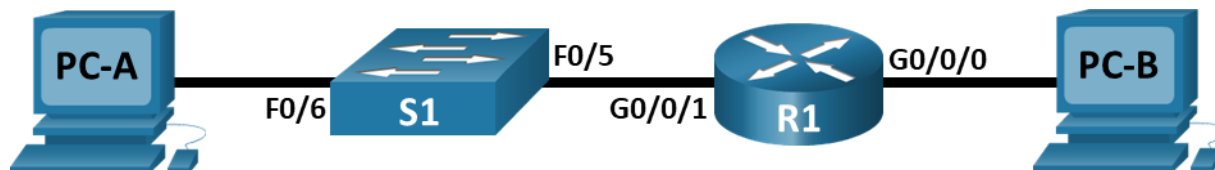# Packet Tracer - Configure IPv6 Addresses on Network Devices - Physical Mode

Topology

Addressing Table

Device	Interface	IPv6 Address	Prefix Length	Default Gateway
R1	G0/0/0	2001:db8:acad:a::1	64	N/A
	G0/0/1	2001:db8:acad:1::1	64	N/A
S1	VLAN 1	2001:db8:acad:1::b	64	N/A (fe80::1)
PC-A	NIC	2001:db8:acad:1::3	64	fe80::1
PC-B	NIC	2001:db8:acad:a::3	64	fe80::1

Objectives

Part 1: Set Up Topology and Configure Basic Router and Switch Settings

Part 2: Configure IPv6 Addresses Manually

Part 3: Verify End-to-End Connectivity

Background / Scenario

In this Packet Tracer Physical Mode (PTPM) activity, you will configure hosts and device interfaces with IPv6 addresses. You will issue **show** commands to view IPv6 unicast addresses. You will use **ping** and **traceroute** commands to verify end-to-end connectivity.

Instructions

Part 1: Cable the Network and Configure Basic Router and Switch Settings

In this part, you will cable the network, power the devices, and then configure the router and switch with basic device settings.

Step 1: Cable the network and power the devices.

Cable the network according to the topology. Power the devices as needed.

Step 2: Configure the router.

Assign the hostname and configure the basic device settings.

Step 3: Configure the switch.

Assign the hostname and configure the basic device settings.

Part 2: Configure IPv6 Addresses Manually

In this part, you will manually configure IPv6 addressing on all the devices in the network.

Step 1: Assign the IPv6 addresses to Ethernet interfaces on R1.

a. Assign the IPv6 global unicast addresses, listed in the Addressing Table, to both Ethernet interfaces on R1.

b. Verify that the correct IPv6 unicast address is assigned to each interface.

   Note: The link-local address (fe80::) displayed is based on EUI-64 addressing, which automatically uses the interface Media Access Control (MAC) address to create a 128-bit IPv6 link-local address.

c. To get the link-local address to match the global unicast address on the interface, manually enter the link-local addresses on each of the Ethernet interfaces on R1.

   Note: Each router interface belongs to a separate network. Packets with a link-local address never leave the local network; therefore, you can use the same link-local address on both interfaces.

d. Use a command of your choice to verify that the link-local address has been changed to **fe80::1.**

   Which two multicast groups have been assigned to interface G0/0/0?

Step 2: Enable IPv6 routing on R1.

a. From a PC-B command prompt, enter the **ipconfig** command to examine the IPv6 address information assigned to the PC interface.

   Has an IPv6 unicast address been assigned to the network interface card (NIC) on PC-B?

b. Use the **IPv6 unicast-routing** command to enable IPv6 routing on R1.

c. Use a command to verify the new multicast group is assigned to interface G0/0/0. Notice that the all-router multicast group (ff02::2) now appears for interface G0/0/0.

   Note: This will allow the PCs to obtain the IP address and default gateway information automatically using Stateless Address Autoconfiguration (SLAAC).

d. Now that R1 is part of the all-router multicast group FF02::2, from PC-B re-issue the **ipconfig** command and examine the IPv6 address information.

   Why did PC-B receive the Global Routing Prefix and Subnet ID that you configured on R1?

Step 3: Assign IPv6 addresses to the management interface (SVI) on S1.

a. Assign the IPv6 address for S1. Also assign a link-local address for this interface.

   Note: The switch will automatically receive its default gateway address from the RA message sent by the router. It will use the source IPv6 address of the RA message, which is the router's link-local address. However, your version of Packet Tracer may not yet support this on the switch.

b. Use a command of your choice to verify that the IPv6 addresses are properly assigned to the management interface.

Step 4: Assign static IPv6 addresses to the PCs.

    a.   Open the **IP Configuration** window on each PC and assign IPv6 addressing.

    b.   Verify both PCs have the correct IPv6 address information. Each PC should have two Global IPv6 addresses: one static and one SLAAC.

Part 3: Verify End-to-End Connectivity

    a.   From PC-A, ping **fe80::1**. This is the link-local address assigned to G0/0/1 on R1.

    b.   From PC-A, use the **tracert** command to verify that you have end-to-end connectivity to PC-B.

    c.   From PC-B, ping PC-A.

    d.   From PC-B, ping the link-local address for G0/0/0 on R1.

Note: If end-to-end connectivity is not established, troubleshoot your IPv6 address assignments to verify that you entered the addresses correctly on all devices.

Reflection Questions

1.   Why can the same link-local address, fe80::1, be assigned to both Ethernet interfaces on R1?

2.   What is the Subnet ID of the IPv6 unicast address 2001:db8:acad::aaaa:1234/64, if the global routing prefix is a /48?