

UNIVERSIDAD NACIONAL DE INGENIERIA

FACULTAD DE CIENCIAS

Tema:
Diseño de una red con Varias SubRedes



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Curso: Núcleo y Redes para la Computación Paralela
Codigo Curso: CC482

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Armar red de servicios-routers-switches

1. Instalando Cisco Packet Tracer:

Windows: ir al link de descarga, y ejecutar el .exe

linux: descargar el archivo PacketTracer6.2_Linux.tar.gz

y hacer:

descomprimir y luego en la carpeta PacketTracer62

sudo ./install

sudo ./set_env.sh

añadimos imagen:

sudo su

cd /usr/share/applications

sudo vim packettracer.desktop

[Desktop Entry]

Name= Packettracer

Comment=Networking

GenericName=Cisco Packettracer

Exec=/opt/packettracer/packettracer

Icon=/usr/share/icons/packettracer.jpeg

StartupNotify=true

Terminal=false

Type=Application

Para ejecutar:

sudo packettracer

2. Desinstalando Cisco Packet Tracer:

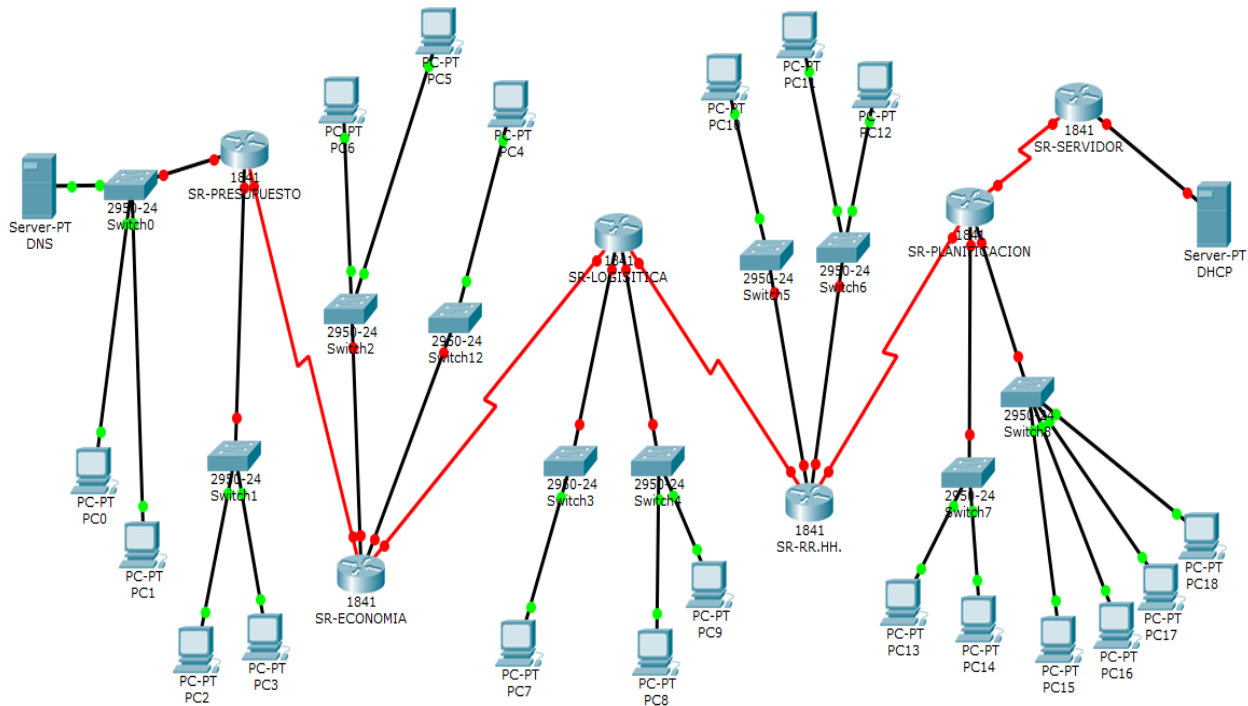
sudo rm -rf /opt/pt

sudo rm /usr/share/icons/hicolor/48x48/apps/pt6.png

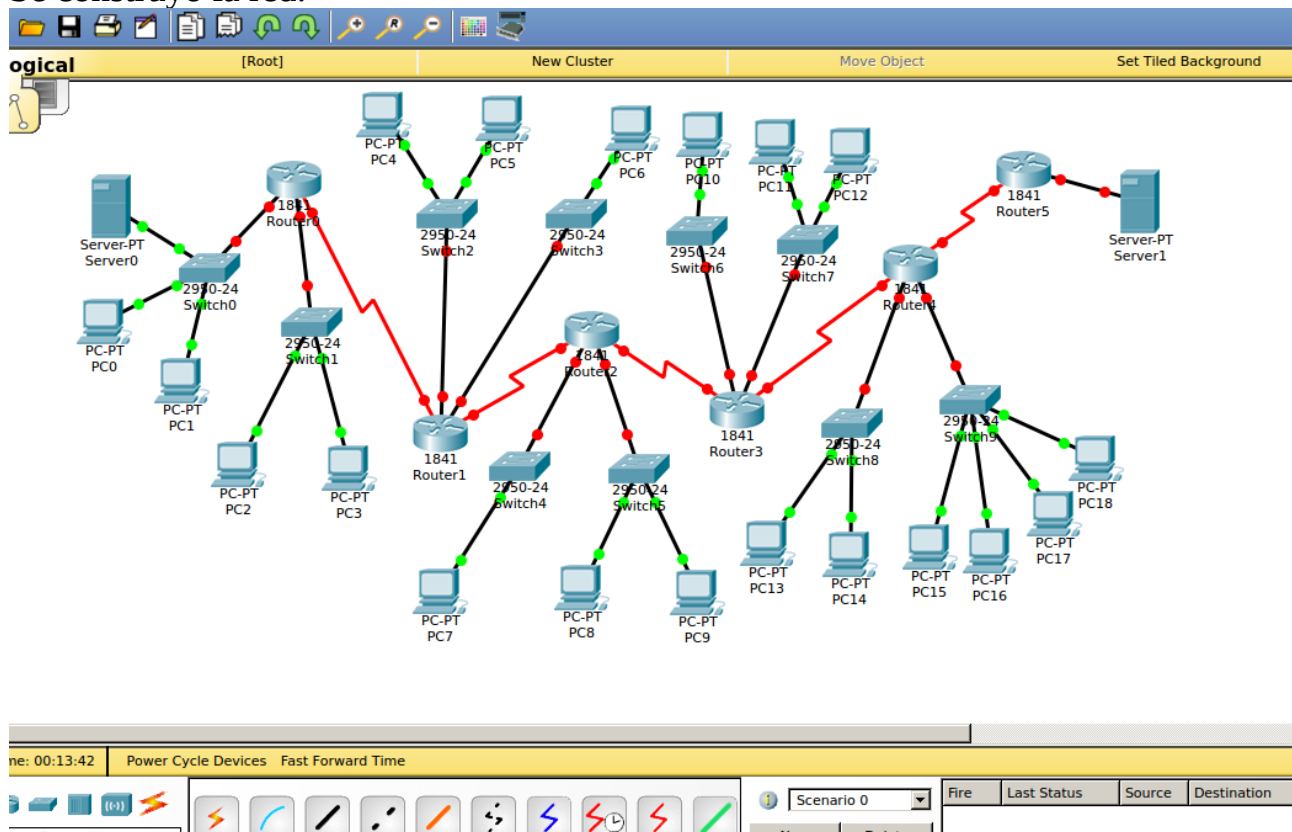
sudo rm /usr/share/applications/pt6.desktop

sudo rm /usr/local/bin/packettracker

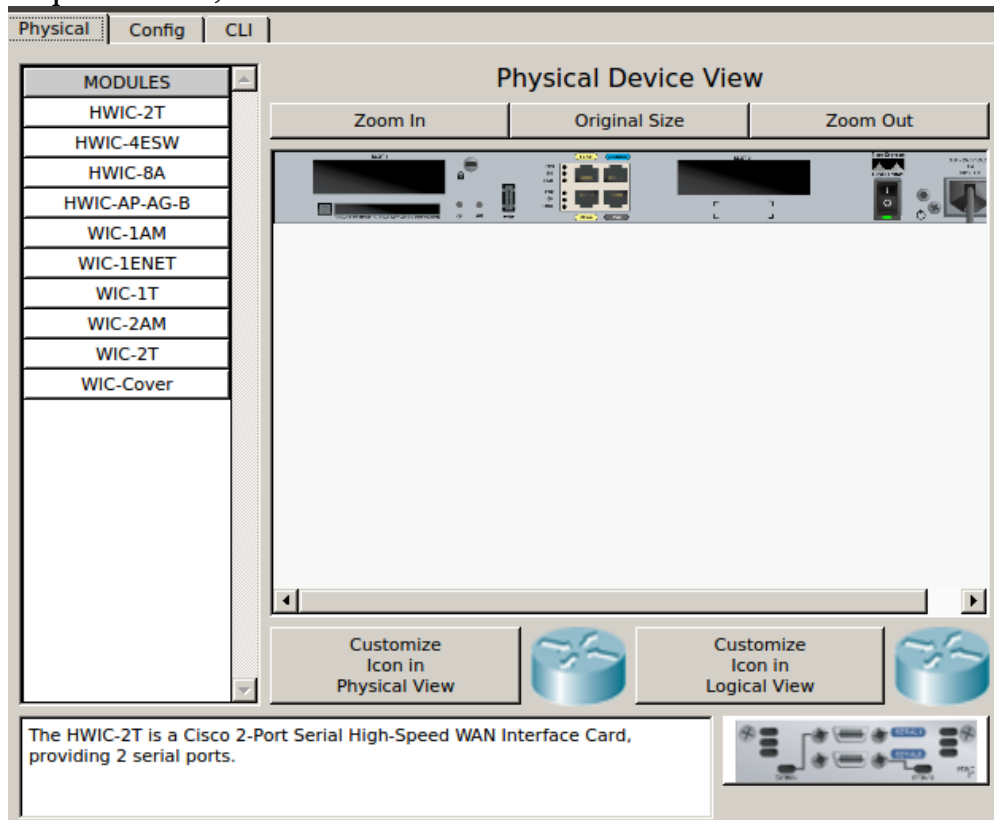
2. Red de servicios virtual:



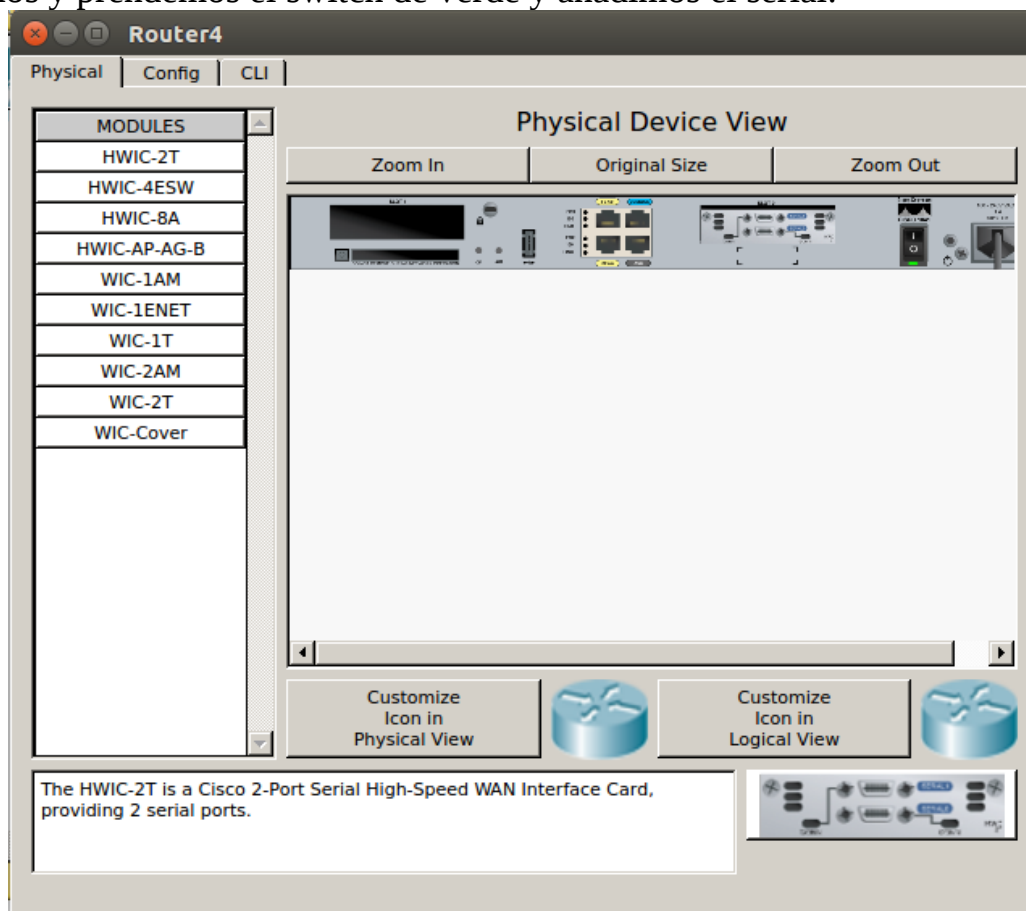
Se construyó la red:



Lo primero que se hace, es activar los seriales de los routers:



Apagamos y prendemos el switch de verde y añadimos el serial:



Configurando el Servet-PT DNS:

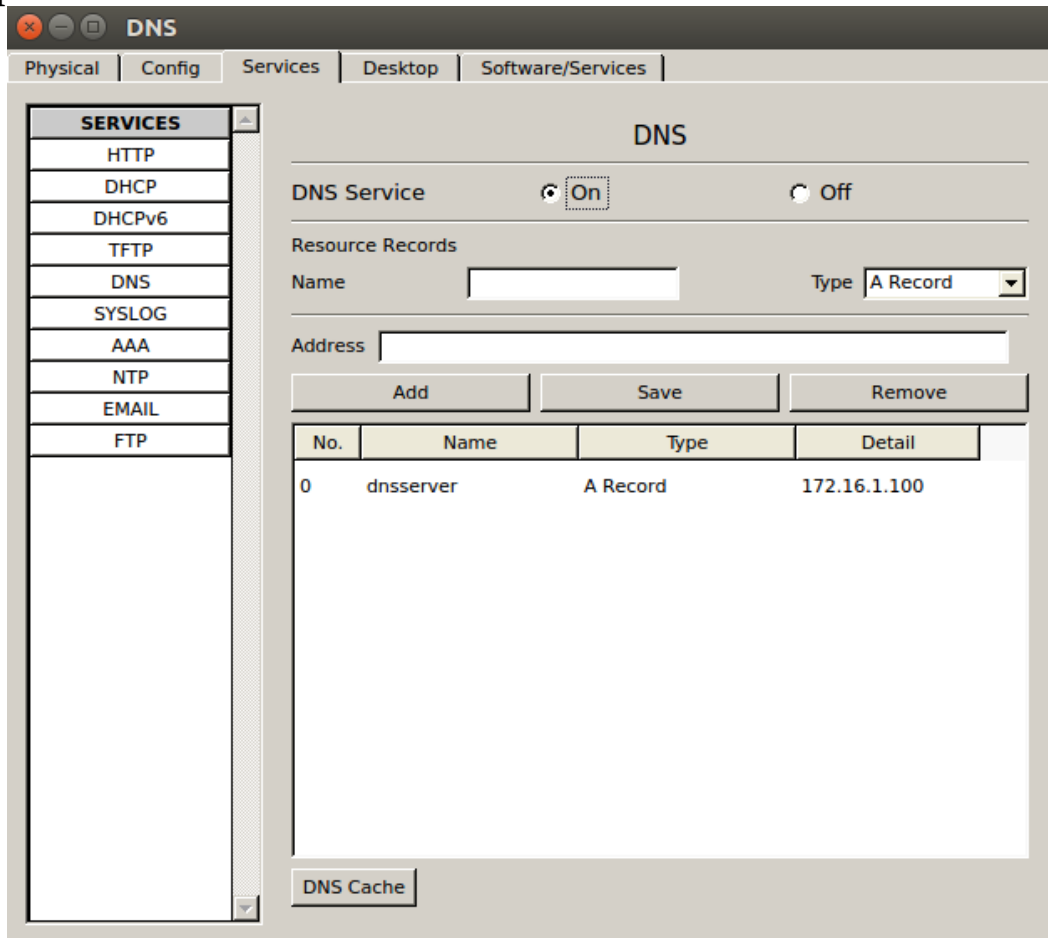
En la opción config->settings: cambiamos el nombre, y le asignamos un ip

The screenshot shows the 'DNS' configuration window with the 'Config' tab selected. The left sidebar has 'GLOBAL' selected, and the main area is titled 'Global Settings'. The 'Display Name' field is set to 'DNS'. The 'Interfaces' dropdown menu is set to 'FastEthernet0'. Under 'Gateway/DNS', the 'Static' radio button is selected, and the 'Gateway' field is set to '172.16.1.1'. The 'DNS Server' field is empty. Under 'Gateway/DNS IPv6', the 'Static' radio button is selected, and the 'IPv6 Gateway' and 'IPv6 DNS Server' fields are empty.

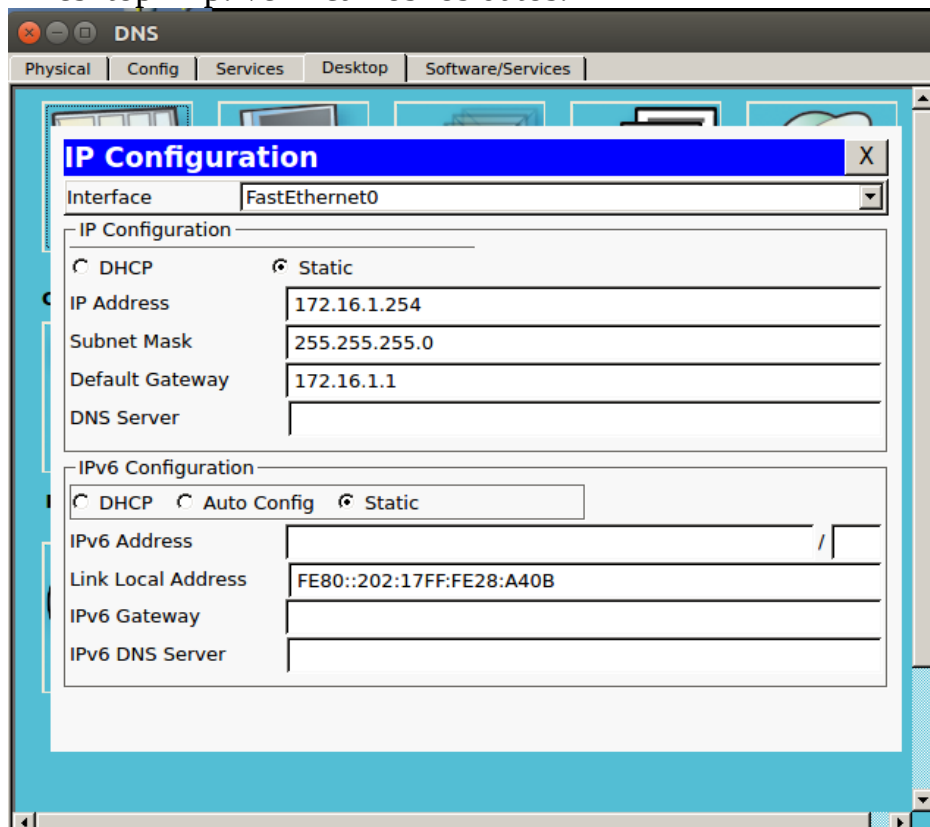
En la opción config->FastEthernet: asignamos un Ip estático, activamos(On)

The screenshot shows the 'DNS' configuration window with the 'Config' tab selected. The left sidebar has 'INTERFACE' selected, and the main area is titled 'FastEthernet0'. The 'Port Status' checkbox is checked and labeled 'On'. The 'Bandwidth' dropdown is set to 'Auto'. The 'Duplex' dropdown is set to 'Auto'. The 'MAC Address' field is set to '0002.1728.A40B'. Under 'IP Configuration', the 'Static' radio button is selected, and the 'IP Address' field is set to '172.16.1.254'. The 'Subnet Mask' field is set to '255.255.255.0'. Under 'IPv6 Configuration', the 'Static' radio button is selected, and the 'IPv6 Address' field is empty. The 'Link Local Address' field is set to 'FE80::202:17FF:FE28:A40B'.

En la opción services → DNS: activamos un servidor DNS



En la opción Desktop → Ip: verificamos los datos.



Los Switch quedan tal cual están, solo basta activar sus interface fast ethernet:

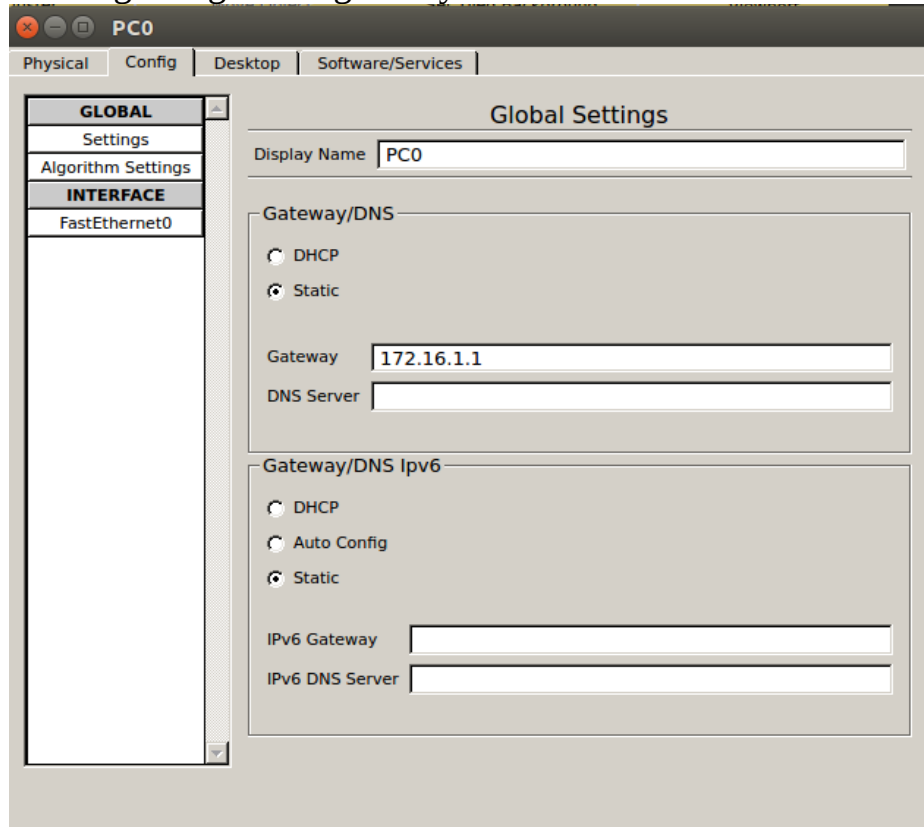
```
Switch(config)#interface FastEthernet0/1
Switch(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
Switch(config-if)#no shutdown

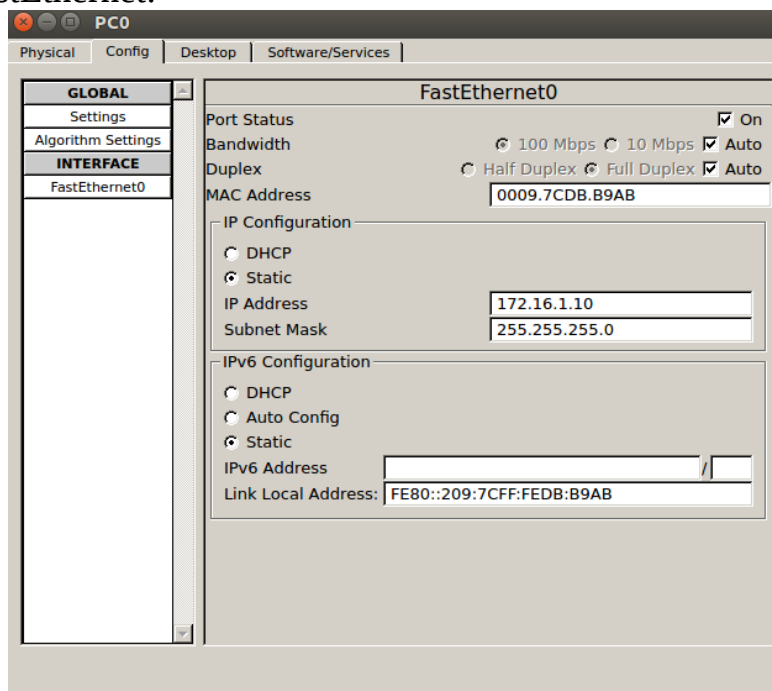
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down
Switch(config-if)#
```

Configurando las PCs:

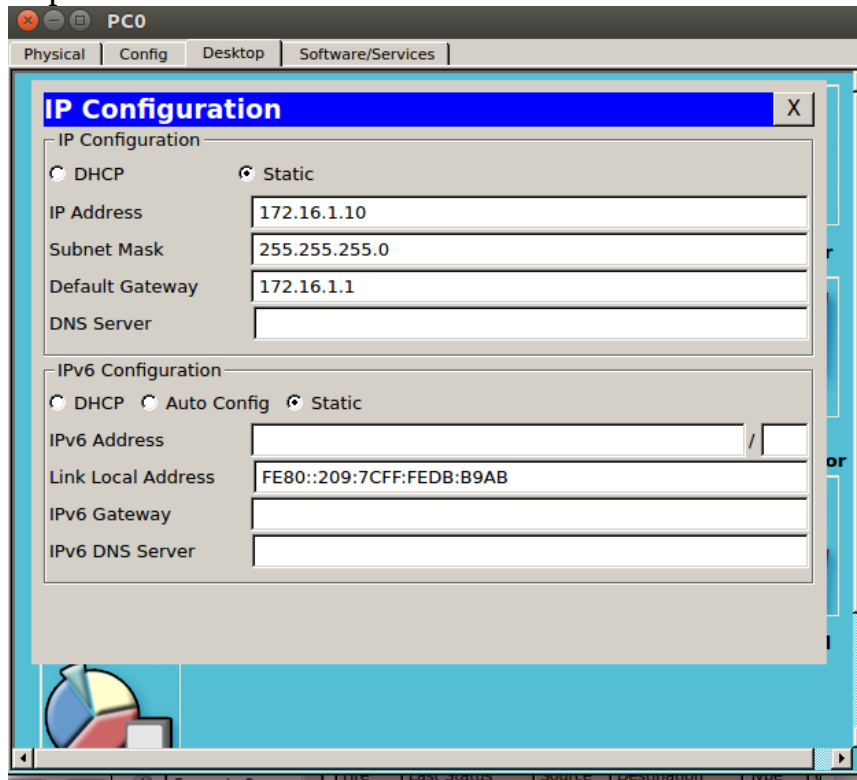
En config → settings: asignamos gateway



En config → FastEthernet:



Verificamos las Ips:



Configurando los Routers:

Mediante CLI

```
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 172.16.1.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
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)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 172.16.0.0
Router(config-router)#

Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#
```

Network sirve para ajustar el RIP.

Mediante Interface verificamos:

The screenshot shows the 'Sr-Presupuesto' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'INTERFACE' expanded, and 'FastEthernet0/0' selected. The main panel displays the configuration for 'FastEthernet0/0'. The 'Port Status' is checked 'On'. 'Bandwidth' is set to '100 Mbps'. 'Duplex' is set to 'Full Duplex'. 'MAC Address' is '0060.5C21.B501'. The 'IP Configuration' section shows 'IP Address' as '172.16.1.1' and 'Subnet Mask' as '255.255.255.0'. 'Tx Ring Limit' is set to '10'. At the bottom, there is a section for 'Equivalent IOS Commands'.

FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0060.5C21.B501
IP Configuration	
IP Address	172.16.1.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

The screenshot shows the 'Sr-Presupuesto' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'INTERFACE' expanded, and 'FastEthernet0/1' selected. The main panel displays the configuration for 'FastEthernet0/1'. The 'Port Status' is checked 'On'. 'Bandwidth' is set to '100 Mbps'. 'Duplex' is set to 'Full Duplex'. 'MAC Address' is '0060.5C21.B502'. The 'IP Configuration' section shows 'IP Address' as '192.168.1.1' and 'Subnet Mask' as '255.255.255.0'. 'Tx Ring Limit' is set to '10'.

FastEthernet0/1	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0060.5C21.B502
IP Configuration	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

Hasta este punto, podemos ver que un router puede asignar diferentes subredes a su disposición.

Para la comunicación entre 2 routers, se usa el puerto serial que instalamos anteriormente:

```
Router(config-router)#network 172.16.0.0
Router(config-router)#network 192.168.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#network 192.168.2.0
Router(config-router)#network 192.168.3.0
Router(config-router)#
```

y tenemos una red diferente por cada serial:

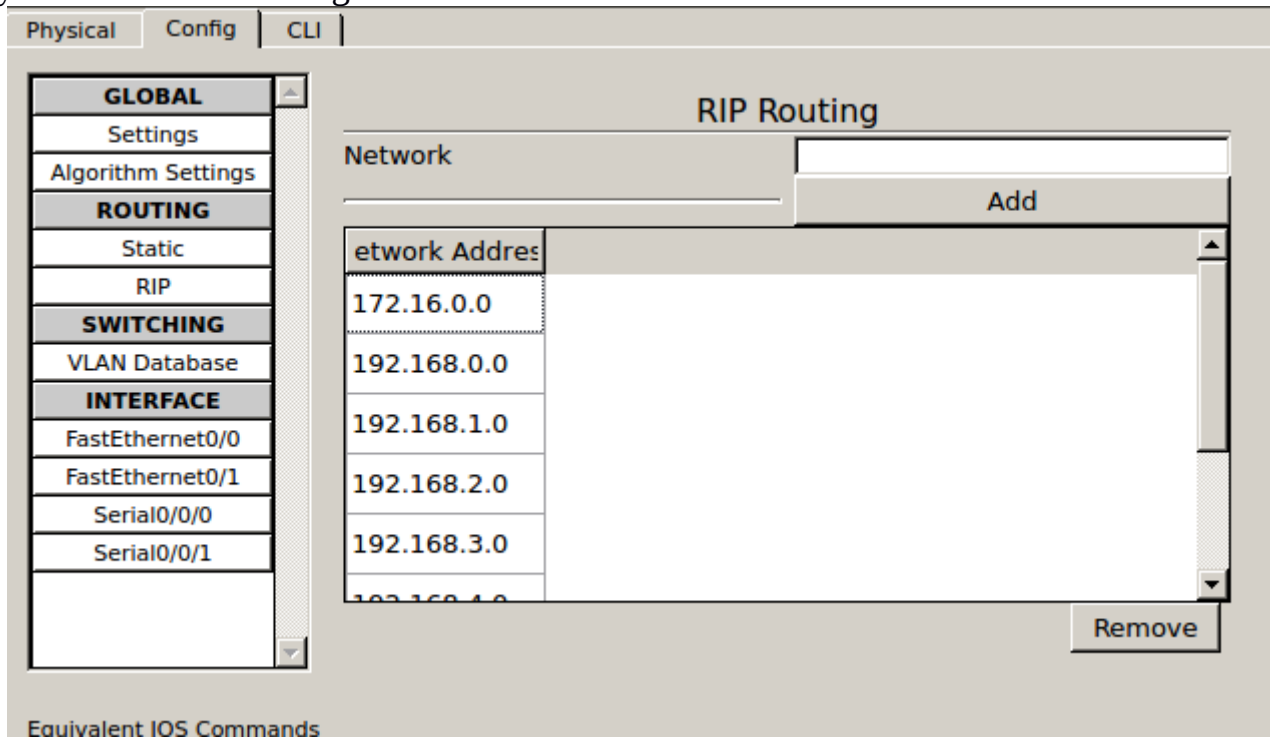
The screenshot shows the configuration window for the Serial0/0/0 interface. The left sidebar has tabs for Physical, Config, and CLI. Under the Config tab, there is a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. The INTERFACE category is expanded, showing FastEthernet0/0, FastEthernet0/1, Serial0/0/0 (selected), and Serial0/0/1. The main area displays the configuration for Serial0/0/0. The Port Status is checked and set to On. Duplex is set to Full Duplex. Clock Rate is set to 2000000. The IP Configuration section shows IP Address 192.168.6.1 and Subnet Mask 255.255.255.0. The Tx Ring Limit is set to 10.

Serial0/0/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	Full Duplex
Clock Rate	2000000
IP Configuration	
IP Address	192.168.6.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

The screenshot shows the configuration window for the Serial0/0/1 interface. The left sidebar is identical to the previous one, with Serial0/0/1 selected under the INTERFACE category. The main area displays the configuration for Serial0/0/1. The Port Status is checked and set to On. Duplex is set to Full Duplex. Clock Rate is set to Not Set. The IP Configuration section shows IP Address 172.16.6.2 and Subnet Mask 255.255.255.0. The Tx Ring Limit is set to 10.

Serial0/0/1	
Port Status	<input checked="" type="checkbox"/> On
Duplex	Full Duplex
Clock Rate	Not Set
IP Configuration	
IP Address	172.16.6.2
Subnet Mask	255.255.255.0
Tx Ring Limit	10

y añadimos los Routing Information Protocol:



nos damos cuenta que con 172.16.0.0, no podemos añadir nuevos RIP como por ejemplo 172.16.1.0, sin embargo, con 192.168.0.0, si podemos seguir añadiendo RIPs.

Y para los demás routers y pcs es repetitivo.

Configurando el Servet-PT DHCP:

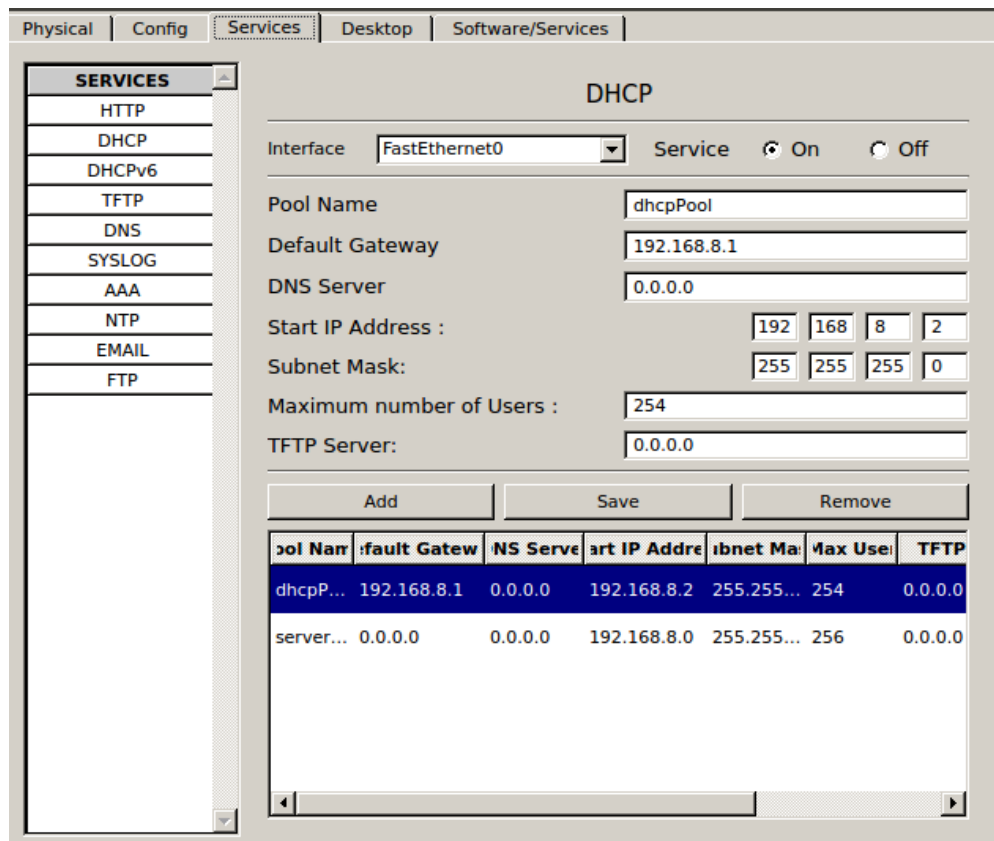
Se ve que para comunicar un router con un servidor se requiere de cable cruzado, a diferencia de las demás conexiones.

The screenshot shows the 'DHCP' configuration window. The left sidebar has a tree view with 'GLOBAL' expanded, containing 'Settings', 'Algorithm Settings', and 'INTERFACE'. Under 'INTERFACE', 'FastEthernet0' is selected. The main area is titled 'Global Settings'. It has a 'Display Name' field set to 'DHCP' and an 'Interfaces' dropdown set to 'FastEthernet0'. There are two sections: 'Gateway/DNS' and 'Gateway/DNS IPv6'. In 'Gateway/DNS', 'Static' is selected, 'Gateway' is '192.168.8.1', and 'DNS Server' is empty. In 'Gateway/DNS IPv6', 'Static' is selected, 'IPv6 Gateway' and 'IPv6 DNS Server' are empty.

Section	Option	Value
Global Settings	Display Name	DHCP
	Interfaces	FastEthernet0
	Gateway/DNS	Static
Gateway/DNS IPv6	Static	
	IPv6 Gateway	
Gateway/DNS IPv6	IPv6 DNS Server	

The screenshot shows the 'FastEthernet0' configuration window. The left sidebar is the same as the previous window. The main area is titled 'FastEthernet0'. It has 'Port Status' checked 'On', 'Bandwidth' set to 'Auto', and 'Duplex' set to 'Auto'. The 'MAC Address' is '00E0.F976.7E28'. There are two sections: 'IP Configuration' and 'IPv6 Configuration'. In 'IP Configuration', 'Static' is selected, 'IP Address' is '192.168.8.254', and 'Subnet Mask' is '255.255.255.0'. In 'IPv6 Configuration', 'Static' is selected, 'IPv6 Address' is empty, and 'Link Local Address' is 'FE80::2E0:F9FF:FE76:7E28'.

Section	Option	Value
FastEthernet0	Port Status	On
	Bandwidth	Auto
	Duplex	Auto
FastEthernet0	MAC Address	00E0.F976.7E28
	IP Configuration	Static
IP Configuration	Subnet Mask	255.255.255.0
	IPv6 Configuration	Static
IPv6 Configuration	IPv6 Address	
	Link Local Address	FE80::2E0:F9FF:FE76:7E28



Probando las comunicaciones del servidor dhcp:
DHCP-Server hacia la Pc3:

Vis.	Time(sec)	Last Device	At Device	Type	Info
...	0.000	--	DHCP	ICMP	
...	0.001	DHCP	Sr-Serv...	ICMP	
...	0.002	Sr-Servid...	Sr-Plani...	ICMP	
...	0.003	Sr-Planifi...	Sr-RRHH	ICMP	
...	0.004	Sr-RRHH	Sr-Logi...	ICMP	
...	0.005	Sr-Logist...	Sr-Econ...	ICMP	
...	0.006	Sr-Econo...	Sr-Pres...	ICMP	
...	0.007	Sr-Presu...	Switch1	ICMP	
...	0.008	Switch1	PC3	ICMP	

DHCP-Server hacia la Pc18:

Simulation Panel					
Event List					
Vis.	Time(sec)	Last Device	At Device	Type	Info
...	0.000	--	DHCP	ICMP	
...	0.002	--	DHCP	ICMP	
...	0.003	DHCP	Sr-Serv...	ICMP	
...	0.004	Sr-Servid...	Sr-Plani...	ICMP	
...	0.005	Sr-Planifi...	Switch9	ICMP	
...	0.006	Switch9	PC18	ICMP	

Finalmente probando la comunicación entre PC3 de distintas redes conectadas mediante Router:

Vis.	Time(sec)	Last Device	At Device	Type	Info
.....	0.001	PC17	Switch9	ICMP	
.....	0.002	Switch9	Sr-Plani...	ICMP	
.....	0.003	Sr-Planifi...	Sr-RRHH	ICMP	
.....	0.004	Sr-RRHH	Sr-Logi...	ICMP	
.....	0.005	Sr-Logist...	Sr-Econ...	ICMP	
.....	0.006	Sr-Econo...	Sr-Presu...	ICMP	
.....	0.007	Sr-Presu...	Switch1	ICMP	
.....	0.008	Switch1	PC3	ICMP	
.....	0.009	PC3	Switch1	ICMP	
.....	0.010	Switch1	Sr-Presu...	ICMP	

Desde la PC17 hacia la PC3.

Modelo Final

