

## **CMPE 305 Data and Digital Communication**

### **MP3 – Basic Switch and OSI Model**

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BSCPE 3-3

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## **2.3.7 – Navigate the IOS**

### **Objectives**

Part 1: Establish Basic Connections,  
Access the CLI, and Explore Help  
Part 2: Explore EXEC Modes  
Part 3: Set the Clock

### **Background/Scenario**

In this activity, you will practice skills necessary for navigating the Cisco IOS, such as different user access modes, various configuration modes, and common commands used on a regular basis. You will also practice accessing the context-sensitive Help by configuring the clock command.

## **Instructions**

### **Part 1: Establish Basic Connections, Access the CLI, and Explore Help**

#### **Step 1: Connect PC1 to S1 using a console cable.**

- a. Click the Connections icon (the one that looks like a lightning bolt) in the lower left corner of the Packet Tracer window.
- b. Select the light blue Console cable by clicking it. The mouse pointer will change to what appears to be a connector with a cable dangling from it.
- c. Click PC1. A window displays an option for an RS-232 connection. Connect the cable to the RS-232 port.
- d. Drag the other end of the console connection to the S1 switch and click the switch to access the connection list.
- e. Select the Console port to complete the connection.

Logical Physical x: 135, y: 328 Root

Click the Connections icon (the one that looks like a lightning bolt) in the lower left corner of the Packet Tracer window. You will also practice accessing the context-sensitive Help by configuring the clock command.

### Instructions

#### Part 1: Establish Basic Connections, Access the CLI, and Explore Help

##### Step 1: Connect PC1 to S1 using a console cable.

- Click the Connections icon (the one that looks like a lightning bolt) in the lower left corner of the Packet Tracer window.
- Select the light blue Console cable by clicking it. The mouse pointer will change to what appears to be a connector with a cable dangling from it.
- Click PC1. A window displays an option for an RS-232 connection. Connect the cable to the RS-232 port.
- Drag the other end of the console connection to the S1 switch and click the switch to access the connection list.
- Select the Console port to complete the connection.


##### Step 2: Establish a terminal session with S1.

- Click PC1 and then select the Desktop tab.
- Click the Terminal application icon. Verify that the Port Configuration default settings are correct.

Time Elapsed: 00:03:43

☒ Dock   1/1

Time: 00:03:41



## Step 2: Establish a terminal session with S1

- Click **PC1** and then select the **Desktop** tab.
- Click the **Terminal** application icon. Verify that the Port Configuration default settings are correct.

Question: What is the setting for bits per second? **9600**

switch to access the connection list.

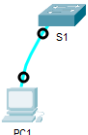
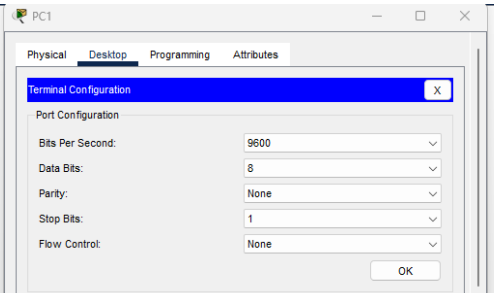
- Select the Console port to complete the connection.

##### Step 2: Establish a terminal session with S1.

- Click PC1 and then select the Desktop tab.
- Click the Terminal application icon. Verify that the Port Configuration default settings are correct.

What is the setting for bits per second?

- The screen that appears may have several messages displayed. Somewhere on the screen there should be a **Press RETURN to get started!** message. Press ENTER.

- The screen that appears may have several messages displayed. Somewhere on the screen there should be a **Press RETURN to get started!** message. Press ENTER.

Question: What is the prompt displayed on the screen? **S1>**

**Step 2: Establish a terminal session with S1.**

- Click PC1 and then select the Desktop tab.
- Click the **Terminal** application icon. Verify that the Port Configuration default settings are correct.

What is the setting for bits per second?

- The screen that appears may have several messages displayed. Somewhere on the screen there should be a **Press RETURN to get started!** message. Press ENTER.

What is the prompt displayed on the screen?

**Step 3: Explore the IOS Help.**

- The IOS can provide help for commands depending on the level accessed. The prompt currently displayed is called **User EXEC**, and the device is waiting for a command. The most basic form of help is

```

Terminal
Motherboard revision number : B0
Model number                : WS-C2960-24TT-L
System serial number        : FOC1010X104
Top Assembly Part Number    : 800-27221-02
Top Assembly Revision Number : A0
Version ID                  : V02
CLBI Code Number            : COM3L00BRA
Hardware Board Revision Number : 0x01

Switch Ports Model          SW Version        SW Image
-----
*  1 26    WS-C2960-24TT-L  15.0(2)SE4       C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE
SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed 26-Jun-13 02:49 by mnguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down

S1>
S1>

```

### Step 3: Explore the IOS Help

a. The IOS can provide help for commands depending on the level accessed. The prompt currently displayed is called **User EXEC**, and the device is waiting for a command. The most basic form of help is to type a question mark (?) at the prompt to display a list of commands.

S1> ?

Question: Which command begins with the letter 'C'? **connect**

What is the prompt displayed on the screen?

**Step 3: Explore the IOS Help.**

- The IOS can provide help for commands depending on the level accessed. The prompt currently displayed is called **User EXEC**, and the device is waiting for a command. The most basic form of help is to type a question mark (?) at the prompt to display a list of commands.

S1> ?

Which command begins with the letter 'C'?

- At the prompt, type t and then a question mark (?).

S1> t?

Which commands are displayed?

At the prompt, type te and then a question mark (?).

```

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Compiled Wed 26-Jun-13 02:49 by mnguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down

S1>
S1>?
Exec commands:
connect      Open a terminal connection
disable     Turn off privileged commands
disconnect   Disconnect an existing network connection
enable       Turn on privileged commands
exit         Exit from the EXEC
logout       Exit from the EXEC
ping         Send echo messages
resume       Resume an active network connection
show         Show running system information
ssh          Open a secure shell client connection
telnet       Open a telnet connection
terminal     Set terminal line parameters
traceroute   Trace route to destination

S1>

```

b. At the prompt, type t and then a question mark (?).

S1> t?

Question: Which commands are displayed? **telnet terminal traceroute**

What is the prompt displayed on the screen?

**Step 3: Explore the IOS Help.**

a. The IOS can provide help for commands depending on the level accessed. The prompt currently displayed is called User EXEC, and the device is waiting for a command. The most basic form of help is to type a question mark (?) at the prompt to display a list of commands.

S1> ?

Which command begins with the letter 'C'?

b. At the prompt, type t and then a question mark (?).

S1> t?

Which commands are displayed?

At the prompt, type te and then a question mark (?).

Time Elapsed: 00:00:00 Completion: 1/1

Exec commands:

Command	Description
connect	Open a terminal connection
disable	Turn off privileged commands
disconnect	Disconnect an existing network connection
enable	Turn on privileged commands
exit	Exit from the EXEC
logout	Exit from the EXEC
ping	Send echo messages
resume	Resume an active network connection
show	Show running system information
ssh	Open a secure shell client connection
telnet	Open a telnet connection
terminal	Set terminal line parameters
traceroute	Trace route to destination

S1> t?

telnet terminal traceroute

S1> t?

telnet terminal traceroute

S1> t

At the prompt, type te and then a question mark (?).

S1> te?

Question: Which commands are displayed? **telnet terminal**

b. At the prompt, type t and then a question mark (?).

S1> t?

Which commands are displayed?

At the prompt, type te and then a question mark (?).

S1> te?

Which commands are displayed?

This type of help is known as context-sensitive help. It provides more information as the commands are expanded.

**Part 2: Explore EXEC Modes**

In Part 2 of this activity, you will switch to privileged EXEC mode and issue additional commands

Exec commands:

Command	Description
connect	Open a terminal connection
disable	Turn off privileged commands
disconnect	Disconnect an existing network connection
enable	Turn on privileged commands
exit	Exit from the EXEC
logout	Exit from the EXEC
ping	Send echo messages
resume	Resume an active network connection
show	Show running system information
ssh	Open a secure shell client connection
telnet	Open a telnet connection
terminal	Set terminal line parameters
traceroute	Trace route to destination

S1> t?

telnet terminal traceroute

S1> t?

telnet terminal traceroute

S1> te?

telnet terminal

S1> te

## Part 2: Explore EXEC Modes

### Step 1: Enter privileged EXEC mode.

- a. At the prompt, type the question mark (?).

S1> ?

Question: What information is displayed for the **enable** command? **Turn on privileged commands**

**Part 2: Explore EXEC Modes**

In Part 2 of this activity, you will switch to privileged EXEC mode and issue additional commands

**Step 1: Enter privileged EXEC mode.**

a. At the prompt, type the question mark (?).

S1> ?

What information is displayed for the **enable** command?

b. Type **en** and press the **Tab** key.

S1> en<Tab>

What displays after pressing the **Tab** key?

This is called command completion (or tab completion). When part of a command is typed, the **Tab** key can be used to complete the partial command. If the characters typed are enough to make the command unique, as in the case of the **enable** command, the remaining portion of the command is displayed.

Time Elapsed: 00:00:00 Completion:

[Check Results](#) [Back](#) 1/1 [Next](#)

```
resume      Resume an active network connection
show        Show running system information
ssh         Open a secure shell client connection
telnet      Open a telnet connection
terminal    Set terminal line parameters
traceroute  Trace route to destination

S1>?
telnet      terminal traceroute
S1>?
telnet      terminal traceroute
S1>te?
telnet      terminal
S1>?

Exec commands:
connect     Open a terminal connection
disable     Turn off privileged commands
disconnect  Disconnect an existing network connection
enable     Turn on privileged commands
exit        Exit from the EXEC
logout      Exit from the EXEC
ping        Send echo messages
resume      Resume an active network connection
show        Show running system information
ssh         Open a secure shell client connection
telnet      Open a telnet connection
terminal    Set terminal line parameters
traceroute  Trace route to destination

S1>
```

- b. Type **en** and press the **Tab** key.

S1> en<Tab>

Question: What displays after pressing the **Tab** key? **S1>enable**

a. At the prompt, type the question mark (?).

S1> ?

What information is displayed for the **enable** command?

b. Type **en** and press the **Tab** key.

S1> en<Tab>

What displays after pressing the **Tab** key?

This is called command completion (or tab completion). When part of a command is typed, the **Tab** key can be used to complete the partial command. If the characters typed are enough to make the command unique, as in the case of the **enable** command, the remaining portion of the command is displayed.

What would happen if you typed **te<Tab>** at the prompt?

c. Enter the **enable** command and press **ENTER**.

How does the prompt change?

Time Elapsed: 00:00:00 Completion:

[Check Results](#) [Back](#) [Next](#)

```
resume      Resume an active network connection
show        Show running system information
ssh         Open a secure shell client connection
telnet      Open a telnet connection
terminal    Set terminal line parameters
traceroute  Trace route to destination

S1>?
telnet      terminal traceroute
S1>?
telnet      terminal traceroute
S1>te?
telnet      terminal
S1>?

Exec commands:
connect     Open a terminal connection
disable     Turn off privileged commands
disconnect  Disconnect an existing network connection
enable     Turn on privileged commands
exit        Exit from the EXEC
logout      Exit from the EXEC
ping        Send echo messages
resume      Resume an active network connection
show        Show running system information
ssh         Open a secure shell client connection
telnet      Open a telnet connection
terminal    Set terminal line parameters
traceroute  Trace route to destination

S1>en
S1>enable
```

What would happen if you typed **te<Tab>** at the prompt? **S1>te**

b. Type **en** and press the **Tab** key.

`S1> en<Tab>`

What displays after pressing the **Tab** key?

This is called command completion (or tab completion). When part of a command is typed, the **Tab** key can be used to complete the partial command. If the characters typed are enough to make the command unique, as in the case of the **enable** command, the remaining portion of the command is displayed.

What would happen if you typed `te<Tab>` at the prompt?

c. Enter the **enable** command and press **ENTER**.

How does the prompt change?

d. When prompted, type the question mark (?).

Elapsed: 00:00:00 Completion: 1/1

Check Results Back Next

```

S1 con0 is now available

Press RETURN to get started.

S1>te
S1>tete
S1>te
S1>te|
  
```

c. Enter the **enable** command and press **ENTER**.

Question: How does the prompt change?

The prompt will change from:

- `S1> to:`
- `S1#`

What displays after pressing the **Tab** key?

This is called command completion (or tab completion). When part of a command is typed, the **Tab** key can be used to complete the partial command. If the characters typed are enough to make the command unique, as in the case of the **enable** command, the remaining portion of the command is displayed.

What would happen if you typed `te<Tab>` at the prompt?

c. Enter the **enable** command and press **ENTER**.

How does the prompt change?

d. When prompted, type the question mark (?).

`S1# ?`

One command starts with the letter 'C' in user EXEC mode.

Elapsed: 00:00:00 Completion: 1/1

Check Results Back Next

```

S1 con0 is now available

Press RETURN to get started.

S1>te
S1>tete
S1>te
S1>enable
S1#
  
```

d. When prompted, type the question mark (?).

`S1# ?`

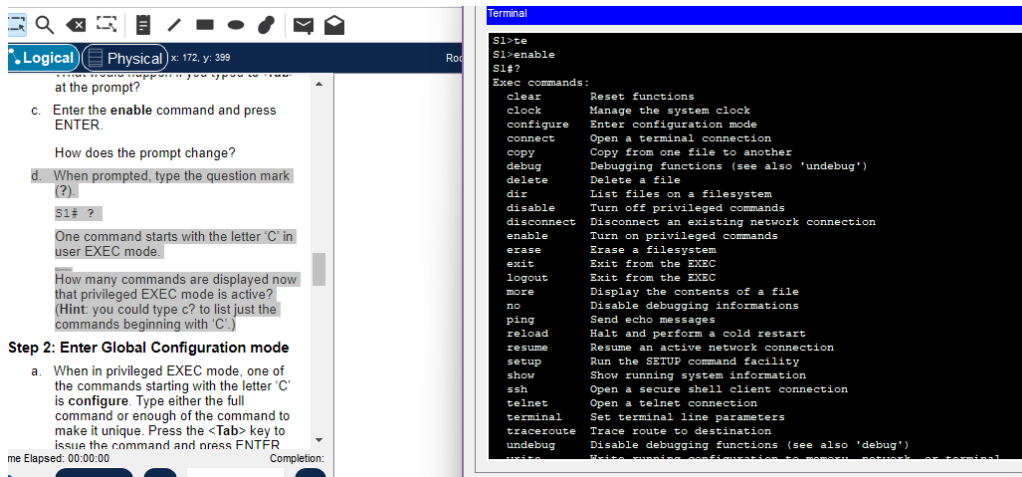
One command starts with the letter 'C' in user EXEC mode.

Question: How many commands are displayed now that privileged EXEC mode is active?  
(Hint: you could type `c?` to list just the commands beginning with 'C'.)

There are 5 commands that starts with letter C and these are:

- `clear`

- clock
- configure
- connect
- copy

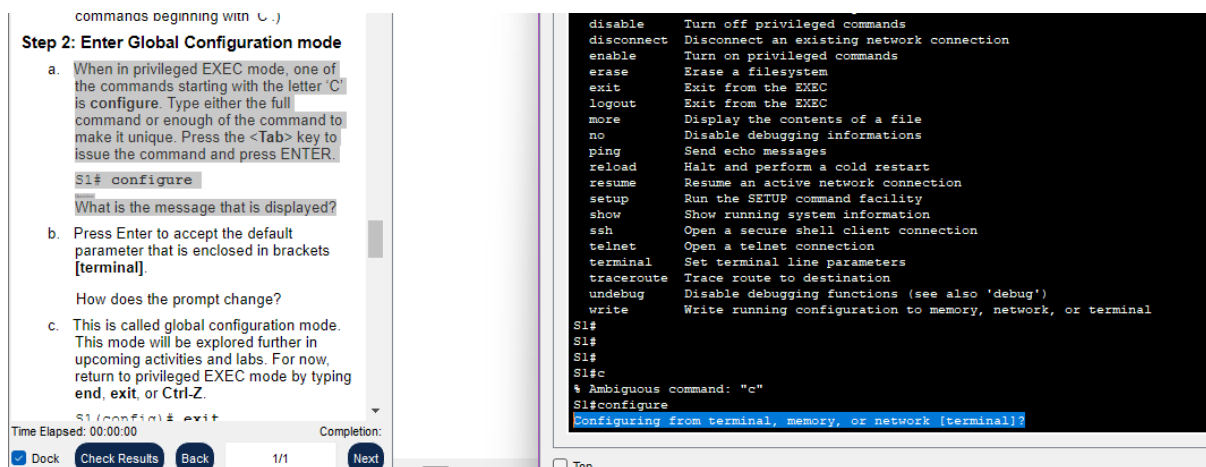


## Step 2: Enter Global Configuration mode

- When in privileged EXEC mode, one of the commands starting with the letter 'C' is **configure**. Type either the full command or enough of the command to make it unique. Press the <Tab> key to issue the command and press ENTER.

S1# **configure**

Question: What is the message that is displayed? Configuring from terminal, memory, or network [terminal]?



- Press Enter to accept the default parameter that is enclosed in brackets **[terminal]**.

Question: How does the prompt change? From S1# to S1(config)#

[illegible]



## Part 3: Set the Clock

### Step 1: Use the clock command.

a. Use the **clock** command to further explore Help and command syntax. Type **show clock** at the privileged EXEC prompt.

S1# **show clock**

Question: What information is displayed? What is the year that is displayed?

**\*13:58:14.391 UTC Mon Mar 1 1993**

The screenshot shows a Cisco Packet Tracer interface with a lab activity titled "Part 3: Set the Clock". The activity is divided into steps. Step 1 is "Use the clock command." and includes a sub-step 'a' which instructs the user to use the **clock** command to explore Help and command syntax, and to type **show clock** at the privileged EXEC prompt. The user has entered **S1# show clock** and the output is displayed: **\*13:58:14.391 UTC Mon Mar 1 1993**. The interface also shows a command list on the right side of the terminal window, including **logout**, **more**, **no**, **ping**, **reload**, **resume**, **setup**, **show**, **ssh**, **telnet**, **terminal**, **traceroute**, **undebug**, and **write**.

b. Use the context-sensitive help and the clock command to set the time on the switch to the current time. Enter the command **clock** and press ENTER.

S1# **clock<ENTER>**

Question What information is displayed? **% Incomplete command.**

The screenshot shows a Cisco Packet Tracer interface with a lab activity titled "Part 3: Set the Clock". The activity is divided into steps. Step 1 is "Use the clock command." and includes a sub-step 'b' which instructs the user to use the context-sensitive help and the **clock** command to set the time on the switch to the current time. The user has entered **S1# clock<ENTER>** and the output is displayed: **% Incomplete command.** The interface also shows a command list on the right side of the terminal window, including **ping**, **reload**, **resume**, **setup**, **show**, **ssh**, **telnet**, **terminal**, **traceroute**, **undebug**, and **write**.

c. The “% Incomplete command” message is returned by the IOS. This indicates that the clock command needs more parameters. Any time more information is needed, help can be provided by typing a space after the command and the question mark (?).

S1# clock ?

Question: What information is displayed? set Set the time and date

Logical
Physical
x: 429, y: 371

Ro

What information is displayed? What is the year that is displayed?

b. Use the context-sensitive help and the **clock** command to set the time on the switch to the current time. Enter the command **clock** and press ENTER.

```
S1# clock<ENTER>
```

What information is displayed?

c. The "% Incomplete command" message is returned by the IOS. This indicates that the **clock** command needs more parameters. Any time more information is needed, help can be provided by typing a space after the command and the question mark (?).

```
S1# clock ?
```

What information is displayed?

d. Set the clock using the **clock set** command. Proceed through the command one step at a time.

```
S1# clock set ?
```

```

setup      Run the setup command factory default
show       Show running system information
ssh        Open a secure shell client
telnet     Open a telnet connection
terminal   Set terminal line parameters
traceroute Trace route to destination
undebg     Disable debugging function
write      Write running configuration to nvram

S1#
S1#
S1#
S1#c
% Ambiguous command: "c"
S1#configure
Configuring from terminal, memory, or network
Enter configuration commands, one per line. End with CTRL-Z (single character)
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by admin
S1#show clock
*13:58:14.391 UTC Mon Mar 1 1993
S1#clock
% Incomplete command.
S1#clock
S1#clock
% Incomplete command.
S1#
S1#clock ?
    set Set the time and date
S1#clock

```

Time Elapsed: 00:00:00
Completion:

☒ Dock
Check Results
Back
1/1
Next

d. Set the clock using the **clock set** command. Proceed through the command one step at a time.

**S1# clock set ?**

Questions: What information is being requested? hh:mm:ss Current Time

the clock command needs more parameters. Any time more information is needed, help can be provided by typing a space after the command and the question mark (?).

```
S1# clock ?
```

What information is displayed?

d. Set the clock using the clock set command. Proceed through the command one step at a time.

```
S1# clock set ?
```

What information is being requested?

What would have been displayed if only the clock set command had been entered, and no request for help was made by using the question mark?

e. Based on the information requested by issuing the clock set ? command, enter a time of 3:00 p.m. by using the 24-hour format of 15:00:00. Check to see if more parameters are needed.

```
ssh          Open a secure shell client connection
telnet       Open a telnet connection
terminal     Set terminal line parameters
traceroute   Trace route to destination
undebug      Disable debugging functions (see also 'debug')
write        Write running configuration to memory, network, or terminal

S1#
S1#
S1#
S1#c
% Ambiguous command: "c"
S1#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

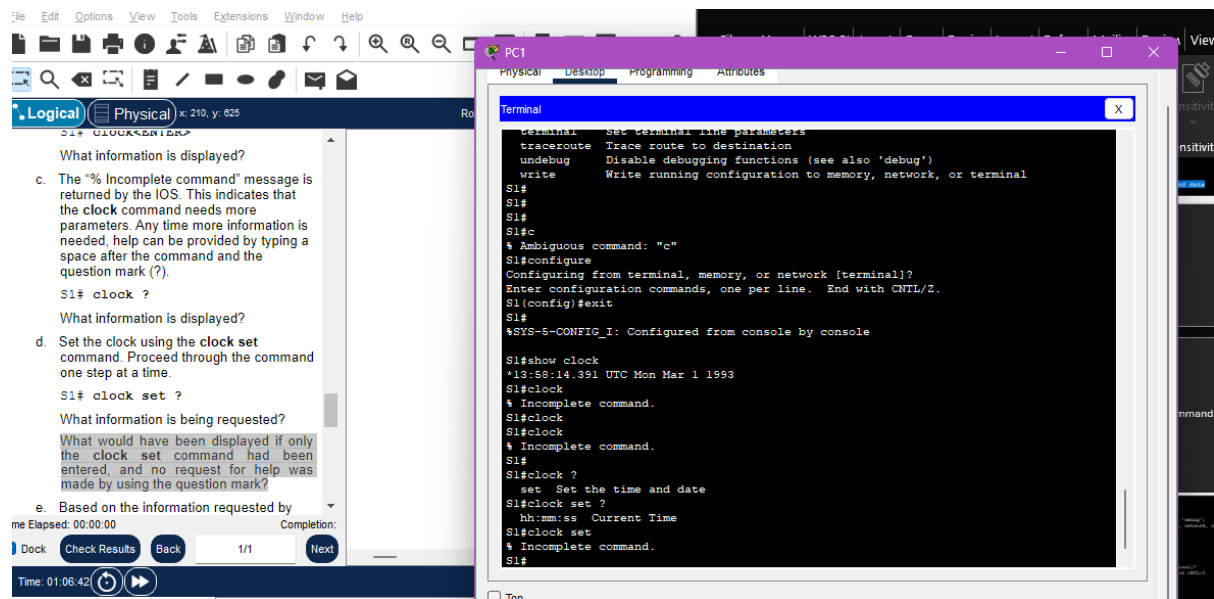
S1#show clock
*13:58:14.391 UTC Mon Mar 1 1993
S1#clock
% Incomplete command.
S1#clock
S1#clock
% Incomplete command.
S1#
S1#clock ?
      set Set the time and date
S1#clock set ?
      hh:mm:ss Current Time
S1#clock set
```

Time Elapsed: 00:00:00

Completion:

✓ Dock
Check Results
Back
1/1
Next

What would have been displayed if only the **clock set** command had been entered, and no request for help was made by using the question mark? **% Incomplete command.**



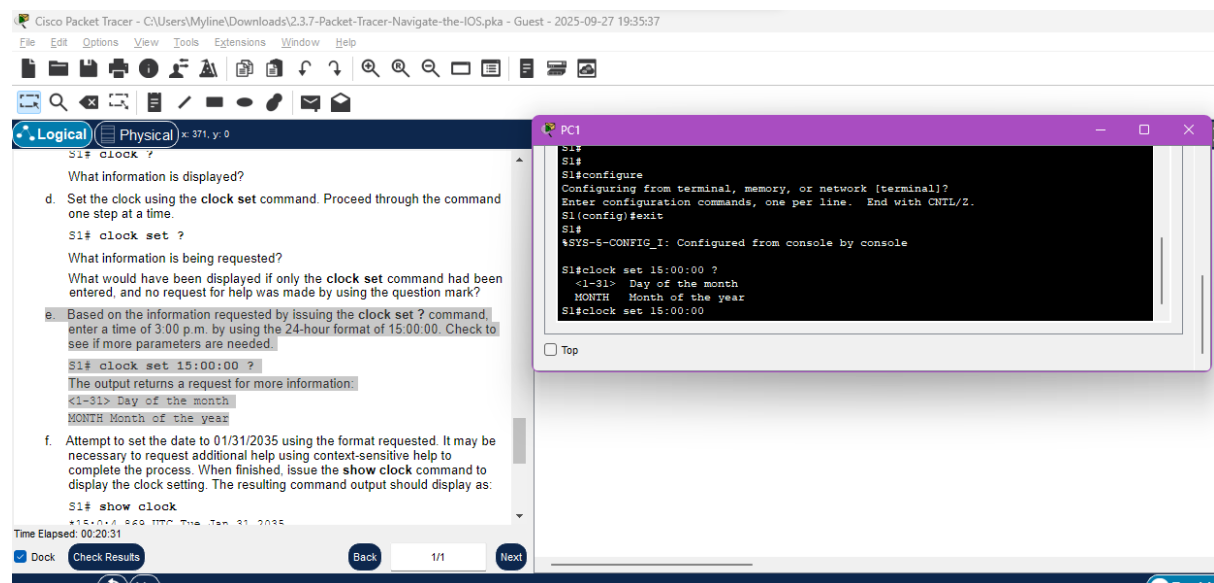
e. Based on the information requested by issuing the **clock set ?** command, enter a time of 3:00 p.m. by using the 24-hour format of 15:00:00. Check to see if more parameters are needed.

**S1# clock set 15:00:00 ?**

The output returns a request for more information:

<1-31> Day of the month

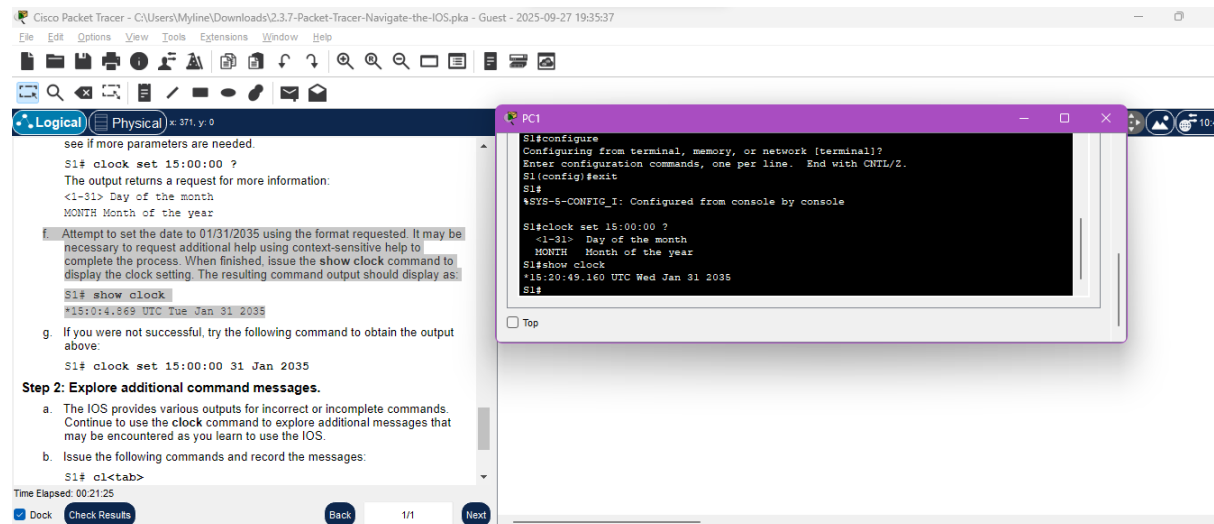
MONTH Month of the year



f. Attempt to set the date to 01/31/2035 using the format requested. It may be necessary to request additional help using context-sensitive help to complete the process. When finished, issue the **show clock** command to display the clock setting. The resulting command output should display as:

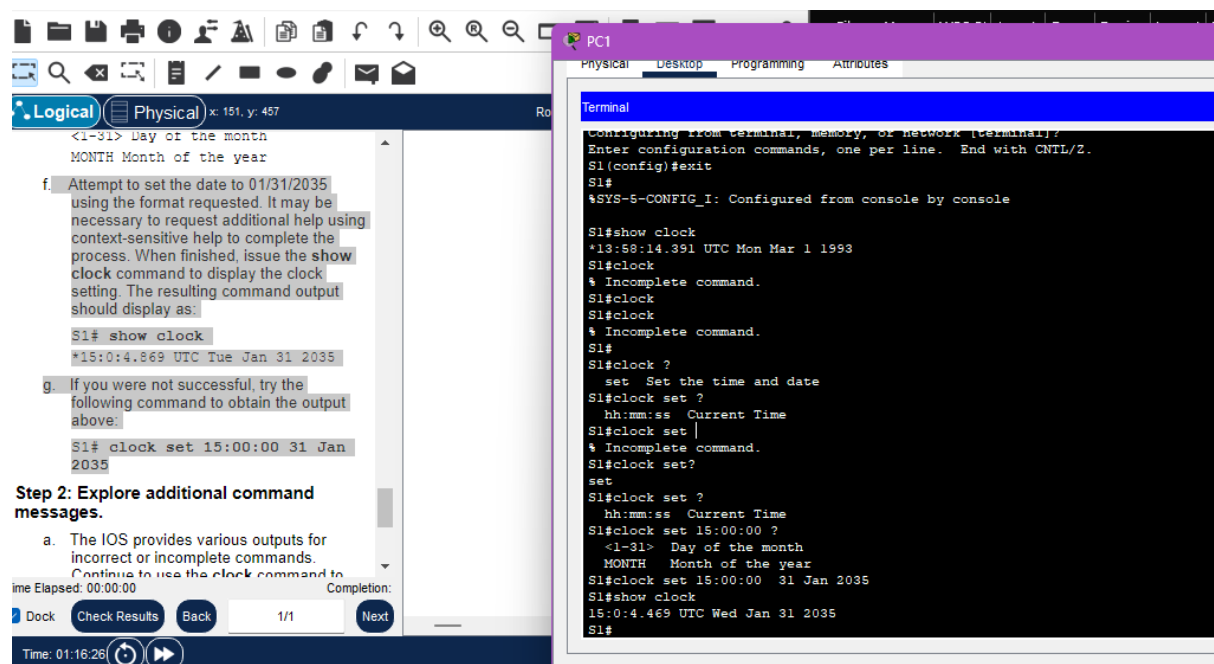
**S1# show clock**

**\*15:0:4.869 UTC Tue Jan 31 2035**



g. If you were not successful, try the following command to obtain the output above:

**S1# clock set 15:00:00 31 Jan 2035**



## Step 2: Explore additional command messages.

b. Issue the following commands and record the messages:

S1# **cl<tab>** | Questions: What information was returned?

S1#**cl**

S1#**clock**

S1# **clock** | Question: What information was returned?

% Incomplete command.

S1# **clock set 25:00:00** | Question: What information was returned?

S1#**clock set 25:00:00**

^

% Invalid input detected at '^' marker.

S1# **clock set 15:00:00 32** | Question: What information was returned?

S1#**clock set 25:00:00:00 32**

^

% Invalid input detected at '^' marker.

