Instituto Politécnico Nacional

Escuela Superior de Cómputo

1.4 Tablas de enrutamiento

Materia:

Administración de servicios en red

Grupo:

4CV13

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Fecha:

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Actividad y práctica "Desafío del comando Show IP Route "

Objetivos:

- Analizar las tablas de enrutamiento de los respectivos routers
- Dibujar la topología de una red utilizando los resultados del comando **show ip route**.
- Construir la topología en Packet Tracer con su respectiva configuración.

Tarea 1: Examinar los resultados del router.

a) Identifica el protocolo de enrutamiento, los segmentos de red, enlaces directamente conectados, rutas estáticas o cualquier otra información que te parezca útil

Paso 1: Examine el resultado del router R1.

```
R1#show ip route
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
     10.0.0.0/30 is subnetted, 4 subnets
R        10.10.10.0 [120/1] via 10.10.10.6, 00:00:09, Serial0/0/0
C        10.10.10.4 is directly connected, Serial0/0/0
C        10.10.10.8 is directly connected, Serial0/0/1
R        10.10.10.12 [120/1] via 10.10.10.10, 00:00:09, Serial0/0/1
     172.16.0.0/16 is variably subnetted, 10 subnets, 5 masks
C        172.16.1.0/27 is directly connected, FastEthernet0/0
R        172.16.1.32/28 [120/2] via 10.10.10.10, 00:00:09, Serial0/0/1
R        172.16.1.192/26 [120/1] via 10.10.10.6, 00:00:09, Serial0/0/0
R        172.16.2.0/26 [120/2] via 10.10.10.6, 00:00:09, Serial0/0/0
R        172.16.2.64/27 [120/1] via 10.10.10.10, 00:00:09, Serial0/0/1
C        172.16.3.0/25 is directly connected, FastEthernet0/1
R        172.16.3.128/26 [120/1] via 10.10.10.6, 00:00:09, Serial0/0/0
R        172.16.3.192/29 [120/2] via 10.10.10.6, 00:00:09, Serial0/0/0
R        172.16.4.0/27 [120/1] via 10.10.10.10, 00:00:09, Serial0/0/1
R        172.16.4.128/25 [120/2] via 10.10.10.10, 00:00:09,
Serial0/0/1
C        192.168.1.0/24 is directly connected, Loopback0
S*       0.0.0.0/0 is directly connected, Loopback0
```

Paso 2: Examine el resultado del router R2.

```
R2#show ip route
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 10.10.10.2 to network 0.0.0.0
```

```
10.0.0.0/30 is subnetted, 4 subnets
C 10.10.10.0 is directly connected, Serial0/0/0
R 10.10.10.4 [120/1] via 10.10.10.2, 00:00:04, Serial0/0/0
R 10.10.10.8 [120/2] via 10.10.10.2, 00:00:04, Serial0/0/0
R 10.10.10.12 [120/3] via 10.10.10.2, 00:00:04, Serial0/0/0
172.16.0.0/16 is variably subnetted, 10 subnets, 5 masks
R 172.16.1.0/27 [120/2] via 10.10.10.2, 00:00:04, Serial0/0/0
R 172.16.1.32/28 [120/4] via 10.10.10.2, 00:00:04, Serial0/0/0
R 172.16.1.192/26 [120/1] via 10.10.10.2, 00:00:04, Serial0/0/0
C 172.16.2.0/26 is directly connected, FastEthernet0/0
R 172.16.2.64/27 [120/3] via 10.10.10.2, 00:00:04, Serial0/0/0
R 172.16.3.0/25 [120/2] via 10.10.10.2, 00:00:04, Serial0/0/0
R 172.16.3.128/26 [120/1] via 10.10.10.2, 00:00:04, Serial0/0/0
C 172.16.3.192/29 is directly connected, FastEthernet0/1
R 172.16.4.0/27 [120/3] via 10.10.10.2, 00:00:04, Serial0/0/0
R 172.16.4.128/25 [120/4] via 10.10.10.2, 00:00:04, Serial0/0/0
R 192.168.1.0/24 [120/2] via 10.10.10.2, 00:00:04, Serial0/0/0
R* 0.0.0.0/0 [120/2] via 10.10.10.2, 00:00:04, Serial0/0/0
```

Paso 3: Examine el resultado del router R3.

```
R3#show ip route
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 10.10.10.5 to network 0.0.0.0
10.0.0.0/30 is subnetted, 4 subnets
C 10.10.10.0 is directly connected, Serial0/0/1
C 10.10.10.4 is directly connected, Serial0/0/0
R 10.10.10.8 [120/1] via 10.10.10.5, 00:00:04, Serial0/0/0
R 10.10.10.12 [120/2] via 10.10.10.5, 00:00:04, Serial0/0/0
172.16.0.0/16 is variably subnetted, 10 subnets, 5 masks
R 172.16.1.0/27 [120/1] via 10.10.10.5, 00:00:04, Serial0/0/0
R 172.16.1.32/28 [120/3] via 10.10.10.5, 00:00:04, Serial0/0/0
C 172.16.1.192/26 is directly connected, FastEthernet0/1
R 172.16.2.0/26 [120/1] via 10.10.10.1, 00:00:03, Serial0/0/1
R 172.16.2.64/27 [120/2] via 10.10.10.5, 00:00:04, Serial0/0/0
R 172.16.3.0/25 [120/1] via 10.10.10.5, 00:00:04, Serial0/0/0
C 172.16.3.128/26 is directly connected, FastEthernet0/0
R 172.16.3.192/29 [120/1] via 10.10.10.1, 00:00:03, Serial0/0/1
R 172.16.4.0/27 [120/2] via 10.10.10.5, 00:00:04, Serial0/0/0
R 172.16.4.128/25 [120/3] via 10.10.10.5, 00:00:04, Serial0/0/0
R 192.168.1.0/24 [120/1] via 10.10.10.5, 00:00:04, Serial0/0/0
R* 0.0.0.0/0 [120/1] via 10.10.10.5, 00:00:04, Serial0/0/0
```

Paso 4: Examine el resultado del router R4.

```
R4#show ip route
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 10.10.10.9 to network 0.0.0.0
10.0.0.0/30 is subnetted, 4 subnets
R 10.10.10.0 [120/2] via 10.10.10.9, 00:00:14, Serial0/0/0
R 10.10.10.4 [120/1] via 10.10.10.9, 00:00:14, Serial0/0/0
C 10.10.10.8 is directly connected, Serial0/0/0
C 10.10.10.12 is directly connected, Serial0/0/1
172.16.0.0/16 is variably subnetted, 10 subnets, 5 masks
R 172.16.1.0/27 [120/1] via 10.10.10.9, 00:00:14, Serial0/0/0
R 172.16.1.32/28 [120/1] via 10.10.10.14, 00:00:17, Serial0/0/1
R 172.16.1.192/26 [120/2] via 10.10.10.9, 00:00:14, Serial0/0/0
R 172.16.2.0/26 [120/3] via 10.10.10.9, 00:00:14, Serial0/0/0
C 172.16.2.64/27 is directly connected, FastEthernet0/1
R 172.16.3.0/25 [120/1] via 10.10.10.9, 00:00:14, Serial0/0/0
R 172.16.3.128/26 [120/2] via 10.10.10.9, 00:00:14, Serial0/0/0
R 172.16.3.192/29 [120/3] via 10.10.10.9, 00:00:14, Serial0/0/0
C 172.16.4.0/27 is directly connected, FastEthernet0/0
R 172.16.4.128/25 [120/1] via 10.10.10.14, 00:00:17, Serial0/0/1
R 192.168.1.0/24 [120/1] via 10.10.10.9, 00:00:14, Serial0/0/0
R* 0.0.0.0/0 [120/1] via 10.10.10.9, 00:00:14, Serial0/0/0
```

Paso 5: Examine el resultado del router R5.

```
R5#show ip route
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 10.10.10.13 to network 0.0.0.0

R 10.10.10.0 [120/3] via 10.10.10.13, 00:00:21, Serial0/0/0
R 10.10.10.4 [120/2] via 10.10.10.13, 00:00:21, Serial0/0/0
R 10.10.10.8 [120/1] via 10.10.10.13, 00:00:21, Serial0/0/0
C 10.10.10.12 is directly connected, Serial0/0/0
172.16.0.0/16 is variably subnetted, 10 subnets, 5 masks
R 172.16.1.0/27 [120/2] via 10.10.10.13, 00:00:21, Serial0/0/0
C 172.16.1.32/28 is directly connected, FastEthernet0/1
R 172.16.1.192/26 [120/3] via 10.10.10.13, 00:00:21, Serial0/0/0
R 172.16.2.0/26 [120/4] via 10.10.10.13, 00:00:21, Serial0/0/0
R 172.16.2.64/27 [120/1] via 10.10.10.13, 00:00:21, Serial0/0/0
R 172.16.3.0/25 [120/2] via 10.10.10.13, 00:00:21, Serial0/0/0
R 172.16.3.128/26 [120/3] via 10.10.10.13, 00:00:21, Serial0/0/0
R 172.16.3.192/29 [120/4] via 10.10.10.13, 00:00:21, Serial0/0/0
R 172.16.4.0/27 [120/1] via 10.10.10.13, 00:00:21, Serial0/0/0
C 172.16.4.128/25 is directly connected, FastEthernet0/0
R 192.168.1.0/24 [120/2] via 10.10.10.13, 00:00:21, Serial0/0/0
R* 0.0.0.0/0 [120/2] via 10.10.10.13, 00:00:21, Serial0/0/0
```

Tarea 2: Crear un diagrama de la red con base a los resultados del router.

Paso 1:

Dibuja en el siguiente espacio la topología completa, con sus respectivos ID de subredes que identificaste en cada una de las interfaces, (incluye aquí la imagen que hayas realizado ya sea en tu cuaderno, en el espacio de trabajo de Packet o cualquier otra herramienta que te permita plasmar el diseño).
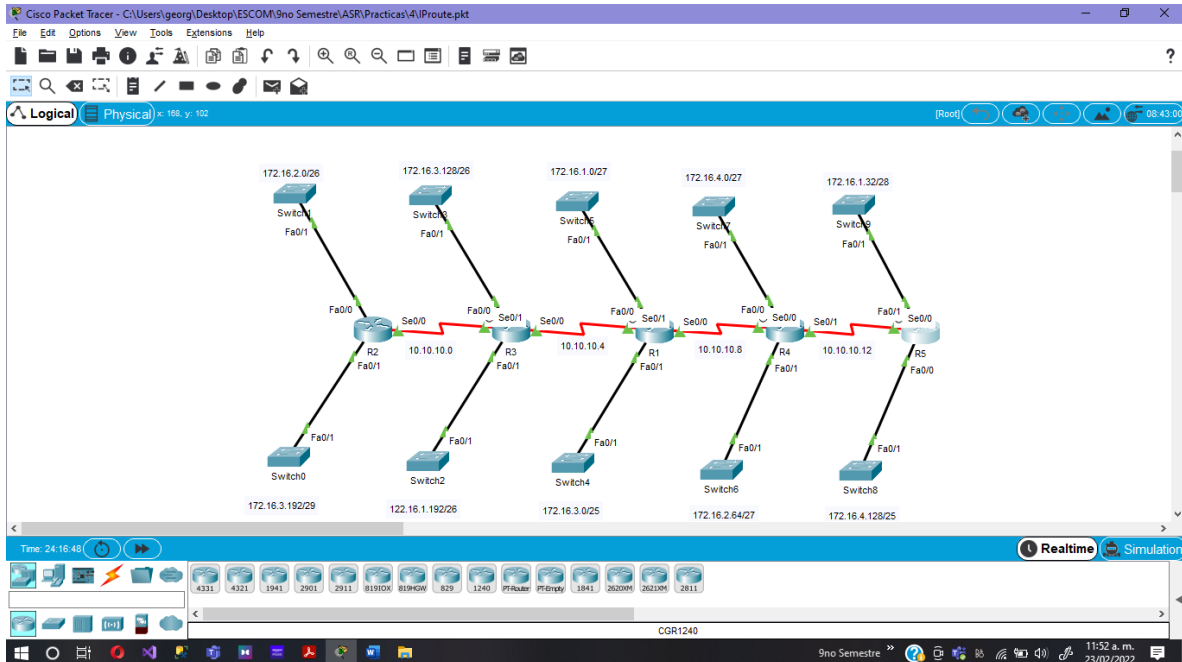
Paso 2:

Documente las direcciones de interfaz en la tabla de direccionamiento.
Tabla de direccionamiento (incluir una tabla)

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Dirección de red
R1	S0/0	10.10.10.5	/30	10.10.10.4
	S0/1	10.10.10.9	/30	10.10.10.8
	FastEthernet0/0	172.16.1.1	/27	172.16.1.0
	FastEthernet0/1	172.16.3.1	/25	172.16.3.0
R2	S0/0	10.10.10.1	/30	10.10.10.0
	FastEthernet0/0	172.16.2.1	/26	172.16.2.0
	FastEthernet0/1	172.16.3.193	/29	172.16.3.192
R3	S0/0	10.10.10.6	/30	10.10.10.4
	S0/1	10.10.10.2	/30	10.10.10.0
	FastEthernet0/0	172.16.3.129	/26	172.16.3.128
	FastEthernet0/1	172.16.1.193	/26	172.16.1.192
R4	S0/0	10.10.10.10	/30	10.10.10.8
	S0/1	10.10.10.13	/30	10.10.10.12
	FastEthernet0/0	172.16.4.1	/27	172.16.1.0
	FastEthernet0/1	172.16.2.65	/27	172.16.3.0
R5	S0/0	10.10.10.14	/30	10.10.10.12
	FastEthernet0/0	172.16.4.129	/25	172.16.2.0
	FastEthernet0/1	172.16.1.33	/28	172.16.3.192

Tarea 3:

Crear y configurar el diagrama con Packet Tracer.

Paso 1: Cree el diagrama de topología en Packet Tracer, utilizar el modelo del router que prefieras.
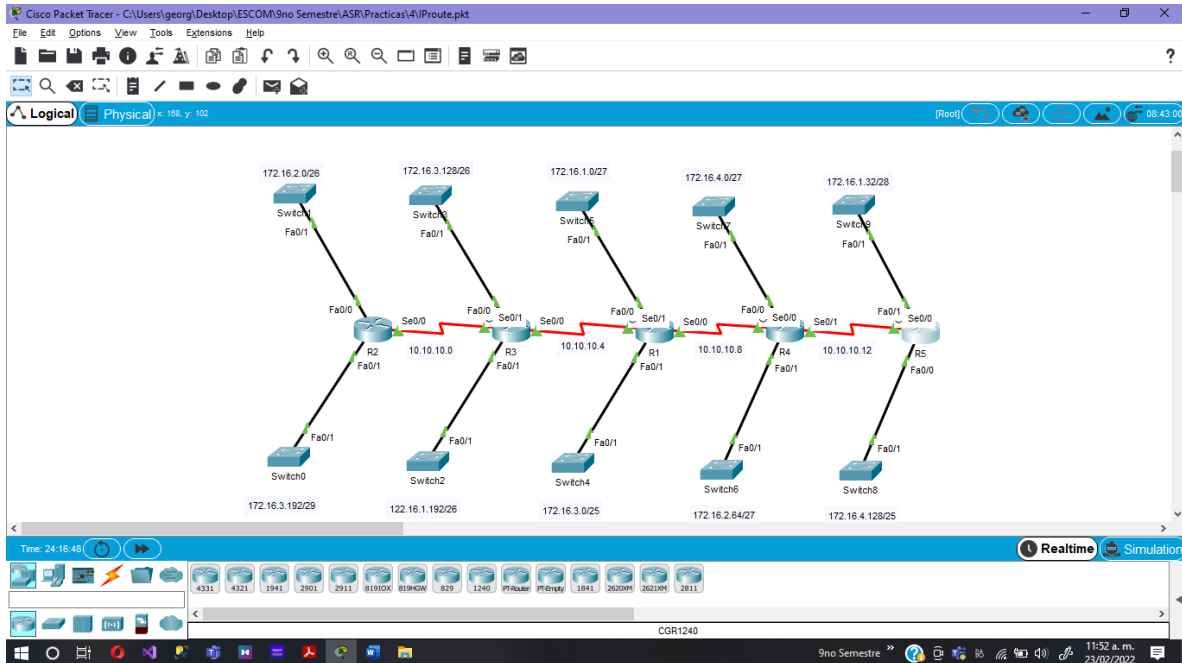
Paso 2: Configure las interfaces con la dirección IP y máscara de subred correspondientes.

Paso 3: Configure el protocolo de enrutamiento correspondiente para cada router y notifique a todas las redes conectadas directamente.

Paso 4: Verifique que las configuraciones coincidan con los resultados de la Tarea 1.

```
%LINK-5-CHANGED: Interface Serial0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up


Router>ena
Router#show ip route
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 0.0.0.0 to network 0.0.0.0

     10.0.0.0/30 is subnetted, 2 subnets
C       10.10.10.4 is directly connected, Serial0/0
C       10.10.10.8 is directly connected, Serial0/1
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.1.0/27 is directly connected, FastEthernet0/0
C       172.16.3.0/25 is directly connected, FastEthernet0/1
C    192.168.1.0/24 is directly connected, Loopback0
S*   0.0.0.0/0 is directly connected, Loopback0
```

```
Press RETURN to get started.




Router>ena
Router#show ip route
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

     10.0.0.0/30 is subnetted, 2 subnets
C       10.10.10.0 is directly connected, Serial0/0
R       10.10.10.4 [120/1] via 10.10.10.2, 00:00:08, Serial0/0
     172.16.0.0/16 is variably subnetted, 4 subnets, 2 masks
R       172.16.1.192/26 [120/1] via 10.10.10.2, 00:00:08, Serial0/0
C       172.16.2.0/26 is directly connected, FastEthernet0/0
R       172.16.3.128/26 [120/1] via 10.10.10.2, 00:00:08, Serial0/0
C       172.16.3.192/29 is directly connected, FastEthernet0/1

Router#
```

Physical Config CLI Attributes

IO

```
Press RETURN to get started.




Router>ena
Router#show ip route
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

     10.0.0.0/30 is subnetted, 2 subnets
C       10.10.10.0 is directly connected, Serial0/1
C       10.10.10.4 is directly connected, Serial0/0
     172.16.0.0/16 is variably subnetted, 4 subnets, 2 masks
C       172.16.1.192/26 is directly connected, FastEthernet0/1
R       172.16.2.0/26 [120/1] via 10.10.10.1, 00:00:20, Serial0/1
C       172.16.3.128/26 is directly connected, FastEthernet0/0
R       172.16.3.192/29 [120/1] via 10.10.10.1, 00:00:20, Serial0/1

Router#
```

Physical Config CLI Attributes

IO

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up


Router>ena
Router#show ip route
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

     10.0.0.0/30 is subnetted, 2 subnets
C       10.10.10.8 is directly connected, Serial0/0
C       10.10.10.12 is directly connected, Serial0/1
     172.16.0.0/16 is variably subnetted, 4 subnets, 3 masks
R       172.16.1.32/28 [120/1] via 10.10.10.14, 00:00:11, Serial0/1
C       172.16.2.64/27 is directly connected, FastEthernet0/1
C       172.16.4.0/27 is directly connected, FastEthernet0/0
R       172.16.4.128/25 [120/1] via 10.10.10.14, 00:00:11, Serial0/1

Router#
```

R5

Physical | Config | CLI | Attributes

IC

```
Press RETURN to get started!

%LINK-5-CHANGED: Interface Serial0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up


Router>ena
Router#show ip route
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

     10.0.0.0/30 is subnetted, 2 subnets
R       10.10.10.8 [120/1] via 10.10.10.13, 00:00:04, Serial0/0
C       10.10.10.12 is directly connected, Serial0/0
     172.16.0.0/16 is variably subnetted, 4 subnets, 3 masks
C       172.16.1.32/28 is directly connected, FastEthernet0/1
R       172.16.2.64/27 [120/1] via 10.10.10.13, 00:00:04, Serial0/0
R       172.16.4.0/27 [120/1] via 10.10.10.13, 00:00:04, Serial0/0
C       172.16.4.128/25 is directly connected, FastEthernet0/0

Router#
```