



Instituto Politécnico Nacional

Escuela Superior de Cómputo



Practica 2.3. VLAN

Materia:

Administración de servicios en red

Grupo:

4CV13

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Fecha:

jueves, 31 de marzo de 2022

Activity 2.3.8: Configuring Basic Switch Management

NOTE TO USER: Although you can complete this activity without printed instructions, a PDF version is available on the text side of the same page from which you launched this activity.

Addressing Table

Device	Interface	IP Address	Subnet Mask
S1	VLAN99	172.17.99.11	255.255.255.0
PC1	NIC	172.17.99.21	255.255.255.0
Server	NIC	172.17.99.31	255.255.255.0

Learning Objectives

- Connect to the switch using a console connection
- Navigate through various CLI modes
- Use the Help Facility to configure the clock
- Access and configure command history
- Configure the boot sequence
- Configure a PC and connect it to a switch
- Configure full duplex
- Manage the MAC address table
- Manage the switch configuration file

Introduction:

Basic switch management is the foundation for configuring switches. This activity focuses on navigating command-line interface modes, using help functions, accessing the command history, configuring boot sequence parameters, setting speed and duplex settings, as well as managing the MAC address table and switch configuration file. Skills learned in this activity are necessary for configuring basic switch security in later chapters.

Task 1: Connect to the Switch

Step 1. Connect S1 and PC1.

- Using a console cable, connect the RS 232 interface on PC1 to the console interface on switch S1.
- Click **PC1** and then click the **Desktop** tab. Select **Terminal** in the Desktop tab.
- Keep these default settings for Terminal Configuration and then click **OK**:
 - Bits Per Second = 9600
 - Data Bits = 8
 - Parity = None
 - Stop Bits = 1
 - Flow Control = None
- You are now consoled into S1. Press **Enter** to get the Switch prompt.

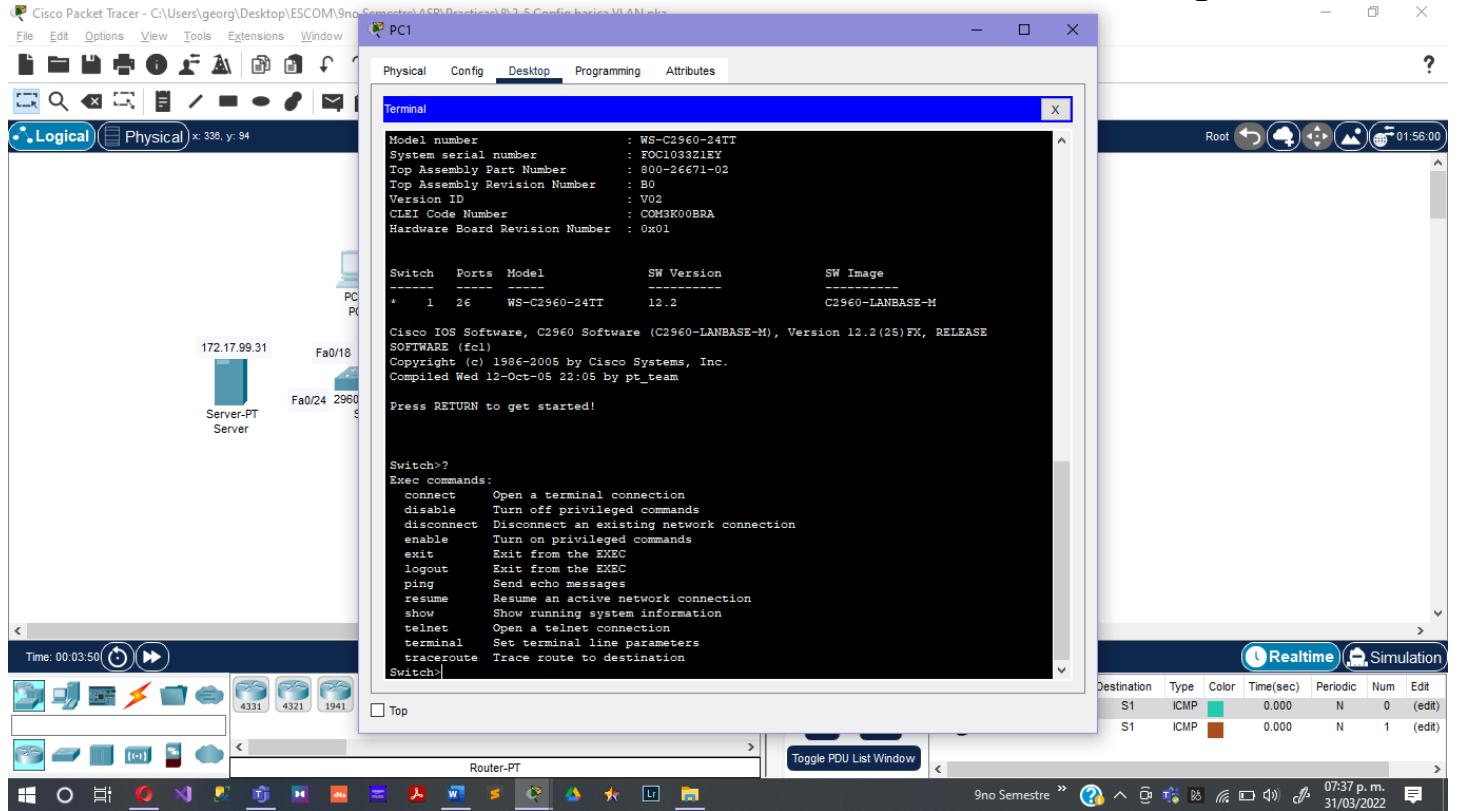
Step 2. Check results.

Your completion percentage should be 6%. If not, click Check Results to see which required components are not yet completed.

Task 2: Navigate Through CLI Modes

Step 1. In user EXEC mode, type ?. Note the list of available commands.

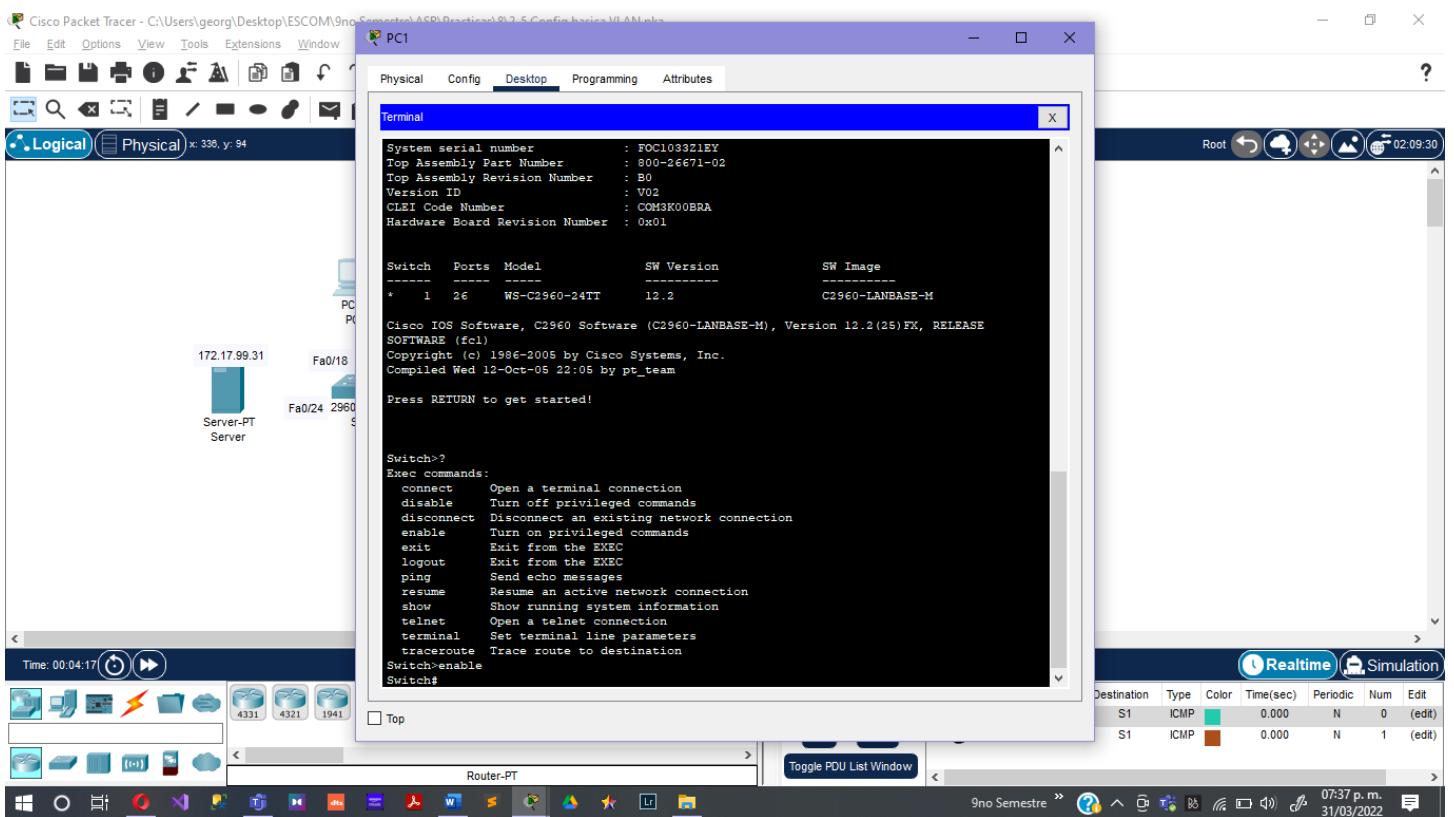
While in user EXEC mode, the available commands are limited to basic monitoring commands.



Step 2. Use the enable command to go to privileged EXEC mode.

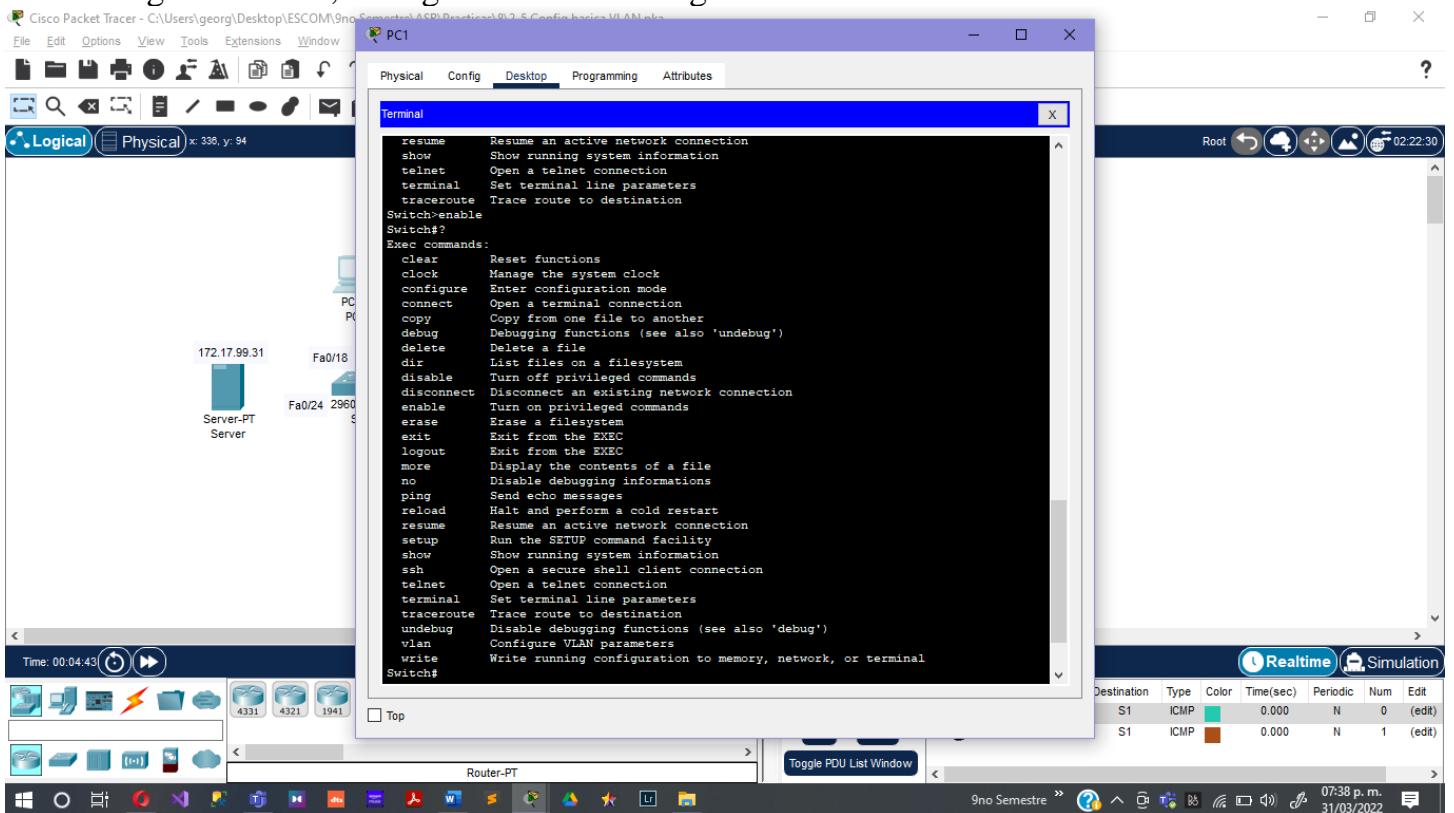
```
Switch>enable
Switch#
```

The prompt changes from > to #.



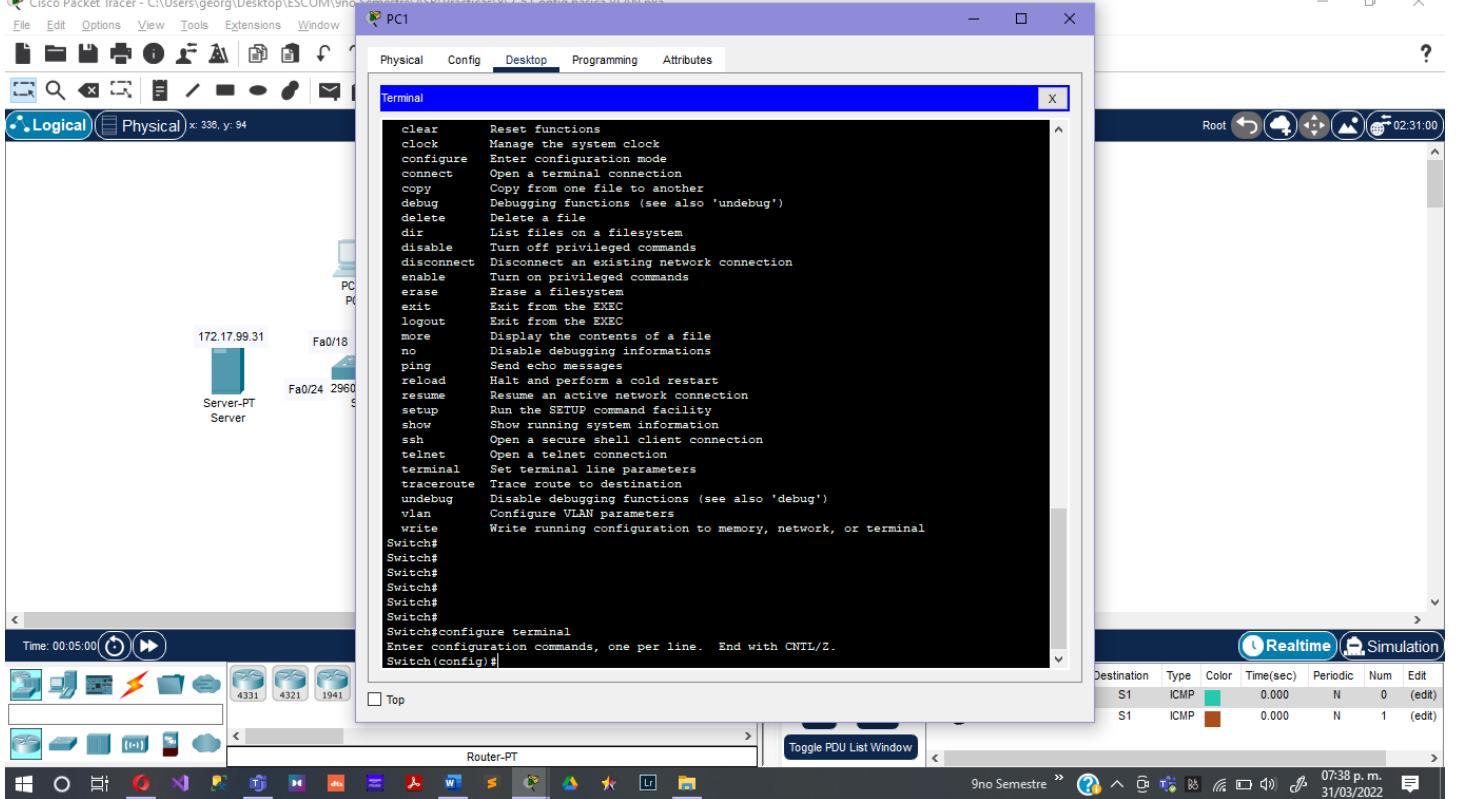
Step 3. In privileged EXEC mode, type ?. Note the list of available commands.

There are now more available commands compared to user EXEC mode. In addition to the basic monitoring commands, configuration and management commands can now be accessed.

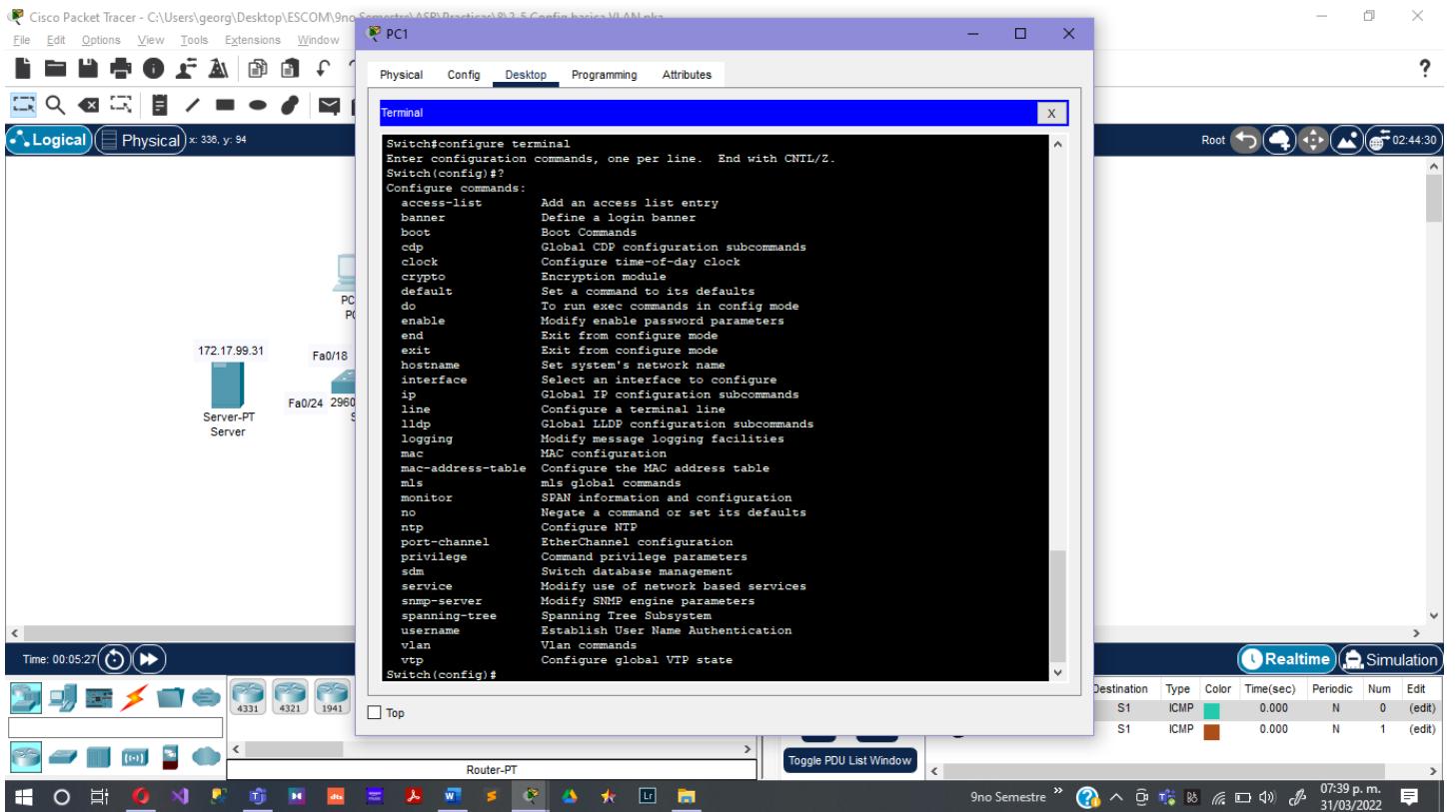


Step 4. Change to global configuration mode.

```
Switch#configure terminal  
Switch(config) #
```



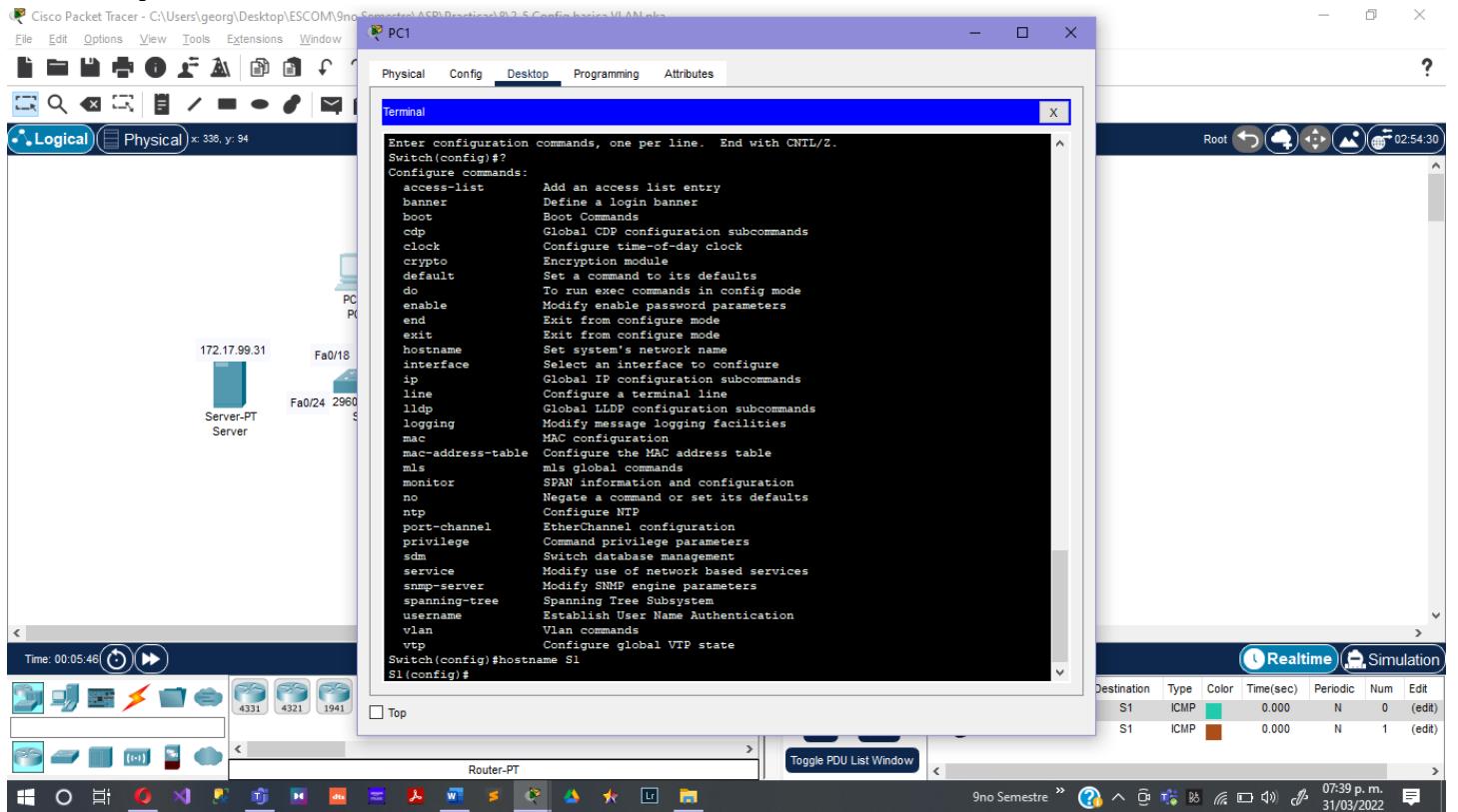
Step 5. In global configuration mode, type ?. Note the list of available commands.



Step 6. Configure S1 as the hostname.

```
Switch(config)#hostname S1
```

```
S1(config)#
```

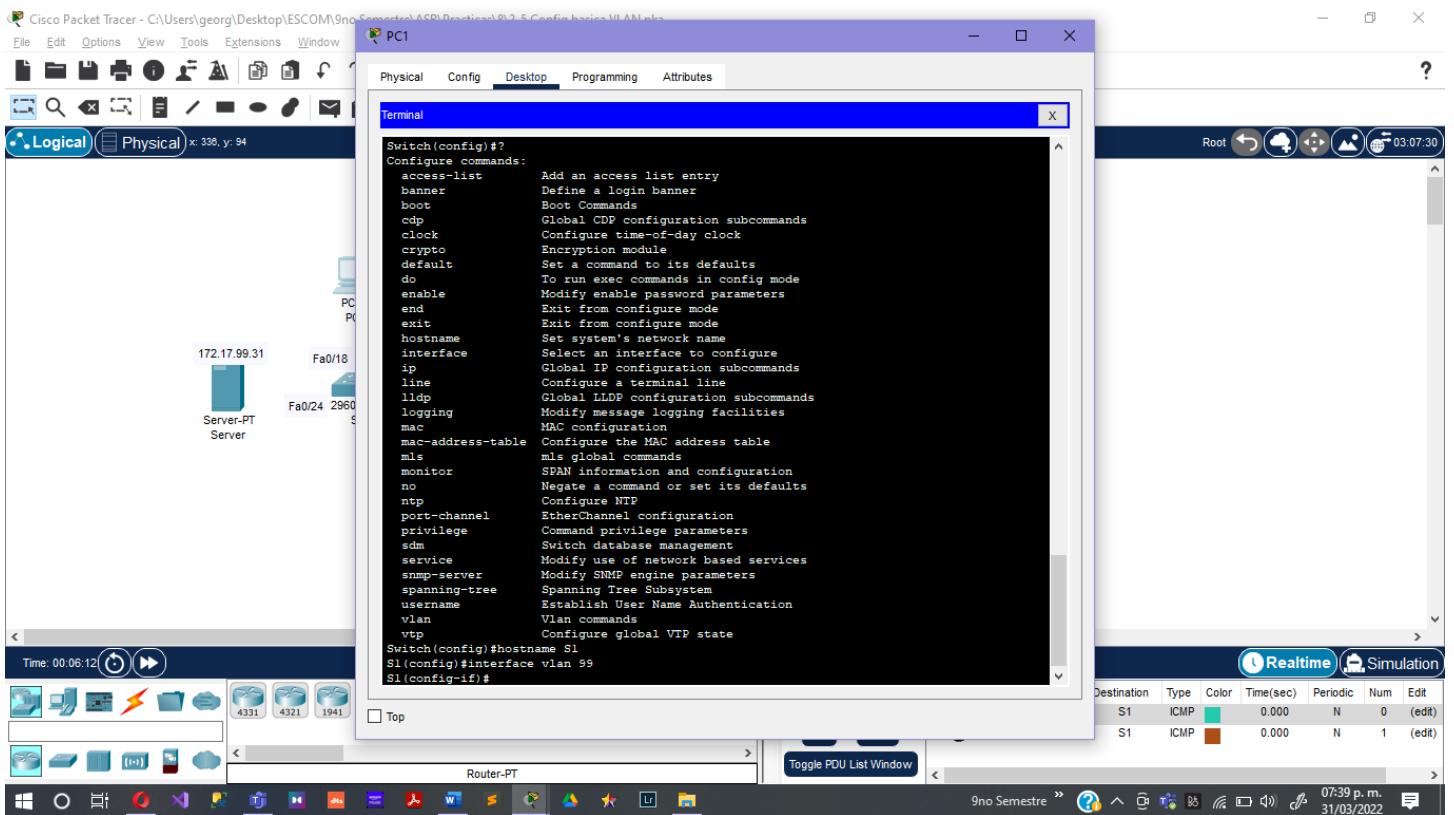


Step 7. Change to interface configuration mode for VLAN99.

The **interface vlan 99** command creates the interface and changes to interface configuration mode for VLAN99.

```
S1(config)#interface vlan 99
```

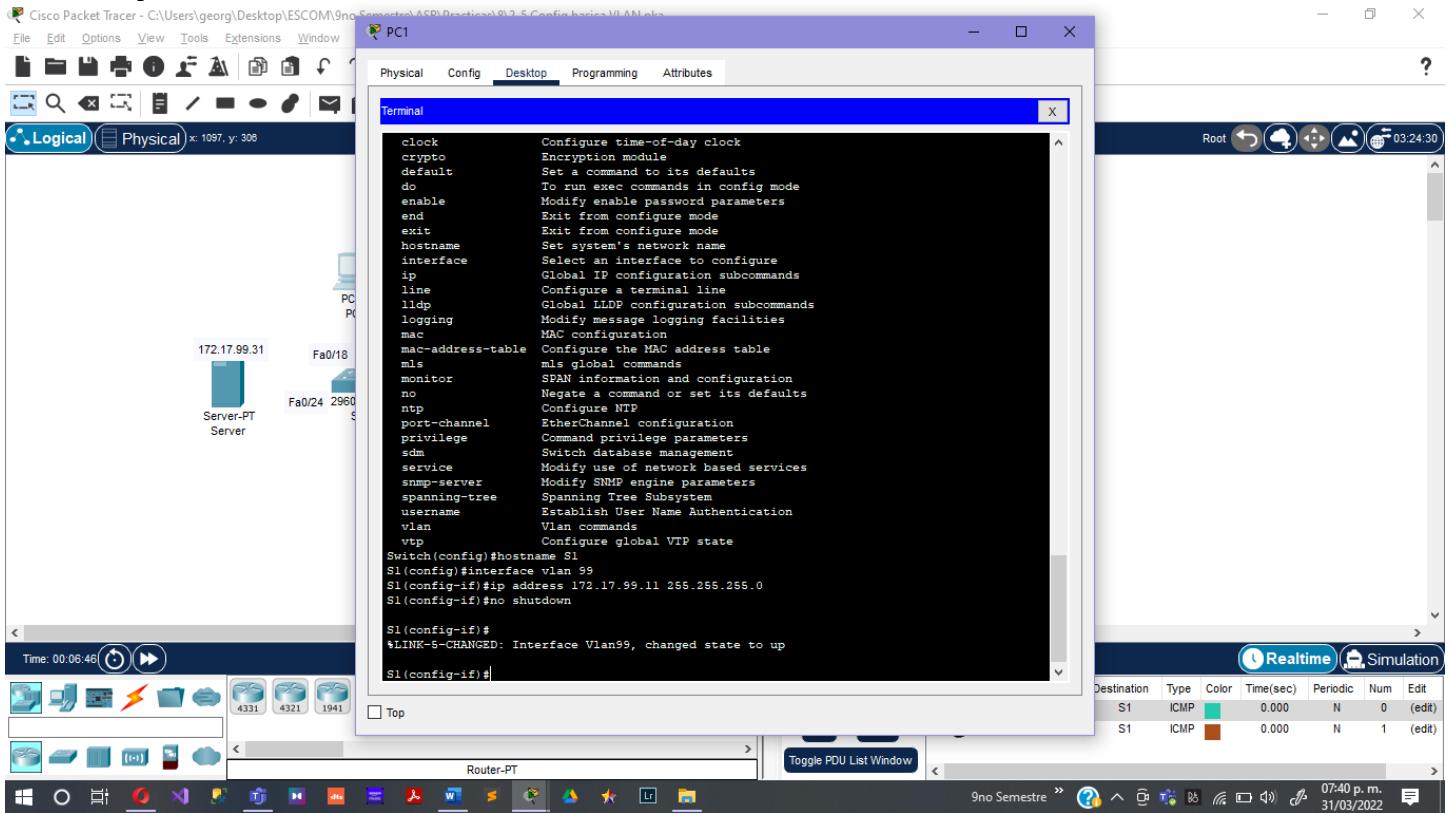
```
S1(config-if)#[/pre]
```



Step 8. Configure VLAN99 with 172.17.99.11/24 and activate the interface.

Use the **ip address** and **no shutdown** commands to assign the correct IP address/subnet mask and activate the interface.

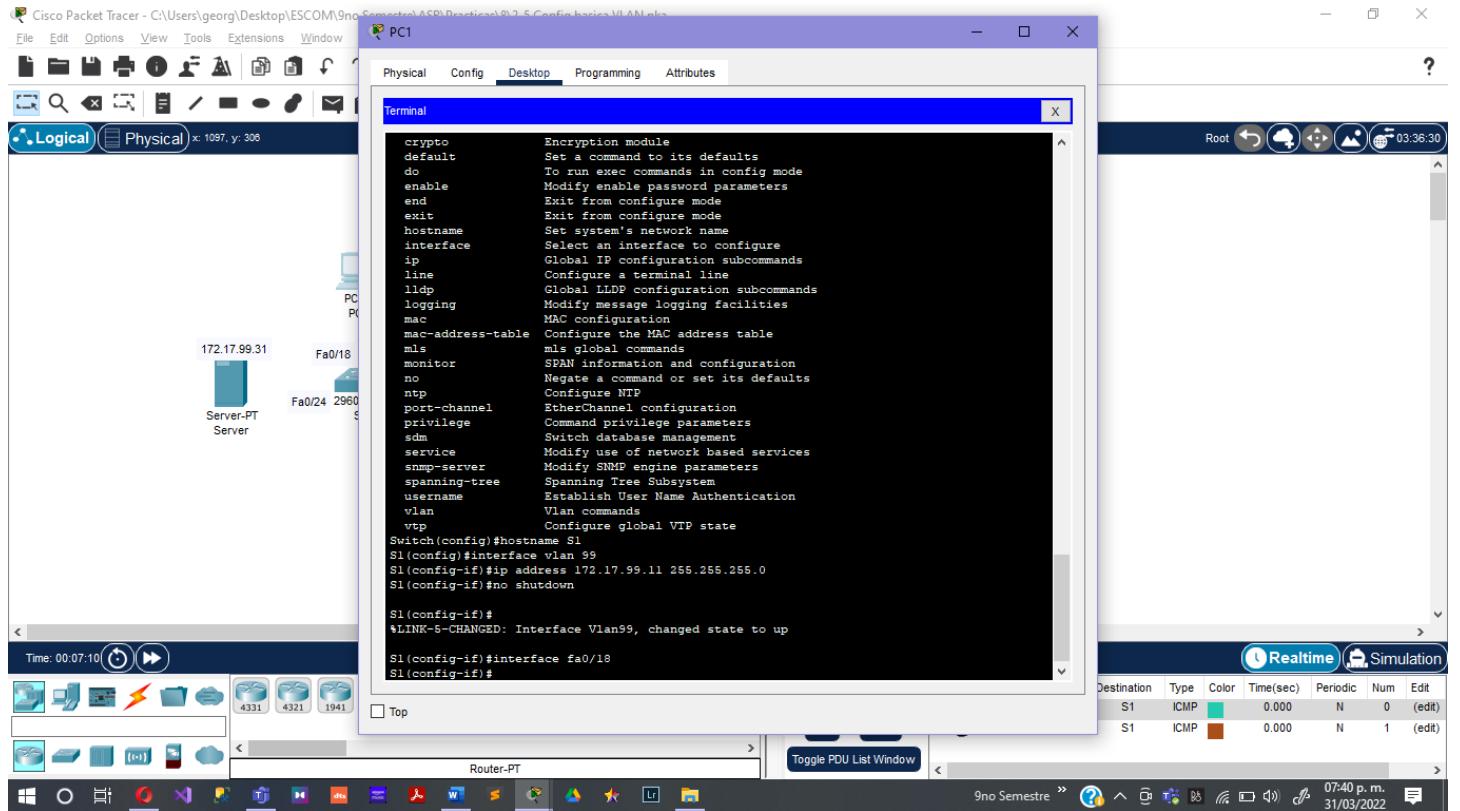
```
S1(config-if)#ip address 172.17.99.11 255.255.255.0
S1(config-if)#no shutdown
```



Step 9. Change to interface configuration mode for Fa0/18.

```
S1(config-if)#interface fa0/18
```

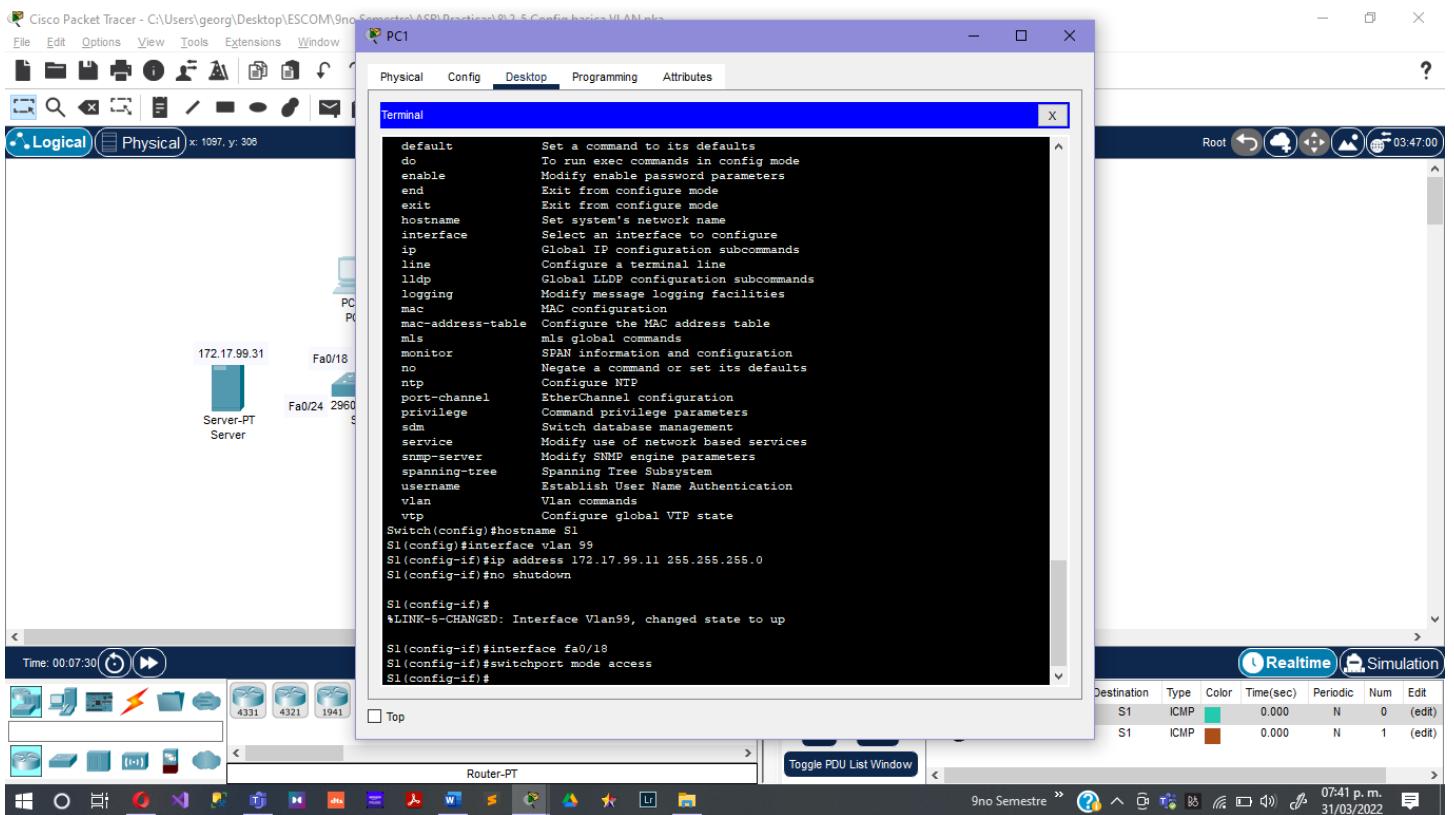
```
S1(config-if)#[/pre>
```



Step 10. Set the port mode to access.

To allow for frames to be sent and received from the interface, change the switching mode to access using the **switchport mode access** command.

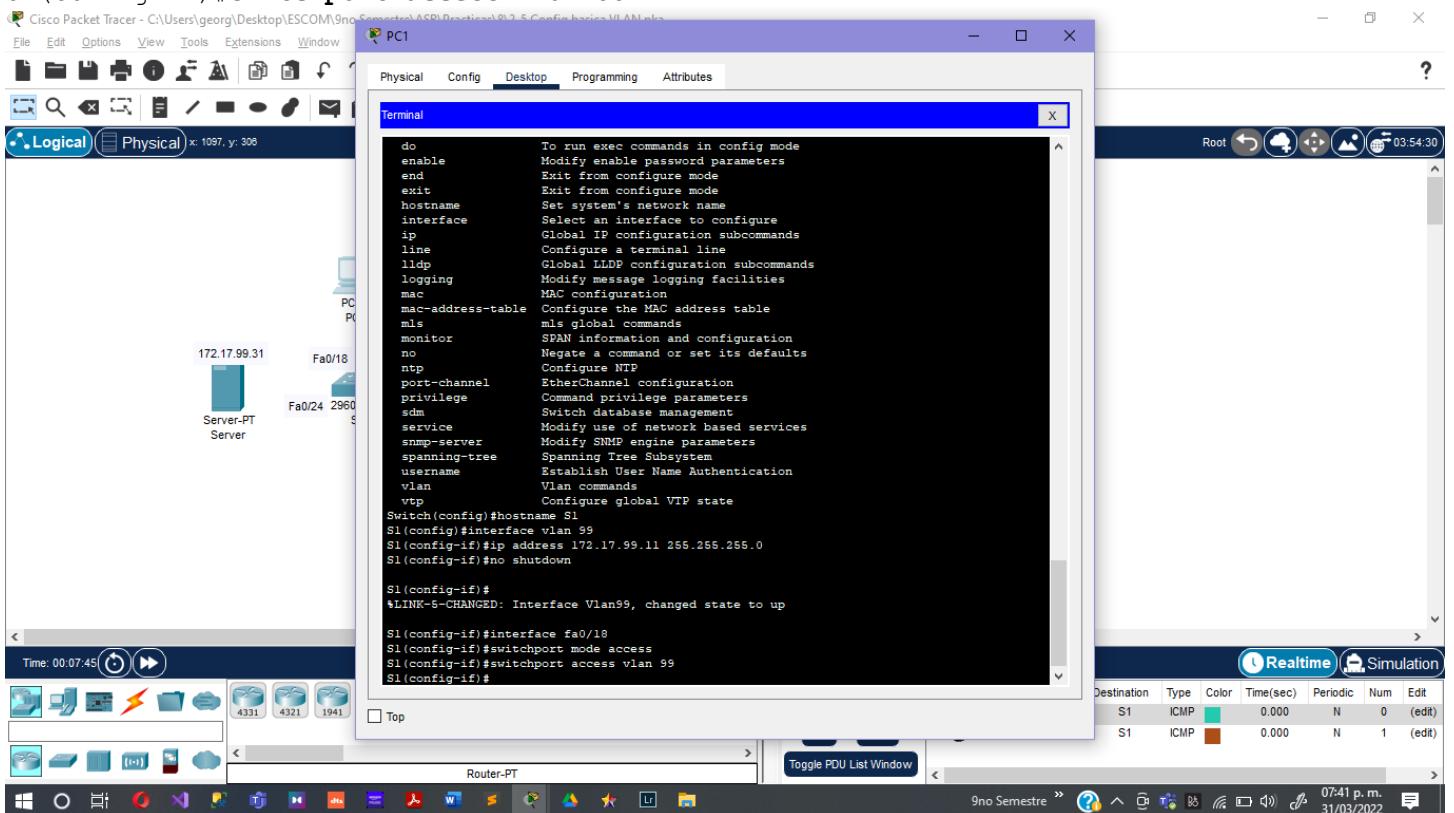
```
S1(config-if)#switchport mode access
```



Step 11. Assign VLAN99 to the port.

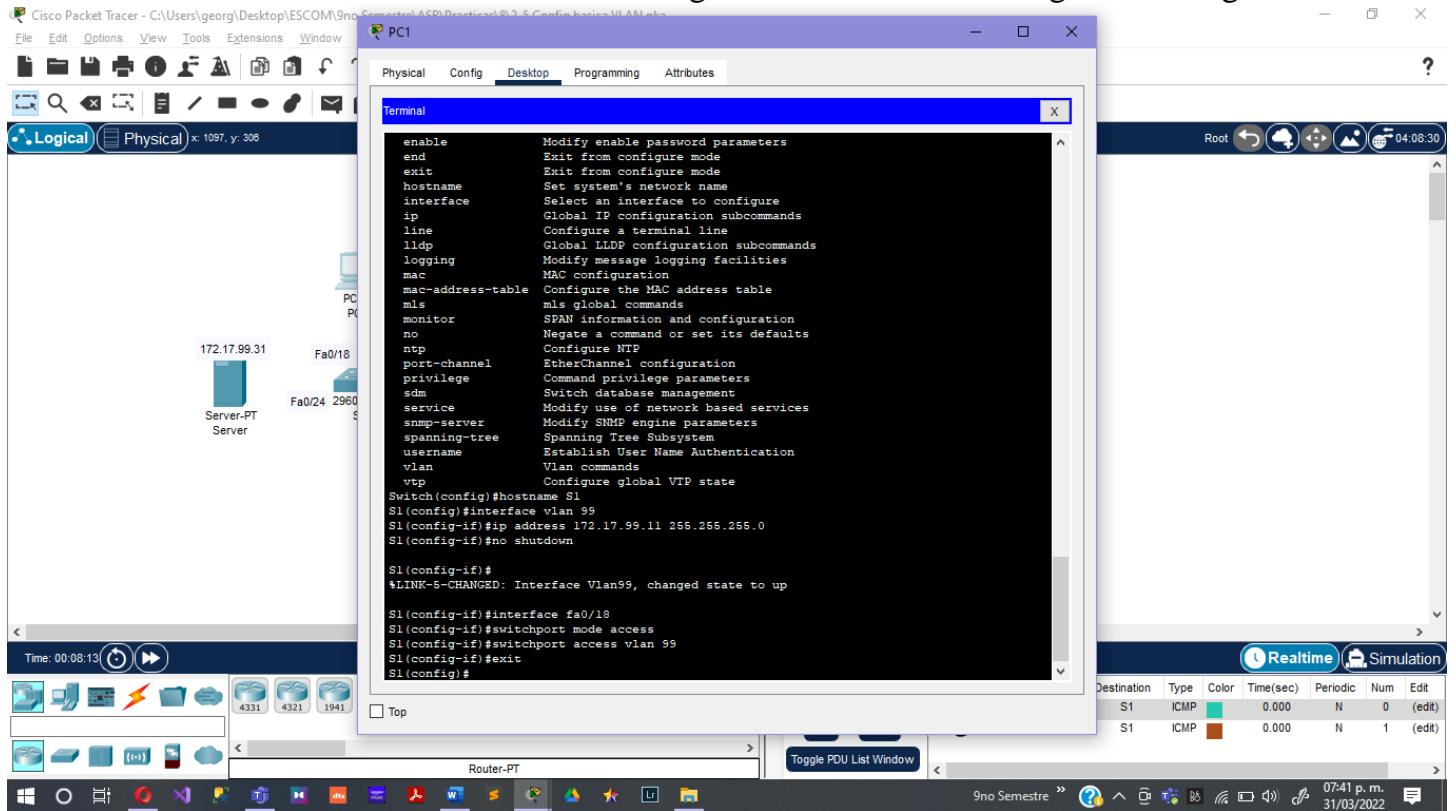
To allow the Fa0/18 interface to act as a member of VLAN 99, issue the **switchport access vlan 99** command.

```
S1(config-if)#switchport access vlan 99
```



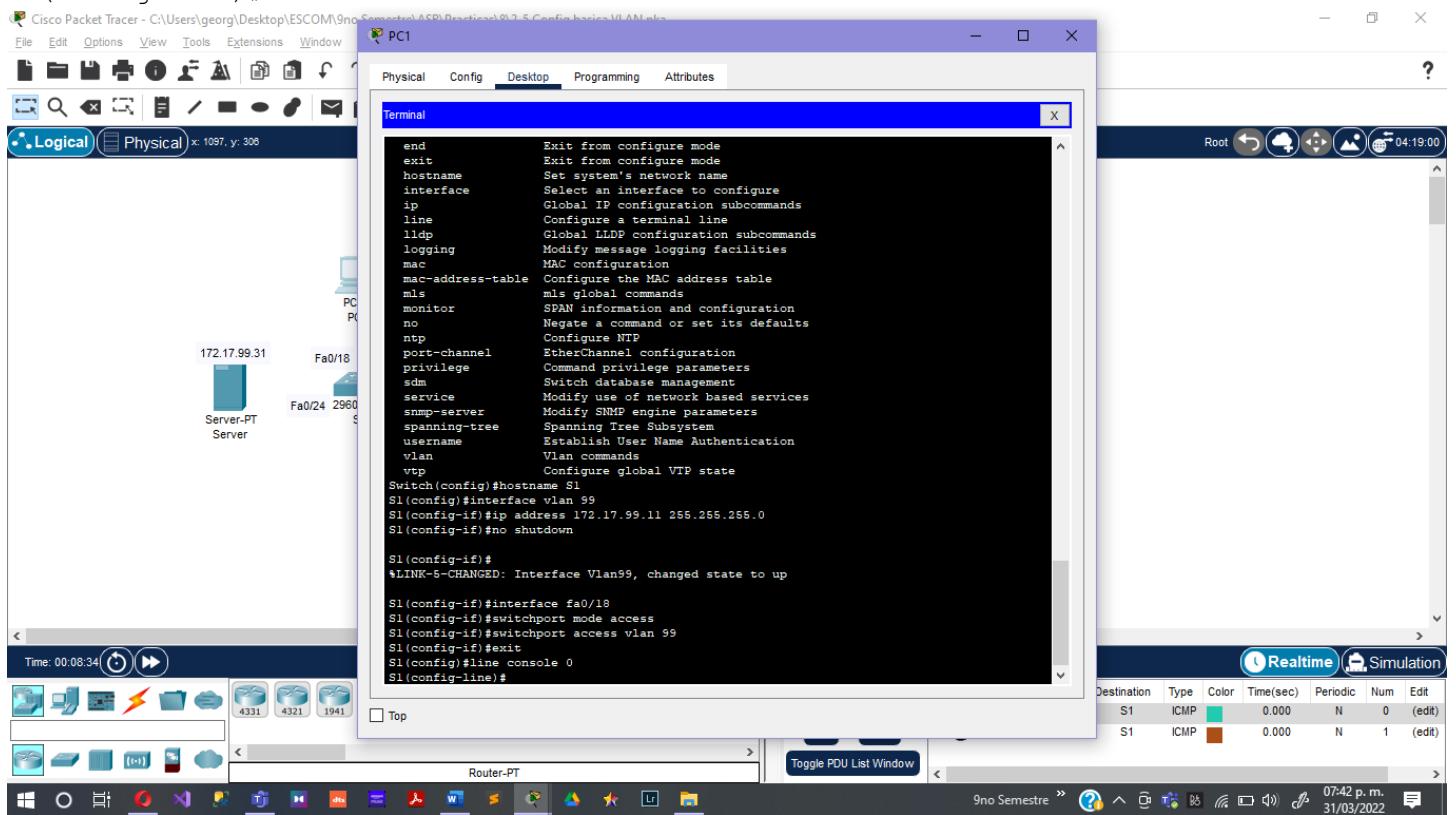
Step 12. Exit interface configuration mode.

Issue the **exit** command to leave interface configuration mode and enter global configuration mode.

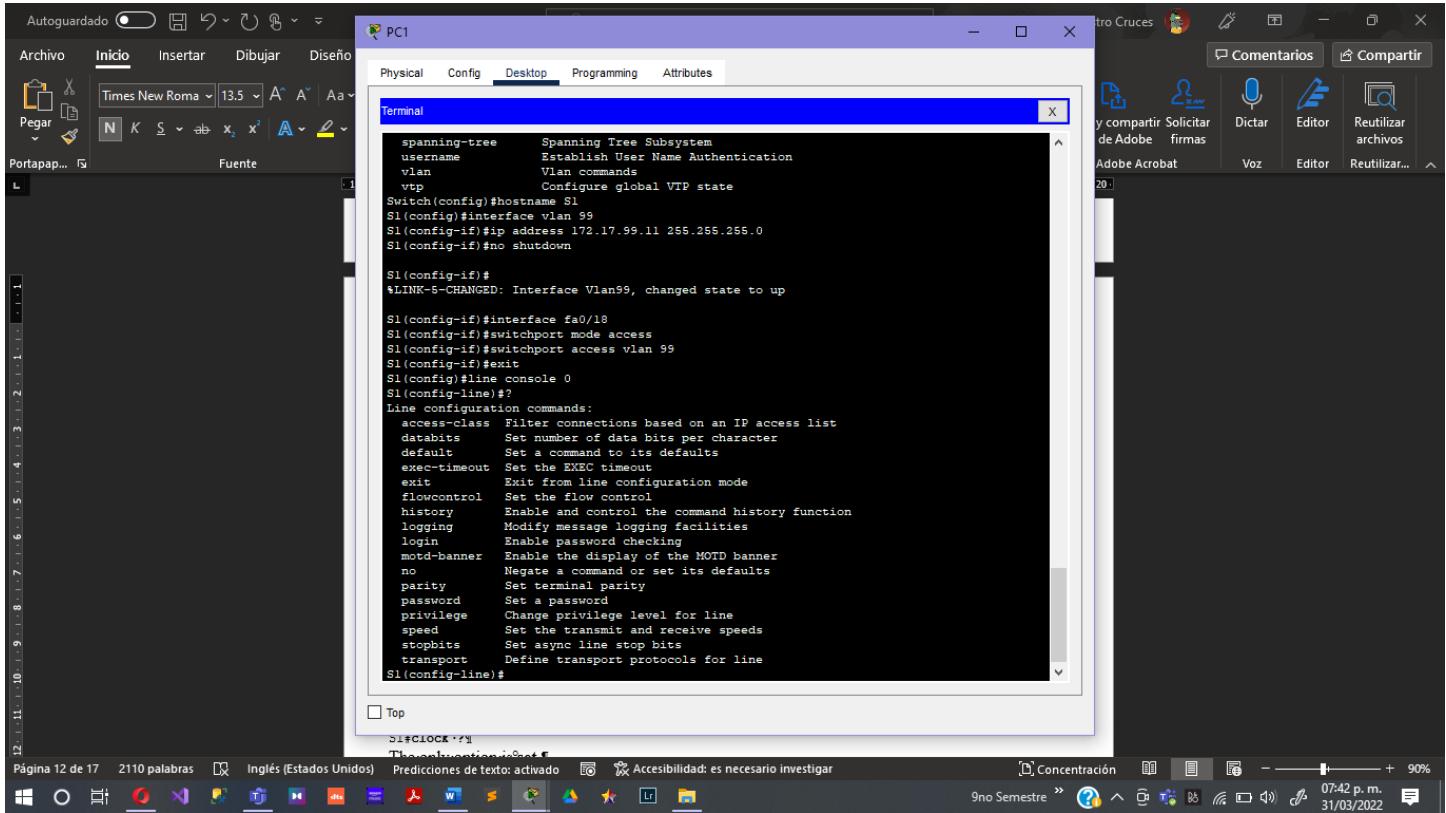


Step 13. Enter configuration mode for the console line.

```
S1(config) #line console 0
S1(config-line) #
```

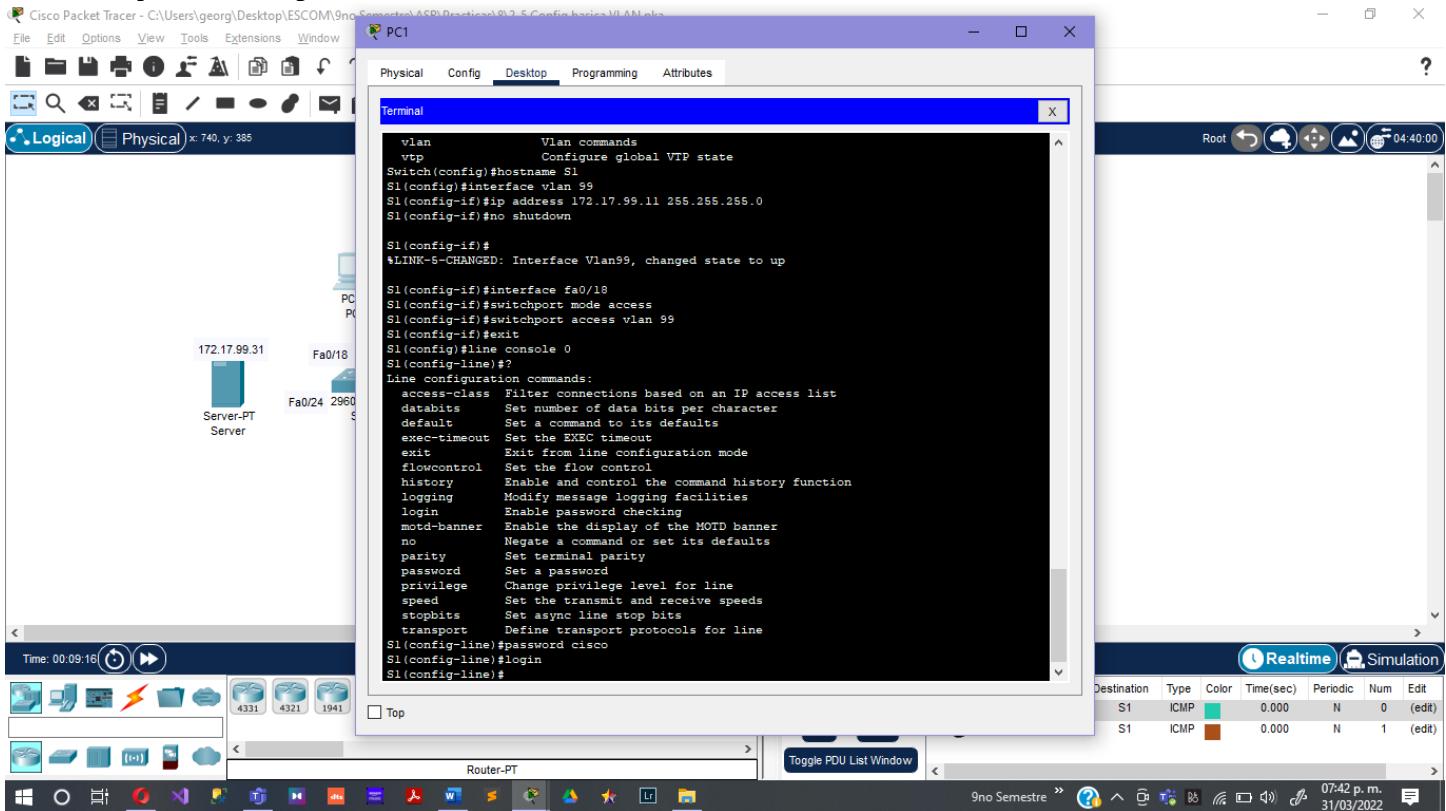


Step 14. In line configuration mode, type ?. Note the list of available commands.



Step 15. Enter cisco as the password.

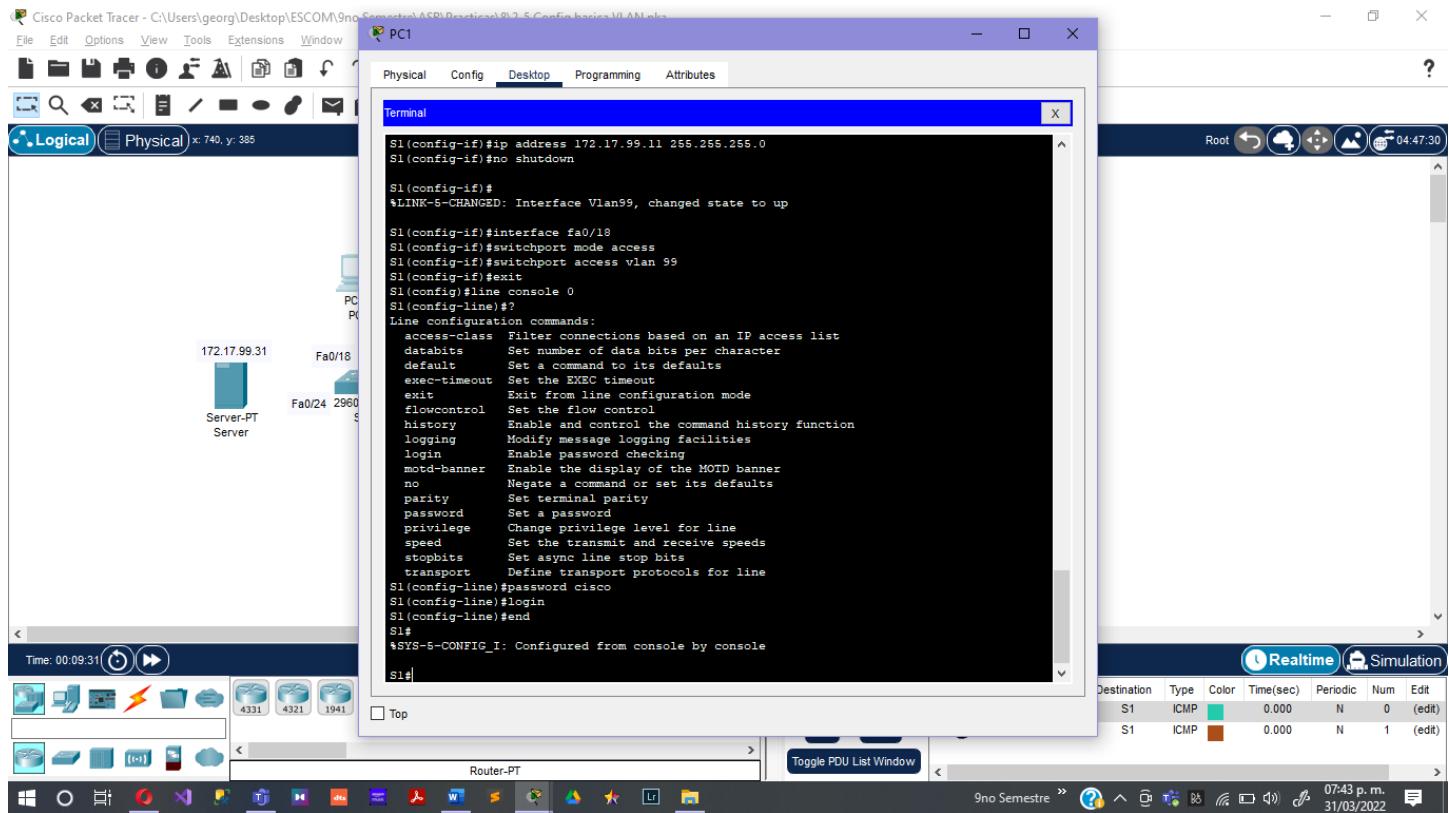
```
S1(config-line)#password cisco
S1(config-line)#login
```



Step 16. Return to privileged EXEC mode using the end command.

```
S1(config-line)#end
```

```
S1#
```



Step 17. Check results.

Your completion percentage should be 31%. If not, click **Check Results** to see which required components are not yet completed.



x: 740, y: 385

PT Activity: 20:22:51

Activity 2.3.8: Configuring Basic Switch Management

NOTE TO USER: Although you can complete this activity without printed instructions, a PDF version is available on the text side of the same page from which you launched this activity.

Addressing Table

Device	Interface	IP Address	Subnet Mask
S1	VLAN99	172.17.99.11	255.255.255.0
PC1	NIC	172.17.99.21	255.255.255.0
Server	NIC	172.17.99.31	255.255.255.0

Learning Objectives

- Connect to the switch using a console connection
- Navigate through various CLI modes
- Use the Help Facility to configure the clock

Time Elapsed: 20:22:51 Completion: 25%

Back 1/1 Next

Realtime Simulation

Router-PT

Toggle PDU List Window

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
●	--	PC1	S1	ICMP	■■■■■	0.000	N	0	(edit)
●	--	Server	S1	ICMP	■■■■■	0.000	N	1	(edit)

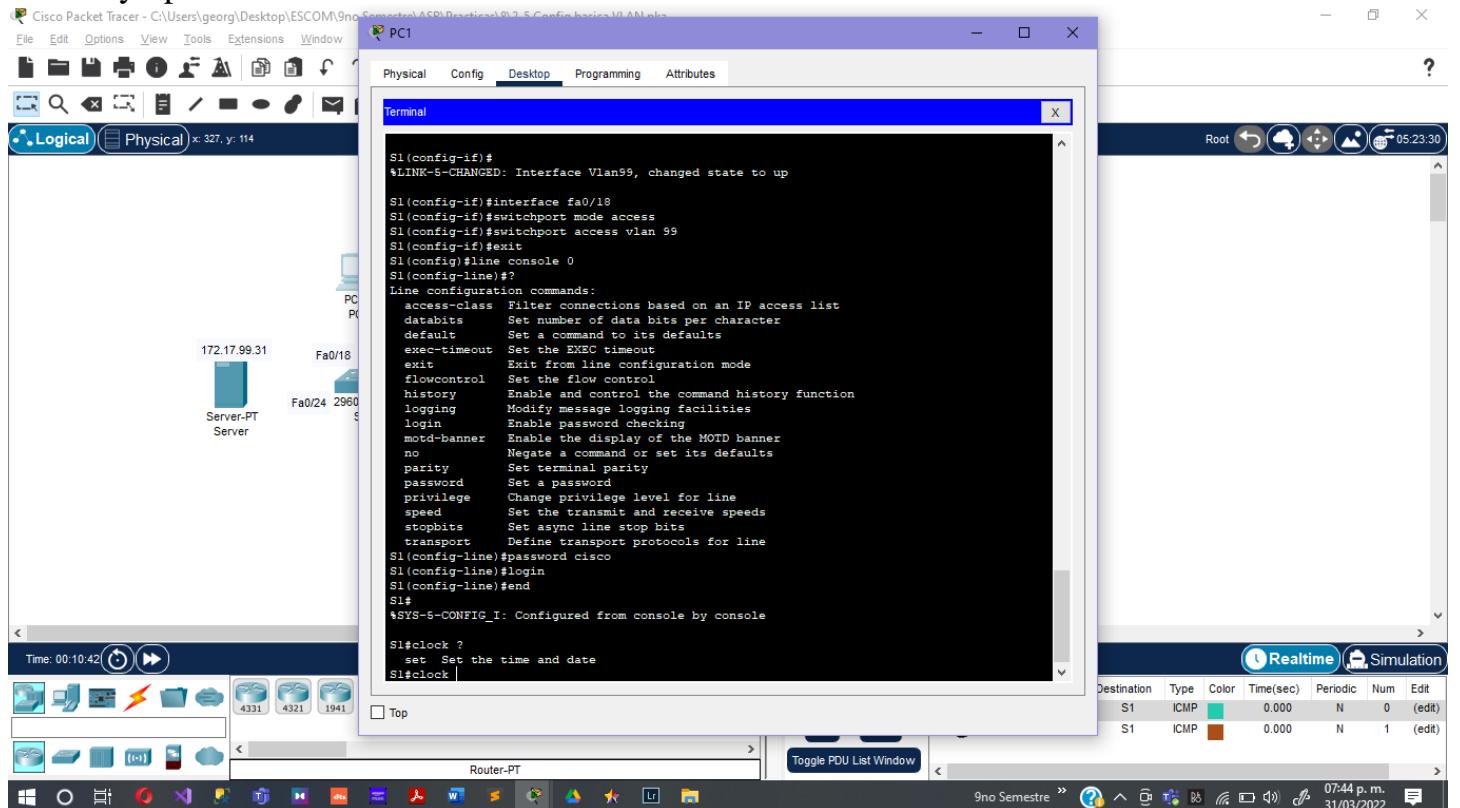
9no Semestre 07:43 p.m. 31/03/2022

Task 3: Use Help Facility to Configure the Clock

Step 1. At the privileged EXEC command prompt, type clock ?.

S1#clock ?

The only option is set.



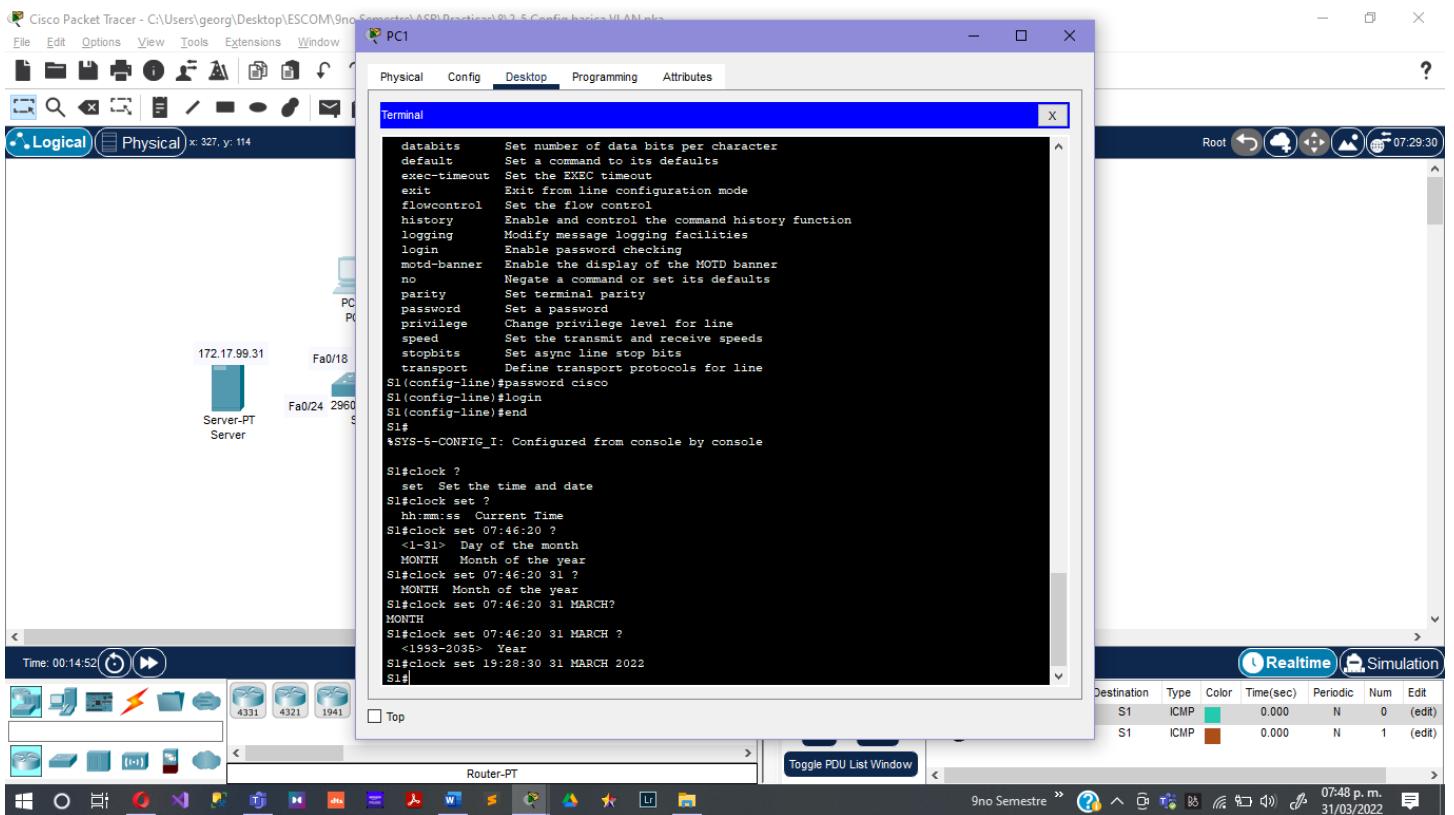
Step 2. Use Help to assist setting the clock to the current time.

```
S1#clock ?
      set Set the time and date
```

```
S1#clock set ?
      hh:mm:ss Current Time
```

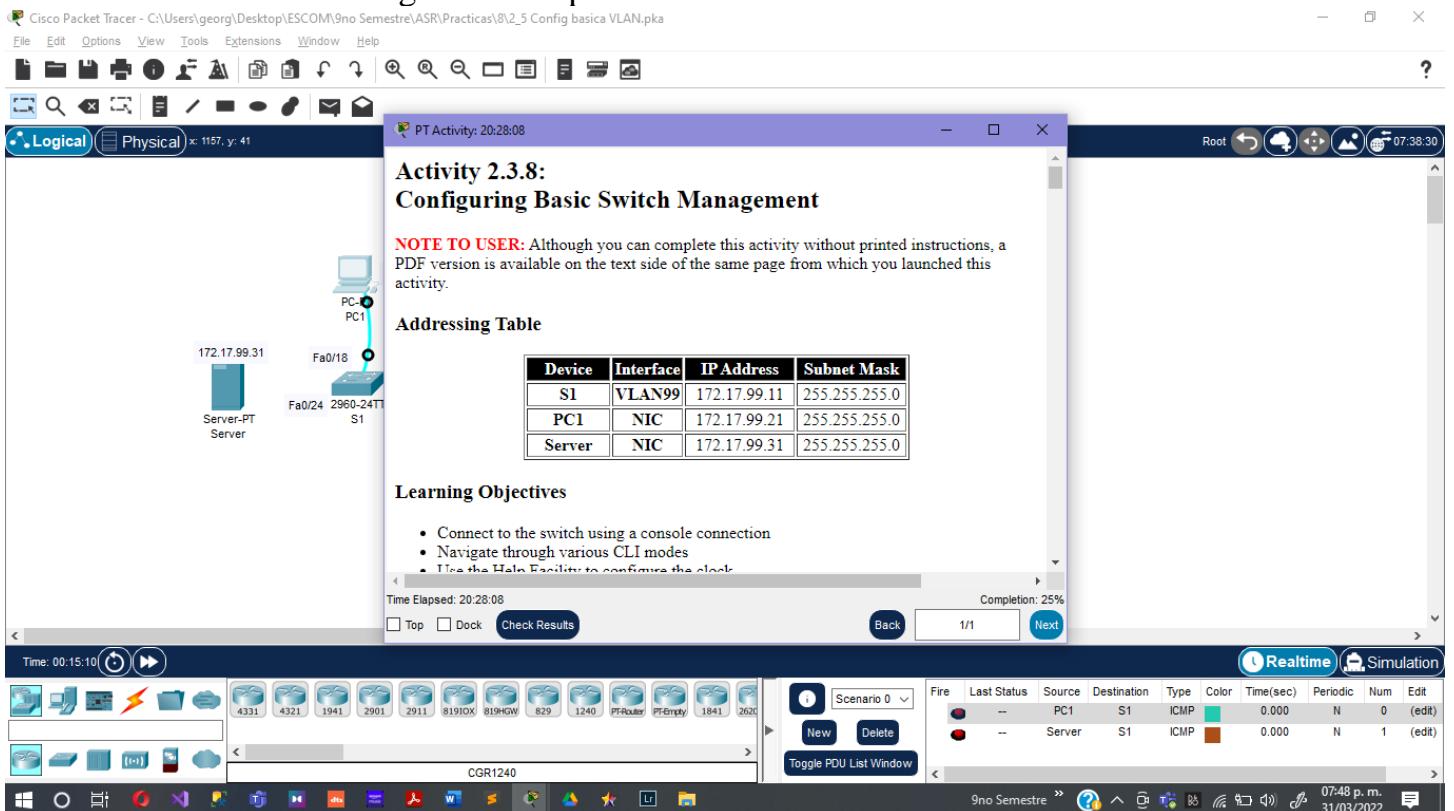
```
S1#clock set 12:12:12 ?
      <1-31> Day of the month
      MONTH Month of the year
```

Continue issuing the ? command until you have completed configuring the clock. You are warned with a % Incomplete command message if the **clock** command is not fully entered with all the required arguments.



Step 3. Verify that the clock is set.

To verify that the clock is set, issue the **show clock** command. **Note:** Packet Tracer does not always show the correct time configured. Completion is still at 31% at the end of this Task.

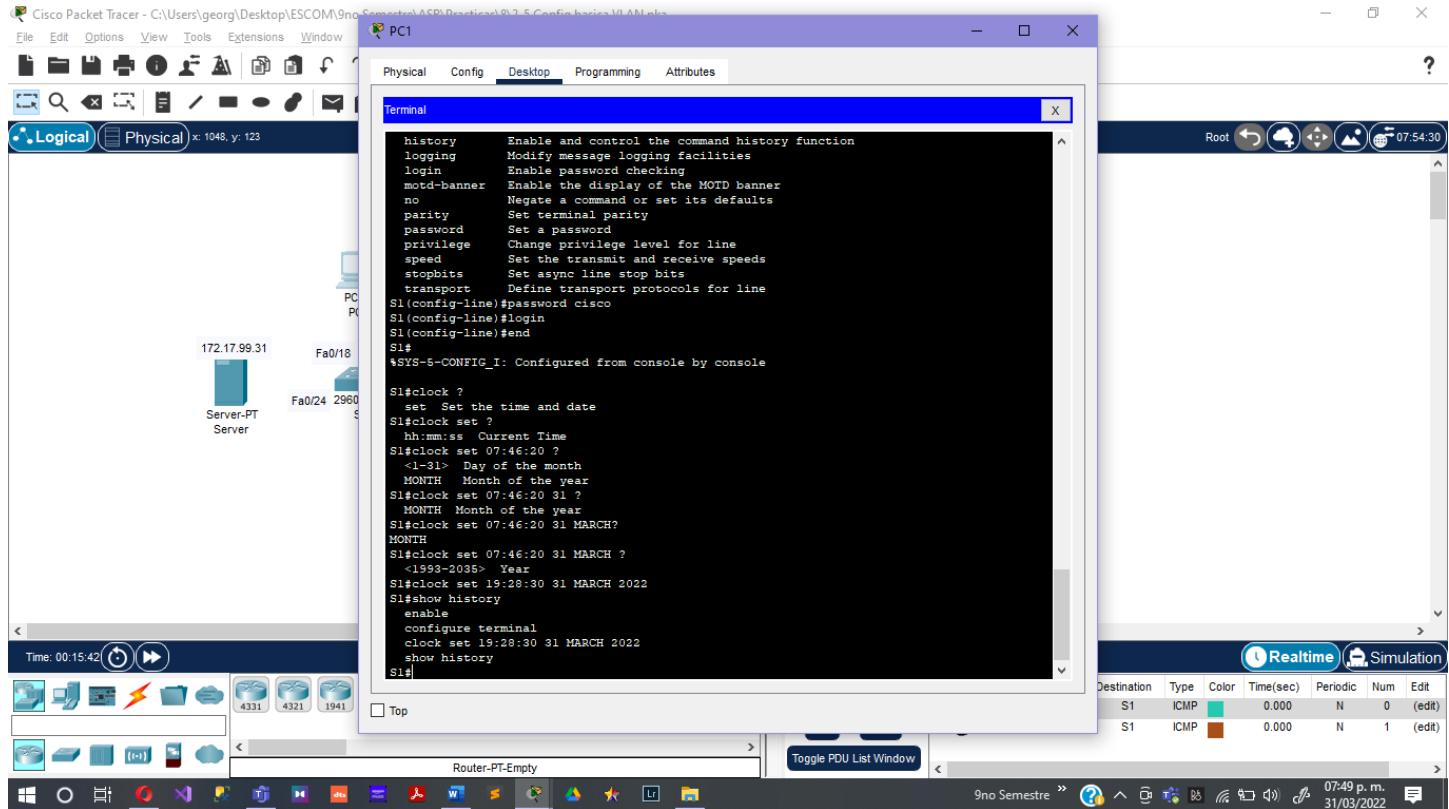


Task 4: Access and Configure Command History

Step 1. View the most recent commands entered.

Issue the **show history** command. Remember how many commands are listed.

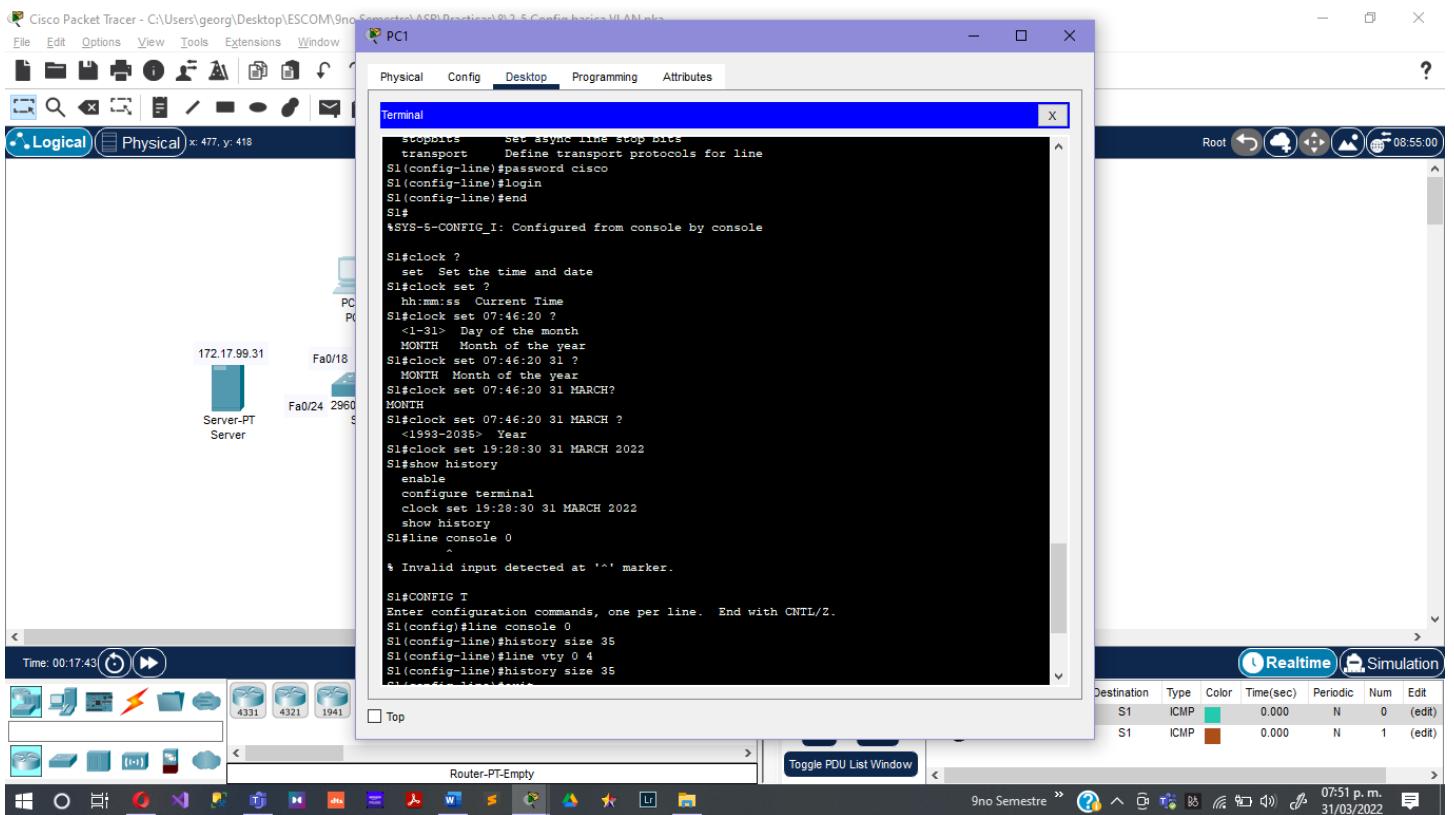
```
S1#show history
```



Step 2. Change the number of commands stored in the history buffer.

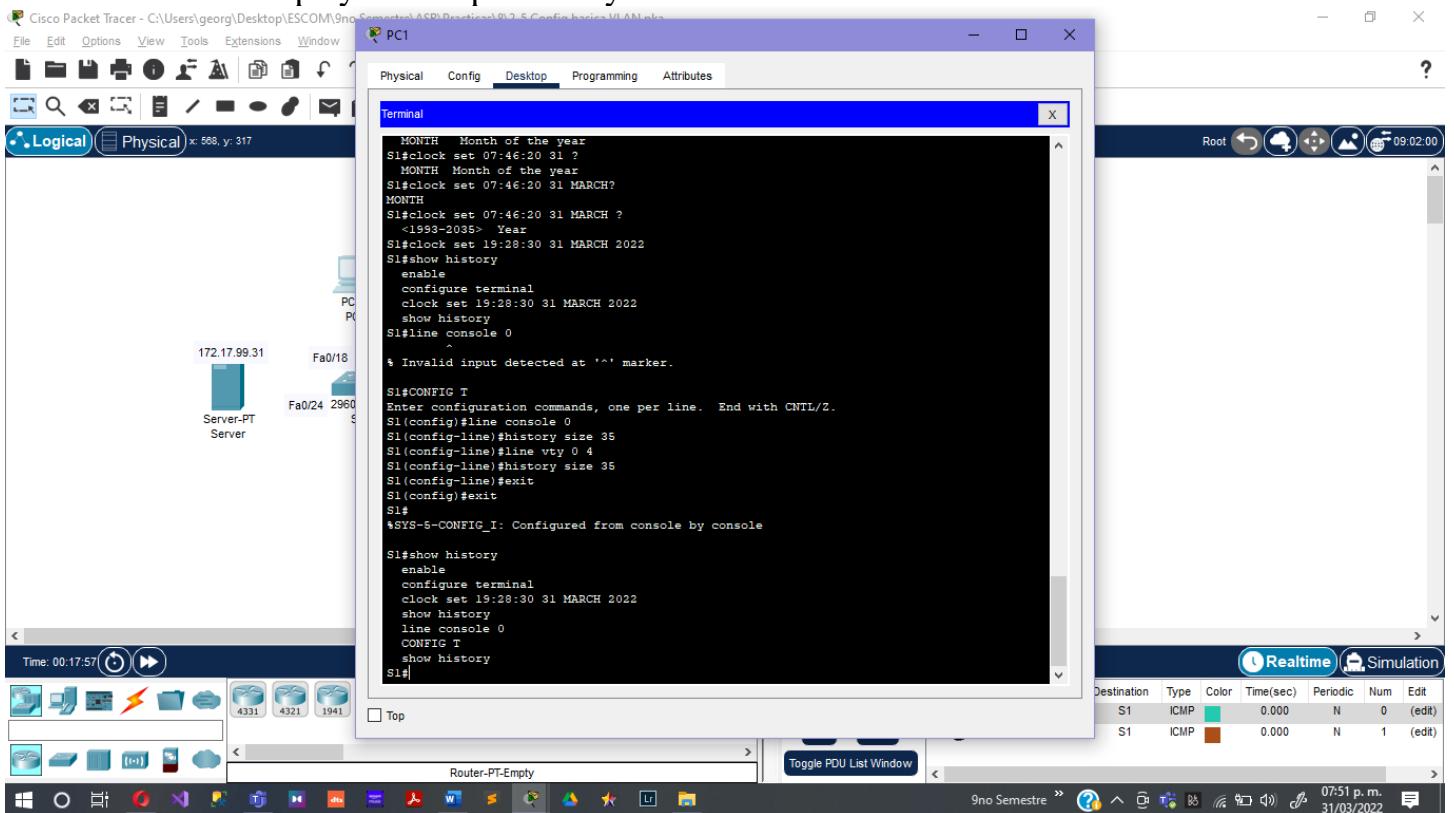
Enter line configuration mode for both the console and Telnet lines. Set the number of commands held in the history buffer to 35.

```
S1(config)#line console 0
S1(config-line)#history size 35
S1(config-line)#line vty 0 4
S1(config-line)#history size 35
```



Step 3. Verify that the size of the history buffer has changed.

Return to privileged EXEC mode and issue the **show history** command again. There should be more commands displayed than previously.



Step 4. Check results.

Your completion percentage should be 50%. If not, click **Check Results** to see which required components are not yet completed.

Cisco Packet Tracer - C:\Users\georgi\Desktop\ESCOM\9no Semestre\ASR\Practicas\8\2_5_Config basica VLAN.pka

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1086, y: 245

PT Activity: 20:31:08 Root 09:08:30

Activity 2.3.8:
Configuring Basic Switch Management

NOTE TO USER: Although you can complete this activity without printed instructions, a PDF version is available on the text side of the same page from which you launched this activity.

Addressing Table

Device	Interface	IP Address	Subnet Mask
S1	VLAN99	172.17.99.11	255.255.255.0
PC1	NIC	172.17.99.21	255.255.255.0
Server	NIC	172.17.99.31	255.255.255.0

Learning Objectives

- Connect to the switch using a console connection
- Navigate through various CLI modes
- Use the Help Facility to configure the clock

Time Elapsed: 20:31:08 Completion: 43% Back 1/1 Next

Realtime Simulation

Router-PT-Empty

Toggle PDU List Window

9no Semestre 07:51 p. m. 31/03/2022

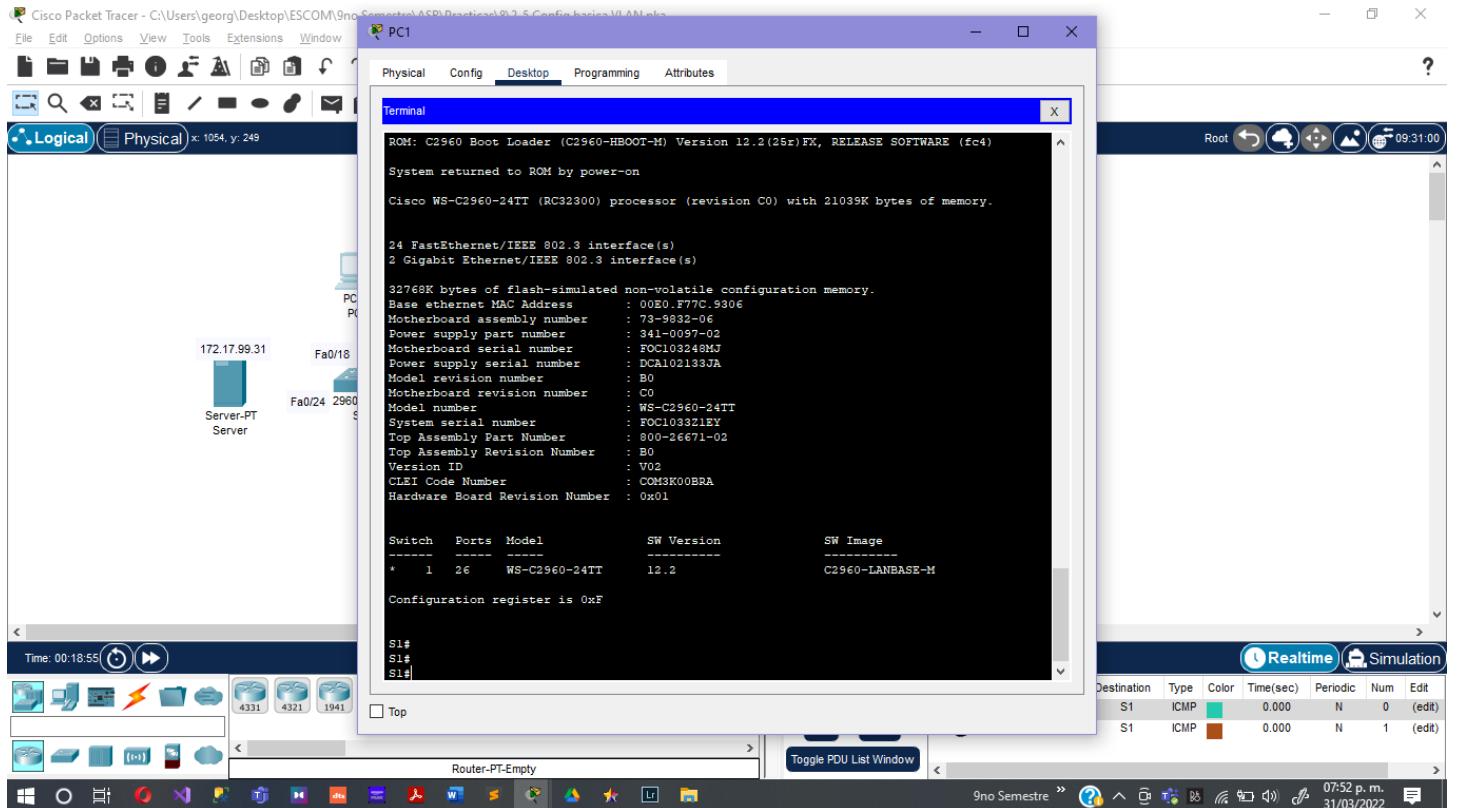
The screenshot shows the Cisco Packet Tracer interface. At the top, there's a menu bar with File, Edit, Options, View, Tools, Extensions, Window, Help, and a search bar. Below the menu is a toolbar with icons for opening files, saving, printing, and other functions. A legend indicates Logical and Physical views. The main window displays a network topology with a Server-PT Server, PC1, and S1 switch. A table titled 'Addressing Table' lists device IP addresses and subnet masks. Below the table, 'Learning Objectives' are listed. The bottom part of the interface shows a timeline, a 'PDU List Window' table, and system status information like time and date.

Task 5: Configure the Boot Sequence

Step 1. Check which Cisco IOS software version is currently loaded.

```
S1#show version
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE
SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team
<output omitted>
```

The version is listed in the first line.



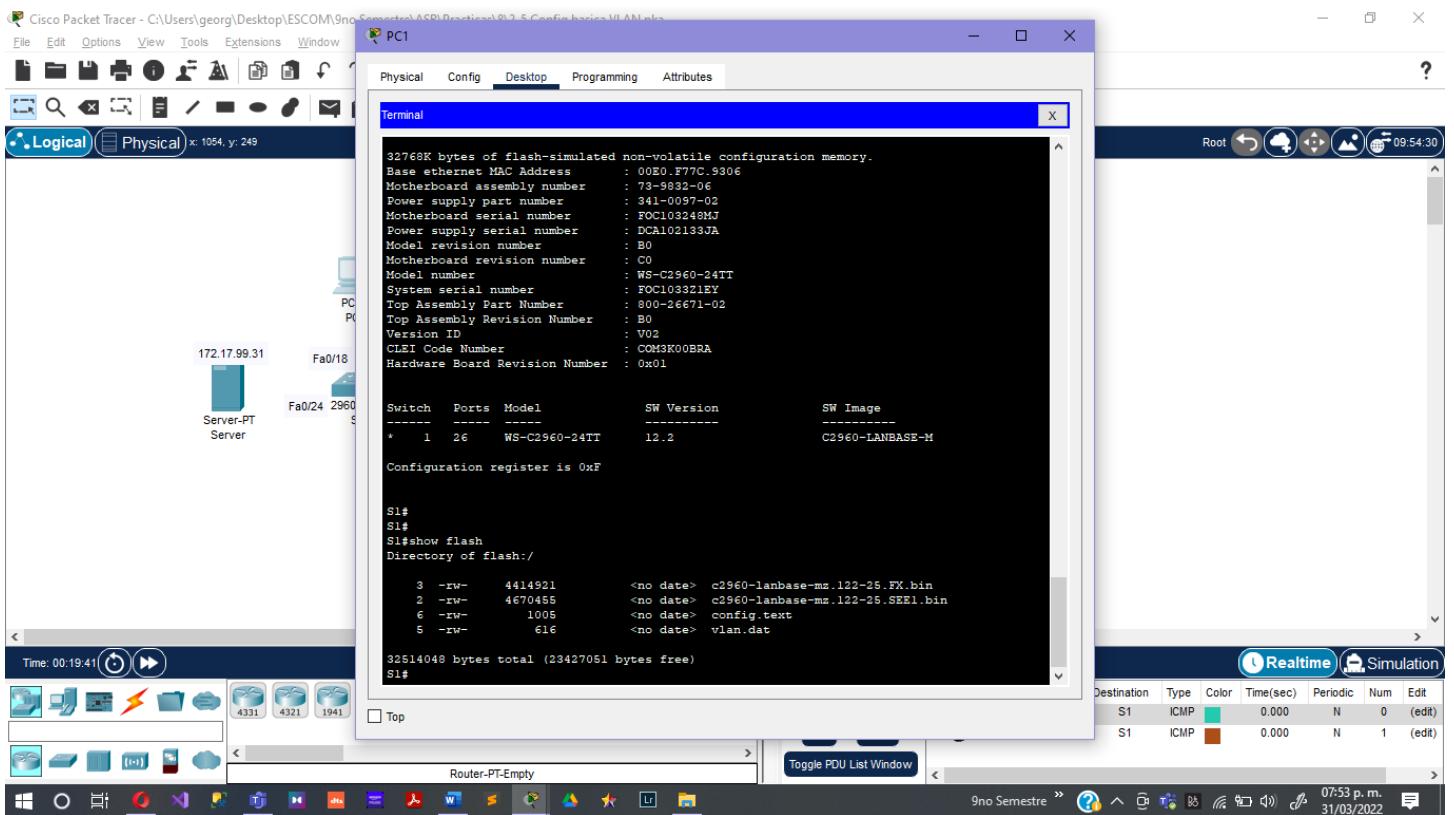
Step 2. Check which Cisco IOS images are loaded in flash memory.

```
S1#show flash
Directory of flash:/

3  -rw-        4414921          c2960-lanbase-mz.122-25.FX.bin
2  -rw-        4670455          c2960-lanbase-mz.122-25.SEE1.bin
6  -rw-         616             vlan.dat

32514048 bytes total (23428056 bytes free)
```

Note that there are two versions in flash memory. The version that is currently loaded is **c2960-lanbase-mz.122-25.FX.bin**.

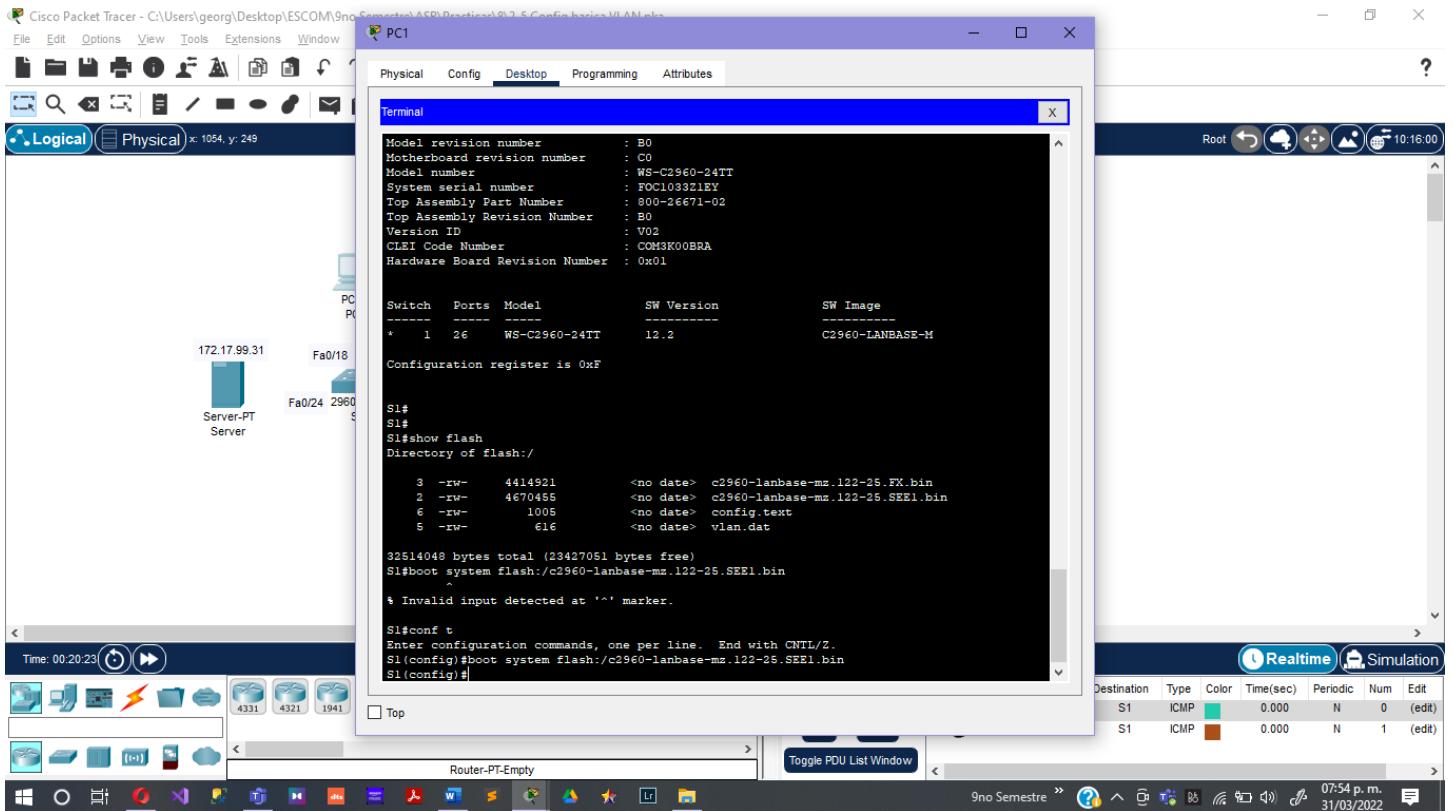


Step 3. Configure the system to boot using a different Cisco IOS image.

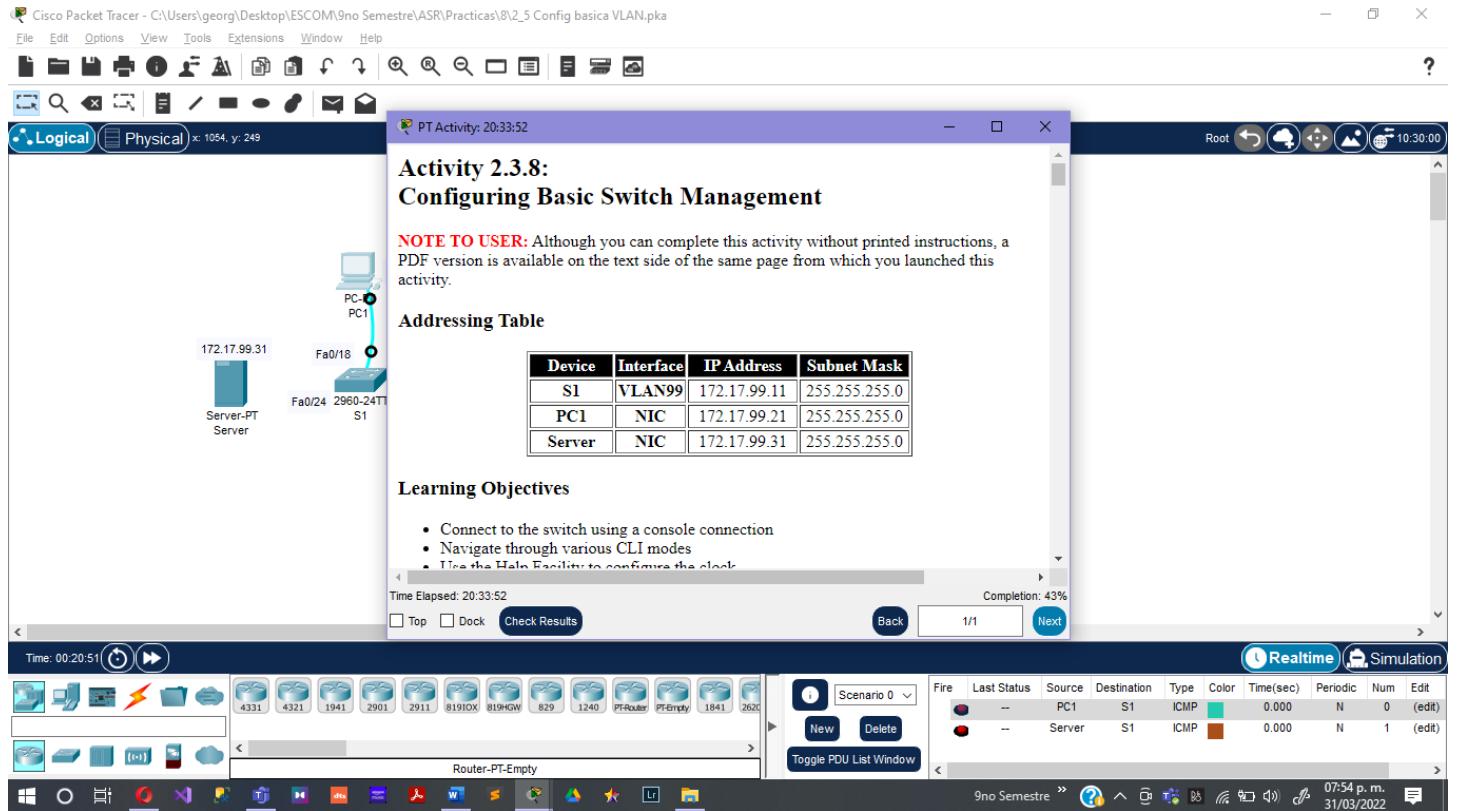
In global configuration mode, issue this command.

```
S1(config)#boot system flash:/c2960-lanbase-mz.122-25.SEE1.bin
```

Note: Although you can enter this command in Packet Tracer, the switch still loads the first image listed in flash.



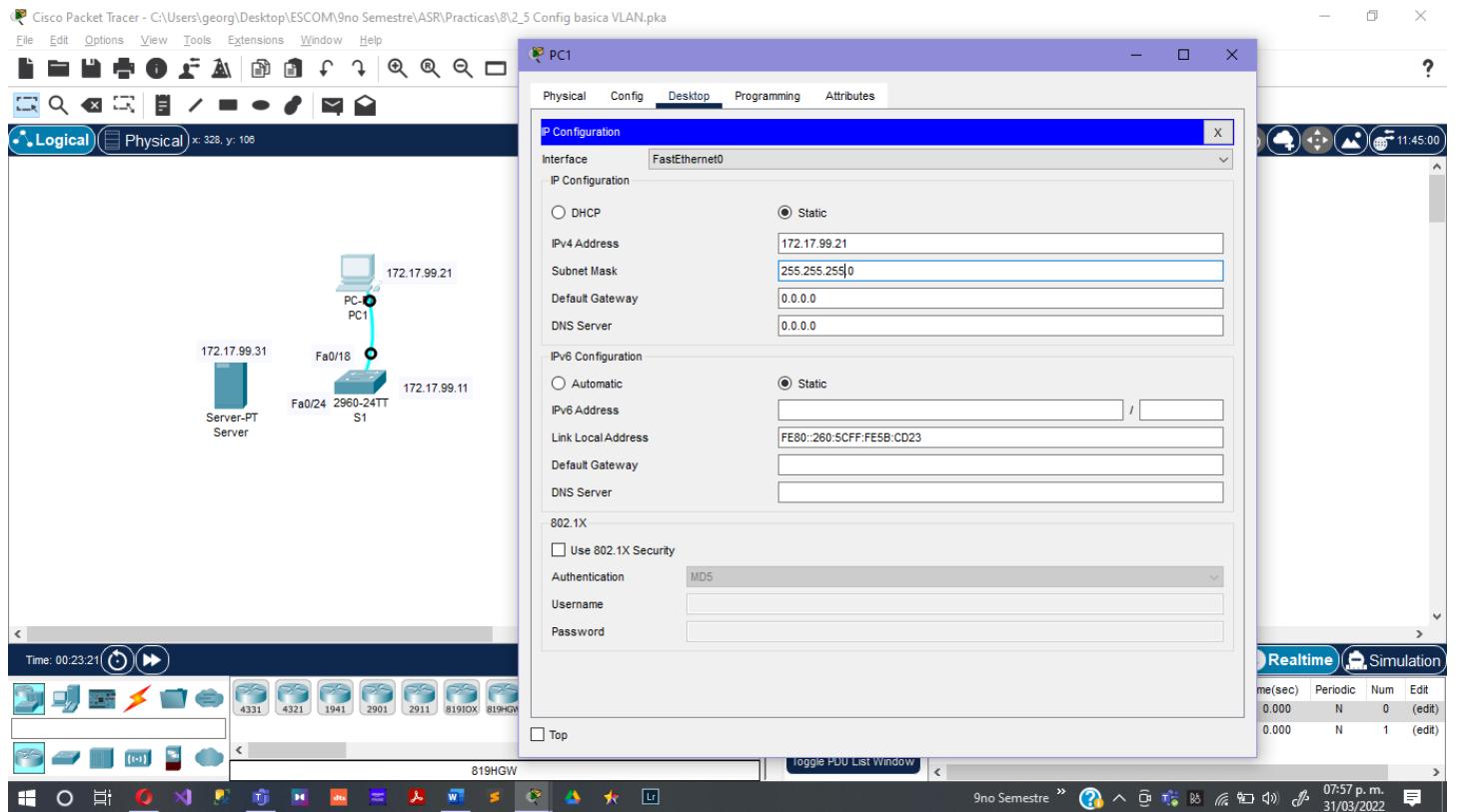
Packet Tracer does not grade the **boot system** command on switches, so completion remains at 50% at the end of this task.



Task 6: Configure a PC and Connect it to a Switch

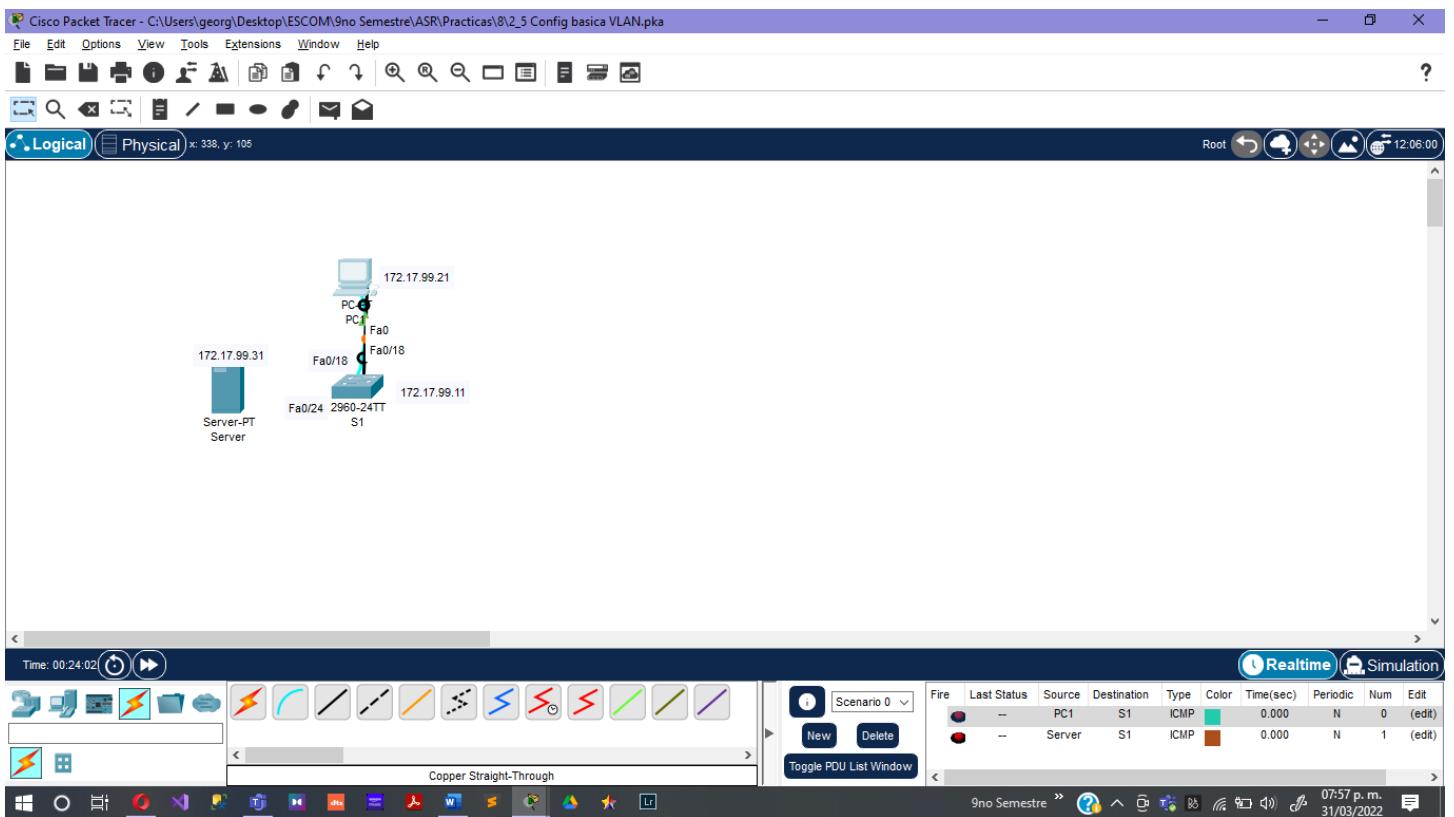
Step 1. Configure PC1 with the IP address/subnet mask 172.17.99.21/24.

- Exit the terminal to return to the **Desktop** tab.
- Click **IP Configuration** and set the IP address to 172.17.99.21 and subnet mask to 255.255.255.0



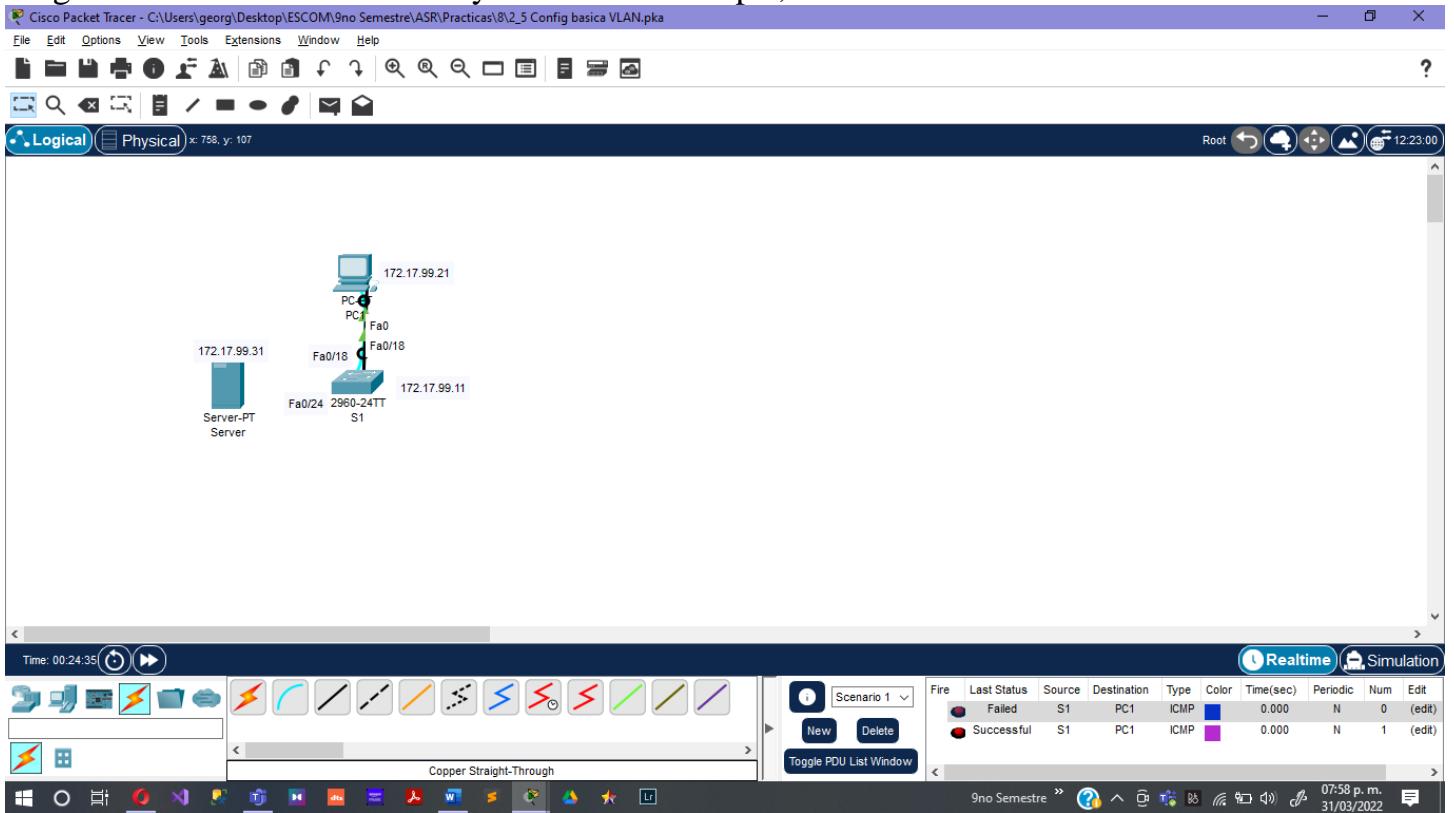
Step 2. Connect PC1 to Fa0/18 on the switch.

Using the copper straight-through cable, connect the FastEthernet port of the PC to the Fa0/18 port on the switch.



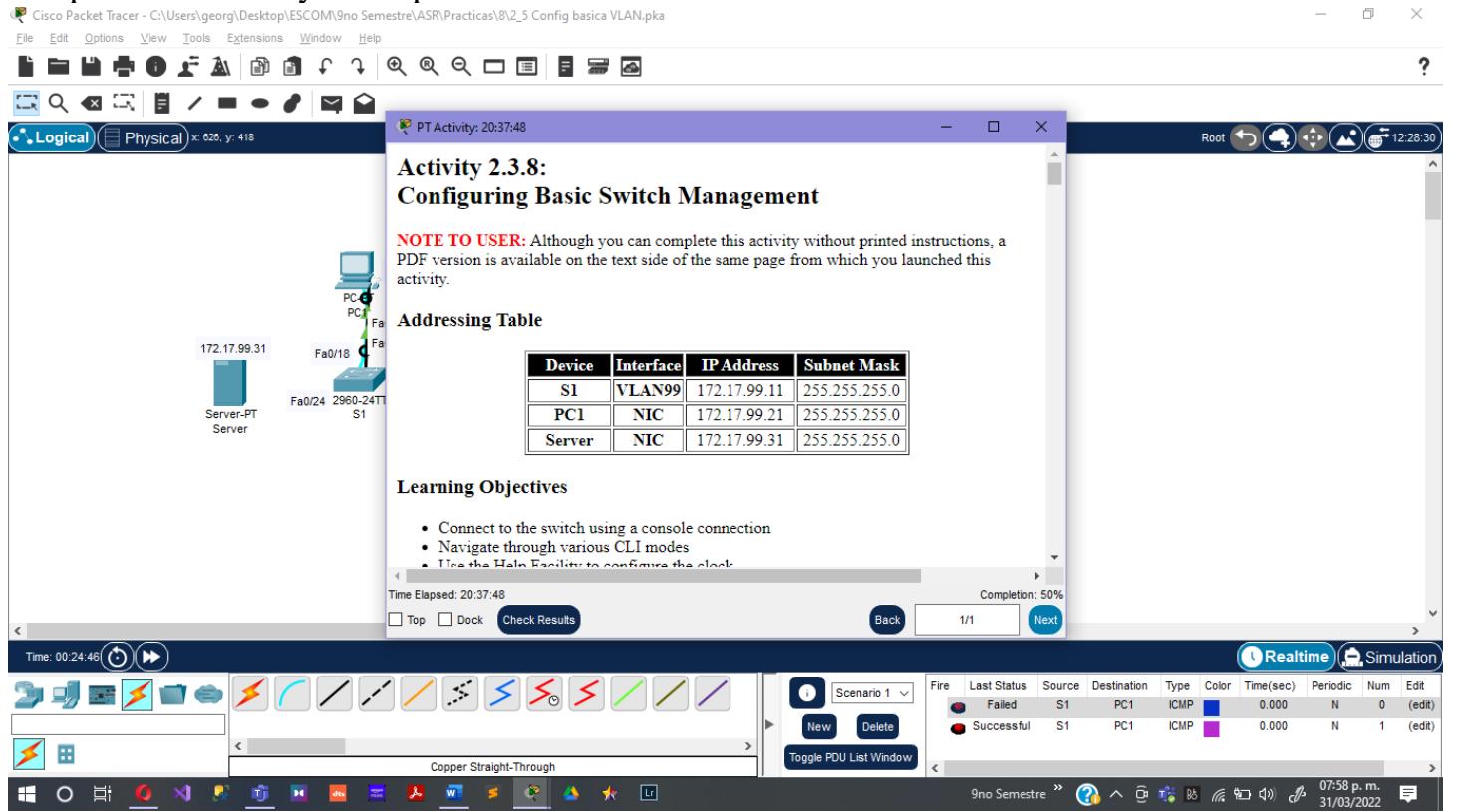
Step 3. Test connectivity between S1 and PC1.

Ping between S1 and PC1. It may take a few attempts, but it should be successful.



Step 4. Check results.

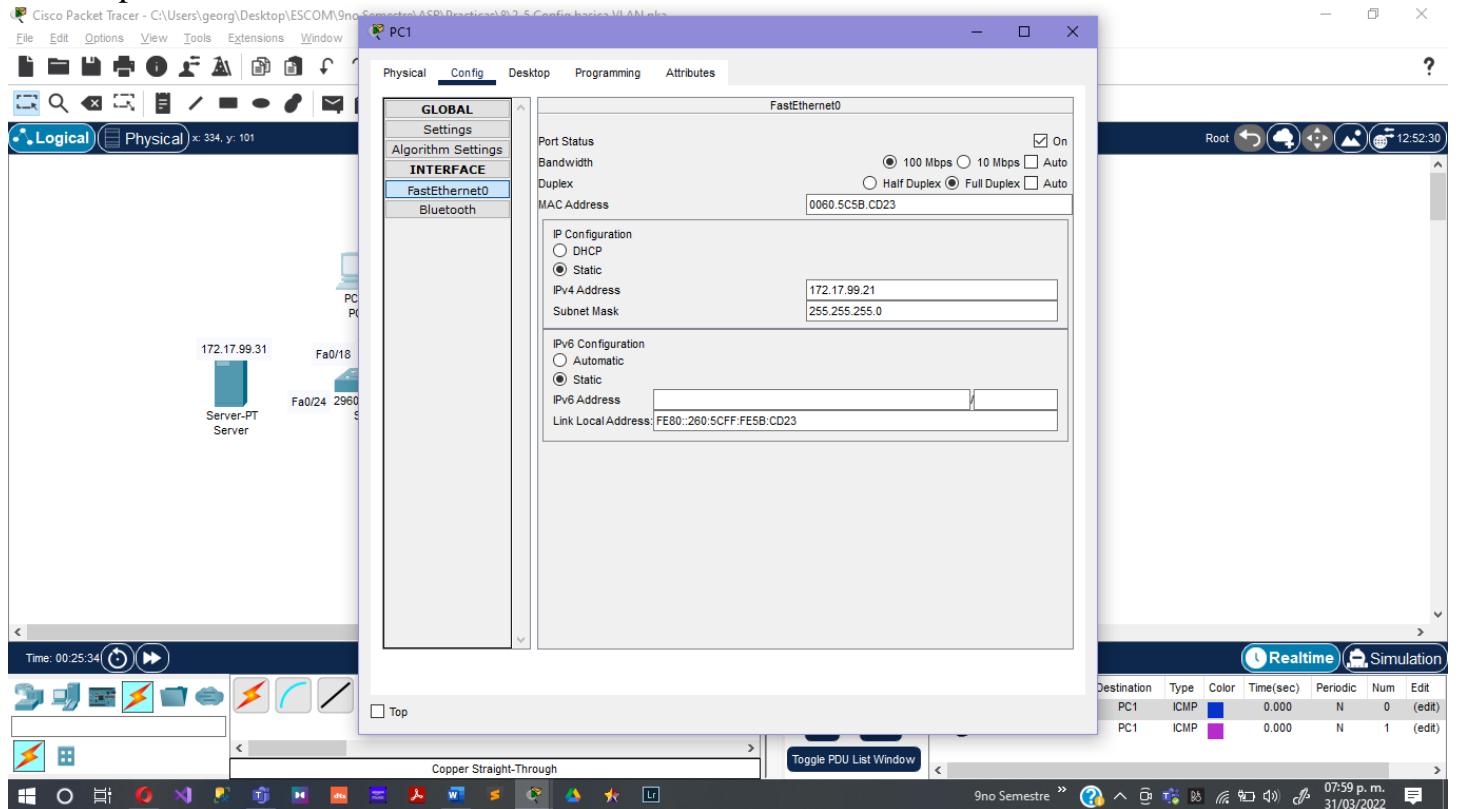
Your completion percentage should be 69%. If not, click **Check Results** to see which required components are not yet completed.



Task 7: Configure Duplex and Speed

Step 1. Use the Config tab change the settings.

On PC1, select the **Config** tab. Set the bandwidth of the FastEthernet interface to 100 Mbps and Full Duplex.



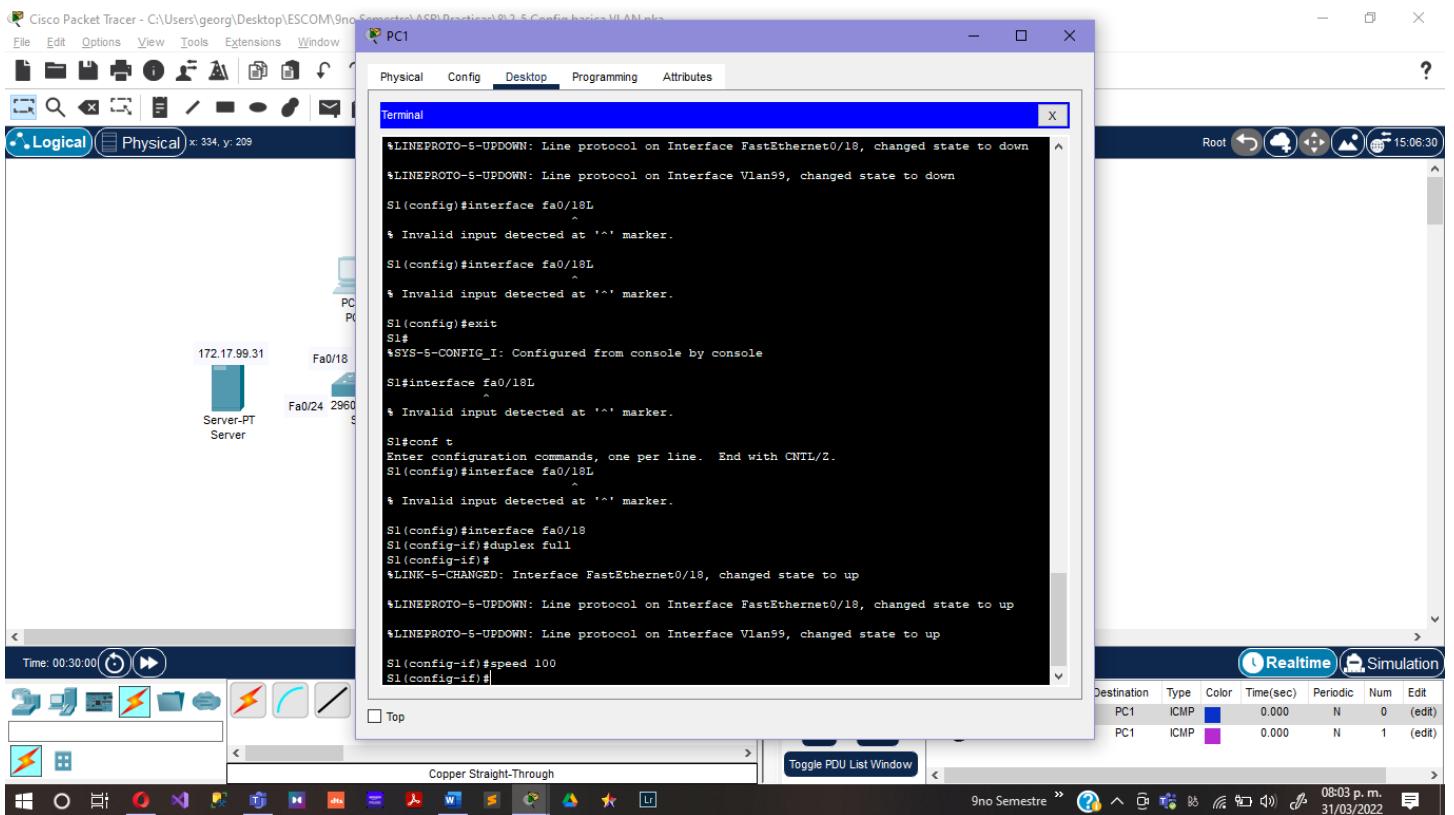
Step 2. Use Cisco IOS commands to set Fa0/18.

Return to the desktop and select **Terminal**, and then configure the interface.

S1(config)#**interface fa0/18**

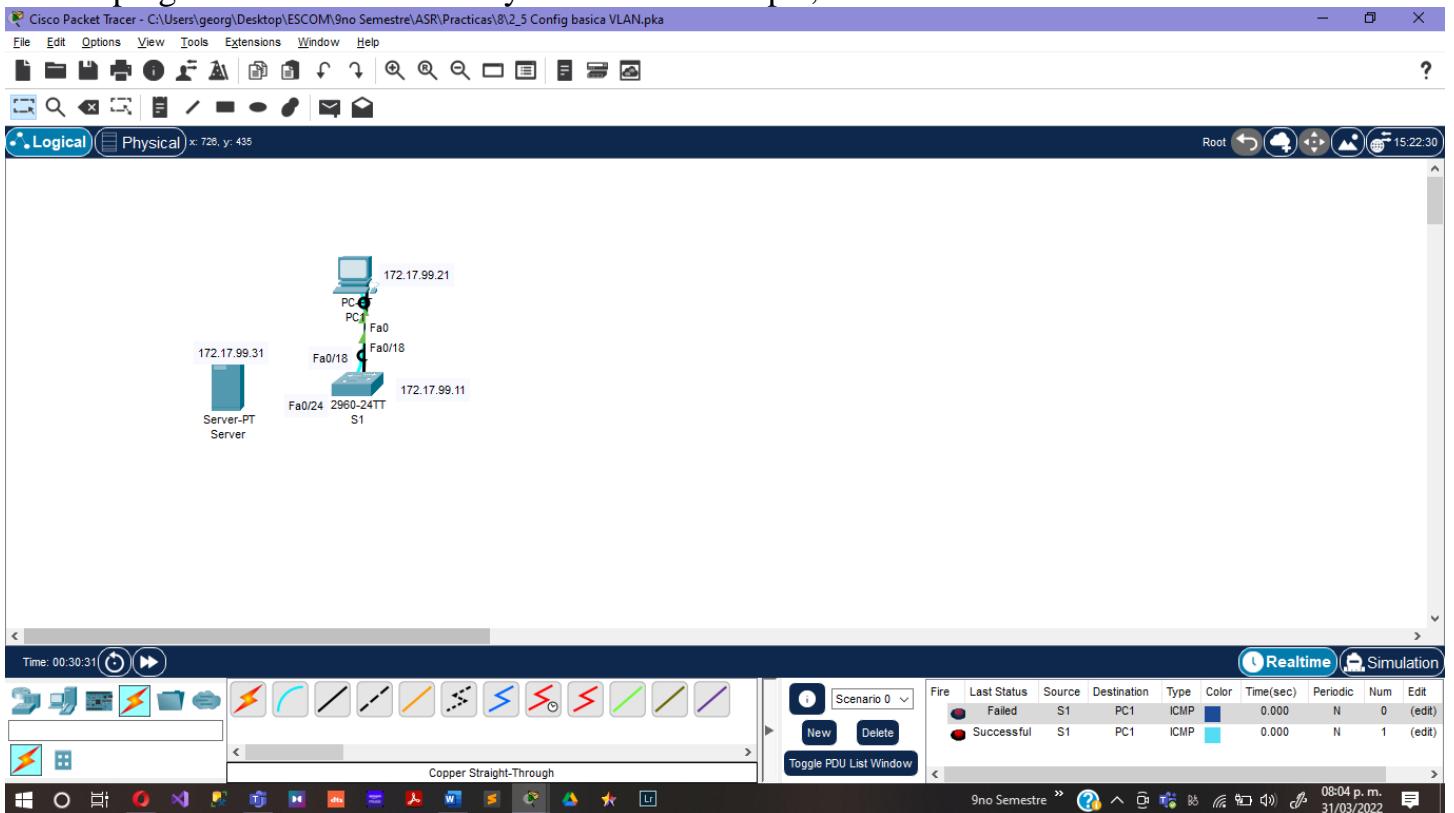
S1(config-if)#**duplex full**

S1(config-if)#**speed 100**



Step 3. Test connectivity between S1 and PC1.

Issue a ping from S1 to PC1. It may take a few attempts, but it should be successful.



Step 4. Check results.

Your completion percentage should be 81%. If not, click **Check Results** to see which required components are not yet completed.

Cisco Packet Tracer - C:\Users\georg\Desktop\ESCOM\9no Semestre\ASR\Practicas\3\2_5 Config basica VLAN.pka

File Edit Options View Tools Extensions Window Help

Logical Physical x: 726, y: 435

PT Activity: 20:43:44

Activity 2.3.8:
Configuring Basic Switch Management

NOTE TO USER: Although you can complete this activity without printed instructions, a PDF version is available on the text side of the same page from which you launched this activity.

Addressing Table

Device	Interface	IP Address	Subnet Mask
S1	VLAN99	172.17.99.11	255.255.255.0
PC1	NIC	172.17.99.21	255.255.255.0
Server	NIC	172.17.99.31	255.255.255.0

Learning Objectives

- Connect to the switch using a console connection
- Navigate through various CLI modes
- Use the Help Facility to configure the switch

Time Elapsed: 20:43:44

Completion: 50%

Back 1/1 Next

Realtime Simulation

Toggle PDU List Window

Scenario 0 Failed S1 PC1 ICMP 0.000 N 0 (edit)

Successful S1 PC1 ICMP 0.000 N 1 (edit)

Time: 00:30:39

9no Semestre 08:04 p.m. 31/03/2022

The screenshot shows the Cisco Packet Tracer interface. On the left, there's a network diagram with a Server-PT Server, a 2960-24T switch (S1), and two PCs (PC1 and PC2). PC1 is connected to Fa0/18 and Fa0/24 of S1, and PC2 is connected to Fa0/19. All three have IP addresses in the 172.17.99.x range. A table titled 'Addressing Table' lists these configurations. Below the diagram is a 'Learning Objectives' section with three bullet points. At the bottom, there's a toolbar with icons for various functions like 'Edit', 'Search', and 'File'. A status bar at the bottom right shows the time as 08:04 p.m. on 31/03/2022.

Task 8: Manage the MAC Address Table

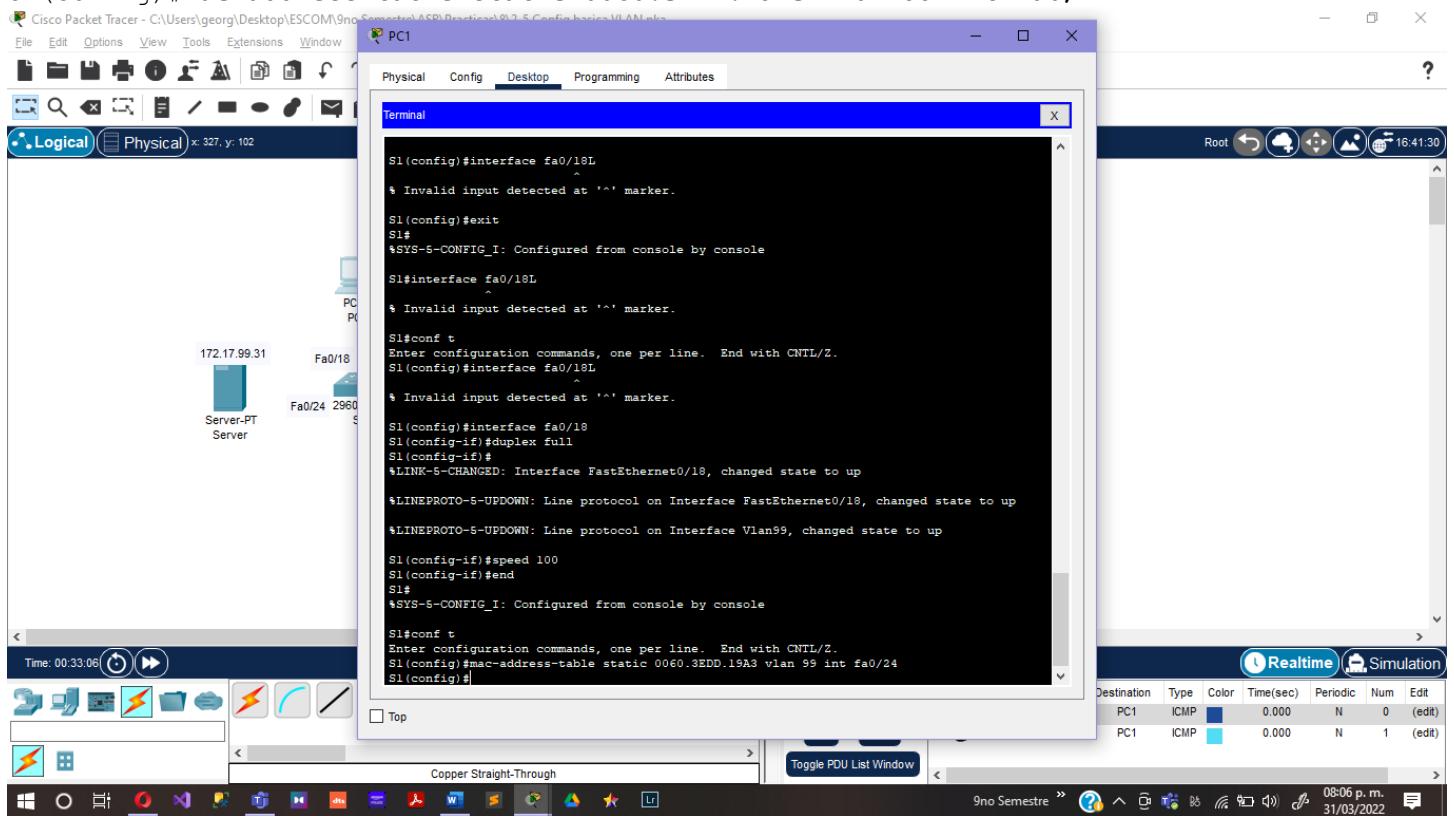
Step 1. Check the MAC address of the server.

Click the Server, then the **Config** tab, and then **FastEthernet**. The MAC Address is 0060.3EDD.19A3.

Step 2. Configure static MAC for the TFTP server.

By configuring a static MAC for the TFTP server, the switch always knows which port to use to send out traffic destined for the server. In global configuration mode on S1, add the MAC address to the addressing table of the switch:

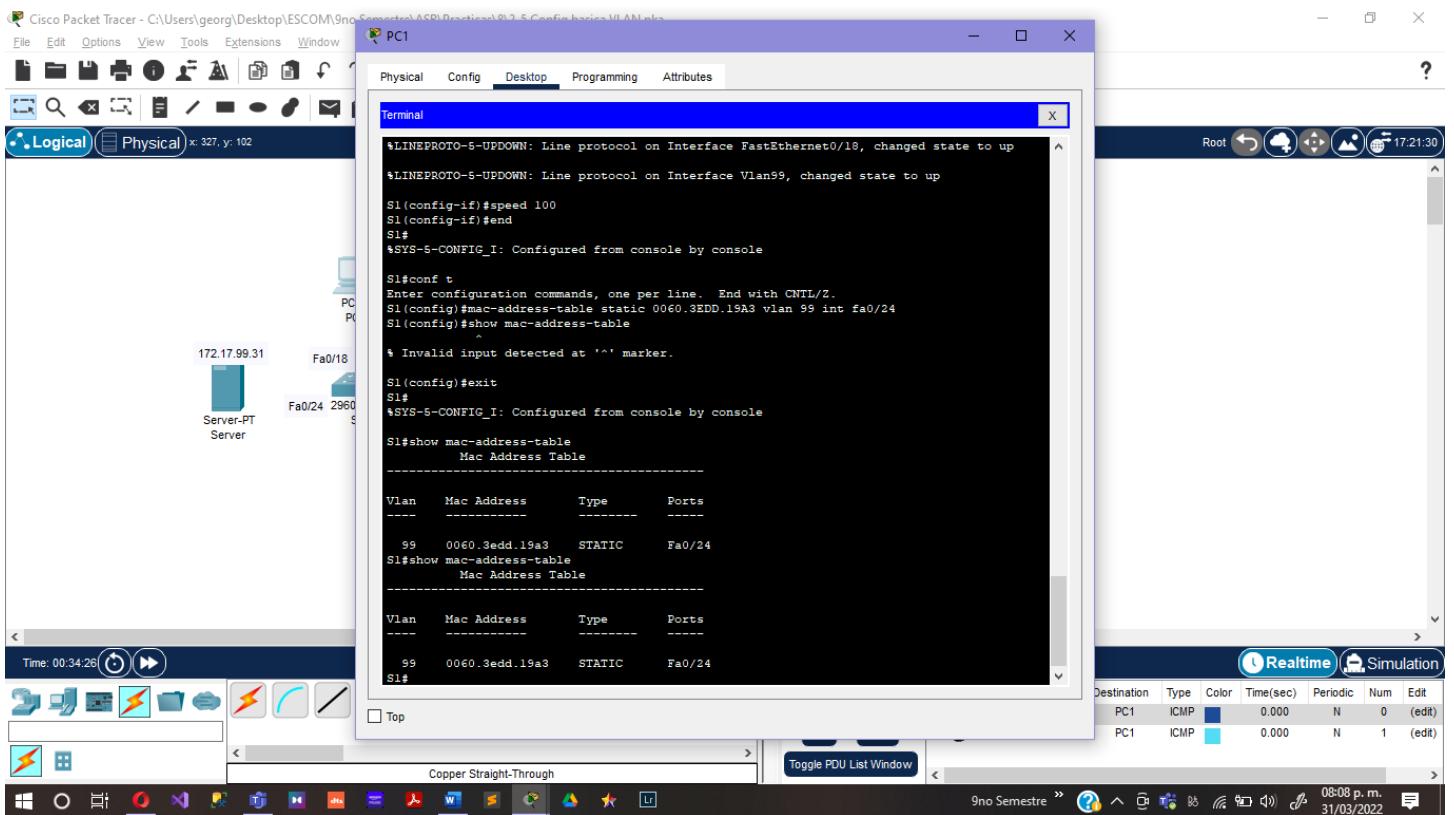
```
S1(config)#mac-address-table static 0060.3EDD.19A3 vlan 99 int fa0/24
```



Step 3. Verify that the static MAC address is now in the MAC address table.

```
S1#show mac-address-table
  Mac Address Table
-----
Vlan      Mac Address          Type      Ports
----      -----
 99      0060.3edd.19a3      STATIC    Fa0/24
 99      0060.5c5b.cd23      DYNAMIC   Fa0/18

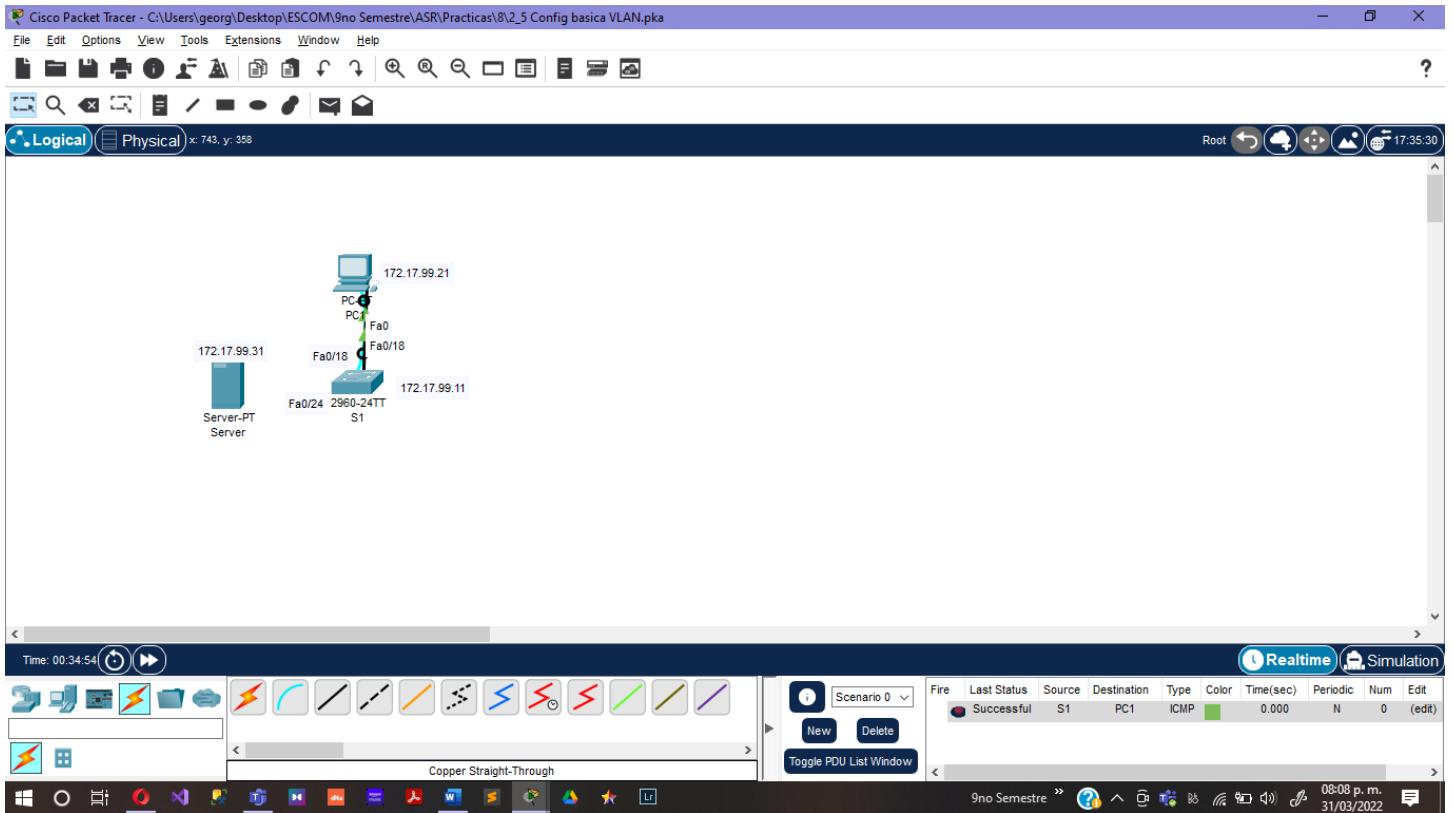
S1#
```



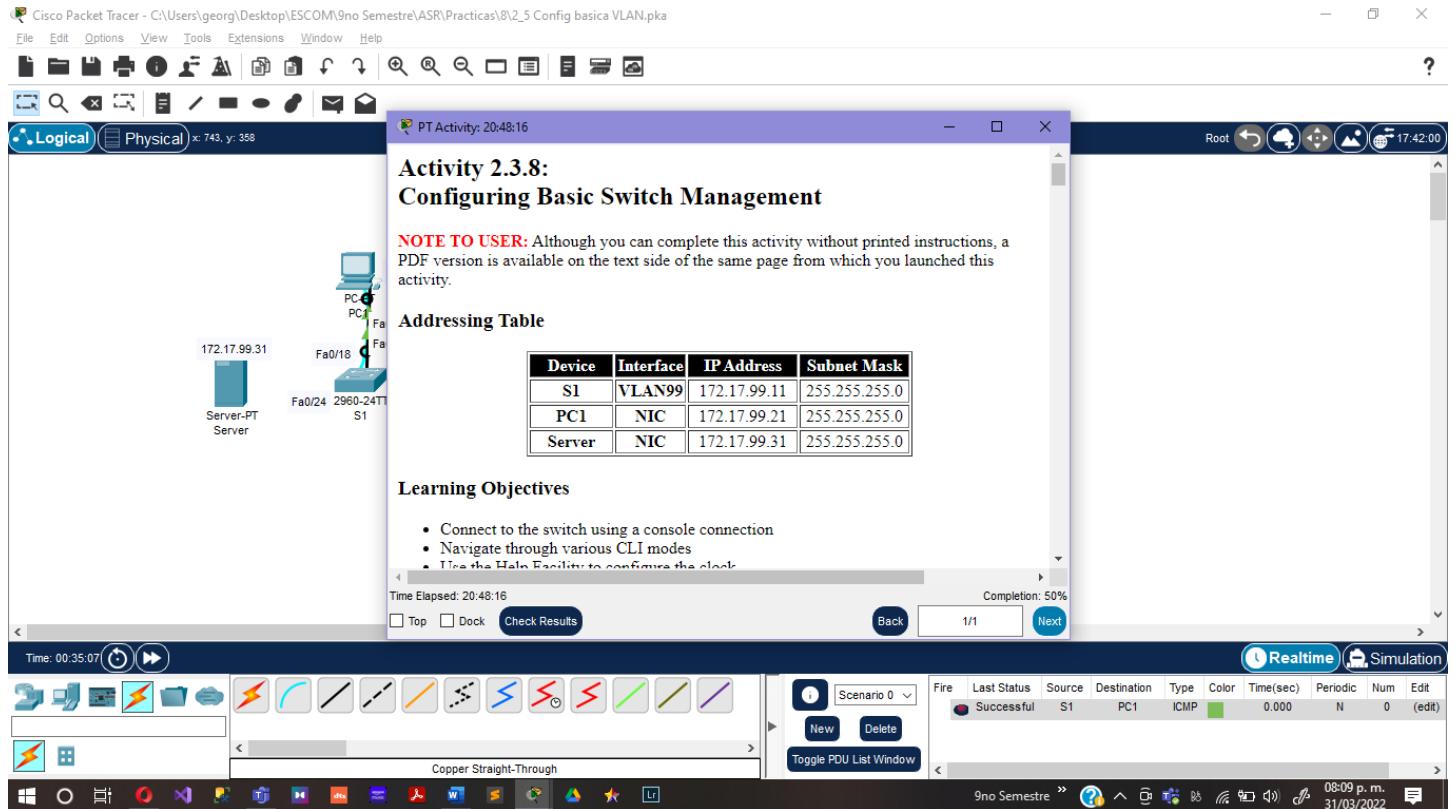
Notice how the MAC address from PC1 was added dynamically. This entry may or may not be in your table depending on how long it has been since you pinged from PC1 to S1.

Step 4. Test connectivity between S1 and PC1.

Issue a ping from S1 to PC1. It may take a few attempts, but the command should be successful.

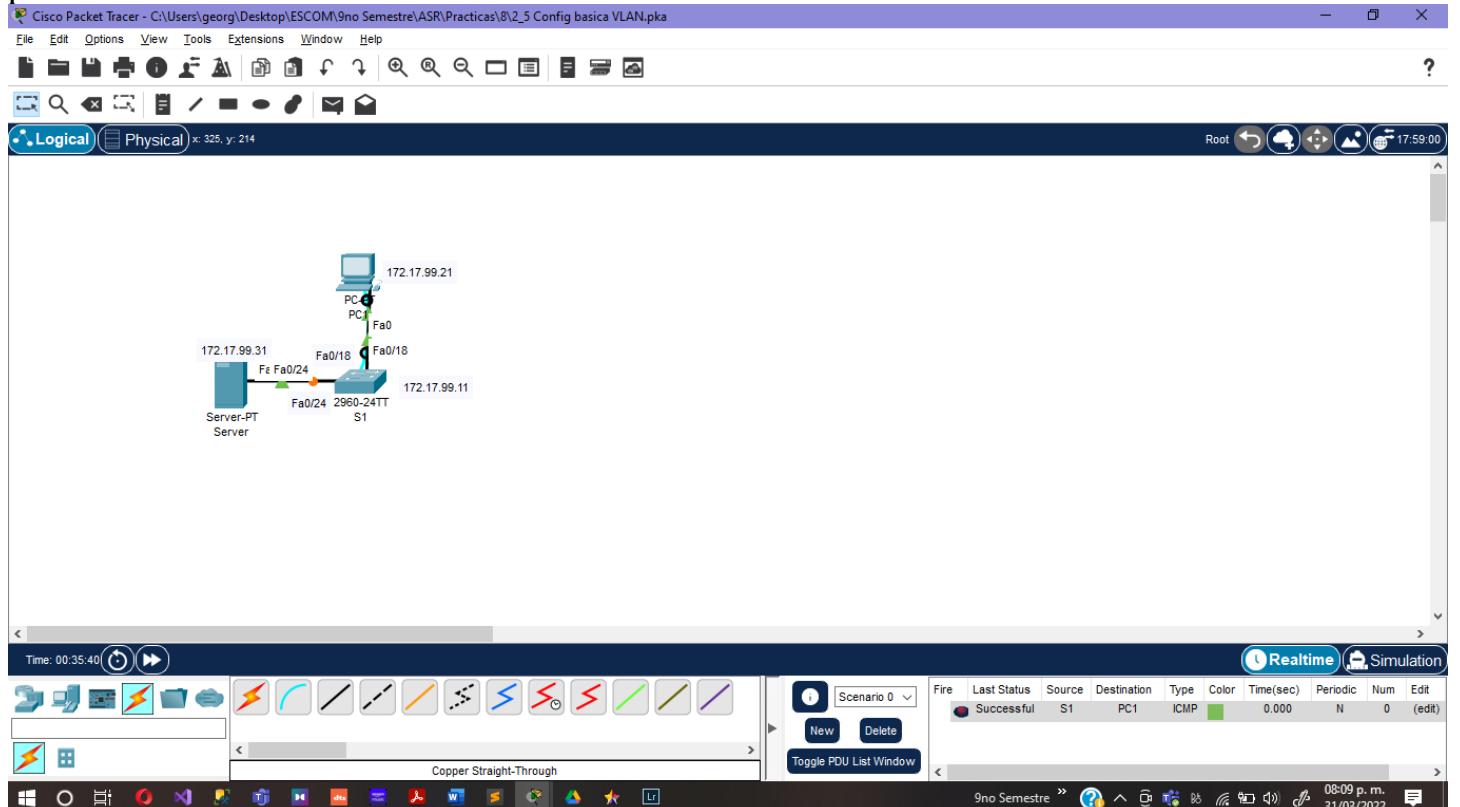


Packet Tracer does not grade this command. This command is needed to allow the switch to know where to send traffic destined for the server. Completion is still at 81% at the end of this task.



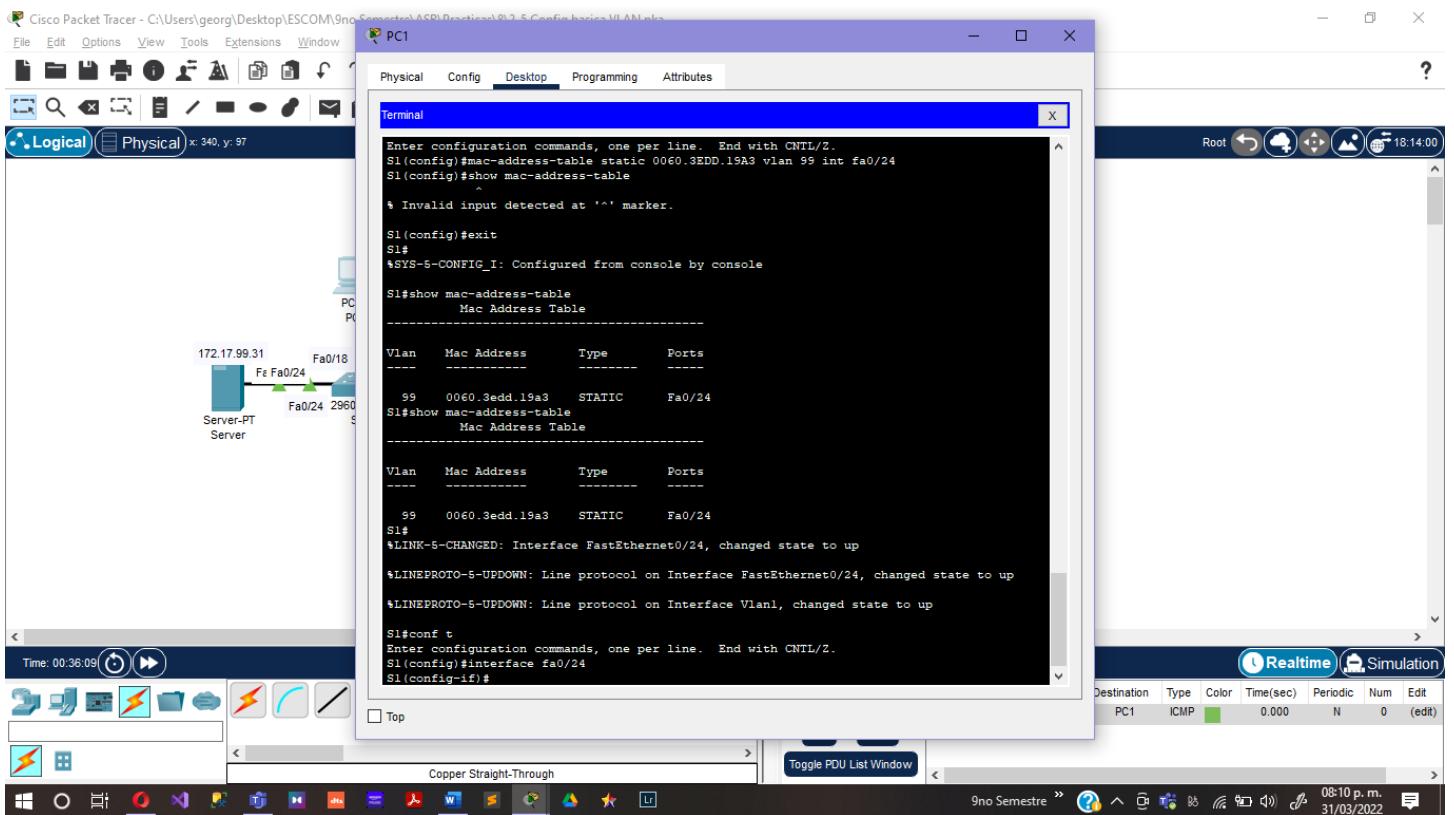
Task 9: Manage the Switch Configuration File

Using a copper straight-through cable, connect the FastEthernet port on the server to the Fa0/24 port on the switch.



Step 1. Enter interface configuration mode for Fa0/24.

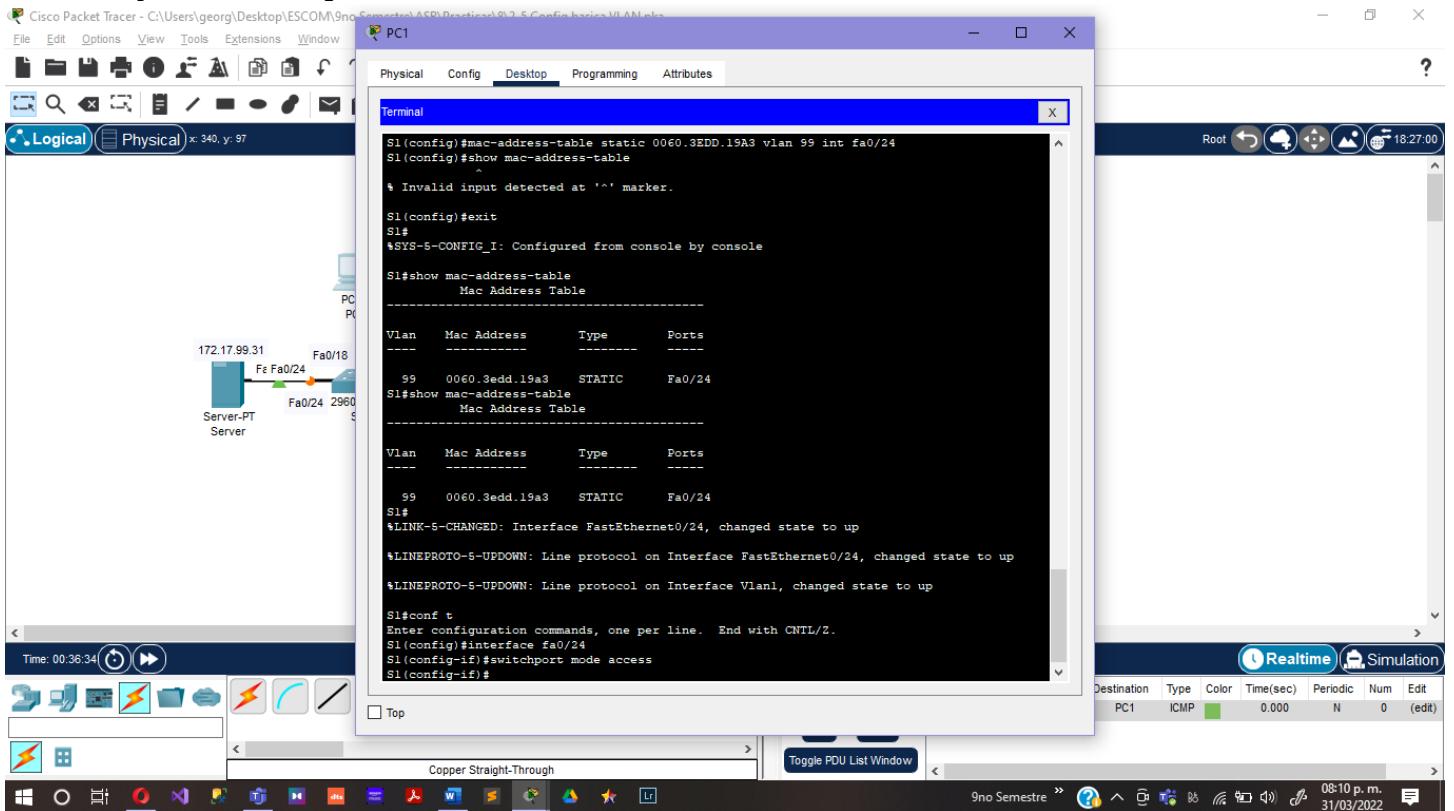
```
S1#configure terminal  
S1(config)#interface fa0/24  
S1(config-if) #
```



Step 2. Set the port mode to access.

Setting the port mode to access allows frames to be sent and received from the interface.

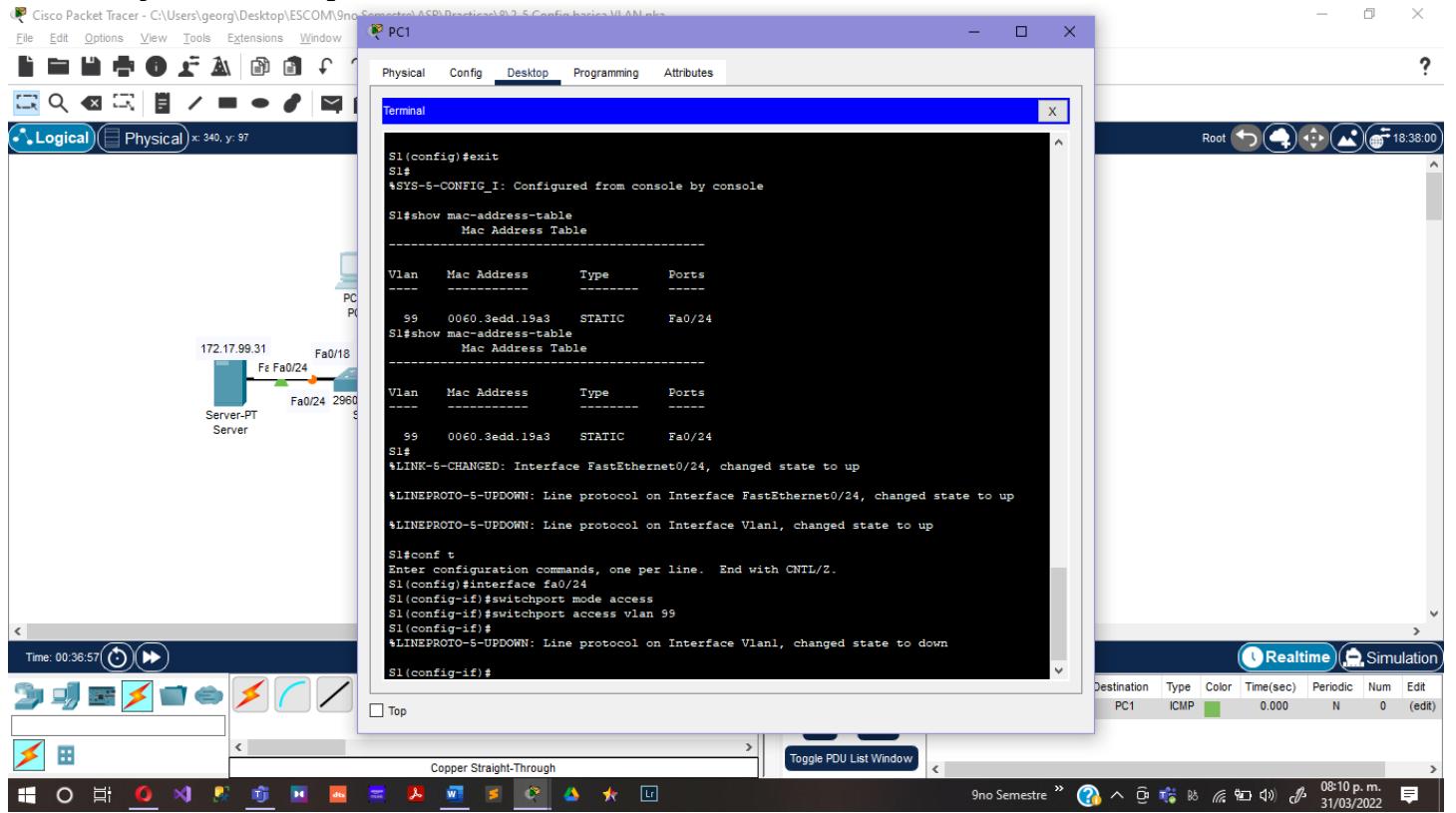
S1(config-if)#switchport mode access



Step 3. Assign VLAN99 to the port.

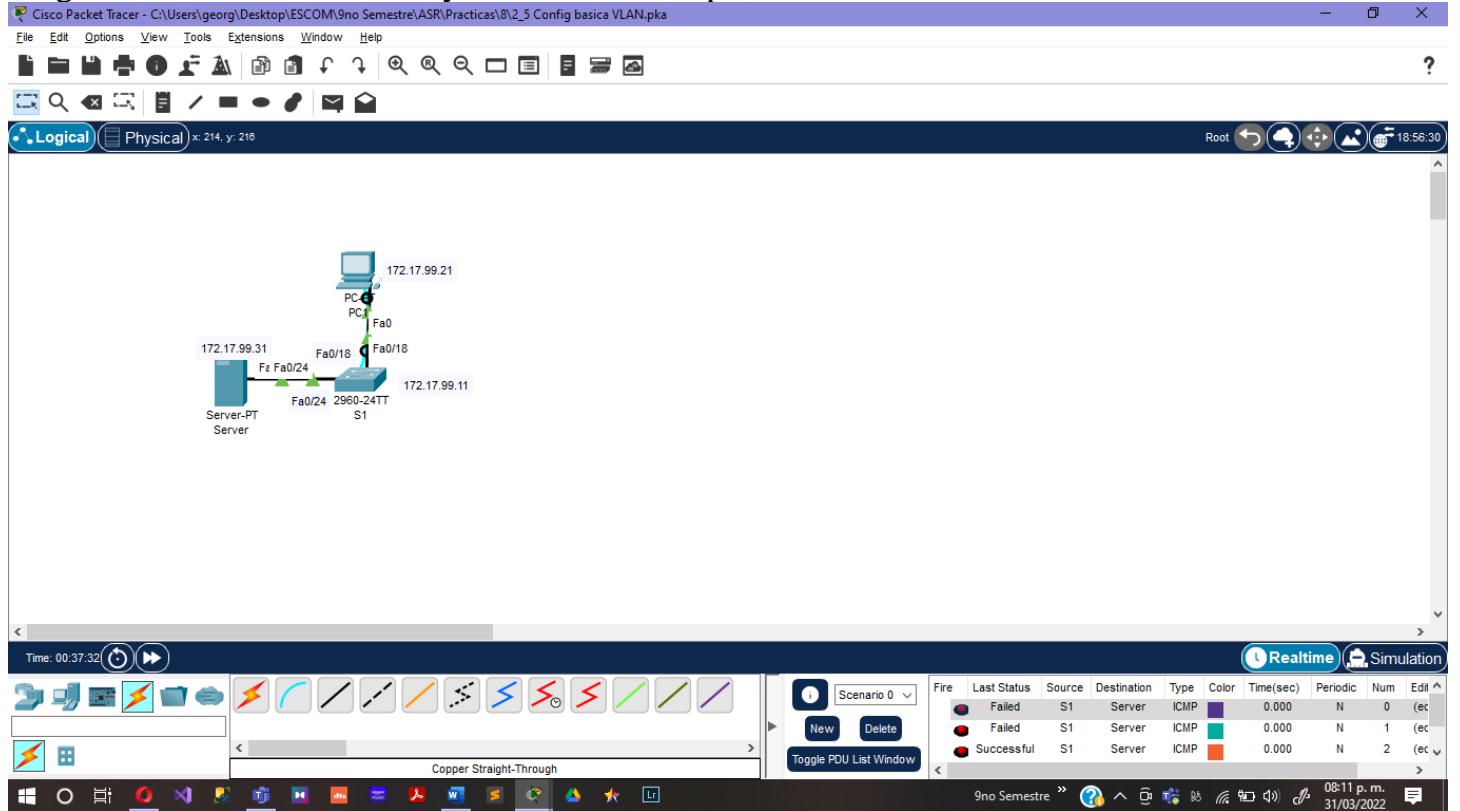
Assigning VLAN99 to the port allows the Fa0/24 interface to act as a member of VLAN 99.

```
S1(config-if)#switchport access vlan 99
```



Step 4. Verify S1 can ping the server.

Ping the server from S1. It may take a few attempts, but it should be successful.

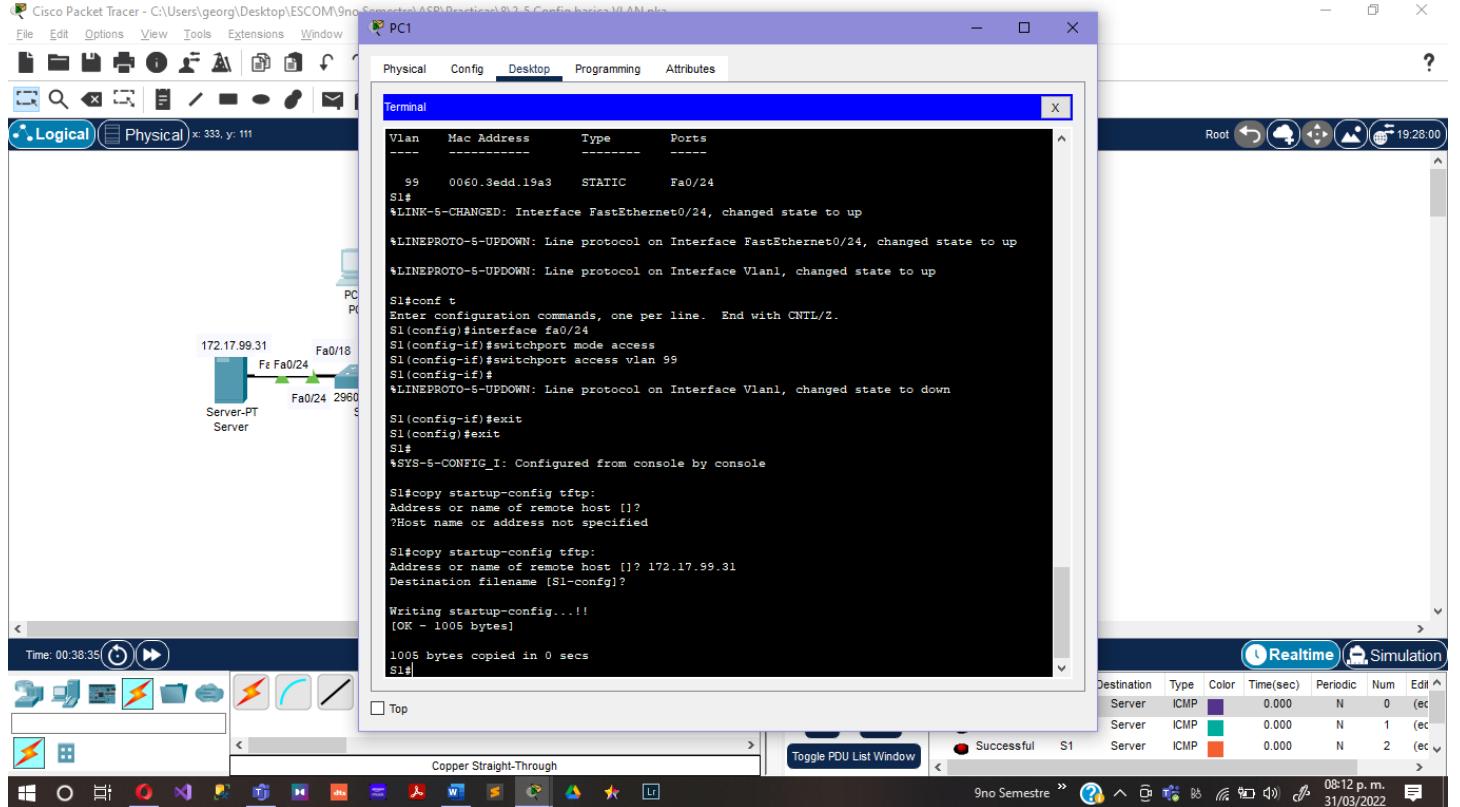


Step 5. Back up the startup configuration to the server.

In privileged EXEC mode, copy the startup configuration to the sever. When you are prompted for the address of the remote host, enter IP address of the server, 172.17.99.31. For the destination filename, use the default filename by pressing **Enter**.

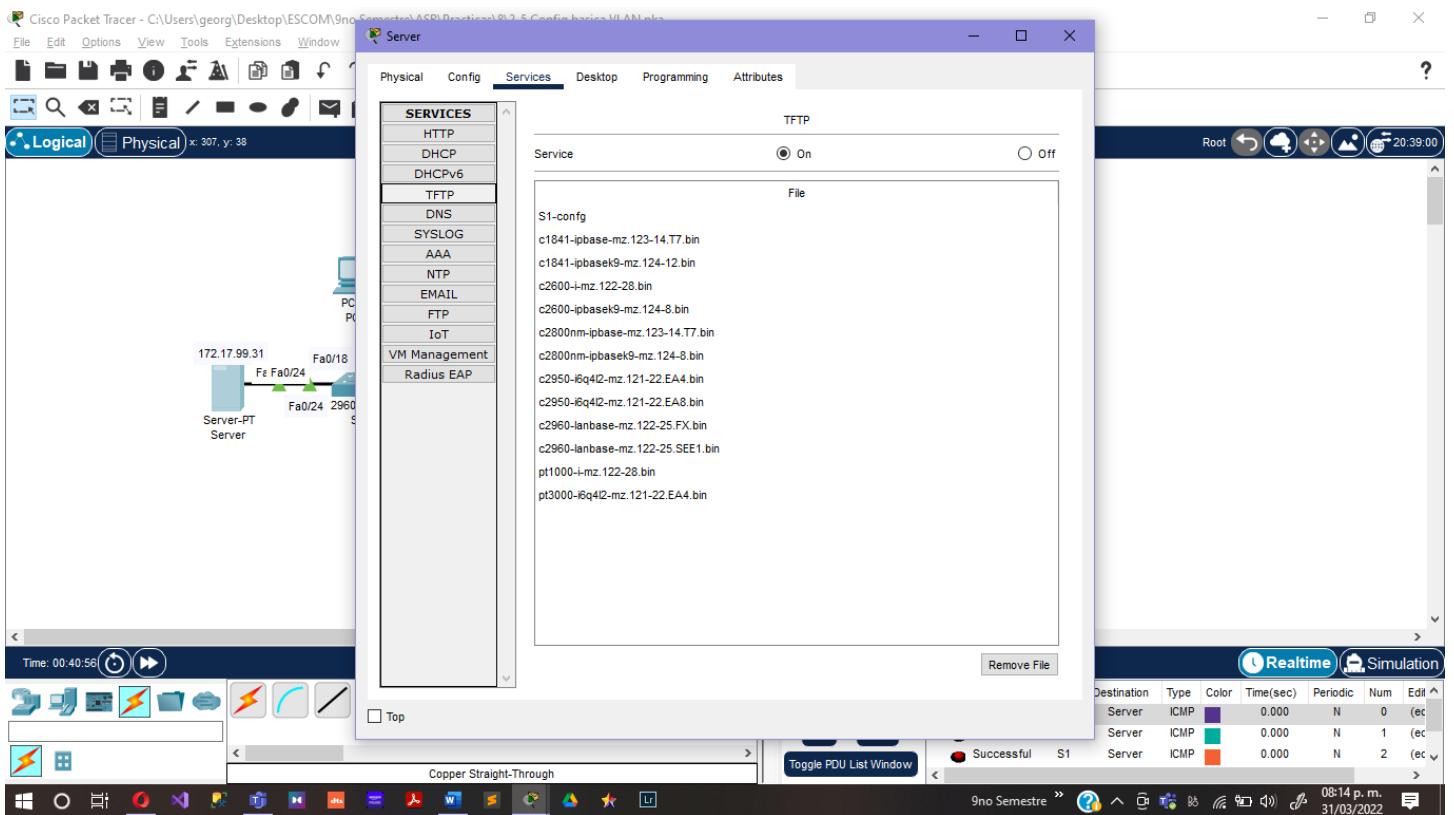
```
S1#copy startup-config tftp:  
Address or name of remote host []? 172.17.99.31
```

```
Destination filename [S1-config]? [Enter]
```



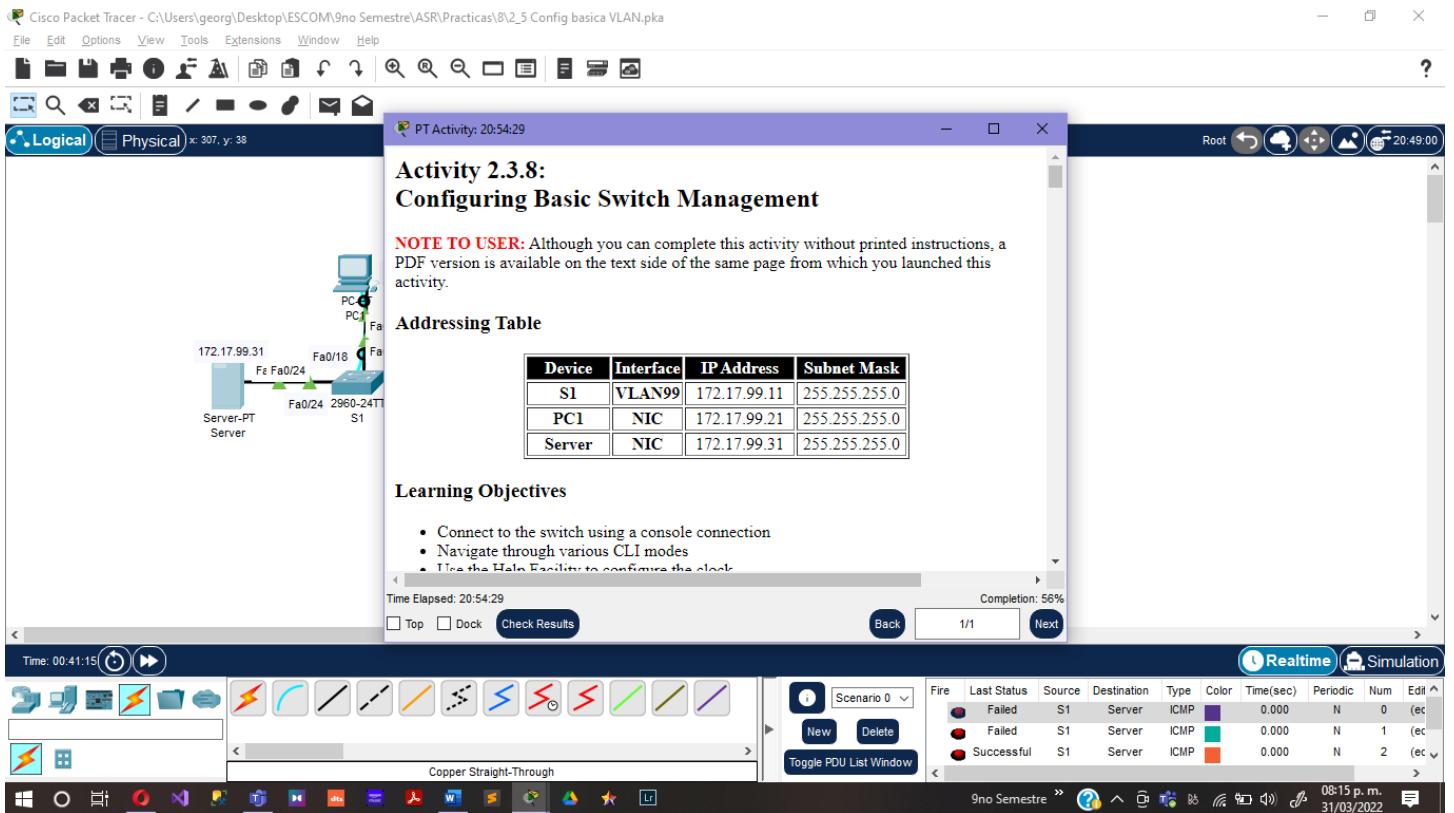
Step 6. Verify that the server has the startup configuration.

To determine if the startup configuration was successfully transferred to the server, click the server and then click the **Config** tab. The S1-config file should be listed under Services and TFTP. **Note:** Restoring the startup from the server is not fully simulated in Packet Tracer.



Step 7. Check results.

Your completion percentage should be 100%. If not, click **Check Results** to see which required components are not yet completed.



Conclusiones:

Arévalo Andrade Miguel Ángel:

Se cumplieron los objetivos:

- Conéctese al commutador mediante una conexión de consola
- Navegar a través de varios modos CLI
- Use la función de ayuda para configurar el reloj
- Acceder y configurar el historial de comandos
- Configurar la secuencia de arranque
- Configurar una PC y conectarla a un switch
- Configurar dúplex completo
- Administrar la tabla de direcciones MAC
- Administrar el archivo de configuración del switch

Castro Cruces Jorge Eduardo:

Se cumplieron los objetivos principales de la práctica:

- Connect to the switch using a console connection
- Navigate through various CLI modes
- Use the Help Facility to configure the clock
- Access and configure command history

López Mares Irene Elizabeth:

Está práctica nos ayudo a observar mejor el funcionamiento de las vlan ya que pudimos crear una red lógica dentro de la red física, además también pudimos manejar diferentes comandos dentro del switch por primera vez, como fueron cambiarle el nombre, configurar el reloj, configurar duplex entre otros.

Pedroza García Rodolfo:

En esta práctica interactuamos con el switch, a través de diferentes modos de consola, configuramos una vlan básica, también se configuro direcciones MAC, y además aprendimos a configurar el reloj del switch. Fue una practica introductoria a los switches y aprendimos configuraciones básicas de estos.