

## GII TDRC MEMORIA Práctica 2

### Configuración de rutas estáticas y dinámicas

Autor: Miguel Ángel López (Revisión Antonio M. Mora, Antonio Fernández Ares)

Duración: 1 sesión

NOMBRE Y APELLIDOS	Carlos García Segura				
OPCIÓN	D	ISLA X	3	ISLA Y	7

**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

PC3\_4

The screenshot shows a virtual desktop environment for PC3\_4. The desktop has a taskbar with icons for 'Physical', 'Config', 'Desktop' (selected), 'Programming', and 'Attributes'. A 'Command Prompt' window is open, displaying the output of the 'ipconfig' command. The output shows network configuration for 'FastEthernet0' and 'Bluetooth' connections. The 'FastEthernet0' connection is active and shows an IPv4 address of 10.3.2.103 and a default gateway of 10.3.2.101. The 'Bluetooth' connection is also shown with default values.

```
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::201:97FF:FEA3:B31E
    IPv6 Address . . . . .: ::
    IPv4 Address. . . . .: 10.3.2.103
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                10.3.2.101

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address. . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                0.0.0.0

C:\>|
```

☐ Top

## 2. CONFIGURACIÓN INICIAL DEL ROUTER



## 6. Direcciones IP del router R3\_A

R3\_A

Physical

Config

CLI

Attributes

IOS Command Line Interface

agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:  
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to  
[export@cisco.com](mailto:export@cisco.com).

Cisco 1841 (revision 5.0) with 114688K/16384K bytes of memory.  
Processor board ID FTX0947Z18E  
M860 processor: part number 0, mask 49  
2 FastEthernet/IEEE 802.3 interface(s)  
191K bytes of NVRAM.  
63488K bytes of ATA CompactFlash (Read/Write)  
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1, RELEASE SOFTWARE (fc2)  
Technical Support: <http://www.cisco.com/techsupport>  
Copyright (c) 1986-2007 by Cisco Systems, Inc.  
Compiled Wed 18-Jul-07 04:52 by pt\_team

Press RETURN to get started!

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

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

Router>show ip

% Incomplete command.

Router>show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	172.16.3.102	YES	manual	up	up
FastEthernet0/1	10.3.1.101	YES	manual	up	up
Vlan1	unassigned	YES	unset	administratively down	down

Router>

Ctrl+F6 to exit CLI focus

Copy

Paste

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## 6. Direcciones IP del router R3\_B

R3\_B

Physical

Config

CLI

Attributes

IOS Command Line Interface

Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:  
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

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Technical Support: <http://www.cisco.com/techsupport>  
Copyright (c) 1986-2007 by Cisco Systems, Inc.  
Compiled Wed 18-Jul-07 04:52 by pt\_team

Press RETURN to get started!

%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

Router>show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	172.16.3.103	YES	manual	up	up
FastEthernet0/1	10.3.2.101	YES	manual	up	up
Vlan1	unassigned	YES	unset	administratively down	down

Router>

Ctrl+F6 to exit CLI focus

Copy

Paste

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## 7. Alcanzabilidad desde el router R3\_A

[illegible]



## 7. Alcanzabilidad desde el router R3\_B

R3\_B

PhysicalConfigCLIAttributes

IOS Command Line Interface

```
Cisco 1841 (revision 5.0) with 114688K/16384K bytes of memory.
Processor board ID FTX0947Z18E
M860 processor: part number 0, mask 49
2 FastEthernet/IEEE 802.3 interface(s)
191K bytes of NVRAM.
63488K bytes of ATA CompactFlash (Read/Write)
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1, RELEASE
SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!

%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

Router>show ip interface brief
Interface      IP-Address      OK? Method Status      Protocol
FastEthernet0/0 172.16.3.103    YES manual up          up
FastEthernet0/1 10.3.2.101      YES manual up          up
Vlan1          unassigned      YES unset  administratively down down
Router>10.3.2.103
Trying 10.3.2.103 ...
% Connection refused by remote host
Router>ping 10.3.2.103

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.3.2.103, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router>
```

Ctrl+F6 to exit CLI focus

CopyPaste

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## 3. CONFIGURACIÓN RUTAS ESTÁTICAS



## 1. Rutas estáticas de R3\_A

R3\_A

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router>ping 10.3.2.103

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.3.2.103, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

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       10.3.1.0 is directly connected, FastEthernet0/1
      172.16.0.0/24 is subnetted, 1 subnets
C       172.16.3.0 is directly connected, FastEthernet0/0

Router>
```

Ctrl+F6 to exit CLI focus

CopyPaste

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## 1. Rutas estáticas de R3\_B

R3\_B

Physical Config **CLI** Attributes

IOS Command Line Interface

```
%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

Router>show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    172.16.3.103    YES manual up          up
FastEthernet0/1    10.3.2.101      YES manual up          up
Vlan1              unassigned      YES unset  administratively down down
Router>10.3.2.103
Trying 10.3.2.103 ...
% Connection refused by remote host
Router>ping 10.3.2.103

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.3.2.103, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

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       10.3.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.3.0 is directly connected, FastEthernet0/0

Router>
```

Ctrl+F6 to exit CLI focus

Copy Paste

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## 2. Comandos necesarios para configurar R3\_A

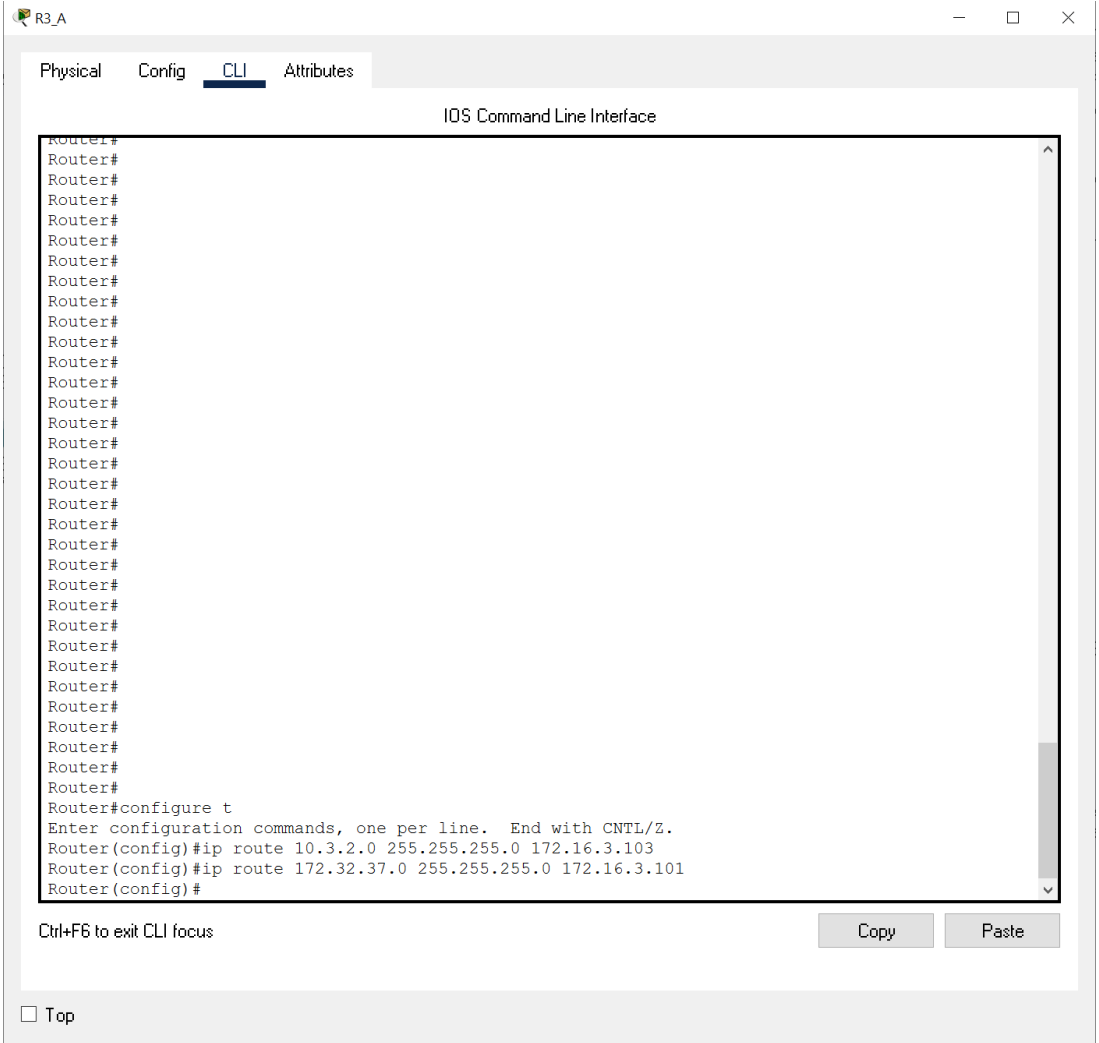
Ip route 10.3.2.0 255.255.255.0 172.16.3.103  
Ip route 172.32.37.0 255.255.255.0 172.16.3.101

## 2. Comandos necesarios para configurar R3\_B

Ip route 10.3.1.0 255.255.255.0 172.16.3.102  
Ip route 172.32.37.0 255.255.255.0 172.16.3.101



### 3. Configuración de las rutas en R3\_A





### 3. Configuración de las rutas en R3\_B

R3\_B

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router>show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          172.16.3.103    YES manual up          up
FastEthernet0/1          10.3.2.101      YES manual up          up
Vlan1                    unassigned      YES unset  administratively down down
Router>10.3.2.103
Trying 10.3.2.103 ...
% Connection refused by remote host
Router>ping 10.3.2.103

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.3.2.103, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

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       10.3.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.3.0 is directly connected, FastEthernet0/0

Router>enable
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.3.1.0 255.255.255.0 172.16.3.102
Router(config)#ip route 172.32.37.0 255.255.255.0 172.16.3.102
Router(config)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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4. Tabla  
encaminamiento  
R3\_A

R3\_A

PhysicalConfigCLIAttributes

IOS Command Line Interface

```
Router#
Router#
Router#
Router#
Router#
Router#
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.3.2.0 255.255.255.0 172.16.3.103
Router(config)#ip route 172.32.37.0 255.255.255.0 172.16.3.101
Router(config)#show ip route
^
% Invalid input detected at '^' marker.

Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
C    10.3.1.0 is directly connected, FastEthernet0/1
S    10.3.2.0 [1/0] via 172.16.3.103
172.16.0.0/24 is subnetted, 1 subnets
C    172.16.3.0 is directly connected, FastEthernet0/0
172.32.0.0/24 is subnetted, 1 subnets
S    172.32.37.0 [1/0] via 172.16.3.101

Router#
```

Ctrl+F6 to exit CLI focus

CopyPaste

☐ Top

#### 4. Tabla encaminamiento R3\_B

```
R3_B
Physical Config CLI Attributes
IOS Command Line Interface
P - periodic downloaded static route
Gateway of last resort is not set
  10.0.0.0/24 is subnetted, 1 subnets
C    10.3.2.0 is directly connected, FastEthernet0/1
  172.16.0.0/24 is subnetted, 1 subnets
C    172.16.3.0 is directly connected, FastEthernet0/0
Router>enable
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.3.1.0 255.255.255.0 172.16.3.102
Router(config)#ip route 172.32.37.0 255.255.255.0 172.16.3.102
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
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    10.3.1.0 [1/0] via 172.16.3.102
C    10.3.2.0 is directly connected, FastEthernet0/1
  172.16.0.0/24 is subnetted, 1 subnets
C    172.16.3.0 is directly connected, FastEthernet0/0
  172.32.0.0/24 is subnetted, 1 subnets
S    172.32.37.0 [1/0] via 172.16.3.102
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

4. ¿Cuántas redes  
tienen que  
aparecer?

Tienen que aparecer en cada router tantas redes como haya en la tabla de enrutamiento. En este caso al conectarnos a la red de la isla de gestion y las 3 redes de la Isla x pues aparecen 4 redes.



## 6. Comprobación conectividad I

PC3\_3

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 2ms, Average = 1ms

C:\>ping 10.3.1.102

Pinging 10.3.1.102 with 32 bytes of data:

Reply from 10.3.1.102: bytes=32 time<1ms TTL=126
Reply from 10.3.1.102: bytes=32 time=1ms TTL=126
Reply from 10.3.1.102: bytes=32 time<1ms TTL=126
Reply from 10.3.1.102: bytes=32 time=1ms TTL=126

Ping statistics for 10.3.1.102:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
      Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
C:\>tracert 10.3.1.102

Tracing route to 10.3.1.102 over a maximum of 30 hops:

  0  0 ms    0 ms    0 ms    10.3.2.101
  1  0 ms    0 ms    1 ms    172.16.3.102
  2  0 ms    1 ms    0 ms    10.3.1.102

Trace complete.

C:\>tracert 10.3.1.102

Tracing route to 10.3.1.102 over a maximum of 30 hops:

  0  4 ms    1 ms    0 ms    10.3.2.101
  1  0 ms    0 ms    0 ms    172.16.3.102
  2  0 ms    0 ms    0 ms    10.3.1.102

Trace complete.

C:\>
```

☐ Top

## 6. Comprobación conectividad II

PC3\_4

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 10.3.1.103

Pinging 10.3.1.103 with 32 bytes of data:

Request timed out.
Reply from 10.3.1.103: bytes=32 time<1ms TTL=126
Reply from 10.3.1.103: bytes=32 time=1ms TTL=126
Reply from 10.3.1.103: bytes=32 time<1ms TTL=126

Ping statistics for 10.3.1.103:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.3.1.103

Pinging 10.3.1.103 with 32 bytes of data:

Reply from 10.3.1.103: bytes=32 time=44ms TTL=126
Reply from 10.3.1.103: bytes=32 time<1ms TTL=126
Reply from 10.3.1.103: bytes=32 time<1ms TTL=126
Reply from 10.3.1.103: bytes=32 time=16ms TTL=126

Ping statistics for 10.3.1.103:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 44ms, Average = 15ms

C:\>tracert 10.3.1.103

Tracing route to 10.3.1.103 over a maximum of 30 hops:

  0  3 ms      0 ms      0 ms      10.3.2.101
  1  0 ms      227 ms    1 ms      172.16.3.102
  2  1 ms      0 ms      0 ms      10.3.1.103

Trace complete.

C:\>
```

☐ Top

## 5. Necesidad del router R3\_C

El router C no se necesita porque este no conecta con las redes que tienen dispositivos terminales en la isla X en el momento en el que queramos salir de la isla X si necesitaremos el router C.

## 4. CONFIGURACIÓN DE ENRUTAMIENTO DINÁMICO RIP



#### 4. Configuración RIP en R3\_A

R3\_A

Physical

Config

CLI

Attributes

IOS Command Line Interface

Compiled wed 16-Jul-07 04:32 by pt\_team

Press RETURN to get started!

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

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

Router>

Router>

Router>

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 10.3.1.0 is directly connected, FastEthernet0/1

172.16.0.0/24 is subnetted, 1 subnets

C 172.16.3.0 is directly connected, FastEthernet0/0

Router>enable

Router#configure 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 10.3.1.0

Router(config-router)#network 172.16.3.0

Router(config-router)#

Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top



#### 4. Configuración RIP en R3\_B

R3\_B

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!

%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

Router>
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       10.3.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.3.0 is directly connected, FastEthernet0/0

Router>enable
Router#configure 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 10.3.2.0
Router(config-router)#network 172.16.3.0
Router(config-router)#
```

Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top





## 5. Comprobación RIP en R3\_A

R3\_A

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>enable
Router#configure 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 10.3.1.0
Router(config-router)#network 172.16.3.0
Router(config-router)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip protocols
^
% Invalid input detected at '^' marker.

Router#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 23 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
    172.16.3.101    120          00:00:11
  Distance: (default is 120)
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top



## 5. Comprobación RIP en R3\_B

R3\_B

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#network 10.3.2.0
Router(config-router)#network 172.16.3.0
Router(config-router)#
Router(config-router)#
Router(config-router)#
Router(config-router)#show ip protocols
^
% Invalid input detected at '^' marker.

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

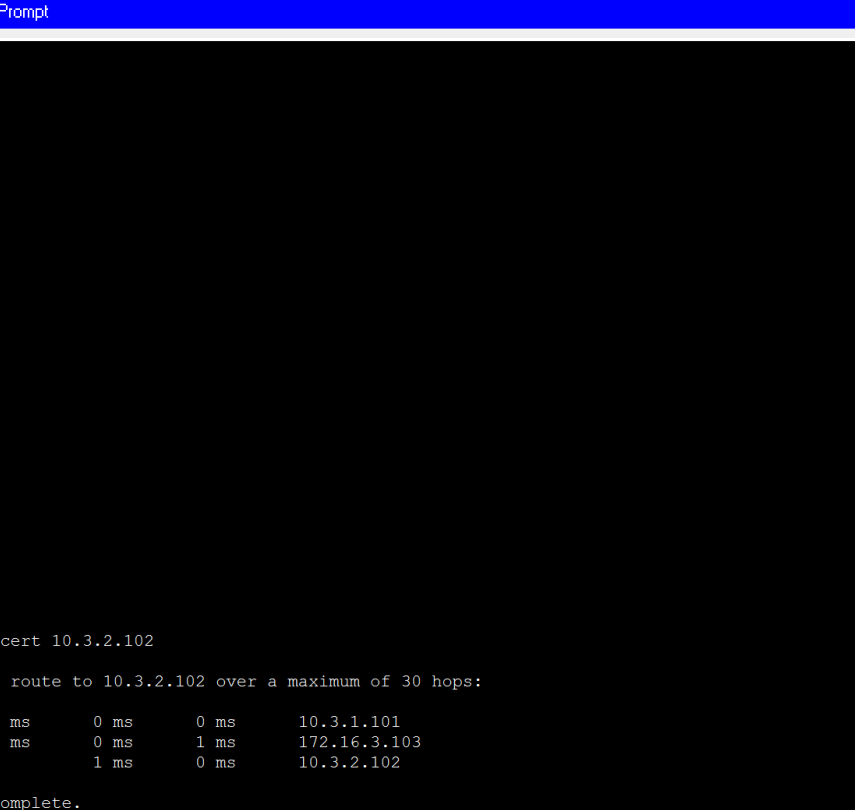
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 21 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
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
  172.16.3.102    120          00:00:00
  172.16.3.101    120          00:00:13
Distance: (default is 120)
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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## 6. Comprobación conectividad I



The screenshot shows a window titled "PC3\_1" with four tabs: "Physical", "Config", "Desktop", and "Attributes". The "Desktop" tab is active. Inside the window is a "Command Prompt" window. The command prompt shows a series of "C:\>" prompts, followed by the command "tracert 10.3.2.102". The output of the command is as follows:

```
C:\>tracert 10.3.2.102

Tracing route to 10.3.2.102 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    10.3.1.101
  2  0 ms    0 ms    1 ms    172.16.3.103
  3  *        1 ms    0 ms    10.3.2.102

Trace complete.

C:\>
```

At the bottom left of the window, there is a checkbox labeled "Top".



## 6. Comprobación conectividad II

PC3\_2

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>tracert 10.3.2.103

Tracing route to 10.3.2.103 over a maximum of 30 hops:

  1  0 ms      1 ms      82 ms     10.3.1.101
  2  0 ms      0 ms      0 ms     172.16.3.103
  3  0 ms      0 ms      0 ms     10.3.2.103

Trace complete.

C:\>|
```

☐ Top

## 6. Explicación

Si tiene sentido. Es la ruta mas adecuada.



7. Tabla  
encaminamiento  
R3\_A

R3\_A

PhysicalConfigCLIAttributes

IOS Command Line Interface

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
172.16.3.101	120	00:00:11

Distance: (default is 120)

Router#

Router#

Router#

Router#

Router#

Router#

Router#

Router#

Router#

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

C10.3.1.0 is directly connected, FastEthernet0/1

R10.3.2.0 [120/1] via 172.16.3.103, 00:00:28, FastEthernet0/0

172.16.0.0/24 is subnetted, 1 subnets

C172.16.3.0 is directly connected, FastEthernet0/0

172.32.0.0/24 is subnetted, 1 subnets

R172.32.37.0 [120/1] via 172.16.3.101, 00:00:08, FastEthernet0/0

Router#

Ctrl+F6 to exit CLI focus

CopyPaste

☐ Top

## 7. Tabla encaminamiento R3\_B

R3\_B

Physical Config **CLI** Attributes

IOS Command Line Interface

```
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
  172.16.3.102    120           00:00:00
  172.16.3.101    120           00:00:13
Distance: (default is 120)
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    10.3.1.0 [120/1] via 172.16.3.102, 00:00:17, FastEthernet0/0
C    10.3.2.0 is directly connected, FastEthernet0/1
  172.16.0.0/24 is subnetted, 1 subnets
C    172.16.3.0 is directly connected, FastEthernet0/0
  172.32.0.0/24 is subnetted, 1 subnets
R    172.32.37.0 [120/1] via 172.16.3.101, 00:00:03, FastEthernet0/0
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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## 7. Explicación

Las redes que tienen el código R se han aprendido por RIP



## 9. Encaminamiento entre islas

PC3\_4

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>tracert 10.7.2.103

Tracing route to 10.7.2.103 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    10.3.2.101
  2  3 ms    9 ms    0 ms    172.16.3.101
  3  0 ms    0 ms    0 ms    172.32.37.102
  4  0 ms    0 ms    0 ms    172.16.7.103
  5  0 ms    0 ms    0 ms    10.7.2.103

Trace complete.

C:\>|
```

☐ Top

### 9. Explicación

Si tiene sentido, es el camino mas corto.

### 10. Explicación

La distancia en este caso es 120 que es la que tiene RIP siempre por defecto.  
En este caso no hay ninguna red a la que RIP permita acceder por 2 rutas distintas

## 11. Base de datos RIP

R7\_B

Physical Config CLI Attributes

IOS Command Line Interface

```
10.0.0.0/24 is subnetted, 1 subnets
C    10.7.2.0 is directly connected, FastEthernet0/1
    172.16.0.0/24 is subnetted, 1 subnets
C    172.16.7.0 is directly connected, FastEthernet0/0

Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 10.7.2.0
Router(config-router)#network 172.16.7.0
Router(config-router)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
Router#show ip rip
% Incomplete command.
Router#show ip rip database
10.3.1.0/24    auto-summary
10.3.1.0/24
[3] via 172.16.7.101, 00:00:24, FastEthernet0/0
10.3.2.0/24    auto-summary
10.3.2.0/24
[3] via 172.16.7.101, 00:00:24, FastEthernet0/0
10.7.1.0/24    auto-summary
10.7.1.0/24
[1] via 172.16.7.102, 00:00:14, FastEthernet0/0
10.7.2.0/24    auto-summary
10.7.2.0/24    directly connected, FastEthernet0/1
172.16.3.0/24    auto-summary
172.16.3.0/24
[2] via 172.16.7.101, 00:00:24, FastEthernet0/0
172.16.7.0/24    auto-summary
172.16.7.0/24    directly connected, FastEthernet0/0
172.32.37.0/24    auto-summary
172.32.37.0/24
[1] via 172.16.7.101, 00:00:24, FastEthernet0/0
Router#
```

Ctrl+F6 to exit CLI focus

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☐ Top

## 12. Explicación

Las updates son cada 30 segundos por defecto  
Se reciben todas las redes a las que se puede acceder directa o indirectamente desde el router por las interfaces que tenga el router  
La version se sabe porque pone v2 (version 2)  
La direccion multicast es 224.0.0.9

## 5. CONFIGURACIÓN DE ENRUTAMIENTO DINÁMICO OSPF





3. Conectividad  
entre islas

PC3\_2

Physical Config Desktop Programming Attributes

Command Prompt

Packet Tracer PC Command Line 1.0

C:\>tracert 10.7.1.103

Tracing route to 10.7.1.103 over a maximum of 30 hops:

1	0 ms	0 ms	0 ms	10.3.1.101
2	3 ms	0 ms	0 ms	172.16.3.101
3	0 ms	0 ms	0 ms	172.32.37.102
4	0 ms	0 ms	0 ms	172.16.7.102
5	*	0 ms	0 ms	10.7.1.103

Trace complete.

C:\>tracert 10.7.1.103

Tracing route to 10.7.1.103 over a maximum of 30 hops:

1	0 ms	0 ms	0 ms	10.3.1.101
2	0 ms	0 ms	0 ms	172.16.3.101
3	0 ms	0 ms	0 ms	172.32.37.102
4	0 ms	0 ms	0 ms	172.16.7.102
5	0 ms	0 ms	0 ms	10.7.1.103

Trace complete.

C:\>

☐ Top



#### 4. Tabla de enrutamiento I

R3\_A

Physical

Config

CLI

Attributes

IOS Command Line Interface

Gateway of last resort is not set

10.0.0.0/24 is subnetted, 2 subnets

C 10.3.1.0 is directly connected, FastEthernet0/1

O 10.3.2.0 [110/2] via 172.16.3.103, 00:00:03, FastEthernet0/0

172.16.0.0/24 is subnetted, 1 subnets

C 172.16.3.0 is directly connected, FastEthernet0/0

Router#

00:13:45: %OSPF-5-ADJCHG: Process 54, Nbr 172.32.37.101 on FastEthernet0/0 from LOADING to FULL, Loading Done

Router#

Router#

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

C 10.3.1.0 is directly connected, FastEthernet0/1

O 10.3.2.0 [110/2] via 172.16.3.103, 00:05:13, FastEthernet0/0

O 10.7.1.0 [110/4] via 172.16.3.101, 00:01:42, FastEthernet0/0

O 10.7.2.0 [110/4] via 172.16.3.101, 00:01:05, FastEthernet0/0

172.16.0.0/24 is subnetted, 2 subnets

C 172.16.3.0 is directly connected, FastEthernet0/0

O 172.16.7.0 [110/3] via 172.16.3.101, 00:01:52, FastEthernet0/0

172.32.0.0/24 is subnetted, 1 subnets

O 172.32.37.0 [110/2] via 172.16.3.101, 00:02:13, FastEthernet0/0

Router#

Ctrl+F6 to exit CLI focus

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#### 4. Tabla de enrutamiento II

R3\_C

PhysicalConfigCLIAttributes

IOS Command Line Interface

```
00:15:45: %OSPF-5-ADJCHG: Process 54, Nbr 172.16.3.102 on FastEthernet0/1 from LOADING to FULL, Loading Done

Router(config-router)#no network 172.32.3.101 0.0.0.0 area 0
Router(config-router)#network 172.32.37.101 0.0.0.0 area 0
Router(config-router)#
Router(config-router)#
00:15:36: %OSPF-5-ADJCHG: Process 54, Nbr 172.32.37.102 on FastEthernet0/0 from LOADING to FULL, Loading Done

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

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      10.3.1.0 [110/2] via 172.16.3.102, 00:04:01, FastEthernet0/1
O      10.3.2.0 [110/2] via 172.16.3.103, 00:04:01, FastEthernet0/1
O      10.7.1.0 [110/3] via 172.32.37.102, 00:01:54, FastEthernet0/0
O      10.7.2.0 [110/3] via 172.32.37.102, 00:01:12, FastEthernet0/0
    172.16.0.0/24 is subnetted, 2 subnets
C      172.16.3.0 is directly connected, FastEthernet0/1
O      172.16.7.0 [110/2] via 172.32.37.102, 00:01:54, FastEthernet0/0
    172.32.0.0/24 is subnetted, 1 subnets
C      172.32.37.0 is directly connected, FastEthernet0/0

Router#
```

Ctrl+F6 to exit CLI focus

CopyPaste

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#### 4. Tabla de enrutamiento III

R7\_C

PhysicalConfigCLIAttributes

IOS Command Line Interface

```
00:15:37: %OSPF-5-ADJCHG: Process 54, Nbr 172.16.7.102 on FastEthernet0/1 from LOADING to FULL, Loading Done

00:16:44: %OSPF-5-ADJCHG: Process 54, Nbr 172.16.7.103 on FastEthernet0/1 from LOADING to FULL, Loading Done

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

Router#
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       10.3.1.0 [110/3] via 172.32.37.101, 00:02:39, FastEthernet0/0
O       10.3.2.0 [110/3] via 172.32.37.101, 00:02:39, FastEthernet0/0
O       10.7.1.0 [110/2] via 172.16.7.102, 00:02:18, FastEthernet0/1
O       10.7.2.0 [110/2] via 172.16.7.103, 00:01:31, FastEthernet0/1
    172.16.0.0/24 is subnetted, 2 subnets
O       172.16.3.0 [110/2] via 172.32.37.101, 00:02:39, FastEthernet0/0
C       172.16.7.0 is directly connected, FastEthernet0/1
    172.32.0.0/24 is subnetted, 1 subnets
C       172.32.37.0 is directly connected, FastEthernet0/0

Router#
```

Ctrl+F6 to exit CLI focus

CopyPaste

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#### 4. Tabla de enrutamiento IV

R7\_A

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
00:16:43: %OSPF-5-ADJCHG: Process 54, Nbr 172.16.7.103 on FastEthernet0/0 from LOADING to FULL, Loading Done

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

Router#
Router#
Router#
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       10.3.1.0 [110/4] via 172.16.7.101, 00:02:34, FastEthernet0/0
O       10.3.2.0 [110/4] via 172.16.7.101, 00:02:34, FastEthernet0/0
C       10.7.1.0 is directly connected, FastEthernet0/1
O       10.7.2.0 [110/2] via 172.16.7.103, 00:01:48, FastEthernet0/0
    172.16.0.0/24 is subnetted, 2 subnets
O       172.16.3.0 [110/3] via 172.16.7.101, 00:02:34, FastEthernet0/0
C       172.16.7.0 is directly connected, FastEthernet0/0
    172.32.0.0/24 is subnetted, 1 subnets
O       172.32.37.0 [110/2] via 172.16.7.101, 00:02:34, FastEthernet0/0

Router#
```

Ctrl+F6 to exit CLI focus

Copy

Paste

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## 5. Comprobación del funcionamiento de OSPF

R3\_A

Physical Config CLI Attributes

IOS Command Line Interface

```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#debug ip ospf
      ^
% Invalid input detected at '^' marker.

Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
debug ip ospf
% Incomplete command.
Router#debug ip ospf 54
      ^
% Invalid input detected at '^' marker.

Router#debug ip ospf ?
  adj      OSPF adjacency events
  events   OSPF events
Router#debug ip ospf events
OSPF events debugging is on
Router#
00:19:46: OSPF: Rcv hello from 172.32.37.101 area 0 from FastEthernet0/0 172.16.3.101

00:19:46: OSPF: End of hello processing

00:19:51: OSPF: Rcv hello from 172.16.3.103 area 0 from FastEthernet0/0 172.16.3.103

00:19:51: OSPF: End of hello processing
terminal monitor
Router#
00:19:56: OSPF: Rcv hello from 172.32.37.101 area 0 from FastEthernet0/0 172.16.3.101

00:19:56: OSPF: End of hello processing

00:20:01: OSPF: Rcv hello from 172.16.3.103 area 0 from FastEthernet0/0 172.16.3.103

00:20:01: OSPF: End of hello processing
```

Ctrl+F6 to exit CLI focus

Copy Paste

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