CMPE 305 Data and Digital Communication

MP3 – Basic Switch and OSI Model

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BSCPE 3-3

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2.5.5 – Configure Initial Switch Settings

Objectives

Part 1: Verify the Default Switch Configuration

Part 2: Configure a Basic Switch Configuration

Part 3: Configure a MOTD Banner

Part 4: Save Configuration Files to NVRAM

Part 5: Configure S2

Background / Scenario

In this activity, you will perform basic switch configuration tasks. You will secure access to the command-line interface (CLI) and console ports using encrypted and plain text passwords. You will also learn how to configure messages for users logging into the switch. These message banners are also used to warn unauthorized users that access is prohibited.

Note: In Packet Tracer, the Catalyst 2960 switch uses IOS version 12.2 by default. If required, the IOS version can be updated from a file server in the Packet Tracer topology. The switch can then be configured to boot to IOS version 15.0, if that version is required.

Instructions

Part 1: Verify the Default Switch Configuration

Step 1: Enter privileged EXEC mode.

You can access all switch 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.

The privileged EXEC command set includes the commands available in user EXEC mode, many additional commands, and the configure command through which access to the configuration modes is gained.

a. Click S1 and then the CLI tab. Press Enter.

b. Enter privileged EXEC mode by entering the enable command:

Open Configuration Window for S1

Switch> enable

Switch#

Notice that the prompt changed to reflect privileged EXEC mode.

Step 2: Examine the current switch configuration.

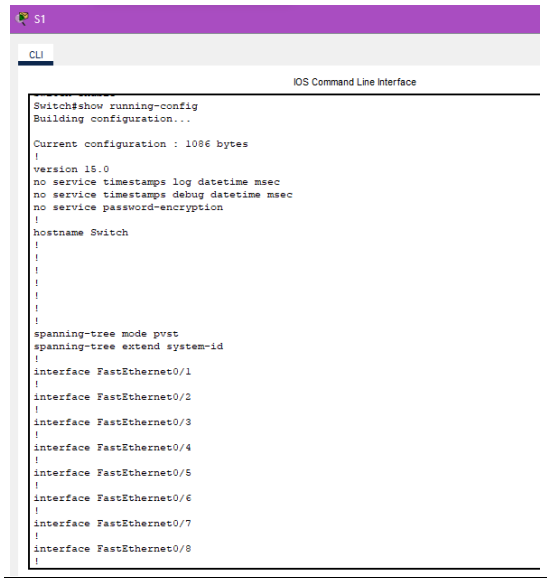
Enter the show running-config command.

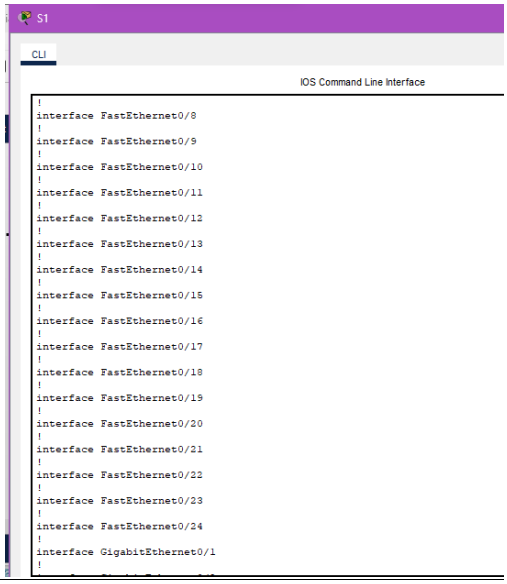
Switch# **show running-config**

Answer the following questions:

1. How many Fast Ethernet interfaces does the switch have? 24 Fast Ethernet interfaces
2. How many Gigabit Ethernet interfaces does the switch have? 2 Gigabit Ethernet interfaces
3. What is the range of values shown for the vty lines? The vty lines are configured in two ranges: **0 to 4** and **5 to 15**

4. Which command will display the current contents of non-volatile random-access memory (NVRAM)? show startup-config
5. Why does the switch respond with “startup-config is not present? The switch responds with “**startup-config is not present**” when you use the show startup-config command because the running configuration has **not been saved to NVRAM**. The running-config is the configuration currently in use, stored in RAM. Unless a network administrator explicitly saves it with the copy running-config startup-config command, it won't be in NVRAM. Therefore, if the switch were to lose power, it would boot up with its default configuration, not the one shown in the running-config.





Part 2: Create a Basic Switch Configuration

Step 1: Assign a name to a switch.

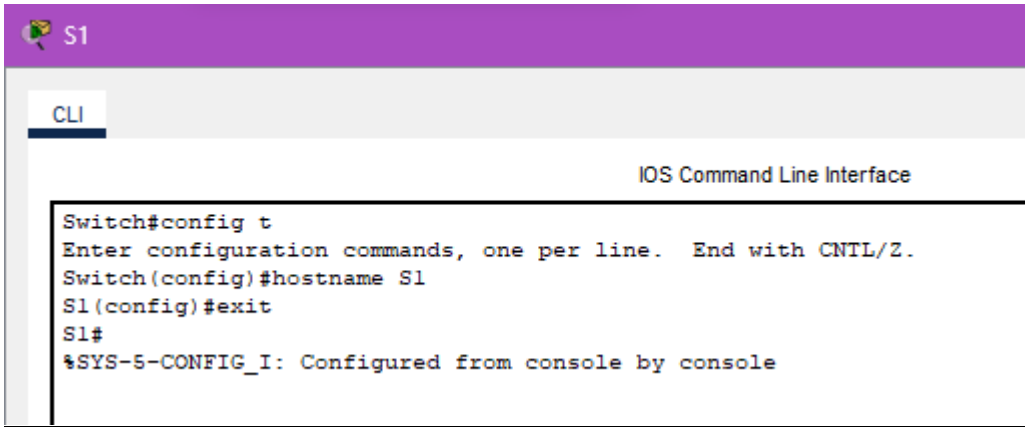
To configure parameters on a switch, you may be required to move between various configuration modes. Notice how the prompt changes as you navigate through the switch.

Switch# configure terminal

Switch(config)# hostname S1

S1(config)# exit

S1#



Step 2: Secure access to the console line.

To secure access to the console line, access config-line mode and set the console password to **letmein**.

S1# **configure terminal**

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)# **line console 0**

S1(config-line)# **password letmein**

S1(config-line)# **login**

S1(config-line)# **exit**

S1(config)# **exit**

%SYS-5-CONFIG_I: Configured from console by console

S1#

Question: Why is the **login** command required? The **login** command is required because it **activates the password checking** for that specific line. Without the login command, the password letmein command is just an entry in the configuration, but it's not being enforced.

```
S1>en
S1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#line console 0
S1(config-line)#password letmein
S1(config-line)#login
S1(config-line)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

Step 3: Verify that console access is secured.

Exit privileged mode to verify that the console port password is in effect.

S1# **exit**

Switch con0 is now available

Press RETURN to get started.

User Access Verification

Password:

S1>

Note: If the switch did not prompt you for a password, then you did not configure the **login** parameter in Step 2.

```
User Access Verification

Password:

S1>
```

Step 4: Secure privileged mode access.

Set the **enable** password to **c1$c0**. This password protects access to privileged mode.

Note: The **0** in **c1$c0** is a zero, not a capital O. This password will not grade as correct until after you encrypt it in Step 8.

S1> **enable**

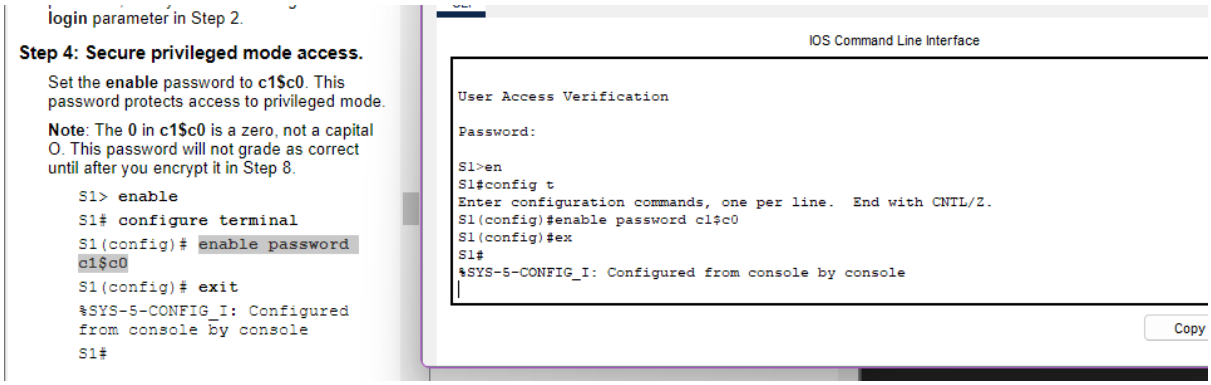
S1# **configure terminal**

S1(config)# **enable password c1$c0**

S1(config)# **exit**

%SYS-5-CONFIG_I: Configured from console by console

S1#



Step 5: Verify that privileged mode access is secure.

a. Enter the **exit** command again to log out of the switch.

b. Press **<Enter>** and you will now be asked for a password:

User Access Verification

Password:

c. The first password is the console password you configured for **line con 0**. Enter this password to return to user EXEC mode.

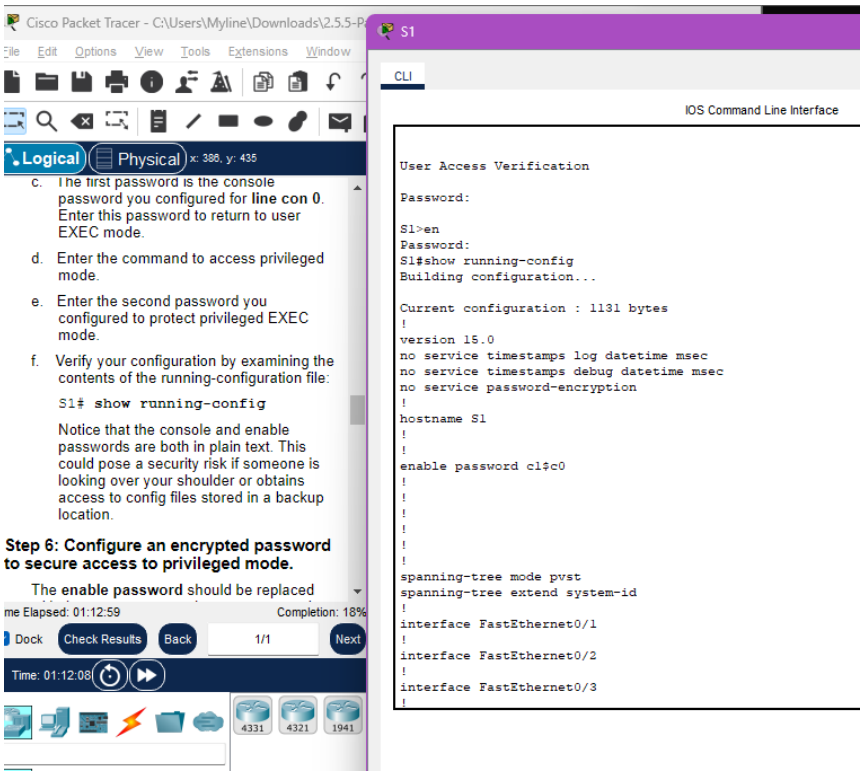
d. Enter the command to access privileged mode.

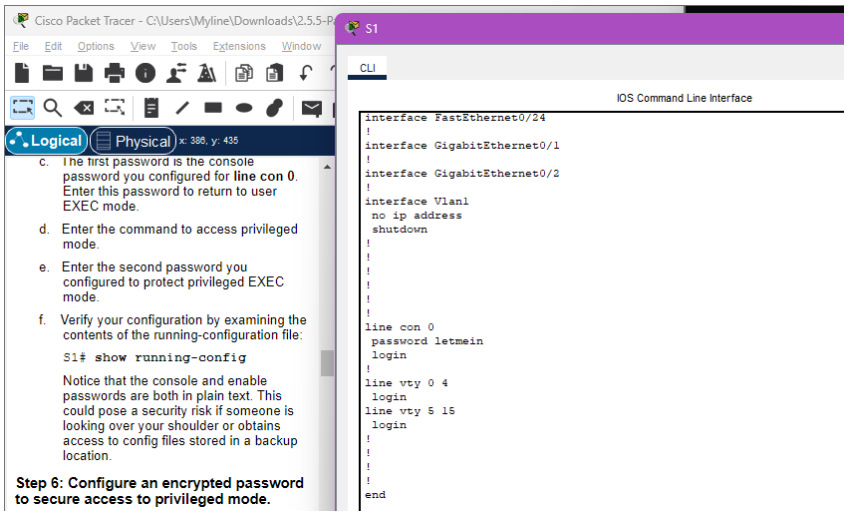
e. Enter the second password you configured to protect privileged EXEC mode.

f. Verify your configuration by examining the contents of the running-configuration file:

S1# **show running-config**

Notice that the console and enable passwords are both in plain text. This could pose a security risk if someone is looking over your shoulder or obtains access to config files stored in a backup location.





Step 6: Configure an encrypted password to secure access to privileged mode.

The **enable password** should be replaced with the newer encrypted secret password using the **enable secret** command. Set the enable secret password to **itsasecret**.

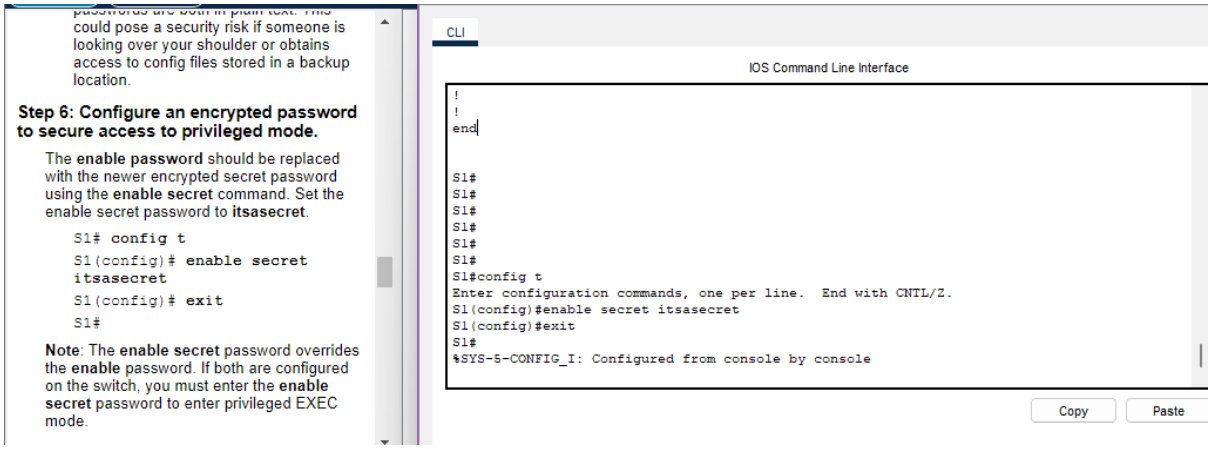
S1# **config t**

S1(config)# **enable secret itsasecret**

S1(config)# **exit**

S1#

Note: The **enable secret** password overrides the **enable** password. If both are configured on the switch, you must enter the **enable secret** password to enter privileged EXEC mode.



Step 7: Verify that the enable secret password is added to the configuration file.

Enter the show running-config command again to verify the new enable secret password is configured.

Note: You can abbreviate **show running-config** as

S1# **show run**

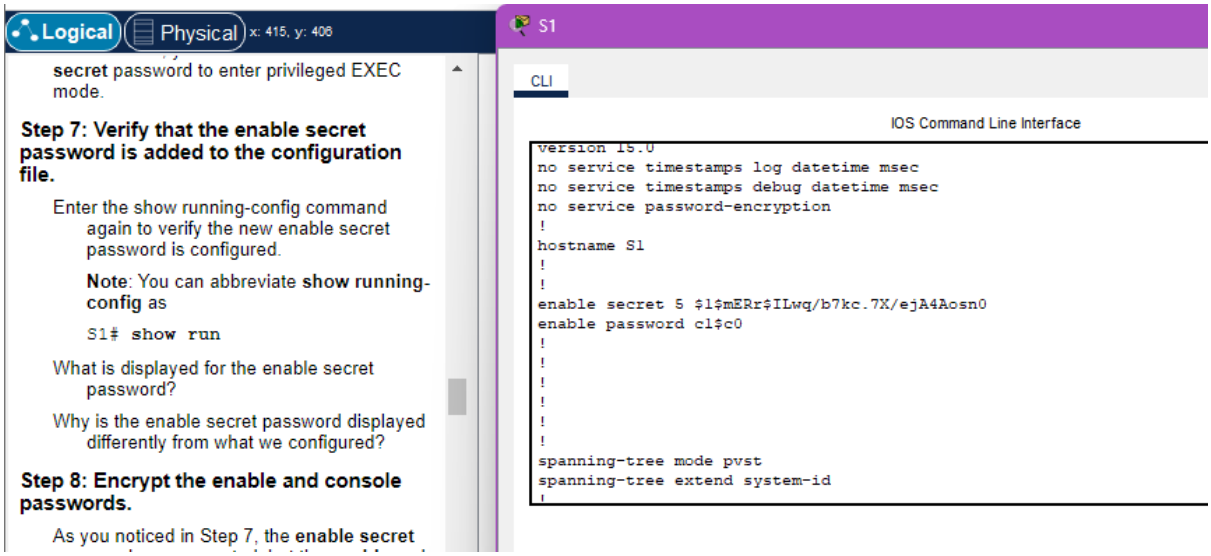
Questions:

What is displayed for the enable secret password?

enable secret 5 1mERr$ILwq/b7kc.7X/ejA4Aosn0

Why is the enable secret password displayed differently from what we configured?

The enable secret password is displayed differently because it is **encrypted using a strong, one-way cryptographic hash function**. The 5 in the output indicates that it's using the **SHA-1** algorithm, which is a much more secure method than the older, unencrypted enable password command. This hashing process converts the password you entered into an irreversible scrambled string. It's designed this way so that if someone gains access to the configuration file, they cannot simply read the password in plain text. This is a crucial security measure to protect against unauthorized access.



Step 8: Encrypt the enable and console passwords.

As you noticed in Step 7, the **enable secret** password was encrypted, but the **enable** and **console** passwords were still in plain text. We will now encrypt these plain text passwords using the **service password-encryption** command.

S1# **config t**

S1(config)# **service password-encryption**

S1(config)# **exit**

Question: If you configure any more passwords on the switch, will they be displayed in the configuration file as plain text or in encrypted form? Explain.

They will be displayed in **encrypted form**. The service password-encryption command automatically applies a weak encryption to any new plaintext passwords you configure after it's been enabled.

The command works as a global setting. Once you run service password-encryption, it affects all future passwords you create that would normally be saved in plain text, such as password, line, and VTY passwords. It **does not affect** the enable secret password, which is already encrypted with a much stronger algorithm. While this encryption is a weak, easily reversible type, it's a basic security step to prevent someone from viewing your passwords by simply looking at the configuration file.

Step 8: Encrypt the enable and console passwords.

As you noticed in Step 7, the **enable secret** password was encrypted, but the **enable** and **console** passwords were still in plain text. We will now encrypt these plain text passwords using the **service password-encryption** command.

```
S1# config t
S1(config)# service password-encryption
S1(config)# exit
```

If you configure any more passwords on the switch, will they be displayed in the configuration file as plain text or in encrypted form? Explain.

IOS Command Line Interface

```
!
end


S1#
S1#
S1#
S1#
S1#
S1#
S1#
S1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#service password-encryption
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

Part 3: Configure a MOTD Banner

Step 1: Configure a message of the day (MOTD) banner.

The Cisco IOS command set includes a feature that allows you to configure messages that anyone logging onto the switch sees. These messages are called message of the day, or MOTD banners. Enclose the banner text in quotations or use a delimiter different from any character appearing in the MOTD string.

S1# **config t**

S1(config)# **banner motd "This is a secure system. Authorized Access Only!"**

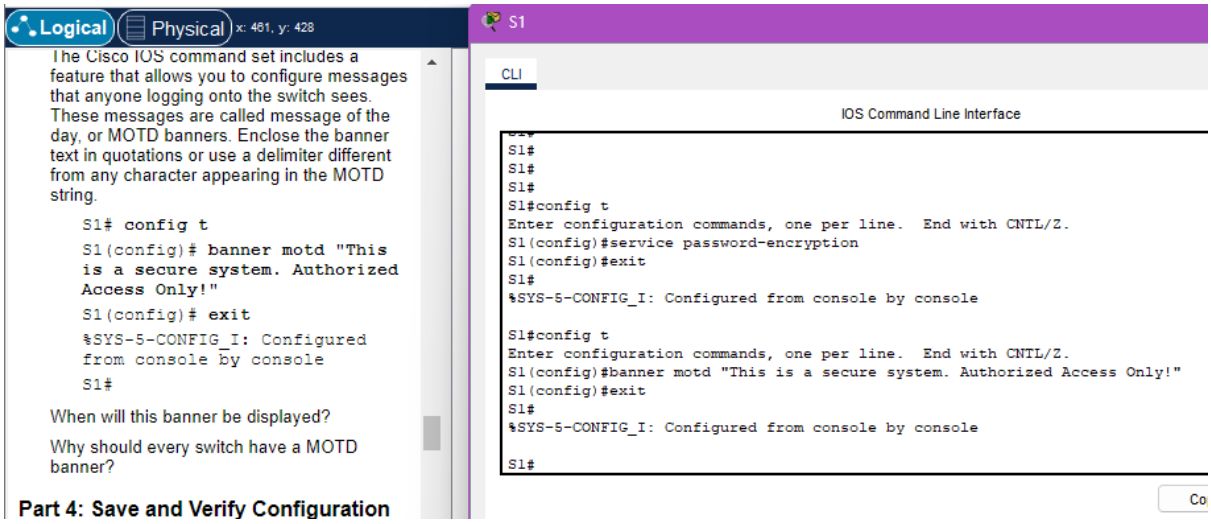
S1(config)# **exit**

%SYS-5-CONFIG_I: Configured from console by console

S1#

Questions:

1. When will this banner be displayed? The MOTD banner will be displayed **before a user logs in** to the switch. It appears right after the "Press RETURN to get started" prompt and before any password or login prompts.
2. Why should every switch have a MOTD banner? Every switch should have a MOTD banner because it's a **legal warning to unauthorized users**. A MOTD banner serves as a clear notice that the device is a private, secure system and that only authorized personnel should attempt to access it. Without a banner, it can be more difficult to prosecute unauthorized access. It acts as a digital "No Trespassing" sign, helping to protect the organization legally by establishing that any unauthorized access is a deliberate violation.



Part 4: Save and Verify Configuration Files to NVRAM

Step 1: Verify that the configuration is accurate using the show run command.

Save the configuration file. You have completed the basic configuration of the switch. 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.

S1# **copy running-config startup-config**

Destination filename [startup-config]?**[Enter]**

Building configuration...

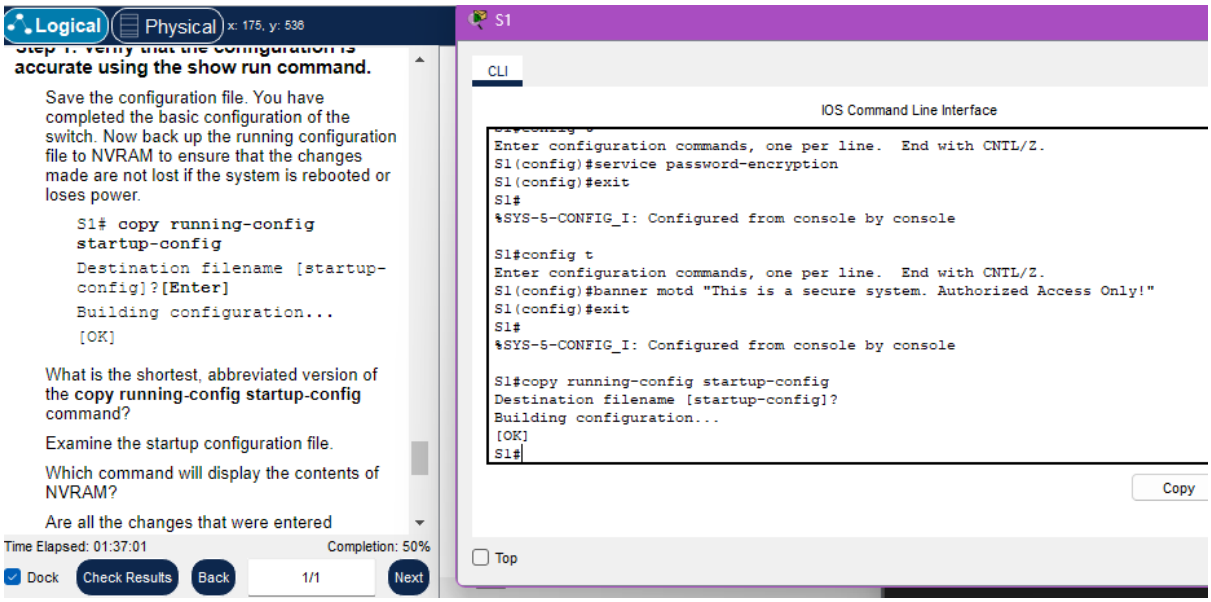
[OK]

Questions:

1. What is the shortest, abbreviated version of the **copy running-config startup-config** command? copy run start

Examine the startup configuration file.

2. Which command will display the contents of NVRAM? show startup-config (or its abbreviation, show start).
3. Are all the changes that were entered recorded in the file? Yes, all the changes that were entered are recorded in the startup configuration file. This is because the copy running-config startup-config command explicitly saves the **current, active configuration** (running-config) to the **non-volatile memory** (NVRAM), where it becomes the startup configuration. The [OK] message confirms the successful transfer. This ensures that any changes, like hostname, passwords, and banners, will be preserved even if the switch is rebooted or loses power.



Part 5: Configure S2

You have completed the configuration on S1. You will now configure S2. If you cannot remember the commands, refer to Parts 1 to 4 for assistance.

Configure S2 with the following parameters:

a. Device name: **S2**

b. Protect access to the console using the **letmein** password.

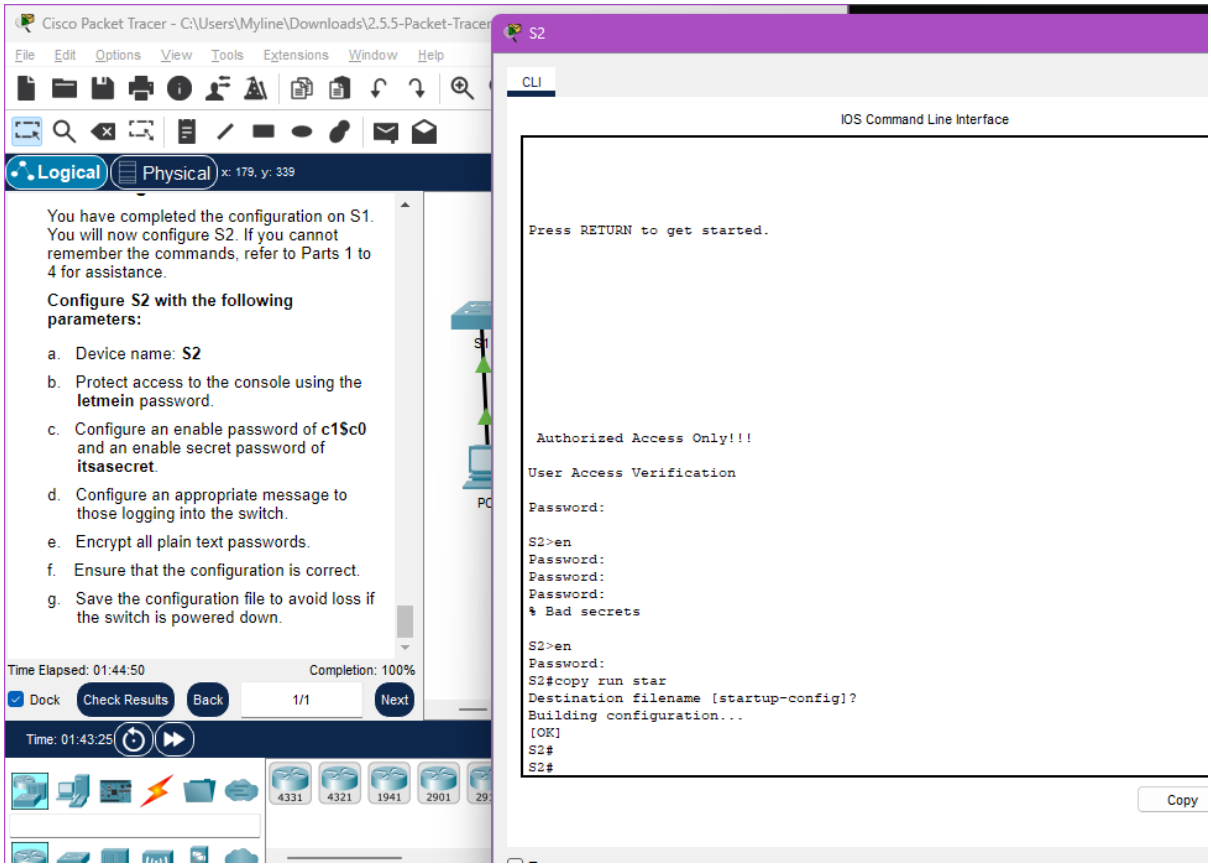
c. Configure an enable password of **c1$c0** and an enable secret password of **itsasecret**.

d. Configure an appropriate message to those logging into the switch.

e. Encrypt all plain text passwords.

f. Ensure that the configuration is correct.

g. Save the configuration file to avoid loss if the switch is powered down.



Completion: 100%