Polytechnic University of Puerto Rico

Department of Electrical Engineering

Hato Rey

Module 8 Project COE 4331

Computer Networks Laboratory

January 4, 2025

Schmidt Montilla, Coral S., Student ID: 148830

Professor: Juan Tovar

Table of Contents

Introduction

       This lab focused on configuring and verifying the initial settings of a router using Cisco Packet Tracer. The primary objective was to establish a secure and functional router configuration by setting up hostname, banners, and passwords, and saving the configuration to prevent data loss during power failures. The activity emphasized hands-on application of network concepts, such as managing access permissions and ensuring secure communication. Through step-by-step guidance and exploration of router settings, this lab reinforced foundational knowledge of network device configuration while offering practical experience in handling real-world scenarios.

Method

Packet Tracer - Configure Initial Router Settings

Objectives

Part 1: Verify the Default Router Configuration

Part 2: Configure and Verify the Initial Router Configuration

Part 3: Save the Running Configuration File

Background

In this activity, you will perform basic router configuration tasks. You will secure access to the CLI and console port using encrypted and plain-text passwords. You will also configure messages for users who are logging into the router. These banners warn unauthorized users that access is prohibited. Finally, you will verify and save your running configuration.

Instructions

a. Verify the Default Router Configuration

Establish a console connection to R1.

Choose a **Console** cable from the available connections.

Click **PCA** and select **RS 232**.

Click **R1** and select **Console**.

Click **PCA** > **Desktop** tab > **Terminal**.

Click **OK** and press **ENTER**. You are now able to configure **R1**.

Enter privileged mode and examine the current configuration.

You can access all the router commands from privileged EXEC mode. However, because many of the privileged commands configure operating parameters, privileged access should be password-protected to prevent unauthorized use.

Enter privileged EXEC mode by entering the **enable** command.

```
Router> enable
Router#
```

- Notice that the prompt changed in the configuration to reflect privileged EXEC mode.

Enter the **show running-config** command.

```
Router# show running-config
```

- What is the router's hostname?

  The routers' host name is Router.

- How many Fast Ethernet interfaces does the Router have?

  The router has 4 Fast Ethernet interfaces (FastEthernet0/1/0, FastEthernet0/1/1, FastEthernet0/1/2, FastEthernet0/1/3).

- How many Gigabit Ethernet interfaces does the Router have?

  The router has 2 Gigabit Ethernet interfaces (GigabitEthernet0/0, GigabitEthernet0/1).

- How many Serial interfaces does the router have?

  <u>The router has 2 Serial interfaces (Serial0/0/0, Serial0/0/1).</u>

- What is the range of values shown for the vty lines?

  <u>The range of vty lines is 0 4.</u>

Display the current contents of NVRAM.

```
Router# show startup-config
startup-config is not present
```

- Why does the router respond with the **startup-config is not present** message?

  <u>The router responds with the message "startup-config is not present" because there has not been a configuration saved to the router's Non-Volatile Random Access Memory (NVRAM).</u>

b. Configure and Verify the Initial Router Configuration

To configure parameters on a router, you may be required to move between various configuration modes. Notice how the prompt changes as you navigate through the IOS configuration modes.

Configure the initial settings on R1.

Note: If you have difficulty remembering the commands, refer to the content for this topic. The commands are the same as you configured on a switch.

- b. Configure **R1** as the hostname.
- c. Configure Message of the day text: **Unauthorized access is strictly prohibited.**
- d. Encrypt all plain text passwords.
- Use the following passwords:
- Privileged EXEC, unencrypted: **cisco**
- Privileged EXEC, encrypted: **itsasecret**
- Console: **letmein**

Verify the initial settings on R1.

Verify the initial settings by viewing the configuration for R1.

- What command do you use?
  <u>show running-config</u>

Exit the current console session until you see the following message:

```
R1 con0 is now available


Press RETURN to get started.
```

Press **ENTER**; you should see the following message:

```
Unauthorized access is strictly prohibited.


User Access Verification


Password:
```

- Why should every router have a message-of-the-day (MOTD) banner

  An MOTD banner provides important information to users logging into the router, such as a warning that unauthorized access is prohibited. This acts as a legal notice and can deter unauthorized users.

- If you are not prompted for a password before reaching the user EXEC prompt, what console line command did you forget to configure?

  You forgot to configure the login command under the console line.

Enter the passwords necessary to return to privileged EXEC mode.

- Why would the **enable secret** password allow access to the privileged EXEC mode and **the enable password** no longer be valid?

  The enable secret password takes precedence over the enable password because it is stored in an encrypted format. If both are configured, the router uses the enable secret password and ignores the enable password.

- If you configure any more passwords on the router, are they displayed in the configuration file as plain text or in encrypted form? Explain.

  They are displayed in encrypted form if the service password-encryption command has been configured. This command encrypts all plaintext passwords in the configuration file to enhance security.

c. Save the Running Configuration File

Save the configuration file to NVRAM.

You have configured the initial settings for **R1**. Now back up the running configuration file to NVRAM to ensure that the changes made are not lost if the system is rebooted or loses power.

- What command did you enter to save the configuration to NVRAM?

  The command I entered was copy running-config startup-config.

- What is the shortest, unambiguous version of this command?

  The shortest, unambiguous version of this command is copy run start.

Optional: Save the startup configuration file to flash.

Although you will be learning more about managing the flash storage in a router in later chapters, you may be interested to know that, as an added backup procedure, you can save your startup configuration file to flash. By default, the router still loads the startup configuration from NVRAM, but if NVRAM becomes corrupt, you can restore the startup configuration by copying it over from flash.

Complete the following steps to save the startup configuration to flash.

Examine the contents of flash using the **show flash** command:

```
R1# show flash
```

- How many files are currently stored in flash?

- Which of these files would you guess is the IOS image?

  The file with an .bin extension is likely the IOS image.

- Why do you think this file is the IOS image?

IOS images typically have the .bin extension and are stored in flash memory as the operating system for the router. This file is necessary for the router to boot.
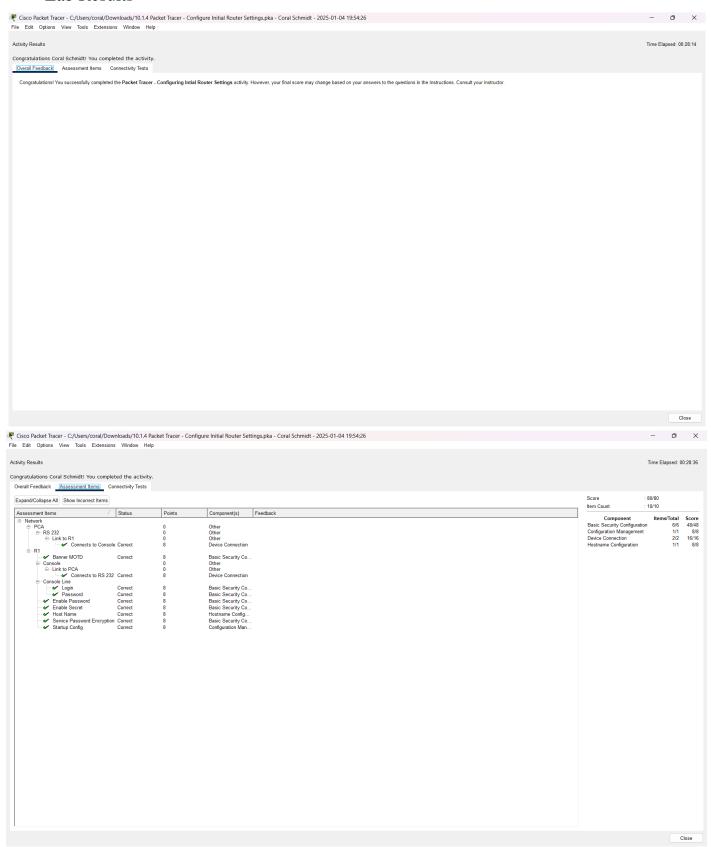
```
R1# copy startup-config flash
Destination filename [startup-config]
```

- The router prompts you to store the file in flash using the name in brackets. If the answer is yes, then press **ENTER**; if not, type an appropriate name and press **ENTER**.

Use the **show flash** command to verify the startup configuration file is now stored in flash.

Lab Results

Conclusion

      The lab provided valuable insight into the process of configuring and securing a router's initial settings. By following the steps to set up hostnames, banners, and passwords, and save configurations to NVRAM, we ensured the router was both functional and secure. The use of tools like Cisco Packet Tracer allowed for a practical understanding of the importance of safeguarding configurations and preparing for potential system reboots. This exercise not only strengthened technical skills in router setup but also highlighted the significance of proper configuration in maintaining a stable and secure network environment.

References

[1] P. Tracer, "10.1.4 Packet Tracer - Configure Initial Router Settings," *YouTube*, Jul. 09, 2020. Available: https://www.youtube.com/watch?v=9bXQStByy8Y. [Accessed: Jan. 04, 2025]

[2] P. Tracer, "Packet Tracer 10.1.4 - Configure Initial Router Settings," *YouTube*, Nov. 09, 2020. Available: https://www.youtube.com/watch?v=W0zBugooJyA. [Accessed: Jan. 04, 2025]

[3] "Week 5 Routers and Routing protocols configuration," *Blackboard.com*, 2025. Available: https://alt-5dae0b35612af.blackboard.com/bbcswebdav/pid-3044479-dt-content-rid-28912521_1/courses/COE4331-Base-Ultra/Module%2007/Lesson%201/Subtheme%202/index.html?one_hash=59B977037FE81E1568743CA8FCADA8AB&f_hash=CD0BC27D2929F84A1F308A2FAE929D77. [Accessed: Jan. 04, 2025]