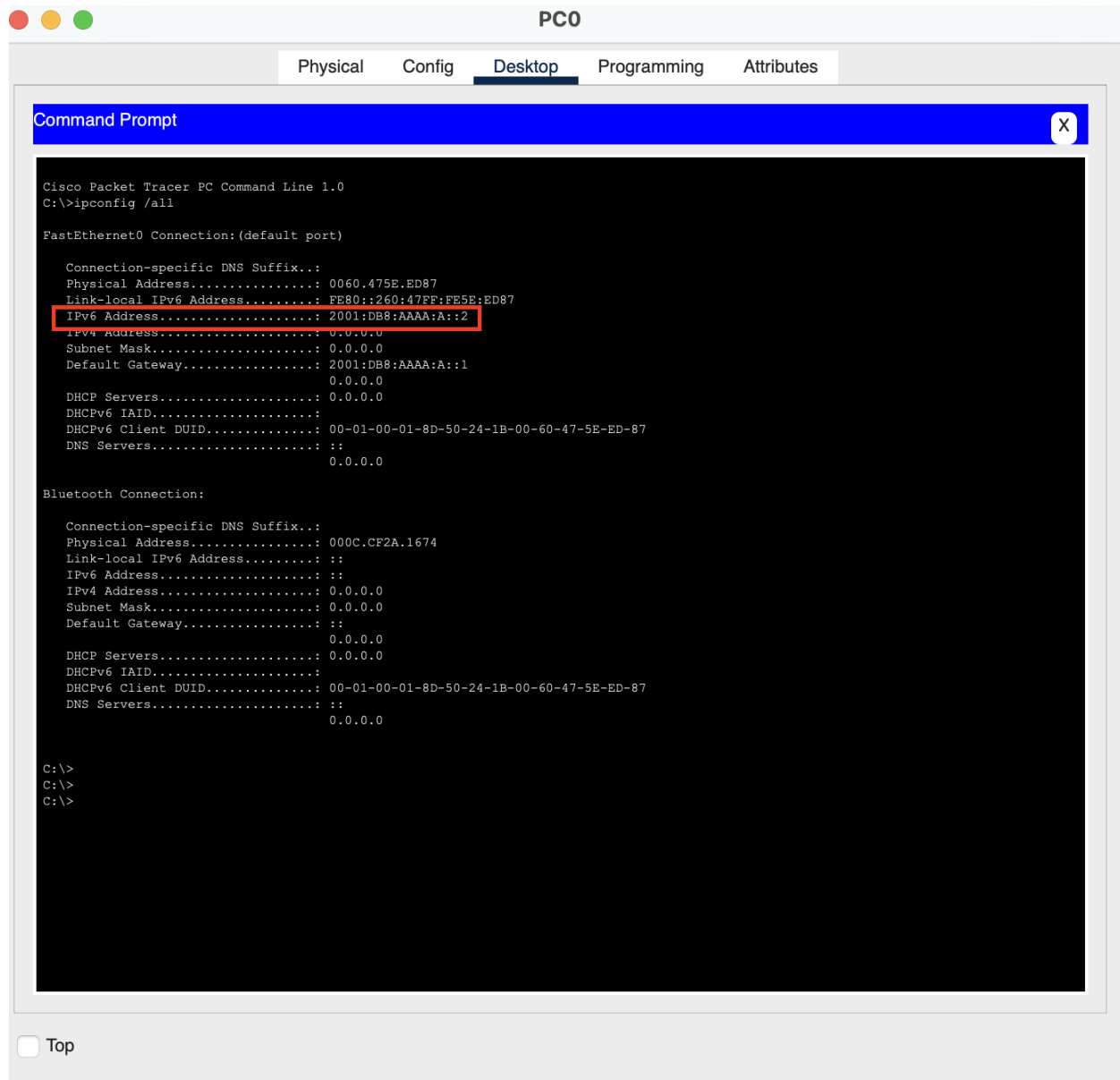
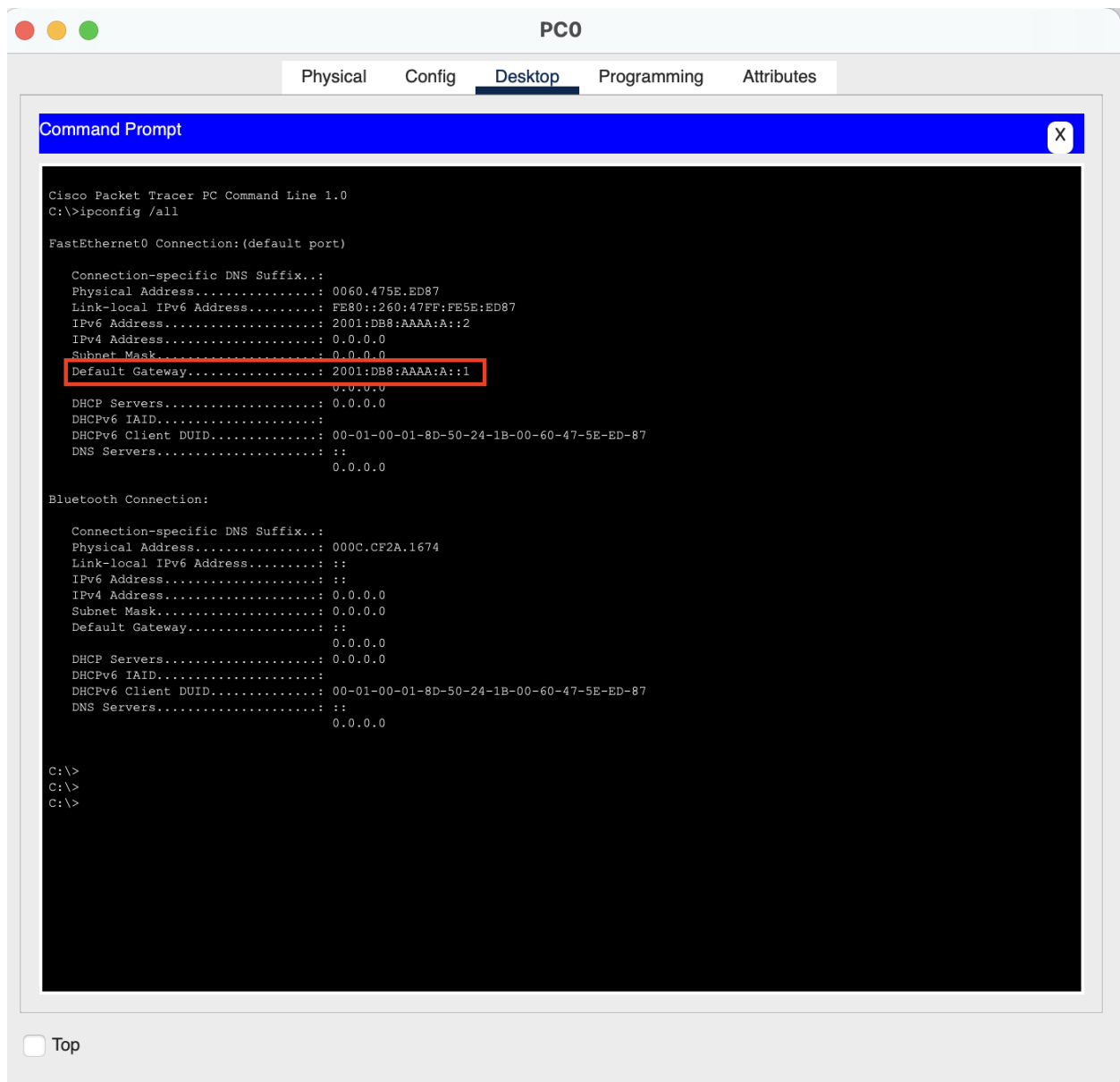


Lab 9 - IPv6

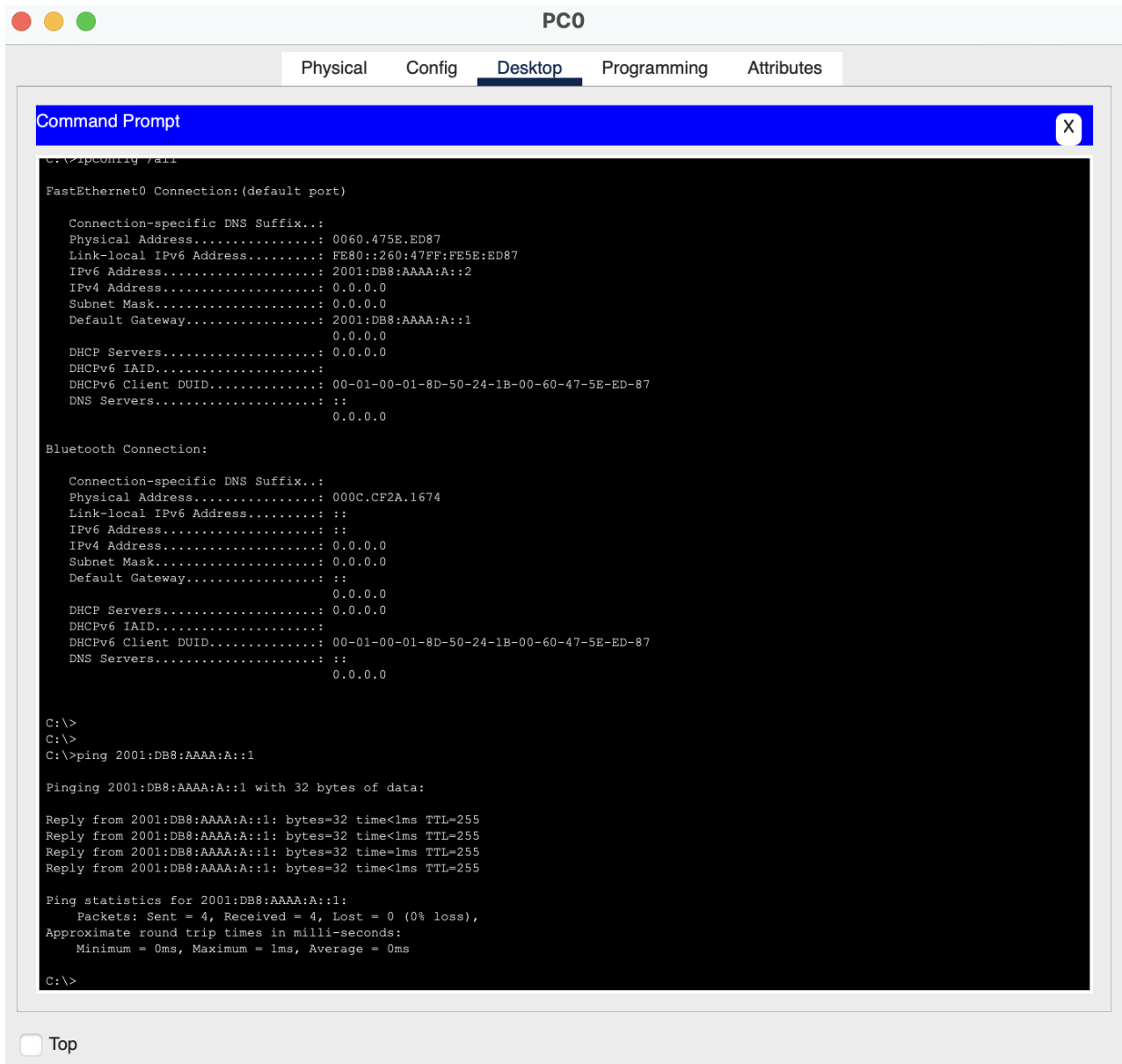
1. (2 pts) On PC0, configure static IPv6 address 2001:DB8:AAAA:A::2/64. Set the IPv6 gateway to routable IPv6 address of router.
Verify that you can ping the router. From PC0, submit screenshots of (i) the IPv6 address configured on PC0,



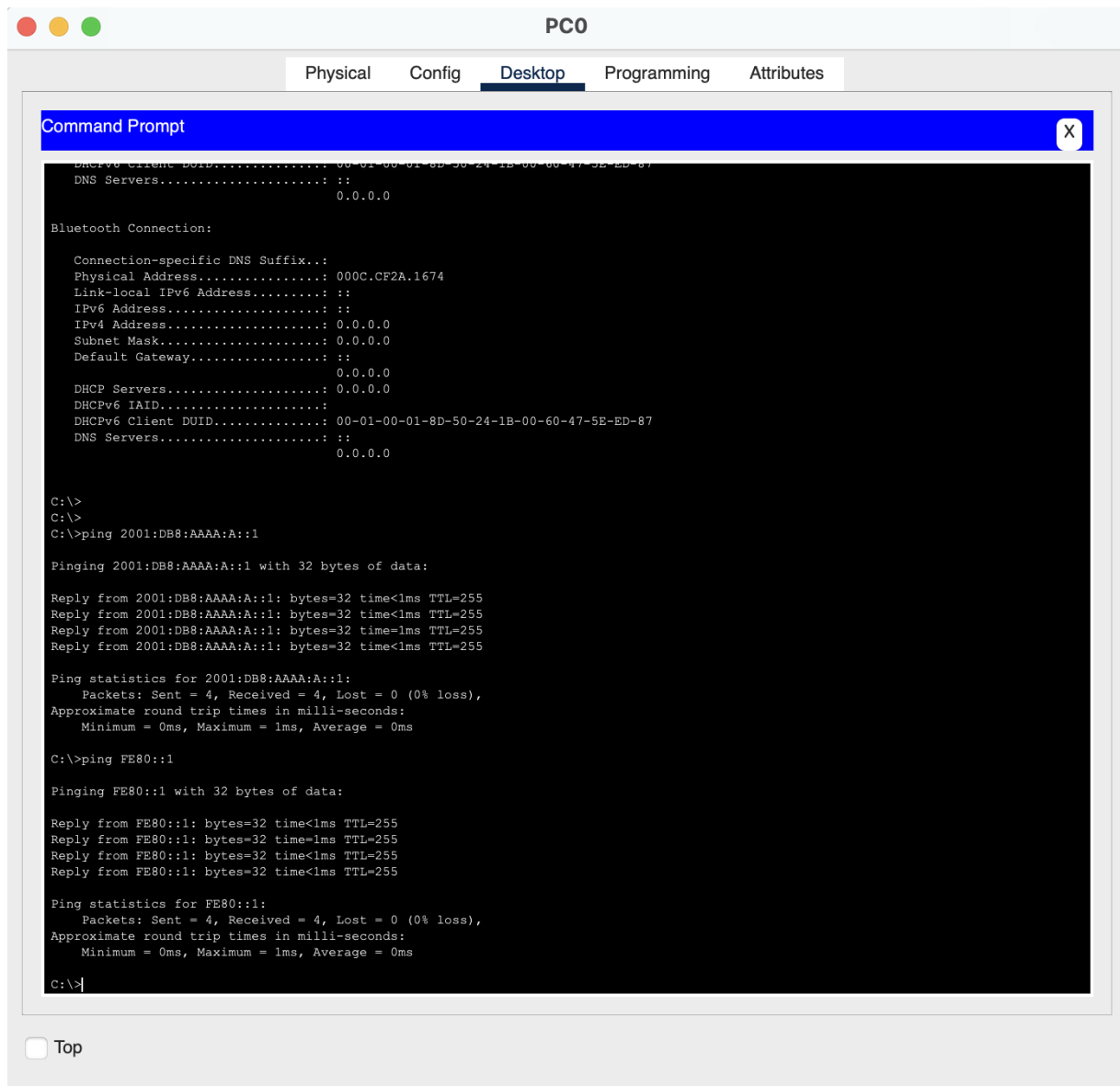
- (ii) IPv6 gateway configured on PC0,



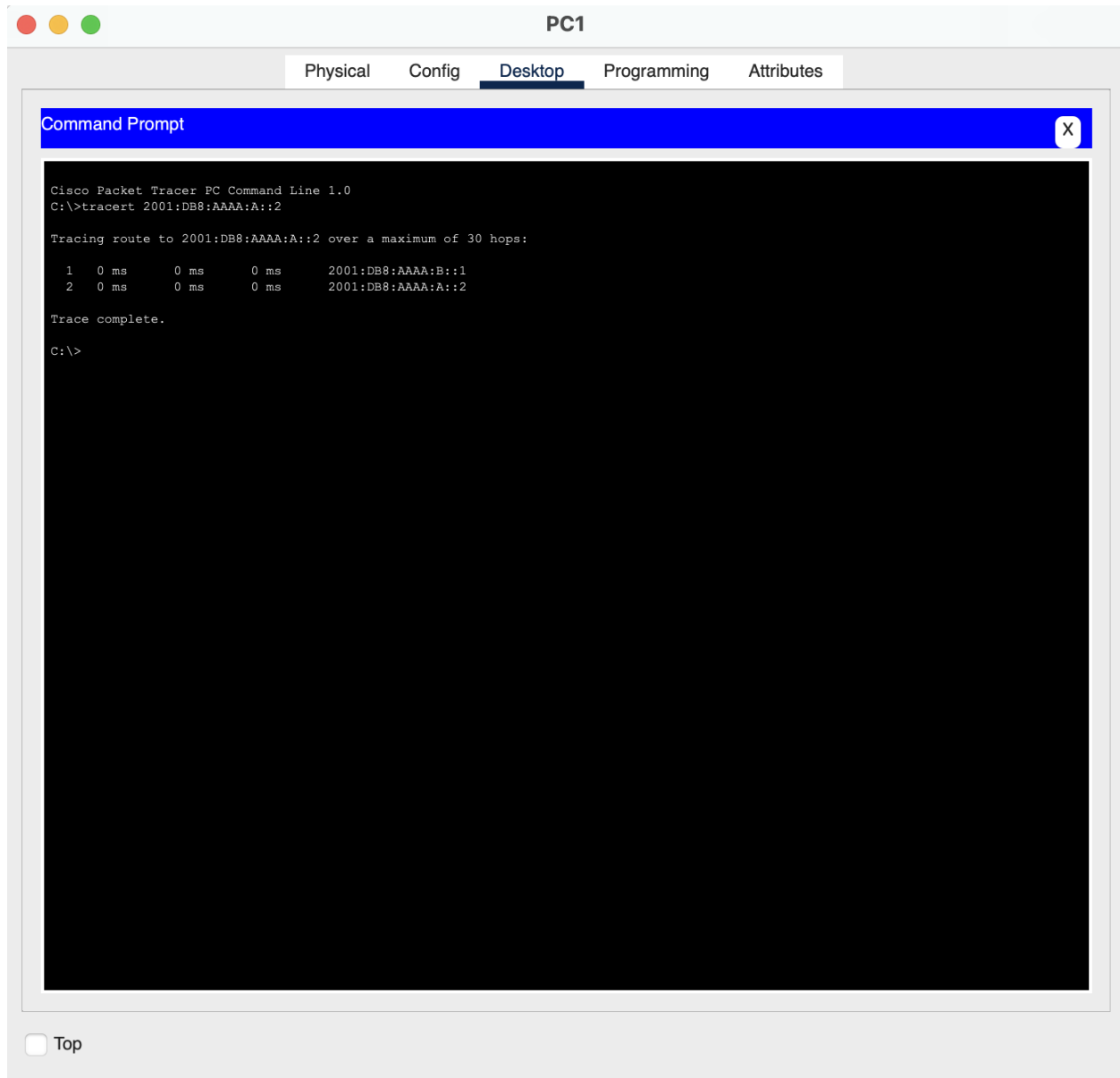
(iii) “ping 2001:DB8:AAAA:A::1”,



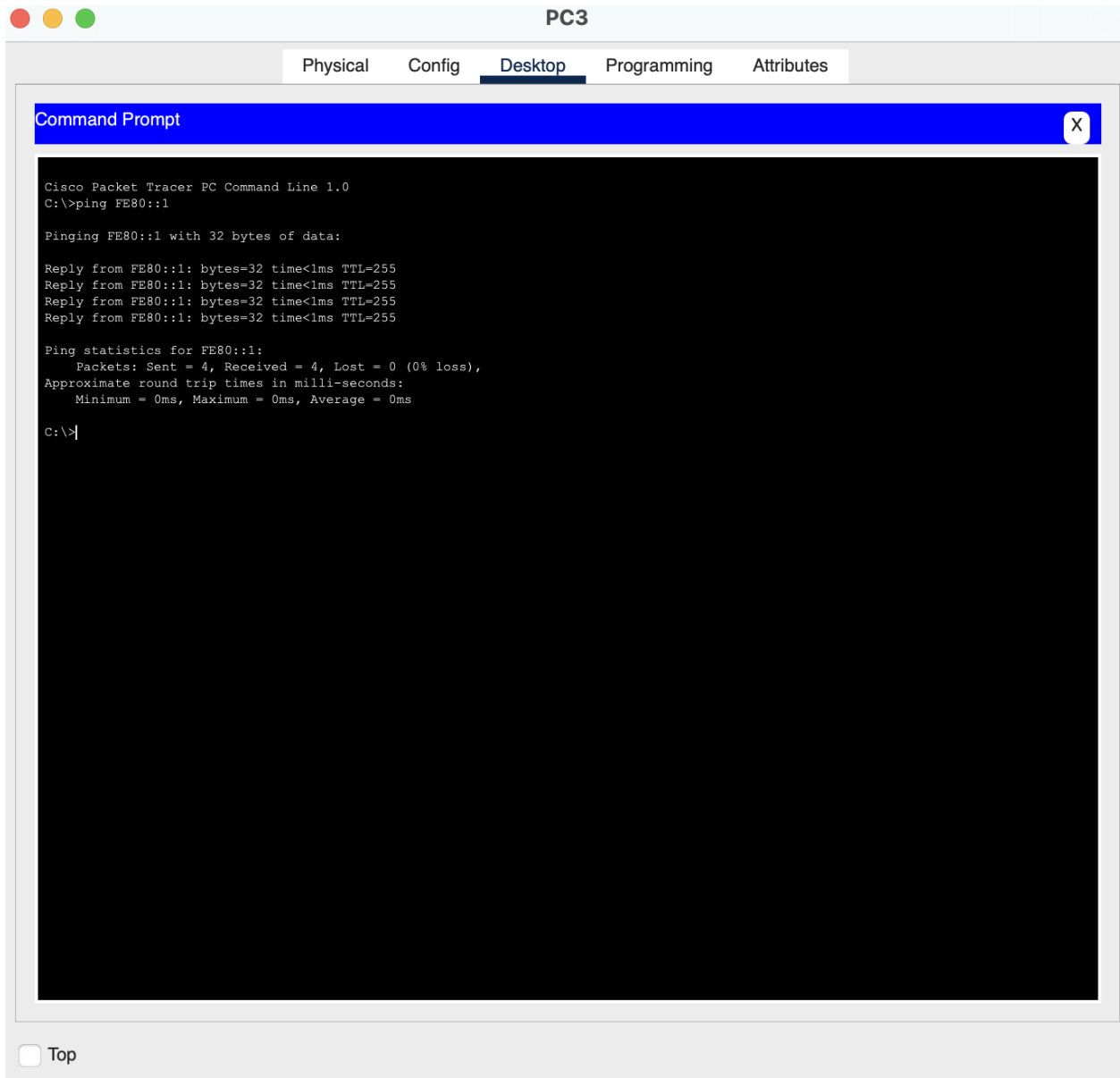
and (iv) “ping FE80::1” .



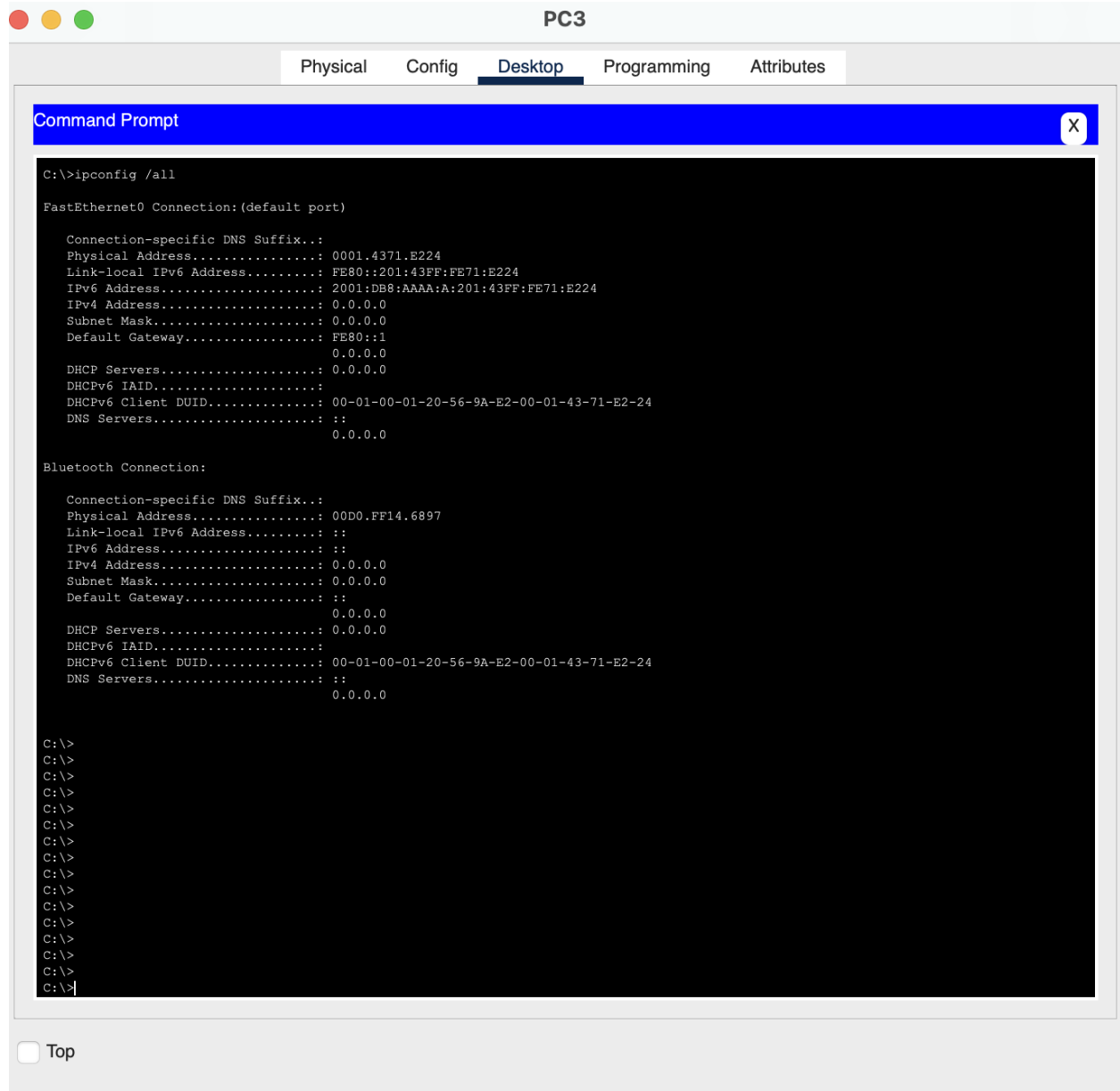
2. (1 pt) On PC1, configure static IPv6 address 2001:DB8:AAAA:B::2/64 and set the IPv6 gateway to the IPv6 address of the router. Verify that from PC1 you can ping the router and PC0. Submit screenshot of “tracert 2001:DB8:AAAA:A::2” from the command prompt window of PC1.



3. (2.5 pts) On PC3, enable “auto config” in order that PC3 can automatically obtain an IPv6 address. Verify that PC3 can ping the link local address of the router.
- a. Submit a screenshot of “ping FE80::1”.

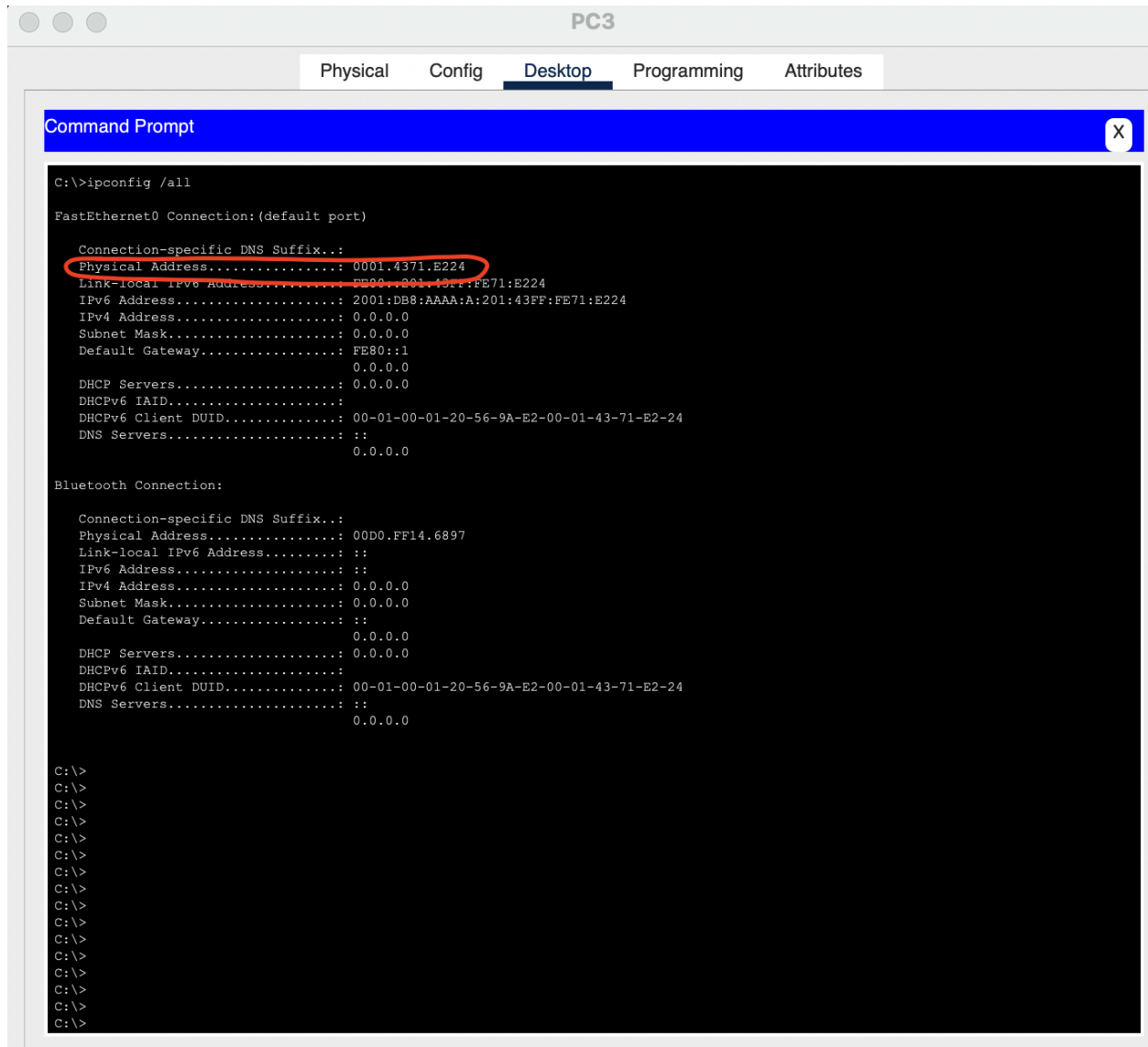


b. Submit a screenshot of “ipconfig /all” .

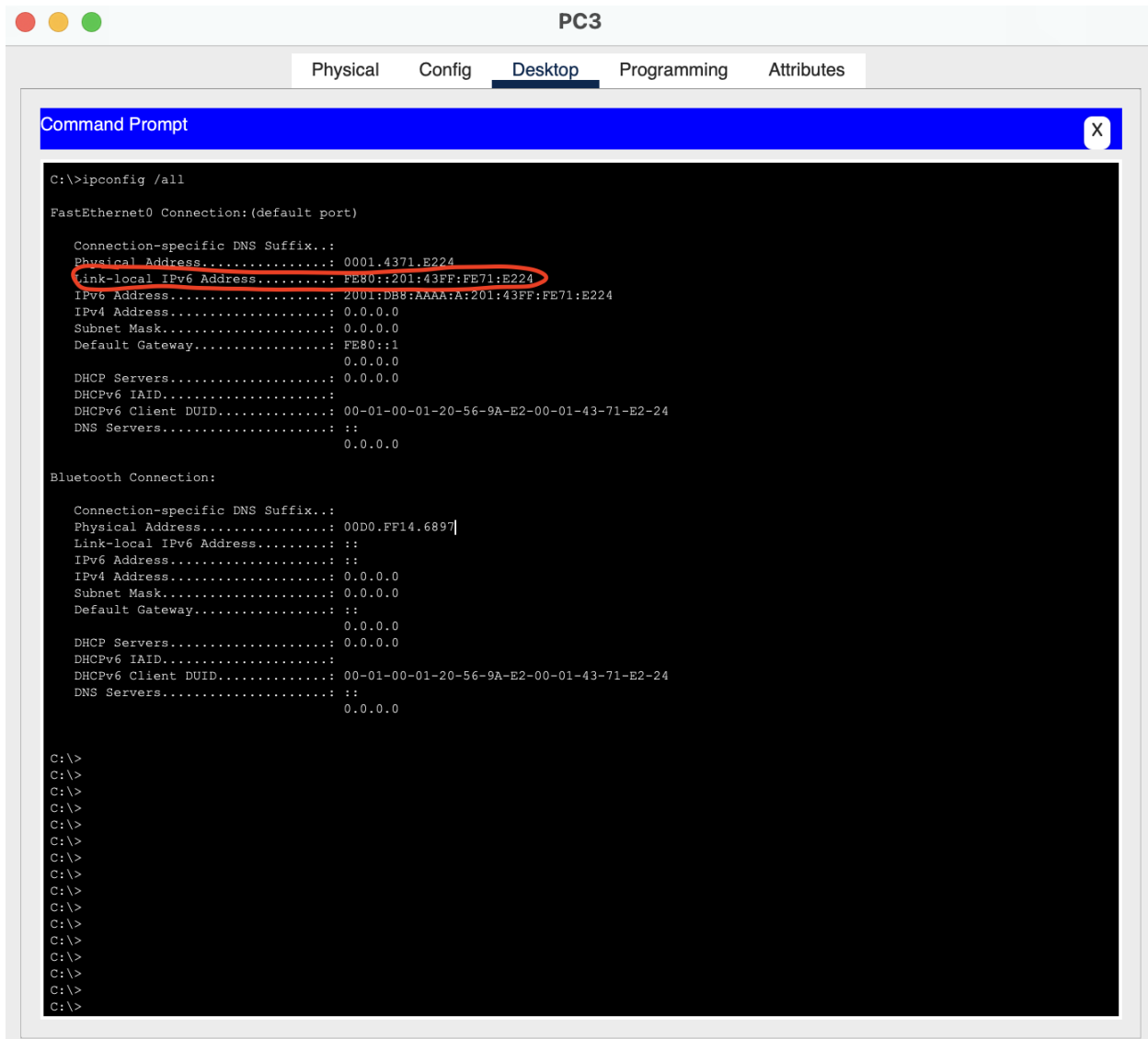


c. What is the physical address of PC3's network interface?

The physical address is 0001.4371.E224



d. What is the link local IPv6 address of PC3's network interface?

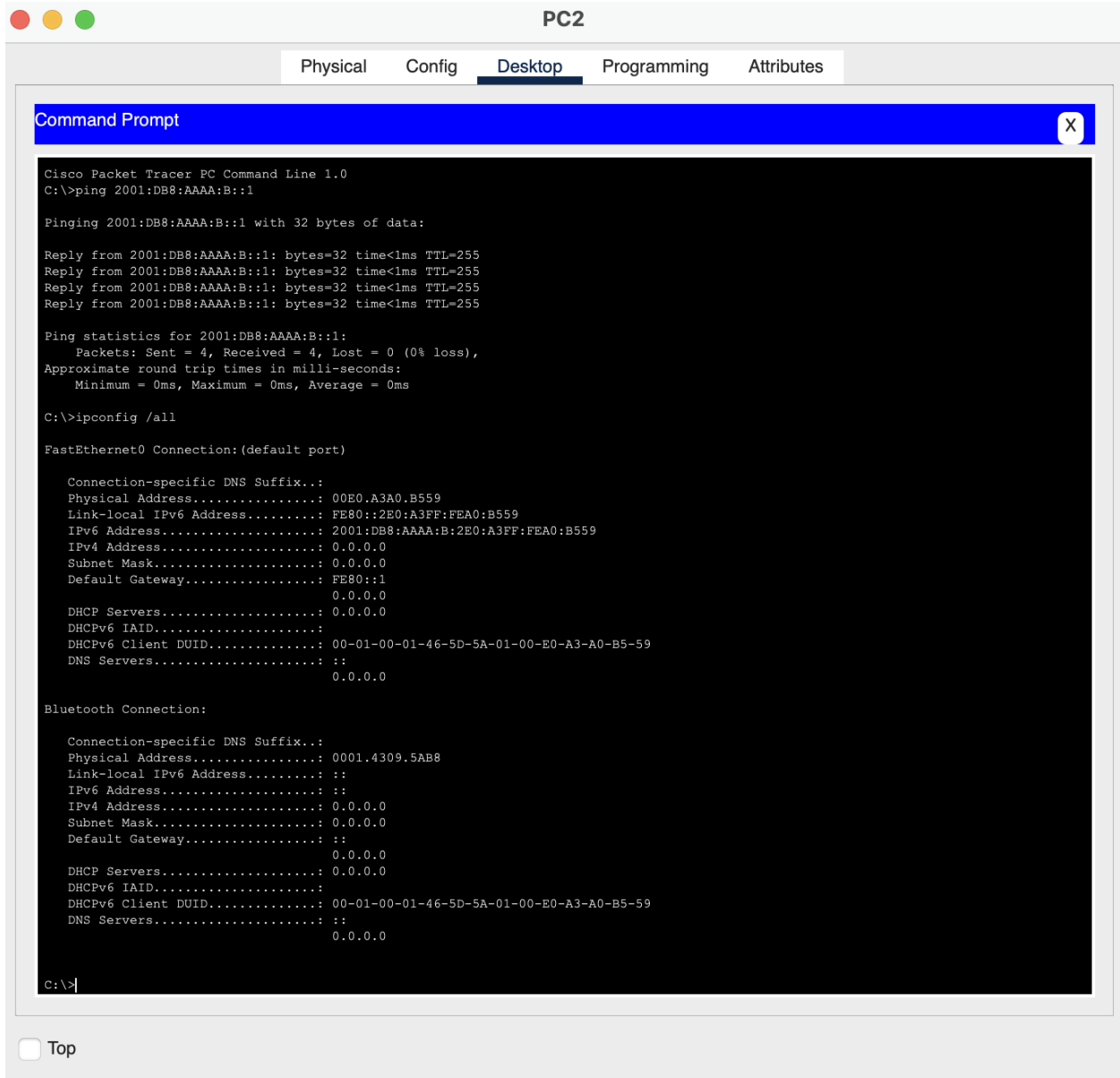


e. How was the link local IPv6 address derived from the physical address?

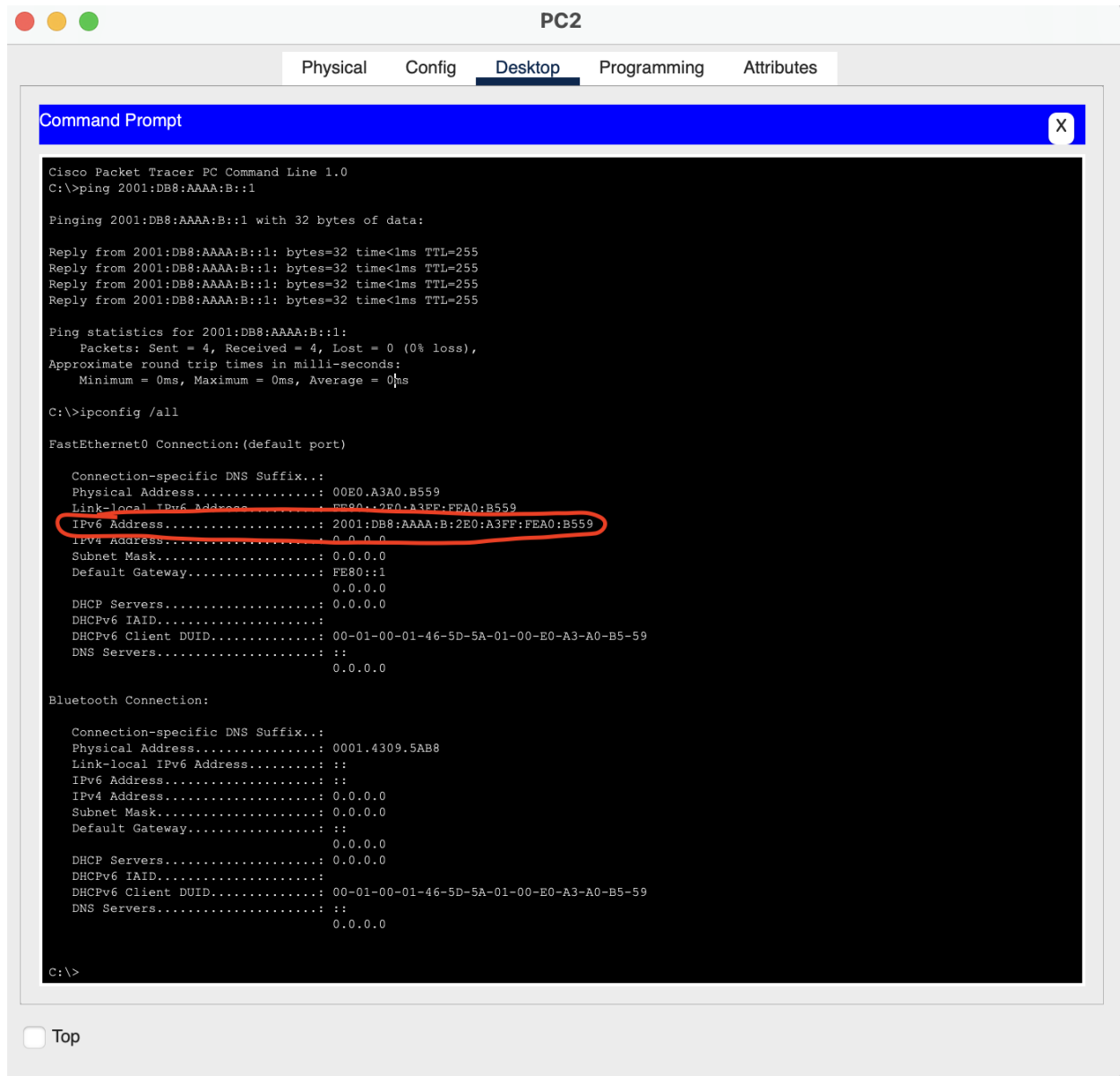
The link local IPv6 address is derived from the physical address because the link local IPv6 are made from the first 64-bit reservation and the rest of the bits are from the mac address. Since the mac address has only 48 bits it adds with the 64 bit to make a total of 112 bits when a IPv6 address is about 128 bits long.

4. (2.5 pts) On PC2, enable “auto config” in order that PC2 can automatically obtain an IPv6 address. Verify that PC2 can ping the IPv6 address of the router from the command prompt window of PC2.

a. Submit screenshots of “ping 2001:DB8:AAAA:B::1” and “ipconfig /all” on PC2.

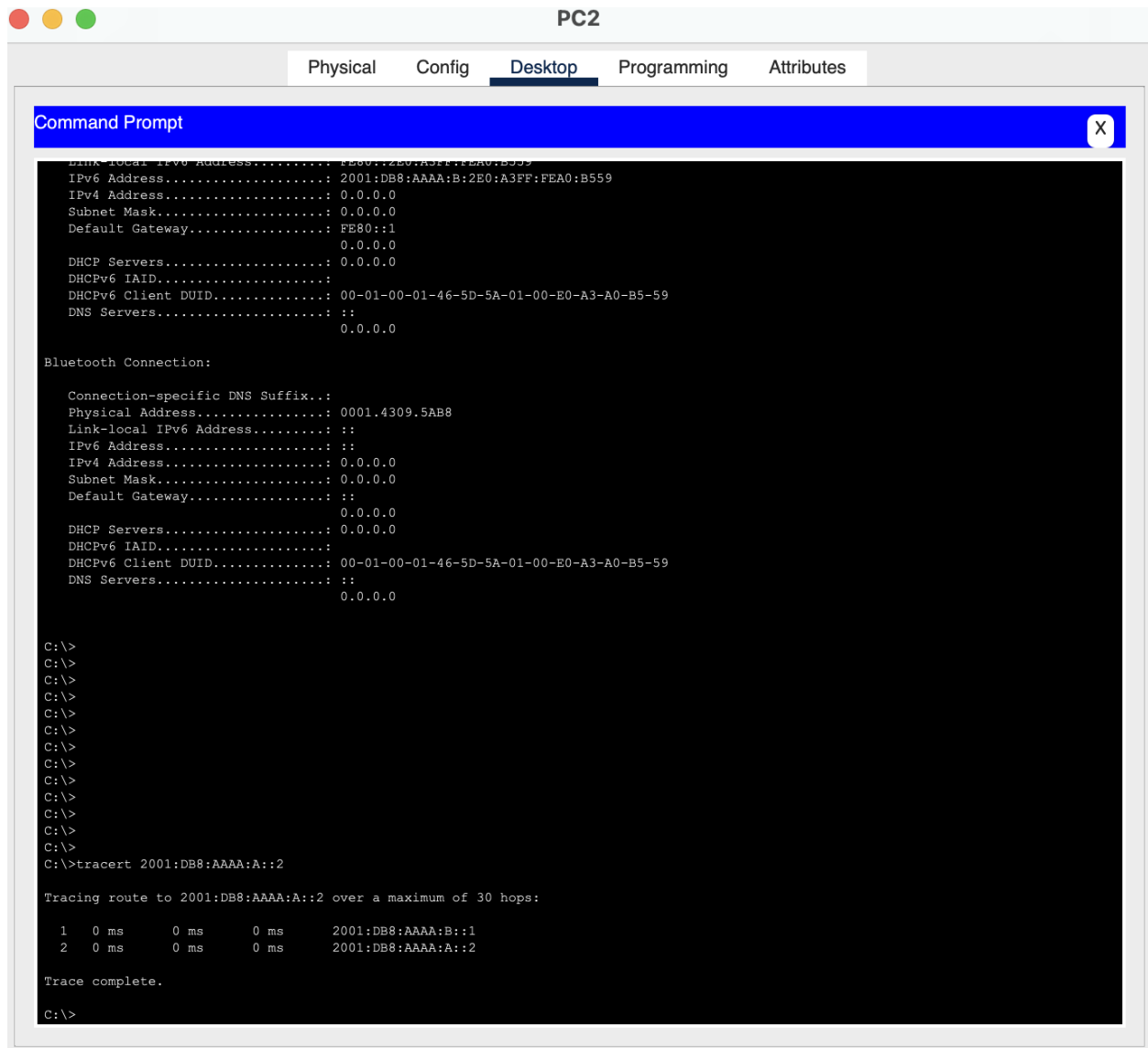


b. Submit a screenshot of a window that displays PC2's routable IPv6 address. What is this value?

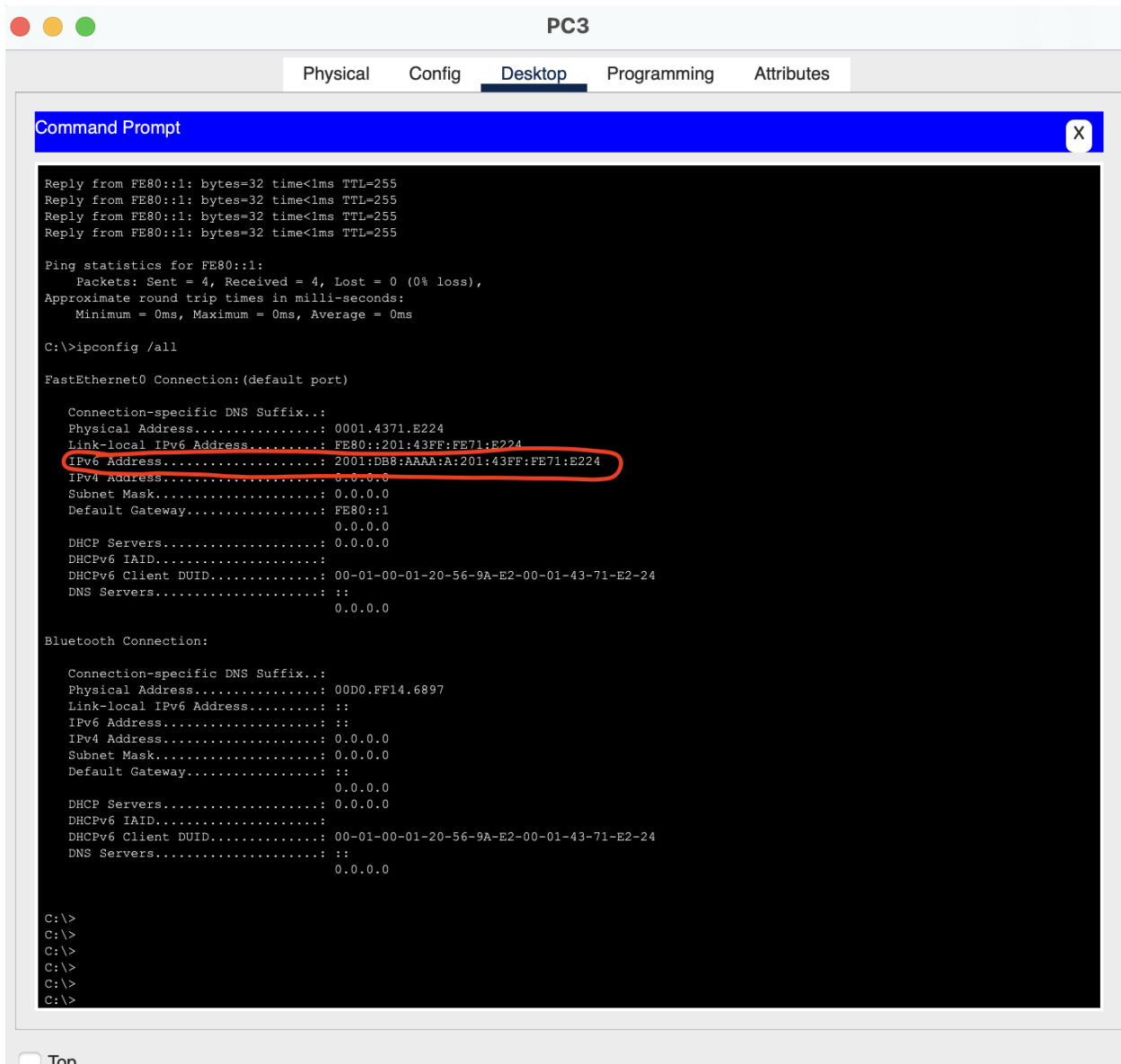


The routable IPv6 address for PC2 is 2001:DB8:AAAA:B:2E0:A3FF:FEA0:B559

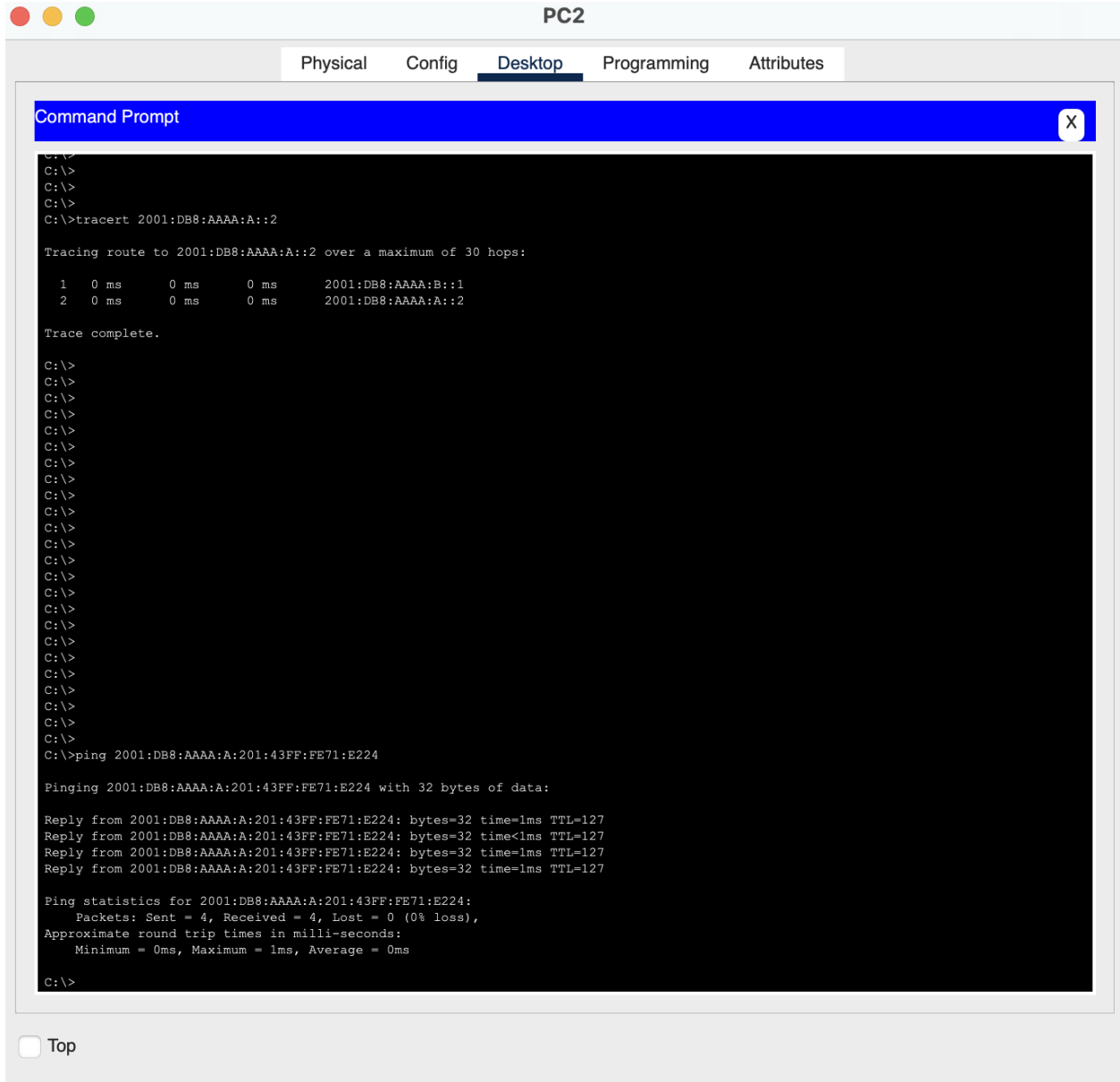
c. PC2 should be able to ping PC0. Submit a screenshot of “tracert 2001:DB8:AAAA:A::2”.



d. What is PC3's auto-configured routable IPv6 address? Submit a screenshot showing this value.



The routable IPv6 address for PC3 is 2001:DB8:AAAA:A:201:43FF:FE71:E224
e. PC2 should be able to ping PC3. Submit a screenshot of traceroute from PC2 to PC3.



5. (1 pt) In simulation mode, capture/decode Neighbor Discovery Protocol packets and submit screenshots of any two of the following ND messages: Router Solicitation (ICMPv6 type 133), Router Advertisement (ICMPv6 type 134), Neighbor Solicitation (ICMPv6 type 135), Neighbor Advertisement (ICMPv6 type 136).

PDU Information at Device: PC3

OSI Model

Inbound PDU Details

Outbound PDU Details

At Device: PC3
Source: PC0
Destination: FF02::1:FF71:E224

In Layers

Layer7

Layer6

Layer5

Layer4

Layer 3: IPv6 Header Src. IP: 2001:DB8:AAAA:A::2, Dest. IP: FF02::1:FF71:E224 ICMPv6 Neighbor Message Type: 135

Layer 2: Ethernet II Header 0060.475E.ED87 >> 3333.FF71.E224

Layer 1: Port FastEthernet0

Out Layers

Layer7

Layer6

Layer5

Layer4

Layer 3: IPv6 Header Src. IP: 2001:DB8:AAAA:A: 201:43FF:FE71:E224, Dest. IP: 2001:DB8:AAAA:A::2 ICMPv6 Neighbor Message Type: 136

Layer 2: Ethernet II Header 0001.4371.E224 >> 0060.475E.ED87

Layer 1: Port(s): FastEthernet0

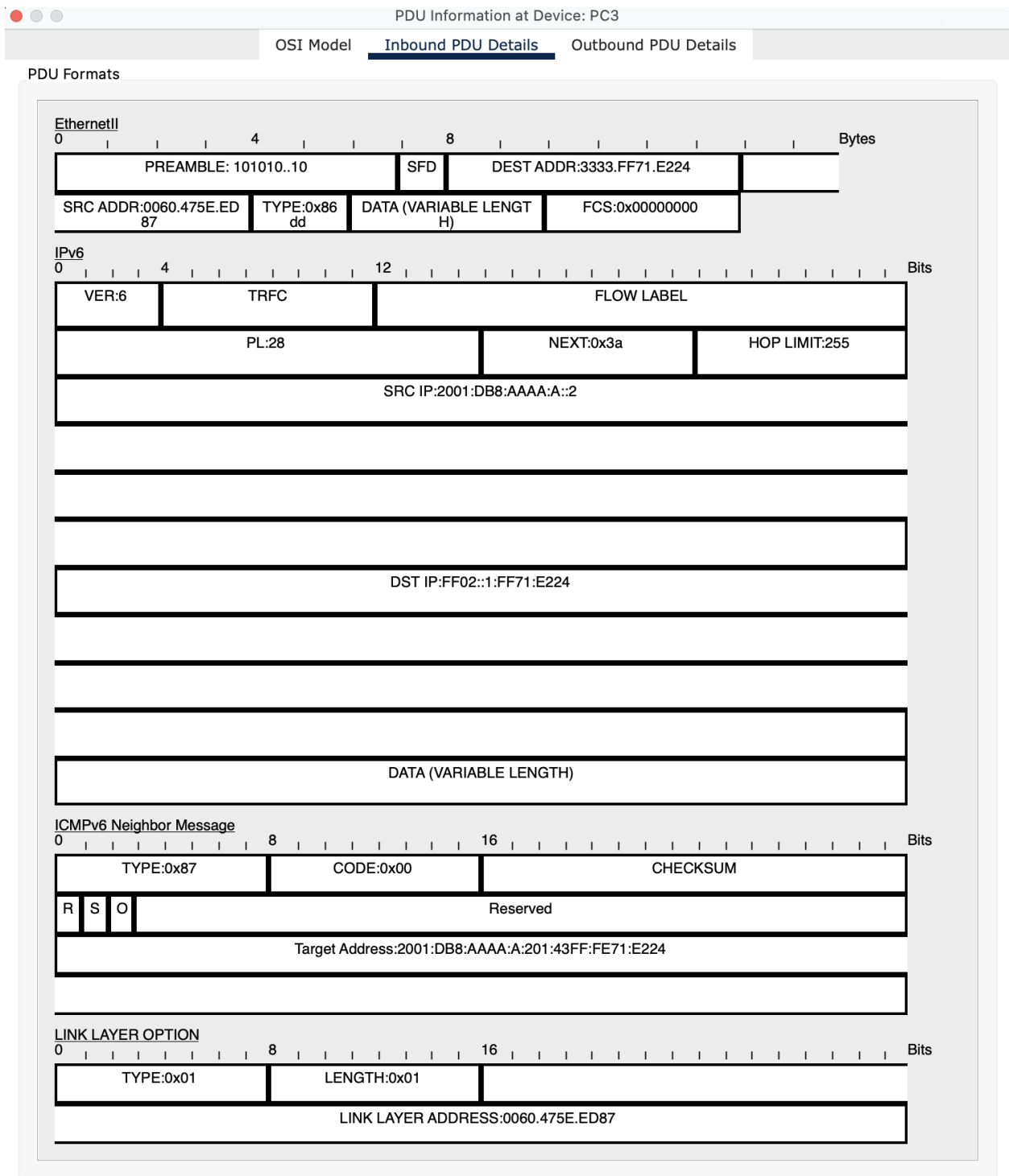
1. FastEthernet0 receives the frame.

Challenge Me

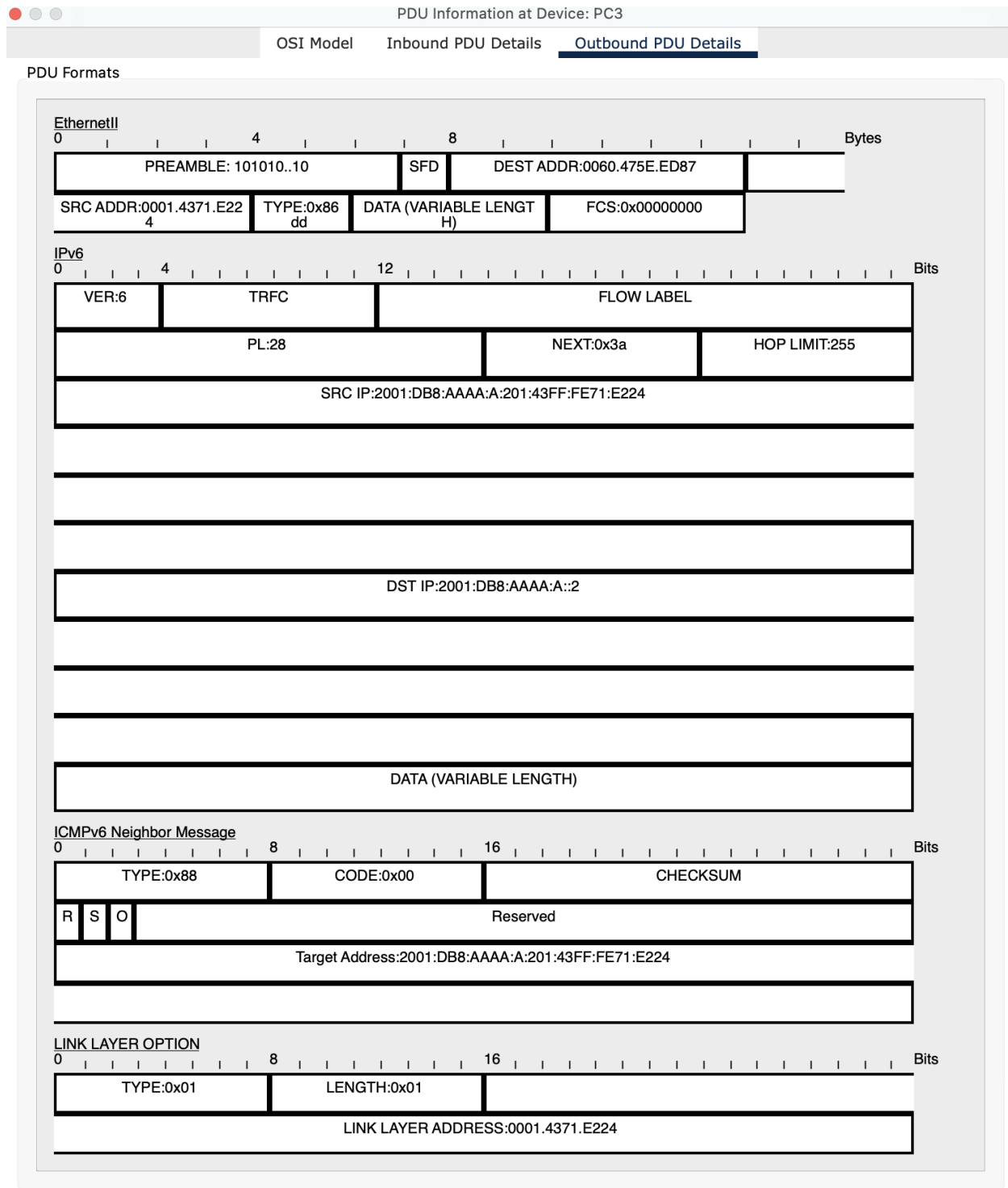
<< Previous Layer

Next Layer >>

(First image is a ICMPv6 type 135)



(Second image is ICMPv6 type 136)



6. (1 pt) submit printout of output of “show running-config” from the router.

Router#show running-config

Building configuration...

Current configuration : 970 bytes

!

version 12.4

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router

!

!

!

!

!

!

!

!

ip cef

ipv6 unicast-routing

!

no ipv6 cef

!

!

!

!

!

!

!

!

!

!

!

!

spanning-tree mode pvst

!

!

!

!

!

!

interface FastEthernet0/0

```
description Link to LAN 1
no ip address
duplex auto
speed auto
ipv6 address FE80::1 link-local
ipv6 address 2001:DB8:AAAA:A::1/64
!
interface FastEthernet0/1
description Link to LAN 2
no ip address
duplex auto
speed auto
ipv6 address FE80::1 link-local
ipv6 address 2001:DB8:AAAA:B::1/64
!
interface Vlan1
no ip address
shutdown
!
router rip
!
ip classless
!
ip flow-export version 9
!
ipv6 route 2001:DB8:AAAA:A::/64 2001:DB8:AAAA:A::2
ipv6 route 2001:DB8:AAAA:B::/64 2001:DB8:AAAA:B::2
ipv6 route 2001:DB8:AAAA:A::/64 FastEthernet0/1 FE80::1
ipv6 route 2001:DB8:AAAA:B::/64 2001:DB8:AAAA:A::2
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
```

```
line vty 0 4
login
!
!
!
end
```