

**ACTIVITY 7.****SWITCH/ROUTER BOOT UP PROCESS AND CONFIGURATION REGISTER SETTINGS****OBJECTIVES:**

1. To understand the boot up processes of switch and router
2. To understand the settings of configuration register
3. To configure the settings of configuration register
4. To troubleshoot the switch and router startup with password settings

**STEPS AND PROCEDURES:**

1. **Open Cisco and Add Router and Switch. Go to router and check if it is on and go to (CLI) Command Line Interface.**

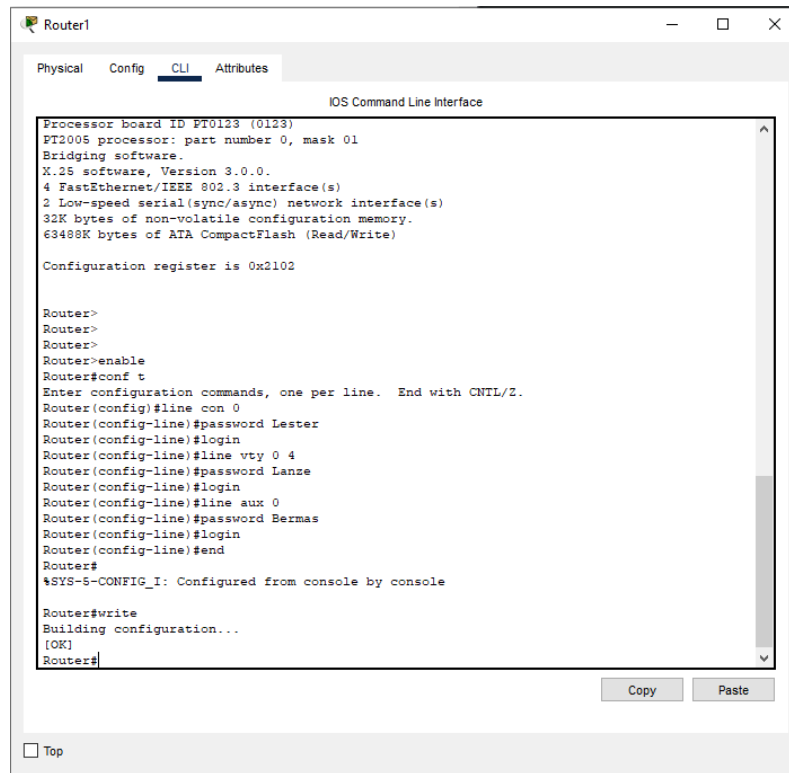


2. **Type command “enable” to enter to user exec-privilege mode and enter command “show version” to show the router’s register version.**

A screenshot of the Cisco Packet Tracer Command Line Interface (CLI) window for a PT1000 router. The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The text in the CLI window shows the initial boot sequence, including the prompt "Would you like to enter the initial configuration dialog? [yes/no]: n", followed by "Press RETURN to get started!". The user enters "enable" to reach user exec-privilege mode, then "show version" to display system information. The output includes details about the Cisco Internetwork Operating System Software (IOS), the PT1000 processor (revision 0x200), and the system image file "flash:pt1000-i-mz.122-28.bin". It also lists hardware components like the PT1001 processor, PT0123 board, and PT2005 processor, along with the X.25 software version 3.0.0.0. The window ends with a "--More--" prompt and "Copy" and "Paste" buttons at the bottom right.

```
Router
Physical Config CLI Attributes
IOS Command Line Interface
System Configuration Dialog
Would you like to enter the initial configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>enable
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 15:01 by miwang
Image text-base: 0x8000808C, data-base: 0x80A1FECC
ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
System returned to ROM by reload
System image file is "flash:pt1000-i-mz.122-28.bin"
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
--More--
```

3. Enter the command **“conf t or configure terminal”** to set a password in configuration. In order to do that we use **“password and login”** command. After setting up, use **“end”** command to end the process and **“write”** to save the password.



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

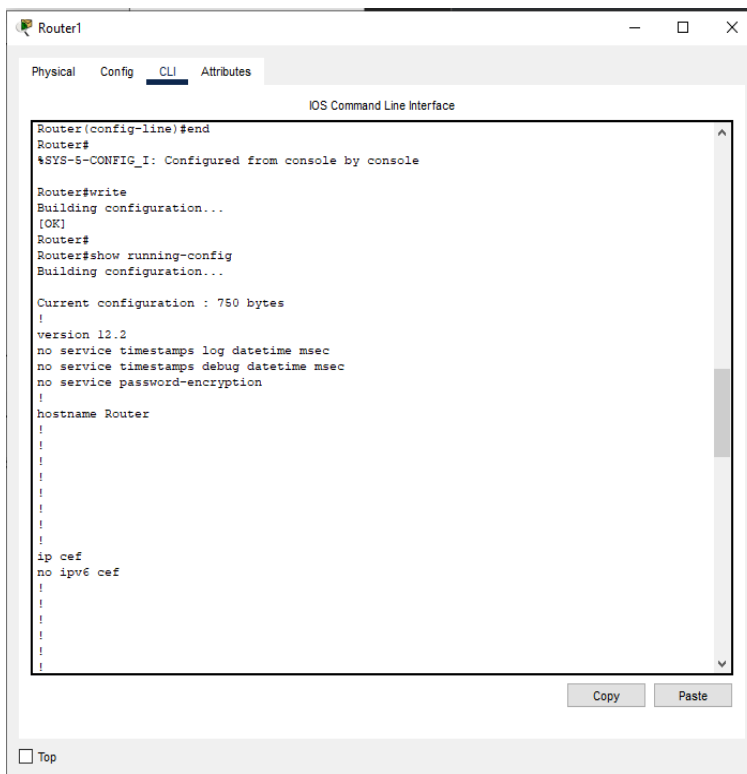
Processor board ID FT0123 (0123)
FT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63498K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102

Router>
Router>
Router>
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#line con 0
Router(config-line)#password Lester
Router(config-line)#login
Router(config-line)#line vty 0 4
Router(config-line)#password Lanze
Router(config-line)#login
Router(config-line)#line aux 0
Router(config-line)#password Bermas
Router(config-line)#login
Router(config-line)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#
```

4. To show the password we have set, enter the command **“show running config”**

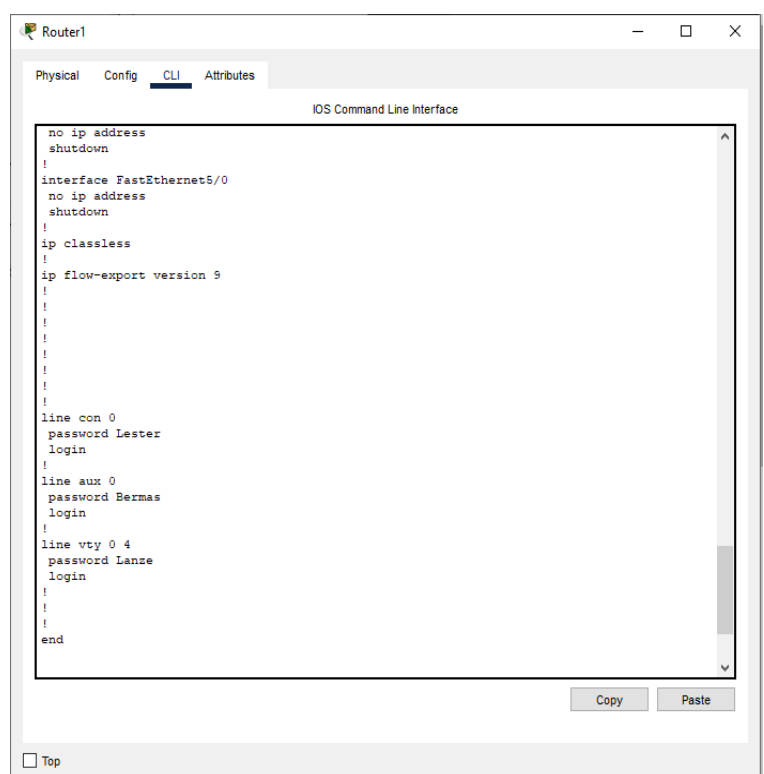


```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Router(config-line)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#
Router#show running-config
Building configuration...

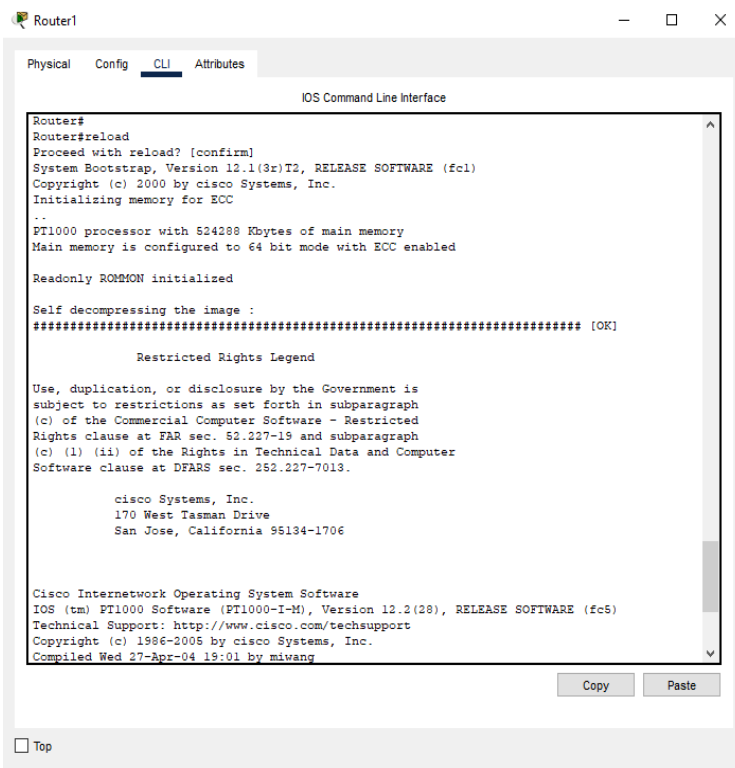
Current configuration : 750 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
```



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

no ip address
shutdown
!
interface FastEthernet5/0
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
!
line con 0
password Lester
login
!
line aux 0
password Bermas
login
!
line vty 0 4
password Lanze
login
!
!
!
end
```

5. Now, to restart the router we use “reload” command and input password that we’ve input in the configuration.



The screenshot shows the Router1 CLI interface with the 'CLI' tab selected. The command 'Router#reload' has been entered, and the router is displaying the following output:

```
Router#
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
Initializing memory for ECC
..
PT1000 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

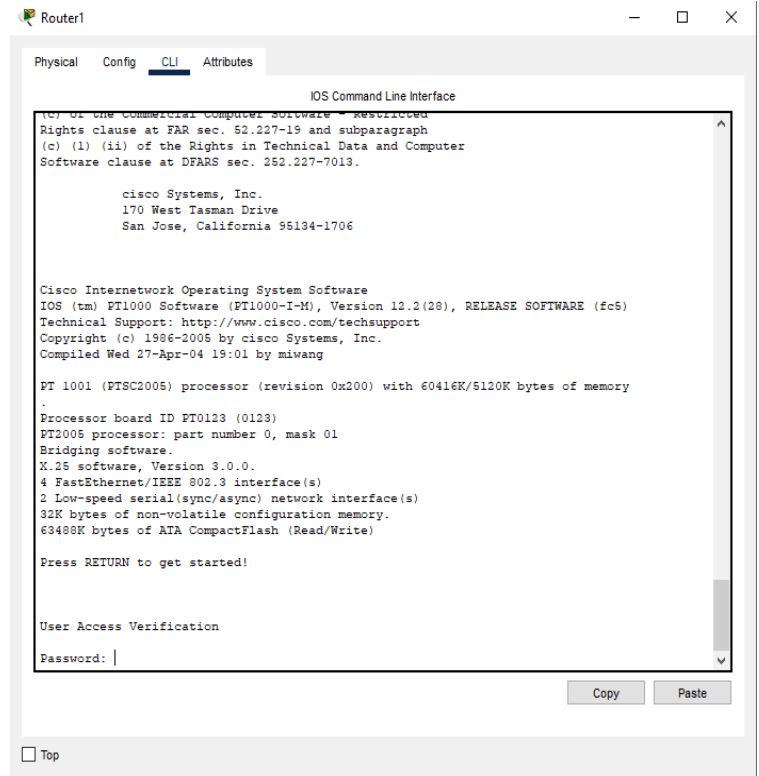
Self decompressing the image :
##### [OK]

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cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
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```



The screenshot shows the Router1 CLI interface with the 'CLI' tab selected. The output from the previous command is visible, and the router is now prompting for a password:

```
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Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang

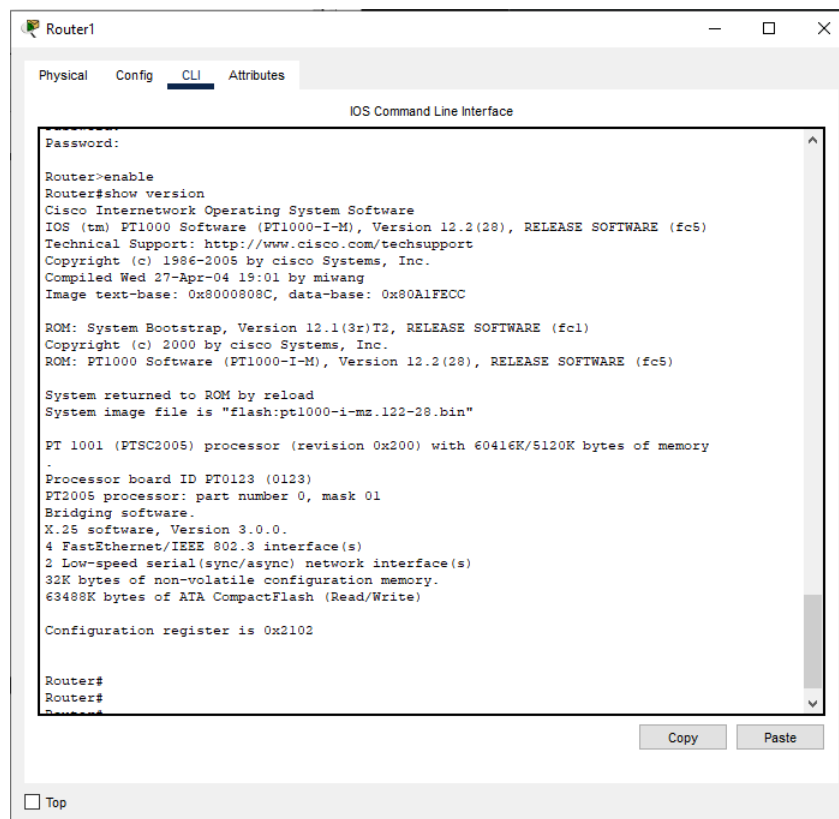
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Press RETURN to get started!

User Access Verification

Password: |
```

6. Enter the command “enable” following the “show version” command to see the latest version, the configuration register should display 0x2102.



The screenshot shows the Router1 CLI interface with the 'CLI' tab selected. The command 'Router#enable' has been entered, and the router is displaying the following output:

```
Router#enable
Router#show version

Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
Image text-base: 0x8000808C, data-base: 0x80A1FECC

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

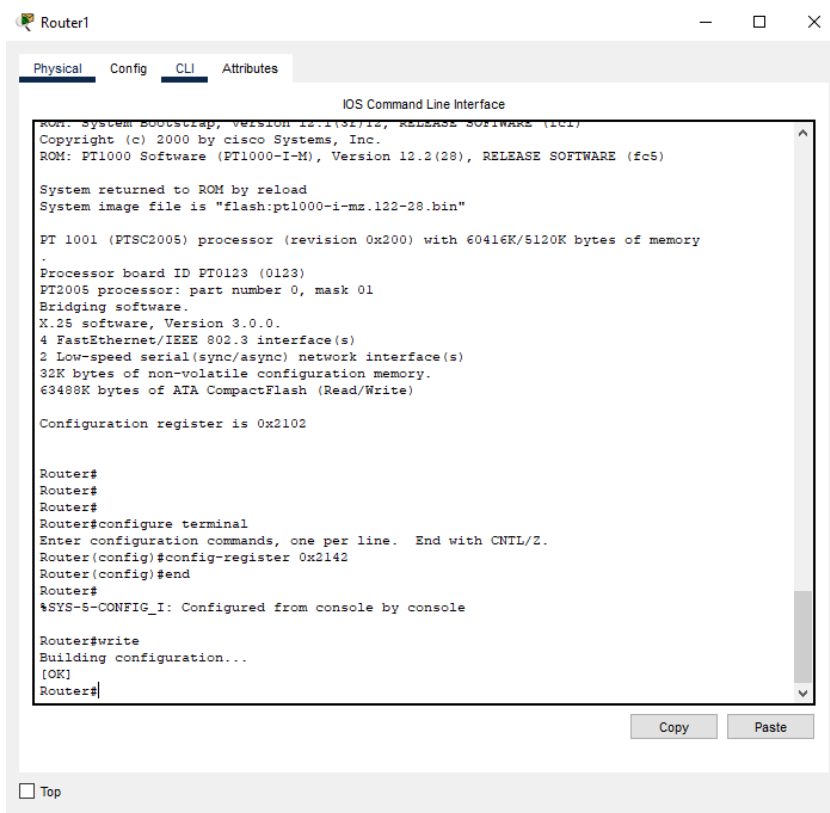
System returned to ROM by reload
System image file is "flash:pt1000-i-mz.122-28.bin"

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102

Router#
Router#
```

7. Change the register from 2x2102 to 0x2142 to bypass the password by using the command “configure terminal and config-register” following, replace the register and enter the command “end” then “write” to save the process.



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface
ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

System returned to ROM by reload
System image file is "flash:pt1000-i-mz.122-28.bin"

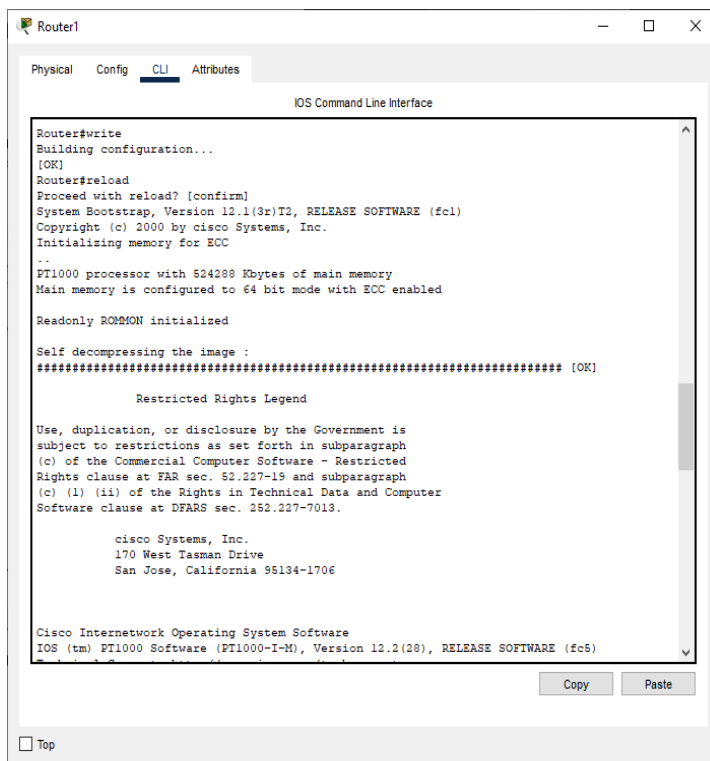
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102

Router#
Router#
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#config-register 0x2142
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#
```

8. In order to get the 0x2142 we have to enter command “reload” then type “enable & show version” the version must be 2x2142 it means that the configuration register has been bypassed.



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Router#write
Building configuration...
[OK]
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
Initializing memory for ECC
..
PT1000 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

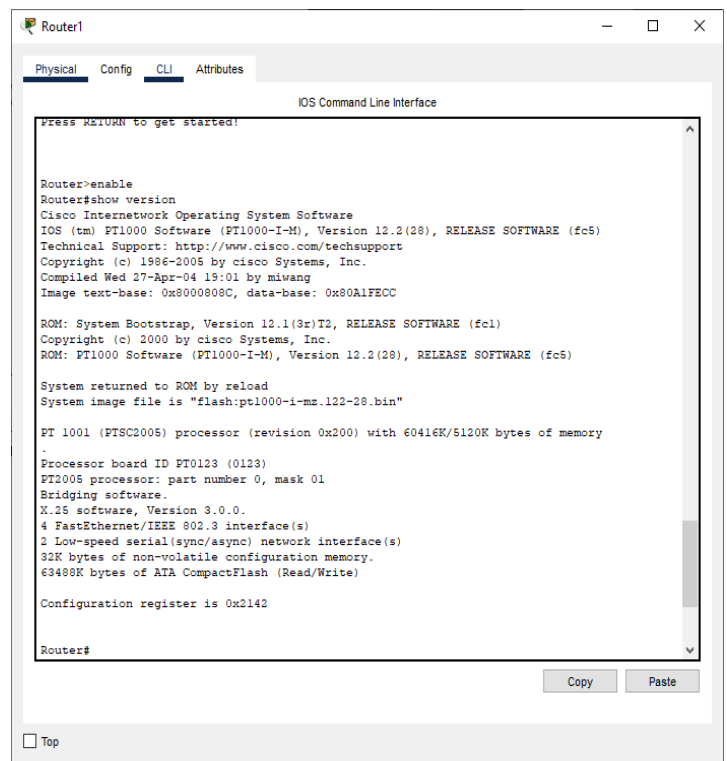
Self decompressing the image :
***** [OK]

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IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
```



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

Router>enable
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
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Image text-base: 0x8000808C, data-base: 0x80A1FECC

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

System returned to ROM by reload
System image file is "flash:pt1000-i-mz.122-28.bin"

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory

Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

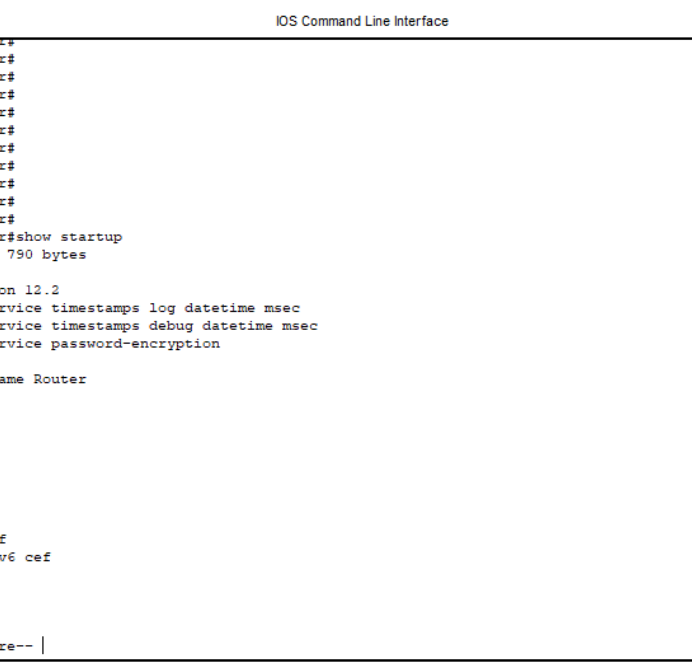
Configuration register is 0x2142

Router#
```

9. Enter “show running-config” to be able to see if there are saved password. In the image we can see that no password was saved in the configuration.

[illegible]

10. Now, enter “show startup” to show the password of the configuration register 0x2102.

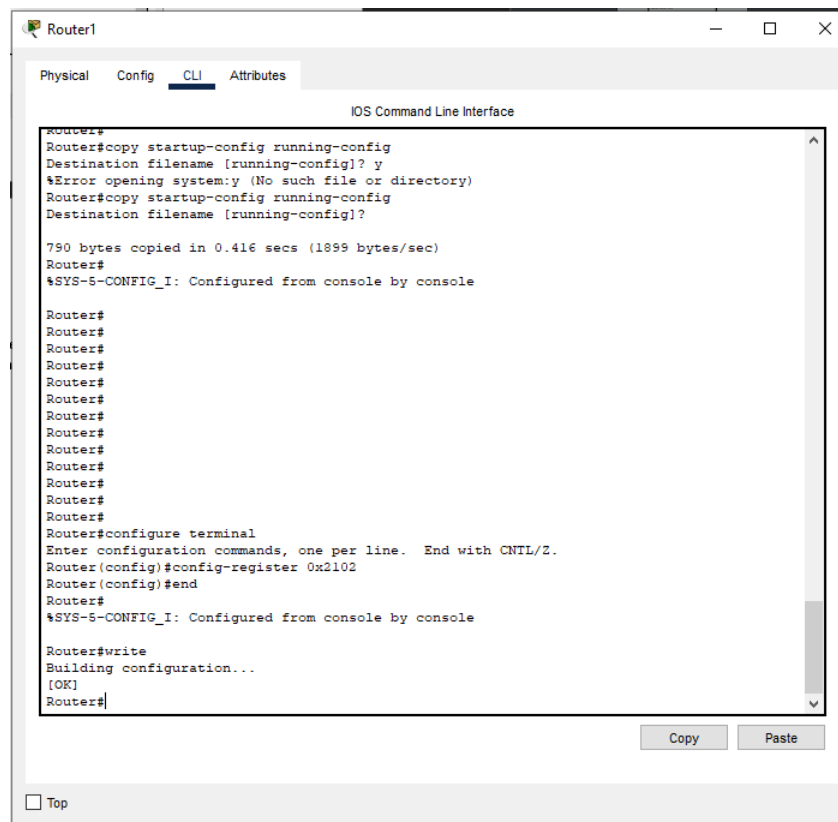


The screenshot shows the Cisco Packet Tracer interface with Router1 selected. The CLI window displays the following configuration:

```
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#  
Router#show startup  
Using 790 bytes  
!  
version 12.2  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname Router  
!  
!  
!  
!  
!  
!  
!  
!  
ip cef  
no ipv6 cef  
!  
!  
!  
!  
--More-- |
```

The interface includes tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, and the output shows the configuration of Router1. The bottom of the window has a 'Top' button and a 'Copy' button.

11. Enter “copy startup-config running-config” to save the previous passwords. Enter the command “configure terminal” & “config-register 0x2102” to get the previous register.



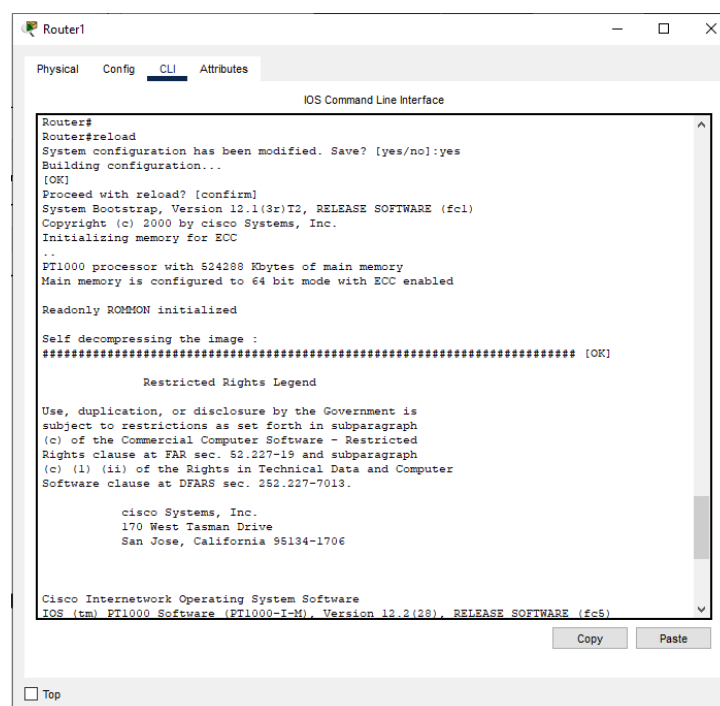
The screenshot shows the Cisco Router CLI interface with the following commands and output:

```
Router#
Router#copy startup-config running-config
Destination filename [running-config]? y
%Error opening system:y (No such file or directory)
Router#copy startup-config running-config
Destination filename [running-config]?
790 bytes copied in 0.416 secs (1899 bytes/sec)
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#config-register 0x2102
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#
```

12. Enter the command “reload” to restart the router. After that enter the password that you’ve set.



The screenshot shows the Cisco Router CLI interface during a reload process with the following output:

```
Router#
Router#reload
System configuration has been modified. Save? [yes/no]:yes
Building configuration...
[OK]
Proceed with reload? [confirm]
System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by Cisco Systems, Inc.
Initializing memory for ECC
...
PT1000 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled
Readonly ROMMON initialized

Self decompressing the image :
***** [OK]

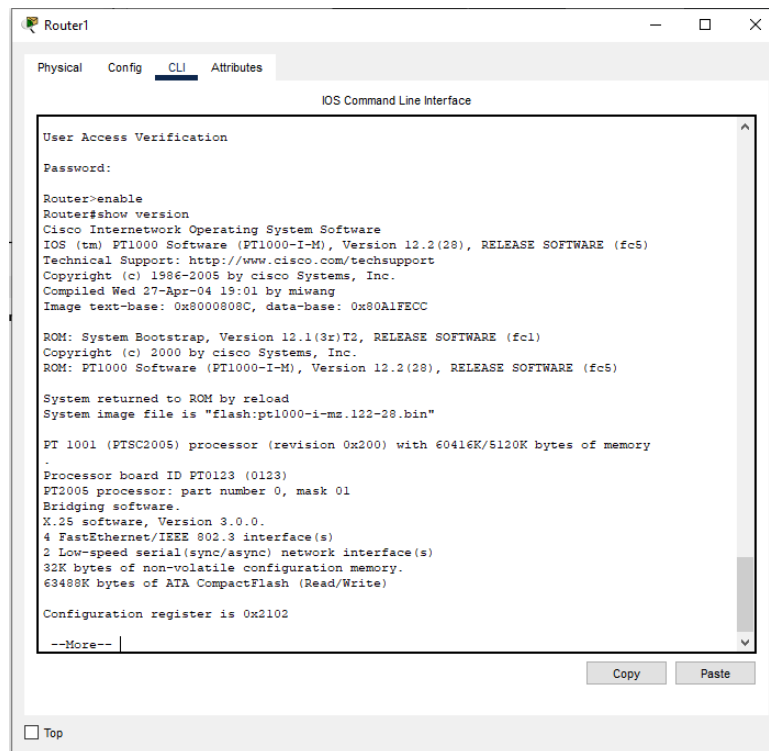
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IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
```

13. It will show 0x2102 register is on the configuration terminal by inputting the command “enable” and “show version”



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:
Router>enable
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
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Compiled Wed 27-Apr-04 19:01 by miwang
Image text-base: 0x8000808C, data-base: 0x80A1FECC

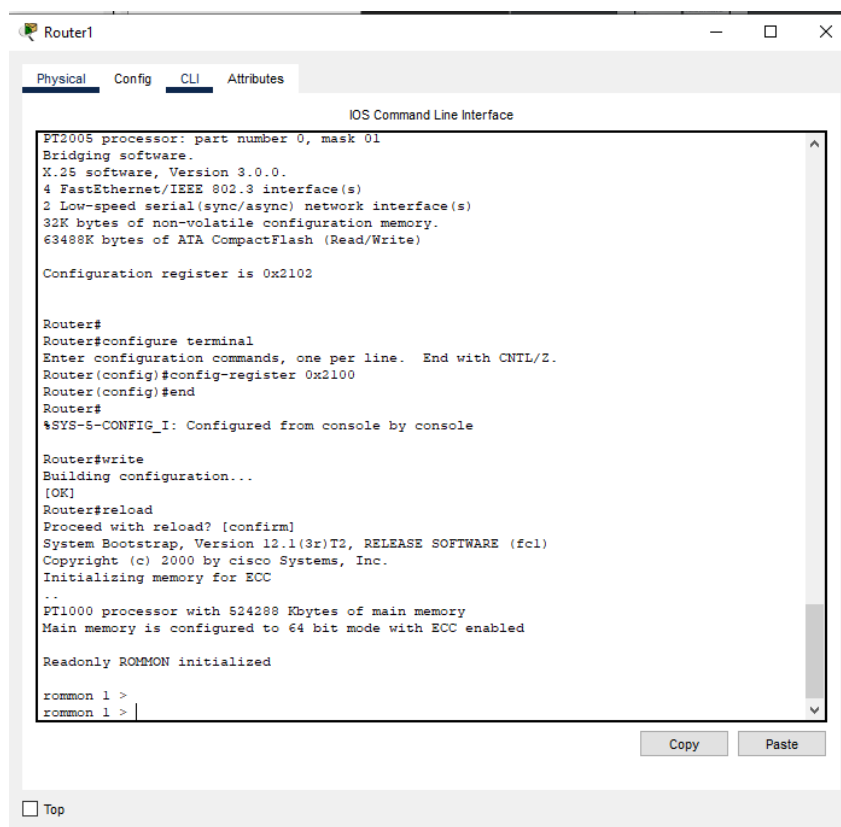
ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by Cisco Systems, Inc.
ROM: PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

System returned to ROM by reload
System image file is "flash:pt1000-i-mz.122-28.bin"

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102
--More--
Copy Paste
Top
```

14. For the next objective, go to third register. 0x2100 where located on ROM monitor mode. Enter the command “configure terminal” and “config-register 0x2100” to enter the ROM mode.



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102

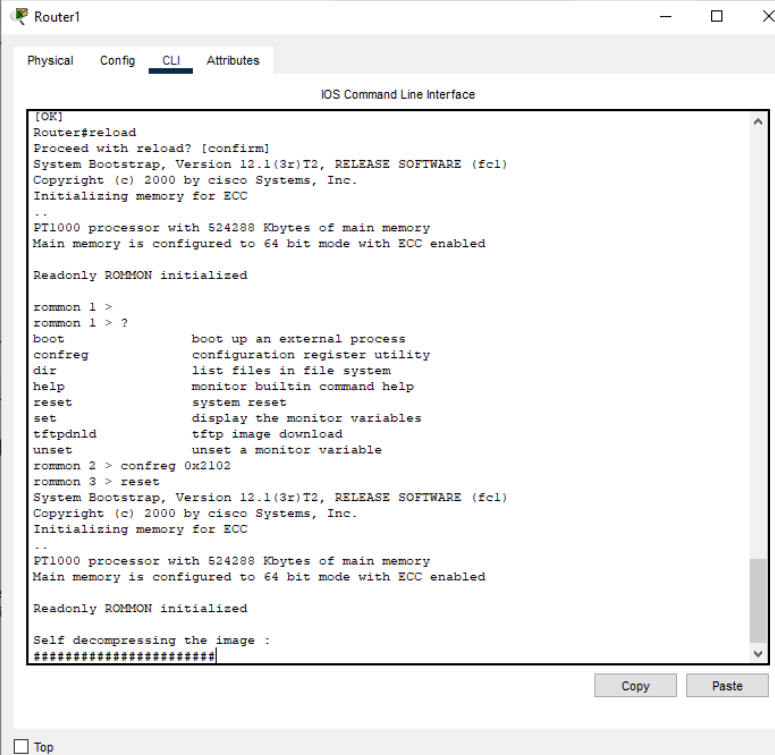
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#config-register 0x2100
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by Cisco Systems, Inc.
Initializing memory for ECC
..
PT1000 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

rommon 1 >
rommon 1 >
Copy Paste
Top
```

15. Now, we enter the ROM mode, enter command “?” to see the command listed in CLI. Type the command “confreg” to see the configuration register utility then “reset” to reload the changes.



The screenshot shows the Cisco Router CLI interface with the following text:

```
[OK]
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
Initializing memory for ECC
...
PT1000 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

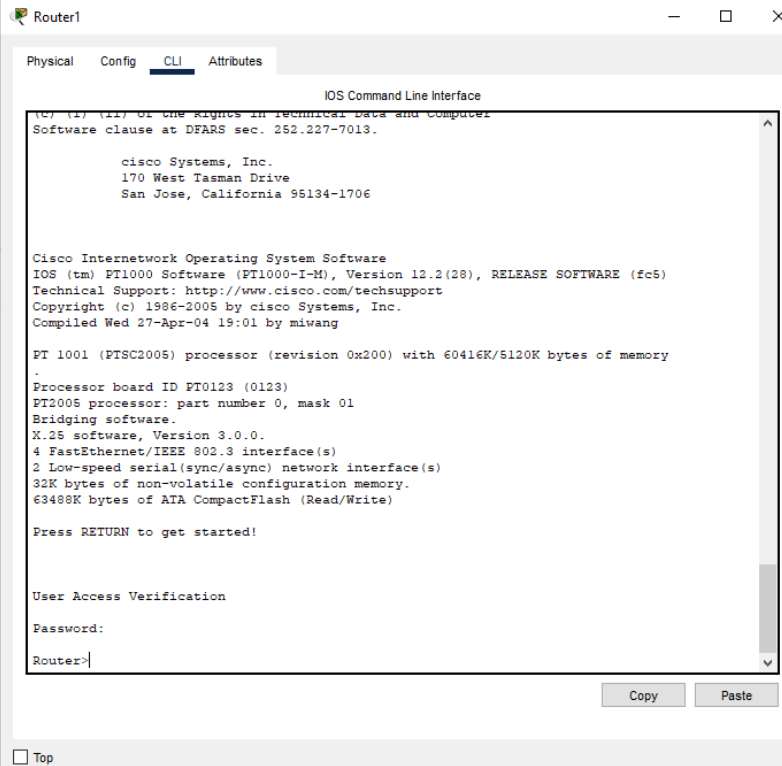
rommon 1 >
rommon 1 > ?
boot                boot up an external process
confreg             configuration register utility
dir                list files in file system
help               monitor builtin command help
reset              system reset
set                display the monitor variables
tftpdnld           tftp image download
unset              unset a monitor variable
rommon 2 > confreg 0x2102
rommon 3 > reset
System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
Initializing memory for ECC
...
PT1000 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

Self decompressing the image :
*****
```

At the bottom of the terminal window, there are "Copy" and "Paste" buttons, and a "Top" button.

16. If the CLI is reloaded, the interface asks for password.



The screenshot shows the Cisco Router CLI interface with the following text:

```
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San Jose, California 95134-1706

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Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
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X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Press RETURN to get started!

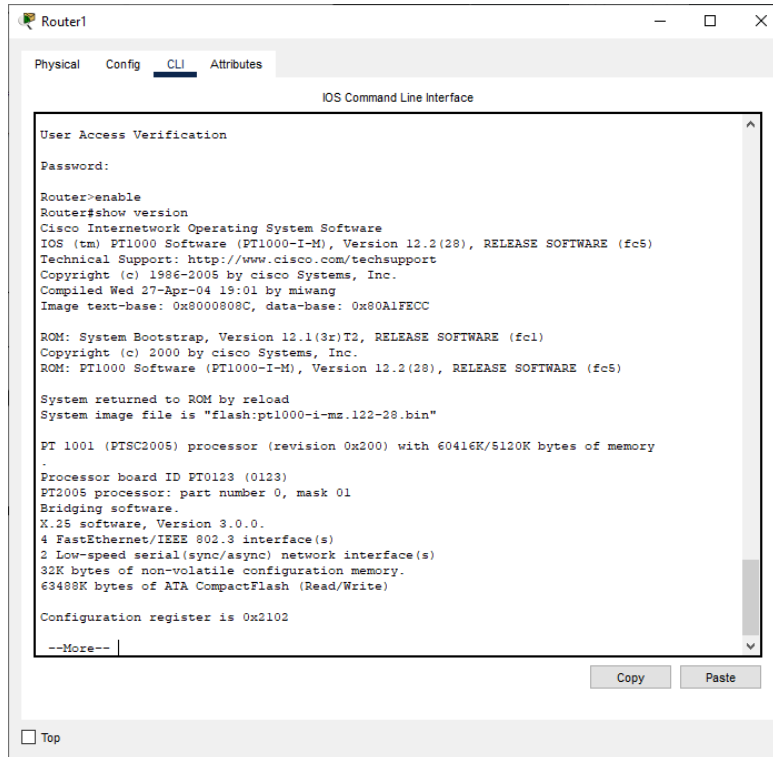
User Access Verification

Password:
Router>
```

At the bottom of the terminal window, there are "Copy" and "Paste" buttons, and a "Top" button.



17. Enter “enable” following by “show version” to see the latest configuration register.



The screenshot shows the CLI of a device named Router1. The user has entered 'enable' to enter privileged EXEC mode, followed by 'show version'. The output displays detailed information about the Cisco PT1000 software and hardware, including the system image file, processor details, and configuration register.

```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:

Router>enable
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
Image text-base: 0x8000808C, data-base: 0x80A1FECC

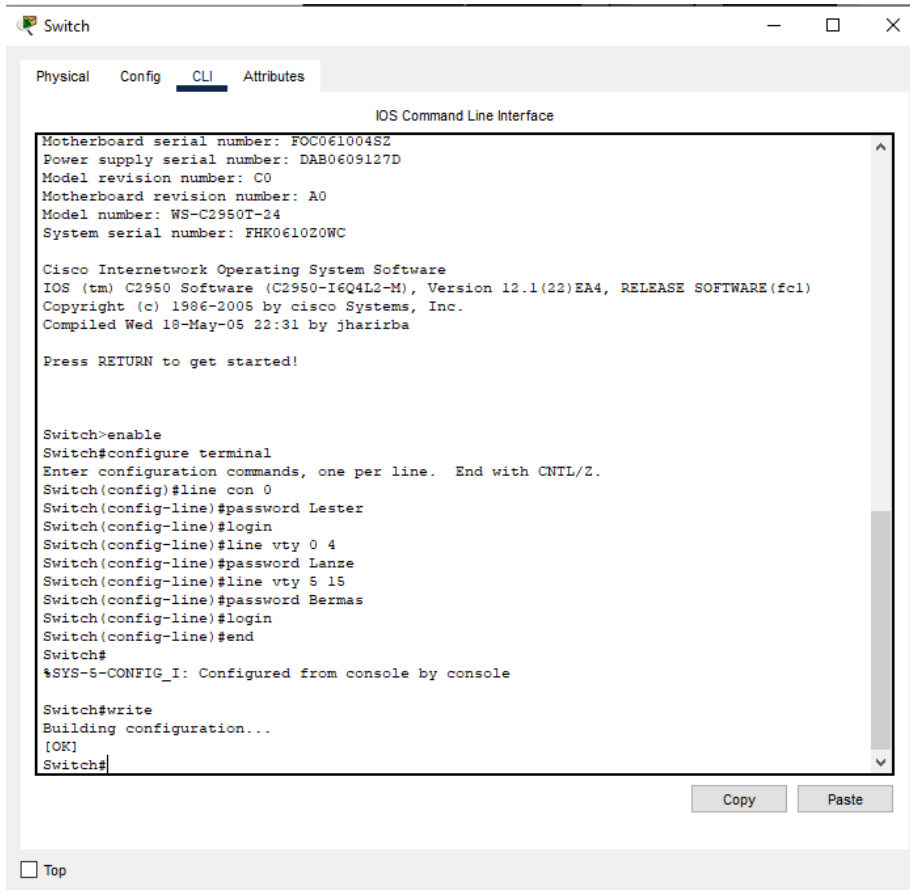
ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

System returned to ROM by reload
System image file is "flash:pt1000-i-mz.122-28.bin"

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102
--More--
```

18. We have completed the router, now go to switch. Go to switch CLI and type “enable” & “configure terminal” to check the version and configure the password. Do the same thing just like we have done on the router. Use command “write” to save password.



The screenshot shows the CLI of a device named Switch. The user enters 'enable' to enter privileged EXEC mode, then 'configure terminal' to enter global configuration mode. They configure console, vty, and login passwords. Finally, they use the 'write' command to save the configuration.

```
Switch
Physical Config CLI Attributes
IOS Command Line Interface

Motherboard serial number: FOC061004S2
Power supply serial number: DAB0609127D
Model revision number: C0
Motherboard revision number: A0
Model number: WS-C2950T-24
System serial number: FHK0610Z0WC

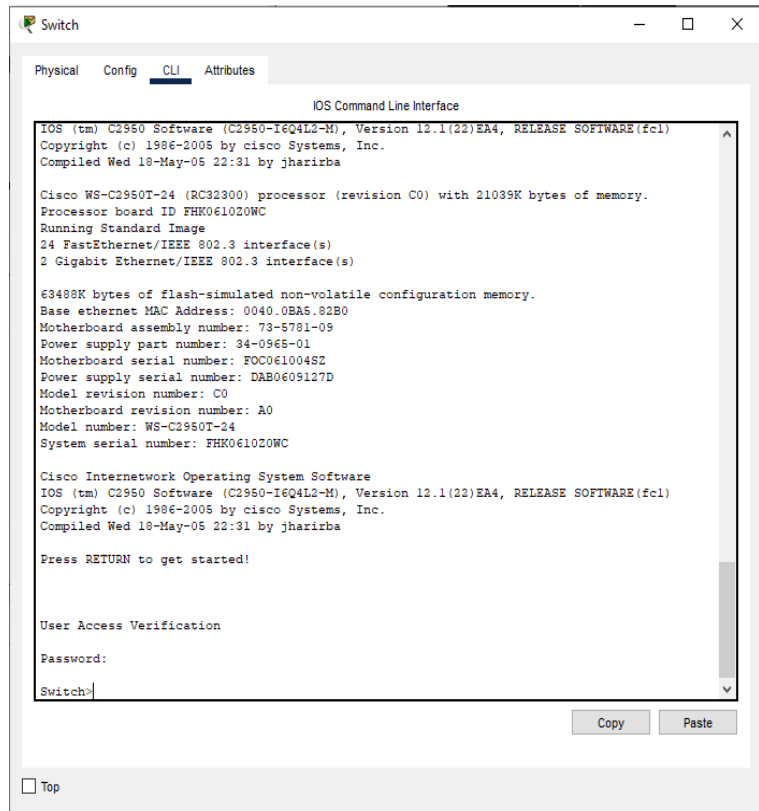
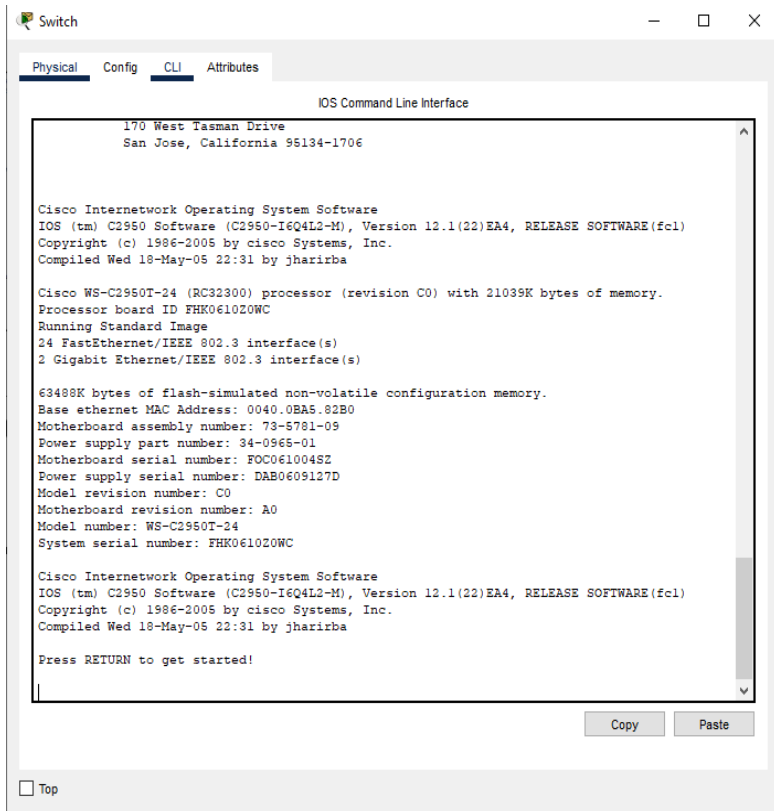
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(22)EA4, RELEASE SOFTWARE(fc1)
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 18-May-05 22:31 by jharirba

Press RETURN to get started!

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNIL/Z.
Switch(config)#line con 0
Switch(config-line)#password Lester
Switch(config-line)#login
Switch(config-line)#line vty 0 4
Switch(config-line)#password Lanze
Switch(config-line)#line vty 5 15
Switch(config-line)#password Bermas
Switch(config-line)#login
Switch(config-line)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#write
Building configuration...
[OK]
Switch#
```

## 19. Use the command “reload” command to restart the switch and the CLI will ask for password.



## OBSERVATION AND RESULTS:

In this activity, I've noticed a lots of commands, in particular when we used (CLI) Command Line Interface, the activity result in this activity is how the registers' password are updated in configuration settings and on each component, such as router and switch.

## CONCLUSION:

To sum it up, the procedure of router and switch is important, we are making sure that the device is appropriately configured and prepared for to operate. By setting for the configuration register are used to regulate the device while booting up process. In this activity the configuration registers can be utilized in variety of ways to alter the behavior of routers.