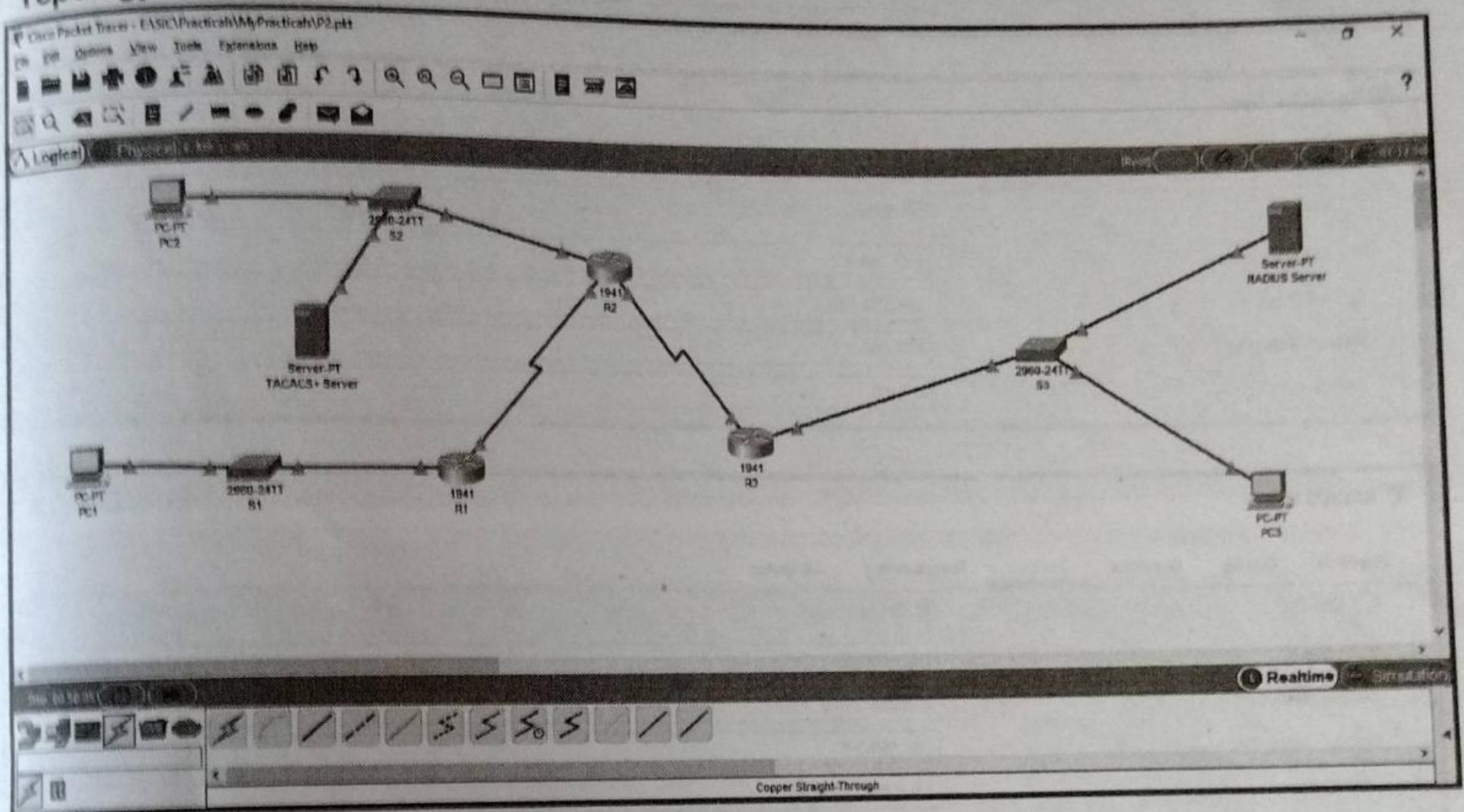
Practical 2

Aim : Configure AAA Authentication

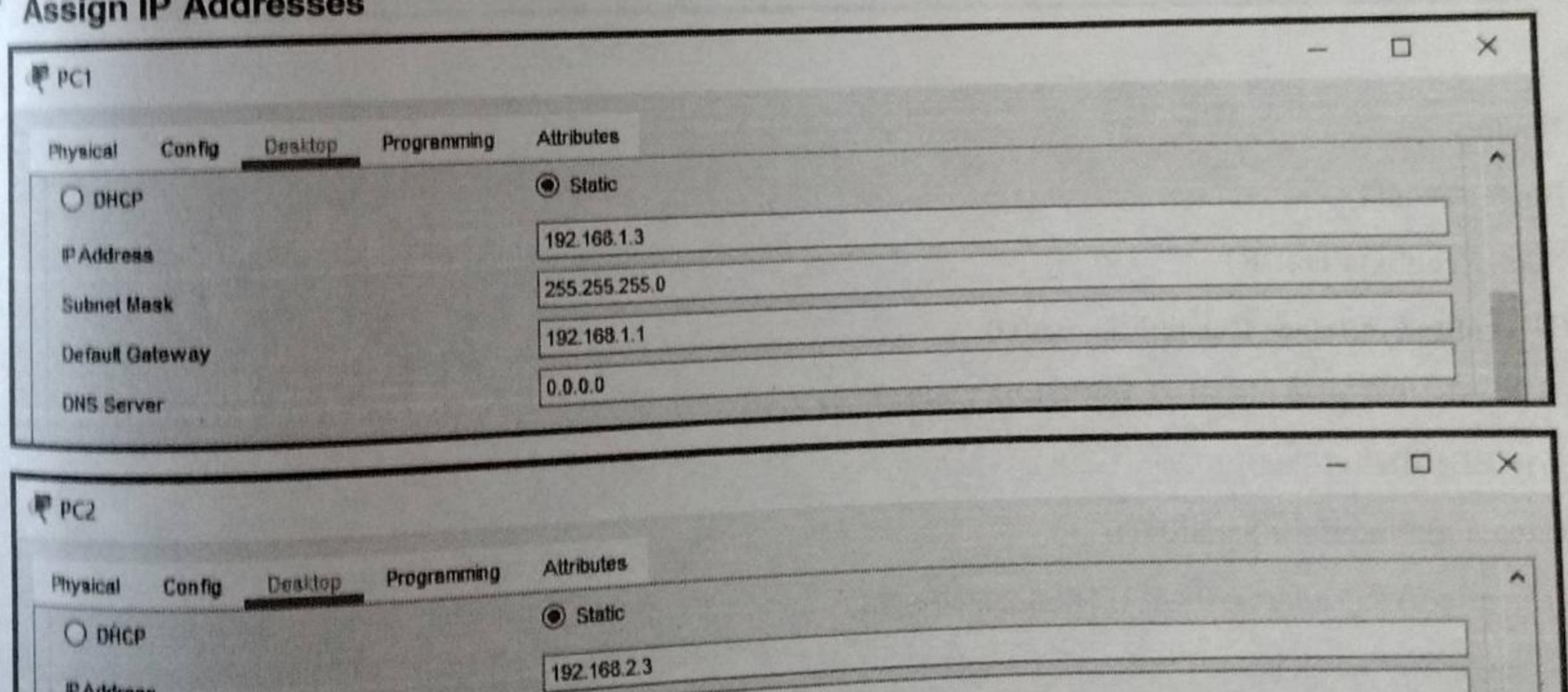
a. Configure a local user account on Router and configure authenticate on the consoleand vty lines using local AAA

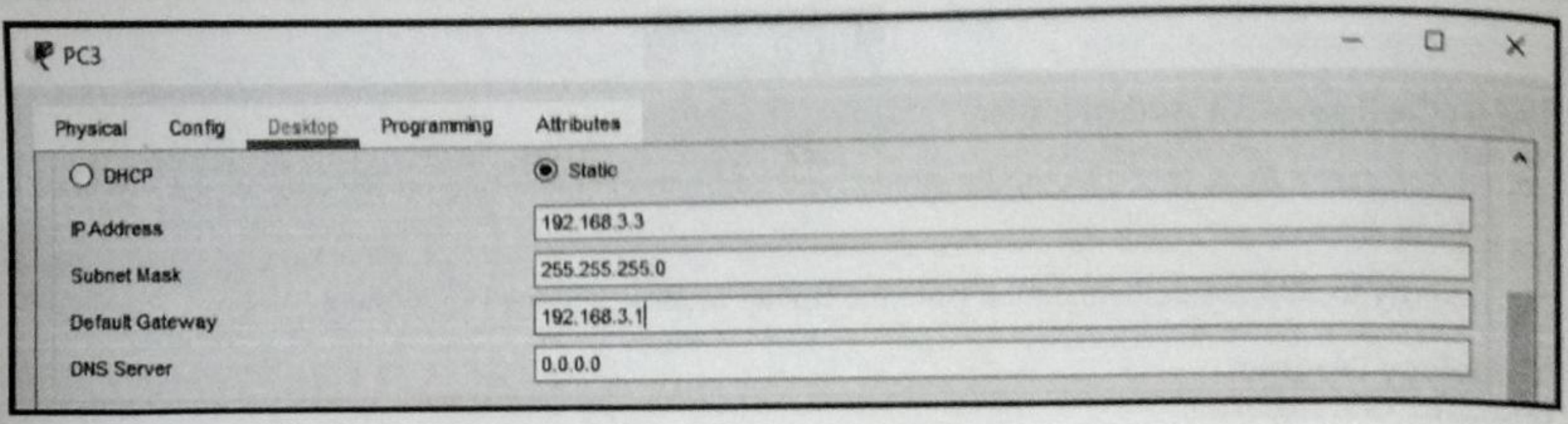
b. Verify local AAA authentication from the Router console and the PC-A client

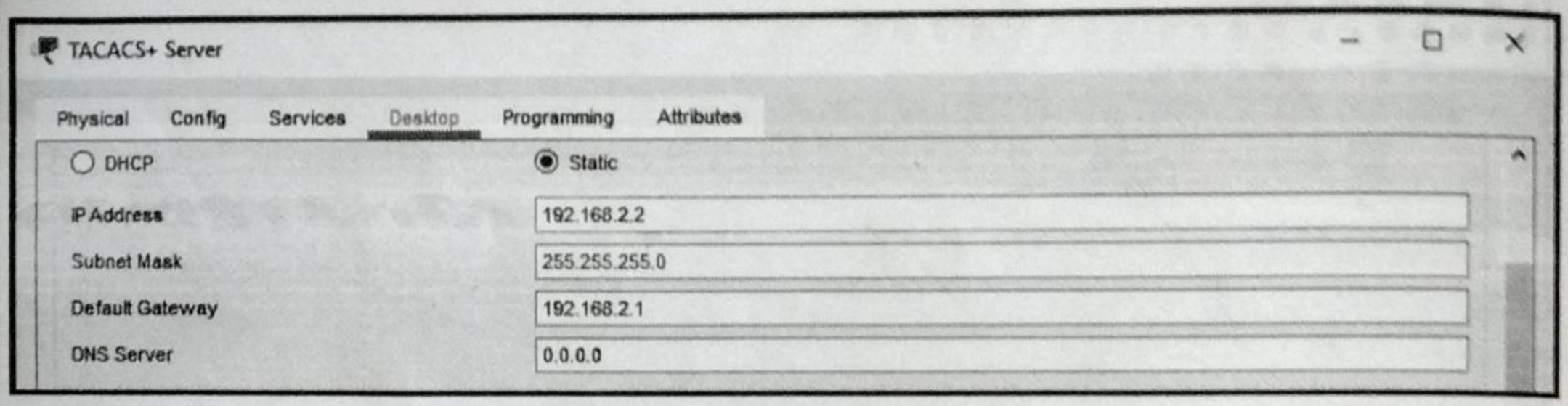
Topology Diagram

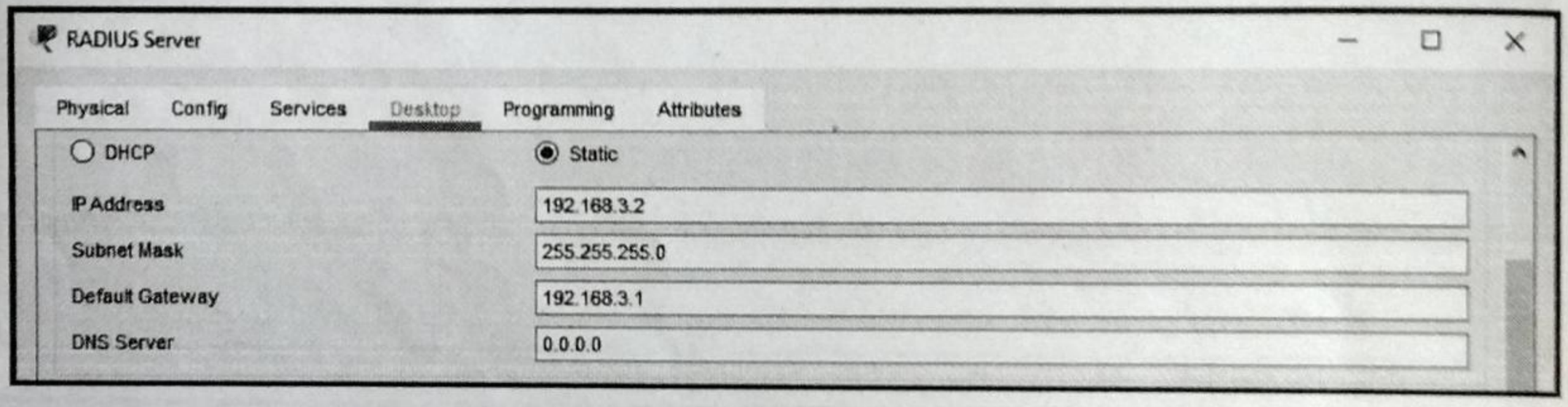


Assign IP Addresses










```
Router>en
Router#conf t
Router(config)#host R1
R1(config)#interface GigabitEthernet0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shut
R1(config)#interface Serial0/0/0
R1(config-if)#ip address 10.1.1.2 255.255.255.252
R1(config-if)#no shut
R1(config-if)#^Z
R1#exit
```

```
Router>en
Router#conf t
Router(config)#host R2
R2(config)#interface GigabitEthernet0/0
R2(config-if)#ip address 192.168.2.1 255.255.255.0
R2(config-if)#no shut
R2(config)#interface Serial0/0/0
R2(config-if)#ip address 10.1.1.1 255.255.255.252
R2(config-if)#no shut
R2(config)#interface Serial0/0/1
R2(config-if)#ip address 10.2.2.1 255.255.255.252
R2(config-if)#no shut
R2(config-if)#^Z
R2#exit
```

```
Router>en
Router#conf t
Router(config)#host R3
R3(config)#interface GigabitEthernet0/0
R3(config-if)#ip address 192.168.3.1 255.255.255.0
R3(config-if)#no shut
R3(config)#interface Serial0/0/0
R3(config-if)#ip address 10.2.2.2 255.255.255.252
R3(config-if)#no shut
R3(config-if)#^Z
R3#exit
```

☞ Displaying IP Address Details of Routers

```
R1>show ip interface brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 192.168.1.1 YES manual up up
```

```
GigabitEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 10.1.1.2 YES manual up up
Serial0/0/1 unassigned YES unset administratively down down
Vlan1 unassigned YES unset administratively down down
```

```
R2>show ip interface brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 192.168.2.1 YES manual up up
GigabitEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 10.1.1.1 YES manual up up
Serial0/0/1 10.2.2.1 YES manual up up
Vlan1 unassigned YES unset administratively down down
```

```
R3>show ip interface brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 192.168.3.1 YES manual up up
GigabitEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 10.2.2.2 YES manual up up
Serial0/0/1 unassigned YES unset administratively down down
Vlan1 unassigned YES unset administratively down down
```

☞ Configure RIP on routers

```
R1>en
R1#conf t
R1(config)#router rip
R1(config-router)#network 192.168.1.0
R1(config-router)#network 10.1.1.0
R1(config-router)#^Z
R1#exit
```

```
R2>en
R2#conf t
R2(config)#router rip
R2(config-router)#network 10.1.1.0
R2(config-router)#network 192.168.2.0
R2(config-router)#network 10.2.2.0
R2(config-router)# ^Z
R2#exit
```

```
R3>en
R3#conf t
R3(config)#router rip
R3(config-router)#network 192.168.3.0
R3(config-router)#network 10.2.2.0
R3(config-router)# ^Z
R3#exit
```

☞ Displaying routing table of routers

```
R1>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

▶ Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C 10.1.1.0/30 is directly connected, Serial0/0/0
L 10.1.1.2/32 is directly connected, Serial0/0/0
R 10.2.2.0/30 [120/1] via 10.1.1.1, 00:00:00, Serial0/0/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.1.0/24 is directly connected, GigabitEthernet0/0
L 192.168.1.1/32 is directly connected, GigabitEthernet0/0
R 192.168.2.0/24 [120/1] via 10.1.1.1, 00:00:00, Serial0/0/0
R 192.168.3.0/24 [120/2] via 10.1.1.1, 00:00:00, Serial0/0/0
```

```
R2>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

▶ **Gateway of last resort is not set**

```
10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C 10.1.1.0/30 is directly connected, Serial0/0/0
L 10.1.1.1/32 is directly connected, Serial0/0/0
C 10.2.2.0/30 is directly connected, Serial0/0/1
L 10.2.2.1/32 is directly connected, Serial0/0/1
R 192.168.1.0/24 [120/1] via 10.1.1.2, 00:00:26, Serial0/0/0
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.2.0/24 is directly connected, GigabitEthernet0/0
L 192.168.2.1/32 is directly connected, GigabitEthernet0/0
R 192.168.3.0/24 [120/1] via 10.2.2.2, 00:00:08, Serial0/0/1
```

```
R3>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
R 10.1.1.0/30 [120/1] via 10.2.2.1, 00:00:10, Serial0/0/0
C 10.2.2.0/30 is directly connected, Serial0/0/0
L 10.2.2.2/32 is directly connected, Serial0/0/0
R 192.168.1.0/24 [120/2] via 10.2.2.1, 00:00:10, Serial0/0/0
R 192.168.2.0/24 [120/1] via 10.2.2.1, 00:00:10, Serial0/0/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.3.0/24 is directly connected, GigabitEthernet0/0
L 192.168.3.1/32 is directly connected, GigabitEthernet0/0
```

Configure Local AAA Authentication for Console Lines on R1

```
R1>en
R1#conf t
R1(config)#username aaaAdmin secret aaapwd
R1(config)#aaa new-model
R1(config)#aaa authentication login default local
R1(config)#line console 0
R1(config-line)#login authentication default
R1(config-line)#^Z
R1#exit
```

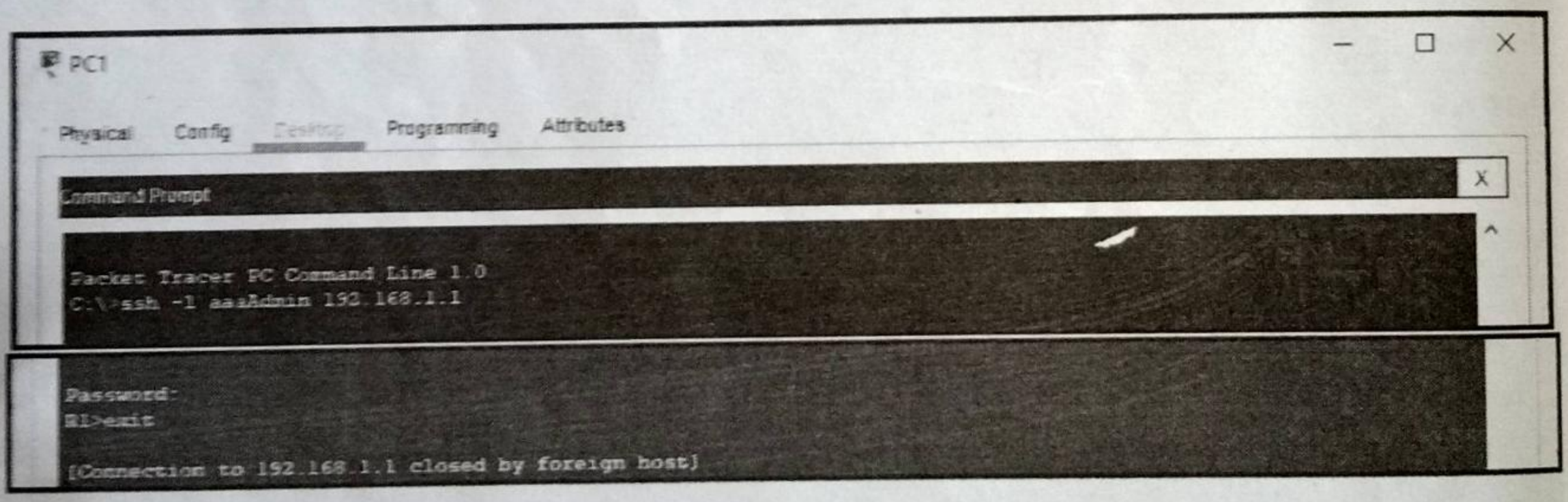
```
User Access Verification
Username: aaaAdmin
Password:
R1>
```

Configure Local AAA Authentication for vty Lines on R1

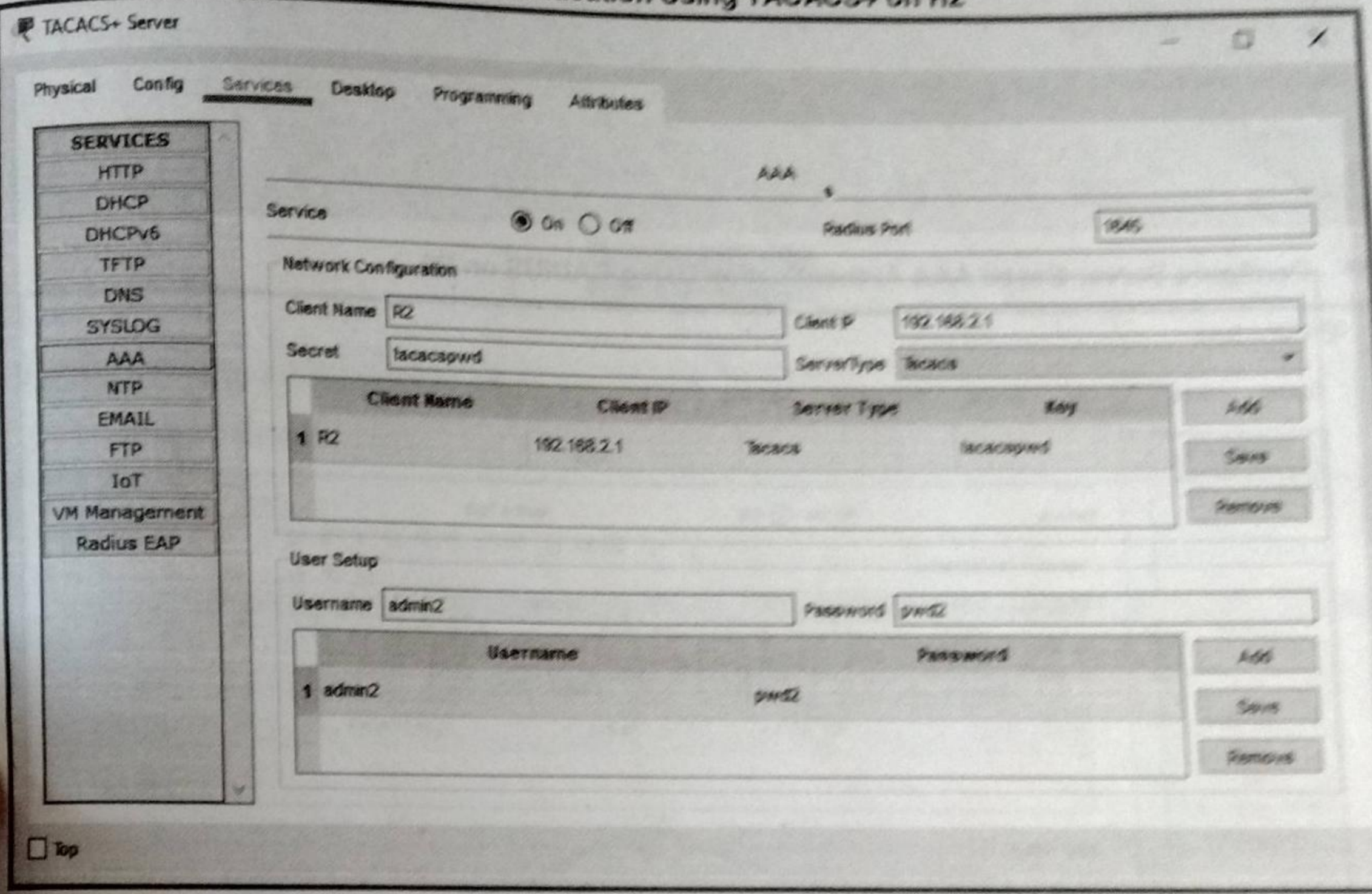
```
R1>en
R1#conf t
R1(config)#ip domain-name sic.com
R1(config)#crypto key generate rsa
```

- The name for the keys will be: R1.sic.com
- Choose the size of the key modulus in the range of 360 to 2048 for yourGeneral Purpose Keys. Choosing a key modulus greater than 512 may takea few minutes.
- How many bits in the modulus [512]: 1024
- % Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

```
R1(config)#aaa authentication login SSH-LOGIN local
*Mar 1 2:2:12.412: %SSH-5-ENABLED: SSH 1.99 has been enabled
R1(config)#line vty 0 4
R1(config-line)#login authentication SSH-LOGIN
R1(config-line)#transport input ssh
R1(config-line)#^Z
R1#exit
```



Configure Server-Based AAA Authentication Using TACACS+ on R2




```
R2>en
R2#conf t
R2(config)#username admin2 secret pwd2
R2(config)#tacacs-server host 192.168.2.2
R2(config)#tacacs-server key tacacspwd
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)# ^Z
R2#exit
```

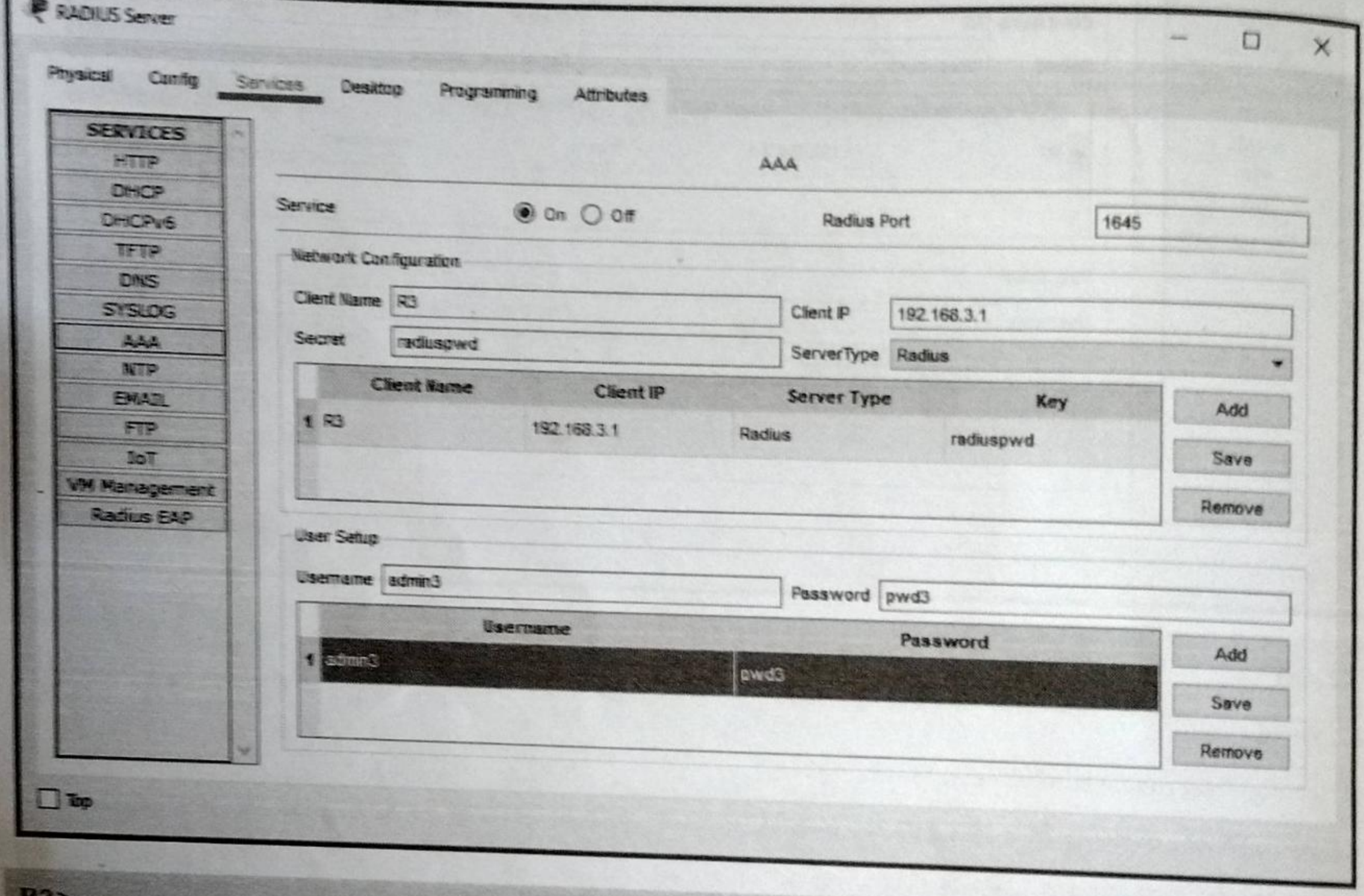
```
User Access Verification

Username: admin2

Password:

R2>
```

Configure Server-Based AAA Authentication Using RADIUS on R3




```
R3>en
R3#conf t
R3(config)#username admin3 secret pwd3
R3(config)#radius-server host 192.168.3.2
R3(config)#radius-server key radiuspwd
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)# ^Z
R3#exit
```