



## LAB 4

### IPv6 - Wireless LAN

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Nhóm học phần: CT29303

- Các sinh viên bị phát hiện sao chép bài của nhau sẽ nhận 0đ cho tất cả bài thực hành của môn này.
- Bài nộp phải ở dạng PDF, hình minh họa phải rõ ràng chi tiết. Hình minh họa chỉ cần chụp ở nội dung thực hiện, không chụp toàn màn hình.

#### 1. Cấu hình IPv6 - Phần 2

Xem [video hướng dẫn](#) và thực hiện các yêu cầu sau:

Sử dụng file *Lab04-01 - IPv6 Configuration Part 1.pkt*, thực hiện:

IPv4 đã được cấu hình thành công trên các thiết bị. Sinh viên cần thực hiện cấu hình IPv6 để hỗ trợ song song IPv4 và IPv6.

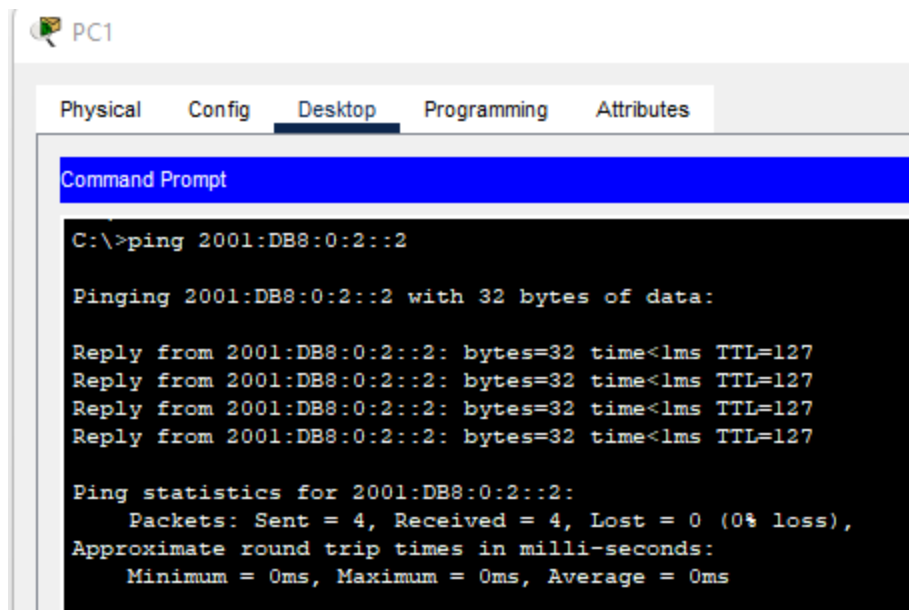
- Bật IPv6 routing trên R1.
- Cấu hình địa chỉ IPv6 phù hợp cho R1. Hiển thị running-configuration của R1 (chụp hình minh họa).

```
R1#show running-config
Building configuration...

Current configuration : 848 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
!
!
ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524H6F0-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
-
```

```
interface GigabitEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
 ipv6 address 2001:DB8:0:1::1/64
 !
interface GigabitEthernet0/1
 ip address 192.168.2.1 255.255.255.0
 duplex auto
 speed auto
 ipv6 address 2001:DB8:0:2::1/64
 !
interface GigabitEthernet0/2
 ip address 192.168.3.1 255.255.255.0
 duplex auto
 speed auto
 ipv6 address 2001:DB8:0:3::1/64
 !
interface Vlan1
 no ip address
 shutdown
 !
ip classless
 !
ip flow-export version 9
 !
 !
 !
 !
 !
 !
 !
 !
line con 0
 !
line aux 0
 !
line vty 0 4
 login
 !
 !
 !
- end
```

- Cấu hình địa chỉ IPv6 cho các PC, lưu ý cấu hình địa chỉ default gateway phù hợp.
- Kiểm tra nối kết mạng giữa các PC (IPv4 và IPv6) bằng lệnh ping (**chụp hình minh họa**).
  - + Pc1 ping sang pc2 bằng ipv6



PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

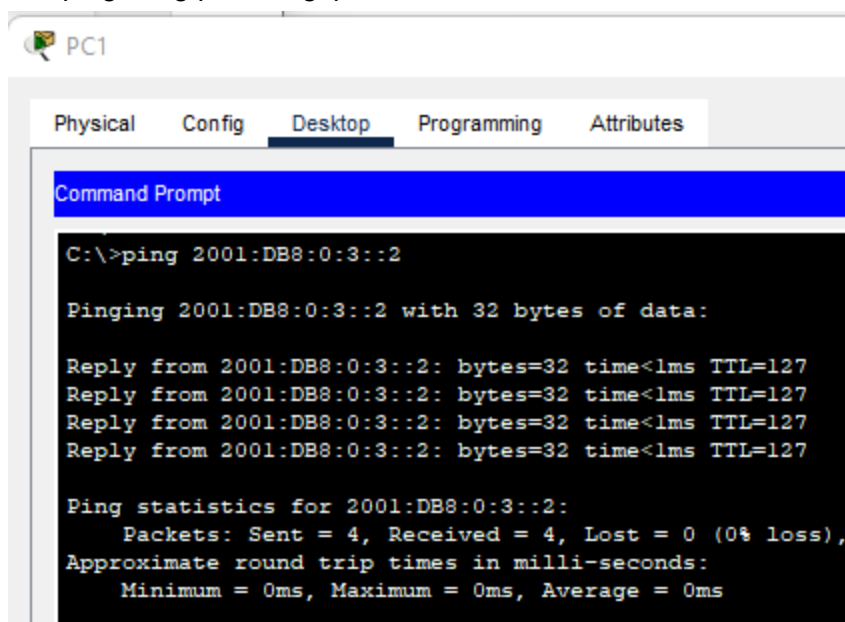
```
C:\>ping 2001:DB8:0:2::2

Pinging 2001:DB8:0:2::2 with 32 bytes of data:

Reply from 2001:DB8:0:2::2: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:0:2::2: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:0:2::2: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:0:2::2: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:0:2::2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

- +
- + Pc1 ping sang pc3 bằng ipv6



PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 2001:DB8:0:3::2

Pinging 2001:DB8:0:3::2 with 32 bytes of data:

Reply from 2001:DB8:0:3::2: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:0:3::2: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:0:3::2: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:0:3::2: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:0:3::2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

- +
- + Pc1 ping sang pc2 bằng ipv4

PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

- + Pc1 ping sang pc3 bằng ipv4

PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

## 2. Cấu hình IPv6 - Phần 2

Xem [video hướng dẫn](#) và thực hiện các yêu cầu sau:

Sử dụng file *Lab04-02 - IPv6 Configuration Part 2.pkt*, thực hiện:

- Sử dụng EUI-64 để cấu hình địa chỉ IPv6 cho interface G0/1 của router R1/R2.
- Cấu hình địa chỉ IPv6 cho các PC, lưu ý cấu hình địa chỉ default gateway phù hợp.
- Bật IPv6 cho interface G0/0 của router R1/R2 mà không cần cấu hình địa chỉ cụ thể. Hiển thị running-configuration của R1 và R2 (**chụp hình minh họa**).
-

- running-configuration của R1

```
R1#sh running-config
Building configuration...

Current configuration : 916 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
!
ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524J9F0-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
.
```

```
interface GigabitEthernet0/0
 ip address 192.168.1.1 255.255.255.252
 duplex auto
 speed auto
 ipv6 enable
 !
interface GigabitEthernet0/1
 ip address 10.0.1.254 255.255.255.0
 duplex auto
 speed auto
 ipv6 address 2001:DB8::/64 eui-64
 !
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
 shutdown
 !
interface Vlan1
 no ip address
 shutdown
 !
ip classless
ip route 10.0.2.0 255.255.255.0 192.168.1.2
 !
ip flow-export version 9
 !
ipv6 route 2001:DB8:0:1::/64 GigabitEthernet0/0 FE80::201:63FF:FE80:B801
 !
 !
no cdp run
 !
 !
 !
 !
 !
 !
line con 0
 !
line aux 0
 !
line vty 0 4
 login
 !
 !
 !
end
```

- Hiển thị running-configuration của R2

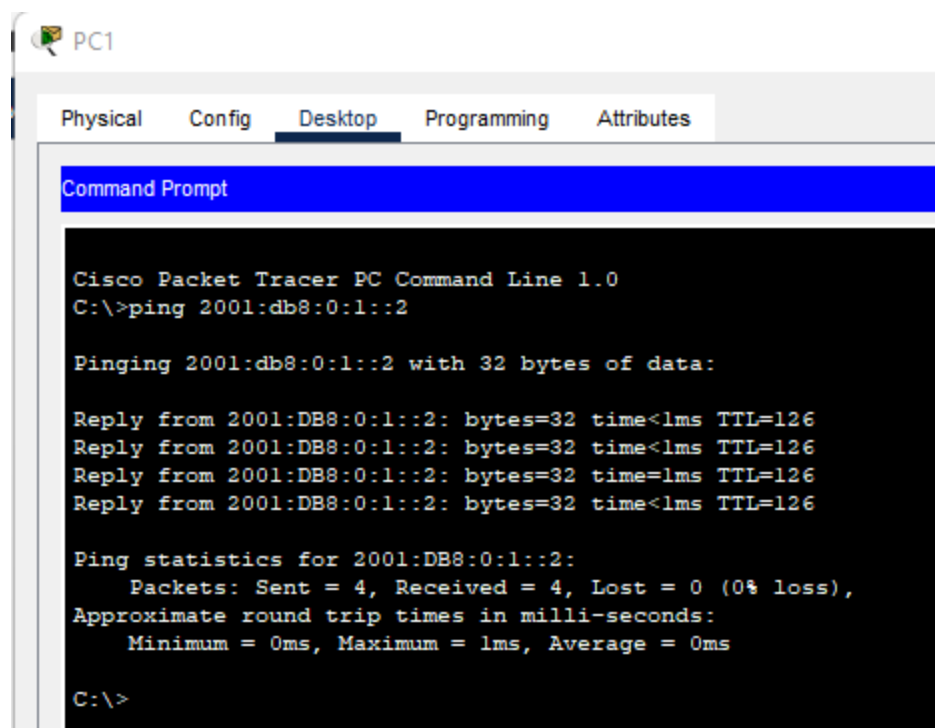
```
R2#sh running-config
Building configuration...

Current configuration : 916 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R2
!
!
!
!
!
!
!
!
ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX15245WU1-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
-
```



```
interface GigabitEthernet0/0
 ip address 192.168.1.2 255.255.255.252
 duplex auto
 speed auto
 ipv6 enable
 !
interface GigabitEthernet0/1
 ip address 10.0.2.254 255.255.255.0
 duplex auto
 speed auto
 ipv6 address 2001:DB8:0:1::/64 eui-64
 !
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
 shutdown
 !
interface Vlan1
 no ip address
 shutdown
 !
ip classless
ip route 10.0.1.0 255.255.255.0 192.168.1.1
 !
ip flow-export version 9
 !
ipv6 route 2001:DB8::/64 GigabitEthernet0/0 FE80::230:F2FF:FE36:4501
 !
 !
no cdp run
 !
 !
 !
 !
 !
 !
line con 0
 !
line aux 0
 !
line vty 0 4
 login
 !
 !
 !
end
```

- 
- Cấu hình vạch đường tĩnh cho router R1/R2 cho PC1 ping PC2 (chụp hình minh họa).



The screenshot shows the PC1 configuration window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The text in the command prompt is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 2001:db8:0:1::2

Pinging 2001:db8:0:1::2 with 32 bytes of data:

Reply from 2001:DB8:0:1::2: bytes=32 time<1ms TTL=126
Reply from 2001:DB8:0:1::2: bytes=32 time<1ms TTL=126
Reply from 2001:DB8:0:1::2: bytes=32 time=1ms TTL=126
Reply from 2001:DB8:0:1::2: bytes=32 time<1ms TTL=126

Ping statistics for 2001:DB8:0:1::2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

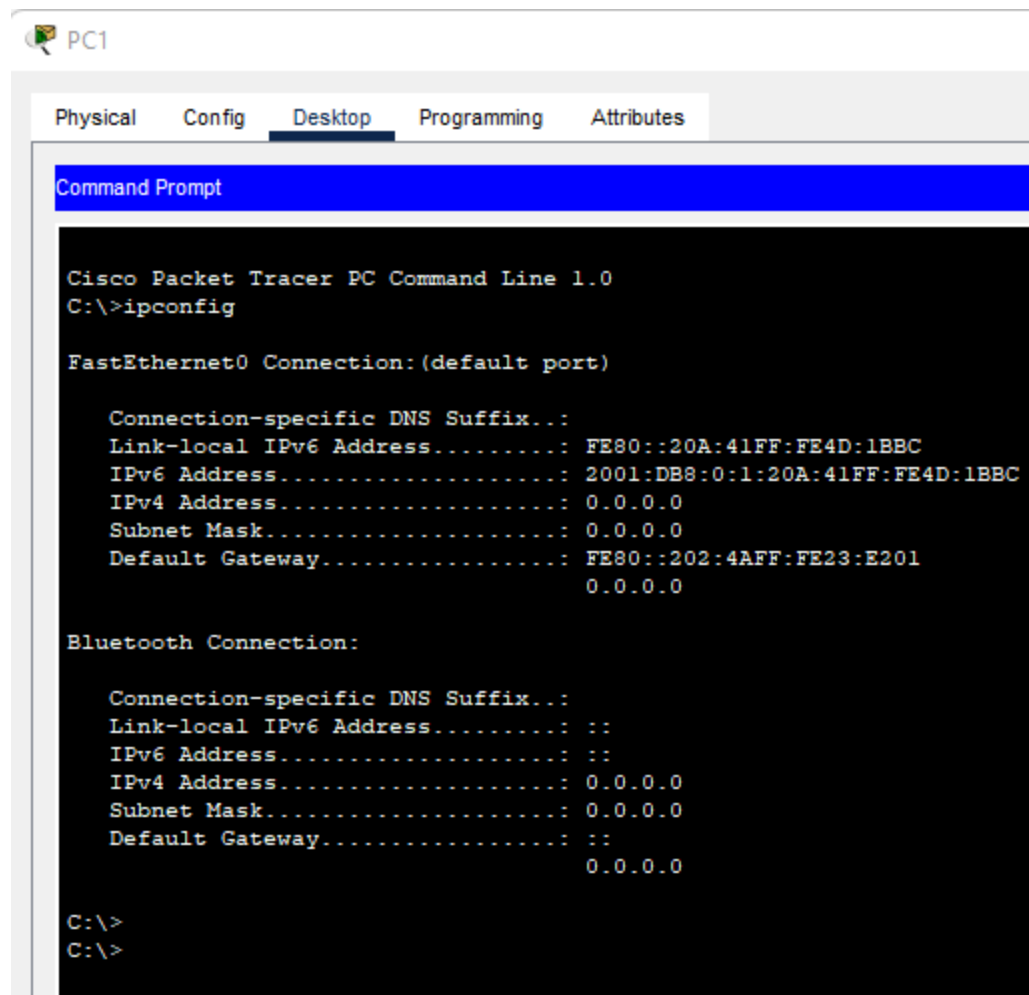
### 3. Vạch đường tĩnh IPv6

Xem [video hướng dẫn](#) và thực hiện các yêu cầu sau:

Sử dụng file *Lab04-03 - IPv6 Static Routes.pkt*, thực hiện:

IPv6 đã được cấu hình thành công trên các routers. Các nối kết serial chỉ sử dụng địa chỉ link-local.

- Bật IPv6 routing trên các router.
- Sử dụng SLAAC để cấu hình địa chỉ IPv6 cho các PC. Địa chỉ nào đã được sử dụng? (**chụp hình minh họa**).
- IPv6 của pc1 là : 2001:DB8:0:1:20A:41FF:FE4D:1BBC



The screenshot shows the 'PC1' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The text in the Command Prompt is as follows:

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

FastEthernet0 Connection:(default port)

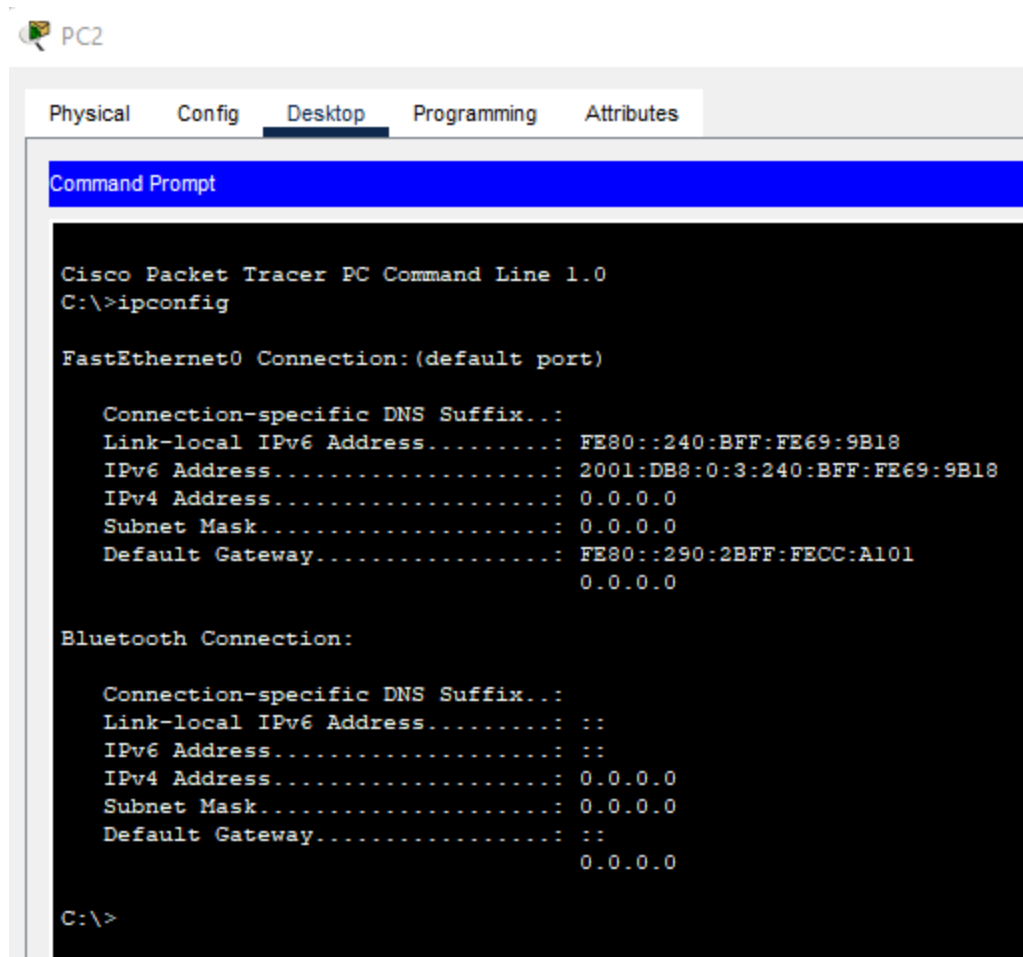
    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::20A:41FF:FE4D:1BBC
    IPv6 Address . . . . .: 2001:DB8:0:1:20A:41FF:FE4D:1BBC
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: FE80::202:4AFF:FE23:E201
                                0.0.0.0

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:\>
C:\>
```

- IPv6 của pc2 là : 2001:DB8:0:3:240:BFF:FE69:9B18



The screenshot shows the 'PC2' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The prompt shows the output of the 'ipconfig' command, detailing the configuration for the 'FastEthernet0' and 'Bluetooth' connections. The 'FastEthernet0' connection is configured with a Link-local IPv6 address of FE80::240:BFF:FE69:9B18, an IPv6 address of 2001:DB8:0:3:240:BFF:FE69:9B18, an IPv4 address of 0.0.0.0, a subnet mask of 0.0.0.0, and a default gateway of FE80::290:2BFF:FECC:A101. The 'Bluetooth' connection is configured with a Link-local IPv6 address of ::, an IPv6 address of ::, an IPv4 address of 0.0.0.0, a subnet mask of 0.0.0.0, and a default gateway of ::.

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

FastEthernet0 Connection: (default port)

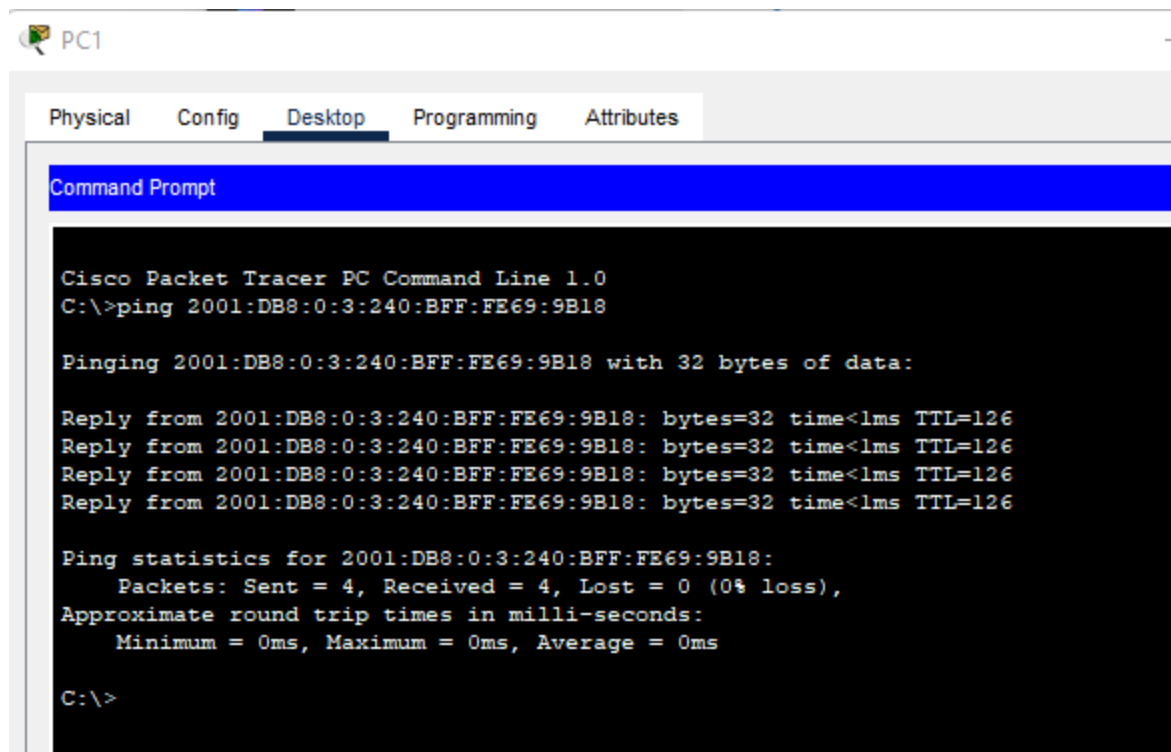
    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::240:BFF:FE69:9B18
    IPv6 Address . . . . .: 2001:DB8:0:3:240:BFF:FE69:9B18
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: FE80::290:2BFF:FECC:A101
                                0.0.0.0

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:\>
```

- 
- Cấu hình vạch đường tĩnh cho các router để PC1 ping tới được PC2 (chụp hình minh họa). Lưu ý đường mạng qua R2 được sử dụng như đường dự phòng.
- Pc1 ping tới pc2



The screenshot shows the 'PC1' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The text in the Command Prompt is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 2001:DB8:0:3:240:BFF:FE69:9B18

Pinging 2001:DB8:0:3:240:BFF:FE69:9B18 with 32 bytes of data:

Reply from 2001:DB8:0:3:240:BFF:FE69:9B18: bytes=32 time<1ms TTL=126
Reply from 2001:DB8:0:3:240:BFF:FE69:9B18: bytes=32 time<1ms TTL=126
Reply from 2001:DB8:0:3:240:BFF:FE69:9B18: bytes=32 time<1ms TTL=126
Reply from 2001:DB8:0:3:240:BFF:FE69:9B18: bytes=32 time<1ms TTL=126

Ping statistics for 2001:DB8:0:3:240:BFF:FE69:9B18:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- 
- Hiển thị running-configuration của các router (chụp hình minh họa).
- Router 1

```
R1#sh running-config
Building configuration...

Current configuration : 1027 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
!
no ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524890H-
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
-
```

```
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:DB8:0:1::1/64
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:DB8:0:13::1/64
!
interface GigabitEthernet0/2
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface Serial0/0/0
  no ip address
  ipv6 enable
!
interface Serial0/0/1
  no ip address
  clock rate 2000000
  shutdown
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
!
ip flow-export version 9
!
ipv6 route 2001:DB8:0:3::/64 GigabitEthernet0/1 2001:DB8:0:13::2
ipv6 route 2001:DB8:0:3::/64 Serial0/0/0 FE80::20B:BEFF:FED7:4901 5
!
!
no cdp run
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
end
```

- Router 2

```
R2#sh running-config
Building configuration...

Current configuration : 998 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R2
!
!
!
!
!
!
!
!
no ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524905C-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
```



```
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface GigabitEthernet0/2
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface Serial0/0/0
  no ip address
  ipv6 enable
  clock rate 64000
!
interface Serial0/0/1
  no ip address
  ipv6 enable
  clock rate 64000
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
!
ip flow-export version 9
!
ipv6 route 2001:DB8:0:1::/64 Serial0/0/0 FE80::202:4AFF:FE23:E201
ipv6 route 2001:DB8:0:3::/64 Serial0/0/1 FE80::290:2BFF:FECC:A101
!
!
no cdp run
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
end
```

- Route 3

```
-
R3#sh running-config
Building configuration...

Current configuration : 1027 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R3
!
!
!
!
!
!
!
no ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX15245527-
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
-
```

```
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:DB8:0:3::1/64
  !
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:DB8:0:13::2/64
  !
interface GigabitEthernet0/2
  no ip address
  duplex auto
  speed auto
  shutdown
  !
interface Serial0/0/0
  no ip address
  ipv6 enable
  !
interface Serial0/0/1
  no ip address
  clock rate 2000000
  shutdown
  !
interface Vlan1
  no ip address
  shutdown
  !
ip classless
  !
ip flow-export version 9
  !
ipv6 route 2001:DB8:0:1::/64 GigabitEthernet0/1 2001:DB8:0:13::1
ipv6 route 2001:DB8:0:1::/64 Serial0/0/0 FE80::20B:BEFF:FED7:4901 5
  !
  !
no cdp run
  !
  !
  !
  !
  !
line con 0
  !
line aux 0
  !
line vty 0 4
  login
  !
  !
  !
end
```

#### 4. Wireless LAN

Xem [video hướng dẫn](#) và thực hiện các yêu cầu sau:

Sử dụng file *Lab04-04 - Wireless LANs.pkt*, thực hiện:

- Sử dụng trình duyệt web trên PC1 truy cập (HTTPS) vào GUI của WLC1  
+Username: admin  
+Password: Cisco123
- Làm quen với giao diện GUI của WLC
- Cấu hình dynamic interface cho Internal & Guest WLANs (chụp hình minh họa).
- Cấu hình dynamic interface cho Internal WLANs

#### General Information

Interface Name	Internal
MAC Address	00:0A:F3:8C:86:B1

#### Configuration

Guest Lan	<input type="checkbox"/>
Quarantine	<input type="checkbox"/>
Quarantine Vlan Id	<input type="text" value="0"/>
NAS-ID	<input type="text"/>

#### Physical Information

Port Number	<input type="text" value="1"/>
Backup Port	<input type="text" value="0"/>
Active Port	1
Enable Dynamic AP Management	<input type="checkbox"/>

#### Interface Address

VLAN Identifier	<input type="text" value="100"/>
IP Address	<input type="text" value="10.0.0.10"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="10.0.0.1"/>

#### DHCP Information

Primary DHCP Server	<input type="text" value="10.0.0.1"/>
Secondary DHCP Server	<input type="text"/>
DHCP Proxy Mode	Global <input type="button" value="v"/>
Enable DHCP Option 82	<input type="checkbox"/>

- Cấu hình dynamic interface cho Guest WLANs

### General Information

Interface Name                      Guest

MAC Address                        00:D0:58:E5:C5:38

### Configuration

Guest Lan                            ☐

Quarantine                           ☐

Quarantine Vlan Id                0

NAS-ID                               

### Physical Information

Port Number                        1

Backup Port                         0

Active Port                         1

Enable Dynamic AP Management ☐

### Interface Address

VLAN Identifier                    200

IP Address                         10.1.0.10

Netmask                            255.255.255.0

Gateway                            10.1.0.1

### DHCP Information

Primary DHCP Server             10.1.0.1

Secondary DHCP Server          

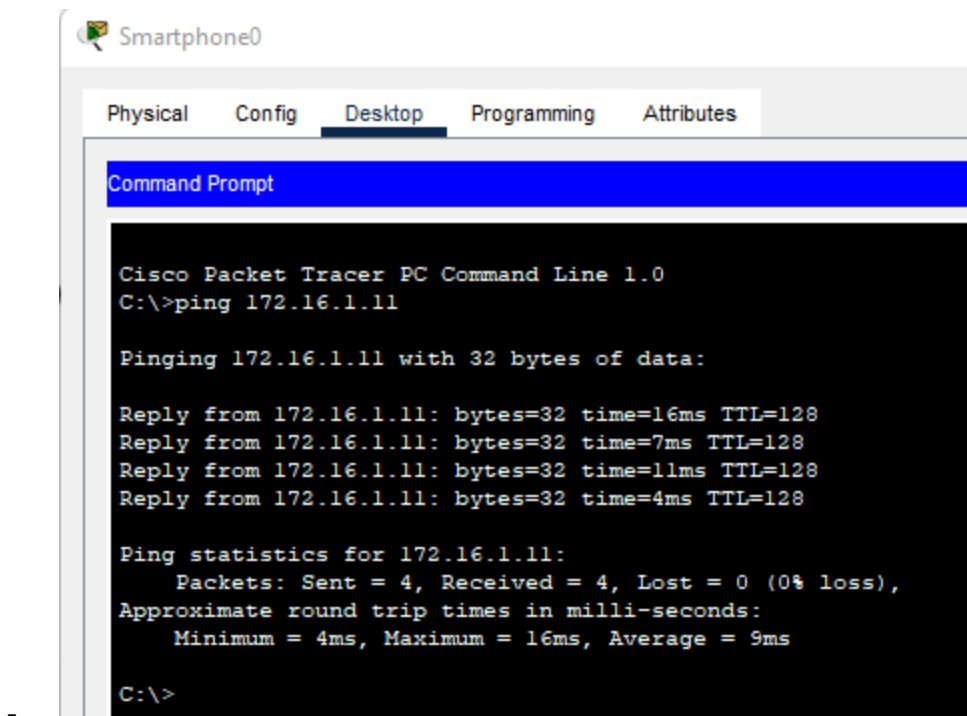
DHCP Proxy Mode                Global ▼

Enable DHCP Option 82           ☐

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- Tạo Internal & Guest WLANs sử dụng WPA2+PSK (chụp hình minh họa).

<input type="checkbox"/>	WLAN ID	Type	Profile Name	WLAN SSID	Admin Status	Security Policies	
<input type="checkbox"/>	1	WLAN	Internal	Internal	Enabled	[WPA2][Auth(PSK)]	<a href="#">Remove</a>
<input type="checkbox"/>	2	WLAN	Guest	Guest	Enabled	[WPA2][Auth(PSK)]	<a href="#">Remove</a>

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- Thêm 1 thiết bị wireless client và kết nối với AP. Thiết bị có thể ping tới PC1 không (chụp hình minh họa)?
- Smart Phone ping tới Pc1



The image shows a Cisco Packet Tracer interface for a device named 'Smartphone0'. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of a 'ping' command to the IP address 172.16.1.11. The output indicates that four packets were successfully received with 0% loss. The round trip times are listed as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.16.1.11

Pinging 172.16.1.11 with 32 bytes of data:

Reply from 172.16.1.11: bytes=32 time=16ms TTL=128
Reply from 172.16.1.11: bytes=32 time=7ms TTL=128
Reply from 172.16.1.11: bytes=32 time=11ms TTL=128
Reply from 172.16.1.11: bytes=32 time=4ms TTL=128

Ping statistics for 172.16.1.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 16ms, Average = 9ms

C:\>
```

--- Hết ---