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Resolución de la ruta que falta

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Gateway por defecto
R1	Fa0/0	172.16.3.1	255.255.255.0	N/A
	S0/0/0	172.16.2.1	255.255.255.0	N/A
R2	Fa0/0	172.16.1.1	255.255.255.0	N/A
	S0/0/0	172.16.2.2	255.255.255.0	N/A
	S0/0/1	192.168.1.2	255.255.255.0	N/A
R3	Fa0/0	192.168.2.1	255.255.255.0	N/A
	S0/0/1	192.168.1.1	255.255.255.0	N/A
PC1	NIC	172.16.3.10	255.255.255.0	172.16.3.1
PC2	NIC	172.16.1.10	255.255.255.0	172.16.1.1
PC3	NIC	192.168.2.10	255.255.255.0	192.168.2.1

Introducción:
En esta actividad, examinaremos el problema de una ruta estática mal configurada descrito en esta sección. Utilizaremos el modo simulación del Packet Tracer para rastrear los paquetes en la red mal configurada. Corregiremos la red y observaremos el funcionamiento correcto.

Objetivos de aprendizaje:
- Examinar el router.
- Visualizar la configuración.
- Verificar la conectividad.
- Ver el problema en el modo Simulación.
- Ejecutar la simulación.
- Examinar los resultados.
- Corregir el problema y verificar.
- Reemplazar la ruta estática mal configurada.
- Verificar la conectividad.
- Volver a ejecutar la simulación

Tarea 1: Examen de la red.

Paso 1: Examine la configuración.

En cada uno de los tres routers:

Conéctese al router utilizando la contraseña cisco. Ingrese al modo exec privilegiado utilizando la contraseña class.
Introduzca el comando show running-config para ver cómo está configurado actualmente el enrutamiento estático.
Introduzca el comando show ip route para observar el efecto de la configuración.

Router 1

```
User Access Verification

Password:

R1>show running-config
        ^
% Invalid input detected at '^' marker.

R1>enable
Password:
R1#show running-config
Building configuration...

Current configuration : 825 bytes
!
version 12.3
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
enable secret 5 $1$.3RO$VLUOdBF2OqNBn0EjQBvR./
!
!
!
!
!
!
ip cef
no ipv6 cef
 --More--
```

```
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 0.0.0.0 to network 0.0.0.0

     172.16.0.0/24 is subnetted, 2 subnets
C       172.16.2.0 is directly connected, Serial0/0/0
C       172.16.3.0 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 is directly connected, Serial0/0/0

R1#
```

Router 2

```
User Access Verification

Password:

R2>enable
Password:
R2#show running-config
Building configuration...

Current configuration : 941 bytes
!
version 12.3
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R2
!
!
!
enable secret 5 $1$PCsi$wSNWHdMCJ/OFjFulaGztP0
!
!
!
!
!
!
ip cef
no ipv6 cef
 --More--
```

```
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 0.0.0.0 to network 0.0.0.0

     172.16.0.0/24 is subnetted, 2 subnets
C       172.16.2.0 is directly connected, Serial0/0/0
C       172.16.3.0 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 is directly connected, Serial0/0/0

R1#
```

Router 3

```
User Access Verification

Password:

R3>enable
Password:
R3#show running-config
Building configuration...

Current configuration : 874 bytes
!
version 12.3
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R3
!
!
!
enable secret 5 $1$PCsi$wSNWHdMCJ/OFjFulaGztP0
!
!
!
!
!
!
ip cef
no ipv6 cef
 --More--
```

```
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 not set

     172.16.0.0/22 is subnetted, 1 subnets
S       172.16.0.0 is directly connected, Serial0/0/1
C    192.168.1.0/24 is directly connected, Serial0/0/1
C    192.168.2.0/24 is directly connected, FastEthernet0/0
```

Paso 2: Verifique la conectividad.
Desde la petición de entrada de línea de comandos en PC2, haga ping a la PC1 a 172.16.3.10 El tiempo del ping expira.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.16.3.10

Pinging 172.16.3.10 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.16.3.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

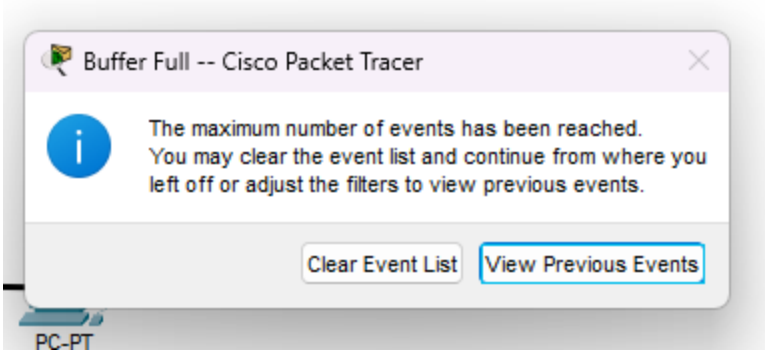
Tarea 2: Visualización del problema en modo Simulación.

Paso 1: Ejecute la simulación.

Ingrese al modo Simulación. La simulación está configurada para mostrar únicamente eventos ICMP. La PDU en la PC2 es una solicitud de eco ICMP específicamente para la PC1. Para acelerar el proceso, la PDU ha sido modificada para tener un valor TTL inicial de 15.

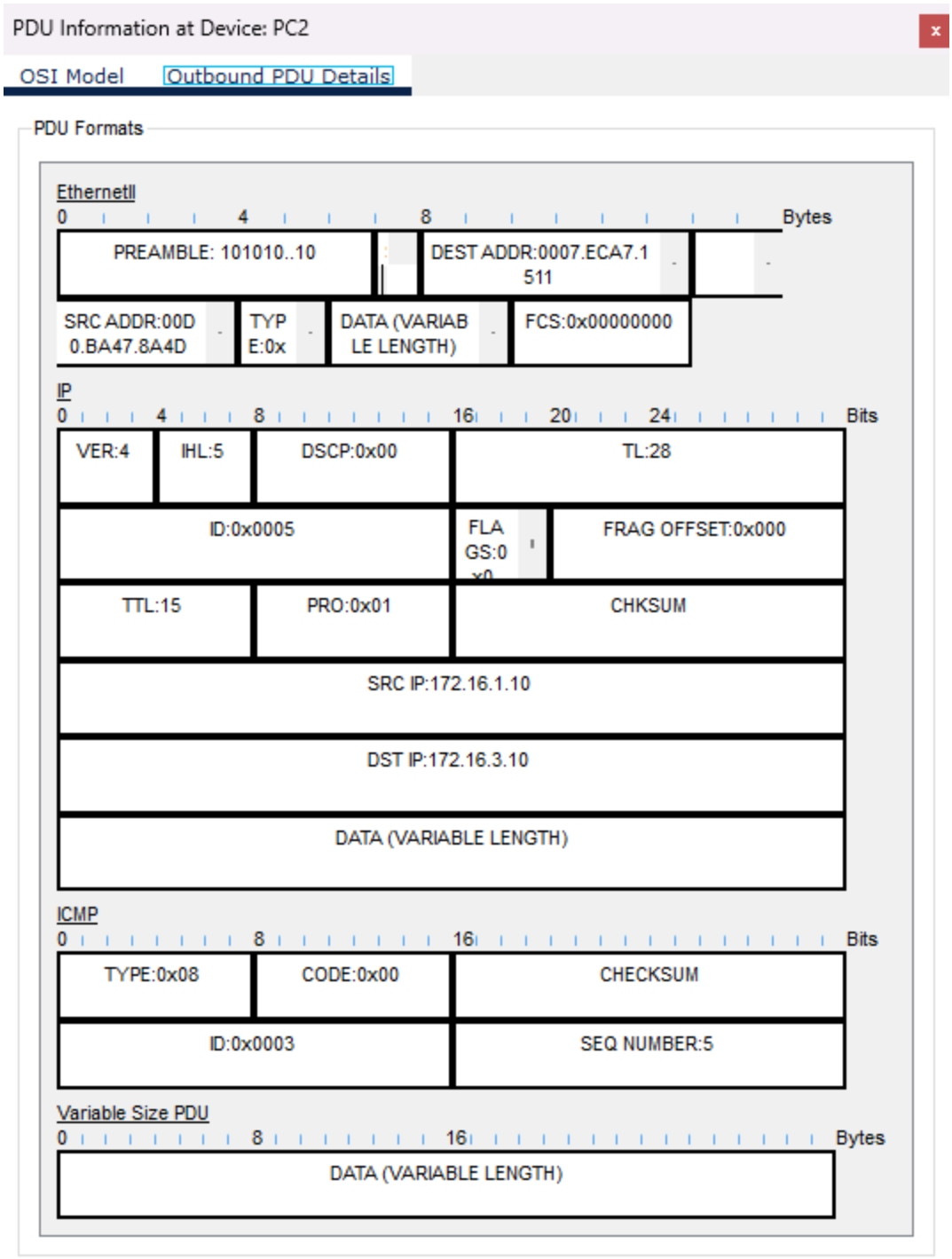
Ejecute la simulación haciendo clic en el botón Capturar/Reproducir automáticamente.

Vea la animación mientras los paquetes dan saltos para atrás y para adelante entre el router R2 y el router R3 a medida que se van agregando eventos a la Lista de eventos.
Cuando la simulación finalice, haga clic en el botón Ver eventos anteriores en el cuadro de diálogo Búfer lleno.

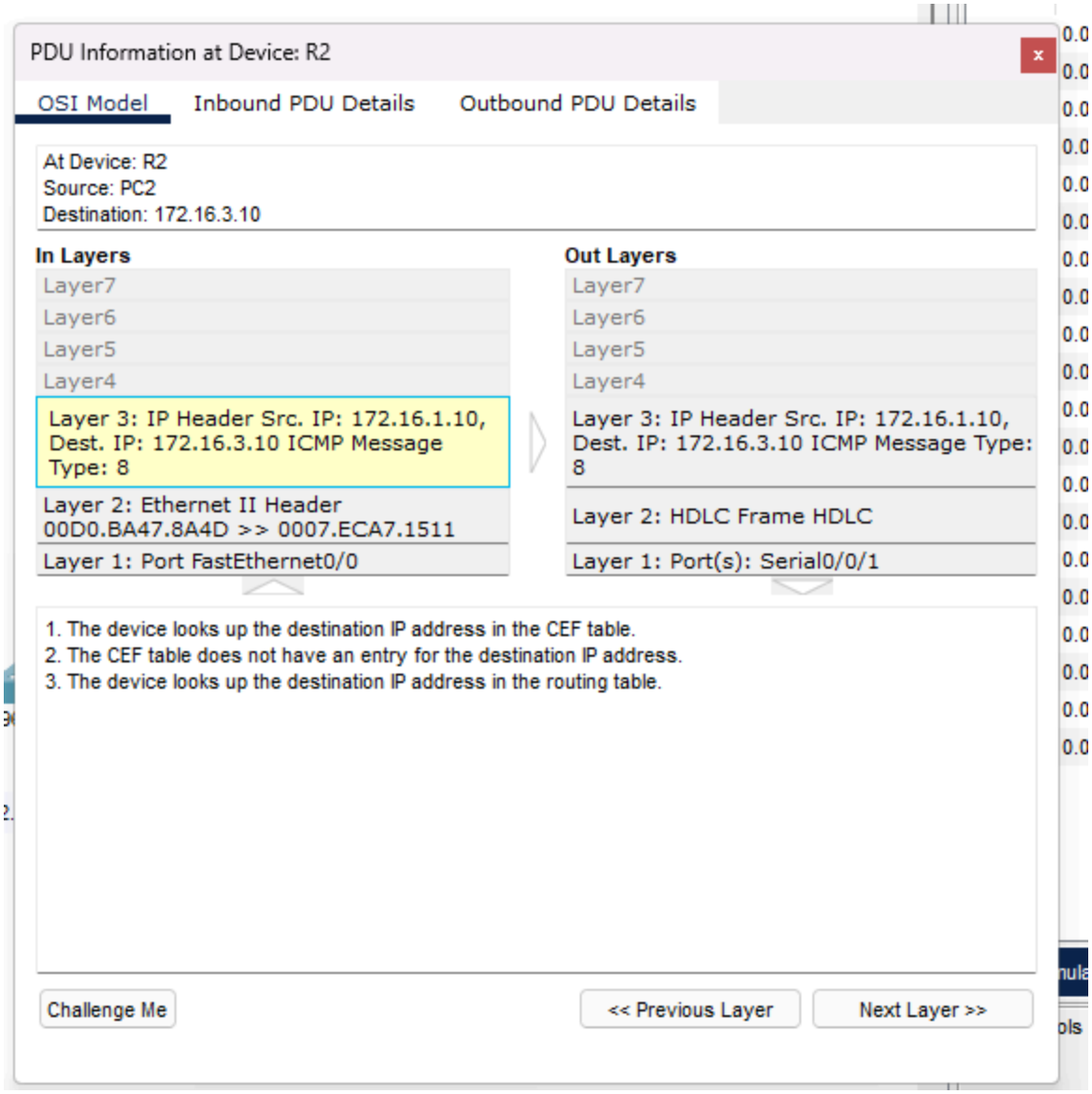


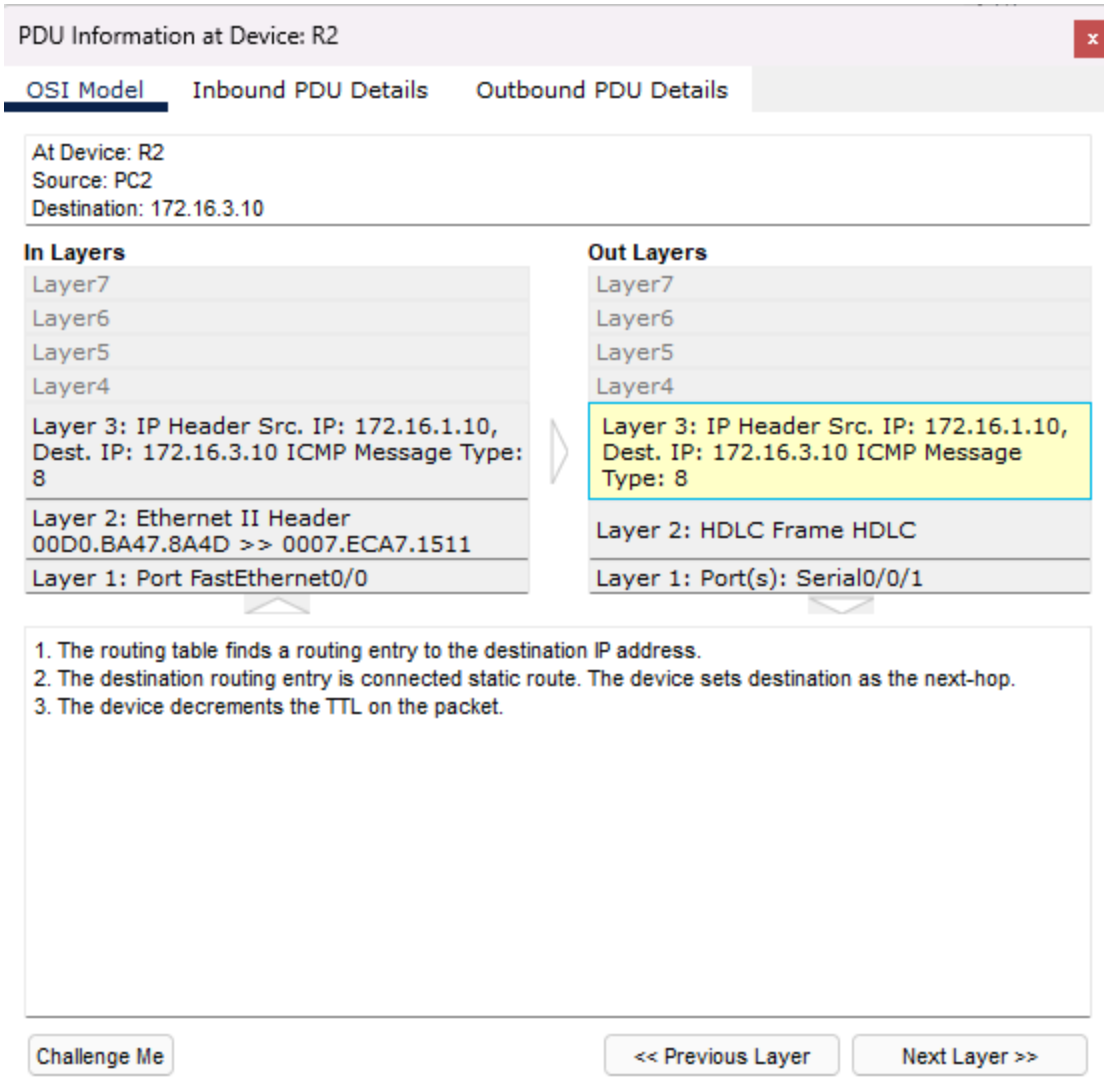
Paso 2: Examine los resultados.

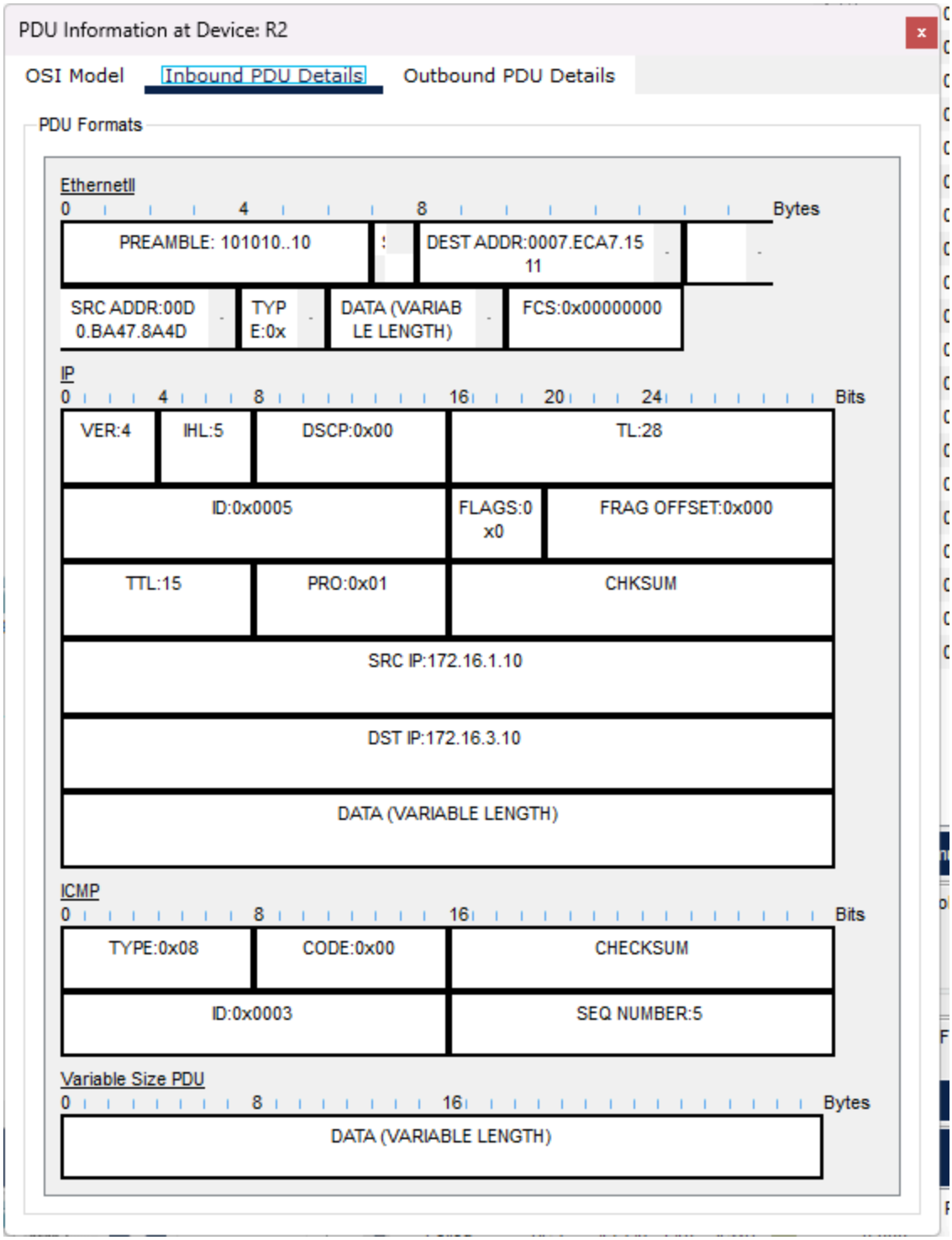
Desplácese a la parte superior de la Lista de eventos. Haga clic en el cuadro de color de la columnaInfo para obtener el primer evento. Se abre la ventana Información de PDU.



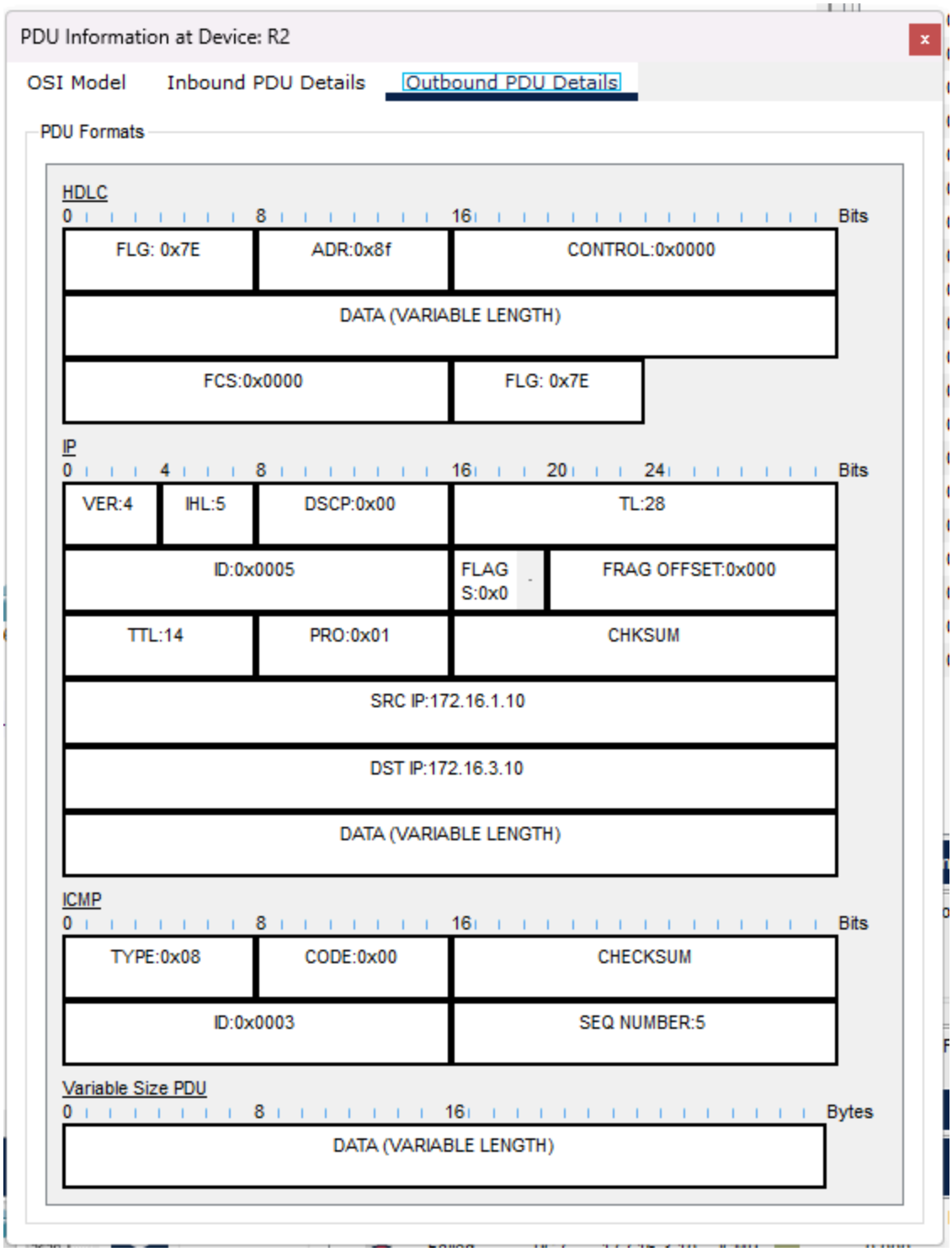
Examine la información de la Capa 3 para las Capas internas y las Capas externas en la ficha Modelo OSI. Examine también las fichas Detalles de PDU de entrada y Detalles de PDU de salida y observe el valor en el campo TTL.


PDU Information at Device: R2
x
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: R2
Source: PC2
Destination: 172.16.3.10
In Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.1.10, Dest. IP: 172.16.3.10 ICMP Message Type: 8
Layer 2: Ethernet II Header 00D0.BA47.8A4D >> 0007.ECA7.1511
Layer 1: Port FastEthernet0/0
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.1.10, Dest. IP: 172.16.3.10 ICMP Message Type: 8
Layer 2: HDLC Frame HDLC
Layer 1: Port(s): Serial0/0/1
1. The device looks up the destination IP address in the CEF table.
2. The CEF table does not have an entry for the destination IP address.
3. The device looks up the destination IP address in the routing table.
Challenge Me
<< Previous Layer
Next Layer >>
0.0


PDU Information at Device: R2
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: R2
Source: PC2
Destination: 172.16.3.10
In Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.1.10, Dest. IP: 172.16.3.10 ICMP Message Type: 8
Layer 2: Ethernet II Header 00D0.BA47.8A4D >> 0007.ECA7.1511
Layer 1: Port FastEthernet0/0
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.1.10, Dest. IP: 172.16.3.10 ICMP Message Type: 8
Layer 2: HDLC Frame HDLC
Layer 1: Port(s): Serial0/0/1
1. The routing table finds a routing entry to the destination IP address.
2. The destination routing entry is connected static route. The device sets destination as the next-hop.
3. The device decrements the TTL on the packet.
Challenge Me
<< Previous Layer
Next Layer >>

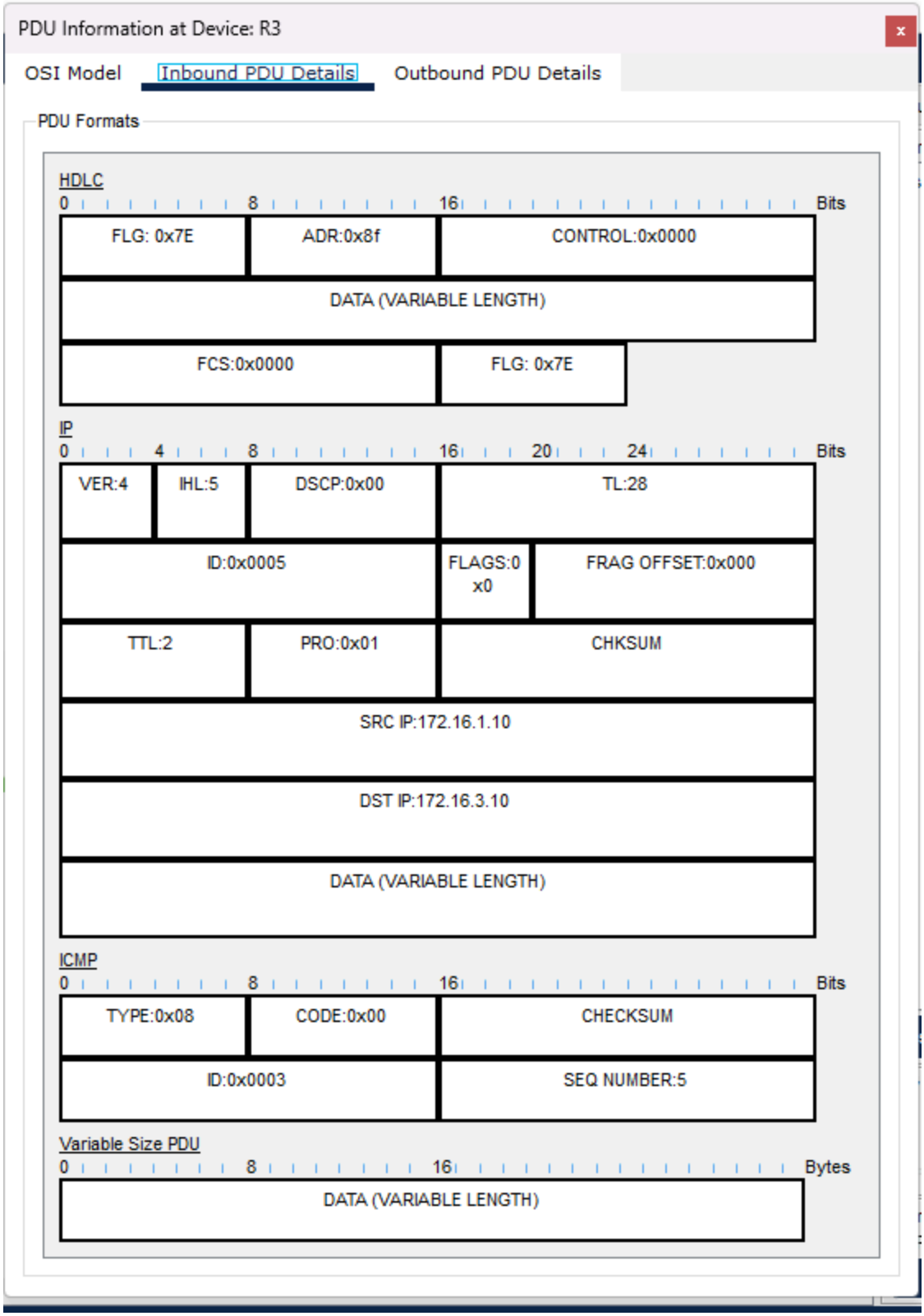

PDU Information at Device: R2
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Ethernetll
0
4
8
Bytes
PREAMBLE: 101010..10
DEST ADDR:0007.ECA7.1511
SRC ADDR:00D0.BA47.8A4D
TYPE:0x
DATA (VARIABLE LENGTH)
FCS:0x00000000
IP
0
4
8
16
20
24
Bits
VER:4
IHL:5
DSCP:0x00
TL:28
ID:0x0005
FLAGS:0x0
FRAG OFFSET:0x000
TTL:15
PRO:0x01
CHKSUM
SRC IP:172.16.1.10
DST IP:172.16.3.10
DATA (VARIABLE LENGTH)
ICMP
0
8
16
Bits
TYPE:0x08
CODE:0x00
CHECKSUM
ID:0x0003
SEQ NUMBER:5
Variable Size PDU
0
8
16
Bytes
DATA (VARIABLE LENGTH)

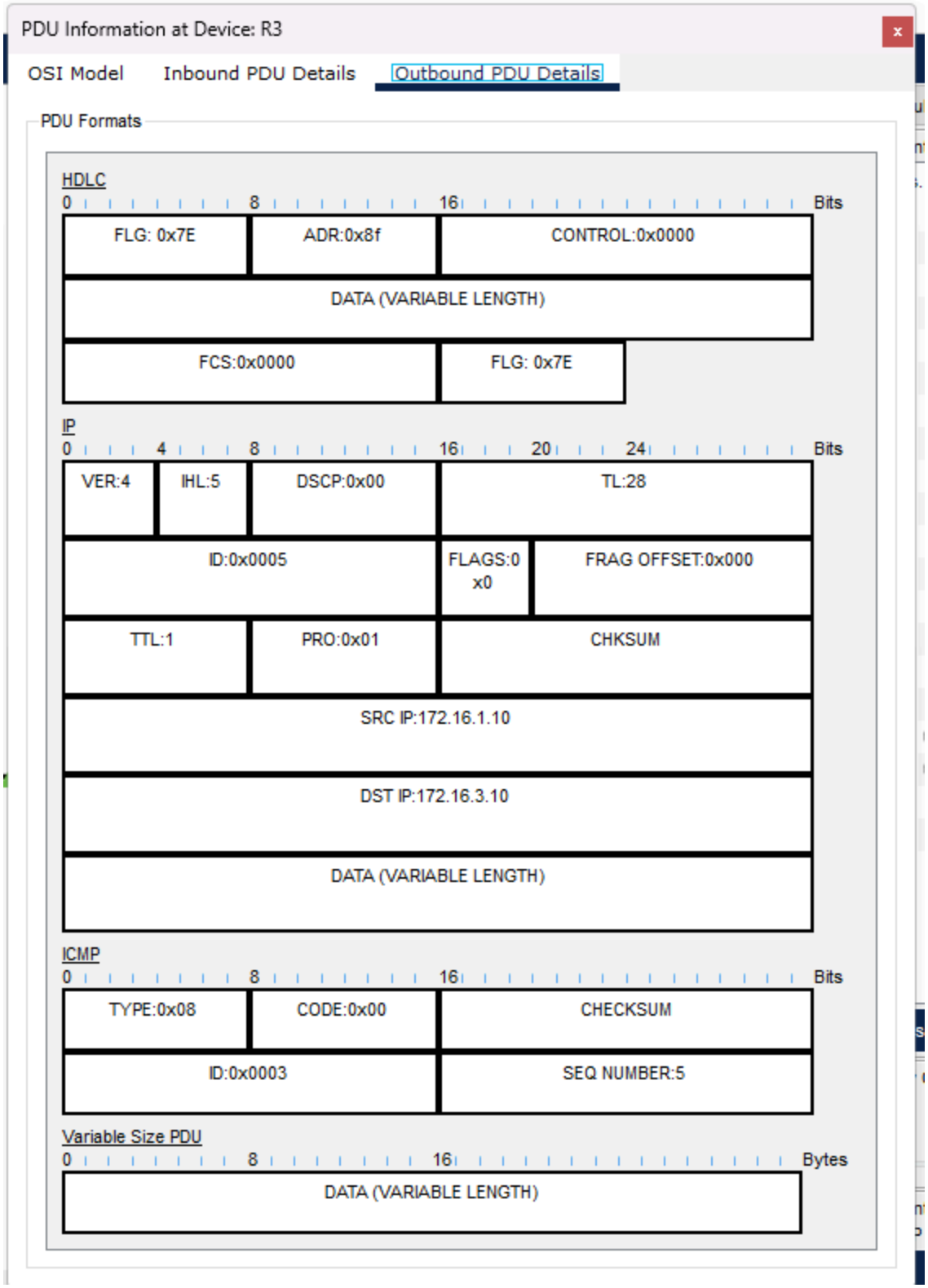
Valor TTL: 15



Valor TTL: 14

Vea la información de los otros eventos a medida que el campo TTL realiza la cuenta regresiva, el paquete es descartado y se envía un mensaje de tiempo superado al origen. Sin este proceso, el paquete haría loop indefinidamente.


PDU Information at Device: R3
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
0
8
16
Bits
FLG: 0x7E
ADR:0x8f
CONTROL:0x0000
DATA (VARIABLE LENGTH)
FCS:0x0000
FLG: 0x7E
IP
0
4
8
16
20
24
Bits
VER:4
IHL:5
DSCP:0x00
TL:28
ID:0x0005
FLAGS:0 x0
FRAG OFFSET:0x000
TTL:2
PRO:0x01
CHKSUM
SRC IP:172.16.1.10
DST IP:172.16.3.10
DATA (VARIABLE LENGTH)
ICMP
0
8
16
Bits
TYPE:0x08
CODE:0x00
CHECKSUM
ID:0x0003
SEQ NUMBER:5
Variable Size PDU
0
8
16
Bytes
DATA (VARIABLE LENGTH)



Se nota como el TTL disminuye con el pasar de los eventos

Tarea 3: Corrección del problema y verificación.

Paso 1: Reemplace la ruta estática mal configurada.

Regrese al modo Tiempo real. En el router R2, ingrese al modo de configuración global e introduzca los siguientes comandos:

R2(config)#no ip route 172.16.3.0 255.255.255.0 s0/0/1
R2(config)#ip route 172.16.3.0 255.255.255.0 s0/0/0

```
User Access Verification

Password:

R2>enable
Password:
R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#no ip route 172.16.3.0 255.255.255.0 s0/0/1
R2(config)#ip route 172.16.3.0 255.255.255.0 s0/0/0
R2(config)#
```

Paso 2: Guarde la configuración actualizada.

En el router R2, salga del modo de configuración presionando Ctrl+z. Guarde la configuración emitiendo el comando copy run start.

```
R2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
```

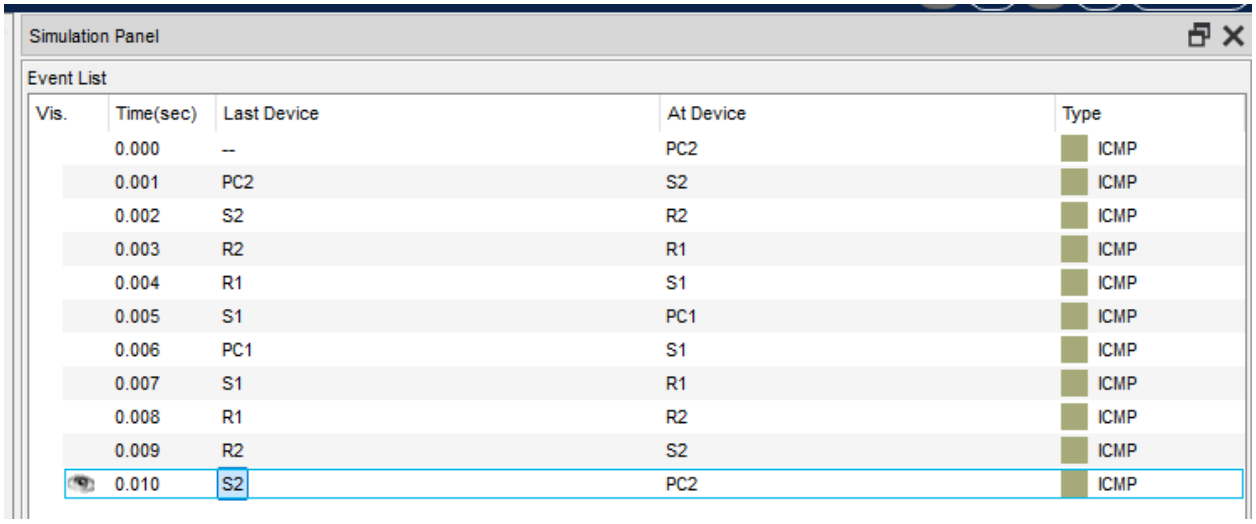
Paso 3: Verifique la conectividad.

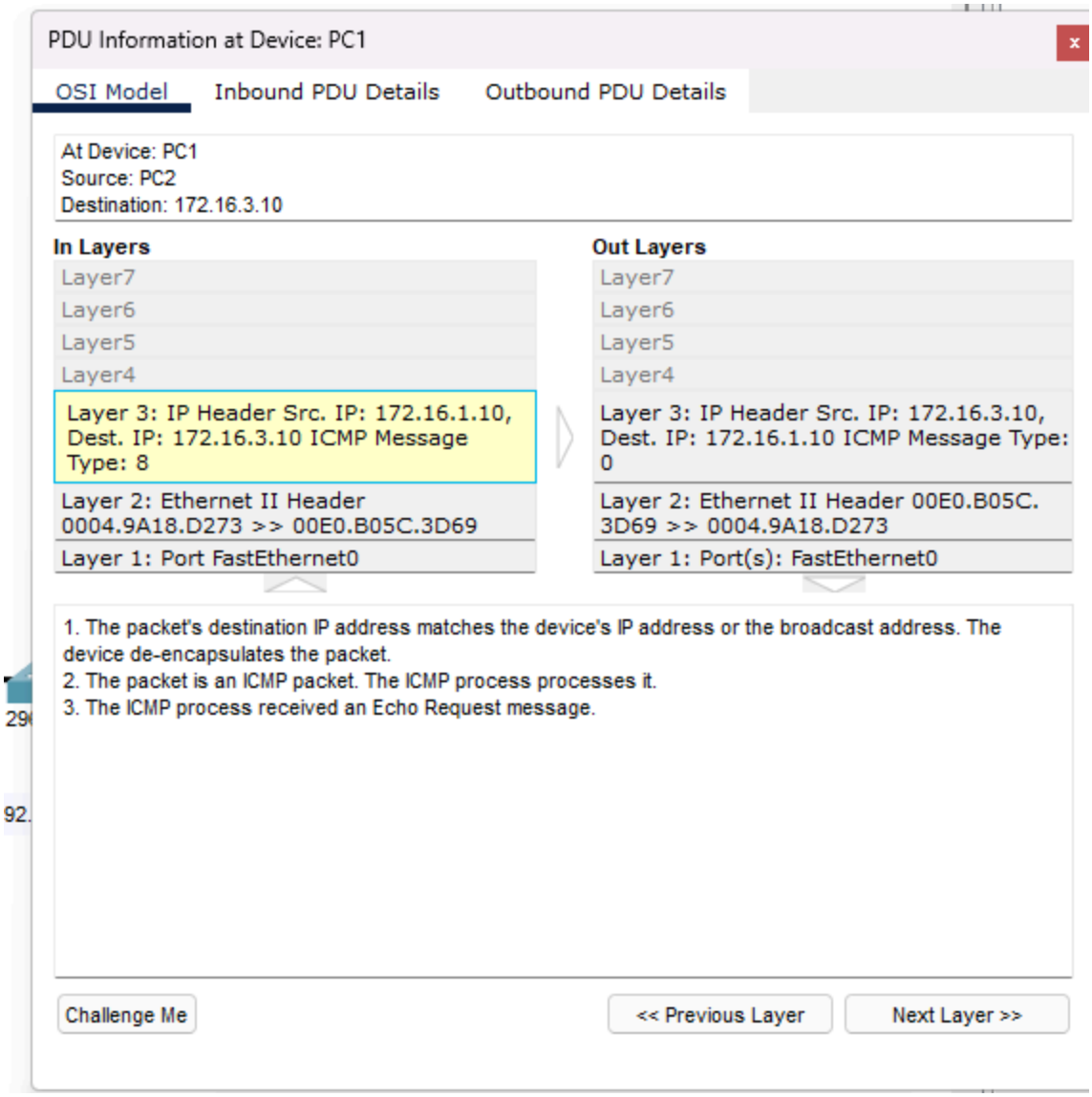
Desde la petición de entrada de línea de comandos en la PC2, haga ping a la PC1 a 172.16.3.10. El ping deberá tener éxito, en caso contrario, resuelva el problema de la ruta estática.

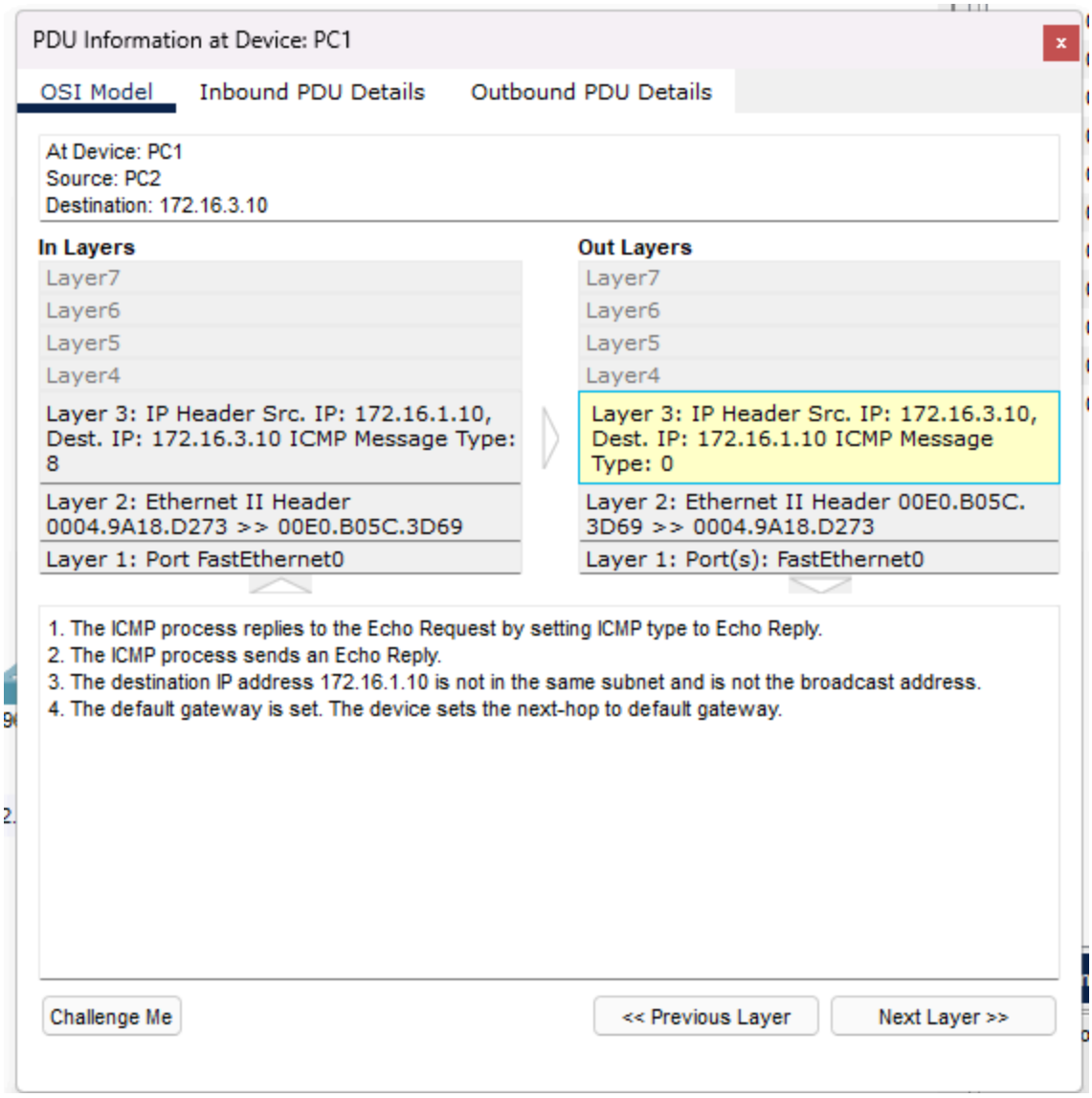
```
C:\>ping 172.16.3.10

Pinging 172.16.3.10 with 32 bytes of data:

Reply from 172.16.3.10: bytes=32 time=17ms TTL=126
Reply from 172.16.3.10: bytes=32 time=8ms TTL=126
Reply from 172.16.3.10: bytes=32 time=5ms TTL=126
Reply from 172.16.3.10: bytes=32 time=15ms TTL=126

Ping statistics for 172.16.3.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 5ms, Maximum = 17ms, Average = 11ms

C:\>
```

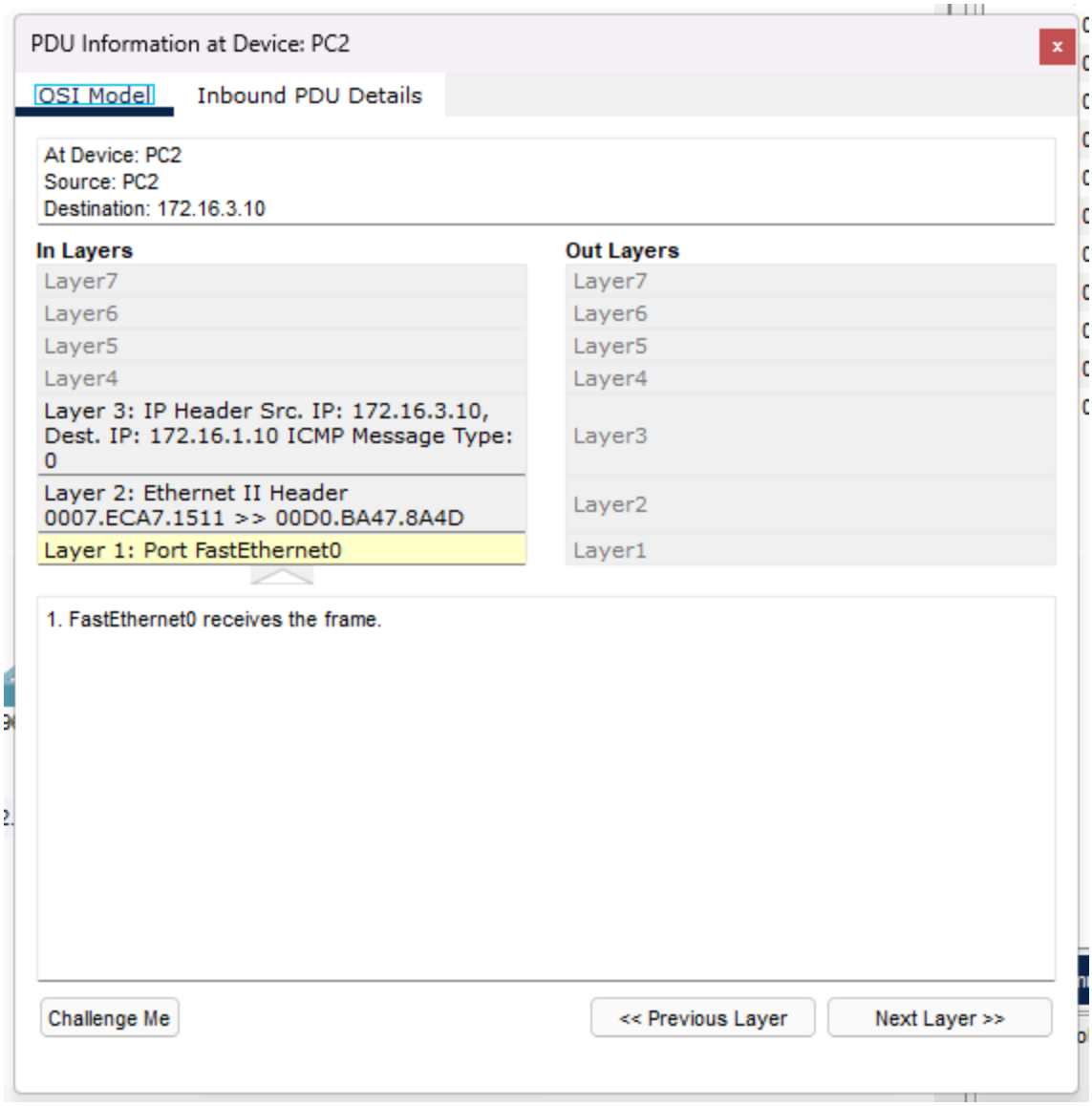
Se observa que el ping es exitoso.

Paso 4: Vuelva a ejecutar la simulación.
Ejecute la simulación tal como se describe en la Tarea 2 para ver el correcto funcionamiento de la red.



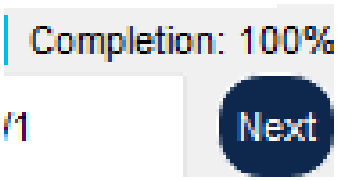

PDU Information at Device: PC1
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: PC1
Source: PC2
Destination: 172.16.3.10
In Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.1.10, Dest. IP: 172.16.3.10 ICMP Message Type: 8
Layer 2: Ethernet II Header 0004.9A18.D273 >> 00E0.B05C.3D69
Layer 1: Port FastEthernet0
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.3.10, Dest. IP: 172.16.1.10 ICMP Message Type: 0
Layer 2: Ethernet II Header 00E0.B05C.3D69 >> 0004.9A18.D273
Layer 1: Port(s): FastEthernet0
1. The packet's destination IP address matches the device's IP address or the broadcast address. The device de-encapsulates the packet.
2. The packet is an ICMP packet. The ICMP process processes it.
3. The ICMP process received an Echo Request message.
Challenge Me
<< Previous Layer
Next Layer >>


PDU Information at Device: PC1
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: PC1
Source: PC2
Destination: 172.16.3.10
In Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.1.10, Dest. IP: 172.16.3.10 ICMP Message Type: 8
Layer 2: Ethernet II Header 0004.9A18.D273 >> 00E0.B05C.3D69
Layer 1: Port FastEthernet0
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 172.16.3.10, Dest. IP: 172.16.1.10 ICMP Message Type: 0
Layer 2: Ethernet II Header 00E0.B05C.3D69 >> 0004.9A18.D273
Layer 1: Port(s): FastEthernet0
1. The ICMP process replies to the Echo Request by setting ICMP type to Echo Reply.
2. The ICMP process sends an Echo Reply.
3. The destination IP address 172.16.1.10 is not in the same subnet and is not the broadcast address.
4. The default gateway is set. The device sets the next-hop to default gateway.
Challenge Me
<< Previous Layer
Next Layer >>



En las imágenes anteriores podemos observar que la red funciona correctamente, realizando comunicaciones exitosas.

Evidencias de trabajo completado al 100%



Activity Results

Congratulations Guest! You completed the activity.

Overall Feedback | Assessment Items | Connectivity Tests

Expand/Collapse All | Show Incorrect Items

Assessment Items	Status	Points	Component(s)	Feedback
Network				
R2		0	Other	
Routes		0	Other	
(deprecated) Static Routes		0	Routing	
(deprecated) Route0	Correct	0	Routing	