**LOYOLA ACADEMY DEGREE & PG COLLEGE**



**OLD ALWAL, SECUNDERABAD - 500 010, TELANGANA, INDIA**

**An Autonomous Institution Affiliated to Osmania University**

**Re-accredited with ‘A’ Grade (III Cycle) by NAAC A “College with Potential for Excellence” by UGC**

**Practical Record**

**CERTIFICATE**

This is to certify that this is a Bonafide record work done in ----------------------- practical during - ---year semester of the academic year 202 —202-

**Name:**

**UID No:**

**Class:**

**Signature of Internal Signature of HoD**

**Signature of External Signature of Principal**

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# Program No:01 Date:

# Configure OSPF MD5 Authentication

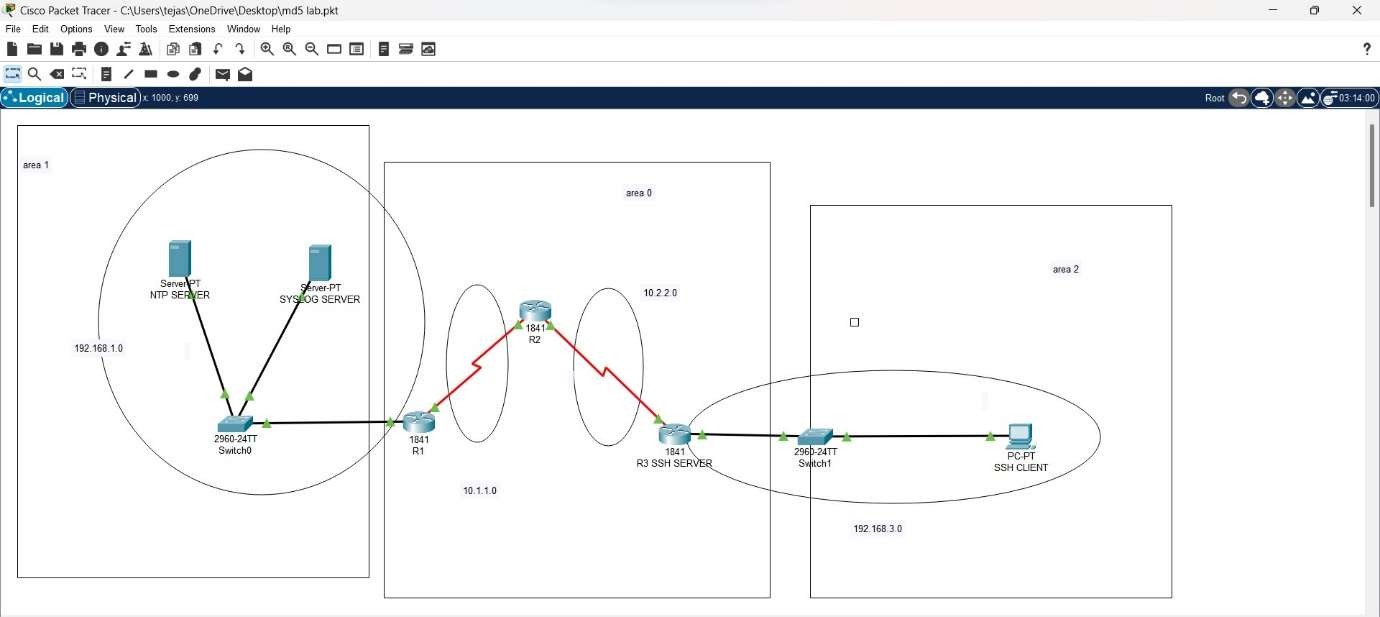
* Open the cisco packet tracer and place 3 routers and rename the display name as R1, R2, R3 and the hostname as the same R1, R2, R3 (In the config tab).
* Then go to R1 – physical tab- switch off the router- place the module name HWIC-2T in the port- switch the router.
* Repeat the same for all the 3 routers.
* Then we need to have the connections between the routers- we need to have serial DTE connection.

have the connection from R1-R2 (use serial0/1/0) and for R2-R3(use serial0/1/1)

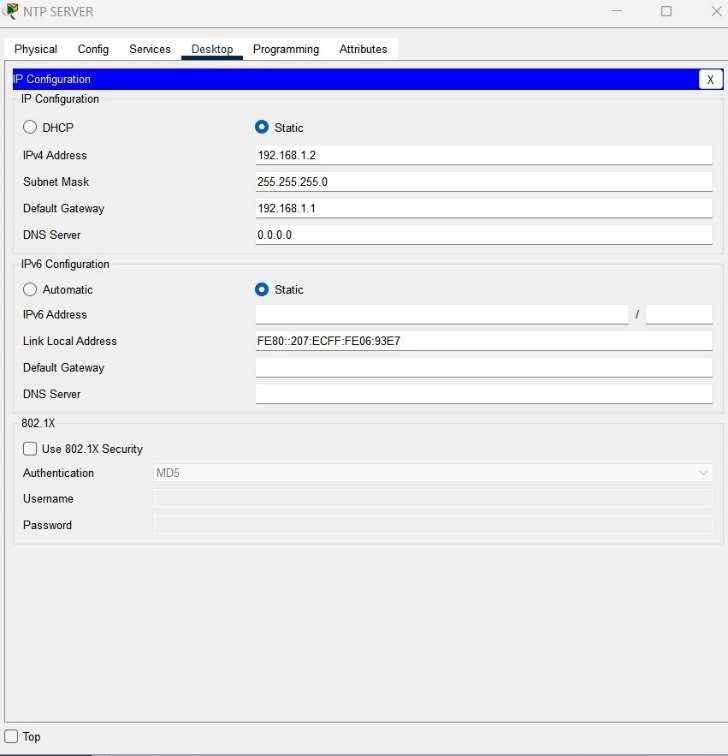
* Then have SWITCHES, SERVERS (SYSLOG SERVER & NTP SERVER) and a PC

(SSH CLIENT) in the network and use the auto connectors for connecting the devices.

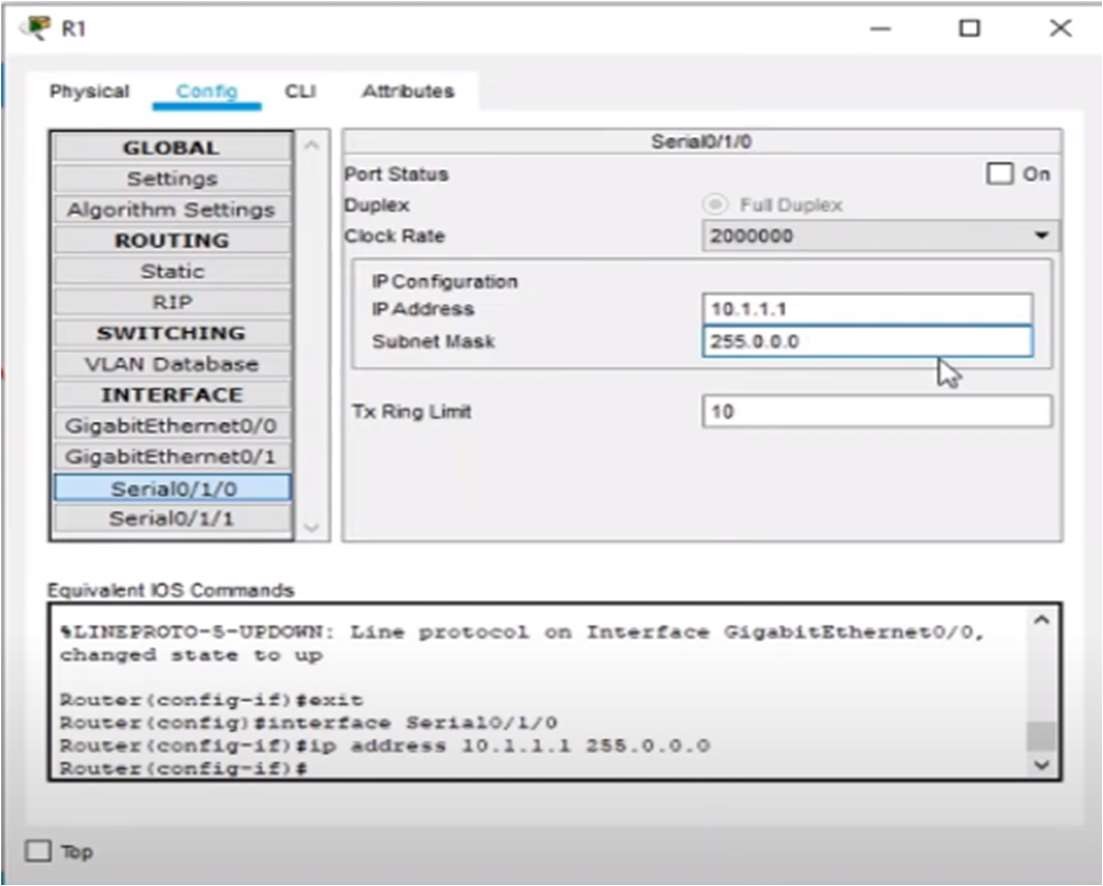
Build the network as shown in the figure.



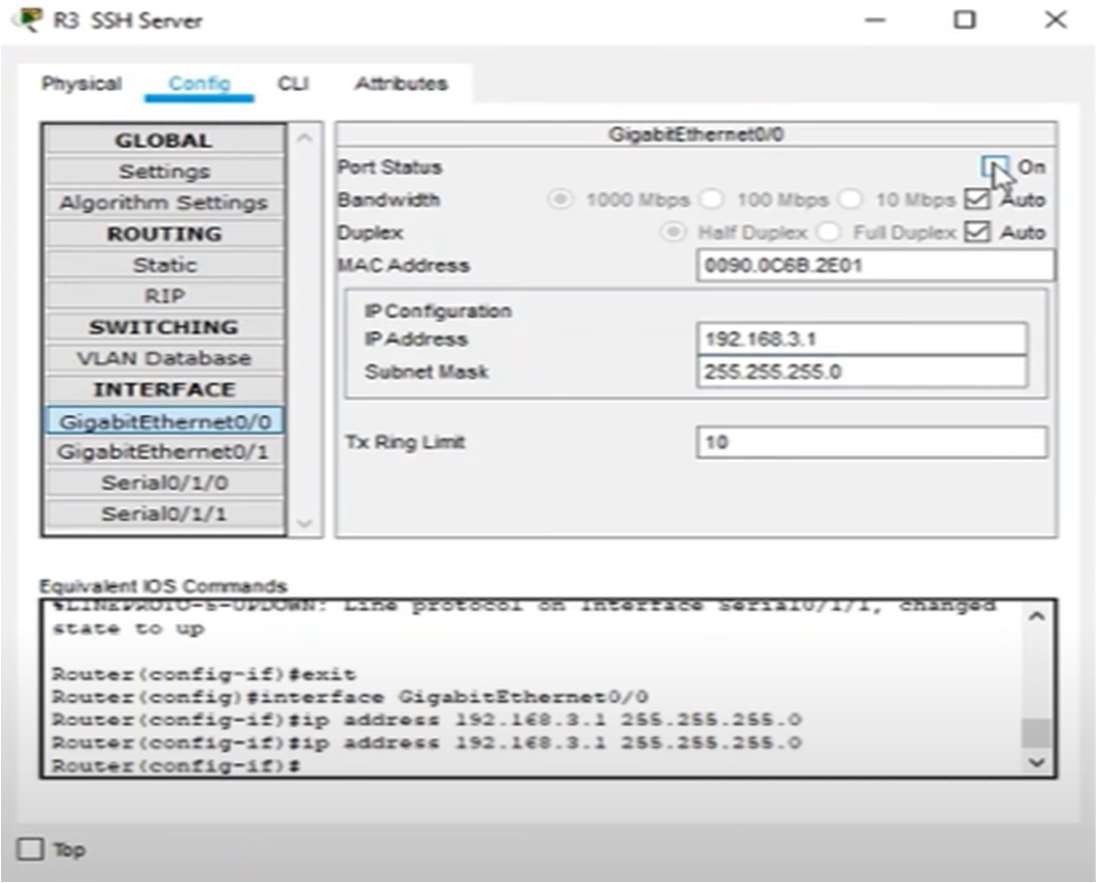
* Now configure the network-
  + Let us have 192.168.1.0 for the first area.
  + Let us have 10.1.1.0 for the second area.
  + Let us have 10.2.2.0 for the third area.
  + Let us have 192.168.3.0 for the fourth area.
* Check the interface at router 1 to switch0 and check the port gig0/0 and configure the Ip address as 192.168.1.1 and subnet mask as 255.255.255.0 and click on.
* Go to the NTP server and go to the desktop and set the Ip address as 192.168.1.2 and subnet mask as 255.255.255.0 and the default gateway will be 192.168.1.1.
* Same for SYSLOG server, go to the desktop- set the Ip address as 192.168.1.3 and the subnet mask as 255.255.255.0 and the default gateway as 192.168.1.1.



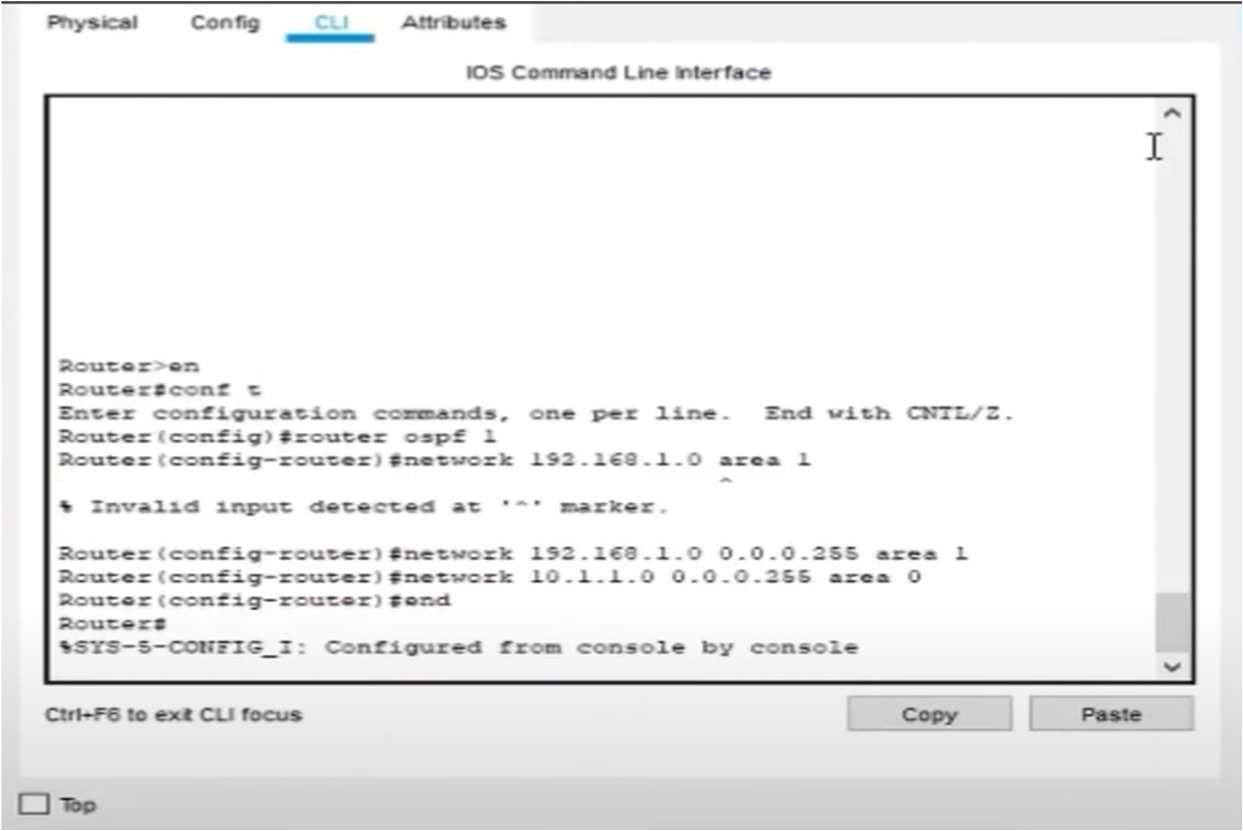
* Now configure routers
  + R1- Go to serial0/1/0 and add the Ip address as 10.1.1.1 and subnet mask as 255.255.255.0 and switch it on.
  + R2- Go to the serial0/1/0 and the Ip address as 10.1.1.2 and the subnet mask as 255.255.255.0 and switch it on.
  + R2- Go to the serial0/1/1 and the Ip address as 10.2.2.1 and subnet mask as 255.255.255.0 and switch it on.
  + R3- Go to the serial0/1/1 and the Ip address as 10.2.2.2 and subnet mask as 255.255.255.0 and switch it on.

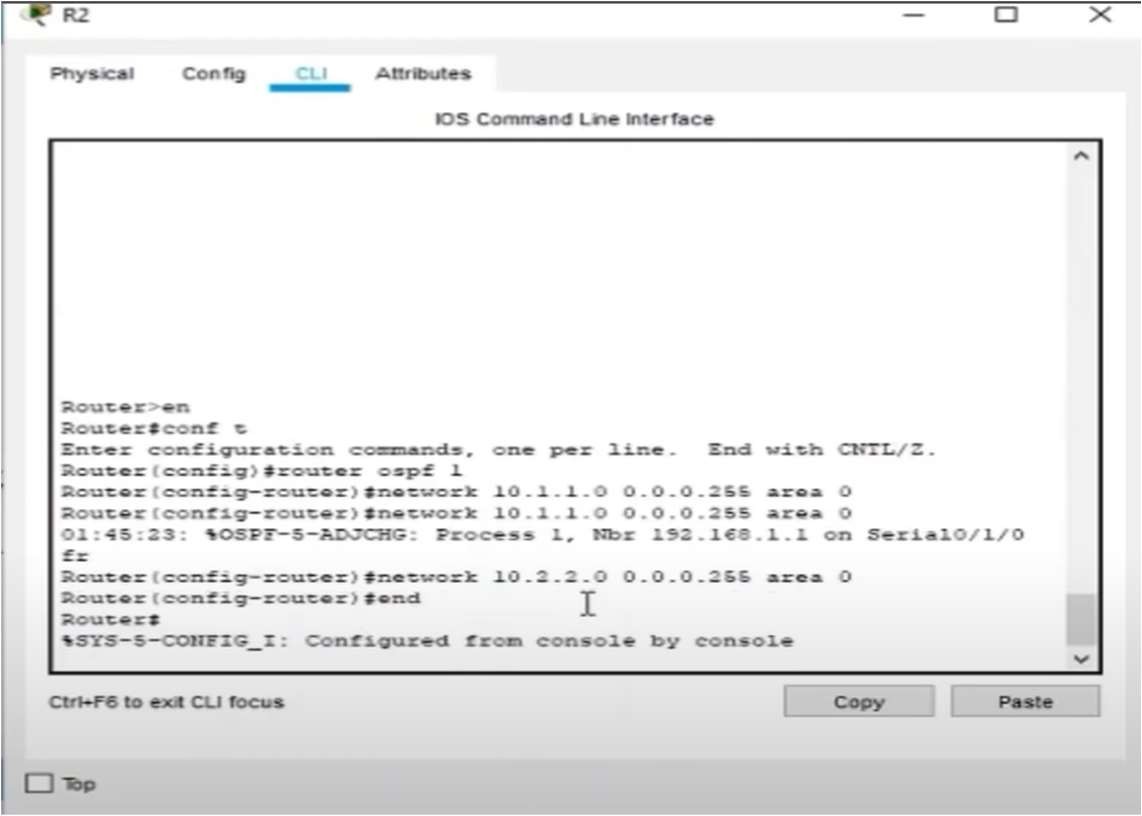


* Now configure the R3-pc area
  + Go to the R3 router and click on connection gig0/1 add the Ip address as 192.168.3.1 and the subnet mask as 255.255.255.0 and switch it ON.
  + The go to PC click on the desktop and add the Ip address as 192.168.3.2 and the subnet mask as 255.255.255.0 and the default gateway as 192.168.3.1.

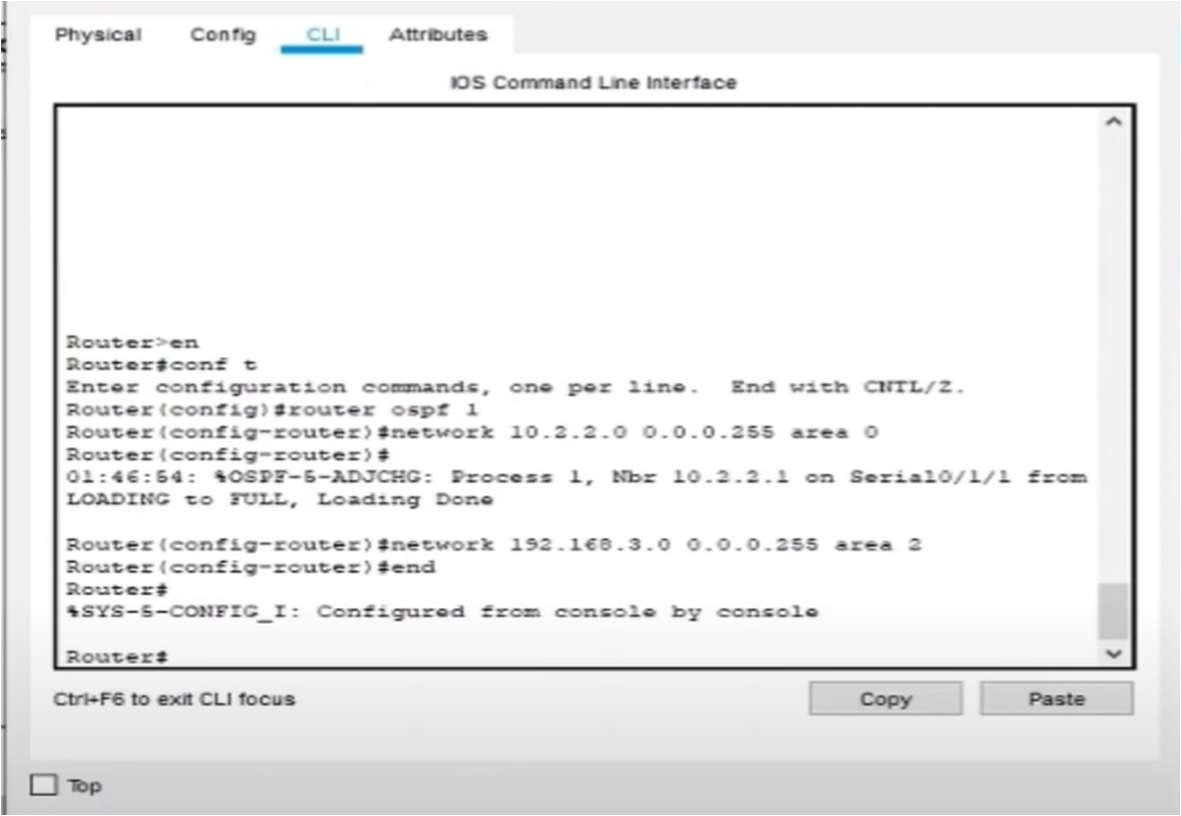


**CONFIGURING OSPF ROUTING**-

* Go to R1 - Go to CLI tab
  + Router>en
  + Router#conf t
  + Router(config)#router ospf 1
  + Router(config-router)#network 192.168.1.0 0 .0.0.255 area 1
  + Router(config-router)#network 10.1.1.0 0.0.0.255 area 0
  + Router(config-router)#end
  + Router#
* Go to R2 - Go to CLI tab
  + Router>en
  + Router#conf t
  + Router(config)#router ospf 1
  + Router(config-router)#network 10.1.1.0 0 .0.0.255 area 0
  + Router(config-router)#network 10.1.1.0 0.0.0.255 area 0
  + Router(config-router)#network 10.2.2.0 0.0.0.255 area 0
  + Router(config-router)#end
  + Router#



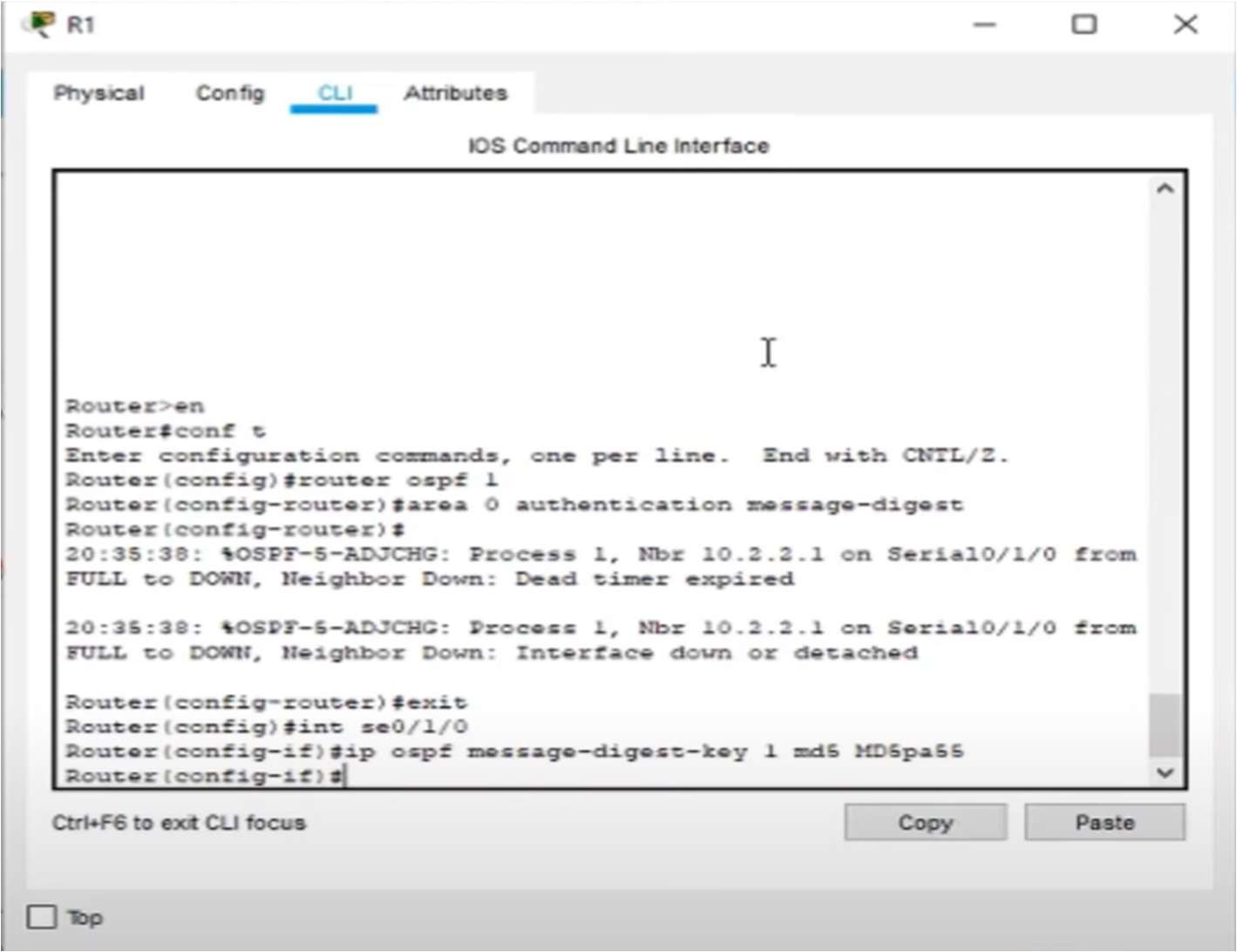
* Go to R3 - Go to CLI tab
  + Router>en
  + Router#conf t
  + Router(config)#router ospf 1
  + Router(config-router)#network 10.2.2.0 0 .0.0.255 area 0
  + Router(config-router)#network 192.168.3.0 0.0.0.255 area 2
  + Router(config-router)#end
  + Router#



**CONFIGURE OSPF MD5 AUTHENTICATION.**

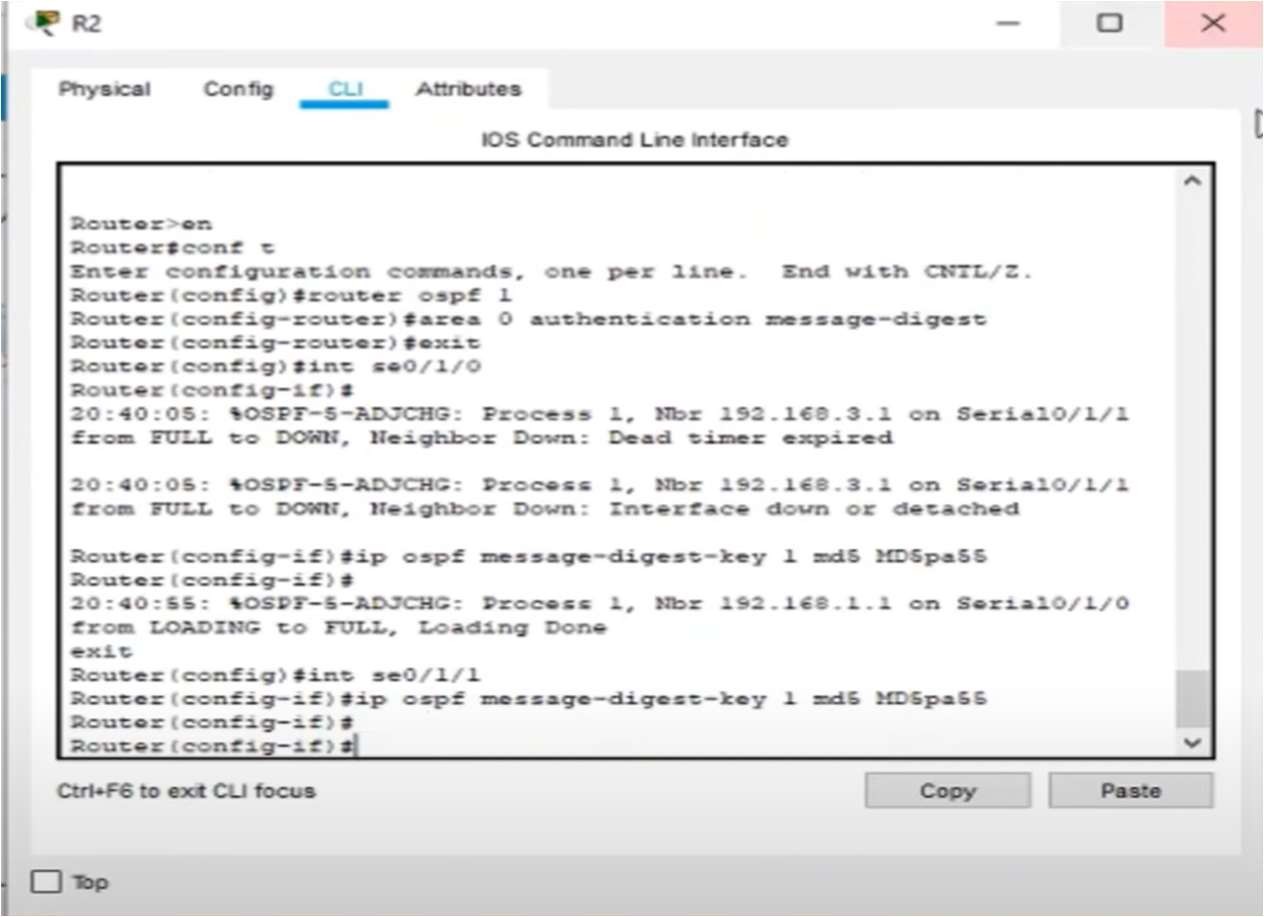
R1- Go to the CLI tab

* Router>en
* Router#conf t
* Router(config)#router ospf 1
* Router(config-router)# area 0 authentication message-digest
* Router(config-router)# exit
* Router(config)# int se0/1/0
* Router(config-if)# ip ospf message-digest-key 1 md5 MD5pa55
* Router(config-if)#

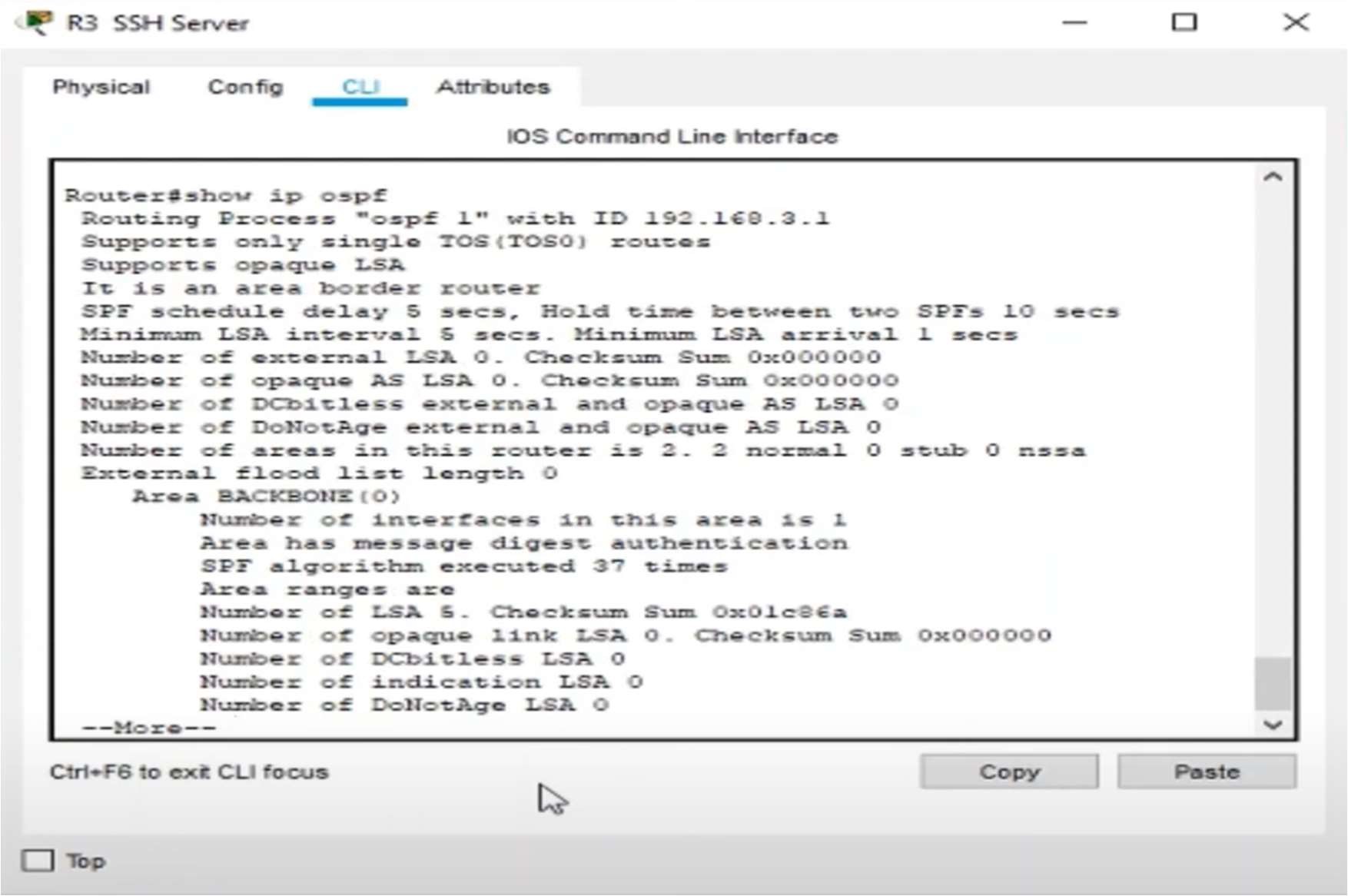


R1- Go to the CLI tab

* Router>en
* Router#conf t
* Router(config)#router ospf 1
* Router(config-router)# area 0 authentication message-digest
* Router(config-router)# exit
* Router(config)# int se0/1/0
* Router(config-if)# ip ospf message-digest-key 1 md5 MD5pa55
* Router(config-if)#exit
* Router(config)# int se0/1/1
* Router(config-if)# ip ospf message-digest-key 1 md5 MD5pa55



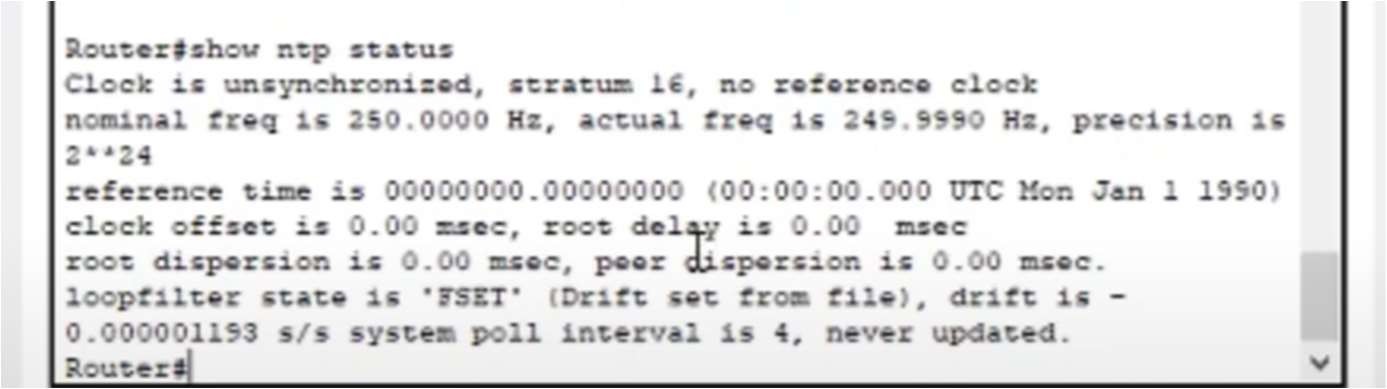
R3- Go to the CLI tab

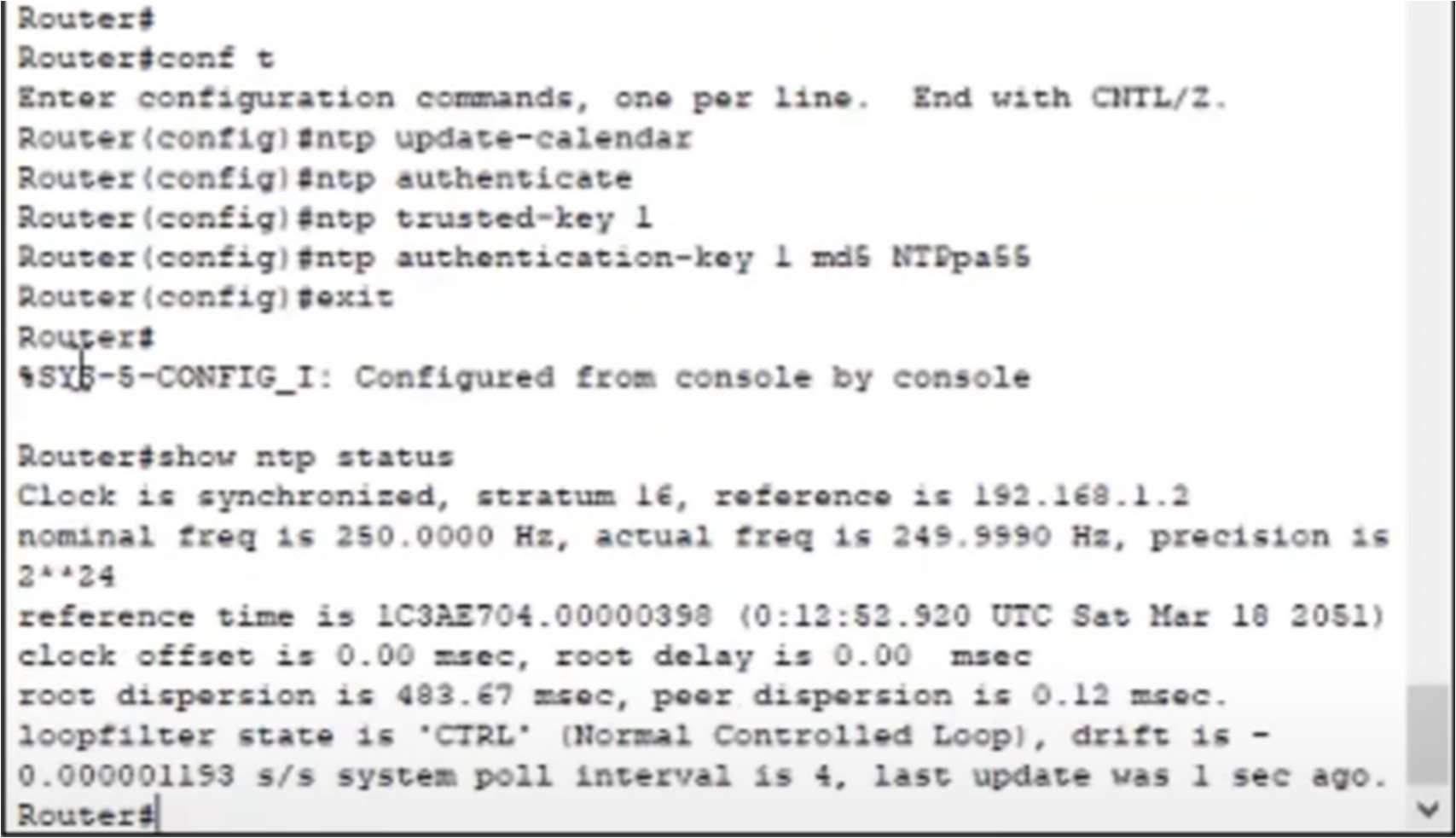
* Router>en
* Router#conf t
* Router(config)#router ospf 1
* Router(config-router)# area 0 authentication message-digest
* Router(config-router)# exit
* Router(config)# int se0/1/1
* Router(config-if)# ip ospf message-digest-key 1 md5 MD5pa55
* Router(config-if)#exit
* Router(config)#exit
* Router# show ip ospf

# Program No:02 Date:

# 

# Configure NTP server

* + Open the cisco packet tracer and open the same network which we have used before.
  + Now enable the NTP server, so click on NTP server and go to services tab- go to NTP and click on enable.
  + Enter the key-1 and the password – NTPpa55 and switch it on.
  + Go to router R1 and go to CLI tab-
    - Router>en
    - Router#conf t
    - Router(config)#ntp server 192.168.1.2
    - Router(config)# exit
    - Router# show ntp status
    - Router# conf t
    - Router(config)#ntp update-calendar
    - Router(config)#ntp authenticate
    - Router(config)#ntp trusted-key 1
    - Router(config)#ntp authentication-key 1 md5 NTPpa55
    - Router(config)#exit
    - Router#show ntp status

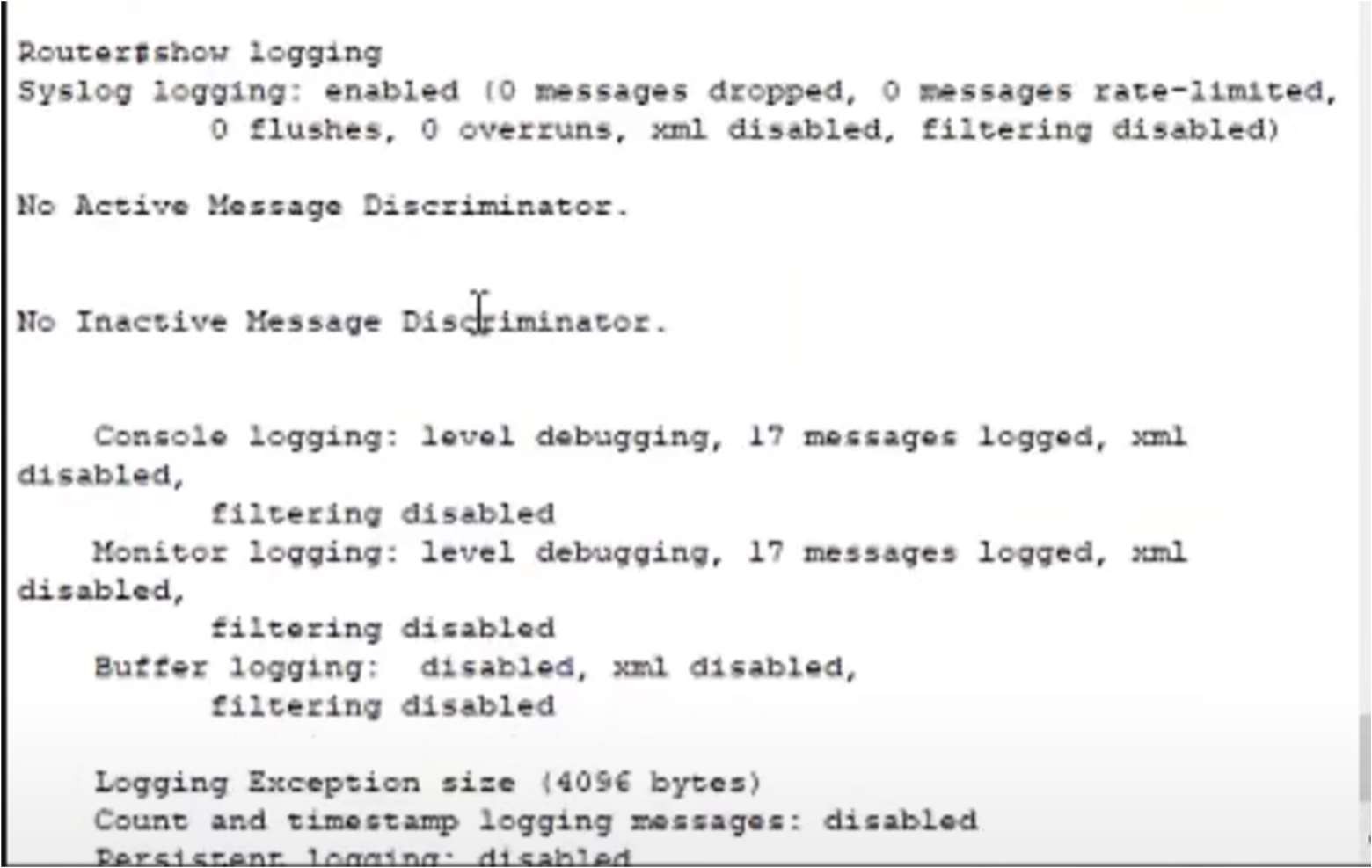


* + Repeat the same for all the 3 routers.

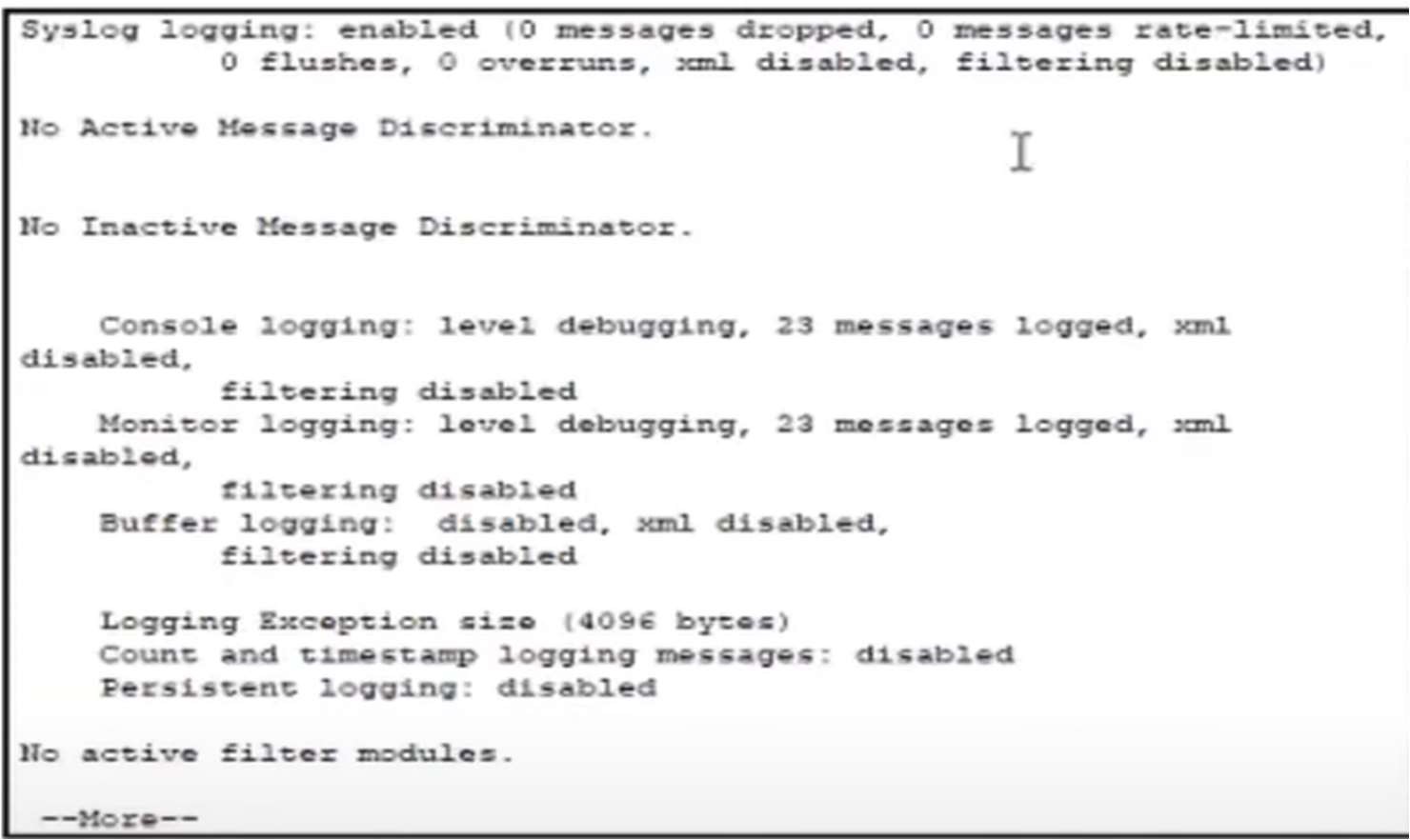
# Program No:03 Date:

# Configure Routers to Log Messages to the Syslog Server

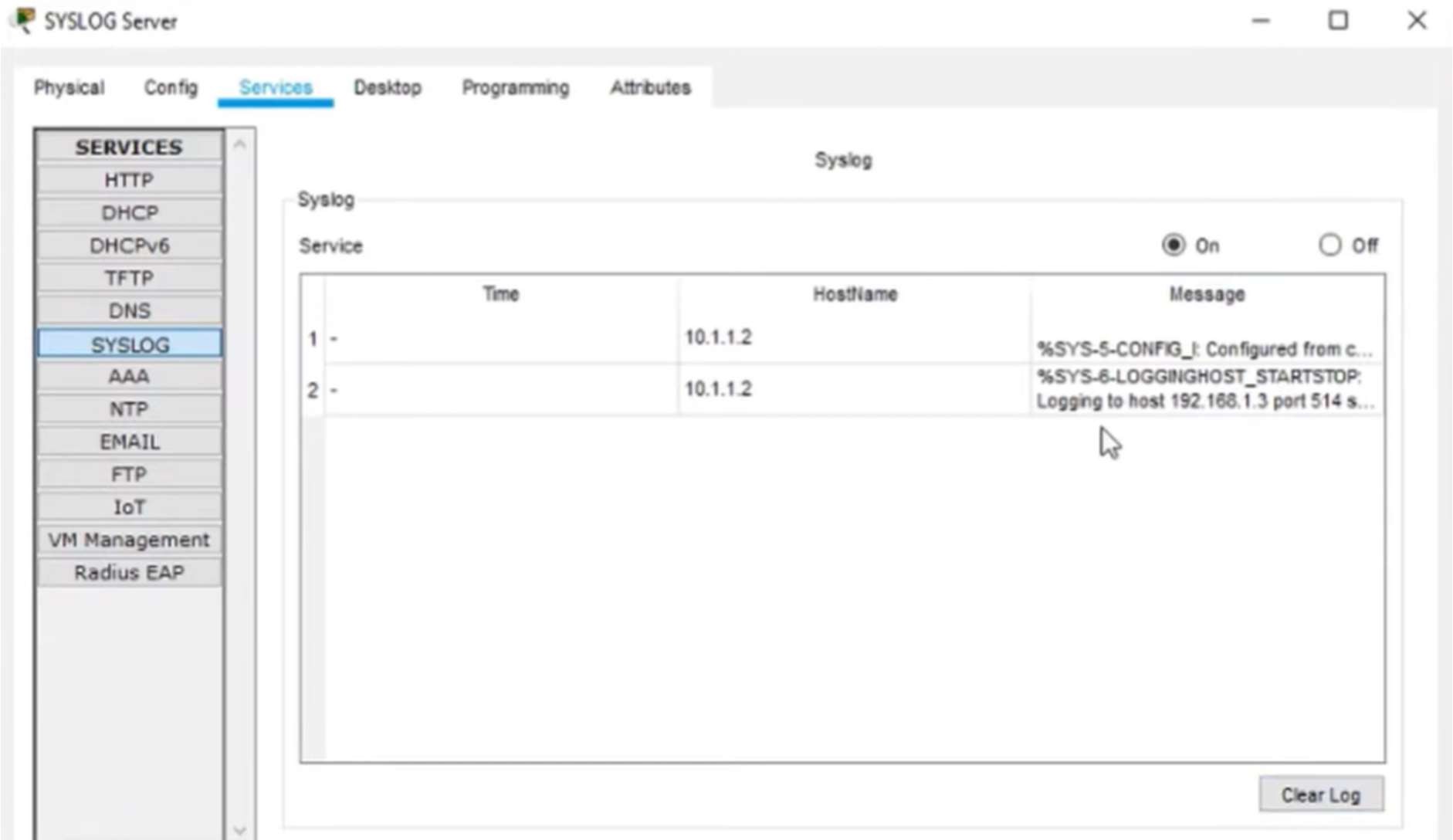
* + Open the cisco packet tracer and open the same network which we have used before.
  + Click on R1 and go to CLI-
    - Router# conf t
    - Router(config)# logging host 192.168.1.3
    - Router(config)# exit
    - Router# show logging



* + Repeat the same for R2
    - Router>en
    - Router# conf t
    - Router(config)# logging host 192.168.1.3
    - Router(config)# exit
    - Router# show logging



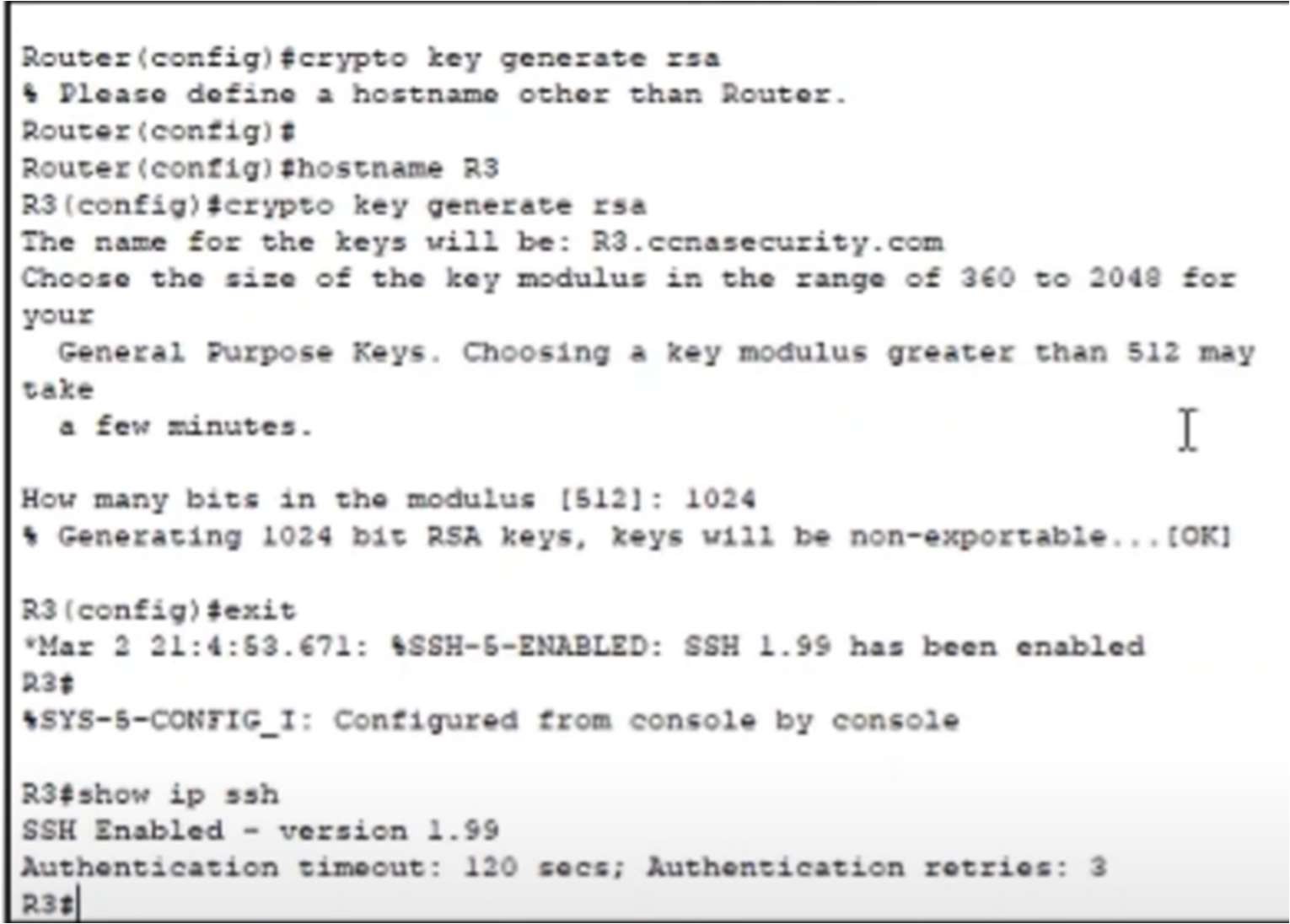
* + Now go to the SYSLOG server and click on services- go to SYSLOG and we can see the message are generating.



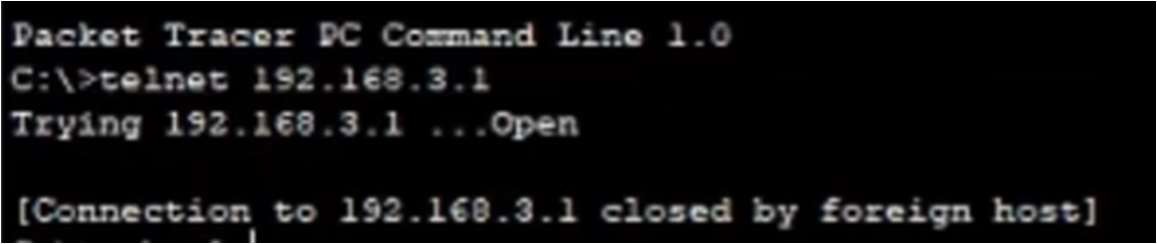
# Program No:04 Date:

# Configure Router to Support SSH Connections

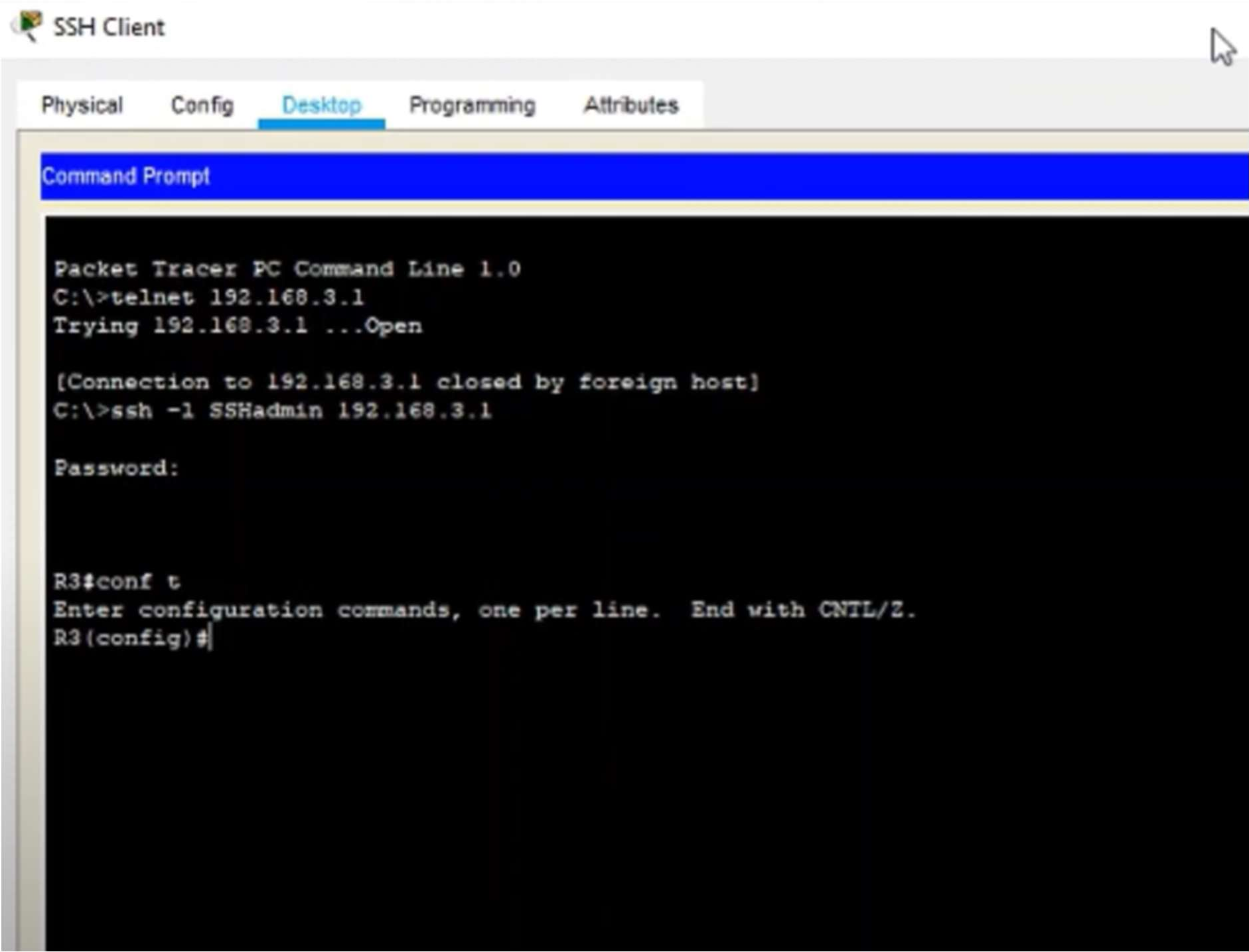
* + Open the cisco packet tracer and open the same network which we have used before.
  + Click on R3 and go to CLI-
    - Router>en
    - Router#conf
    - Router(config)#ip domain-name ccnasecurity.com
    - Router(config)#username SSHadmin privilege 15 secret ciscopa55
    - Router(config)#line vty 0 4
    - Router(config-line)#login local
    - Router(config-line)#transport input ssh
    - Router(config-line)#crypto key generate rsa Change the router name as R3
    - R3(config)#crypto key generate rsa How many bits in the modulus [512]:1024
    - R3(config)#exit
    - R3# show ip ssh



* + Now go to the PC and go to desktop- command prompt
  + **C:\telnet 192.168.3.1**



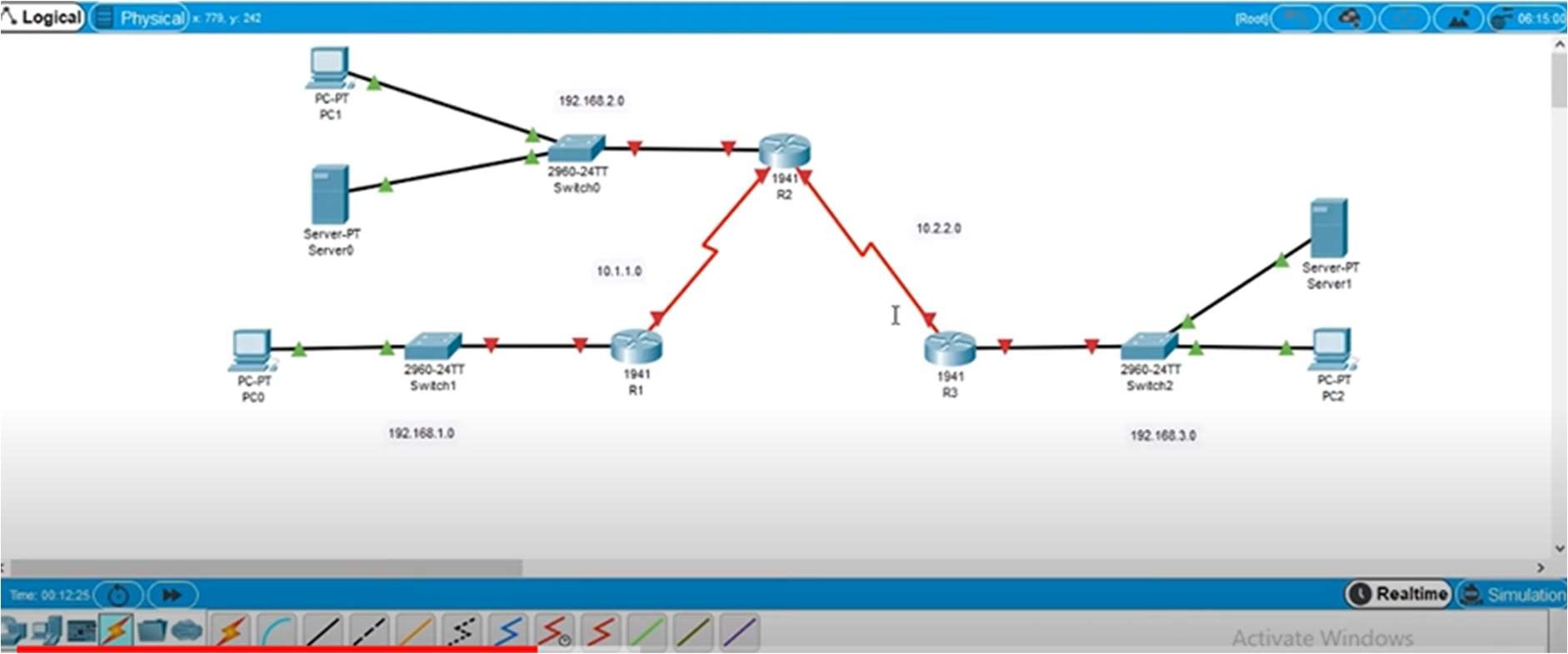
* + **C:\>ssh -l SSHadmin 192.168.3.1 Password: ciscopa55**

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# Program No:05 Date:

# Configure server-based AAA authentication

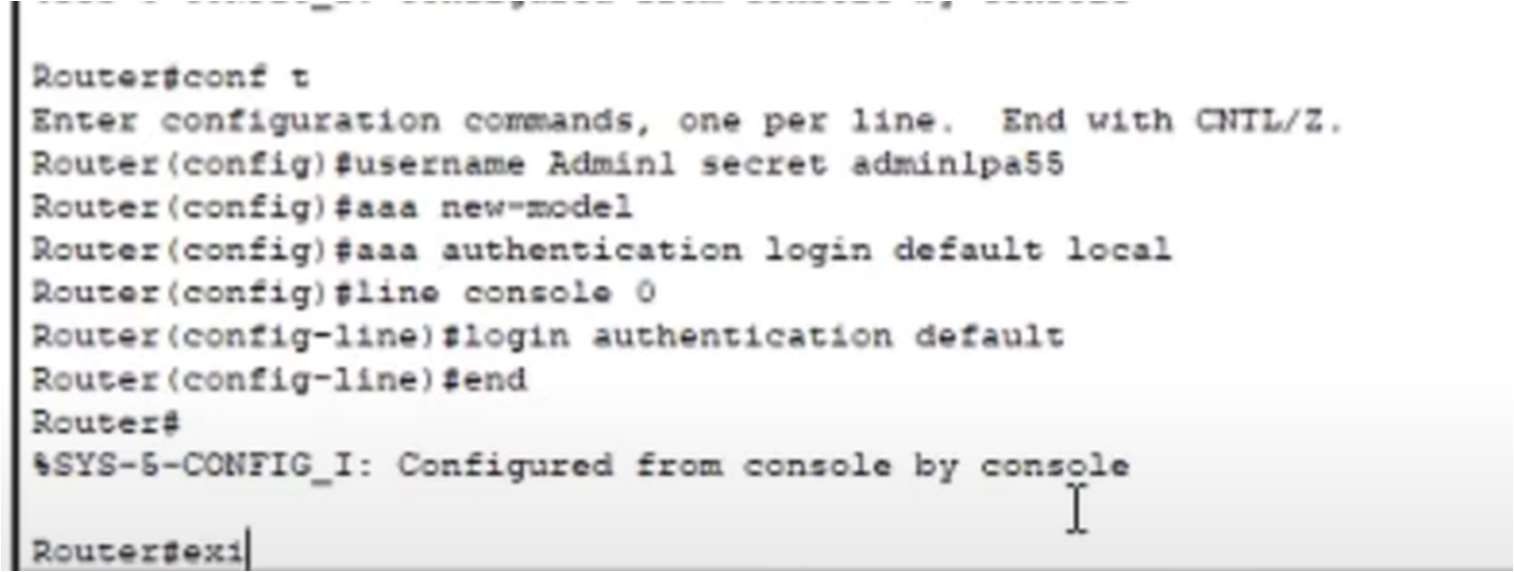
* + Open cisco packet tracer and place 3 routers (1941), 3 switches (2960) , 3 PC and 2 servers and connect the devices as shown in the figure.
  + And have the serial connections between routers so add the port (HWIC-2T) to the routers and connect them with serial DTE connection.



* + Go to the router R1 and click on gig0/0 – ip address- 192.168.1.1 & subnet mask- 255.255.255.0 and switch it on.
  + Go to pc0- desktop- ip address- 192.168.1.2 & subnet mask- 255.255.255.0 and default gateway as 192.168.1.1
  + Now go to R2 and click on gig0/0- ip address-192.168.2.1 and subnet mask is 255.255.255.0 and switch it on.
  + Go to pc1- desktop- op address- 192.168.2.2 & subnet mask as 255.255.255.0 and default gateway as 192.168.2.1
  + Go to the server- desktop- ip address- 192.168.2.3 & subnet mask as 255.255.255.0 and default gateway as 192.168.2.1.
  + Now go to R3 and set the ip configuration in gig0/0- ip address-192.168.3.1 and the subnet mask as 255.255.255.0 and switch it on.
  + Now go to PC3 and set the ip config as 192.168.3.2 and subnet mask as 255.255.255.0 and default gateway will be 192.168.3.1
  + Go to server- desktop- IP address-192.168.3.3 and the subnet mask as 255.255.255.0 and the default gateway as 192.168.3.1
  + Now configure the routers:
    - **(R1- R2)-** serial0/1/0- ip address-10.1.1.1 (R1) & subnet mask- 255.255.255.0(R1)
    - **(R1-R2)-** serial0/1/0-ip address- 10.1.1.2(R2) & subnet mask- 255.255.255.0 (R2)
    - **(R2-R3)-** serial0/1/1- ip address- 10.2.2.1 (R2) & subnet mask- 255.255.255.0 (R2).
    - **(R2-R3)-** serial0/1/1- ip address- 10.2.2.2 (R3) & subnet mask- 255.255.255.0 (R3).
  + Add RIP to all the routers.
    - **R1-** 192.168.1.0 & 10.1.1.0
    - **R2-** 192.168.2.0, 10.1.1.0 & 10.2.2.0
    - **R3-** 192.168.3.0 & 10.2.2.0

**Configure local AAA authentication for console access**

* + Go to the router R1 – Go to the CLI
    - Router#conf t
    - Router(config)#username Admin1 secret admin1pa55
    - Router(config)#aaa new-model
    - Router(config)#aaa authentication login default local
    - Router(config)#line console 0
    - Router ( config-line)# login authentication default
    - Router (config-line)# end
    - Router#exit



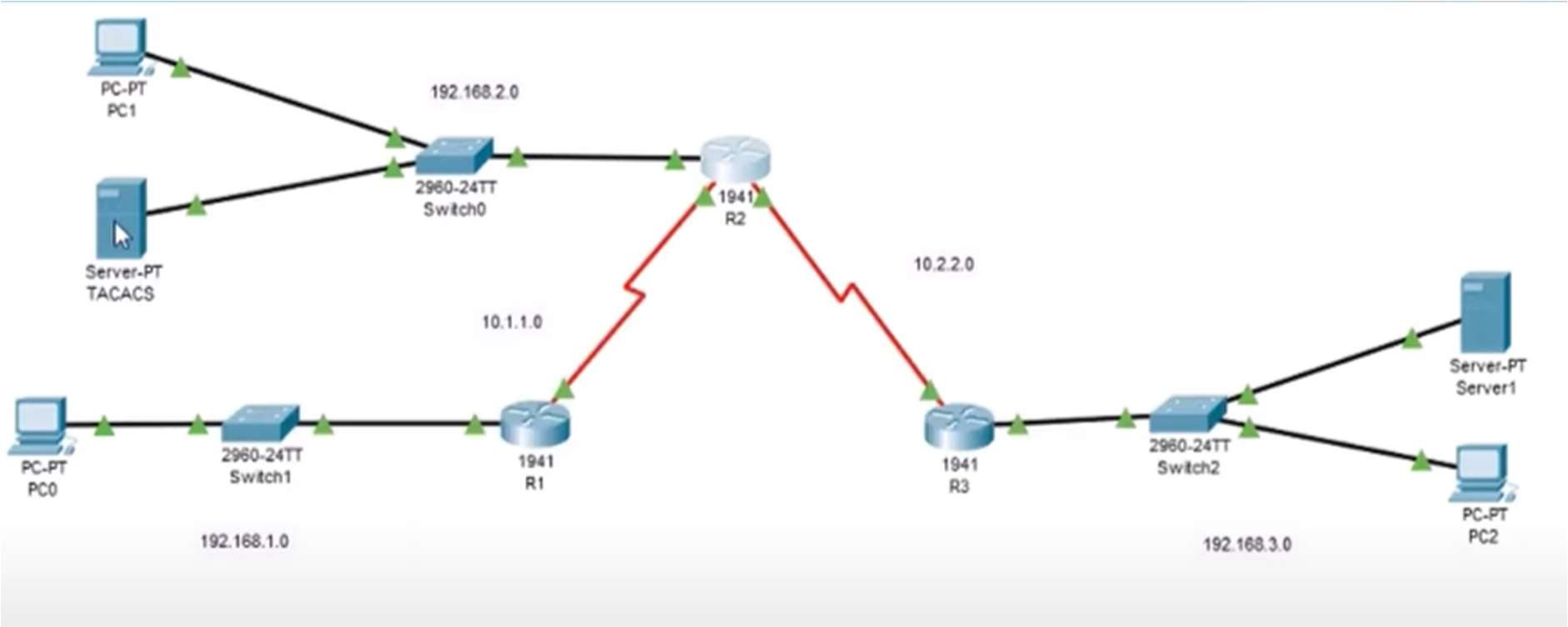
USERNAME: Admin1

PASSWORD: admin1pa55

# Program No:06 Date:

# Configure server-based AAA authentication using TACACS+

* + Go to the same network of AAA which we have configured before and rename the server as TACACS.



* + Click on router R2 and go to CLI tab
    - R2#conf t
    - R2(config)#username Admin2 secret admin2pa55
  + Now go to the TACACS sever and go to services tab- click on AAA Client-name – R2

Client ip- 192.168.2.1

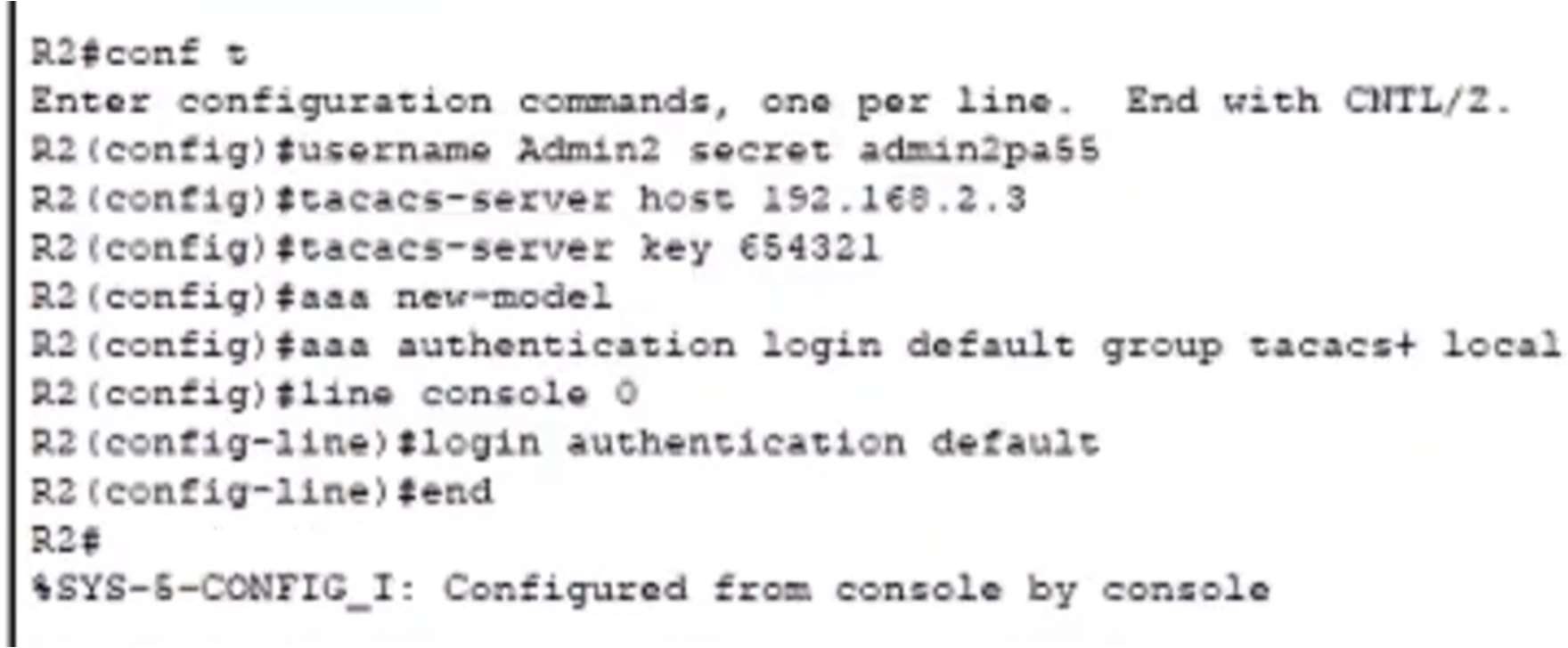
Secret – 654321 Servertype- tacacs **Now click on add**

* + User setup- Username- Admin2

Password- admin2pa55

**Now switch on the server**.

* + Go to R2- CLI mode
    - R2(config)#tacacs-server host 192.168.2.3
    - R2(config)#tacacs-server key 654321
    - R2(config)#aaa new-model
    - R2(config)#aaa authentication login default group tacacs+ local
    - R2(config)#line console 0
    - R2(config-line)#login authentication default
    - R2(config-line)#end
    - R2(config)#exit



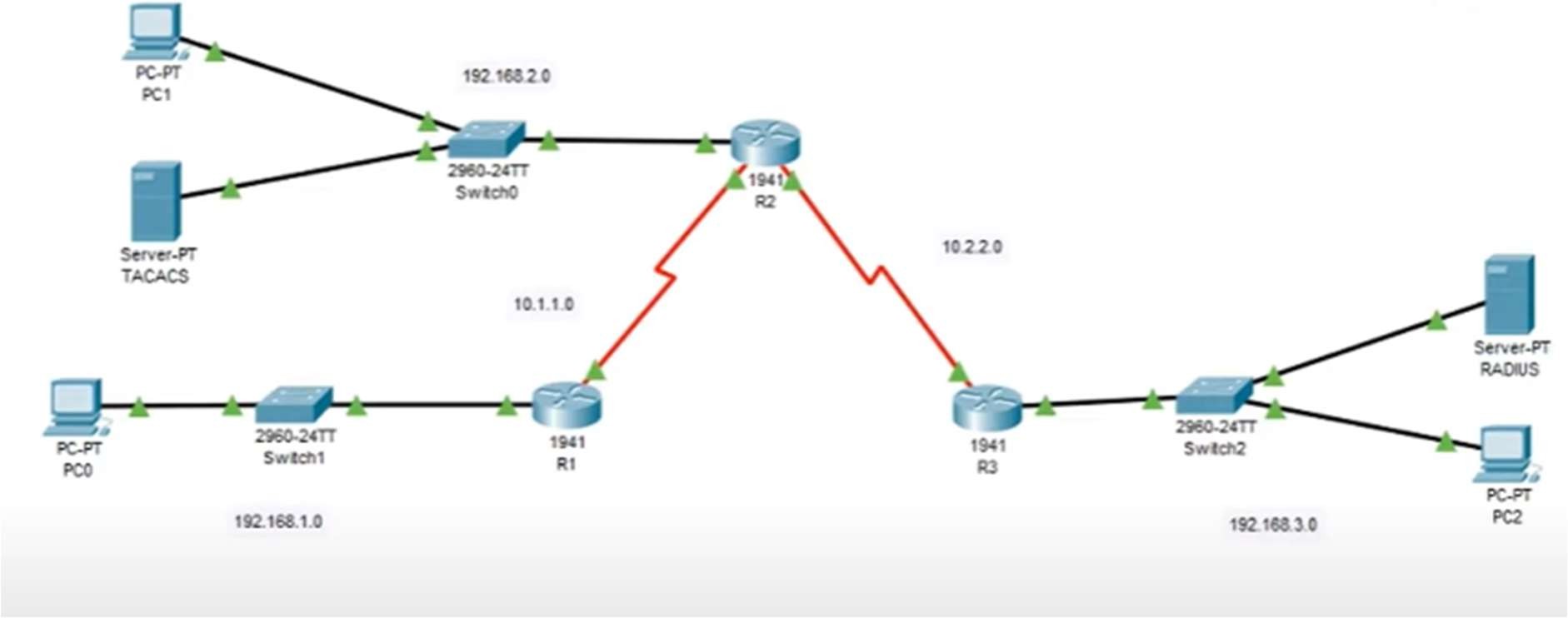
USERNAME: Admin2

PASSWORD: admin2pa55

# Program No:07 Date:

# Configuring Server-Based AAA Authentication Using RADIUS

* + Go to the same network of AAA which we have configured before and rename the server as RADI US.



* + Go to R3 router- CLI tab
    - R3>
    - R3>en
    - R3# conf t
    - R3(config)#username Admin3 secret admin3pa55
  + Go to RADIUS server- go to services – click on AAA
  + Network configuration Client name- R3 Client ip- 192.168.3.1

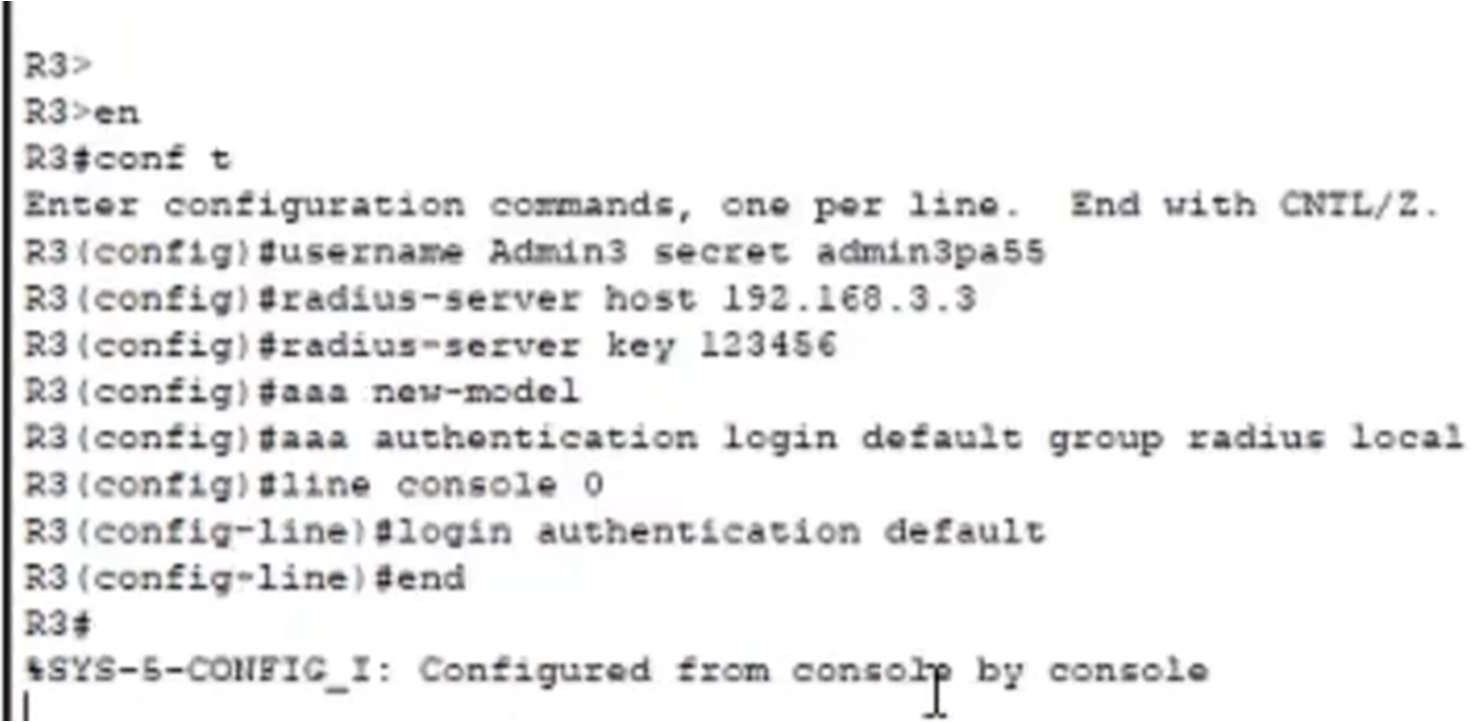
Secret- 123456 Servertype- radius **Now click on add**

* + User setup Username-Admin3

Password- admin3pa55

**And click on add and switch on the server**

* + Go to R3 router- CLI tab
    - R3(config)#radius-server host 192.168.3.3
    - R3(config)#raduis-server key 123456
    - R3(config)#aaa new-model
    - R3(config)#aaa authentication login default group radius local
    - R3(config)#line console 0
    - R3(config-line)#login authentication default
    - R3(config-line)#end
    - R3#exit



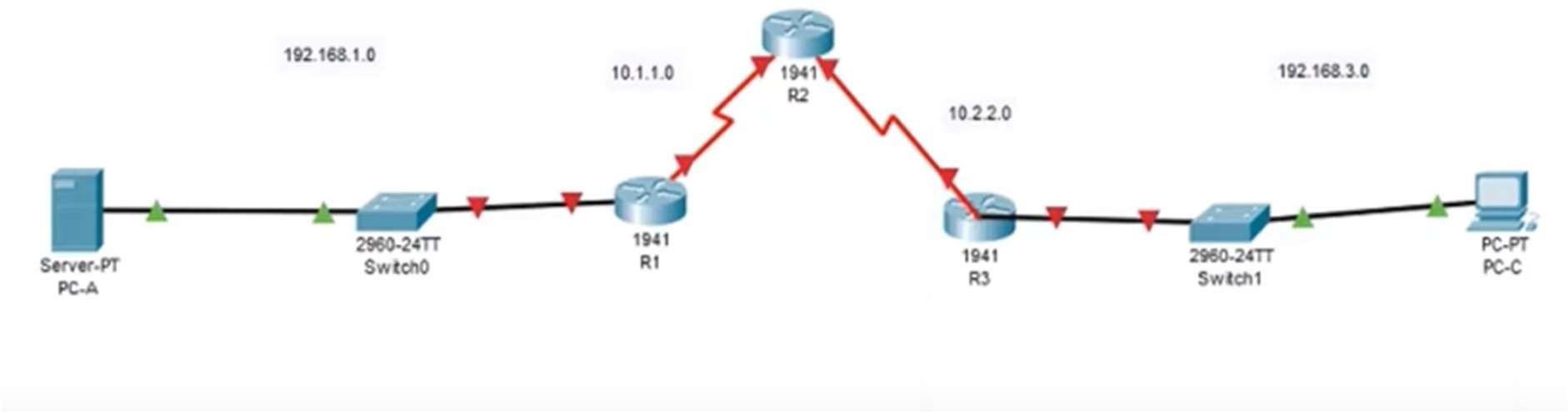
USERNAME: Admin3

PASSWORD: admin3pa55

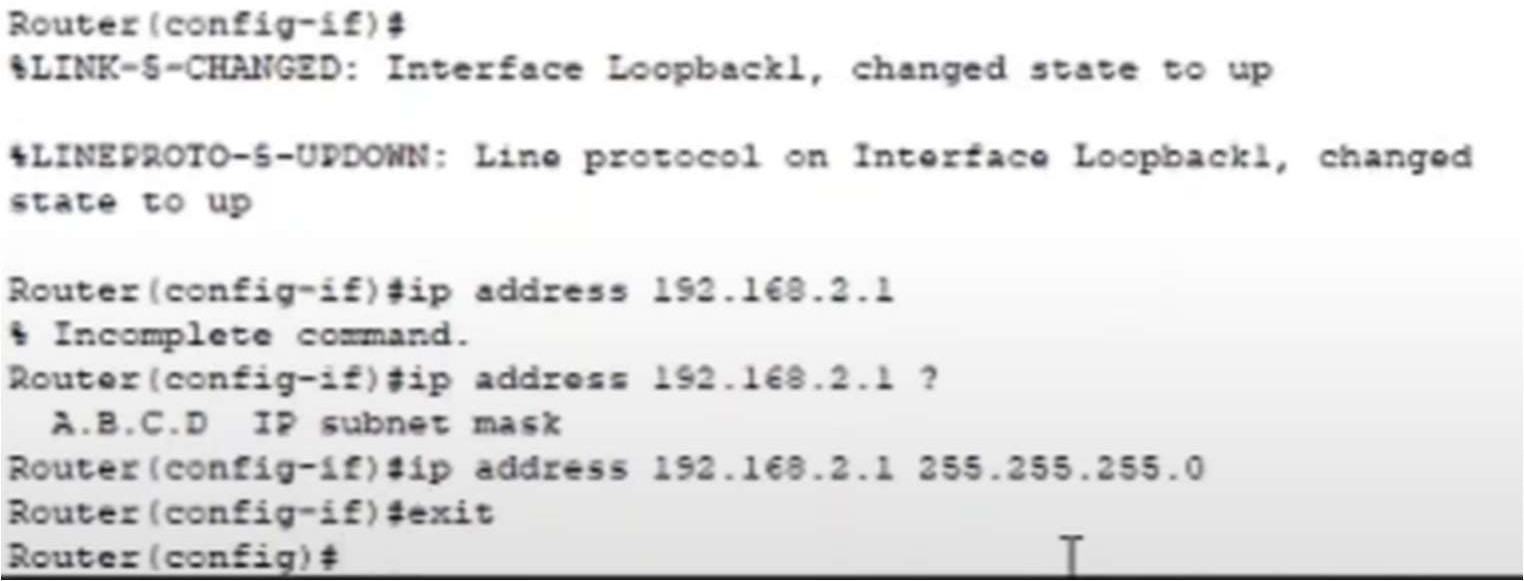
# Program No:08 Date:

# Configuring ACLs

* + Open cisco packet tracer and place 3 routers (1941), 2 switches (2960) , 1 PC and 1 servers and connect the devices as shown in the figure
  + And have the serial connections between routers so add the port (HWIC-2T) to the routers and connect them with serial DTE connection.



* + Go to the router R1 and click on gig0/0 – ip address- 192.168.1.1 & subnet mask- 255.255.255.0 and switch it on.
  + Go to server (PC-A)- desktop- ip address- 192.168.1.2 & subnet mask- 255.255.255.0 and default gateway as 192.168.1.1
  + Now go to R3 and click on gig0/0- ip address-192.168.3.1 and subnet mask is 255.255.255.0 and switch it on.
  + Go to pc-C- desktop- op address- 192.168.3.2 & subnet mask as 255.255.255.0 and default gateway as 192.168.3.1
  + Now configure the routers:
    - **(R1- R2)-** serial0/1/0- ip address-10.1.1.1 (R1) & subnet mask- 255.255.255.0(R1)
    - **(R1-R2)-** serial0/1/0-ip address- 10.1.1.2(R2) & subnet mask- 255.255.255.0 (R2)
    - **(R2-R3)-** serial0/1/1- ip address- 10.2.2.1 (R2) & subnet mask- 255.255.255.0 (R2).
    - **(R2-R3)-** serial0/1/1- ip address- 10.2.2.2 (R3) & subnet mask- 255.255.255.0 (R3).
  + Now set the loopback Ip address- Go to the cli
    - Router(config)#interface loopback 1
    - Router(config-if)#ip address 192.168.2.1 255.255.255.0
    - Router(config)#exit
  + Add RIP to all the routers.
    - **R1-** 192.168.1.0 & 10.1.1.0
    - **R2-** 192.168.2.0, 10.1.1.0 & 10.2.2.0
    - **R3-** 192.168.3.0 & 10.2.2.0



* + Go to R1 – CLI
    - R1(config)#ip domain-name ccnasecurity.com
    - R1(config)#username Admin1 privilege 15 secret cisco1
    - R1(config)#line vty 0 4
    - R1(config-line)#login local
    - R1(config-line)#transport input ssh
    - R1(config-line)#exit
    - R1(config)#crypto key generate rsa how many bits in the module [512] : 1024
    - R1(config)#exit
    - R1# show ip ssh

