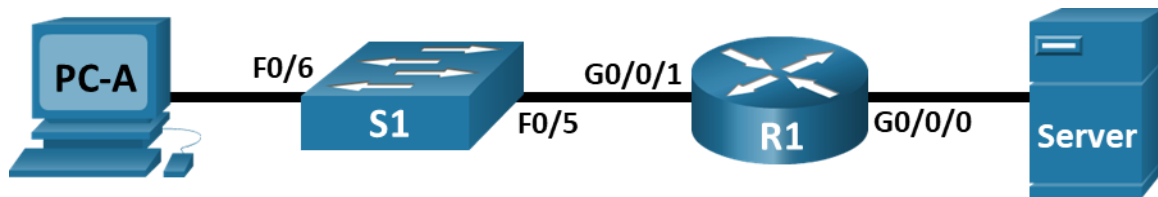


## Packet Tracer - Configure Basic Router Settings - Physical Mode

### Topology



### Addressing Table

Device	Interface	IP Address / Prefix	Default Gateway
R1	G0/0/0	192.168.0.1 /24	N/A
		2001:db8:acad::1 /64	
		fe80::1	
	G0/0/1	192.168.1.1 /24	
		2001:db8:acad:1::1 /64	
		fe80::1	
	Loopback0	10.0.0.1 /24	
		2001:db8:acad:2::1 /64	
		fe80::1	
PC-A	NIC	192.168.1.10 /24	192.168.1.1
		2001:db8:acad:1::10 /64	fe80::1
Server	NIC	192.168.0.10 /24	192.168.0.1
		2001:db8:acad::10 /64	fe80::1

### Objectives

**Part 1: Set Up the Topology and Initialize Devices**

**Part 2: Configure Devices and Verify Connectivity**

**Part 3: Display Router Information**

### Background / Scenario

This is a comprehensive Packet Tracer Physical Mode (PTPM) activity to review previously covered IOS router commands. In Parts 1 and 2, you will cable the equipment and complete basic configurations and interface settings on the router.

In Part 3, you will use SSH to connect to the router remotely and use the IOS commands to retrieve information from the device to answer questions about the router.

For review purposes, this activity provides the commands necessary for specific router configurations.

### Instructions

#### Part 1: Set Up the Topology and Initialize Devices

##### Step 1: Cable the network as shown in the topology.

- Click and drag the **Cisco 4321 ISR**, the **Cisco 2960 Switch**, and the **Server** from the **Shelf** to the **Rack**.
- Click and drag the **PC** from the **Shelf** to the **Table**.
- Cable the devices as specified in the topology diagram. Use **Copper Straight-through** cables for network connections.
- From the **PC**, connect a **Console Cable** to the **Cisco 4321 ISR**.
- Power on the **Cisco 4321 ISR**, **PC-A**, and **Server**. The power button for **Server** is on the bottom right. The 2960 switch should power on automatically.

#### Part 2: Configure Devices and Verify Connectivity

##### Step 1: Configure the PC interfaces.

- Configure the IP address, subnet mask, and default gateway settings on **PC-A**.
- Configure the IP address, subnet mask, and default gateway settings on **Server**.

##### Step 2: Configure the router.

- Console into the router and enable privileged EXEC mode.
- Enter configuration mode.
- Assign a device name to the router.
- Set the router's domain name as ccna-lab.com.
- Encrypt the plaintext passwords.
- Configure the system to require a minimum 12-character password.
- Configure the username **SSHadmin** with an encrypted password of **55Hadm!n2020**.
- Generate a set of crypto keys with a 1024 bit modulus.
- Assign **\$cisco!PRIV\*** as the privileged EXEC password.
- Assign **\$cisco!!CON\*** as the console password. Configure sessions to disconnect after four minutes of inactivity, and enable login.
- Assign **\$cisco!!VTY\*** as the vty password. Configure the vty lines to accept SSH connections only. Configure sessions to disconnect after four minutes of inactivity, and enable login using the local database.
- Create a banner that warns anyone accessing the device that unauthorized access is prohibited.
- Enable IPv6 routing.
- Configure all three interfaces on the router with the IPv4 and IPv6 addressing information from the addressing table above. Configure all three interfaces with descriptions. Activate all three interfaces.  
  
The router should not allow vty logins for two minutes if three failed login attempts occur within 60 seconds.
- Set the clock on the router.

- p. Save the running configuration to the startup configuration file.

What would be the result of reloading the router prior to completing the **copy running-config startup-config** command?

It saves the running config into NVRAM

### Step 3: Verify network connectivity.

- a. Using the command line at **PC-A**, ping the IPv4 and IPv6 addresses for **Server**.

Were the pings successful?

Yes

- b. From **PC-A**, remotely access **R1** using the Telnet / SSH client.

Using the Telnet / SSH client on PC-A, open an SSH session to the R1 Loopback interface IPv4 address. Ensure that the Connection Type is set to **SSH** and use **SSHadmin** as the username. When prompted, enter the password **55Hadm!n2020**.

Was remote access successful?

Yes

- c. Using the Telnet / SSH client on **PC-A**, open an SSH session to the R1 Loopback interface IPv6 address. Ensure that the Connection Type is set to **SSH** and use **SSHadmin** as the username. When prompted, enter the password **55Hadm!n2020**.

Was remote access successful?

Yes

Why is the Telnet protocol considered to be a security risk?

Telnet sessions are not encrypted

## Part 3: Display Router Information

In Part 3, you will use **show** commands from an SSH session to retrieve information from the router.

### Step 1: Establish an SSH session to R1.

Using Telnet / SSH client on PC-A, open an SSH session to the R1 Loopback interface IPv6 address and log in as **SSHadmin** with the password **55Hadm!n2020**.

### Step 2: Retrieve important hardware and software information.

- a. Use the **show version** command to answer questions about the router.

What is the name of the IOS image that the router is running?

isr4300-universalk9.03.16.05.S.155-3.S5-ext.SPA.bin

How much non-volatile random-access memory (NVRAM) does the router have?

32768K bytes

How much Flash memory does the router have?

3223551K bytes

- b. The **show** commands often provide multiple screens of outputs. Filtering the output lets you display certain sections of the output. To enable the filtering command, enter a pipe (|) character after a **show** command, followed by a filtering parameter and a filtering expression. You can match the output to the

filtering statement by using the **include** keyword to display all lines from the output that contain the filtering expression. Filter the **show version** command, using **show version | include register** to answer the following question.

What would be the boot process for the router on the next reload if the configuration register was 0x2142?

The router will bypass startup-config and begin in user-mode

### Step 3: Display the startup configuration.

- a. Use the **show startup-config** command on the router to answer the following question.

How are passwords presented in the output?

Passwords are encrypted with the service password-encryption command.

- b. Use the **show running-config | section vty** command.

What is the result of using this command?

Shows the config section specified

### Step 4: Display the routing table on the router.

Use the **show ip route** command on the router to answer the following questions.

What code is used in the routing table to indicate a directly connected network?

The C designates a directly connected subnet. An L designates a local interface.

How many route entries are coded with a C code in the routing table?

3

### Step 5: Display a summary list of the interfaces on the router.

- a. Use the **show ip interface brief** command on the router to answer the following question.

What command changed the status of the Gigabit Ethernet ports from administratively down to up?  
no shutdown

- b. Use the **show ipv6 int brief** command to verify IPv6 settings on R1.

What is the meaning of the [up/up] part of the output?

up/up refers to the layer 1 & 2 status

- c. On **Server**, change its configuration so that it no longer has a static IPv6 address. Then, issue the **ipconfig** command on **Server** to examine the IPv6 configuration.

What is the IPv6 address assigned to Server?

2001:DB8:ACAD::1/64

What is the default gateway assigned to **Server**?

FE80::2E0:B0FF:FE15:4201

From **PC-B**, issue a ping to the **R1** default gateway link local address. Was it successful?

Yes

From **Server**, issue a ping to the **R1** IPv6 unicast address 2001:db8:acad::1. Was it successful?

Yes

## Reflection Questions

1. In researching a network connectivity issue, a technician suspects that an interface was not enabled. What **show** command could the technician use to troubleshoot this issue?  
  
show ip interface brief
2. In researching a network connectivity issue, a technician suspects that an interface was assigned an incorrect subnet mask. What **show** command could the technician use to troubleshoot this issue?  
  
show running-config