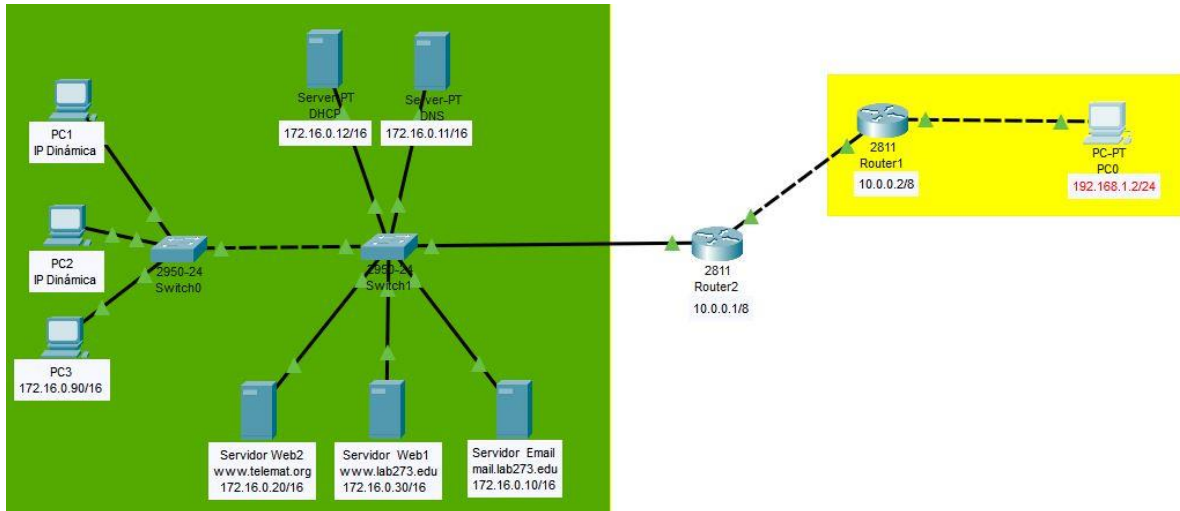


## PRACTIA 1 MODULO 4

Tenemos la réplica de la red



Ahora veamos las configuraciones realizadas para cada dispositivo.

Para el **servidor DHCP** y el **servidor DNS**

Asignamos las direcciones del servidor y su respectiva IP, mas el gateway

Asignamos las direcciones del servidor y su respectiva IP, mas el gateway

Configuramos los servicios del servidor DHCP

Interface: [Interface] Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 172.16.0.1

DNS Server: 172.16.0.11

Start IP Address: 172.16.0.10

Subnet Mask: 255.255.0.0

Maximum Number of Users: 100

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	172.16.0.1	172.16.0.11	172.16.0.100	255.255.0.0	50	0.0.0.0	0.0.0.0

Configuramos los servicios del servidor DNS

DNS Service: ☒ On ☐ Off

Resource Records

No.	Name	Type	Detail
0	mail.lab273.edu	A Record	172.16.0.10
1	www.lab273.edu	A Record	172.16.0.30
2	www.telemat.org	A Record	172.16.0.20

DNS Cache

Para los servidores WEB1 y WEB2 y el servidor EMAIL

Servidor Web2 IP Configuration:

- Static IP Address: 172.16.0.20
- Subnet Mask: 255.255.0.0
- Default Gateway: 172.16.0.1
- DNS Server: 172.16.0.11

Servidor Web1 IP Configuration:

- Static IP Address: 172.16.0.30
- Subnet Mask: 255.255.0.0
- Default Gateway: 172.16.0.1
- DNS Server: 172.16.0.11

Servidor Email IP Configuration:

- Static IP Address: 172.16.0.10
- Subnet Mask: 255.255.0.0
- Default Gateway: 172.16.0.1
- DNS Server: 172.16.0.11

Asignamos las IP y la dirección del servidor mas el gateway

Vemos las configuraciones realizadas para los servidores web 1 y 2

Servidor Web2 Services:

- HTTP: ☒ On ☐ Off
- File Manager:
 

File Name	Edit
1 copyrights.html	(edit)
2 cscoplogo177x111.jpg	(edit)
3 helloworld.html	(edit)
4 image.html	(edit)
5 index.html	(edit)

Servidor Web1 Services:

- HTTP: ☒ On ☐ Off
- File Manager:
 

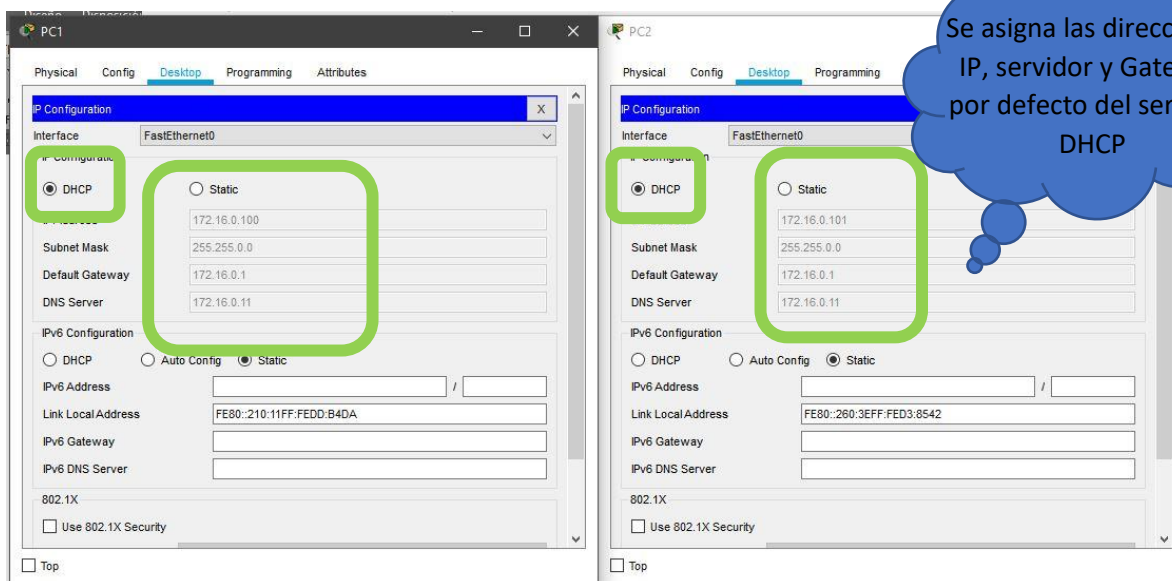
File Name	Edit
1 copyrights.html	(edit)
2 cscoplogo177x111.jpg	(edit)
3 helloworld.html	(edit)
4 image.html	(edit)
5 index.html	(edit)

Servidor Email Services:

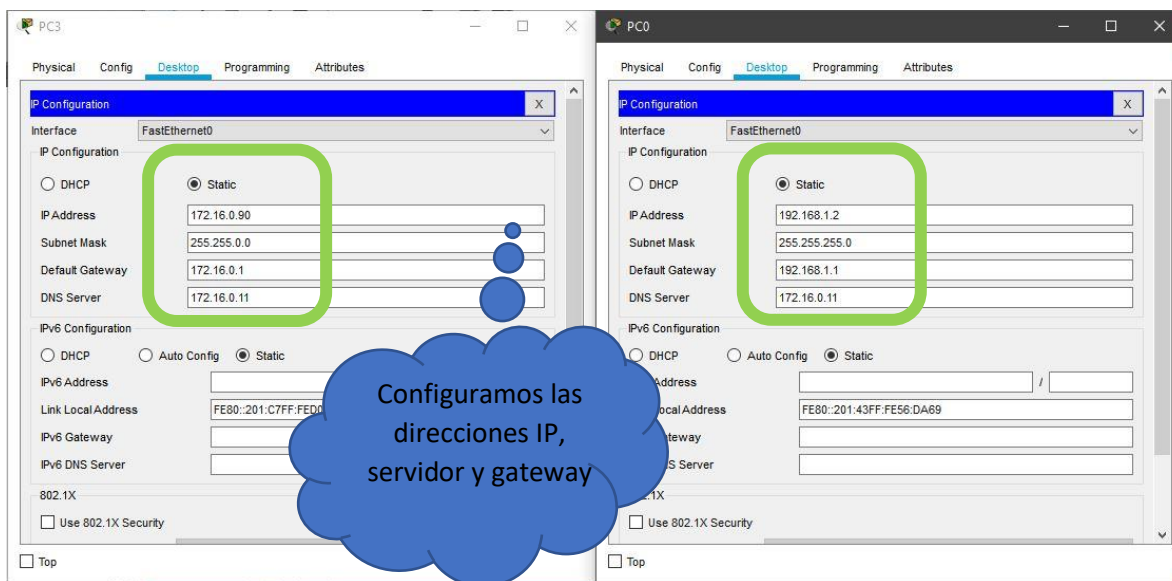
- SMTP Service: ☒ ON ☐ OFF
- POP3 Service: ☒ ON ☐ OFF
- Domain Name: mail.lab273.edu
- User Setup:
 

User	Password
alu1	2468
alu2	

Para los host **PC1** y **PC2**



Para los host **PC3** y **PC0**



Para los **Routers 2 y 1**

Configuramos el fastethernet0/0, para el router 2 y 1

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IP Address

Subnet Mask

Tx Ring Limit

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

0002.17D6.8301

10.0.0.1

255.0.0.0

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#

Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IP Address

Subnet Mask

Tx Ring Limit

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

000A.41DD.8501

10.0.0.2

255.0.0.0

10

Equivalent IOS Commands

Router>enable

Router#

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#

Top

Configuramos el fastethernet0/1, para el router 2 y 1

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IP Address

Subnet Mask

Tx Ring Limit

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

0002.17D6.8302

172.16.0.1

255.255.0.0

10

Equivalent IOS Commands

Router#

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface FastEthernet0/1

Router(config-if)#

Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IP Address

Subnet Mask

Tx Ring Limit

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

000A.41DD.8502

192.168.1.1

255.255.255.0

10

Equivalent IOS Commands

Router#

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface FastEthernet0/1

Router(config-if)#

Top

Configuramos las direcciones de red para los routers 2 y 1

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

RIP Routing (v2)

Network

Network Address

10.0.0.0

172.16.0.0

Remove

Equivalent IOS Commands

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

Router(config)#interface FastEthernet0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface FastEthernet0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#router rip

Router(config-router)#no network 171.16.0.0

Router(config-router)#no network 192.16.1.0

Router(config-router)#

Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

RIP Routing (v2)

Network

Network Address

10.0.0.0

192.168.1.0

Remove

Equivalent IOS Commands

Router#

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#

Router(config-if)#exit

Router(config)#interface FastEthernet0/1

Router(config-if)#

Router(config-if)#exit

Router(config)#router rip

Router(config-router)#

Top

Veamos el trafico que realizan

PDU List Window

Fire	Last O	Successful	PC0	DNS	ICMP	Color	Time(sec)	Periodic	Num	Edit	Delete
●		Successful	PC0	DNS	ICMP		0.000	N	0	(edit)	(delete)
●		Successful	PC0	DHCP	ICMP		0.000	N	1	(edit)	(delete)
●		Successful	PC0	Servidor Email	ICMP		0.000	N	2	(edit)	(delete)
●		Successful	PC0	Servidor Web1	ICMP		0.000	N	3	(edit)	(delete)
●		Successful	PC0	Servidor Web2	ICMP		0.000	N	4	(edit)	(delete)
●		Successful	PC1	PC0	ICMP		0.000	N	5	(edit)	(delete)
●		Successful	PC2	PC0	ICMP		0.000	N	6	(edit)	(delete)
●		Successful	PC3	PC0	ICMP		0.000	N	7	(edit)	(delete)
●		Successful	DHCP	PC0	ICMP		0.000	N	8	(edit)	(delete)
●		Successful	DNS	PC0	ICMP		0.000	N	9	(edit)	(delete)
●		Successful	Servidor ...	PC0	ICMP		0.000	N	10	(edit)	(delete)
●		Successful	Servidor ...	PC0	ICMP		0.000	N	11	(edit)	(delete)
●		Successful	Servidor ...	PC0	ICMP		0.000	N	12	(edit)	(delete)

## 1. ¿Qué es ARP y en que capa de la pila de protocolos trabaja?

Las siglas ARP corresponden a una definición en inglés (Adress Resolution Protocol), un protocolo de resolución de dirección. Que permite encontrar la dirección hardware equivalente a una determinada dirección IP, actuando como traductor e intermediario, este protocolo trabaja a nivel de capa de red.

## 2. ¿Como se borra la tabla ARP de todas las computadoras? – borre la tabla ARP de todas las computadoras.

primero vamos a ver el contenido del atabla ARP antes de borrar la cahe.

PC1 Command Prompt

```

Packet Tracer PC Command Line 1.0
C:\>arp -a
Internet Address      Physical Address      Type
172.16.0.1            0002.17d6.8302       dynamic
172.16.0.10           0001.43b9.4d7b       dynamic
172.16.0.11           0090.2be9.bb5b       dynamic
172.16.0.101          0060.3ed3.8542       dynamic
  
```

PC2 Command Prompt

```

C:\>arp -a
Internet Address      Physical Address      Type
172.16.0.1            0002.17d6.8302       dynamic
172.16.0.30           0007.ec1c.0829       dynamic
  
```

PC3 Command Prompt

```

Packet Tracer PC Command Line 1.0
C:\>arp -a
Internet Address      Physical Address      Type
172.16.0.1            0002.17d6.8302       dynamic
172.16.0.10           0001.43b9.4d7b       dynamic
172.16.0.11           0090.2be9.bb5b       dynamic
172.16.0.20           009a.4102.47bb       dynamic
  
```

PC0 Command Prompt

```

Packet Tracer PC Command Line 1.0
C:\>arp -a
Internet Address      Physical Address      Type
192.168.1.1           000a.41dd.8502       dynamic
  
```

Vemos la tabla ARP antes de eliminarla, esto para todas las PC's



Ahora borramos el ARP de todas las PC's, eso se realizará con el comando **arp -a**

Probamos el comando para poder borrar el cache de ARP

```
C:\>arp -d
C:\>arp -a
No ARP Entries Found
C:\>
```

Probamos el comando para poder borrar el cache de ARP

```
C:\>clear
Invalid Command.
C:\>arp -d
Invalid Command.
C:\>arp -d
Invalid Command.
C:\>arp -s
Invalid Command.
C:\>arp -a
No ARP Entries Found
C:\>
```

Probamos el comando para poder borrar el cache de ARP

```
Packet Tracer PC Command Line 1.0
C:\>arp -a
Internet Address      Physical Address      Type
172.16.0.1            0002.17d6.8302       dynamic
172.16.0.10           0001.42b3.4d79       dynamic
172.16.0.11           0080.2be5.bb5b       dynamic
172.16.0.20           000a.4102.47bb       dynamic

C:\>arp -d
C:\>arp -a
No ARP Entries Found
C:\>
```

Probamos el comando para poder borrar el cache de ARP

```
Packet Tracer PC Command Line 1.0
C:\>arp -a
Internet Address      Physical Address      Type
192.168.1.1           000a.41dd.8502       dynamic

C:\>arp -d
C:\>arp -d
C:\>arp -a
No ARP Entries Found
C:\>
```

### 3. Hacer PING entre dos computadoras de la misma red verde y mostrar la tabla ARP de esas dos computadoras. DESCRIBA QUE ES LO QUE ESTA PASANDO DETALLADAMENTE CON EL MODO SIMULACION.

Podemos ver que hizo primero el envio de paquetes ARP por la misma razón que no conoce la mac destino

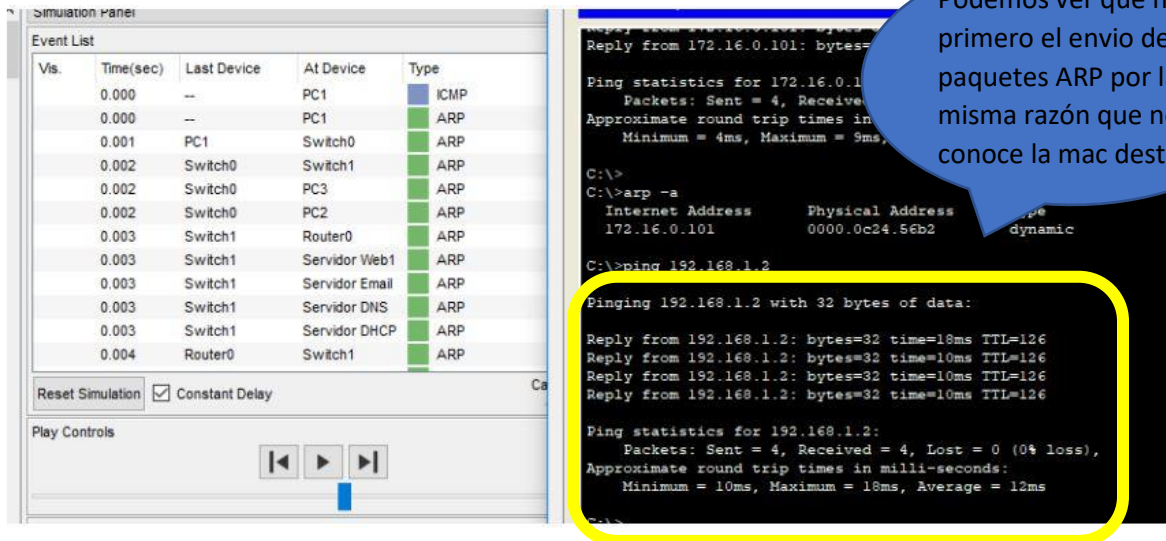
```
C:\>ping 172.16.0.101
Pinging 172.16.0.101 with 32 bytes of data:
Reply from 172.16.0.101: bytes=32 time=9ms TTL=128
Reply from 172.16.0.101: bytes=32 time=4ms TTL=128
Reply from 172.16.0.101: bytes=32 time=4ms TTL=128
Reply from 172.16.0.101: bytes=32 time=4ms TTL=128

Ping statistics for 172.16.0.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 9ms, Average = 5ms
```

Vis.	Time(sec)	Last Device	At Device	Type
0.000	--	PC1		ARP
0.000	--	PC1		ICMP
0.000	--	PC1	Switch0	ARP
0.001	--	PC1		ARP
0.001	--	PC1	Switch0	ARP
0.002	--	Switch0	Switch1	ARP
0.002	--	Switch0	PC2	ARP
0.002	--	Switch0	PC2	ARP
0.003	--	Switch0	Switch1	ARP

Realizamos ping desde la PC1 a la PC2, pues la PC2 manda un paquete arp que pasa por el switch0, luego llega a la PC2, vuelve a la PC1 pasando nuevamente por el switch0 para confirmar el envío de los paquetes de extremo a extremo.

**4. Hacer Ping entre una computadora de la red verde y una de la red amarilla y mostrar la tabla ARP de esas dos computadoras. DESCRIBA QUE ES LO QUE ESTA PASANDO DETALLADAMENTE CON EL MODO SIMULACION.**



The screenshot displays a network simulation interface. On the left, the 'Event List' table shows the sequence of events:

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.000	--	PC1	ARP
	0.001	PC1	Switch0	ARP
	0.002	Switch0	Switch1	ARP
	0.002	Switch0	PC3	ARP
	0.002	Switch0	PC2	ARP
	0.003	Switch1	Router0	ARP
	0.003	Switch1	Servidor Web1	ARP
	0.003	Switch1	Servidor Email	ARP
	0.003	Switch1	Servidor DNS	ARP
	0.003	Switch1	Servidor DHCP	ARP
	0.004	Router0	Switch1	ARP

Below the table are controls for 'Reset Simulation' and 'Constant Delay' (checked). At the bottom, 'Play Controls' include play, stop, and fast-forward buttons.

On the right, a command prompt window shows the following output:

```

Reply from 172.16.0.101: bytes=32 time=18ms TTL=126
Ping statistics for 172.16.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 9ms, Average = 6ms

C:\>arp -a
Internet Address      Physical Address      Type
172.16.0.101          0000.0c24.56b2       dynamic

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=18ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 18ms, Average = 12ms
  
```

A blue speech bubble points to the first ARP entry in the command prompt output, stating: "Podemos ver que hizo primero el envio de paquetes ARP por la misma razón que no conoce la mac destino". A yellow box highlights the ping command and its statistics.

Pues la PC2 manda un paquete arp que pasa por el switch0, luego de la switch0 a la switch1, pc3, pc1, esta información viaja hasta los routers donde se traspasan los paquetes en busca de la dirección solicitada que en nuestro caso es la PC0.