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School of Information Technology and Engineering

Lab Assignment-II, MARCH 2021

B.Tech., Winter-2020-2021

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COURSE CODE	CSE3502
COURSE NAME	INFORMATION SECURITY AND MANAGEMENT
SLOT	L39+L40
FACULTY	Prof. SUMAIYA THASEEN

Gdrive link for .pkt files and video:

Click Here

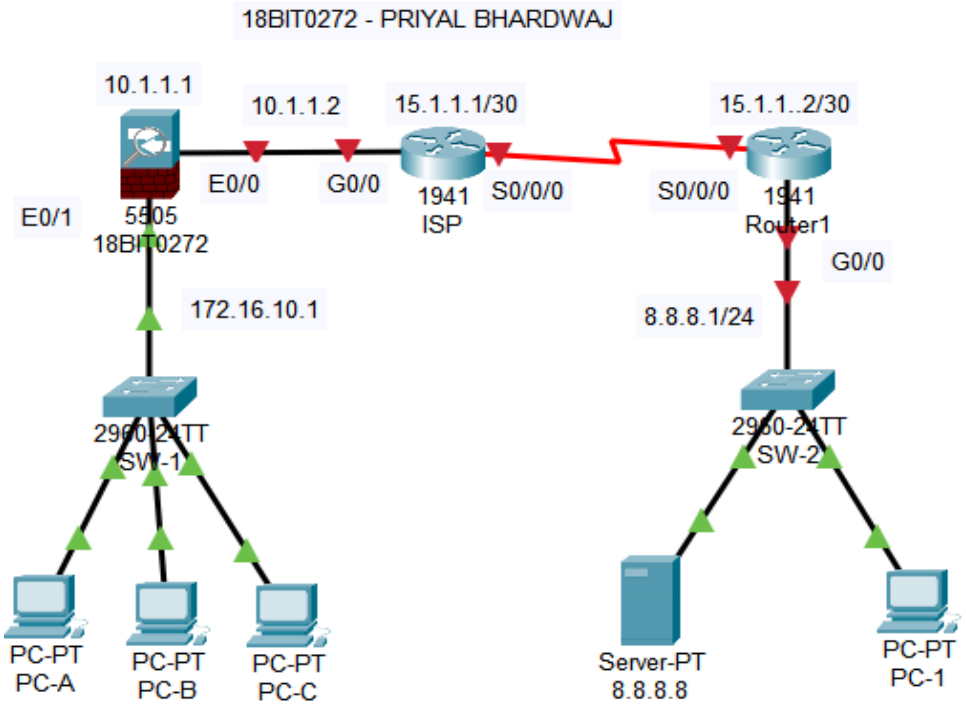
Priyal Bhardwaj

Digitally signed by Priyal Bhardwaj
Date: 2021.03.23 18:54:09 +05'30'

1. Configure Internet Access on CISCO ASA firewall (5 marks)
Rename the ASA device with your registration number and show the snapshot of configuration commands of firewall only.
The last octet IP address of PC-A should be the first two digits of your registration number.
The last octet IP address of PC-B should be the last two digits of your registration number.

Network Topology:

Before configuration:



ASA device renamed to 18BIT0272 (registration number)

ASA Configuration:

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Physical Config CLI Attributes

```
ASA>en
Password:
ASA#show run
: Saved
:
ASA Version 8.4(2)
!
hostname ASA
names
!
interface Ethernet0/0
 switchport access vlan 2
!
interface Ethernet0/1
!
interface Ethernet0/2
!
interface Ethernet0/3
!
interface Ethernet0/4
!
interface Ethernet0/5
!
interface Ethernet0/6
!
interface Ethernet0/7
!
interface Vlan1
 nameif inside
 security-level 100
 ip address 192.168.1.1 255.255.255.0
```

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Physical Config CLI Attributes

IOS Command Line Interface

```
interface Vlan1
 nameif inside
 security-level 100
 ip address 192.168.1.1 255.255.255.0
!
interface Vlan2
 nameif outside
 security-level 0
 ip address dhcp
!
!
!
!
!
!
!
!
!
!
!
telnet timeout 5
ssh timeout 5
!
dhcpd auto_config outside
!
dhcpd address 192.168.1.5-192.168.1.36 inside
dhcpd enable inside
!
!
!
!
!
!
ASA#
```

When we use the **show run** command, we can see that **vlan1 vlan2** interfaces and **dhcpd** are already there. Therefore, we use **no** command to remove them.

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Physical Config CLI Attributes

IOS Command Line Interface

```
ASA#conf t
ASA(config)#no dhcpd address 192.168.1.36 inside
ASA(config)#exit
ASA#show run
: Saved
:
ASA Version 8.4(2)
!
hostname ASA
names
!
interface Ethernet0/0
 switchport access vlan 2
!
interface Ethernet0/1
!
interface Ethernet0/2
!
interface Ethernet0/3
!
interface Ethernet0/4
!
interface Ethernet0/5
!
interface Ethernet0/6
!
interface Ethernet0/7
!
```

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Physical Config CLI Attributes

IOS Command Line Interface

```
interface Vlan1
 nameif inside
 security-level 100
 ip address 192.168.1.1 255.255.255.0
!
interface Vlan2
 nameif outside
 security-level 0
 ip address dhcp
!
!
!
!
!
!
!
!
!
!
!
!
telnet timeout 5
ssh timeout 5
!
dhcpd auto_config outside
!
dhcpd enable inside
!
!
!
```

Now we configure vlan in ASA:

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Physical Config CLI Attributes

IOS Command Line Interface

```
ASA#conf t
ASA(config)#int vlan1
ASA(config-if)#no ip address
WARNING: DHCPD bindings cleared on interface 'inside',
address pool removed
ASA(config-if)#ip address 172.16.10.1
ASA(config-if)#ip address 172.16.10.1 255.255.255.0
ASA(config-if)#nameif inside
ASA(config-if)#security-level 100
ASA(config-if)#exit
ASA(config)#int e0/1
ASA(config-if)#switchport access vlan 1
ASA(config-if)#exit
ASA(config)#int vlan2
ASA(config-if)#ip address 10.1.1.1 255.255.255.0
ASA(config-if)#nameif outside
ASA(config-if)#security-level 0
ASA(config-if)#exit
ASA(config)#int e0/0
ASA(config-if)#switchport access vlan2
                                    ^
% Invalid input detected at '^' marker.

ASA(config-if)#switchport access vlan 2
```

Ctrl+F6 to exit CLI focus Copy Paste

Router Configuration:

ISP

Physical Config CLI Attributes

```
ISP#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ISP(config)#int g0/0
ISP(config-if)#ip address 10.1.1.2 255.255.255.0
ISP(config-if)#no shut

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
ISP(config-if)#int s0/0/0
ISP(config-if)#ip address 15.1.1.1 255.255.255.252
ISP(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
```

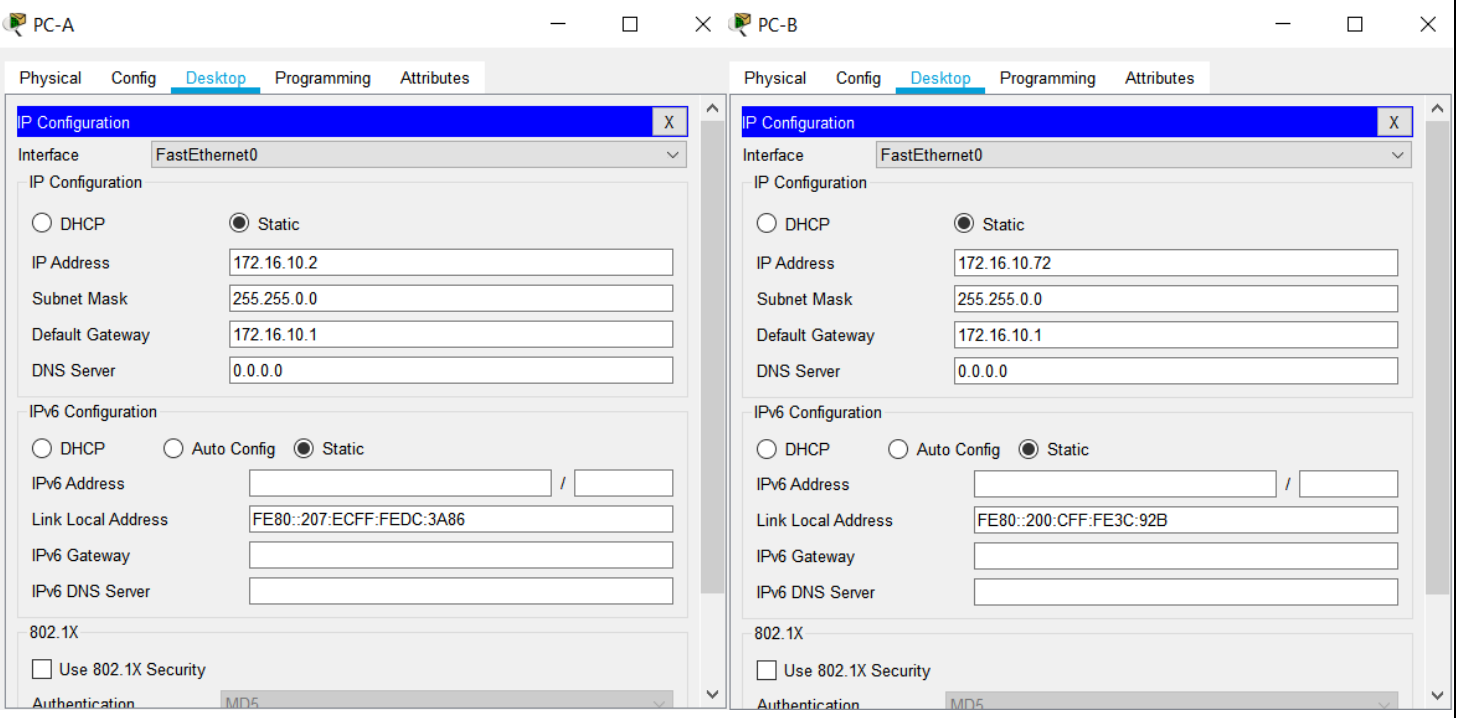
Router1

Physical Config CLI Attributes

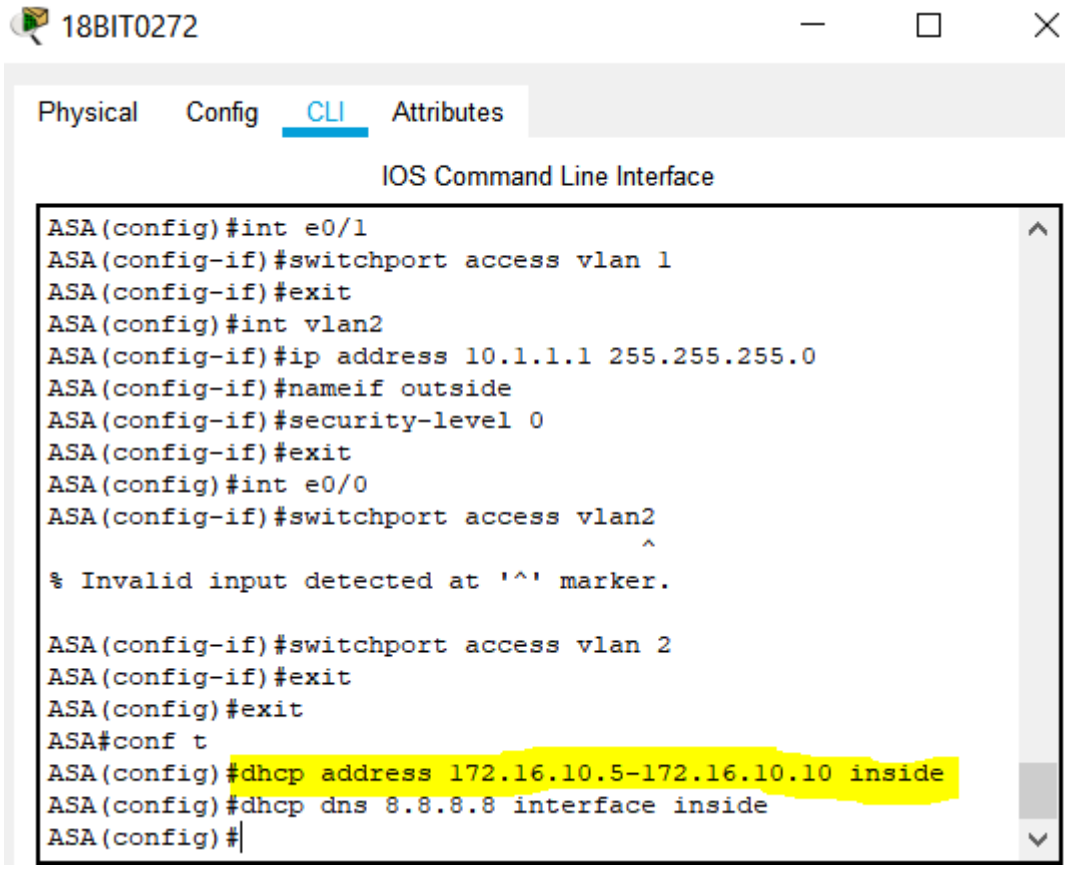
IOS Command Line Interface

```
Router1>en
Router1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router1(config)#int s0/0/0
Router1(config-if)#ip address 15.1.1.2 255.255.255.252
Router1(config-if)#no shut

Router1(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Router1(config-if)#int g0/0
Router1(config-if)#ip address 8.8.8.1 255.255.255.0
Router1(config-if)#no shut

Router1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
```

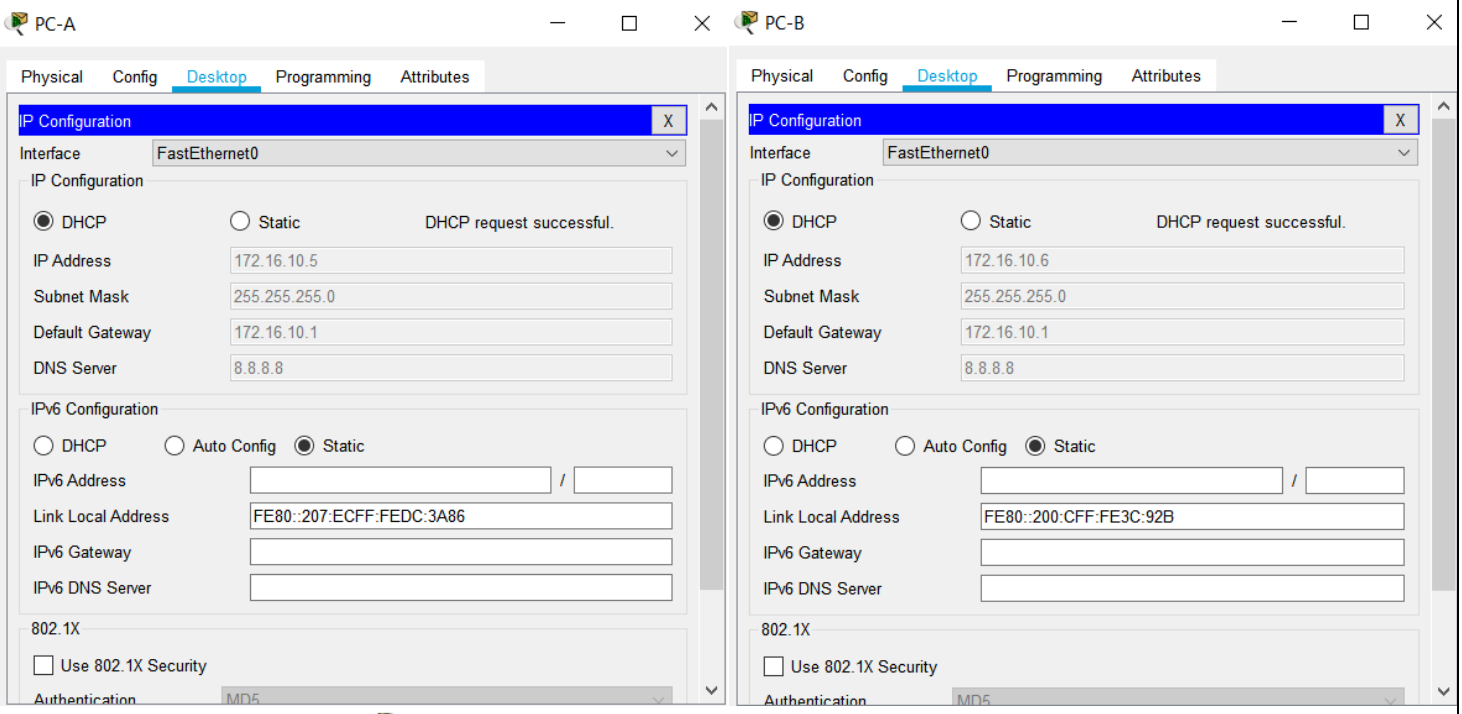
Before we configure DHCP, the IP addresses of PC-A and PC-B as per question are: 172.16.10.2 (18BIT**02**72) and 172.16.10.72 (18BIT02**72**) respectively.

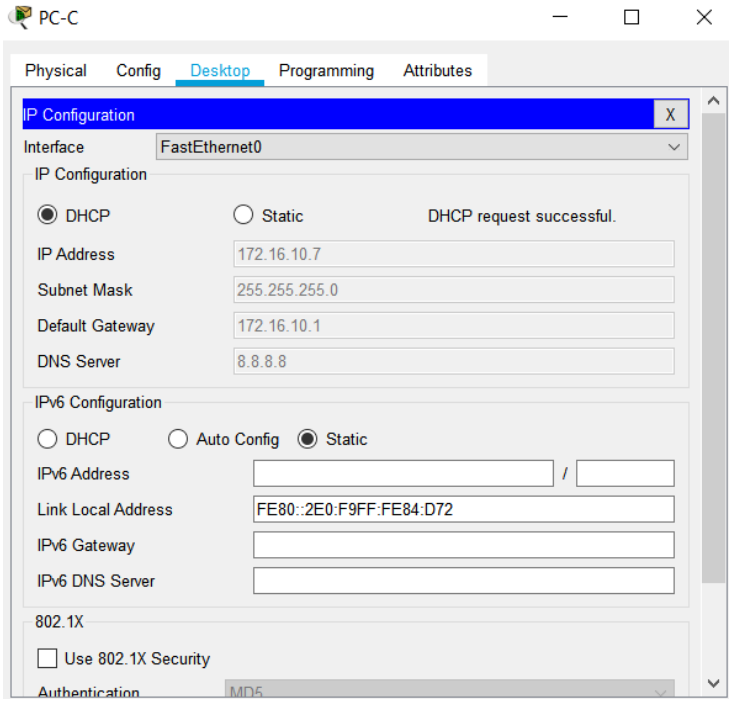


DHCP Configuration:

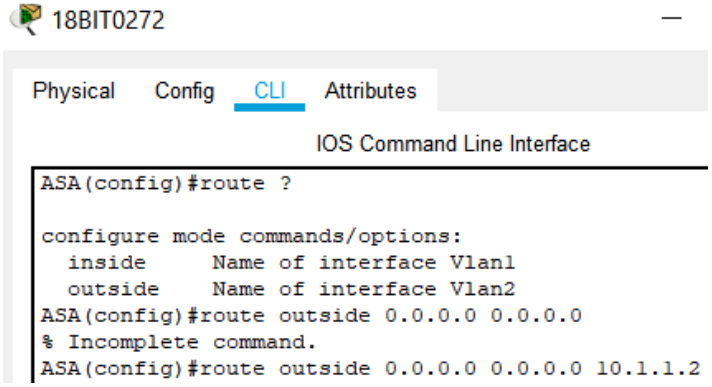


Now we check IP of PC-A, PC-B and PC-C after selecting DHCP.





Configuration of route outside for ASA and pinging default gateway from PC-A:



PC-A

Physical Config Desktop Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.16.10.1

Pinging 172.16.10.1 with 32 bytes of data:

Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Router OSPF configuration:

ISP

Physical Config CLI Attributes

IOS Command Line Interface

```
ISP>en
ISP#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ISP(config)#router ospf 1
ISP(config-router)#network 10.1.1.0 0.0.0.255 area 0
ISP(config-router)#network 15.1.1.0 0.0.0.3 area 0
ISP(config-router)#
13:14:58: %OSPF-5-ADJCHG: Process 1, Nbr 15.1.1.2 on Serial0/0/0 from LOADING to FULL, Loading Done
```

Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router1>en
Router1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router1(config)#router ospf 1
Router1(config-router)#network 15.1.1.0 0.0.0.3 area 0
Router1(config-router)#network
13:14:58: %OSPF-5-ADJCHG: Process 1, Nbr 15.1.1.1 on Serial0/0/0 from LOADING to FULL, Loading Done

% Incomplete command.
Router1(config-router)#network 8.8.8.0 0.0.0.255 area 0
```

Network Address Translation (NAT) configuration on ASA:

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Physical Config CLI Attributes

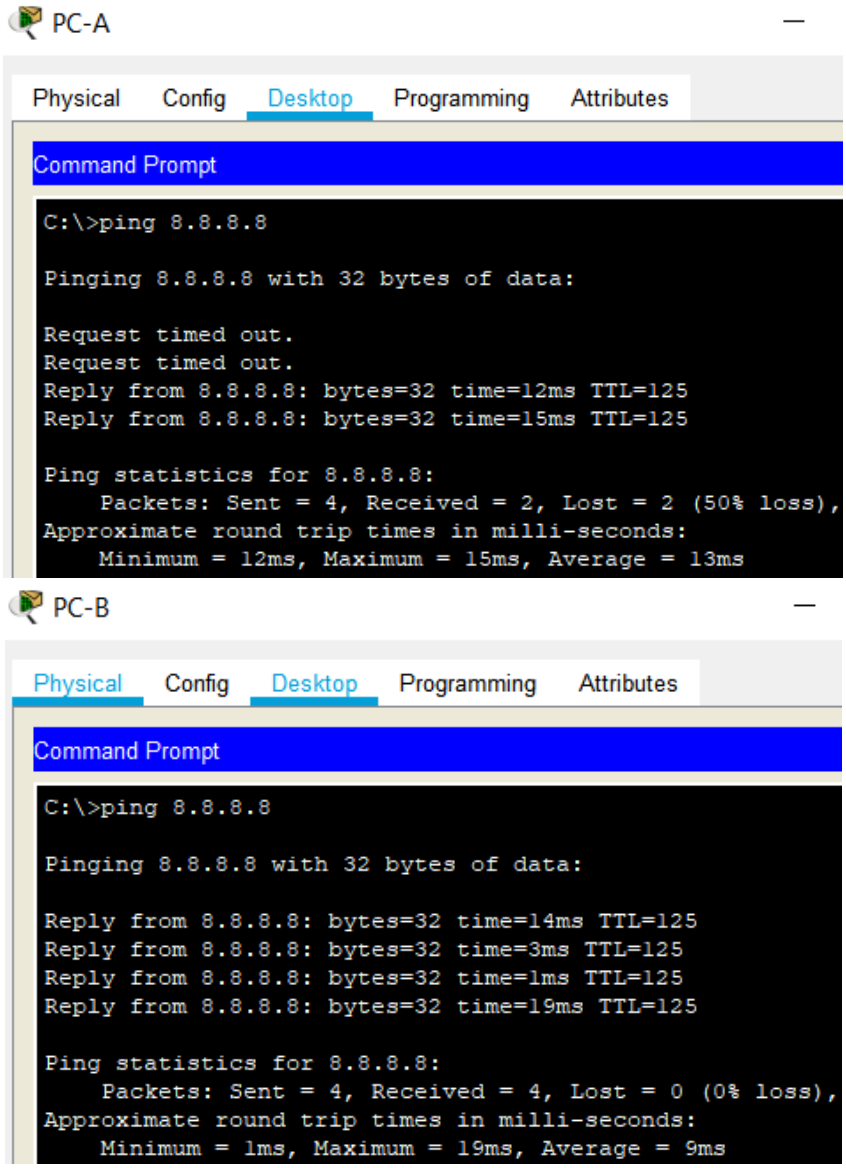
IOS Command Line Interface

```
ASA(config)#object network INSIDE
ASA(config-network-object)#subnet 172.16.10.0 255.255.255.0
ASA(config-network-object)#nat (inside,outside) dynamic interface
ASA(config-network-object)#exit
ASA#conf t
ASA(config)#access-list INTERNET extended permit tcp any any
ASA(config)#access-list INTERNET extended permit icmp any any
ASA(config)#access-list INTERNET in interface outside
                                  ^
% Invalid input detected at '^' marker.

ASA(config)#access-group INTERNET in interface outside
```

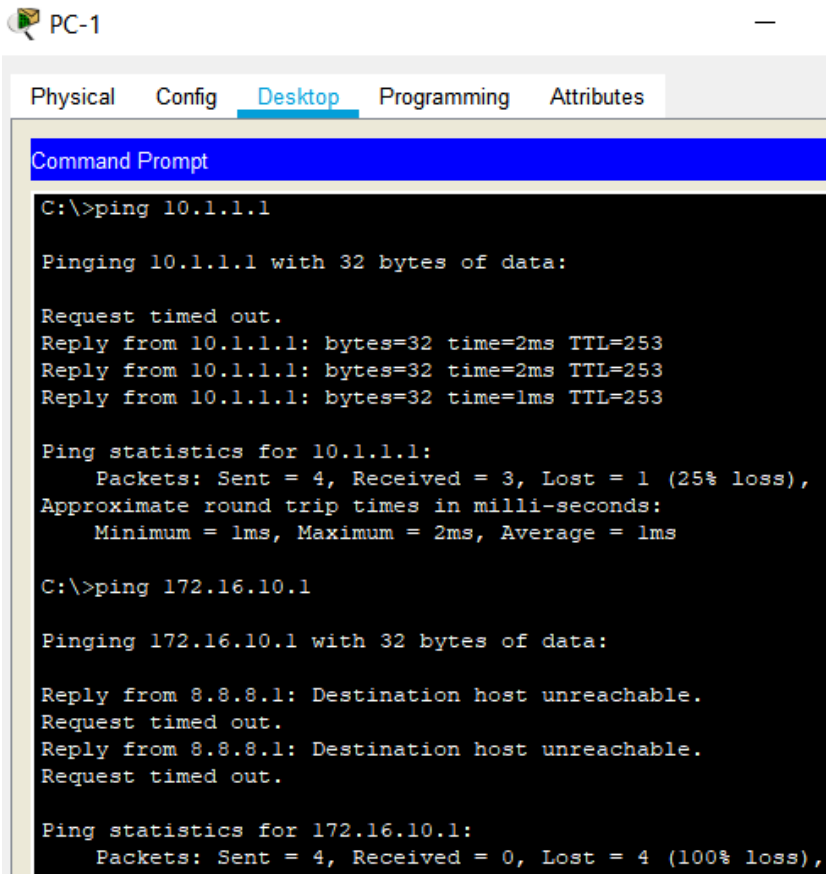
NAT configuration is done and we have created 2 ACLs which will permit tcp and icmp.

Pinging Server(8.8.8.8) from PC-A and PC-B:

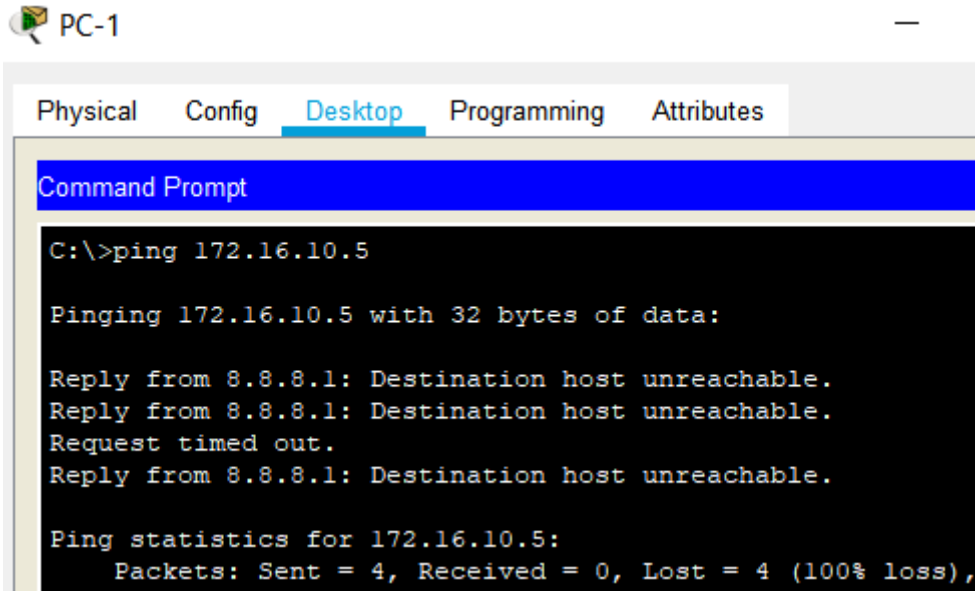


We have received reply from the server.

Pinging firewall interface and default gateway of network from PC-1:



PC-1 can ping the ASA firewall but cannot go inside the 172.16.10.1 network because of ASA configuration. We can recheck this by pinging PC-A from PC-1.



PC-1 cannot ping PC-A because of ASA configuration.

Verifying NAT configuration:

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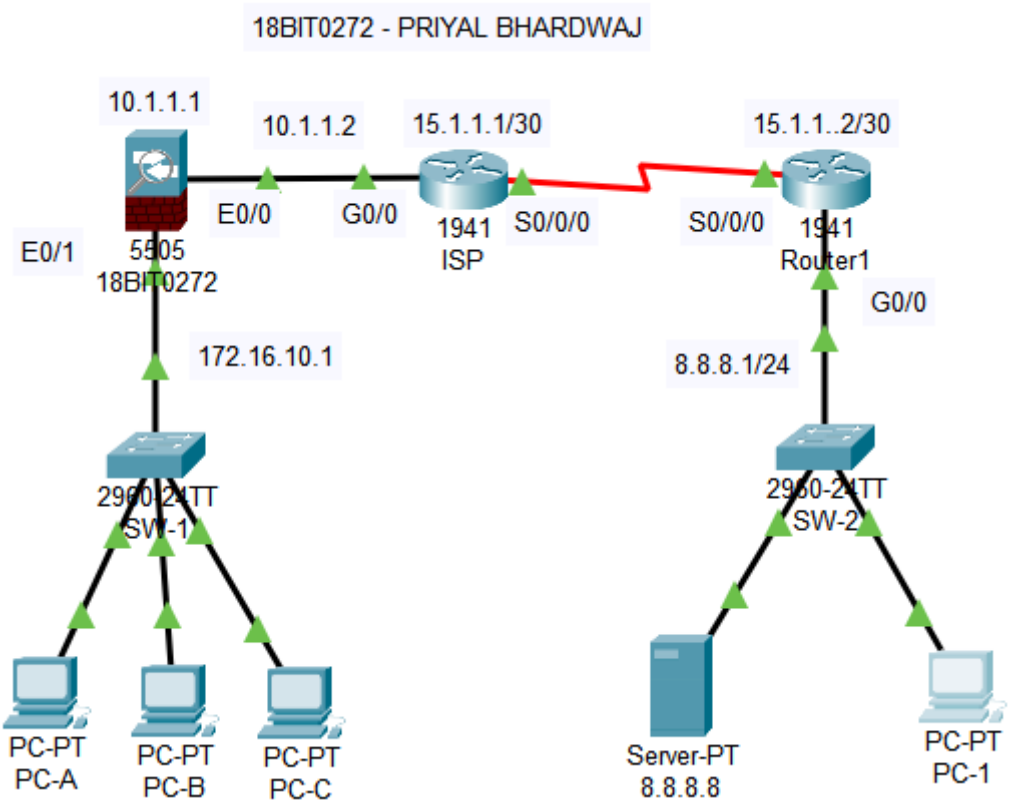
Physical Config CLI Attributes

IOS Command Line Interface

```
ASA(config)#show xlate
0 in use, 0 most used
ASA(config)#show nat
Auto NAT Policies (Section 2)
1 (inside) to (outside) source dynamic INSIDE interface
    translate_hits = 8, untranslate_hits = 6
```

We can see the NAT configurations from inside to outside dynamic INSIDE interface. We can also see the translated and the untranslated hits.

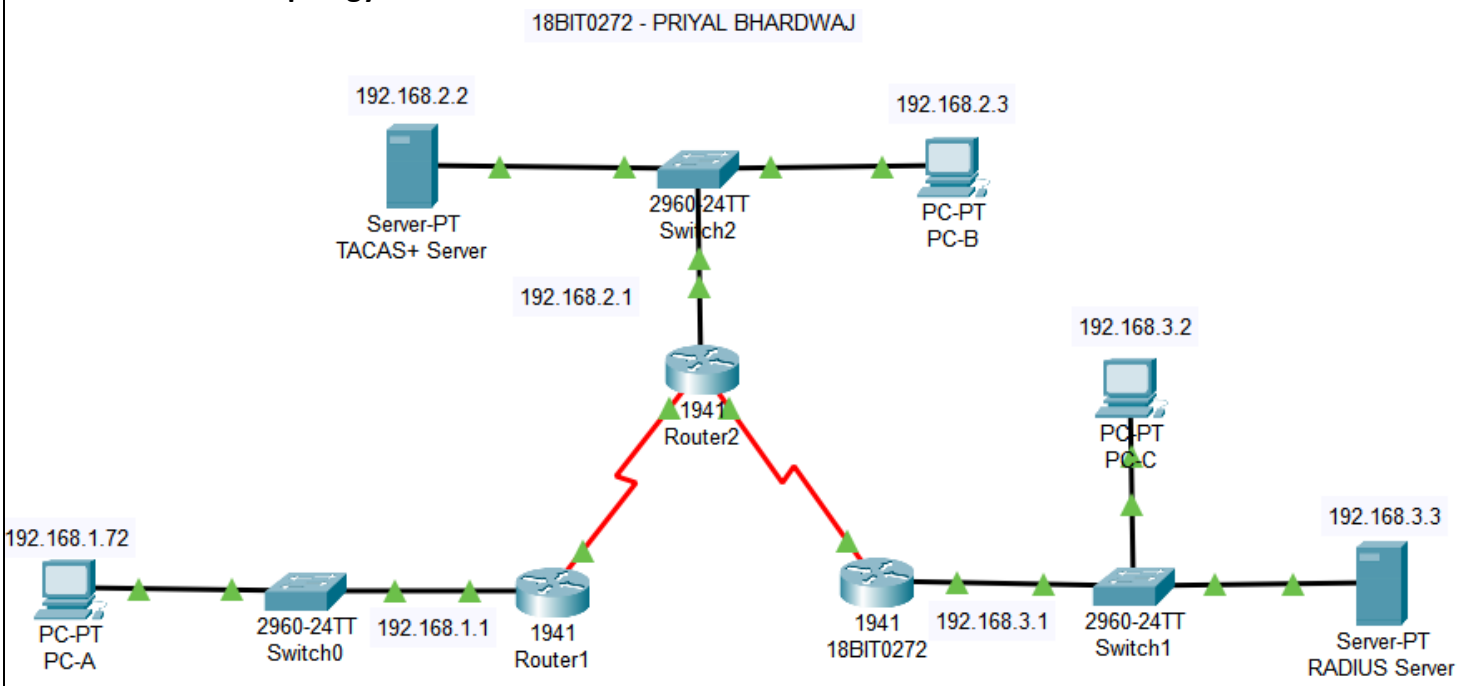
Network topology after configuration of vlans and routers:



So, we have successfully configured ASA and firewall as per the different vlans.

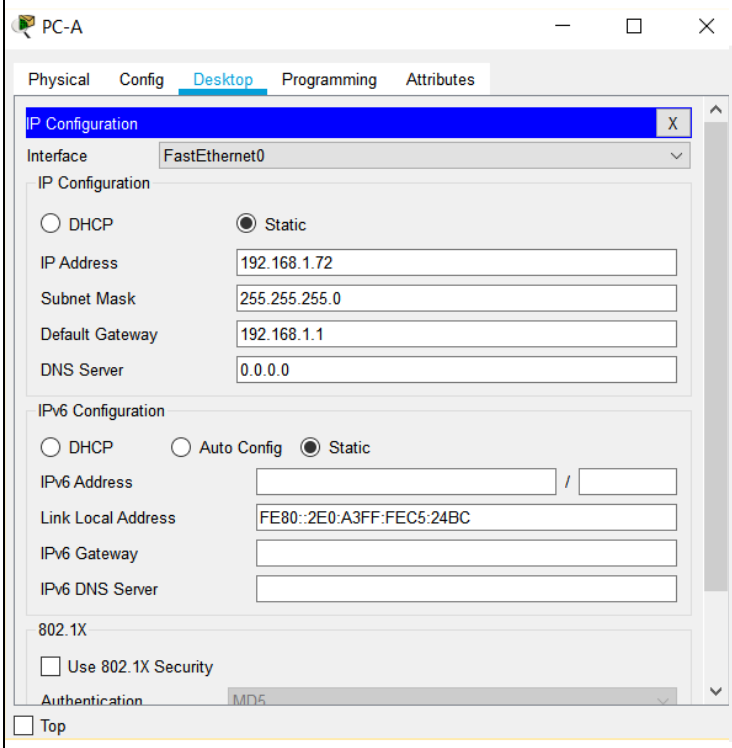
2. Configure AAA authentication on Cisco Routers. (5 marks)
Show only the configuration commands of Router R3. R3 should be renamed with your registration number.
PC-A ip address last octet should be the last two digits of your registration number.
PCA-C ip address last octet should be the first two digits of your registration number.

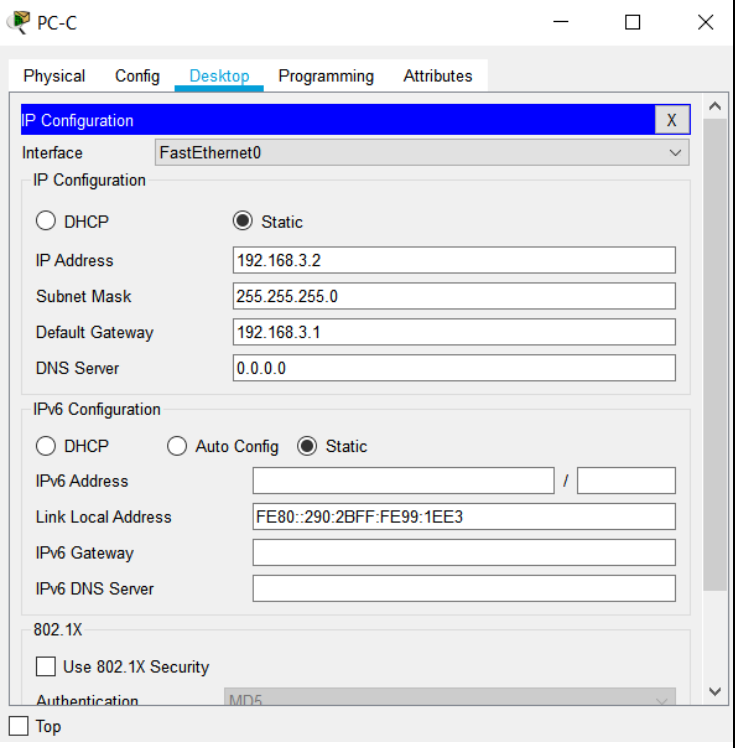
Network Topology:



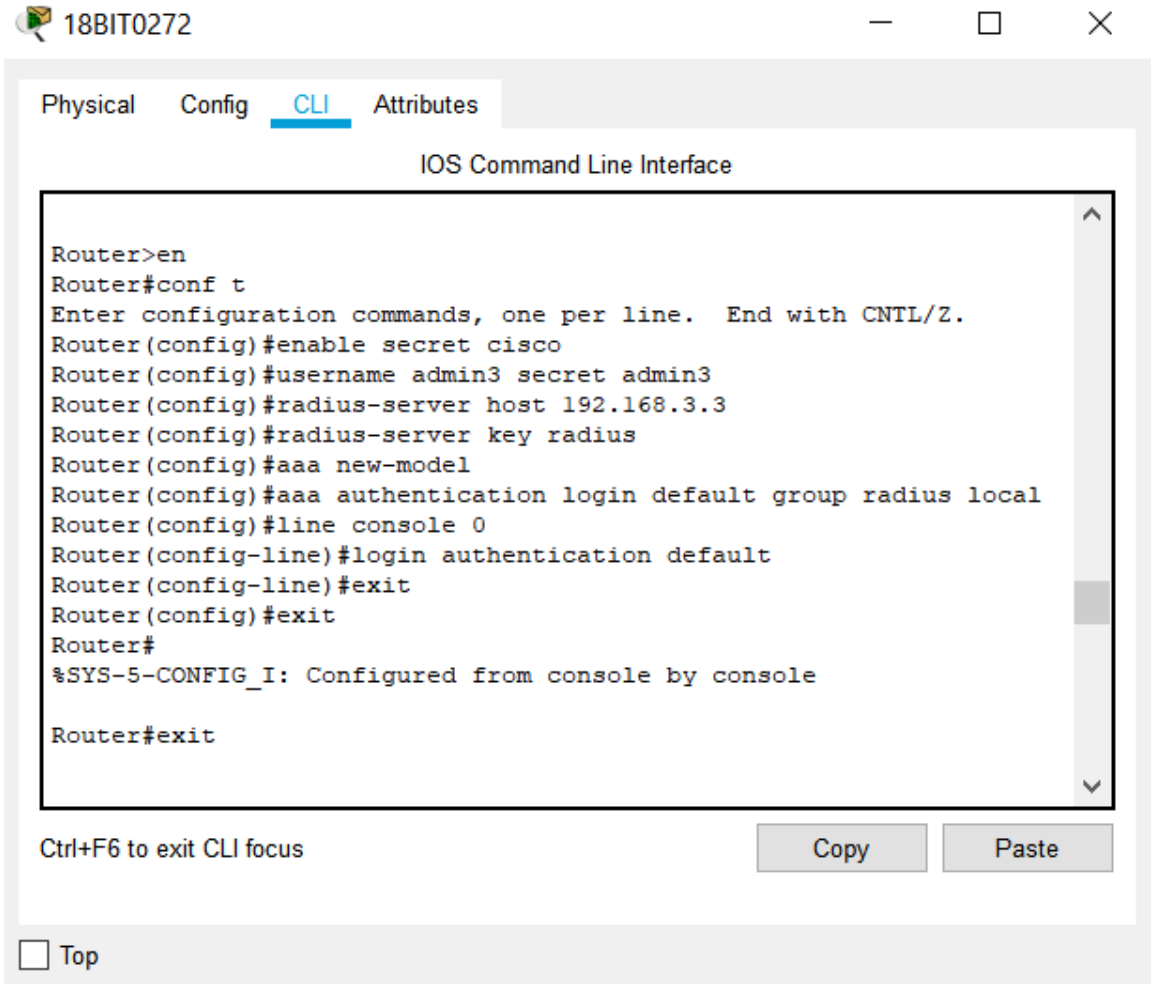
Registration Number: 18BIT0272
PC-A last octet: 72 → 192.168.1.72
PC-C last octet: 02 = 2 → 192.168.3.2

NOTE: 192.168.3.2 was the RADIUS Server IP so I have changed the Server's IP to 192.168.3.3

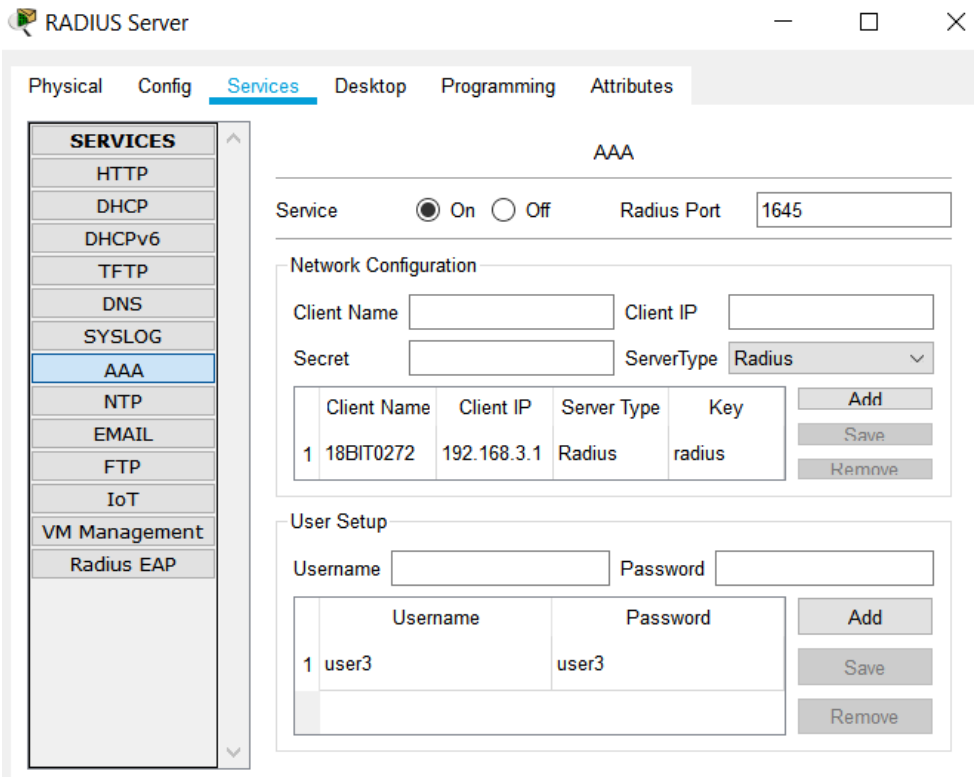




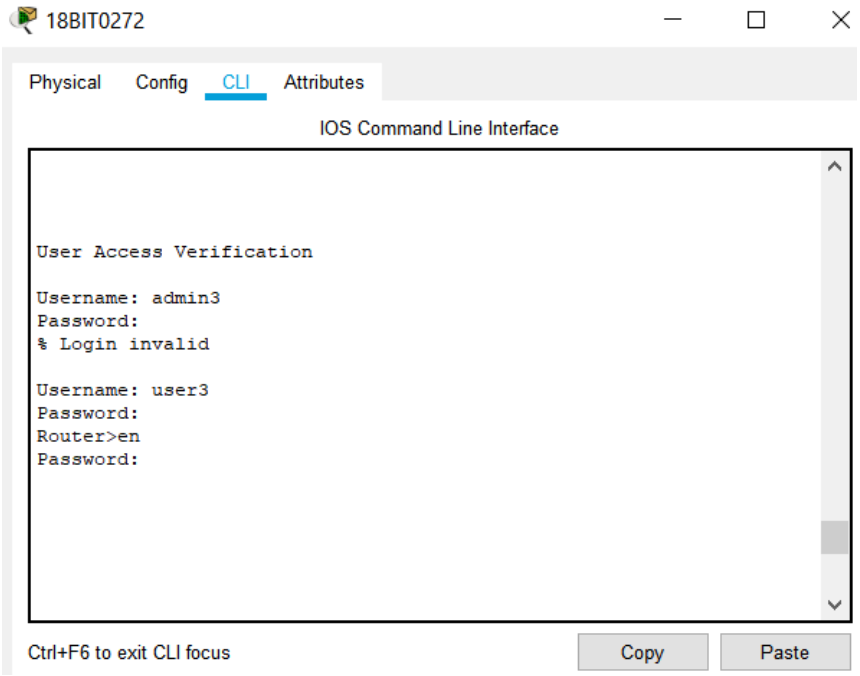
ROUTER 3: 18BIT0272 configuration



RADIUS Server configuration:



Verification of AAA in Router 3: 18BIT0272



So, we can access the router only with **user3** as username and password. When we try to access by using **admin3** as username and secret key password we get **Login Invalid.**

Password for en is **cisco**.