

INSTITUTO TECNOLÓGICO DE SALINA CRUZ

REDES DE COMPUTADORAS

PRACTICA No.6.

UNIDAD 2.

REALIZADA POR: SANCHEZ SANTIAGO NOE

LUGAR Y FECHA: SALINA CRUZ OAXACA A 15 DE ABRIL DE 2015.

DOCENTE: ROMÁN NÁJERA SUSANA MÓNICA.

SEMESTRE Y GRUPO: 6E.

CARRERA: ING. EN TECNOLOGÍAS DE LA INFORMACIÓN Y DE LAS
COMUNICACIONES

OBJETIVO: Desarrollar las habilidades necesarias del alumno que le permitan la configuración básica y manipulación de equipos de interconexión como lo son los router.

INSTRUCCIONES: a partir de la topología mostrada en clases realizar la tabla de enrutamiento y en base a ello realizar el enrutamiento estático.

MATERIALES:

Software packet tracer.

Computadora.

1.- creamos nuestra tabla de ruteo.

	INTERFAZ	DIRECCION IP	MASCARA DE SUBRED	GATEWAY POR DEFECTO
R1	fa0/0	192.168.1.1	255.255.255.0	n/a
	S2/0	11.0.0.2	255.0.0.0	n/a
R2	fa0/0	192.168.2.1	255.255.255.0	n/a
	S2/0	11.0.0.1	255.0.0.0	n/a
	S3/0	12.0.0.1	255.0.0.0	n/a
R3	Fa0/0	192.168.3.1	255.255.255.0	n/a
	S2/0	12.0.0.2	255.0.0.0	n/a
Pc1	Nic	192.168.1.10	255.255.255.0	192.168.1.1
Pc2	Nic	192.168.2.10	255.255.255.0	192.168.2.1
Pc3	Nic	192.168.3.10	255.255.255.0	192.168.3.1

2.- configuración inicial.

PC1

Configuración IP

Configuración IP

☐ DHCP

☒ Estático

Dirección IP

192.168.1.10

Máscara de Subred

255.255.255.0

Gateway por Defecto

192.168.1.1

Servidor DNS

IPv6 Configuration

☐ DHCP

☐ Auto Config

☒ Estático

IPv6 Address

/

Link Local Address

FE80::2E0:F9FF:FE71:6204

IPv6 Gateway

IPv6 DNS Server

PC2

Configuración IP

Configuración IP

☐ DHCP

☒ Estático

Dirección IP

192.168.2.10

Máscara de Subred

255.255.255.0

Gateway por Defecto

192.168.2.1

Servidor DNS

IPv6 Configuration

☐ DHCP

☐ Auto Config

☒ Estático

IPv6 Address

/

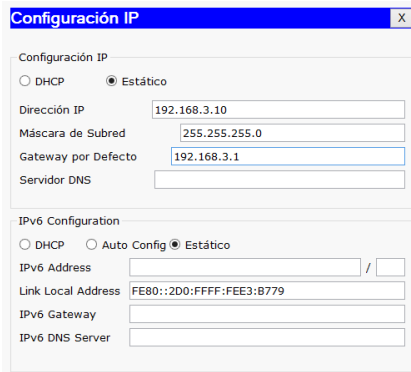
Link Local Address

FE80::201:63FF:FE87:1032

IPv6 Gateway

IPv6 DNS Server

PC3



The screenshot shows a window titled "Configuración IP" with a close button (X). It contains two sections: "Configuración IP" and "IPv6 Configuration".

Configuración IP:

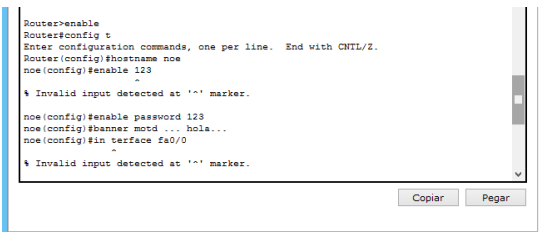
- ☐ DHCP
- ☒ Estático
- Dirección IP: 192.168.3.10
- Máscara de Subred: 255.255.255.0
- Gateway por Defecto: 192.168.3.1
- Servidor DNS: (empty)

IPv6 Configuration:

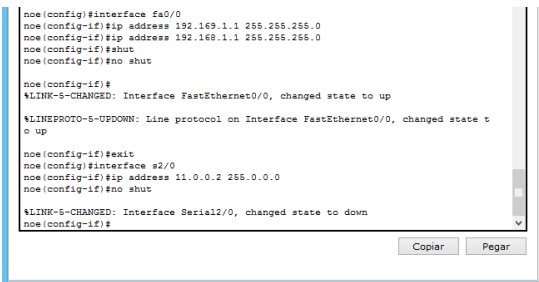
- ☐ DHCP
- ☐ Auto Config
- ☒ Estático
- IPv6 Address: (empty) / (empty)
- Link Local Address: FE80::2D0:FFFF:FEE3:B779
- IPv6 Gateway: (empty)
- IPv6 DNS Server: (empty)

Configuración básica de los routers.

R1



```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname noe
noe(config)#enable 123
^
% Invalid input detected at '^' marker.
noe(config)#enable password 123
noe(config)#banner motd ... hola...
noe(config)#in terface fa0/0
^
% Invalid input detected at '^' marker.
```



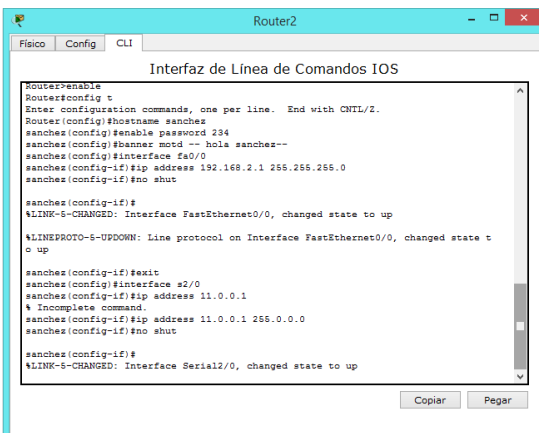
```
noe(config)#interface fa0/0
noe(config-if)#ip address 192.168.1.1 255.255.255.0
noe(config-if)#ip address 192.168.1.1 255.255.255.0
noe(config-if)#shut
noe(config-if)#no shut

noe(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

noe(config-if)#exit
noe(config)#interface s2/0
noe(config-if)#ip address 11.0.0.2 255.0.0.0
noe(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
noe(config-if)#
```

R2



```
Router2>enable
Router2#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router2(config)#hostname sanches
sanches(config)#enable password 234
sanches(config)#banner motd -- hola sanches--
sanches(config)#interface fa0/0
sanches(config-if)#ip address 192.168.2.1 255.255.255.0
sanches(config-if)#no shut

sanches(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

sanches(config-if)#exit
sanches(config)#interface s2/0
sanches(config-if)#ip address 11.0.0.1
% Incomplete command.
sanches(config-if)#ip address 11.0.0.1 255.0.0.0
sanches(config-if)#no shut

sanches(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
```

```
sanchez(config-if)#exit
sanchez(config)#interface s3/0
sanchez(config-if)#ip address 12.0.0.1 255.0.0.0
sanchez(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
sanchez(config-if)#
```

R3

```
Router3>enable
Router3#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router3(config)#hostname santiago
santiago(config)#enable password 346
santiago(config)#banner motd --- hola santiago ---
santiago(config)#interface fa0/0
santiago(config-if)#ip address 192.168.3.1 255.255.255.0
santiago(config-if)#no shut

santiago(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
exit
santiago(config)#interface s2/0
santiago(config-if)#ip address 12.0.0.2 255.0.0.0
santiago(config-if)#no shut

santiago(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

3.- verificamos que todas las interfaces estén activas con el comando “show interface brief”.

```
Router1>enable
Router1#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router1(config)#hostname noe
noe(config)#enable password 346
noe(config)#banner motd --- hola noe ---
noe(config)#interface fa0/0
noe(config-if)#ip address 192.168.1.1 255.255.255.0
noe(config-if)#no shut

noe(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
exit
noe(config)#interface s2/0
noe(config-if)#ip address 12.0.0.2 255.0.0.0
noe(config-if)#no shut

noe(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
noe#show ip interface brief
```

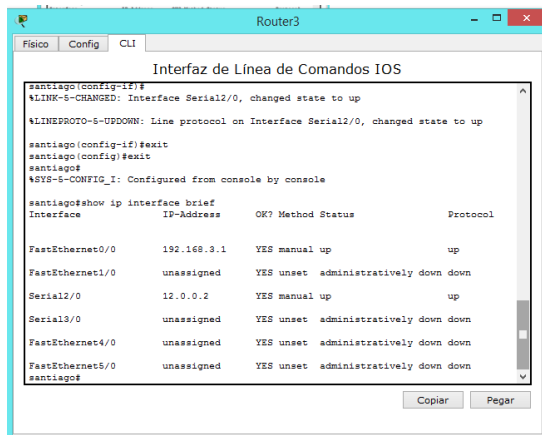
Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.1.1	YES	manual	up	up
FastEthernet1/0	unassigned	YES	unset	administratively down	down
Serial2/0	12.0.0.2	YES	manual	up	up
Serial3/0	unassigned	YES	unset	administratively down	down
FastEthernet4/0	unassigned	YES	unset	administratively down	down
FastEthernet5/0	unassigned	YES	unset	administratively down	down

```
Router2>enable
Router2#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router2(config)#hostname sanchez
sanchez(config)#enable password 346
sanchez(config)#banner motd --- hola sanchez ---
sanchez(config)#interface fa0/0
sanchez(config-if)#ip address 192.168.2.1 255.255.255.0
sanchez(config-if)#no shut

sanchez(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
exit
sanchez(config)#interface s2/0
sanchez(config-if)#ip address 12.0.0.1 255.0.0.0
sanchez(config-if)#no shut

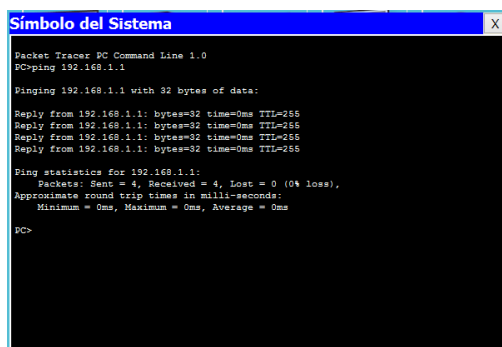
sanchez(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
sanchez#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.2.1	YES	manual	up	up
FastEthernet1/0	unassigned	YES	unset	administratively down	down
Serial2/0	12.0.0.1	YES	manual	up	up
Serial3/0	unassigned	YES	unset	administratively down	down
FastEthernet4/0	unassigned	YES	unset	administratively down	down
FastEthernet5/0	unassigned	YES	unset	administratively down	down

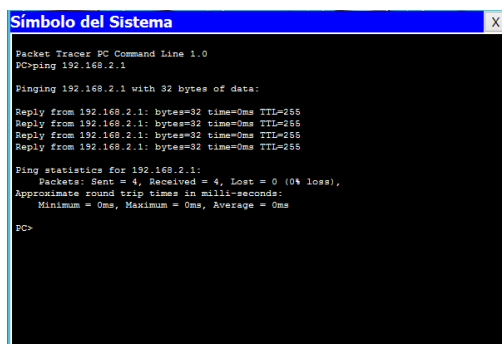


Verificaremos la puerta de enlace de la red o “Gateway”, haciendo ping desde un host a la IP de la interfaz del router conectada a la red a la que pertenece el host.

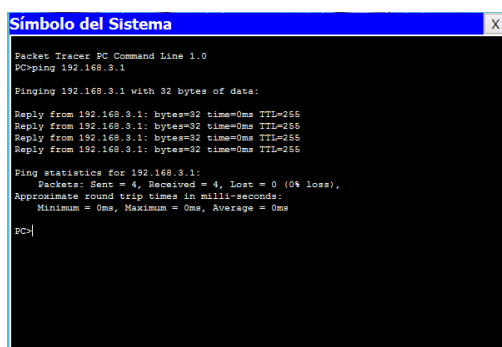
PC1-R1



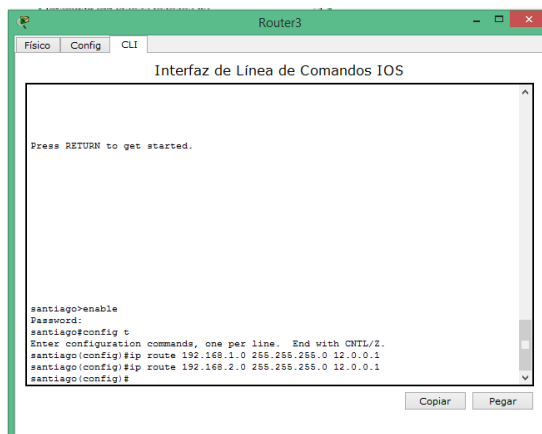
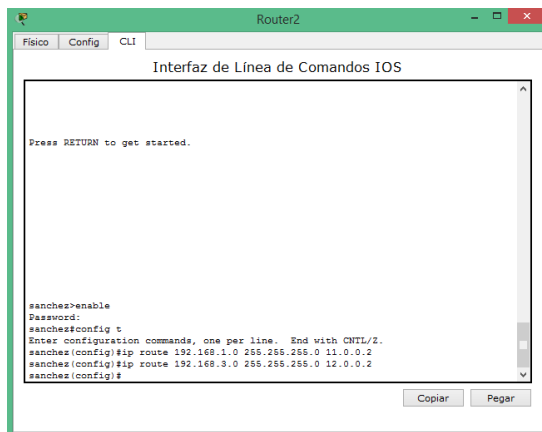
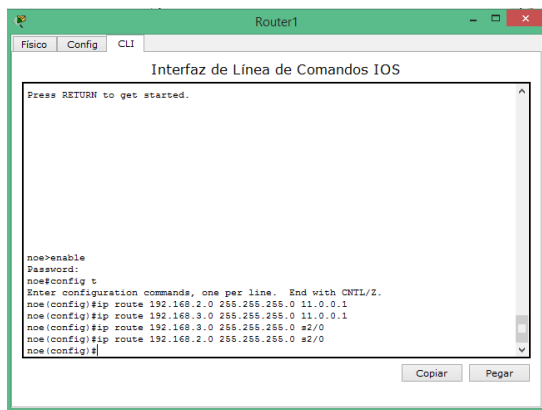
PC2- R2



PC3-R3



4.- configuración de rutas estáticas (ip del siguiente salto).



Interfaz de salida

```
Router2
Fisico Config CLI
Interfaz de Línea de Comandos IOS

Press RETURN to get started.

sanchez@enable
Password:
sanchez#config t
Enter configuration commands, one per line. End with CNTL/Z.
sanchez(config)#ip route 192.168.1.0 255.255.255.0 11.0.0.2
sanchez(config)#ip route 192.168.3.0 255.255.255.0 12.0.0.2
sanchez(config)#ip route 192.168.3.0 255.255.255.0 s3/0
sanchez(config)#ip route 192.168.1.0 255.255.255.0 s2/0
sanchez(config)#
```

```
Router3
Fisico Config CLI
Interfaz de Línea de Comandos IOS

Press RETURN to get started.

santiago@enable
Password:
santiago#config t
Enter configuration commands, one per line. End with CNTL/Z.
santiago(config)#ip route 192.168.1.0 255.255.255.0 12.0.0.1
santiago(config)#ip route 192.168.2.0 255.255.255.0 s3/0
santiago(config)#ip route 192.168.1.0 255.255.255.0 s3/0
santiago(config)#
```

5.- comprobación de rutas estáticas usando la ip del siguiente salto

```
Router1
Fisico Config CLI
Interfaz de Línea de Comandos IOS

noe(config)#ip route 192.168.2.0 255.255.255.0 s2/0
noe(config)#exit
noe#
%SYS-5-CONFIG_I: Configured from console by console

noe#show ip ro
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C 11.0.0.0/8 is directly connected, Serial2/0
C 192.168.1.0/24 is directly connected, FastEthernet0/0
S 192.168.2.0/24 [1/0] via 11.0.0.1
   is directly connected, Serial2/0
S 192.168.3.0/24 [1/0] via 11.0.0.1
   is directly connected, Serial2/0
noe#
```

```
Router2
Fisico Config CLI
Interfaz de Línea de Comandos IOS

sanchez(config)#ip route 192.168.3.0 255.255.255.0 12.0.0.2
sanchez(config)#ip route 192.168.3.0 255.255.255.0 s3/0
sanchez(config)#ip route 192.168.1.0 255.255.255.0 s2/0
sanchez(config)#exit
sanchez#
%SYS-5-CONFIG_I: Configured from console by console

sanchez#show ip ro
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C 11.0.0.0/8 is directly connected, Serial2/0
C 12.0.0.0/8 is directly connected, Serial3/0
S 192.168.1.0/24 [1/0] via 11.0.0.2
   is directly connected, Serial2/0
C 192.168.2.0/24 is directly connected, FastEthernet0/0
S 192.168.3.0/24 [1/0] via 12.0.0.2
   is directly connected, Serial3/0
sanchez#
```

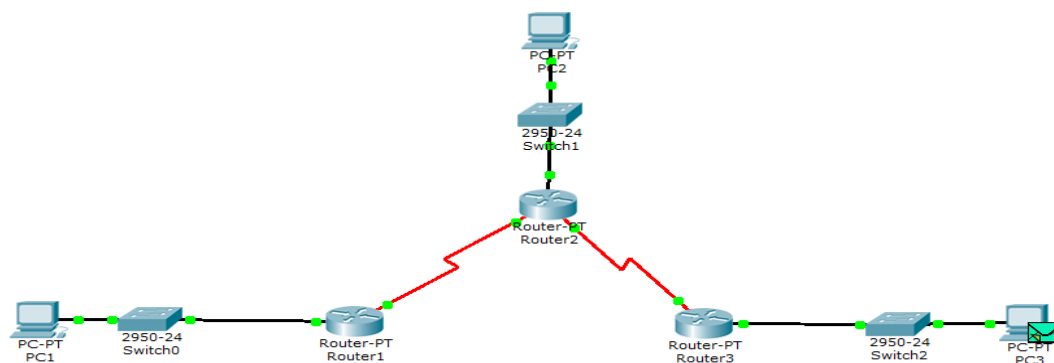
```

Router3
Fisico Config CLI
Interfaz de Línea de Comandos IOS
#santiago#config t
Enter configuration commands, one per line. End with CNTL/Z.
santiago(config)#ip route 192.168.1.0 255.255.255.0 12.0.0.1
santiago(config)#ip route 192.168.2.0 255.255.255.0 12.0.0.1
santiago(config)#ip route 192.168.2.0 255.255.255.0 s3/0
santiago(config)#ip route 192.168.1.0 255.255.255.0 s3/0
santiago(config)#wait
santiago#
%SYS-5-CONFIG_I: Configured from console by console

santiago#show ip ro
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EK - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, S - SGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

C    12.0.0.0/8 is directly connected, Serial2/0
S    192.168.1.0/24 [1/0] via 12.0.0.1
S    192.168.2.0/24 [1/0] via 12.0.0.1
C    192.168.3.0/24 is directly connected, FastEthernet0/0
santiago#
  
```



Disparo	Último Estado	Origen	Destino	Tipo	Color	Tiempo (seq)	Periodo
	Exitoso	PC3	PC2	ICMP		0.000	N
	Exitoso	PC3	PC1	ICMP		0.000	N
	Exitoso	PC2	PC3	ICMP		0.000	N
Disparo	Último Estado	Origen	Destino	Tipo	Color	Tiempo (seq)	Periodo
	Exitoso	PC3	PC1	ICMP		0.000	N
	Exitoso	PC2	PC3	ICMP		0.000	N
	Exitoso	PC2	PC1	ICMP		0.000	N

Conclusión.

para realizar el enrutamiento estático es necesario crear la tabla de enrutamiento o de direcciones una vez creada en base a ella procedemos a asignarle dirección ip a cada pc, posteriormente realizamos el levantamiento de puertos en cada router una vez levantado el puerto o fasethernet procedemos con el levantamiento de los seriales una vez hecho esto podemos continuar con la asignación de rutas estáticas al termino podemos comprobar si existe conexión a los diferentes nodos que forman la red simulando el envío de paquetes de un nodo a otro y cómo podemos observar en la imagen anterior nos indica que el envío fue exitoso y en caso de que no hubiese conexión de un nodo a otro nos indicara que ha fallado.