

Dual Stack Networking Lab – Student Worksheet

Device: Cisco 4321 Router

Device : Cisco 2960 Switch

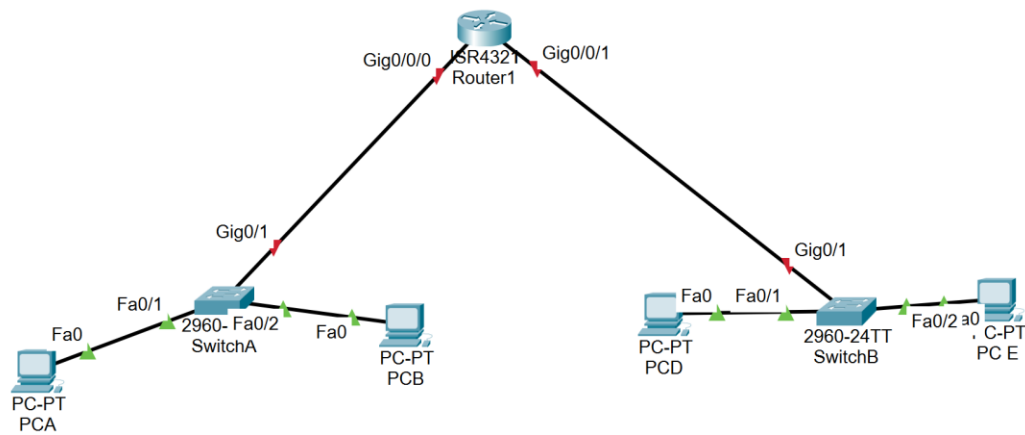
Tool: Packet Tracer

Configuration Method: GUI (Config Tab Only)

Objective

- Build a network with 2 LANs
- Configure IPv4 (Class C and Class B)
- Configure IPv6 Global Unicast addresses
- Enable IPv6 routing
- Verify connectivity using ping

Step 1 – Cable the Topology as Shown



Step 2 – IP Addressing Table

LAN A (Class C Network)

Network: 192.168.10.0 /24

IPv6: 2001:DB8:ACAD:1::/64

Device	IPv4 Address	Subnet Mask	Default Gateway	IPv6 Address	IPv6 Gateway
Router G0/0/0	192.168.10.1	255.255.255.0	—	2001:DB8:ACAD:1::1/64	—
PCA	192.168.10.10	255.255.255.0	192.168.10.1	2001:DB8:ACAD:1::10/64	2001:DB8:ACAD:1::1
PCB	192.168.10.11	255.255.255.0	192.168.10.1	2001:DB8:ACAD:1::11/64	2001:DB8:ACAD:1::1

LAN B (Class B Network)

Network: 172.16.0.0 /16
IPv6: 2001:DB8:ACAD:2::/64

Device	IPv4 Address	Subnet Mask	Default Gateway	IPv6 Address	IPv6 Gateway
Router G0/0/1	172.16.0.1	255.255.0.0	—	2001:DB8:ACAD:2::1/64	—
PCD	172.16.0.10	255.255.0.0	172.16.0.1	2001:DB8:ACAD:2::10/64	2001:DB8:ACAD:2::1
PCE	172.16.0.11	255.255.0.0	172.16.0.1	2001:DB8:ACAD:2::11/64	2001:DB8:ACAD:2::1



Step 3 – Router Configuration

Use the **Config tab** to:

- Assign IPv4 addresses
- Assign IPv6 addresses
- Turn interfaces ON

Enable IPv6 Routing and Configure IPv6 Addresses (CLI)

Enabling IPV6

```
Router> enable
Router# configure terminal
Router(config)# ipv6 unicast-routing
Router(config)#
```

Configure G0/0/0 (LAN A IPv6)

```
Router(config)# interface gigabitEthernet0/0/0
Router(config-if)# ipv6 address 2001:DB8:ACAD:1::1/64
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)#
```

Configure G0/0/1 (LAN A IPv6)

Router(config)# interface gigabitEthernet0/0/1

Router(config-if)# ipv6 address 2001:DB8:ACAD:2::1/64

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)#

Step 4 – PC Configuration

On each PC go to Desktop → IP Configuration and enter:

- IPv4 address
- Subnet mask
- Default gateway
- IPv6 address
- IPv6 default gateway

Step 5 – Connectivity Tests

Same LAN – LAN A:

- Ping PCB from PCA using IPv4
- Ping PCB from PCA using IPv6

Same LAN – LAN B:

- Ping PCE from PCD using IPv4

- Ping PCE from PCD using IPv6

Between LANs:

- Ping PCD from PCA using IPv4
- Ping PCD from PCA using IPv6
- Ping PCA from PCD using IPv4
- Ping PCA from PCD using IPv6

Questions

1. What class is the 192.168.10.0 network?
2. What class is the 172.16.0.0 network?
3. Why is ipv6 unicast-routing required?

Lab Completion Requirement

Demonstrate successful IPv4 and IPv6 communication within each LAN and between LANs.