

## GII TDRC MEMORIA Práctica 2

### Configuración de rutas estáticas y dinámicas

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Duración: 1 sesión

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OPCIÓN	A	ISLA X	8	ISLA Y	10

**IMPORTANTE:** En base a los valores X e Y tendrá que calcular la opción de respuesta del guión de prácticas.  
Para ello, tendrá que seguir la siguiente tabla:

OPCIÓN	VALOR X	VALOR Y
A	PAR	PAR
B	PAR	IMPAR
C	IMPAR	PAR
D	IMPAR	IMPAR

#### INSTRUCCIONES:

- Debe reemplazar por la respuesta correcta todo texto que aparezca de color rojo.
- Incluya capturas de pantalla de las configuraciones donde aparezca el símbolo de imagen (reemplace dicha imagen por la captura o capturas que necesite):



- Puede emplear la herramienta recortes en windows para realizar las capturas de pantalla o emplear el atajo **WINDOWS+IMPRIMIR\_PANTALLA** y posteriormente pegar la captura en el documento.
- Puede emplear la herramienta Shutter en linux para realizar las capturas de pantalla.
- Puede emplear el atajo **COMANDO+MAYUSCULAS+4+BARRA\_ESPACIADORA** en MAC para realizar las capturas de pantalla.

## 1. CONFIGURACIÓN DEL PC

### 5. Credenciales de red del equipo con el comando ipconfig

(OPCIÓN A) PC8\_1

```
Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

    Link-local IPv6 Address.....: FE80::201:42FF:FED6:3E2A
    IP Address.....: 10.8.1.1
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: 10.8.1.100

Bluetooth Connection:

    Link-local IPv6 Address.....: ::
    IP Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: 0.0.0.0

C:\>
```

## 2. CONFIGURACIÓN INICIAL DEL ROUTER

### 6. Direcciones IP del router RX\_A

```
R8_A>show ip interface brief

Interface      IP-Address      OK? Method Status      Protocol
FastEthernet0/0 10.8.1.100      YES manual up          up
FastEthernet0/1 172.16.8.100    YES manual up          up
Vlan1           unassigned      YES unset  administratively down down
```

### 6. Direcciones IP del router RX\_B

```
Router>show ip interface brief

Interface      IP-Address      OK? Method Status      Protocol
FastEthernet0/0 172.16.8.101    YES manual up          up
FastEthernet0/1 10.8.2.100      YES manual up          up
Vlan1           unassigned      YES unset  administratively down down
```

### 7. Alcanzabilidad desde el router RX\_A

```
R8_A>ping 10.8.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.8.1.1, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/1 ms
```

### 7. Alcanzabilidad desde el router RX\_B

```
Router>ping 10.8.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.8.1.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

### 3. CONFIGURACIÓN RUTAS ESTÁTICAS

#### 1. Rutas estáticas de RX\_A

```
R8_A>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

```
10.0.0.0/24 is subnetted, 1 subnets
C    10.8.1.0 is directly connected, FastEthernet0/0
172.16.0.0/24 is subnetted, 1 subnets
C    172.16.8.0 is directly connected, FastEthernet0/1
```

#### 1. Rutas estáticas de RX\_B

```
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

```
10.0.0.0/24 is subnetted, 1 subnets
C    10.8.2.0 is directly connected, FastEthernet0/1
172.16.0.0/24 is subnetted, 1 subnets
C    172.16.8.0 is directly connected, FastEthernet0/0
```

#### 2. Comandos necesarios para configurar RX\_A

**ip route 10.8.2.0 255.255.255.0 172.16.8.101**

#### 2. Comandos necesarios para configurar RX\_B

**ip route 10.8.1.0 255.255.255.0 172.16.8.100**

#### 3. Configuración de las rutas en RX\_A

```
R8_A#config t
Enter configuration commands, one per line. End with CNTL/Z.
R8_A(config)#ip route 10.8.2.0 255.255.255.0 172.16.8.101
```

#### 3. Configuración de las rutas en RX\_B

```
Router(config-if)#ip route 10.8.1.0 255.255.255.0 172.16.8.100
Router(config)#
```

#### 4. Tabla encaminamiento RX\_A

```
R8_A>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

    10.0.0.0/24 is subnetted, 2 subnets
C      10.8.1.0 is directly connected, FastEthernet0/0
S      10.8.2.0 [1/0] via 172.16.8.101
    172.16.0.0/24 is subnetted, 1 subnets
C      172.16.8.0 is directly connected, FastEthernet0/1
```

#### 4. Tabla encaminamiento RX\_B

```
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

    10.0.0.0/24 is subnetted, 2 subnets
S      10.8.1.0 [1/0] via 172.16.8.100
C      10.8.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C      172.16.8.0 is directly connected, FastEthernet0/0
```

#### 4. ¿Cuántas redes tienen que aparecer?

Aparecen tres redes, 2 conectadas y 1 estática. La estática es la que acabamos de configurar, ya que aparece con el identificador S.

#### 6. Comprobación conectividad I

```
C:\>tracert 10.8.2.2

Tracing route to 10.8.2.2 over a maximum of 30 hops:

  1  0 ms      0 ms      0 ms      10.8.1.100
  2  0 ms      1 ms      0 ms      172.16.8.101
  3  *          0 ms      0 ms      10.8.2.2

Trace complete.
```

#### 6. Comprobación conectividad II

```
C:\>tracert 10.8.1.2

Tracing route to 10.8.1.2 over a maximum of 30 hops:

  1  0 ms      0 ms      0 ms      10.8.2.100
  2  0 ms      0 ms      0 ms      172.16.8.100
  3  *          0 ms      0 ms      10.8.1.2

Trace complete.
```

#### 5. Necesidad del router RX\_C

No es necesario la utilización del router R8\_C ya que lo hemos configurado de tal manera, en la cual si hubieramos utilizado dicho router daríamos más saltos hacia el destino. Además si hubieramos configurado el router C en la tabla de enrutamiento, el camino seguiría siendo de router A hacia B porque tiene menos saltos, si se tiene en cuenta dicha métrica.

#### 4. CONFIGURACIÓN DE ENRUTAMIENTO DINÁMICO SIP

##### 4. Configuración SIP en RX\_A

```
R8_A>enable
R8_A#config t
Enter configuration commands, one per line. End with CNTL/Z.
R8_A(config)#router rip
R8_A(config-router)#version 2
R8_A(config-router)#no auto-summary
R8_A(config-router)#network 10.8.1.0
R8_A(config-router)#network 172.16.8.0
R8_A(config-router)#exit
R8_A(config)#exit
R8_A#
%SYS-5-CONFIG_I: Configured from console by console
```

##### 4. Configuración SIP en RX\_B

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#network 10.8.2.0
Router(config-router)#network 172.16.8.0
Router(config-router)#network 172.16.8.0
^
% Invalid input detected at '^' marker.

Router(config-router)#network 172.16.8.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

##### 5. Comprobación SIP en RX\_A

```
R8_A#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv Triggered RIP Key-chain
  FastEthernet0/0      2     2
  FastEthernet0/1      2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  10.0.0.0
  172.16.0.0
Passive Interface(s):
Routing Information Sources:
  Gateway            Distance    Last Update
  172.16.8.101        120         00:00:00
Distance: (default is 120)
```

## 5. Comprobación SIP en RX\_B

```
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 11 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv  Triggered RIP  Key-chain
FastEthernet0/1      2      2
FastEthernet0/0      2      2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
    10.0.0.0
    172.16.0.0
Passive Interface(s):
Routing Information Sources:
    Gateway         Distance      Last Update
    172.16.8.100    120          00:00:11
Distance: (default is 120)
```

## 6. Comprobación conectividad I

```
C:\>tracert 10.8.1.2

Tracing route to 10.8.1.2 over a maximum of 30 hops:

  1  1 ms     0 ms     1 ms     10.8.2.100
  2  0 ms     2 ms     0 ms     172.16.8.100
  3  *         0 ms     0 ms     10.8.1.2

Trace complete.
```

## 6. Comprobación conectividad II

```
C:\>tracert 10.8.1.1

Tracing route to 10.8.1.1 over a maximum of 30 hops:

  1  0 ms     0 ms     0 ms     10.8.2.100
  2  0 ms     0 ms     0 ms     172.16.8.100
  3  *         0 ms     0 ms     10.8.1.1

Trace complete.
```

## 6. Explicación

Evidentemente tiene sentido ya que se realizan tres saltos, los cuales corresponden con las distintas ip de cada router. La primera ip corresponde a la red de servicios R8\_B, la segunda red de gestión R8\_A y finalmente la ip del PC.

## 7. Tabla encaminamiento RX\_A

```
R8_A#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

    10.0.0.0/24 is subnetted, 2 subnets
C       10.8.1.0 is directly connected, FastEthernet0/0
R       10.8.2.0 [120/1] via 172.16.8.101, 00:00:11, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.8.0 is directly connected, FastEthernet0/1
```

## 7. Tabla encaminamiento RX\_B

```
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

    10.0.0.0/24 is subnetted, 2 subnets
R       10.8.1.0 [120/1] via 172.16.8.100, 00:00:10, FastEthernet0/0
C       10.8.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.8.0 is directly connected, FastEthernet0/0
```

### 7. Explicación

Se puede ver claramente tres redes, dos conectadas via FastEthernet y una via protocolo RIP. Se puede ver mediante el identificador R, la cual acabamos de configurar.

## 9. Encaminamiento entre islas

```
C:\>tracert 10.10.1.1

Tracing route to 10.10.1.1 over a maximum of 30 hops:

  1  2 ms    0 ms    0 ms    10.8.1.100
  2  0 ms    0 ms    0 ms    172.16.8.102
  3  0 ms    1 ms    0 ms    172.32.81.101
  4  0 ms    1 ms    0 ms    172.16.10.100
  5  *        0 ms    0 ms    10.10.1.1

Trace complete.
```

### 9. Explicación

Se puede ver que el camino seguido si tiene sentido ya que sólo utiliza routers dónde el número de saltos es mínimo. Además se puede ver perfectamente el recorrido que hace por distintas redes de servicios AX e AY, al igual que las de gestión X, XY y Y.

### 10. Explicación

La distancia administrativa por defecto del protocolo RIP es de 120. No va a haber red por la que se pueda ir por 2 rutas diferentes, ya que al comparar la distancia administrativa de la ruta directa y otra ruta en cuestión, la ruta directa tendrá un coste menor. Además si por casualidad la distancia fuera la misma, esta excederá la metrica basandose en los números de saltos. En el caso de que la distancia y la metrica sean iguales, se guardaran ambas rutas en la tabla.

## 11. Base de datos RIP

```
R10_A#show ip rip database
10.8.1.0/24    auto-summary
10.8.1.0/24
    [3] via 172.16.10.102, 00:00:26, FastEthernet0/0
10.8.2.0/24    auto-summary
10.8.2.0/24
    [3] via 172.16.10.102, 00:00:26, FastEthernet0/0
10.10.1.0/24    auto-summary
10.10.1.0/24    directly connected, FastEthernet0/1
10.10.2.0/24    auto-summary
10.10.2.0/24
    [1] via 172.16.10.101, 00:00:22, FastEthernet0/0
172.16.8.0/24    auto-summary
172.16.8.0/24
    [2] via 172.16.10.102, 00:00:26, FastEthernet0/0
172.16.10.0/24    auto-summary
172.16.10.0/24    directly connected, FastEthernet0/0
172.32.81.0/24    auto-summary
172.32.81.0/24
    [1] via 172.16.10.102, 00:00:26, FastEthernet0/0
```



## 12. Explicación

Los updates se realizan cada 30 segundos. Se reciben todas las redes menos en la que te encuentras y se recibe desde la interfaz FastEthernet0/0 via 172.16.10.101 y FastEthernet0/0 via 172.16.10.102 si estas en el Router R10\_A, es decir de las interfaces conectadas a los routers más cercanos. Se está mandando RIP Version 2 (RIPv2) y la dirección multicast es 224.0.0.9, conociéndose gracias a esta línea:

- "RIP: sending v2 update to 224.0.0.9 via FastEthernet0/1 (10.10.1.100)"

## 5. CONFIGURACIÓN DE ENRUTAMIENTO DINÁMICO OSPF

### 3. Conectividad entre islas

```
C:\>tracert 10.10.2.1

Tracing route to 10.10.2.1 over a maximum of 30 hops:

  1  2 ms      0 ms      1 ms      10.8.2.100
  2  0 ms      0 ms      1 ms      172.16.8.102
  3  0 ms      1 ms      0 ms      172.32.81.101
  4  *          0 ms      2 ms      172.16.10.101
  5  *          0 ms      0 ms      10.10.2.1

Trace complete.
```

### 4. Tabla de enrutamiento I

```
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

10.0.0.0/24 is subnetted, 4 subnets
O    10.8.1.0 [110/2] via 172.16.8.100, 00:07:09, FastEthernet0/0
C    10.8.2.0 is directly connected, FastEthernet0/1
R    10.10.1.0 [120/3] via 172.16.8.102, 00:00:00, FastEthernet0/0
R    10.10.2.0 [120/3] via 172.16.8.102, 00:00:00, FastEthernet0/0
172.16.0.0/24 is subnetted, 2 subnets
C    172.16.8.0 is directly connected, FastEthernet0/0
R    172.16.10.0 [120/2] via 172.16.8.102, 00:00:00, FastEthernet0/0
172.32.0.0/24 is subnetted, 1 subnets
O    172.32.81.0 [110/2] via 172.16.8.102, 00:05:10, FastEthernet0/0
```

### 4. Tabla de enrutamiento II

```
R8_C#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

10.0.0.0/24 is subnetted, 4 subnets
O    10.8.1.0 [110/2] via 172.16.8.100, 00:06:16, FastEthernet0/0
O    10.8.2.0 [110/2] via 172.16.8.101, 00:06:16, FastEthernet0/0
R    10.10.1.0 [120/2] via 172.32.81.101, 00:00:19, FastEthernet0/1
R    10.10.2.0 [120/2] via 172.32.81.101, 00:00:19, FastEthernet0/1
172.16.0.0/24 is subnetted, 2 subnets
C    172.16.8.0 is directly connected, FastEthernet0/0
R    172.16.10.0 [120/1] via 172.32.81.101, 00:00:19, FastEthernet0/1
172.32.0.0/24 is subnetted, 1 subnets
C    172.32.81.0 is directly connected, FastEthernet0/1
```



#### 4. Tabla de enrutamiento III

```
R10_C#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

    10.0.0.0/24 is subnetted, 4 subnets
O       10.8.1.0 [110/3] via 172.32.81.100, 00:05:06, FastEthernet0/0
O       10.8.2.0 [110/3] via 172.32.81.100, 00:05:06, FastEthernet0/0
R       10.10.1.0 [120/1] via 172.16.10.100, 00:00:13, FastEthernet0/1
R       10.10.2.0 [120/1] via 172.16.10.101, 00:00:12, FastEthernet0/1
    172.16.0.0/24 is subnetted, 2 subnets
O       172.16.8.0 [110/2] via 172.32.81.100, 00:05:06, FastEthernet0/0
C       172.16.10.0 is directly connected, FastEthernet0/1
    172.32.0.0/24 is subnetted, 1 subnets
C       172.32.81.0 is directly connected, FastEthernet0/0
```

#### 4. Tabla de enrutamiento IV

```
R10_B#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

    10.0.0.0/24 is subnetted, 4 subnets
R       10.8.1.0 [120/3] via 172.16.10.102, 00:00:29, FastEthernet0/0
R       10.8.2.0 [120/3] via 172.16.10.102, 00:00:29, FastEthernet0/0
O       10.10.1.0 [110/2] via 172.16.10.100, 00:03:37, FastEthernet0/0
C       10.10.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 2 subnets
R       172.16.8.0 [120/2] via 172.16.10.102, 00:00:29, FastEthernet0/0
C       172.16.10.0 is directly connected, FastEthernet0/0
    172.32.0.0/24 is subnetted, 1 subnets
R       172.32.81.0 [120/1] via 172.16.10.102, 00:00:29, FastEthernet0/0
```

#### 5. Comprobación del funcionamiento de OSPF

```
R10_B#debug ip ospf events
OSPF events debugging is on
R10_B#
00:51:29: OSPF: Rcv hello from 172.32.81.101 area 0 from FastEthernet0/0 172.16.10.102

00:51:29: OSPF: End of hello processing

00:51:37: OSPF: Rcv hello from 172.16.10.100 area 0 from FastEthernet0/0 172.16.10.100

00:51:37: OSPF: End of hello processing

00:51:39: OSPF: Rcv hello from 172.32.81.101 area 0 from FastEthernet0/0 172.16.10.102

00:51:39: OSPF: End of hello processing

00:51:47: OSPF: Rcv hello from 172.16.10.100 area 0 from FastEthernet0/0 172.16.10.100

00:51:47: OSPF: End of hello processing

00:51:49: OSPF: Rcv hello from 172.32.81.101 area 0 from FastEthernet0/0 172.16.10.102

00:51:49: OSPF: End of hello processing

R10_B#u all
All possible debugging has been turned off
```

```
R10_B#show ip ospf
Routing Process "ospf 54" with ID 172.16.10.101
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x000000
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
External flood list length 0
  Area BACKBONE(0)
    Number of interfaces in this area is 2
    Area has no authentication
    SPF algorithm executed 6 times
    Area ranges are
    Number of LSA 9. Checksum Sum 0x04fbcc
    Number of opaque link LSA 0. Checksum Sum 0x000000
    Number of DCbitless LSA 0
    Number of indication LSA 0
    Number of DoNotAge LSA 0
    Flood list length 0
R10_B#show ip ospf database
      OSPF Router with ID (172.16.10.101) (Process ID 54)

      Router Link States (Area 0)

Link ID          ADV Router      Age           Seq#           Checksum Link count
172.16.10.101    172.16.10.101  607           0x80000005     0x00d2a6 2
172.16.10.100    172.16.10.100  600           0x80000006     0x00aecd 2
172.32.81.100    172.32.81.100  603           0x80000009     0x0006d5 2
172.16.8.101     172.16.8.101   603           0x80000006     0x009ee2 2
172.16.8.100     172.16.8.100   604           0x80000007     0x0089fa 2
172.32.81.101    172.32.81.101  197           0x80000006     0x0014c4 2

      Net Link States (Area 0)

Link ID          ADV Router      Age           Seq#           Checksum
172.32.81.101    172.32.81.101  610           0x80000001     0x00e00b
172.16.8.102     172.32.81.100  610           0x80000003     0x0090de
172.16.10.101    172.16.10.101  197           0x80000002     0x00c4fb
R10_B#show ip ospf neighbor detail
Neighbor 172.16.10.100, interface address 172.16.10.100
  In the area 0 via interface FastEthernet0/0
  Neighbor priority is 1, State is FULL, 5 state changes
  DR is 172.16.10.101 BDR is 172.16.10.100
  Options is 0x00
  Dead timer due in 00:00:31
  Neighbor is up for 00:11:55
  Index 1/1, retransmission queue length 0, number of retransmission 0
  First 0x0(0)/0x0(0) Next 0x0(0)/0x0(0)
  Last retransmission scan length is 0, maximum is 1
  Last retransmission scan time is 0 msec, maximum is 0 msec
Neighbor 172.32.81.101, interface address 172.16.10.102
  In the area 0 via interface FastEthernet0/0
  Neighbor priority is 1, State is FULL, 5 state changes
  DR is 172.16.10.101 BDR is 172.16.10.100
  Options is 0x00
  Dead timer due in 00:00:33
  Neighbor is up for 00:04:06
  Index 2/2, retransmission queue length 0, number of retransmission 0
  First 0x0(0)/0x0(0) Next 0x0(0)/0x0(0)
  Last retransmission scan length is 0, maximum is 1
  Last retransmission scan time is 0 msec, maximum is 0 msec
```

```
C:\>ping 10.10.2.1
```

```
Pinging 10.10.2.1 with 32 bytes of data:
```

```
Reply from 10.10.2.1: bytes=32 time=1ms TTL=124
```

```
Reply from 10.10.2.1: bytes=32 time<1ms TTL=124
```

```
Reply from 10.10.2.1: bytes=32 time<1ms TTL=124
```

```
Reply from 10.10.2.1: bytes=32 time=1ms TTL=124
```

```
Ping statistics for 10.10.2.1:
```

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
R10_B#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
```

```
10.0.0.0/24 is subnetted, 4 subnets
```

```
O 10.8.1.0 [110/4] via 172.16.10.102, 00:04:22, FastEthernet0/0
```

```
O 10.8.2.0 [110/4] via 172.16.10.102, 00:04:22, FastEthernet0/0
```

```
O 10.10.1.0 [110/2] via 172.16.10.100, 00:12:08, FastEthernet0/0
```

```
C 10.10.2.0 is directly connected, FastEthernet0/1
```

```
172.16.0.0/24 is subnetted, 2 subnets
```

```
O 172.16.8.0 [110/3] via 172.16.10.102, 00:04:22, FastEthernet0/0
```

```
C 172.16.10.0 is directly connected, FastEthernet0/0
```

```
172.32.0.0/24 is subnetted, 1 subnets
```

```
O 172.32.81.0 [110/2] via 172.16.10.102, 00:04:22, FastEthernet0/0
```