

Final Project

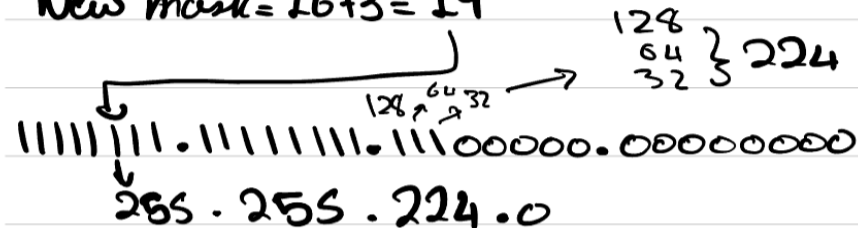
Lab Task 1: Design an IP Address Scheme [site24x7](#)

1. The network 172.16.10.0/16 was divided into seven subnets, as outlined below:

Subnet Processing:

1. Divide 172.16.10.0/16, to create 7 subnets we need 3 additional bits ($2^3=8$)

New mask = $16+3=19$



2. Calculating Usable host:

Host bits = $32-19=13$ bits

Usable add Per subnet = $2^{13}-2=8190$

we sub by 2 because there is 2

two specific address in each subnet are Reserved & cannot be assigned to individual hosts.

1. Network Address 2. Broadcast Address.

2. The value of the new subnet mask is 255.255.224.0
3. $2^{19}=8190$ usable hosts exist per subnet.
- 4.

Subnet ID	Network address	Host Address Range	Broadcast Address	Subnet mask
1	172.16.0.0	172.16.0.1 - 172.16.31.254	172.16.31.255	255.255.224.0
2	172.16.32.0	172.16.32.1 - 172.16.63.254	172.16.63.255	255.255.224.0
3	172.16.64.0	172.16.64.1 - 172.16.95.254	172.16.95.255	255.255.224.0
4	172.16.96.0	172.16.96.1 - 172.16.127.254	172.16.127.255	255.255.224.0
5	172.16.128.0	172.16.128.1 - 172.16.159.254	172.16.159.255	255.255.224.0
6	172.16.160.0	172.16.160.1 - 172.16.191.254	172.16.191.255	255.255.224.0
7	172.16.192.0	172.16.192.1 - 172.16.223.254	172.16.223.255	255.255.224.0

Lab Task 2: Implement VLANs and Trunk

(Listed commands were executed on S1-Office1 and S2-Office1.)

1. en
conf t
vlan 10
name Management
exit
vlan 20
name Marketing
exit
vlan 30
name Accounting
exit
vlan 100
name Native
exit
2. int range fa0/1-10
switchport mode access
switchport access vlan 10
exit
int range fa0/11-20
switchport mode access
switchport access vlan 20
exit
int range fa0/21-24
switchport mode access
switchport access vlan 30
exit

Make sure that you connect pc's to switch in the correct Range

3.
 - **On S1-Office1:**

int gi0/2
switchport mode trunk
switchport trunk native vlan 100
exit
show vlan brief
show int trunk

- **On S2-Office1:**

```

int gi0/1
switchport mode trunk
switchport trunk native vlan 100
exit
show vlan brief
show int trunk

```

4. Interface gig0/1

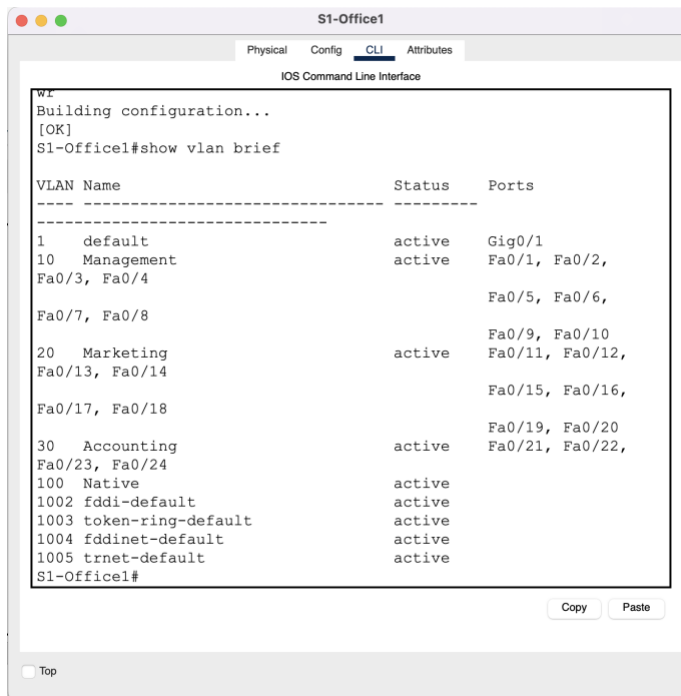

```

switchport nonegotiate
exit
wr

```

S1-Office1# show vlan brief

S2-Office1# show vlan brief



IOS Command Line Interface

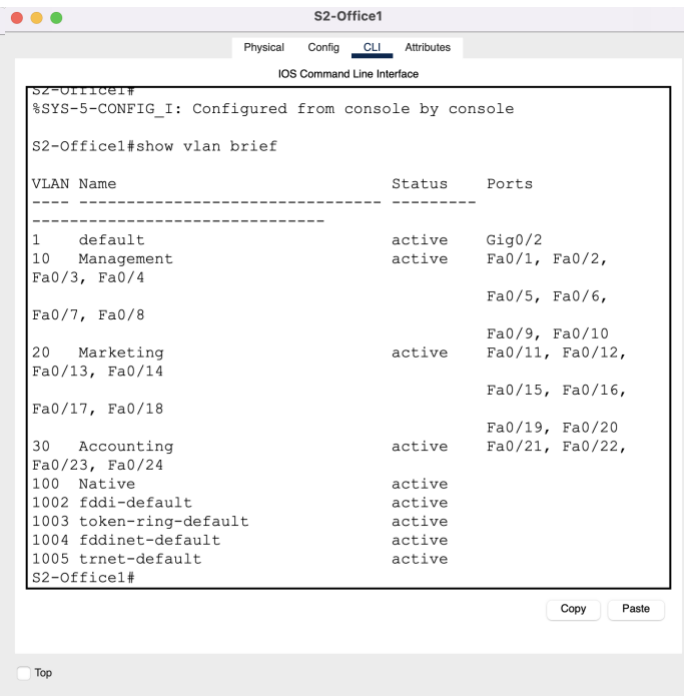
```

S1-Office1#show vlan brief

```

VLAN Name	Status	Ports
1 default	active	Gig0/1
10 Management	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/7, Fa0/8
20 Marketing	active	Fa0/9, Fa0/10, Fa0/11, Fa0/12, Fa0/15, Fa0/16, Fa0/17, Fa0/18
30 Accounting	active	Fa0/19, Fa0/20, Fa0/21, Fa0/22, Fa0/23, Fa0/24
100 Native	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

S1-Office1#



IOS Command Line Interface

```

S2-Office1#show vlan brief

```

VLAN Name	Status	Ports
1 default	active	Gig0/2
10 Management	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8
20 Marketing	active	Fa0/9, Fa0/10, Fa0/11, Fa0/12, Fa0/15, Fa0/16, Fa0/17, Fa0/18
30 Accounting	active	Fa0/19, Fa0/20, Fa0/21, Fa0/22, Fa0/23, Fa0/24
100 Native	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

S2-Office1#

S1-Office1#show int trunk

S2-Office1#show int trunk

S1-Office1

PhysicalConfigCLIAttributes

IOS Command Line Interface

1005 trnet-defaultactive

S1-Office1(config)#exit

S1-Office1#

%SYS-5-CONFIG_I: Configured from console by console

S1-Office1#show int trunk

Port	Mode	Encapsulation	Status	Native
vlan				
Gig0/2	on	802.1q	trunking	100

Port	Vlans allowed on trunk
Gig0/2	1-1005

Port	Vlans allowed and active in management domain
Gig0/2	1,10,20,30,100

Port	Vlans in spanning tree forwarding state and not pruned
Gig0/2	1,10,20,30,100

S1-Office1#

Copy

Paste

☐ Top

S2-Office1

PhysicalConfigCLIAttributes

IOS Command Line Interface

100 Nativeactive

1002 fddi-defaultactive

1003 token-ring-defaultactive

1004 fddinet-defaultactive

1005 trnet-defaultactive

S2-Office1#show int trunk

Port	Mode	Encapsulation	Status	Native
vlan				
Gig0/1	on	802.1q	trunking	100

Port	Vlans allowed on trunk
Gig0/1	1-1005

Port	Vlans allowed and active in management domain
Gig0/1	1,10,20,30,100

Port	Vlans in spanning tree forwarding state and not pruned
Gig0/1	1,10,20,30,100

S2-Office1#

Copy

Paste

☐ Top

Lab Task 3: Assign IP Addresses

Device	Interface	Address	Subnet Mask	Default Gateway
R1	Gig0/0/0	---	255.255.224.0	---
	Serial0/1/0	172.16.128.1	255.255.224.0	---
	Serial0/1/1	172.16.160.1	255.255.224.0	---
	Gig0/0/0.10	172.16.0.1	255.255.224.0	---
	Gig0/0/0.20	172.16.32.1	255.255.224.0	---
	Gig0/0/0.30	172.16.64.1	255.255.224.0	---
R2-Edge_router	Serial0/1/0	172.16.96.2	255.255.224.0	---
	Serial0/1/1	172.16.160.2	255.255.224.0	---
R3	Gig0/0/0	172.16.192.1	255.255.224.0	---
	Serial0/1/0	172.16.128.2	255.255.224.0	---
	Serial0/1/1	172.16.96.1	255.255.224.0	---
S1-Office1	VLAN 10 (Management)	---	255.255.224.0	172.16.32.1
	VLAN 20 (Marketing)	---	255.255.224.0	172.16.32.1
	VLAN 30 (Accounting)	---	255.255.224.0	172.16.32.1
S2-Office1	VLAN 10 (Management)	---	255.255.224.0	172.16.160.1
	VLAN 20 (Marketing)	---	255.255.224.0	172.16.160.1
	VLAN 30 (Accounting)	---	255.255.224.0	172.16.160.1
CEO1	FastEthernet0/0	172.16.0.2	255.255.224.0	172.16.0.1
CEO2	FastEthernet0/1	172.16.0.3	255.255.224.0	172.16.0.1
Dialer1	FastEthernet0/2	172.16.32.2	255.255.224.0	172.16.32.1
Dialer2	FastEthernet0/0	172.16.32.3	255.255.224.0	172.16.32.1
Copywriter1	FastEthernet0/1	172.16.64.9	255.255.224.0	172.16.64.1
Copywriter2	FastEthernet0/2	172.16.64.2	255.255.224.0	172.16.64.1
Emp1	FastEthernet0/0	172.16.192.2	255.255.224.0	172.16.192.1
Emp2	FastEthernet0/1	172.16.192.3	255.255.224.0	172.16.192.1
guest	FastEthernet0/2	172.16.192.4	255.255.224.0	172.16.192.1

Configure R2:

- **Seiral 0/1/0:**
 En
 Conf t
 Interface se0/1/0
 Ip address 172.16.96.2 255.255.224.0
 No shutdown
 Exit
- **Seiral 0/1/1:**
 Interface se0/1/1
 Ip address 172.16.160.2 255.255.224.0
 No shutdown
 Exit
 Exit
 wr

Configure R3:

- **Seiral 0/1/0:**
En
Conf t
Interface se0/1/0
Ip address 172.16.128.2 255.255.224.0
No shutdown
Exit
- **Seiral 0/1/1:**
Interface se0/1/1
Ip address 172.16.96.1 255.255.224.0
No shutdown
Exit
- **Gig 0/0/0:**
Interface gig0/0/0
Ip address 172.16.192.1 255.255.224.0
No shutdown
Exit
Exit
wr

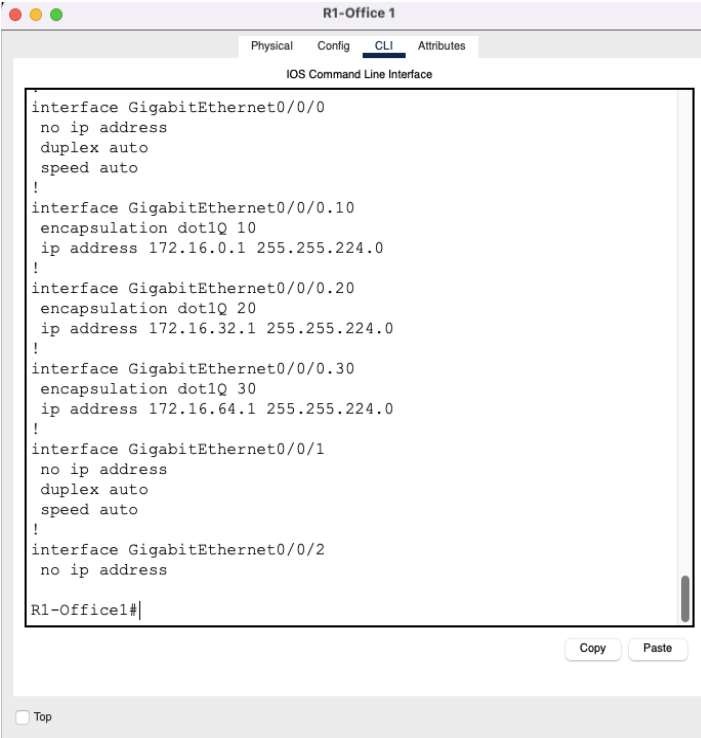
Configure R1:

- **Seiral 0/1/0:**
En
Conf t
Interface se0/1/0
Ip address 172.16.128.1 255.255.224.0
No shutdown
Exit
- **Seiral 0/1/1:**
Interface se0/1/1
Ip address 172.16.160.1 255.255.224.0
No shutdown
Exit
- **Gig 0/0/0:**
Interface gig0/0/0
No shutdown
Exit

Lab Task 4: Configure R1 for Inter-VLAN Routing

(Listed commands were executed on R1, unless otherwise stated.)

- **Gig0/0/0.10**
int g0/0/0.10
encapsulation dot1q 10
ip add 172.16.0.1 255.255.224.0
exit
- **Gig0/0/0.20**
int g0/0/0.20
encapsulation dot1q 20
ip add 172.16.32.1 255.255.224.0
exit
- **Gig0/0/0.30**
int g0/0/0.30
encapsulation dot1q 30
ip add 172.16.64.1 255.255.224.0
exit



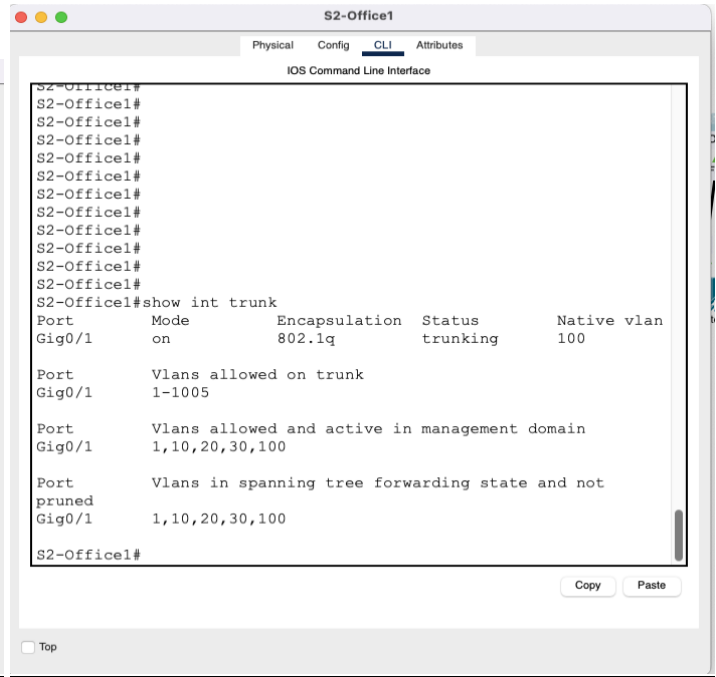
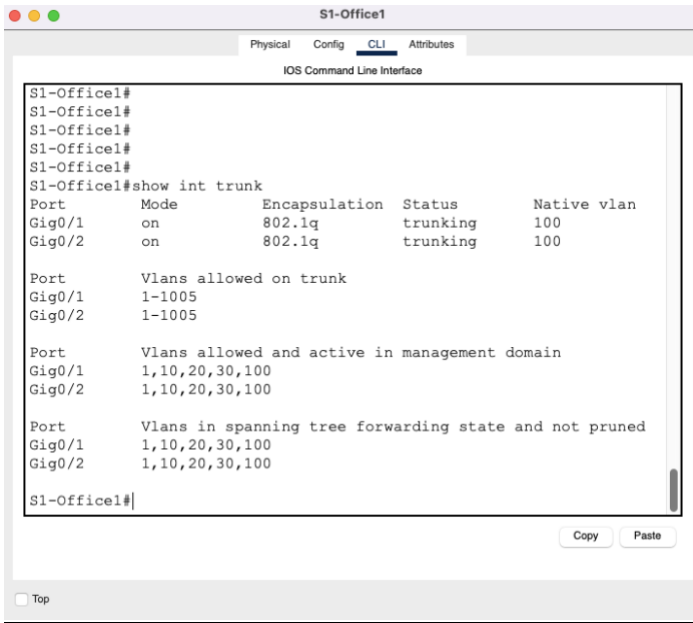
```
interface GigabitEthernet0/0/0
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/0/0.10
encapsulation dot1Q 10
ip address 172.16.0.1 255.255.224.0
!
interface GigabitEthernet0/0/0.20
encapsulation dot1Q 20
ip address 172.16.32.1 255.255.224.0
!
interface GigabitEthernet0/0/0.30
encapsulation dot1Q 30
ip address 172.16.64.1 255.255.224.0
!
interface GigabitEthernet0/0/1
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/0/2
no ip address
R1-Office1#
```

- **On S1-Office1 & S2-Office2, set GigabitEthernet 0/1 as Trunk, with appropriate Native VLAN.**

```

en
conf t
int gig0/1
switchport mode trunk
switchport trunk native vlan 100
no shutdown
exit

```



Lab Task 5: Static Routing for network devices

- **R3-Office 2:**

```

En
Conf t
ip route 172.16.0.0 255.255.224.0 172.16.128.1
ip route 172.16.32.0 255.255.224.0 172.16.128.1
ip route 172.16.64.0 255.255.224.0 172.16.128.1
ip route 172.16.96.0 255.255.224.0 172.16.96.2
ip route 172.16.160.0 255.255.224.0 172.16.96.2
exit
wr

```

- **R2-Edge router:**

```

En
Conf t
ip route 172.16.0.0 255.255.224.0 172.16.160.1
ip route 172.16.32.0 255.255.224.0 172.16.160.1
ip route 172.16.64.0 255.255.224.0 172.16.160.1
ip route 172.16.128.0 255.255.224.0 172.16.96.1
ip route 172.16.192.0 255.255.224.0 172.16.96.1
exit
wr

```

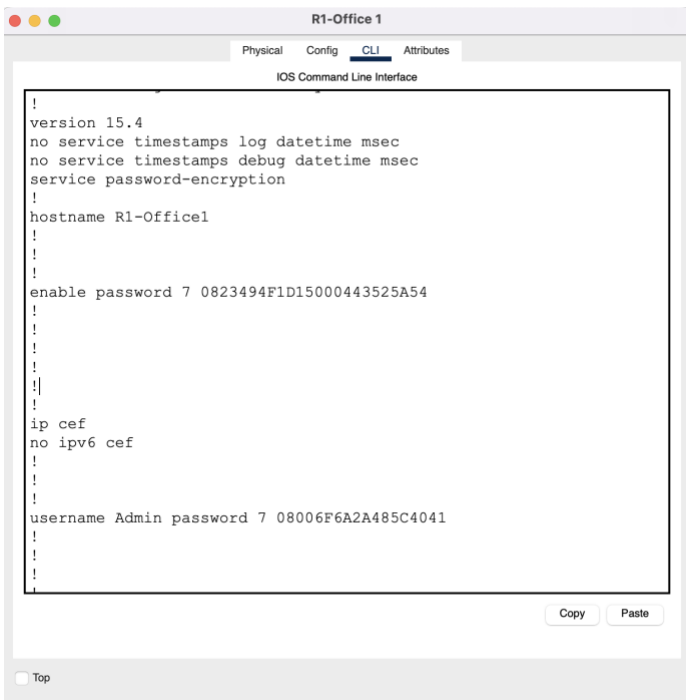
- **R1-Office 1:**

```
en
conf t
ip route 172.16.96.0 255.255.224.0 172.16.96.2
ip route 172.16.192.0 255.255.224.0 172.16.128.2
ip route 0.0.0.0 0.0.0.0 172.16.160.2
exit
```

Lab Task 6: Initial and Security Settings for Network Devices

(Listed commands were executed on all routers and switches)

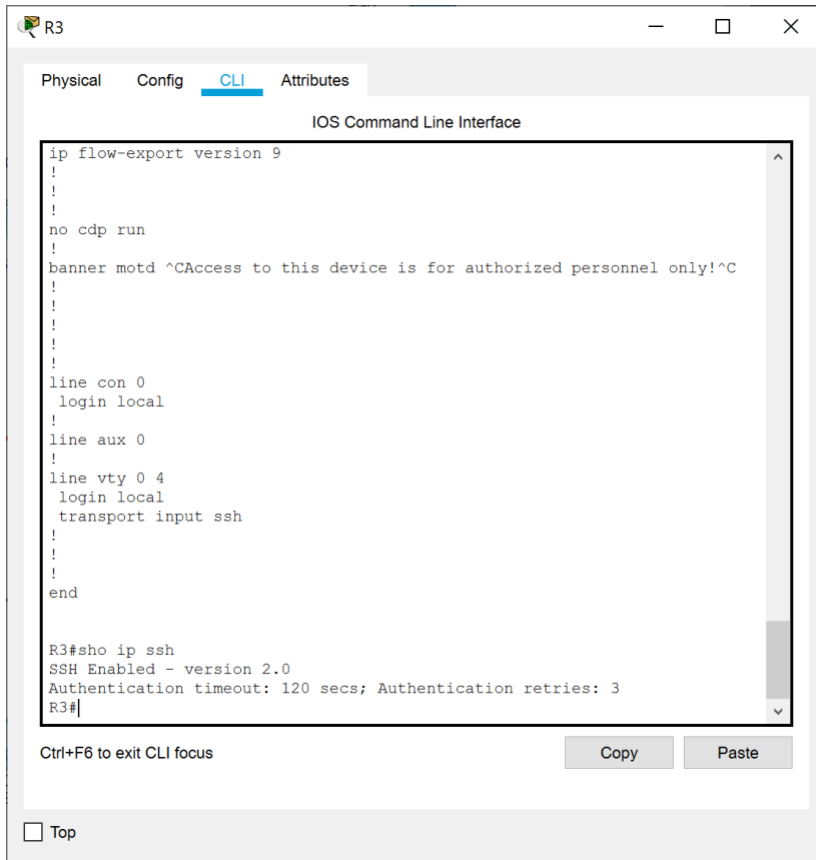
1. en
conf t
username Admin password ACDC1973
2. line console 0
login local
exit
3. enable password beatles1960
4. service password-encryption
5. banner motd #ONLY for admin's#
ex
wr
ex



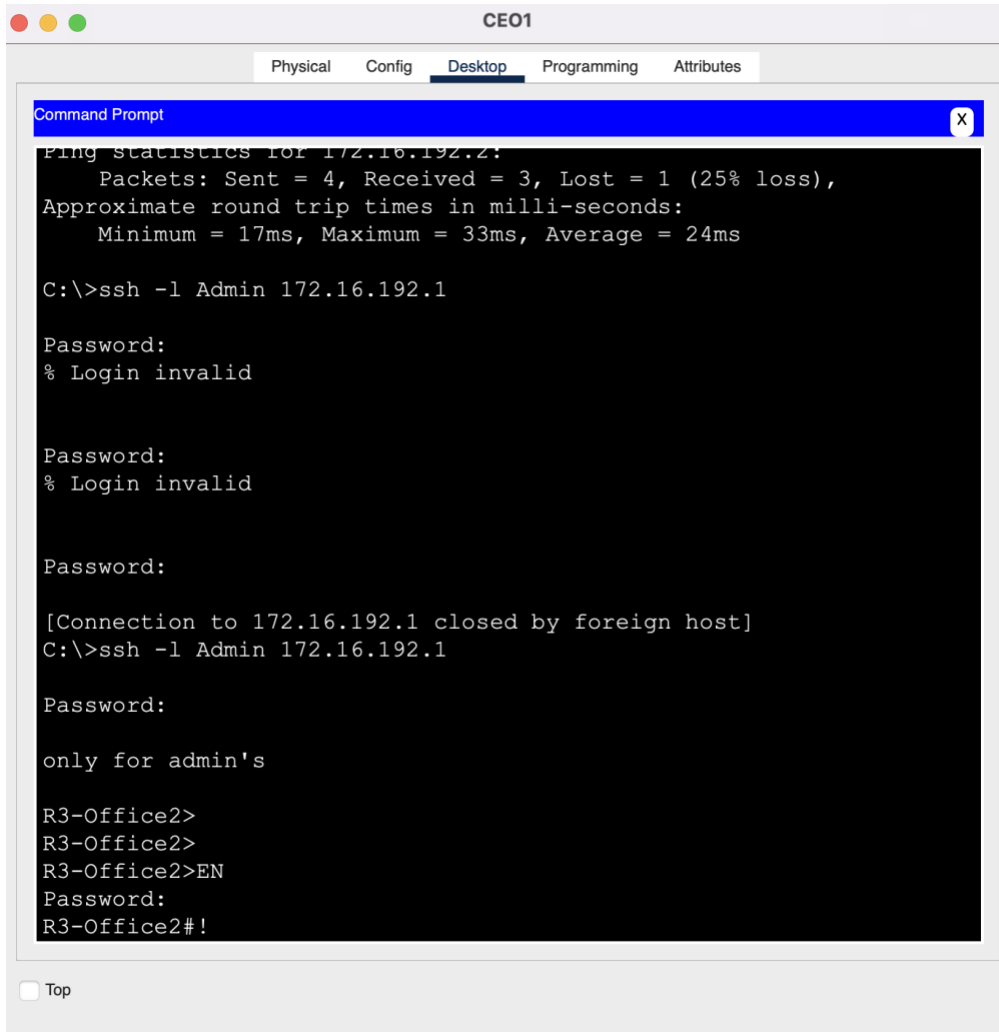
Lab Task 7: Secure Remote Access

(Listed commands were executed on R1, R2, and R3)

1. ip domain-name aast.com
2. crypto key generate rsa
3. 1024
4. ip ssh version 2
5. line vty 0 4
login local
transport input ssh
exit
6. ex
sho ip ssh
sho run
wr



7. Using the command `ssh -l Admin IP-Address`, I was able to successfully SSH into the routers.



```
CEO1
Physical Config Desktop Programming Attributes
Command Prompt
Ping statistics for 172.16.192.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 17ms, Maximum = 33ms, Average = 24ms

C:\>ssh -l Admin 172.16.192.1

Password:
% Login invalid

Password:
% Login invalid

Password:

[Connection to 172.16.192.1 closed by foreign host]
C:\>ssh -l Admin 172.16.192.1

Password:

only for admin's

R3-Office2>
R3-Office2>
R3-Office2>EN
Password:
R3-Office2#!

Top
```