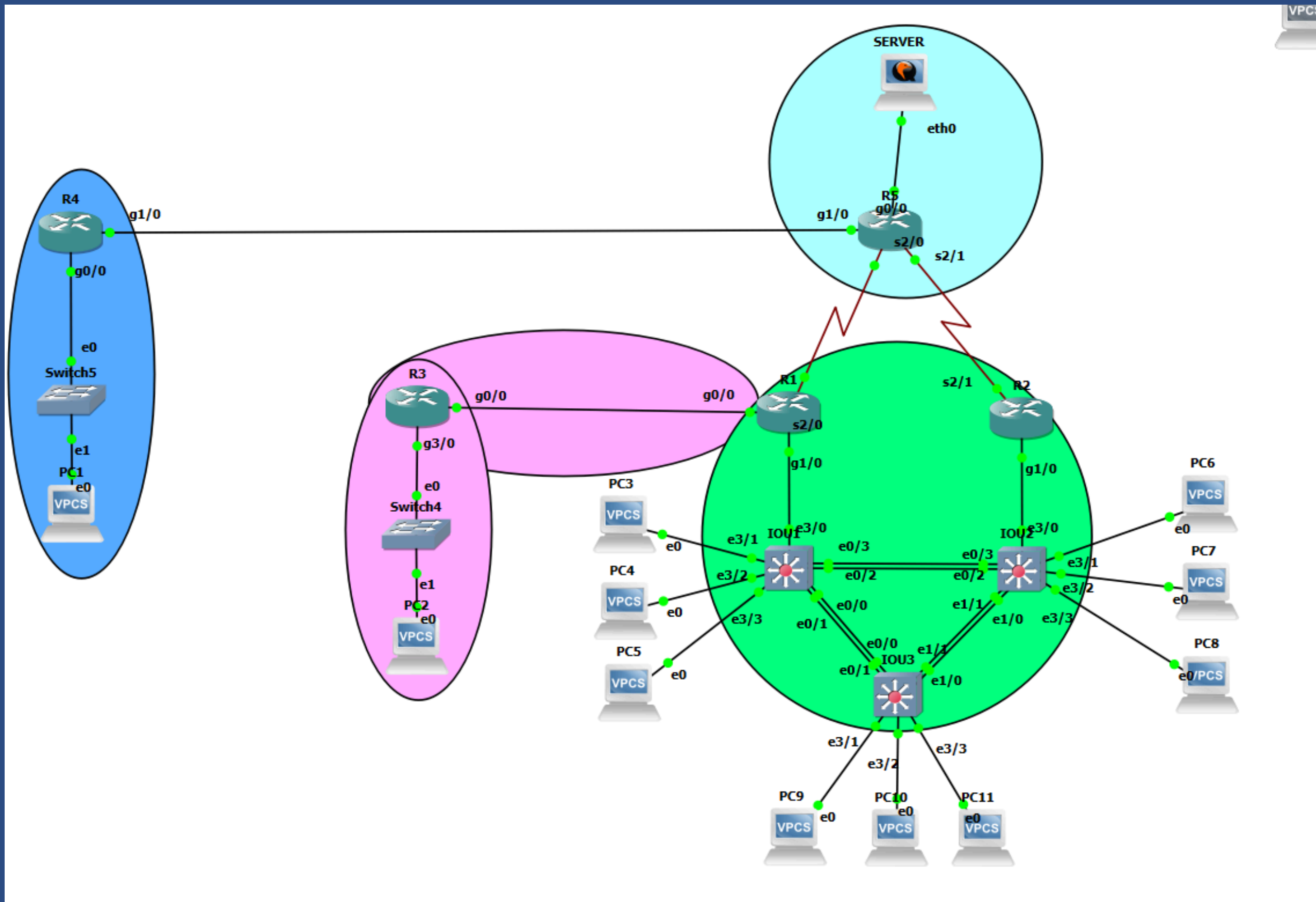
# Examen Parcial 2

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# Topología

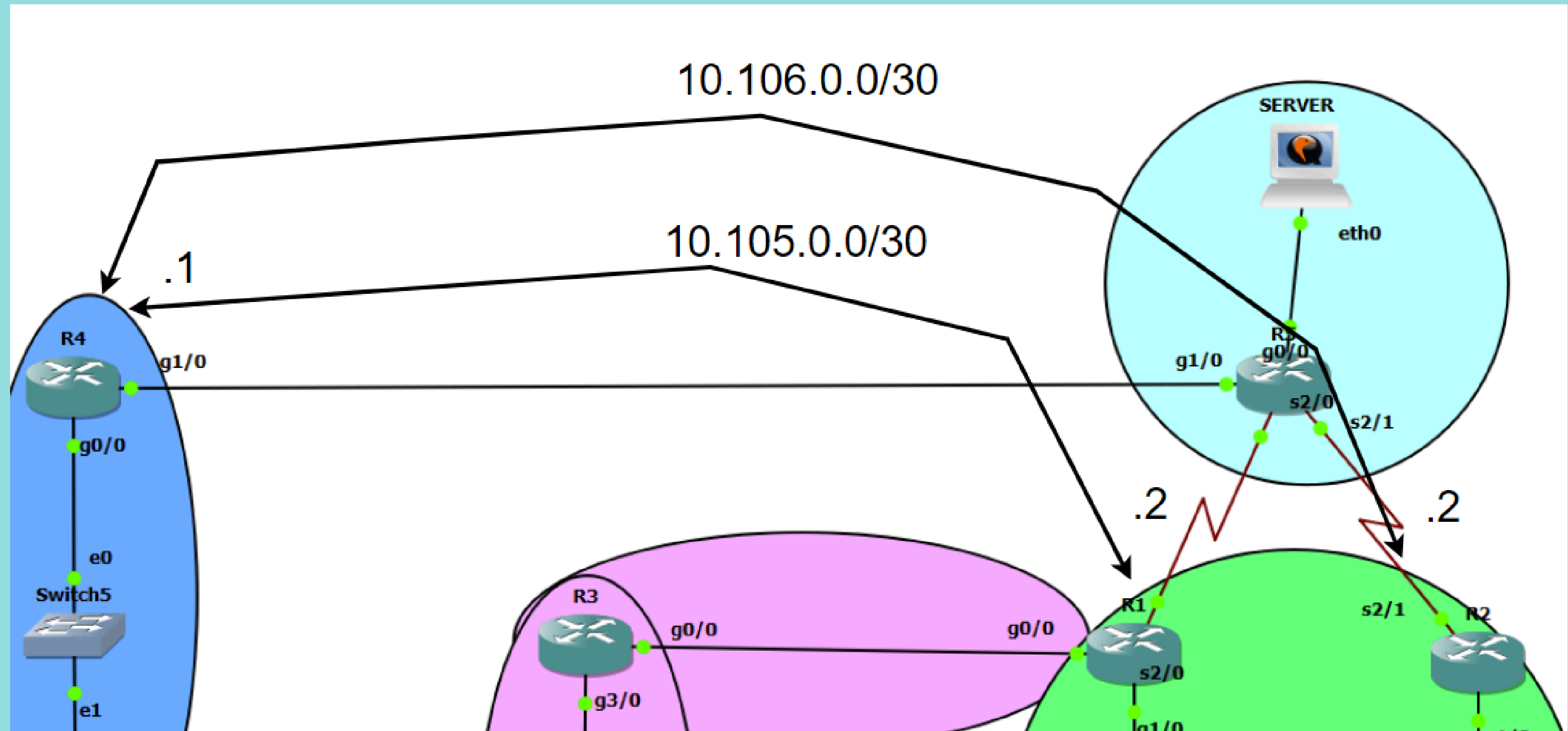


# Subneteo

Network	Name	No. Hosts	Subnet ID	First Host	Last Host	Broadcast IP	CIDR	Mask	wildcard
VLAN 10	ADMINISTRATION	254	10.10.0.0	10.10.0.1	10.10.0.254	10.10.0.255	/24	255.255.255.0	0.0.0.255
VLAN 20	STUDENT	254	10.20.0.0	10.20.0.1	10.20.0.254	10.20.0.255	/24	255.255.255.0	0.0.0.255
VLAN 30	SALES	254	10.30.0.0	10.30.0.1	10.30.0.254	10.30.0.255	/24	255.255.255.0	0.0.0.255
R1 - ISP	-	2	140.69.212.0	140.69.212.1	140.69.212.2	140.69.212.3	/30	255.255.255.252	0.0.0.3
R2 - ISP	-	2	64.27.3.0	64.27.3.1	64.27.3.2	64.27.3.3	/30	255.255.255.252	0.0.0.3
R1 - R3	-	2	10.200.0.0	10.200.0.1	10.200.0.2	10.200.0.3	/30	255.255.255.252	0.0.0.3
ISP - R4	-	2	10.105.0.0	10.105.0.1	10.105.0.2	10.105.0.3	/30	255.255.255.252	0.0.0.3
R3	-	254	10.102.0.0	10.102.0.1	10.102.0.254	10.102.0.255	/24	255.255.255.0	0.0.0.255
R4	-	254	10.101.0.0	10.101.0.1	10.101.0.254	10.101.0.255	/24	255.255.255.0	0.0.0.255
RISP	-	2	200.0.0.0	200.0.0.1	200.0.0.2	200.0.0.3	/30	255.255.255.252	0.0.0.3

# Tunnel GRE

Se realizaron dos tuneles, desde R4 a R1 y de R4 a R2, en la imagen se muestra las ip que se utilizaron y como esta configurado.



# Configuración R4

R4 -----> R1

```
interface Tunnel1
ip address 10.105.0.1 255.255.255.252
tunnel source GigabitEthernet1/0
tunnel destination 140.69.212.1
```

R4 -----> R2

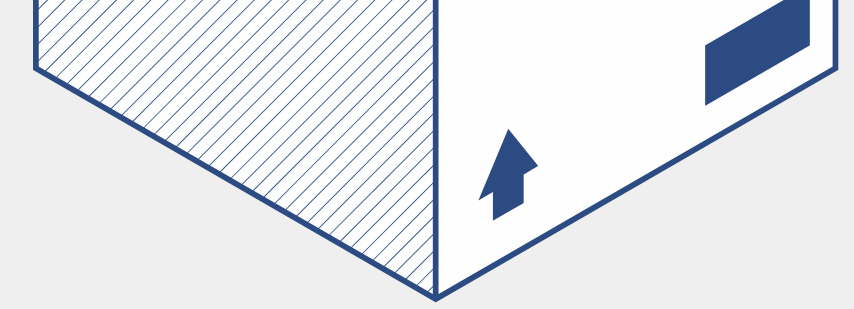
```
interface Tunnel2
ip address 10.106.0.1 255.255.255.252
tunnel source GigabitEthernet1/0
tunnel destination 64.27.3.1
```

Rutas estaticas de R4

```
ip route 0.0.0.0 0.0.0.0 10.104.0.1
ip route 140.69.212.1 255.255.255.255
GigabitEthernet1/0
```

OSPF de R4

```
router ospf 10
 redistribute connected subnets
 redistribute static subnets
 network 10.101.0.0 0.0.0.255 area 0
 network 10.105.0.0 0.0.0.3 area 0
 network 10.106.0.0 0.0.0.3 area 0
```



# R1 y R2

R1 -----> R4

```
interface Tunnel1
ip address 10.105.0.2 255.255.255.252
tunnel source Serial2/0
tunnel destination 10.104.0.2
```

## Rutas Estaticas R1

```
ip route 0.0.0.0 0.0.0.0 140.69.212.2
ip route 10.104.0.2 255.255.255.255 Serial2/0
```

## Rutas Estaticas R1

```
router ospf 10
 redistribute static subnets
 network 10.10.0.0 0.0.0.255 area 0
 network 10.20.0.0 0.0.0.255 area 0
 network 10.30.0.0 0.0.0.255 area 0
 network 10.105.0.0 0.0.0.3 area 0
 network 10.200.0.0 0.0.0.3 area 51
```

R2 -----> R4

```
interface Tunnel2
ip address 10.106.0.2 255.255.255.252
tunnel source Serial2/1
tunnel destination 10.104.0.2
```

## Rutas Estaticas R2

```
ip route 0.0.0.0 0.0.0.0 64.27.3.2
ip route 64.27.3.2 255.255.255.255 Serial2/1
```

## Rutas Estaticas R2

```
router ospf 10
 redistribute static subnets
 network 10.10.0.0 0.0.0.255 area 0
 network 10.20.0.0 0.0.0.255 area 0
 network 10.30.0.0 0.0.0.255 area 0
 network 10.106.0.0 0.0.0.3 area 0
 network 10.200.0.0 0.0.0.3 area 0
```

# Pruebas de Tunnel

## Interfaz de R1

```
Tunnel1 10.105.0.2 YES NVRAM up up
```

## De R1 a PC en R4

```
R1#trace 10.101.0.1
Type escape sequence to abort.
Tracing the route to 10.101.0.1
VRF info: (vrf in name/id, vrf out name/id)
 1 10.105.0.1 44 msec 28 msec 40 msec
 2 10.101.0.1 48 msec 36 msec 40 msec
```

## De R4 a PC en R1

```
R4#trace 10.102.0.1
Type escape sequence to abort.
Tracing the route to 10.102.0.1
VRF info: (vrf in name/id, vrf out name/id)
 1 10.105.0.2 44 msec 40 msec 32 msec
 2 10.200.0.2 48 msec 100 msec 100 msec
 3 10.102.0.1 188 msec 68 msec 68 msec
R4#
```

## Interfaz de R2

```
Tunnel2 10.106.0.2 YES manual up up
```

## De R2 a PC en R4

```
R2#trace 10.101.0.1
Type escape sequence to abort.
Tracing the route to 10.101.0.1
VRF info: (vrf in name/id, vrf out name/id)
 1 10.106.0.1 196 msec 40 msec 28 msec
 2 10.101.0.1 48 msec 40 msec 40 msec
```

## De R4 a PC en R2

```
R4#trace 10.30.0.2
Type escape sequence to abort.
Tracing the route to 10.30.0.2
VRF info: (vrf in name/id, vrf out name/id)
 1 10.106.0.2 52 msec
   10.105.0.2 20 msec
   10.106.0.2 40 msec
 2 10.30.0.2 92 msec 48 msec 64 msec
```



# Propagación de rutas

## Base de Datos en R1

OSPF Router with ID (140.69.212.1) (Process ID 10)					
Router Link States (Area 0)					
Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.105.0.1	10.105.0.1	1691	0x80000014	0x00D332	5
64.27.3.1	64.27.3.1	1475	0x80000015	0x001B1F	5
140.69.212.1	140.69.212.1	1782	0x8000000B	0x00505B	5
Net Link States (Area 0)					
Link ID	ADV Router	Age	Seq#	Checksum	
10.10.0.1	140.69.212.1	1740	0x80000002	0x006A0B	
10.20.0.1	140.69.212.1	1740	0x80000002	0x00F179	
10.30.0.1	140.69.212.1	1493	0x80000002	0x0079E7	
Summary Net Link States (Area 0)					
Link ID	ADV Router	Age	Seq#	Checksum	
10.102.0.0	140.69.212.1	1	0x80000004	0x0055CA	
10.200.0.0	140.69.212.1	1	0x80000004	0x009C25	
Router Link States (Area 51)					
Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.200.0.2	10.200.0.2	1973	0x80000004	0x00104C	2
140.69.212.1	140.69.212.1	1	0x80000005	0x00E450	1
Net Link States (Area 51)					
Link ID	ADV Router	Age	Seq#	Checksum	
10.200.0.1	140.69.212.1	1	0x80000004	0x001A28	
Summary Net Link States (Area 51)					
Link ID	ADV Router	Age	Seq#	Checksum	
10.10.0.0	140.69.212.1	1	0x80000004	0x009FDD	
10.20.0.0	140.69.212.1	1	0x80000004	0x00274C	
10.30.0.0	140.69.212.1	1	0x80000004	0x00AEBA	
10.101.0.0	140.69.212.1	1777	0x80000001	0x0091A7	
10.105.0.0	140.69.212.1	1	0x80000004	0x003FF6	
10.106.0.0	140.69.212.1	1740	0x80000005	0x003BF7	

## Base de Datos en R2

OSPF Router with ID (64.27.3.1) (Process ID 10)					
Router Link States (Area 0)					
Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.105.0.1	10.105.0.1	1779	0x80000014	0x00D332	5
64.27.3.1	64.27.3.1	1562	0x80000015	0x001B1F	5
140.69.212.1	140.69.212.1	1871	0x8000000B	0x00505B	5
Net Link States (Area 0)					
Link ID	ADV Router	Age	Seq#	Checksum	
10.10.0.1	140.69.212.1	1829	0x80000002	0x006A0B	
10.20.0.1	140.69.212.1	1829	0x80000002	0x00F179	
10.30.0.1	140.69.212.1	1582	0x80000002	0x0079E7	
Summary Net Link States (Area 0)					
Link ID	ADV Router	Age	Seq#	Checksum	
10.102.0.0	140.69.212.1	90	0x80000004	0x0055CA	
10.200.0.0	140.69.212.1	90	0x80000004	0x009C25	
Type-5 AS External Link States					
Link ID	ADV Router	Age	Seq#	Checksum	Tag
10.104.0.0	10.105.0.1	9	0x80000004	0x00BCFC	0
10.104.0.2	140.69.212.1	90	0x80000004	0x00730E	0
64.27.3.2	64.27.3.1	830	0x80000003	0x00EFEE	0
140.69.212.1	10.105.0.1	9	0x80000004	0x00A4DC	0



# HSRP (R1)

## Sub-Interzas vlan 10 R1

```
interface GigabitEthernet1/0.1
 encapsulation dot1Q 10
 ip address 10.10.0.1 255.255.255.0
 ip nat inside
 standby 1 ip 10.10.0.254
 standby 1 priority 150
 standby 1 preempt
 ip ospf priority 150
```

## Sub-Interzas vlan 20 R1

```
interface GigabitEthernet1/0.2
 encapsulation dot1Q 20
 ip address 10.20.0.1 255.255.255.0
 ip nat inside
 standby 1 ip 10.20.0.254
 standby 1 priority 150
 standby 1 preempt
 ip ospf priority 150
```

## Sub-Interzas vlan 30 R1

```
interface GigabitEthernet1/0.3
 encapsulation dot1Q 30
 ip address 10.30.0.1 255.255.255.0
 ip nat inside
 standby 1 ip 10.30.0.254
 ip ospf priority 100
```

## Estado del HSRP R1

```
R1#show standby brief
                P indicates configured to preempt.
                |
Interface      Grp  Pri P State      Active      Standby      Virtual IP
Gi1/0.1        1   150 P Active     local       10.10.0.253  10.10.0.254
Gi1/0.2        1   150 P Active     local       10.20.0.253  10.20.0.254
Gi1/0.3        1   100 Standby    10.30.0.253 local       10.30.0.254
```

# HSRP (R2)

## Sub-Interzas vlan 10 R2

```
interface GigabitEthernet1/0.1
 encapsulation dot1Q 10
 ip address 10.10.0.253 255.255.255.0
 ip nat inside
 standby 1 ip 10.10.0.254
 ip ospf priority 100
```

## Sub-Interzas vlan 20 R2

```
interface GigabitEthernet1/0.2
 encapsulation dot1Q 20
 ip address 10.20.0.253 255.255.255.0
 ip nat inside
 standby 1 ip 10.20.0.254
 ip ospf priority 100
```

## Sub-Interzas vlan 30 R2

```
interface GigabitEthernet1/0.3
 encapsulation dot1Q 30
 ip address 10.30.0.253 255.255.255.0
 ip nat inside
 standby 1 ip 10.30.0.254
 standby 1 priority 150
 standby 1 preempt
 ip ospf priority 150
```

## Estado del HSRP R2

```
R2#sh standby brief
                P indicates configured to preempt.
                |
Interface      Grp  Pri  P  State  Active        Standby        Virtual IP
Gi1/0.1        1   100      Standby 10.10.0.1    local         10.10.0.254
Gi1/0.2        1   100      Standby 10.20.0.1    local         10.20.0.254
Gi1/0.3        1   150 P  Active  local        10.30.0.1     10.30.0.254
```

# Ether-Channel

## PortChannel S1

```
Number of channel-groups in use: 2
Number of aggregators:           2
```

Group	Port-channel	Protocol	Ports	
-----+-----+-----+-----				
1	Po1(SU)	PAgP	Et0/0(P)	Et0/1(P)
2	Po2(SU)	LACP	Et0/2(P)	Et0/3(P)

## PortChannel S2

Group	Port-channel	Protocol	Ports	
-----+-----+-----+-----+-----				
2	Po2(SU)	LACP	Et0/2(P)	Et0/3(P)
3	Po3(SU)	LACP	Et1/0(P)	Et1/1(P)

## PortChannel S3

Group	Port-channel	Protocol	Ports	
-----+-----+-----+-----+-----				
1	Po1(SU)	PAgP	Et0/0(P)	Et0/1(P)
3	Po3(SU)	LACP	Et1/0(P)	Et1/1(P)

# NAT/PAT

R1

```
ip nat pool NAT_POOL 175.44.2.2 175.44.2.5 netmask 255.255.255.248
ip nat inside source list 1 pool NAT_POOL overload
ip nat inside source static 10.102.0.1 175.44.2.1
```

R1 AccesList pra la POOL

```
access-list 1 permit 10.0.0.0 0.255.255.255
access-list 1 permit 10.102.0.0 0.0.0.255
```

R2 AccesList pra la POOL

```
access-list 1 permit 10.0.0.0 0.255.255.255
access-list 1 permit 10.102.0.0 0.0.0.255
```

R2

```
ip nat pool NAT_POOL 175.44.2.3 175.44.2.6 netmask 255.255.255.248
ip nat inside source list 1 pool NAT_POOL overload
ip nat inside source static 10.102.0.1 175.44.2.1
```

# Pruebas NAT

Ping al ISP desde R1

```
R1#sh ip nat tr
R1#sh ip nat translations
Pro Inside global      Inside local      Outside local      Outside global
icmp 175.44.2.2:1024    10.10.0.2:23766   200.0.0.1:23766    200.0.0.1:1024
icmp 175.44.2.2:1025    10.10.0.2:24022   200.0.0.1:24022    200.0.0.1:1025
icmp 175.44.2.2:1026    10.10.0.2:24278   200.0.0.1:24278    200.0.0.1:1026
icmp 175.44.2.2:1027    10.10.0.2:24534   200.0.0.1:24534    200.0.0.1:1027
icmp 175.44.2.2:1028    10.10.0.2:24790   200.0.0.1:24790    200.0.0.1:1028
--- 175.44.2.1          10.102.0.1        ---                ---
```

Ping al ISP desde R2

```
R2#sh ip nat translations
Pro Inside global      Inside local      Outside local      Outside global
icmp 175.44.2.3:1024    10.30.0.2:25046   200.0.0.1:25046    200.0.0.1:1024
icmp 175.44.2.3:1025    10.30.0.2:25302   200.0.0.1:25302    200.0.0.1:1025
icmp 175.44.2.3:1026    10.30.0.2:25558   200.0.0.1:25558    200.0.0.1:1026
icmp 175.44.2.3:1027    10.30.0.2:25814   200.0.0.1:25814    200.0.0.1:1027
icmp 175.44.2.3:1028    10.30.0.2:26070   200.0.0.1:26070    200.0.0.1:1028
--- 175.44.2.1          10.102.0.1        ---                ---
```

# ACL

## Configuracion de ACL en R1, R2, R3

```
ip access-list extended EXTERNAL_TRAFFIC_IN
```

```
  permit tcp any host 64.27.3.1 eq 22
```

```
  permit gre any any
```

```
  permit ospf any any
```

```
  permit icmp any any echo
```

```
  permit icmp any any unreachable
```

```
  permit icmp any any time-exceeded
```

```
  deny ip any any log
```

```
ip access-list extended MANAGEMENT_ACCESS
```

```
  permit tcp 10.0.0.0 0.255.255.255 any eq 22
```

```
  permit tcp 192.168.0.0 0.0.255.255 any eq 22
```

```
  deny tcp any any eq 22 log
```

```
  permit udp any any eq 5001
```

```
  deny udp any any eq 5001 log
```

```
access-list 101 permit ip 10.0.0.0 0.255.255.255 any
```

```
access-list 101 permit icmp any any echo-reply
```

```
access-list 101 deny icmp any any echo
```

```
access-list 101 permit ip any any
```



# Pruebas de ACL

```
R4#  
*Oct 25 16:58:51.279: ICMP: echo reply rcvd, src 10.30.0.2, dst 10.105.0.1, topology BASE, dscp 0 topoid 0  
*Oct 25 16:58:51.307: ICMP: echo reply rcvd, src 10.30.0.2, dst 10.105.0.1, topology BASE, dscp 0 topoid 0  
*Oct 25 16:58:51.339: ICMP: echo reply rcvd, src 10.30.0.2, dst 10.105.0.1, topology BASE, dscp 0 topoid 0  
*Oct 25 16:58:51.371: ICMP: echo reply rcvd, src 10.30.0.2, dst 10.105.0.1, topology BASE, dscp 0 topoid 0  
*Oct 25 16:58:51.403: ICMP: echo reply rcvd, src 10.30.0.2, dst 10.105.0.1, topology BASE, dscp 0 topoid 0
```

```
osboxes@osboxes:~$ ping 10.101.0.1  
PING 10.101.0.1 (10.101.0.1) 56(84) bytes of data.  
From 140.69.212.1 icmp_seq=1 Packet filtered  
From 140.69.212.1 icmp_seq=2 Packet filtered  
From 140.69.212.1 icmp_seq=3 Packet filtered  
From 140.69.212.1 icmp_seq=4 Packet filtered  
From 140.69.212.1 icmp_seq=5 Packet filtered
```

# DHCP

## Configuracion R1

```
ip dhcp pool vlanpool10
 network 10.10.0.0 255.255.255.0
 default-router 10.10.0.254
 dns-server 8.8.8.8 8.8.4.4
 domain-name jmowry.com
 lease 3
!
ip dhcp pool vlanpool20
 network 10.20.0.0 255.255.255.0
 default-router 10.20.0.254
 dns-server 8.8.8.8 8.8.4.4
 domain-name jmowry.com
 lease 3
!
ip dhcp pool vlanpool30
 network 10.30.0.0 255.255.255.0
 default-router 10.30.0.254
 dns-server 8.8.8.8 8.8.4.4
 domain-name jmowry.com
 lease 3
```

## Configuracion R2

```
ip dhcp pool vlanpool10
 network 10.10.0.0 255.255.255.0
 default-router 10.10.0.254
 dns-server 8.8.8.8 8.8.4.4
 domain-name jmowry.com
 lease 3
!
ip dhcp pool vlanpool20
 network 10.20.0.0 255.255.255.0
 default-router 10.20.0.254
 dns-server 8.8.8.8 8.8.4.4
 domain-name jmowry.com
 lease 3
!
ip dhcp pool vlanpool30
 network 10.30.0.0 255.255.255.0
 default-router 10.30.0.254
 dns-server 8.8.8.8 8.8.4.4
 domain-name jmowry.com
 lease 3
```

# Prueba DHCP

```
PC3> ip dhcp  
DDORA IP 10.10.0.5/24 GW 10.10.0.254
```

```
PC3>
```

```
PC3> show
```

NAME	IP/MASK	GATEWAY	MAC	LPORT	RHOST:PORT
PC3	10.10.0.5/24	10.10.0.254	00:50:79:66:68:28	20110	127.0.0.1:20111
	fe80::250:79ff:fe66:6828/64				

```
PC3> █
```