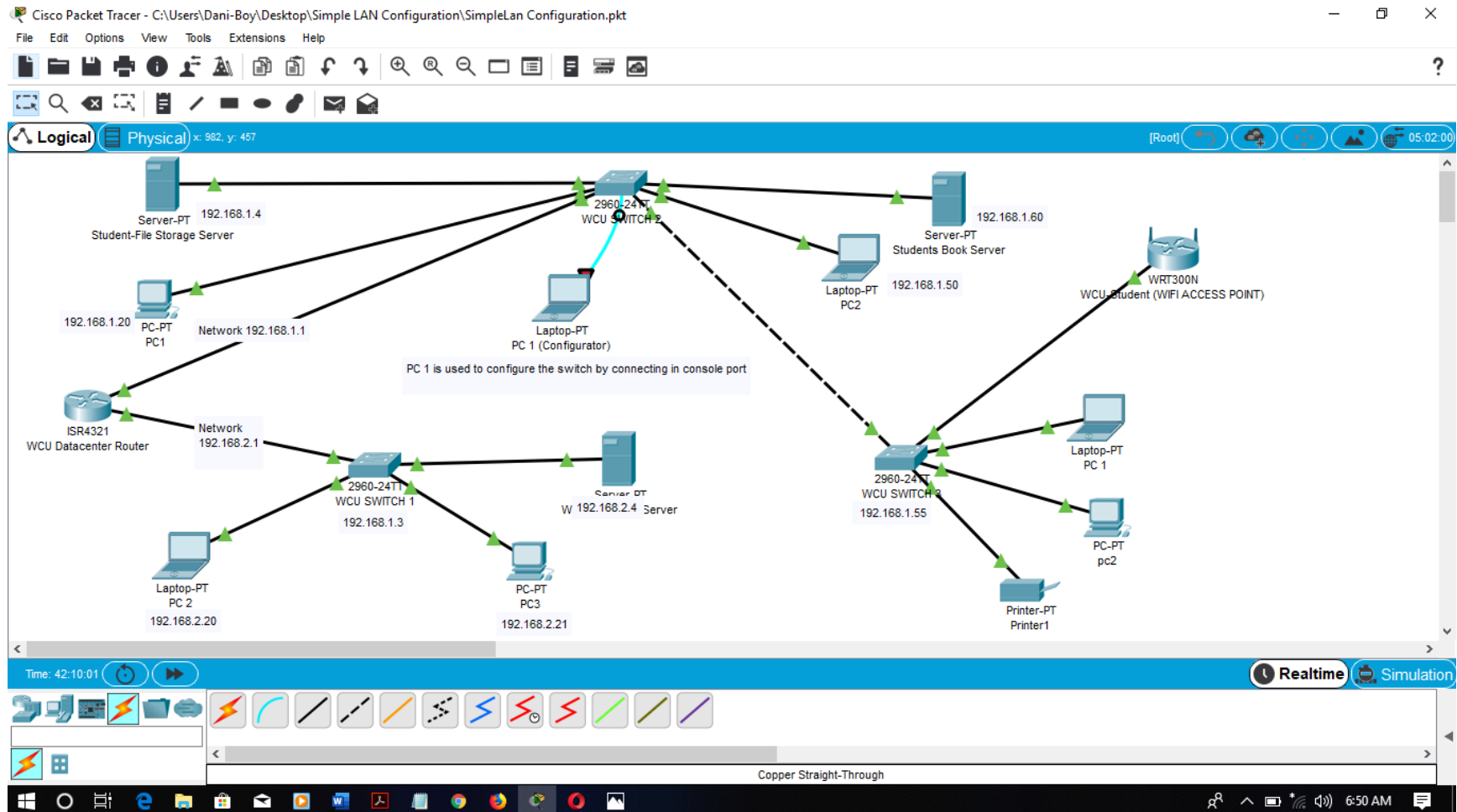


Question 1 create simple LAN (Local area Network)



☞ Here we created simple local area network. By using such as ✓Router

✓ Switches

✓ Computers, servers, WIFI access points and printers.

☞ In our project there is one router that displayed name is known as WCU Datacenter router and there are three switches in our local area network.

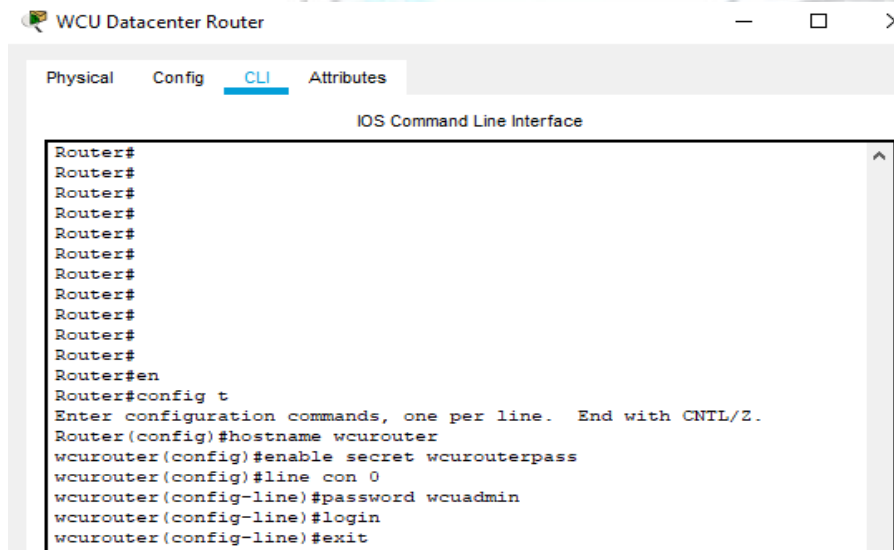
The router connects two different networks in our LAN that addressed by Network 192.168.1.1 with 255.255.255.0 subnet Mask and Network 192.168.2.1 with 255.255.255.0 subnet Mask.

Now let's see below Router and switch configuration by assigning hostname, password and ip address.

2. Configure username and password with privilege levels.

➤ Router Configuration

☞ In this project we have one router that displayed name is WCU Datacenter Router so now let's configure this router by assigning hostname, password and ip address for each interface of router.



```
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname wcurouter
wcurouter(config)#enable secret wcurouterpass
wcurouter(config)#line con 0
wcurouter(config-line)#password wcuadmin
wcurouter(config-line)#login
wcurouter(config-line)#exit
```

⌘ Here the first host name of the router is **Router** but we changed to **wcurouter** by entering into privilege mode.

✓The command **enable** or **en** is used to enter into privilege. Then we should have to write the command **config t**

✓The command **configure terminal** or **config t** is used to enter configuration mode. When we configure router and switch, we should have to write configure terminal command then we can configure in configure terminal mode otherwise it will not work.

✓Router (config) # hostname **wcurouter**

☐Here we assigned the host name of the router.

✓Now the hostname of the router is changed to **wcurouter** now we should have to assign password to the router for secure Authorized access only.

▢wcurouter(config) #enable secret wcurouterpass

▢wcurouter(config)#line console 0 // console is the configuration port of cisco router and switch.

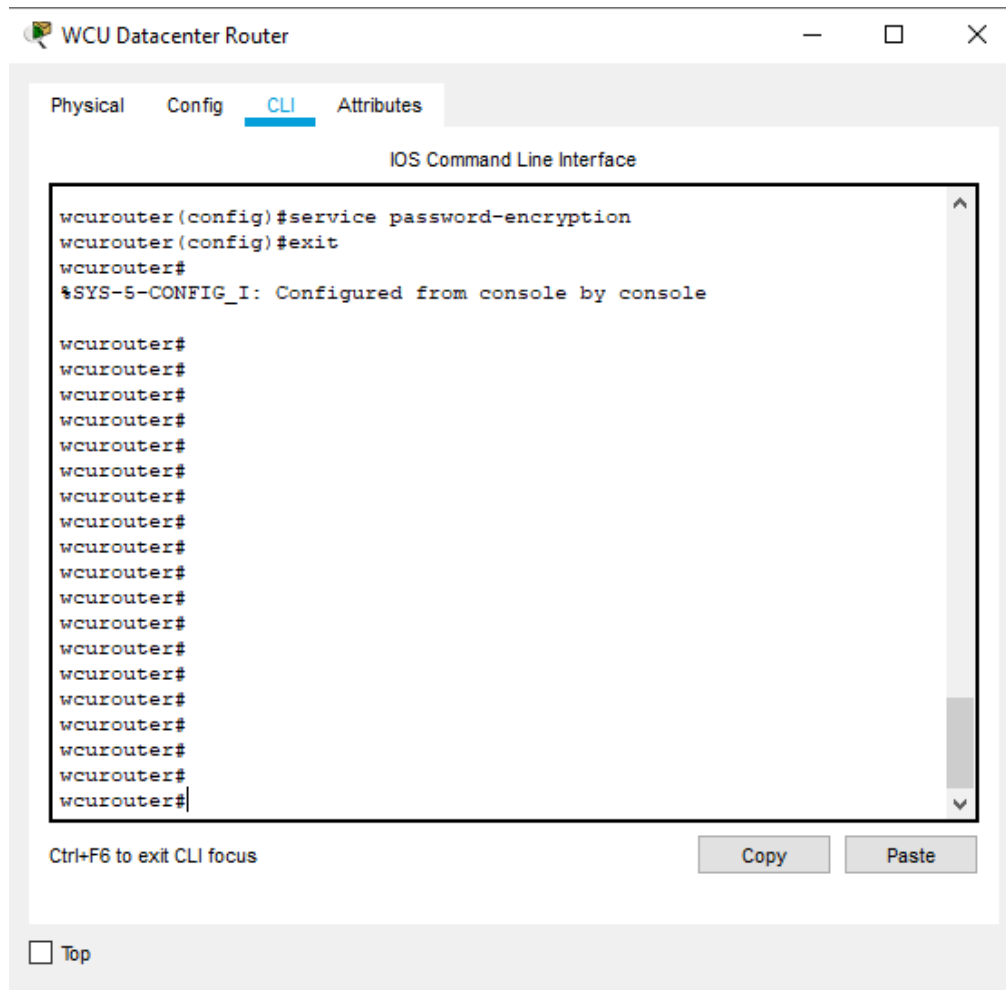
▢wcurouter(config-line)#password **wcuadmin**

▢wcurouter(config-line)#login //This command is used to login into the system by assigned address.

// Here we assigned the router password. The password is **wcuadmin**.

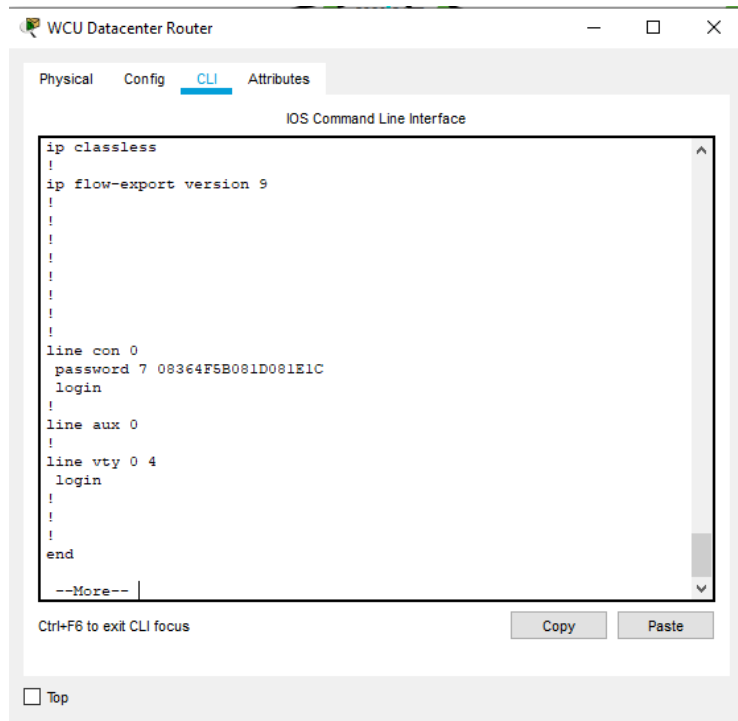
Now we should encrypt the password by using command : wcurouter (Config)# service password-encryption

Lets see the picture below ☺



➤ Here the password is encrypted.

Now we can see all about our router by using the command **show run**.



The screenshot shows a web-based interface for a 'WCU Datacenter Router'. The 'CLI' tab is selected, displaying the 'IOS Command Line Interface'. The configuration commands entered are as follows:

```
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
!
line con 0
password 7 08364F5B081D081E1C
login
!
line aux 0
!
line vty 0 4
login
!
!
!
end
--More--
```

At the bottom of the CLI window, there are buttons for 'Copy' and 'Paste', and a note that says 'Ctrl+F6 to exit CLI focus'. A 'Top' link is also present at the bottom left of the window.

➤ The password we assigned for our router is wcuadmin. But it encrypted into 08364F5B081D081E1C.

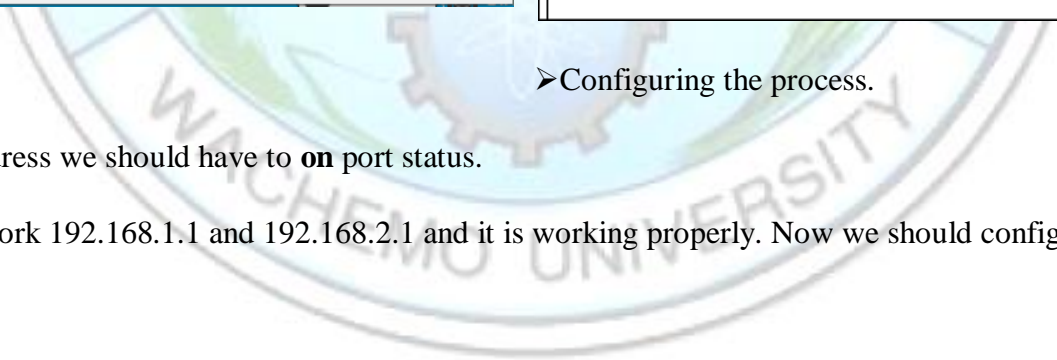
⇒ Now username and password already set so we should have to assign ip address in each interface of router.

⇒ On this router we have to interface such as

☞ GigabitEthernet 0/0/0

☞ GigabitEthernet 0/0/1

⇒ We should have to assign ip address for these interfaces. Then the router routes the network.



```
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#
wcurouter1#en
wcurouter1#config t
Enter configuration commands, one per line. End with CNTL/Z.
wcurouter1(config)#interface
% Incomplete command.
wcurouter1(config)#interface GigabitEthernet0/0
wcurouter1(config-if)#
wcurouter1(config-if)#exit
wcurouter1(config)#interface GigabitEthernet0/0
wcurouter1(config-if)#ip address 192.168.1.1 255.255.255.0
wcurouter1(config-if)#no shutdown

wcurouter1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
```

➤Configuring the process.

// Now we have two network 192.168.1.1 and 192.168.2.1 and it is working properly. Now we should configure switches.

Now we can configure the switches. Let's configure the switch which displayed name is WCU SWITCH 1.

The screenshot displays the Cisco Packet Tracer interface. The main workspace shows a network topology with the following components:

- Server-PT** (192.168.1.4) labeled "Student-File Storage Server" connected to **WCU SWITCH**.
- PC-PT** (192.168.1.20) labeled "PC1" connected to **WCU SWITCH** and **WCU Datacenter Router**.
- Laptop-PT** (192.168.1.20) labeled "PC 1 (Configurator)" connected to **WCU SWITCH**. A note states: "PC 1 is used to configure the switch by connecting in console port".
- WCU Datacenter Router** (ISR4321) connected to **WCU SWITCH** and **WCU SWITCH 2**.
- WCU SWITCH** (2960-24TT) connected to **WCU SWITCH 2**.
- WCU SWITCH 2** (2960-24TT) connected to **Senior DT** (192.168.2.4) labeled "Server" and **PC-PT** (192.168.2.21) labeled "PC3".
- Laptop-PT** (192.168.2.20) labeled "PC 2" connected to **WCU SWITCH 2**.

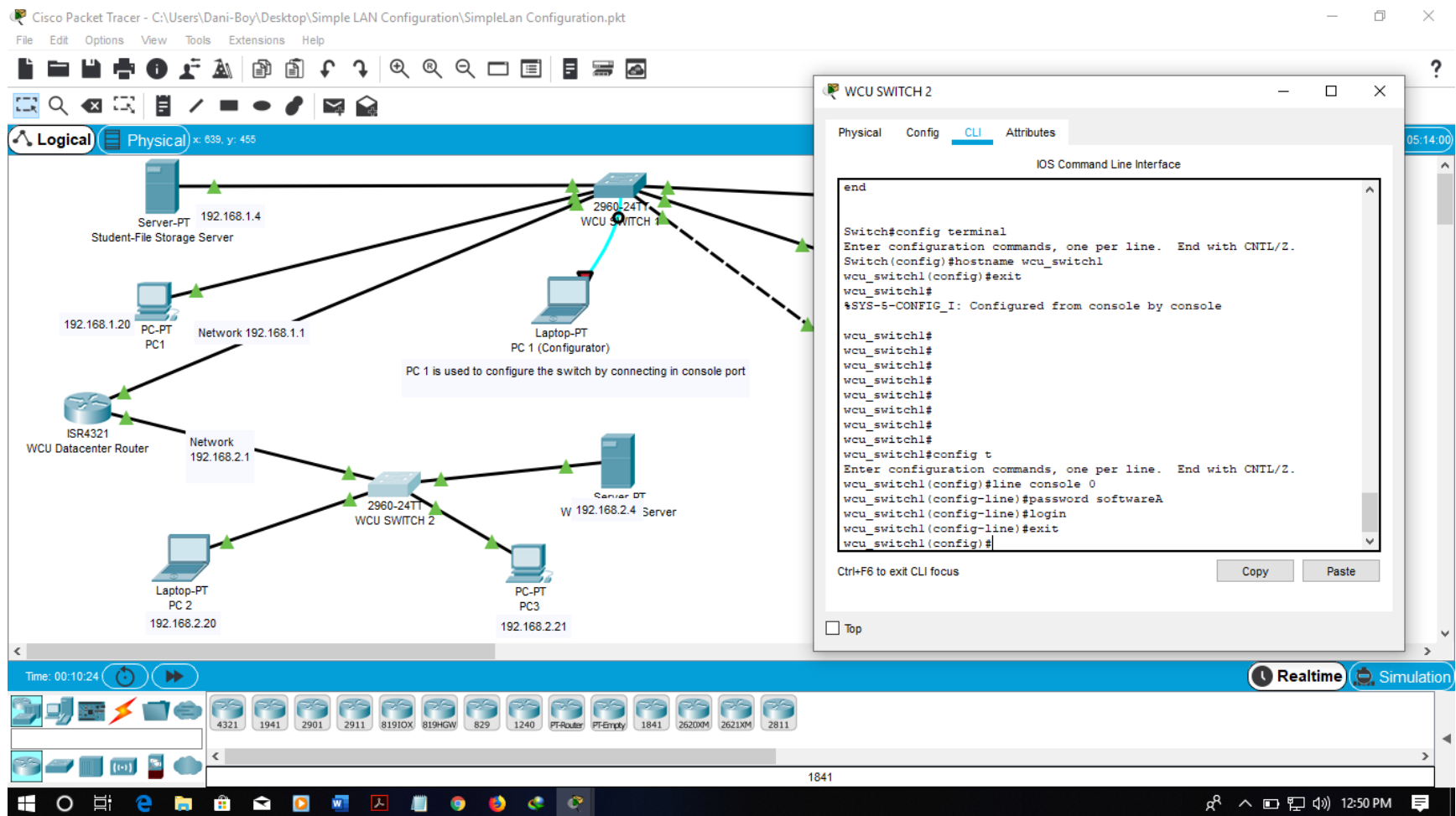
The **WCU SWITCH 2** CLI window is open, showing the following configuration:

```
Switch>enable
Switch#show run
Building configuration...

Current configuration : 1078 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
--More--
```

The bottom status bar shows the time as 00:04:27 and the simulation mode as **Realtime**.

Here this switch is not configured. The above picture shows default switch information. Let's configure the switch below.



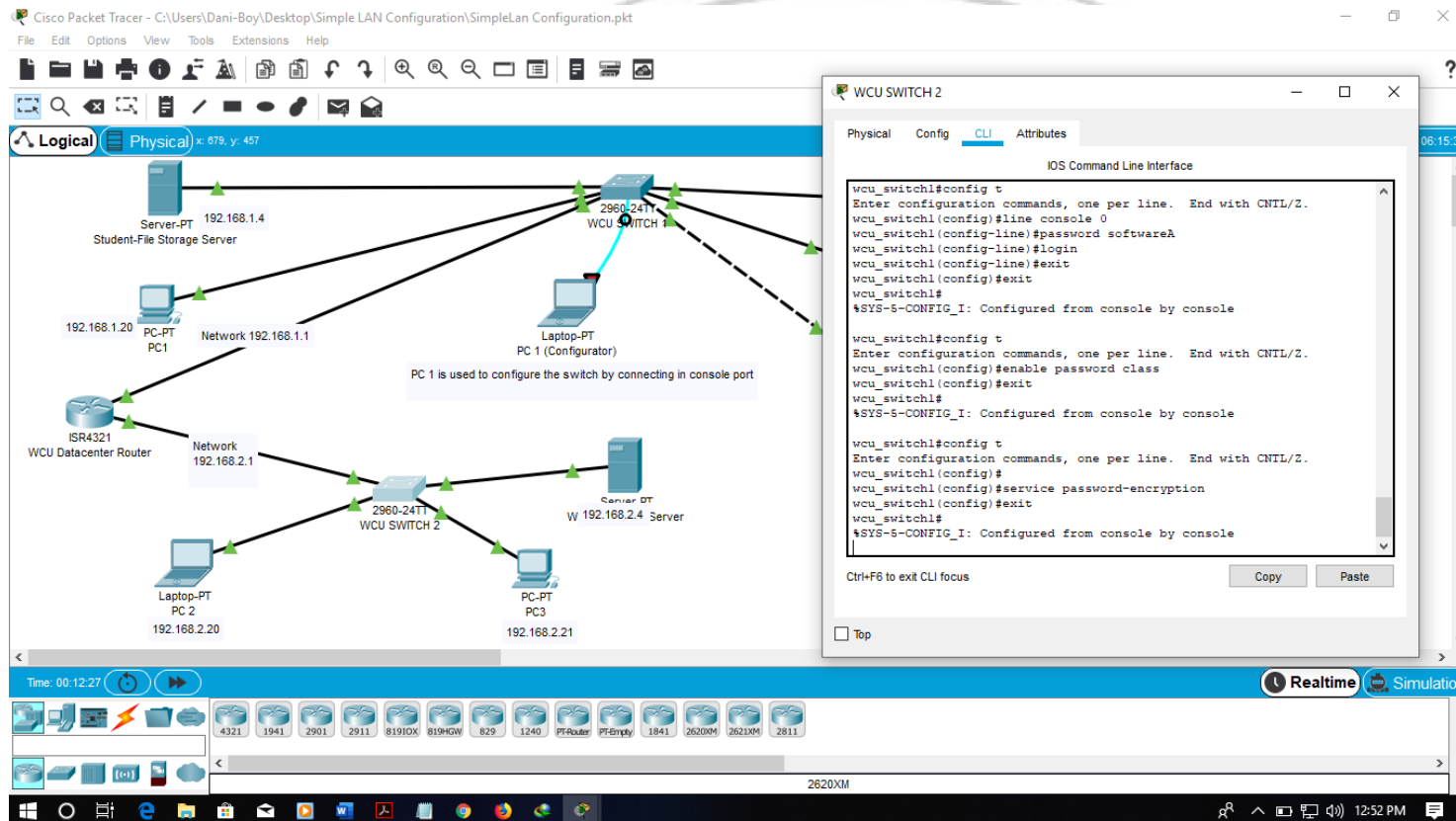
⇒ Here we assigned password to our switch by using the following command.

```

wcu_switch1#enable
wcu_switch1#config t
wcu_switch1(config)#line console 0
wcu_switch1(config-line)#password softwareA
//The password is set here softwareA
  
```

```
Wcu_switch1(config-line)#login
Wcu_switch1(config-line)#exit
```

⇒ Here we should encrypt the password by using the following commands.

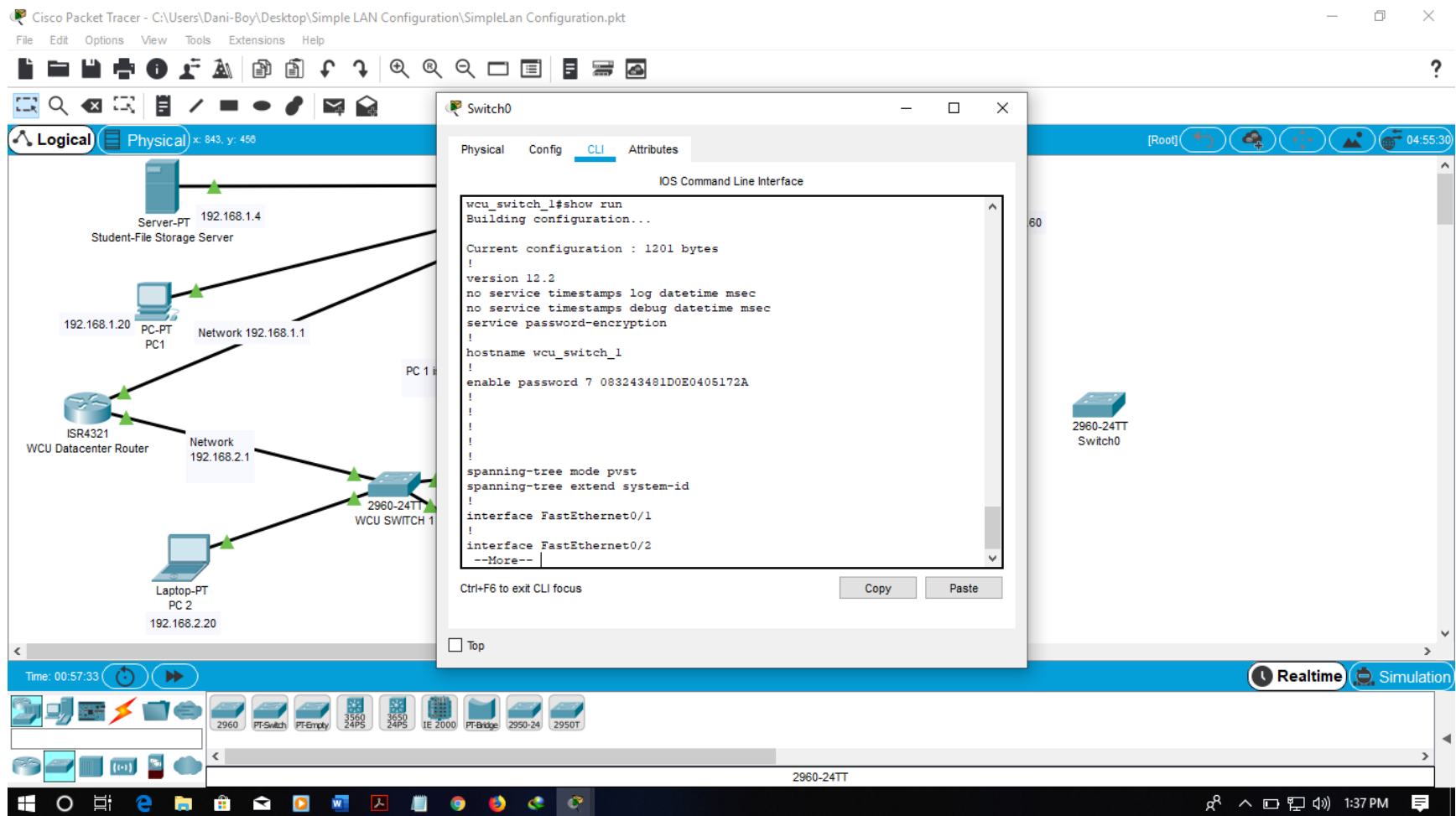


```
Wcu_switch1#en
```

```
Wcu_switch1#config t
```

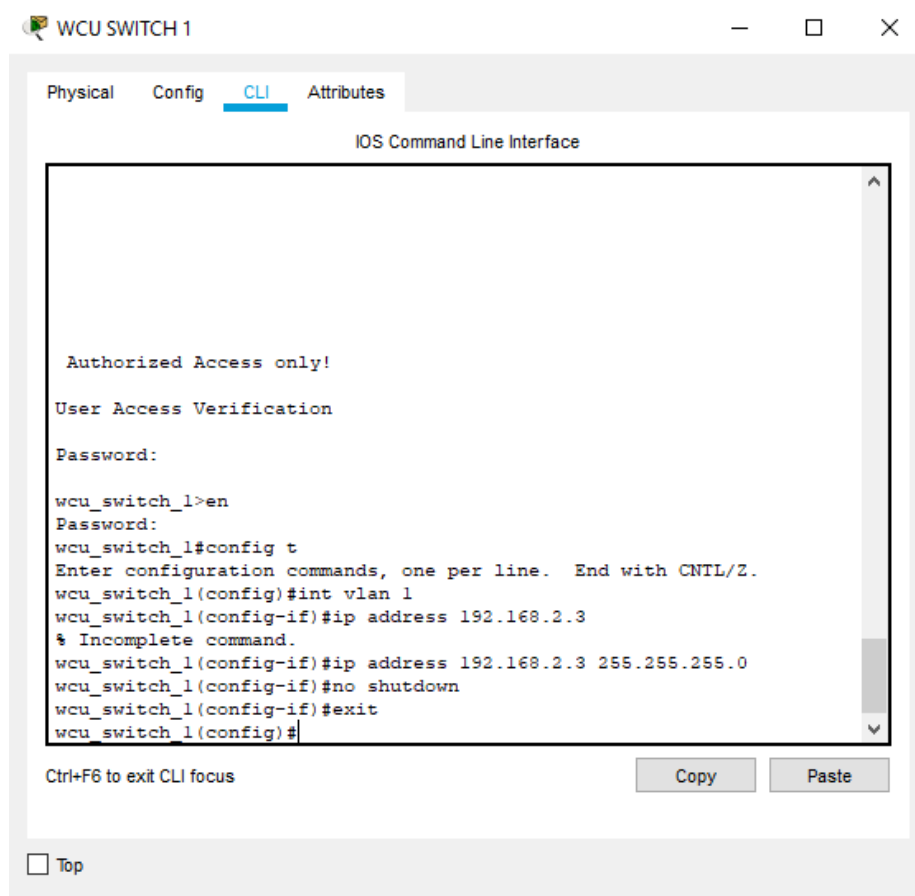
```
Wcu_switch1(config)#service password-encryption //It is used to encrypt the password
```

```
Wcu_switch1(config)#exit
```



- ⇒ The password is already configured and encrypted.
- ⇒ The next step is assigning ip address.

Follow the following step to assign ip address.



The screenshot shows a window titled "WCU SWITCH 1" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The interface shows a login prompt "Authorized Access only!" followed by "User Access Verification" and "Password:". Below this, the CLI session shows the following commands and prompts:

```
wcu_switch_1>en
Password:
wcu_switch_1#config t
Enter configuration commands, one per line. End with CNTL/Z.
wcu_switch_1(config)#int vlan 1
wcu_switch_1(config-if)#ip address 192.168.2.3
% Incomplete command.
wcu_switch_1(config-if)#ip address 192.168.2.3 255.255.255.0
wcu_switch_1(config-if)#no shutdown
wcu_switch_1(config-if)#exit
wcu_switch_1(config)#
```


At the bottom of the CLI window, there is a "Ctrl+F6 to exit CLI focus" message and "Copy" and "Paste" buttons.

Here we assigned ip address for switch 1

Command:

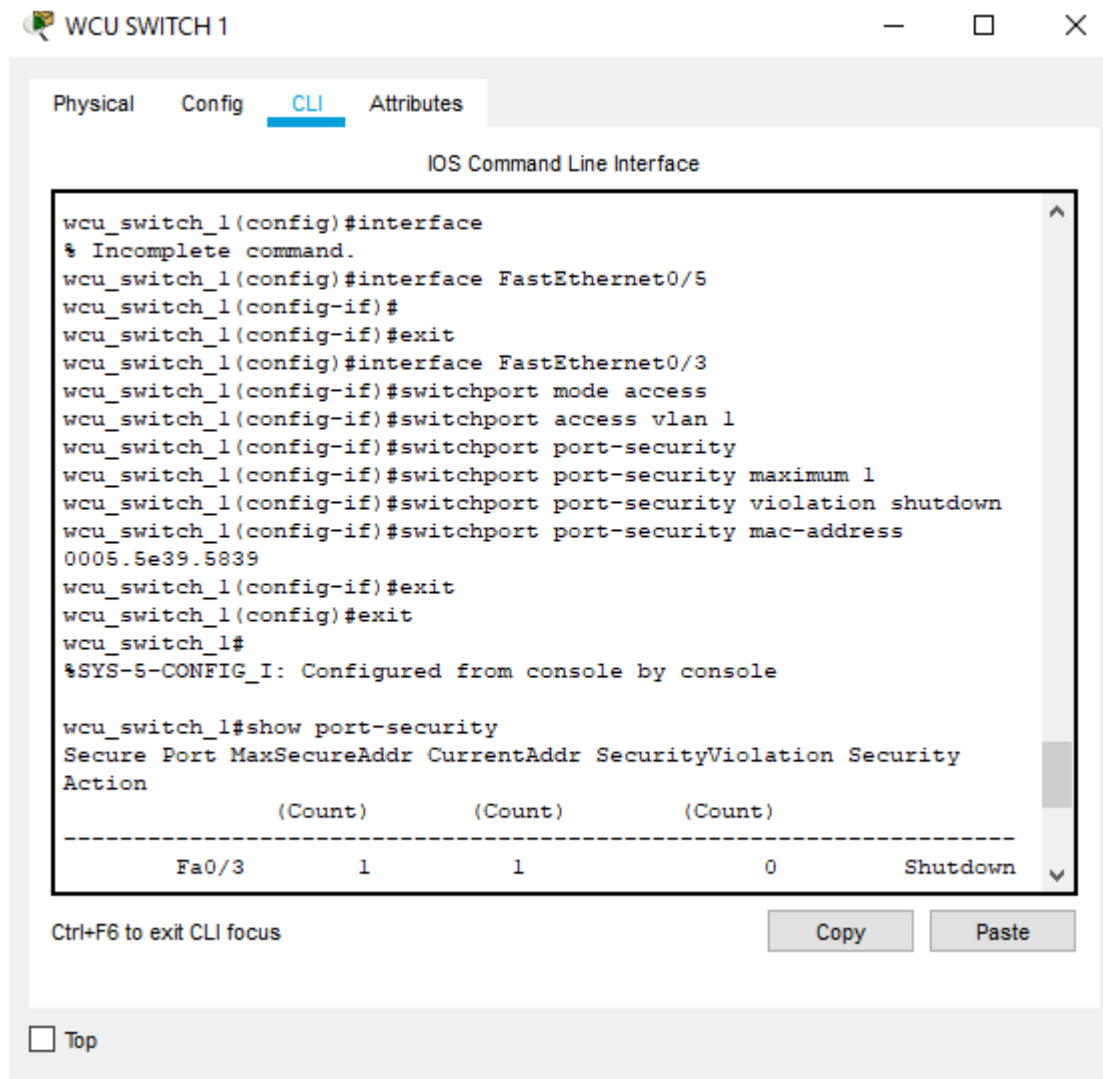
```
Wcu_switch_1>en
Wcu_switch_1#config t
Wcu_switch_1(config)#int vlan 1
Wcu_switch_1(config-if)#ip address 192.168.2.3
255.255.255.0
Wcu_switch_1(config-if)#no shutdown
Wcu_switch_1(config-if)#exit
Wcu_switch_1(config)#
```

So general switch configuration commands listed below. It is including configure Username, password, encrypt password and assign ip address.

The logo of Wachemo University is a circular emblem. It features a central illustration of a traditional wooden structure, possibly a shrine or a well, with a yellow flame or light emanating from the top. Below this structure is a blue globe with a gear-like base. The entire emblem is surrounded by a circular border containing the university's name in Amharic script at the top and 'WACHEMO UNIVERSITY' in English at the bottom. The background of the logo is light blue with green wavy lines on the sides.

```
Switch>enable
Switch# configure terminal
Switch(config)# hostname wcu_switch_1
wcu_switch_1(config)#line console 0
wcu_switch_1(config-line) #password softwareA
wcu_switch_1(config-line)# login
wcu_switch_1(config-line)# exit
wcu_switch_1(config)#enable password softwareA
wcu_switch_1(config)#service password-encryption
wcu_switch_1(config)#exit
wcu_switch_1#config t
wcu_switch_1(config)# banner motd#This is a secure system.Authorized Access Only!#
wcu_switch_1(config)#exit
wcu_switch_1#config t
wcu_switch_1(config)# int vlan 1
wcu_switch_1(config-if)# ip address 192.168.1.3 255.255.255.0
wcu_switch_1(config-if)# no shutdown
wcu_switch_1(config-if)# exit
wcu_switch_1(config)#exit
wcu_switch_1#
```

3. configure switch port security



The screenshot shows the CLI of WCU SWITCH 1. The 'CLI' tab is selected. The command history shows the configuration of interface FastEthernet0/3 with port security. The configuration includes setting the port mode to access, enabling port security, setting the maximum number of secure MAC addresses to 1, setting the violation mode to shutdown, and setting the secure MAC address to 0005.5e39.5839. The command history also shows the command 'show port-security' which displays the following output:

	(Count)	(Count)	(Count)	
Fa0/3	1	1	0	Shutdown

Below the table, there are buttons for 'Copy' and 'Paste', and a 'Top' button.

wcu_switch_1>en

wcu_switch_1(config)#interface F0/3

wcu_switch_1(config-if)#switchport mode access

// Assign port as host port

wcu_switch_1(config-if)#switchport access vlan 1

wcu_switch_1(config-if)#switchport port-security

// Enable port security feature on this port

wcu_switch_1(config-if)#switchport port-security maximum 1

//Set limit for hosts that can be associated with interface. Default value is 1. Skip this command to use default value.

wcu_switch_1(config-if)#switchport port-security violation shutdown

//Set security violation mode. Default mode is shutdown. Skip this command to use default mode.

wcu_switch_1(config-if)#switchport port-security mac-address 0005.5e39.5839

//set mac address of the device

WCU SWITCH 1

Physical Config **CLI** Attributes

IOS Command Line Interface

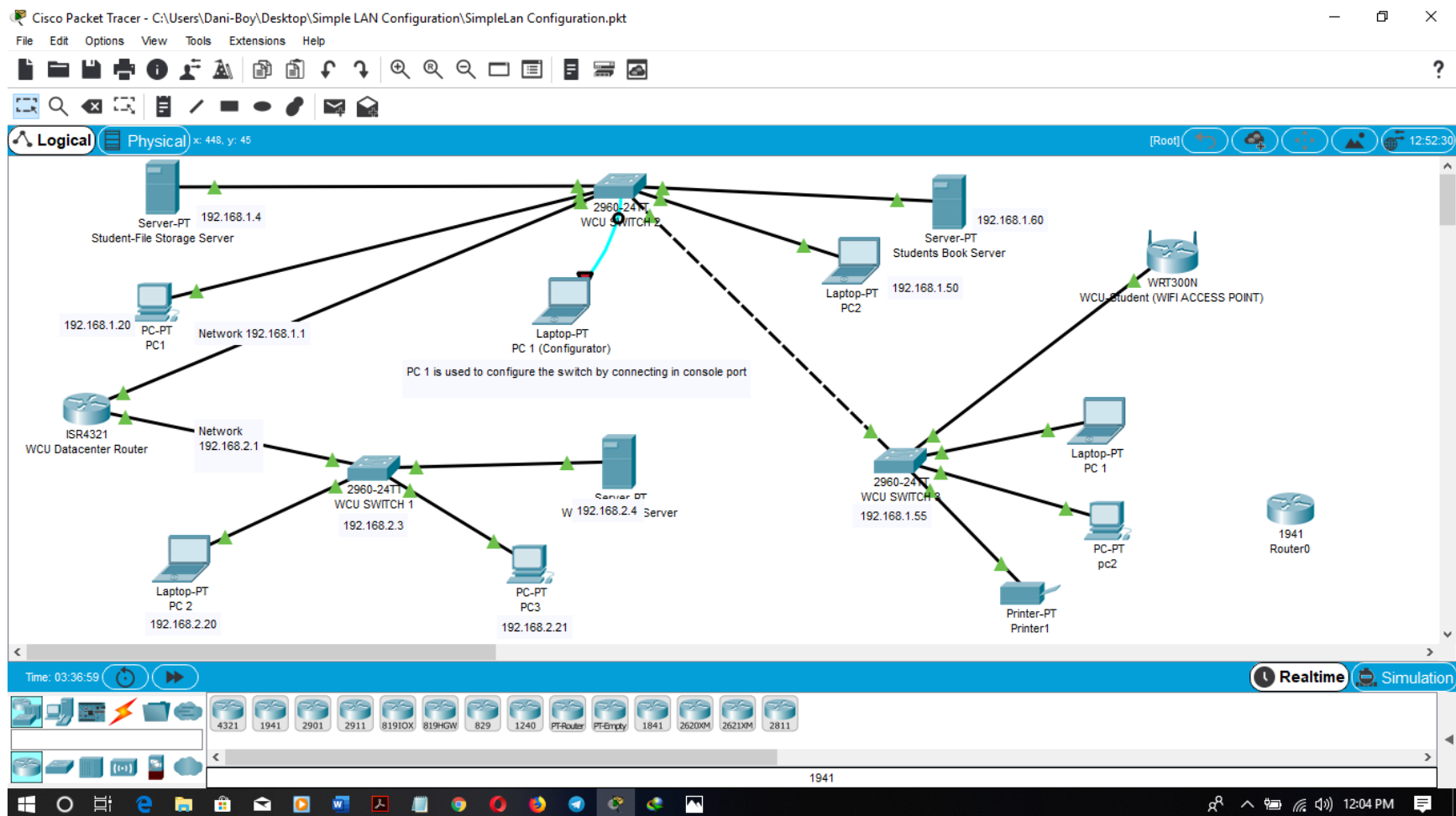
```
wcu_switch_1#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security
Action
              (Count)      (Count)      (Count)
-----
          Fa0/3          1          1          0          Shutdown
-----
-
wcu_switch_1#show port-security address
                          Secure Mac Address Table
-----
Vlan      Mac Address Type      Ports
Remaining Age
              (mins)
-----
1          0005.5E39.5839      SecureConfigured|
FastEthernet0/3      -
-----
Total Addresses in System (excluding one mac per port) : 0
Max Addresses limit in System (excluding one mac per port) : 1024
wcu_switch_1#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

port switch configuration is configured already. We can see the picture.



THE END

