Finance Office Network Implementation

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CEP CCIT

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PROJECT ON

Finance Office Network Implementation

Developed by

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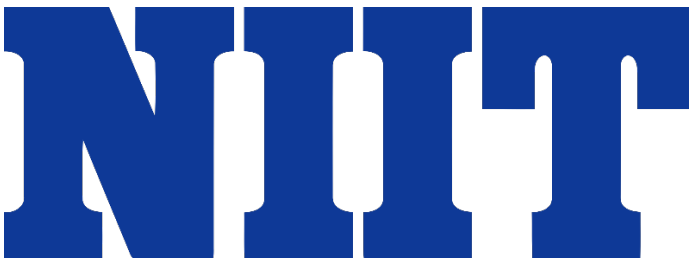

Finance Office Network Implementation

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CERTIFICATE

This is to certify that the report titled "Finance Office Network Implementation", embodies the original work done by Muhammad Armed Bintang Pradana, Nur Iqbal Maulana and Asia Illumina Lessy. Project in partial fulfillment of their course requirement at NIIT.

Coordinator :

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ACKNOWLEDGMENT

The author expresses his gratitude to Allah SWT for all the abundance of grace and mercy. His mercy and grace, and do not forget the shalawat and greetings we send to the Prophet Muhammad SAW, so that we can complete this project with the title "Finance Office Network Implementation" and without him we would not be able to complete this project on time. Time that has been calculated, and the author also wants to thank Mr. Tri Agus Riyadi, S.Kom, MT, as the supervisor who has provided suggestions and advice that are very helpful to the author in writing this project. Although there are many challenges and obstacles that we face in making this project, we can finally complete it. Finally, we were able to complete this project. The author realizes that this assignment is still far from perfection, and if colleagues and lecturers are willing to provide suggestions and criticism, then this assignment is not perfect. Supervisors are pleased to provide suggestions and criticism for the sake of the perfection of this project, and we as writers will be greatly helped. We, as writers, will be greatly helped by these suggestions and criticisms.

BACKGROUND

In today's digital era and technological advances, configuring networks is important. This configuration allows buildings to have network access to carry out various activities that are coordinated with each other, ranging from network speed, secure user data, and resource sharing.

In this project, we will explain the process of implementing a financial office network and understand its workflow. This discussion covers the process from configuring the network device to checking the response to the server and user or user to user, as well as how to deal with various situations that may occur during this implementation.

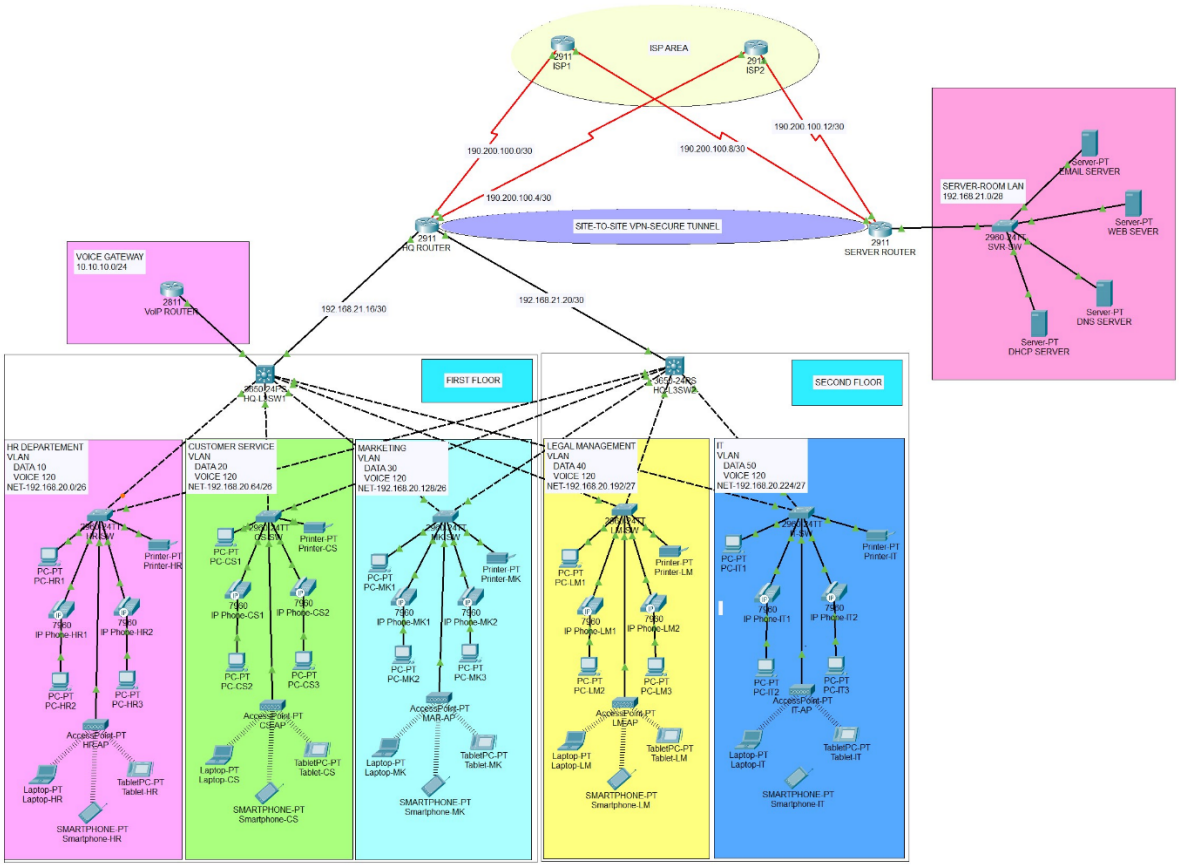
SYSTEM ANALYST

This paper discusses the network simulation Finance Office Network Implementation. The purpose of this research is to investigate the possible benefits and limitations of adopting a network solution.

Thereafter, a thorough simulation of the use, implementation, and potential of the network to completely transform the home security system is presented in this study. The authors discuss the various parts and attributes of the network, which consists of five routers, several PCs, five access points, six switches, two multilayer switches and four servers. Network characteristics include DHCP and static IP addresses.

Finance Office Map

Network



Section	Network Address	Subnetmask	Status
ISP Area			
Server Room LAN	192.168.21.0	225.225.225.240	Static
Voice Gateway	10.10.10.0	225.225.225.0	-
HR Department	192.168.20.0	225.225.225.192	DHCP
Customer Service	192.168.20.64	225.225.225.192	DHCP
Marketing	192.168.20.128	225.225.225.192	DHCP
Legal Management	192.168.20.192	225.225.225.224	DHCP
IT	192.168.20.224	225.225.225.224	DHCP

NETWORK
DEVICES

ISP Area

Device	Device Name	IP Address	Gateway	Features
Router	ISP1	190.200.100.2 190.200.100.10	ISP IP	HWIC-2T Module
Router	ISP2	190.200.100.6 190.200.100.14	ISP IP	HWIC-2T Module
Router	HQ ROUTER	190.200.100.0 190.200.100.4 192.168.21.16 192.168.21.20	ISP IP	HWIC-2T Module

Server Room LAN

Router	SERVER ROUTER	192.168.21.1	ISP IP	HWIC-2T Module
Switch	-	-	-	
Server-PT	EMAIL SERVER	192.168.21.8	192.168.21.1	- Email Server
Server-PT	WEB SERVER	192.168.21.7	192.168.21.1	- Web Server
Server-PT	DNS SERVER	192.168.21.6	192.168.21.1	- DNS Server
Server-PT	DHCP SERVER	192.168.21.5	192.168.21.1	- DHCP Server

VOICE GATEWAY

Router	VoIP ROUTER	10.10.10.1	ISP IP	-

FIRST FLOOR
HR DEPARTMENT

Multilayer Switch	HQ-L3SW1	192.168.21.17	-	AC-POWER-SUPPLY
Switch	HR-SW	-	-	
PC	PC-HR1	192.168.20.17	192.168.20.1	- Browser - CMD
Printer	Printer-HR	192.168.20.6	192.168.20.1	
IP Phone	IP Phone-HR1	10.10.10.8	192.168.20.1	- Communication
IP Phone	IP Phone-HR2	10.10.10.9	192.168.20.1	- Communication
PC	PC-HR2	192.168.20.6	192.168.20.1	- Browser - CMD
PC	PC-HR3	192.168.20.10	192.168.20.1	- Browser - CMD
Access Point	HR-AP	-	192.168.20.1	
Laptop	Laptop-HR	192.168.20.13	192.168.20.1	- Browser - CMD
Smartphone	Smartphone-HR	192.168.20.11	192.168.20.1	- Browser
Tablet PC	Tablet-HR	192.168.20.12	192.168.20.1	- Browser

NETWORK
DEVICES

FIRST FLOOR

CUSTOMER SERVICE

Device	Device Name	IP Address	Gateway	Features
Multilayer Switch	HQ-L3SW1	192.168.21.17	-	AC-POWER-SUPPLY
Switch	CS-SW	-	-	
PC	PC-CS1	192.168.20.70	192.168.20.65	- Browser - CMD
Printer	Printer-CS	192.168.20.72	192.168.20.65	
IP Phone	IP Phone-CS1	10.10.10.3	192.168.20.65	- Communication
IP Phone	IP Phone-CS2	10.10.10.2	192.168.20.65	- Communication
PC	PC-CS2	192.168.20.73	192.168.20.65	- Browser - CMD
PC	PC-CS3	192.168.20.71	192.168.20.65	- Browser - CMD
Access Point	CS-AP	-	192.168.20.65	
Laptop	Laptop-CS	192.168.20.75	192.168.20.65	- Browser - CMD
Smartphone	Smartphone-CS	169.254.118.29	192.168.20.65	- Browser
Tablet PC	Tablet-CS	192.168.20.78	192.168.20.65	- Browser

MARKETING

Multilayer Switch	HQ-L3SW1	192.168.21.17	-	AC-POWER-SUPPLY
Switch	MK-SW	-	-	
PC	PC-MK1	192.168.20.142	192.168.20.129	- Browser - CMD
Printer	Printer-MK	192.168.20.136	192.168.20.129	
IP Phone	IP Phone-MK1	10.10.10.5	192.168.20.129	- Communication
IP Phone	IP Phone-MK2	10.10.10.2	192.168.20.129	- Communication
PC	PC-MK2	192.168.20.141	192.168.20.129	- Browser - CMD
PC	PC-MK3	192.168.20.139	192.168.20.129	- Browser - CMD
Access Point	MK-AP	-	192.168.20.129	
Laptop	Laptop-MK	192.168.20.143	192.168.20.129	- Browser - CMD
Smartphone	Smartphone-MK	169.254.118.144	192.168.20.129	- Browser
Tablet PC	Tablet-MK	192.168.20.146	192.168.20.129	- Browser

NETWORK DEVICES

SECOND FLOOR

LEGAL MANAGEMENT

Device	Device Name	IP Address	Gateway	Features
Multilayer Switch	HQ-L3SW2	192.168.21.21	-	AC-POWER-SUPPLY
Switch	LM-SW	-	-	
PC	PC-LM1	192.168.20.199	192.168.20.193	- Browser - CMD
Printer	Printer-LM	192.168.20.198	192.168.20.193	
IP Phone	IP Phone-LM1	10.10.10.11	192.168.20.193	- Communication
IP Phone	IP Phone-LM2	10.10.10.6	192.168.20.193	- Communication
PC	PC-LM2	192.168.20.197	192.168.20.193	- Browser - CMD
PC	PC-LM3	192.168.20.203	192.168.20.193	- Browser - CMD
Access Point	LM-AP	-	192.168.20.193	
Laptop	Laptop-LM	192.168.20.202	192.168.20.193	- Browser - CMD
Smartphone	Smartphone-LM	192.168.20.204	192.168.20.193	- Browser
Tablet PC	Tablet-LM	192.168.20.200	192.168.20.193	- Browser

IT

Multilayer Switch	HQ-L3SW2	192.168.21.21	-	AC-POWER-SUPPLY
Switch	IT-SW	-	-	
PC	PC-IT1	192.168.20.232	192.168.20.225	- Browser - CMD
Printer	Printer-IT	192.168.20.230	192.168.20.225	
IP Phone	IP Phone-IT1	10.10.10.7	192.168.20.225	- Communication
IP Phone	IP Phone-IT2	10.10.10.10	192.168.20.225	- Communication
PC	PC-IT2	192.168.20.231	192.168.20.225	- Browser - CMD
PC	PC-IT3	192.168.20.233	192.168.20.225	- Browser - CMD
Access Point	IT-AP	-	192.168.20.225	
Laptop	Laptop-IT	192.168.20.237	192.168.20.225	- Browser - CMD
Smartphone	Smartphone-IT	169.254.20.239	192.168.20.225	- Browser
Tablet PC	Tablet-IT	192.168.20.235	192.168.20.225	- Browser

CONFIGURATION STEPS

1. Configurating the Basic Setting to The Important Device

Do command below on CLI in every switches, multilayer switches, and routers. Make sure to change the name to suitable name for every departemen/room name. For information, layer 2 switches is switch that connected to user (PC, Printers, Etc). Layer 3 switches is the Multilayer Switch.

```
//LAYER 2

en
conf t
hostname HQ-RT
banner motd #This is HQ-RT#
line console 0
password cisco
login
exit
no ip domain-lookup
enable password cisco
service password-encryption
```

```
//LAYER 3

en
conf t
hostname HQ-MLSW1
banner motd #This is HQ-MLSW1#
line console 0
password cisco
login
exit
no ip domain-lookup
enable password cisco
service password-encryption
ip domain-name cisco.net
username cisco password cisco
crypto key generate rsa
1024
ip ssh version 2
line vty 0 15
login local
transport input ssh
exit

do wr
```

Some tips here, when trying to do the next configuration, just open the config tab, choose random Interface Port, then type “exit” on the CLI.

2. Configurating the Layer 2 Switch

Enter command below on every Layer 2 Switch CLI so it can communicate with the Router for DATA and VOICE. Make sure to change Highlighted number to suitable number for each department vlan number. IMPORTANT : Make sure to check the ports used on the project suitable with the command (Blue highlighted one).

```
vlan 10
name DATA
vlan 120
name VOICE

exit
int range fa0/1-2
switchport mode trunk
exit

int range fa0/3-24
switchport mode access
switchport access vlan 10
switchport voice vlan 120
exit

do wr
```

3. Configurating the VLAN on Every Multiswitch Layer

Enter Command below to every Multiswitch layer’s CLI. Command below is for “Introducing” any VLAN available to Multiswitch.

```
vlan 10
name HR
vlan 20
name CS
vlan 30
name MK
vlan 40
name LM
vlan 50
name IT
vlan 120
name VOICE
exit
do wr
```

4. Configuring Mac Address and Violation Mode Shutdown On Layer 2 Switch

Enter command below on every Layer 2 Switch's CLI.

```
int range fa0/2-5
switchport mode access
switchport port-security maximum 1
switchport port-security mac-address sticky
switchport port-security violation shutdown
exit
do wr

int range fa0/6-24, gig0/1-2
switchport mode access
switchport mode access vlan 99
shutdown
exit
do wr
```

5. Configuring Ip Subnetting on VoIP Router

Enter Command below on VoIP Router's CLI.

```
int fa0/0.120
encapsulation dot1Q 120
ip add 10.10.10.1 255.255.255.0
exit
do wr
```

6. Configuring OSPF (Open Shortest Path First)

Enter command below to every CLI on labeled devices.

```
//HQ-MLSW1
ip routing
router ospf 10
router id 1.1.1.1
network 10.10.10.0 0.0.0.255 area 0
network 192.168.21.16 0.0.0.3 area 0
network 192.168.20.0 0.0.0.3 area 0
exit
do wr
```

```
//HQ-MLSW2
ip routing
router ospf 10
router id 2.2.2.2
network 10.10.10.0 0.0.0.255 area 0
network 192.168.21.20 0.0.0.3 area 0
network 192.168.20.0 0.0.0.3 area 0
exit
do wr
```

```
//VoIP router
ip routing
router ospf 10
router id 3.3.3.3
network 10.10.10.0 0.0.0.255 area 0
exit
do wr
```

```
//HQ Router
ip routing
router ospf 10
router id 4.4.4.4
network 192.168.21.16 0.0.0.3 area 0
network 192.168.21.20 0.0.0.3 area 0
network 190.200.100.0 0.0.0.3 area 0
network 190.200.100.4 0.0.0.3 area 0
exit
do wr
```

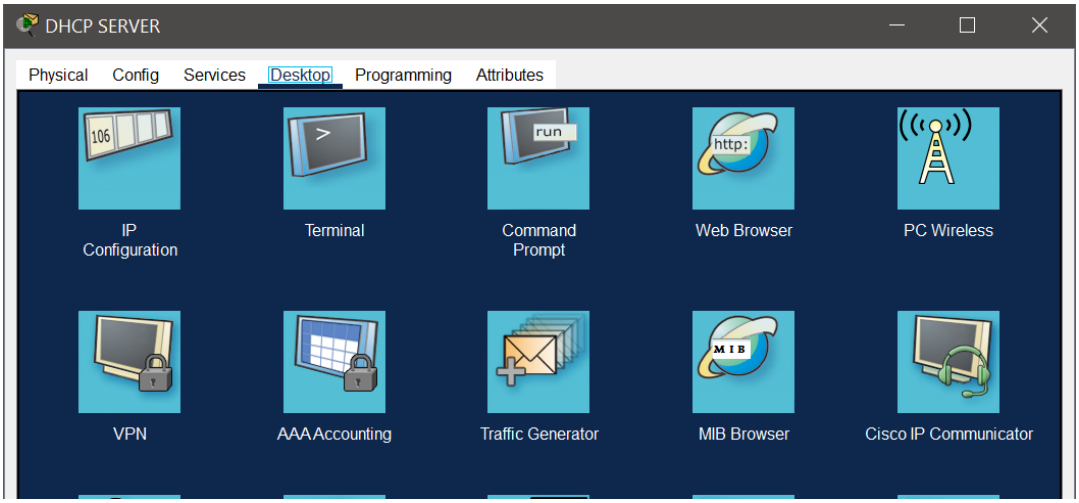
```
//ISP1 Router
ip routing
router ospf 10
router id 5.5.5.5
network 190.200.100.0 0.0.0.3 area 0
network 190.200.100.8 0.0.0.3 area 0
exit
do wr
```

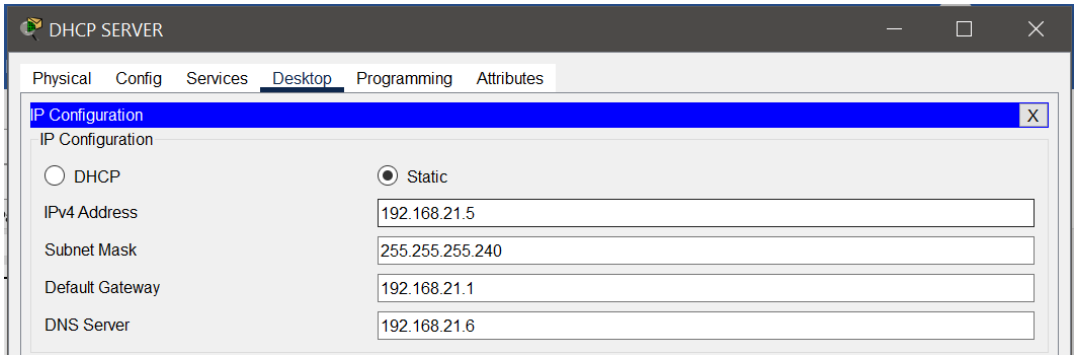
```
//ISP2 Router
ip routing
router ospf 10
router id 6.6.6.6
network 190.200.100.4 0.0.0.3 area 0
network 190.200.100.12 0.0.0.3 area 0
exit
do wr
```

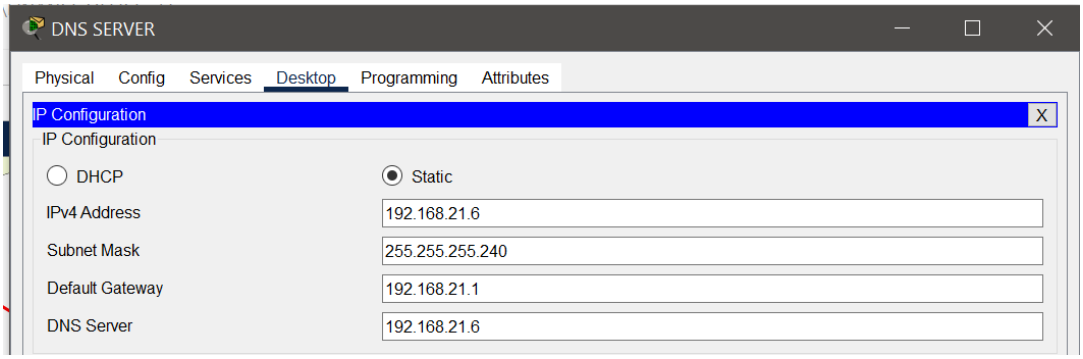
```
//server router
ip routing
router ospf 10
router id 7.7.7.7
network 192.168.21.0 0.0.0.15 area 0
network 190.200.100.8 0.0.0.3 area 0
network 190.200.100.12 0.0.0.3 area 0
exit
do wr
```

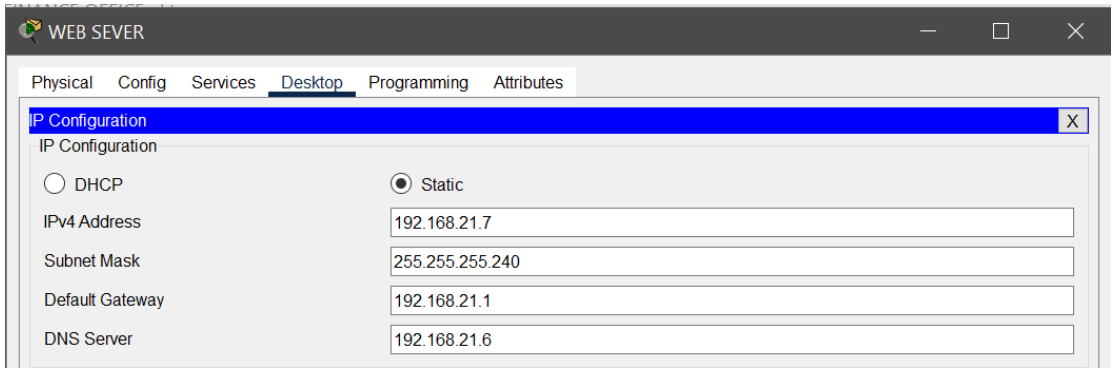
7. Configuring Static IP to Server

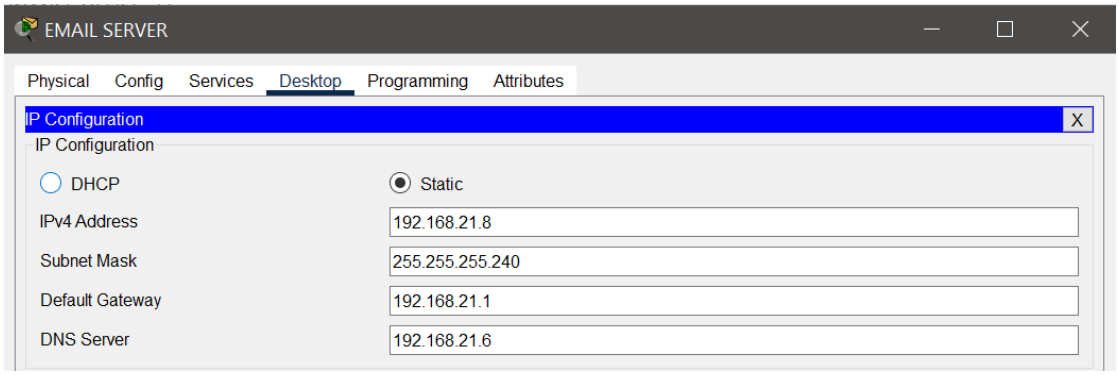
To do this one, open server, go to Desktop, and choose IP Configuration.





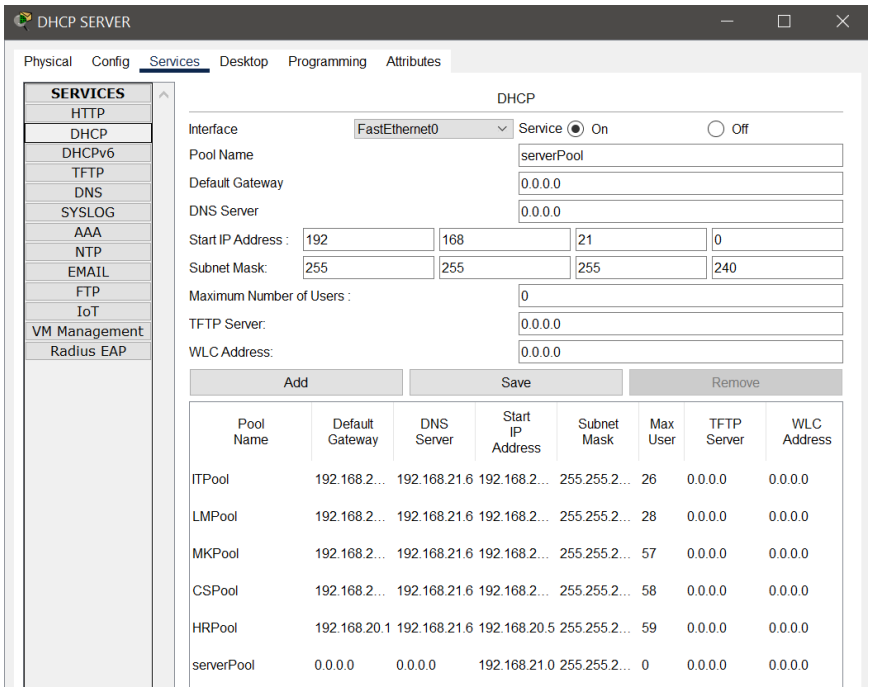






8. Configuring the ServerPool

Open DHCP server, go to Services, and do some setting like picture below. To set Server pool, enter the name, default ip address for each division The subnet mask, and maximum users (60) with the example as below, can be adjusted in each Departements. Don't forget to click add after entering any configuration for each Departements and save if there's any change.



Interface	FastEthernet0	Service	On	Off	
Pool Name	HRPool				
Default Gateway	192.168.20.1				
DNS Server	192.168.21.6				
Start IP Address :	192	168	20	5	
Subnet Mask:	255	255	255	192	
Maximum Number of Users :	59				
TFTP Server:	0.0.0.0				
WLC Address:	0.0.0.0				

Interface	FastEthernet0	Service	On	Off	
Pool Name	CSPool				
Default Gateway	192.168.20.65				
DNS Server	192.168.21.6				
Start IP Address :	192	168	20	70	
Subnet Mask:	255	255	255	192	
Maximum Number of Users :	58				
TFTP Server:	0.0.0.0				
WLC Address:	0.0.0.0				

Interface	FastEthernet0	Service	On	Off	
Pool Name	MKPool				
Default Gateway	192.168.20.129				
DNS Server	192.168.21.6				
Start IP Address :	192	168	20	135	
Subnet Mask:	255	255	255	192	
Maximum Number of Users :	57				
TFTP Server:	0.0.0.0				
WLC Address:	0.0.0.0				

Interface	FastEthernet0	Service	On	Off	
Pool Name	LMPool				
Default Gateway	192.168.20.193				
DNS Server	192.168.21.6				
Start IP Address :	192	168	20	196	
Subnet Mask:	255	255	255	224	
Maximum Number of Users :	28				
TFTP Server:	0.0.0.0				
WLC Address:	0.0.0.0				

Interface	FastEthernet0	Service	On	Off	
Pool Name	ITPool				
Default Gateway	192.168.20.225				
DNS Server	192.168.21.6				
Start IP Address :	192	168	20	230	
Subnet Mask:	255	255	255	224	
Maximum Number of Users :	26				
TFTP Server:	0.0.0.0				
WLC Address:	0.0.0.0				

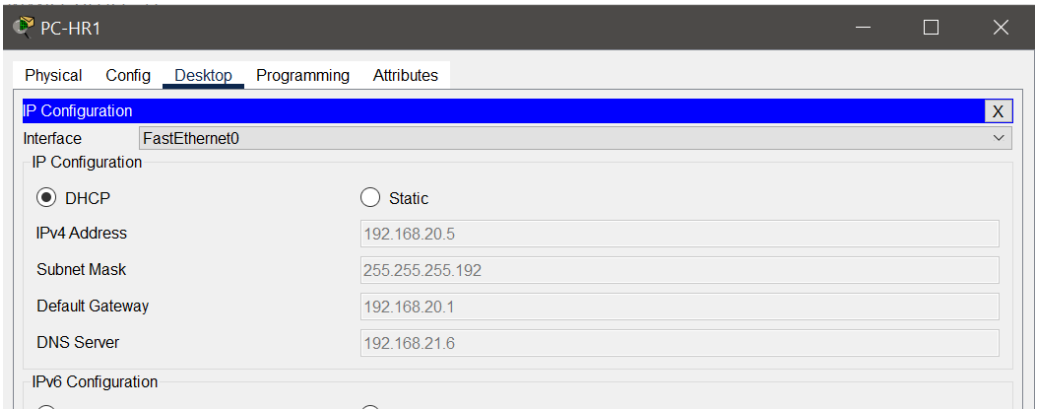
9. Configuring The InterVLAN

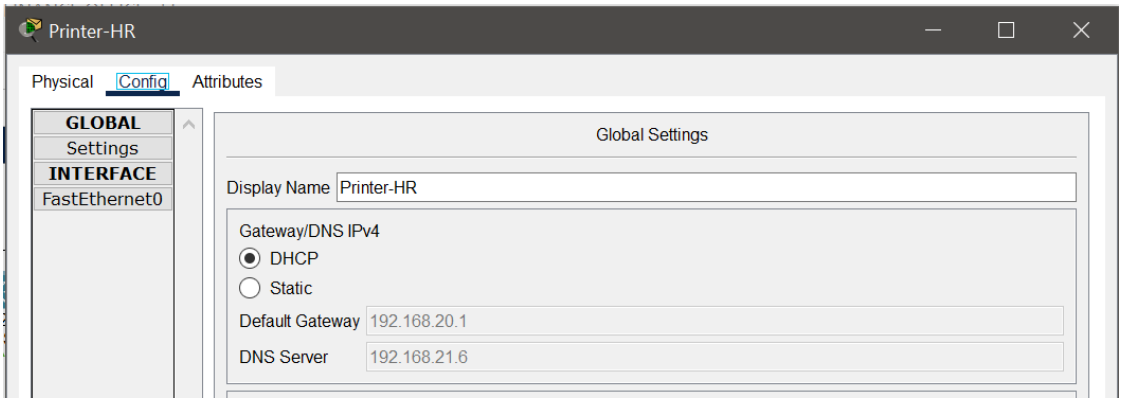
Enter command below on every multilayer switch.

```
int vlan 10
ip add 192.168.20.1 255.255.255.192
ip helper-address 192.168.21.5
exit

int vlan 20
ip add 192.168.20.65 255.255.255.192
ip helper-address 192.168.21.5
exit

int vlan 30
ip add 192.168.20.129 255.255.255.192
ip helper-address 192.168.21.5
exit

int vlan 40
ip add 192.168.20.193 255.255.255.224
ip helper-address 192.168.21.5
exit

int vlan 50
ip add 192.168.20.225 255.255.255.224
ip helper-address 192.168.21.5
exit

do wr
```

10. Check The DHCP on Every Devices

Make sure that every Devices get the DHCP IP. If it failed, wait a minute then move the ip status from dhcp, to static, and dhcp again.





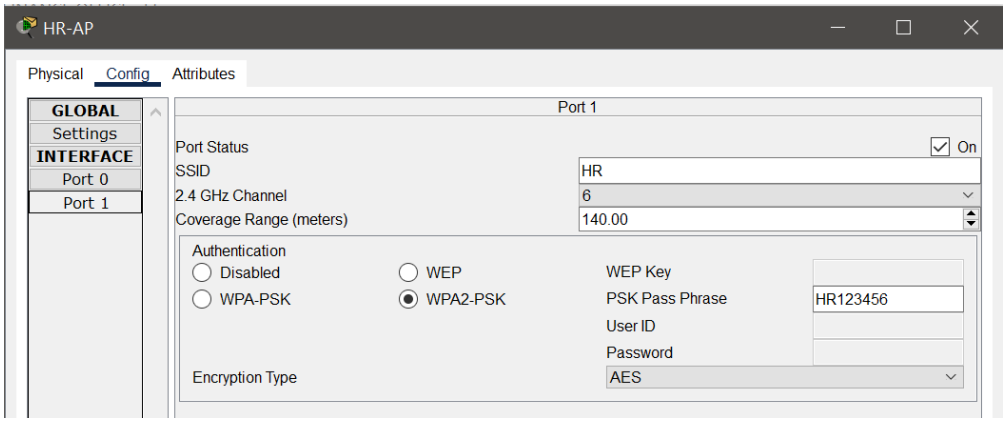
11. Configuring The "Telephony" Networks

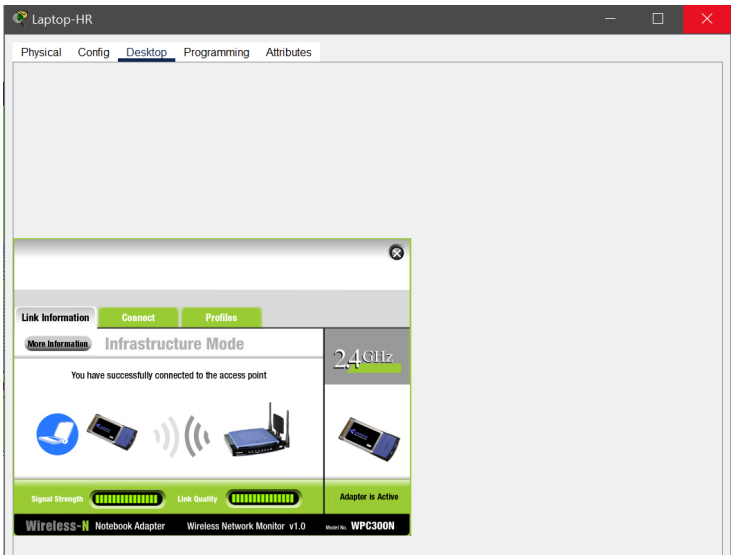
Enter command below on VoIP router to assigning dial number on every IP-Phone.

```
service dhcp pool VOICE
network 10.10.10.0 255.255.255.0
default-router 10.10.10.1
option 150 ip 10.10.10.1
dns-server 10.10.10.1
exit

ip dhcp excluded-address 10.10.10.1

telephony-service
max-ephones 20
max-dn 20
ip source-address 10.10.10.1 port 2000
auto-assign 1 to 20

ephone-dn 0857
ephone-dn 0858
ephone-dn 0859
ephone-dn 0860
ephone-dn 0861
ephone-dn 0862
ephone-dn 0863
ephone-dn 0864
ephone-dn 0865
ephone-dn 0866

exit
do wr

//If the IP-Phone doesnt get the dial number yet, do command below on
VoIP Router

do reload
```

12.Configuring The Wireless Network

Set wireless network, from SSID, authentication mode, to password. Fill in according to the Departements, connect each device available assigned to be wireless devices. The example is on picture below.





13. Configuring The Access List

For making only the IP Departement that can access the switch to the server and router, do some steps below.

```
//for checking the access list, use command below on every
laptop on command prompt from different departement

ssh -l cisco 192.168.20.1

//enter the password and the multilayer switch can be accessed
```

```
//HQ-MLSW1,HQ-MLSW2, VoIP Router, and every router

access-list 10 permit 192.168.20.224 0.0.0.31 //(IP of IT
Departement)
access-list 10 deny any

line vty 0 15
access-class 10 in
exit

do wr

//after the command was applied,do the "check" command, it will
show that the connection is denied
```

14. Configuring the PAT (Private Address Translation)

Enter command below to HQ Router's CLI to configure the PAT.

```
int range gig0/0-1
ip nat inside
exit

int se0/2/0
ip nat outside
int se0/2/1
ip nat outside
exit

access-list 50 permit 192.168.20.0 0.0.0.255 //(this is for nat)

ip nat inside source list 50 interface se0/2/0 overload
ip nat inside source list 50 interface se0/2/1 overload

exit
do wr
```

15. Configuring the VPN

Enter command below to HQ Router and Server Router's CLI.

```
license boot module c2900 technology-package securityk9

yes

do reload

yes
```

Then, enter command below to Server Router's CLI.

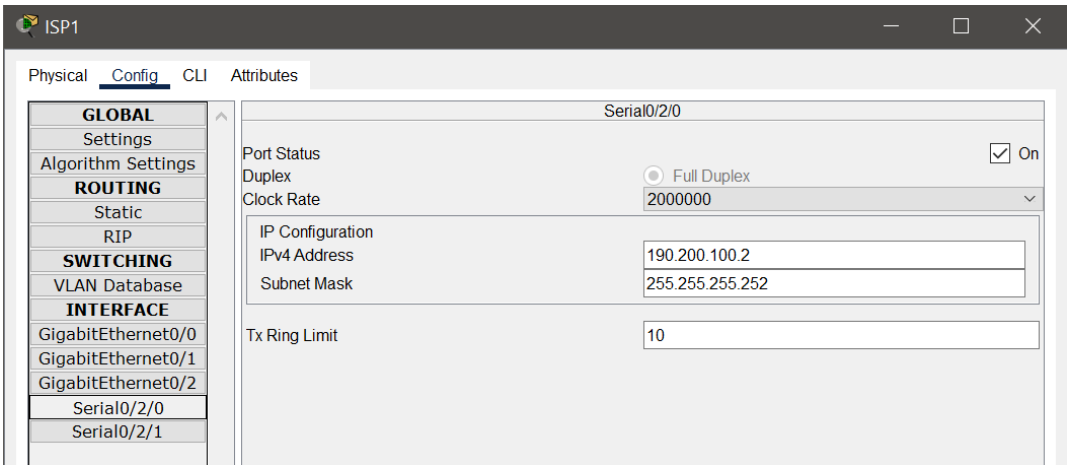
```
access-list 110 permit ip 192.168.21.0 0.0.0.15 192.168.20.0
0.0.0.255

crypto isakmp policy 10

encryption aes 256

authentication pre-share

group 5

exit

crypto isakmp key vpnpa55 address 190.200.100.1

crypto ipsec transform-set VPN-SET esp-aes esp-sha-hmac

crypto map VPN-MAP 10 ipsec-isakmp

description VPN connection to HQ-NETWORK

set peer 190.200.100.1

set transform-set VPN-SET

match address 110

exit

interface s0/2/0

crypto map VPN-MAP
exit


do wr
```

Then, enter command below to HQ Router's CLI.

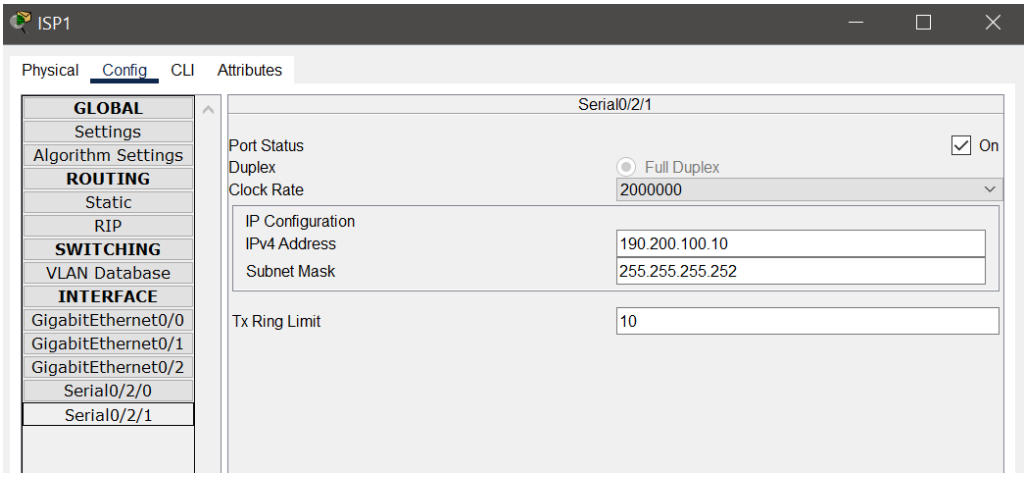
```
access-list 110 permit ip 192.168.20.0 0.0.0.255 192.168.21.0
0.0.0.15

crypto isakmp policy 10

encryption aes 256

authentication pre-share

group 5

exit

crypto isakmp key vpnpa55 address 190.200.100.9

crypto ipsec transform-set VPN-SET esp-aes esp-sha-hmac

crypto map VPN-MAP 10 ipsec-isakmp

description VPN connection to HQ-NETWORK

set peer 190.200.100.9

set transform-set VPN-SET

match address 110

exit

interface s0/2/0

crypto map VPN-MAP
exit


do wr
```

DOCUMENTATION - ROUTER CONFIGURATION

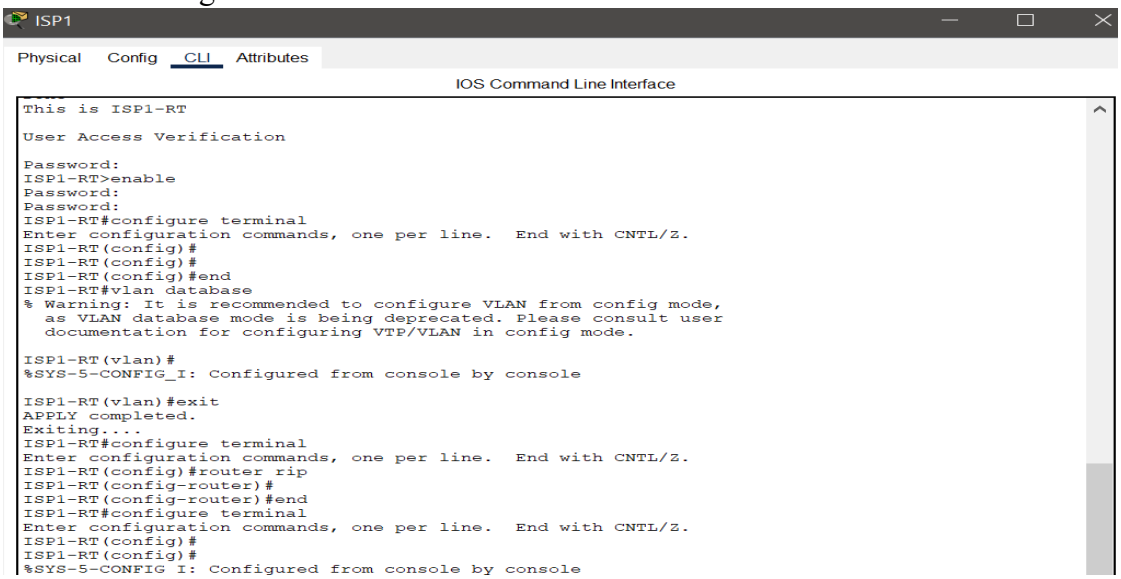
ISP1 Serial Port configuration



ISP1 Serial Port configuration

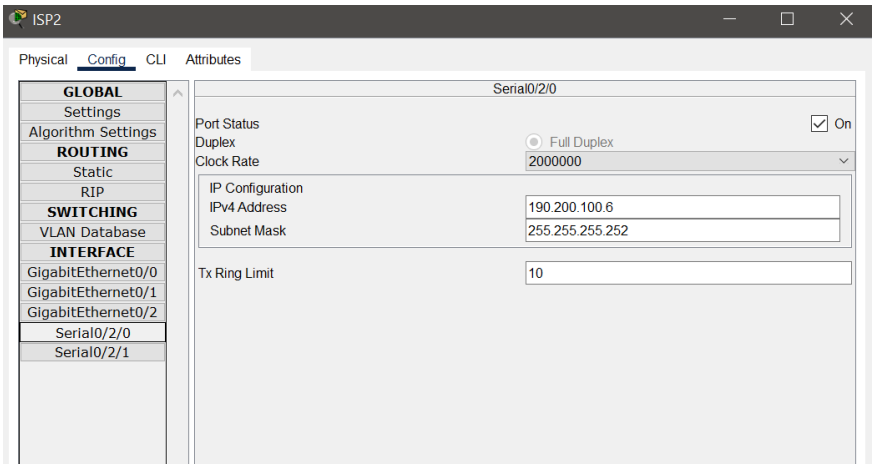


CLI ISP1 configuration

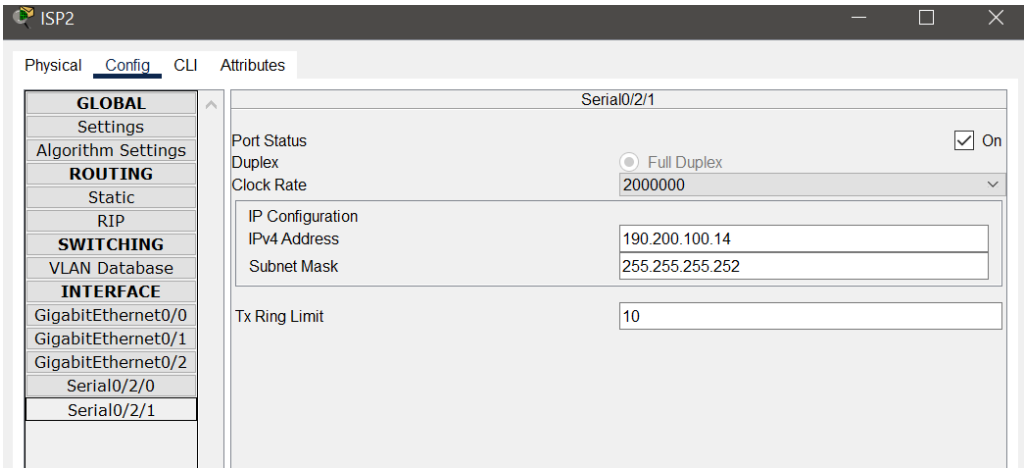


DOCUMENTATION - ROUTER CONFIGURATION

ISP2 Serial Port configuration



ISP2 Serial Port configuration

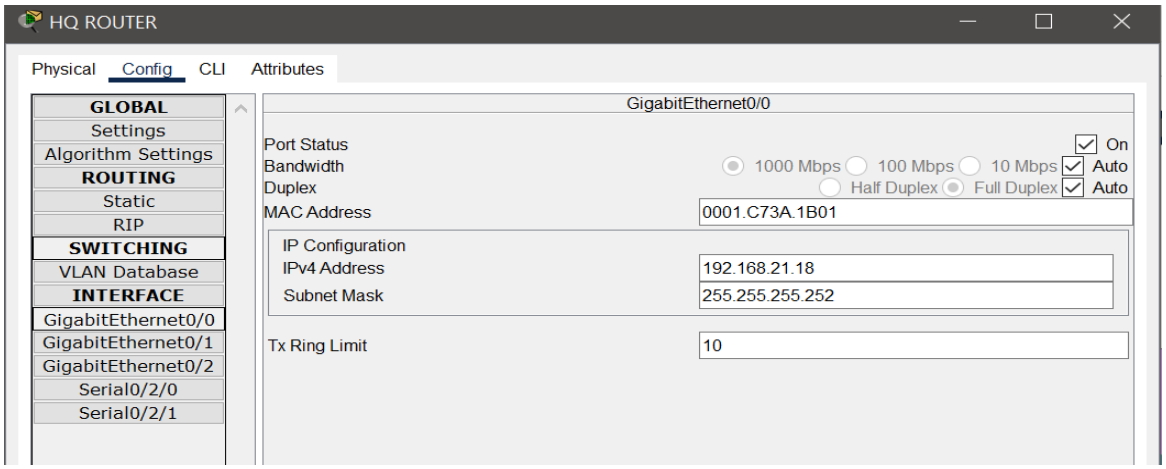


CLI ISP2 configuration

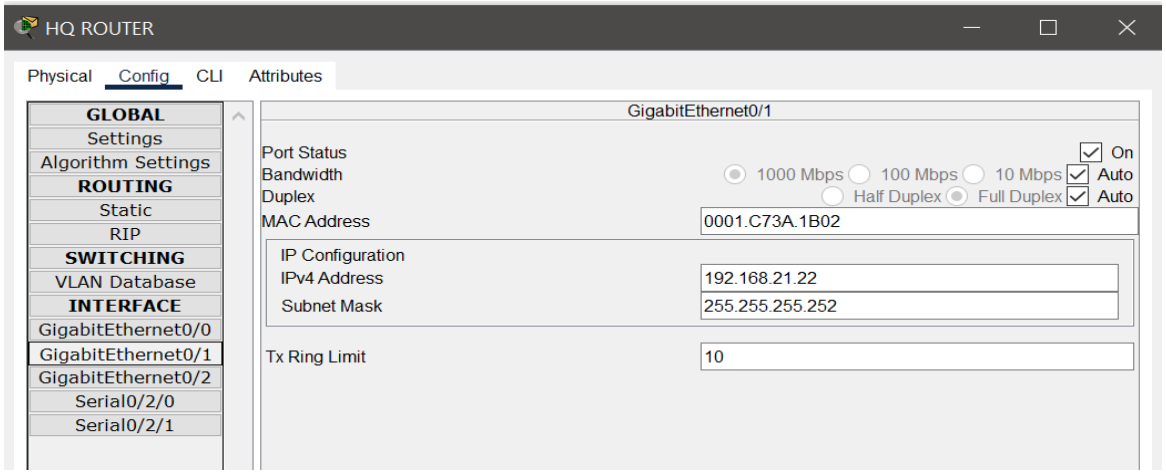
```
This is ISP2-RT

User Access Verification

Password:
ISP2-RT>enable
Password:
Password:
ISP2-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
ISP2-RT(config)#interface Serial0/2/1
ISP2-RT(config-if)#ISP2-RT(config-if)#
ISP2-RT(config-if)#exit
ISP2-RT(config)#interface Serial0/2/1
ISP2-RT(config-if)#% Bad secrets

ISP2-RT(config-if)#
ISP2-RT(config-if)#exit
ISP2-RT(config)#interface Serial0/2/1
ISP2-RT(config-if)#
```

DOCUMENTATION - ROUTER CONFIGURATION

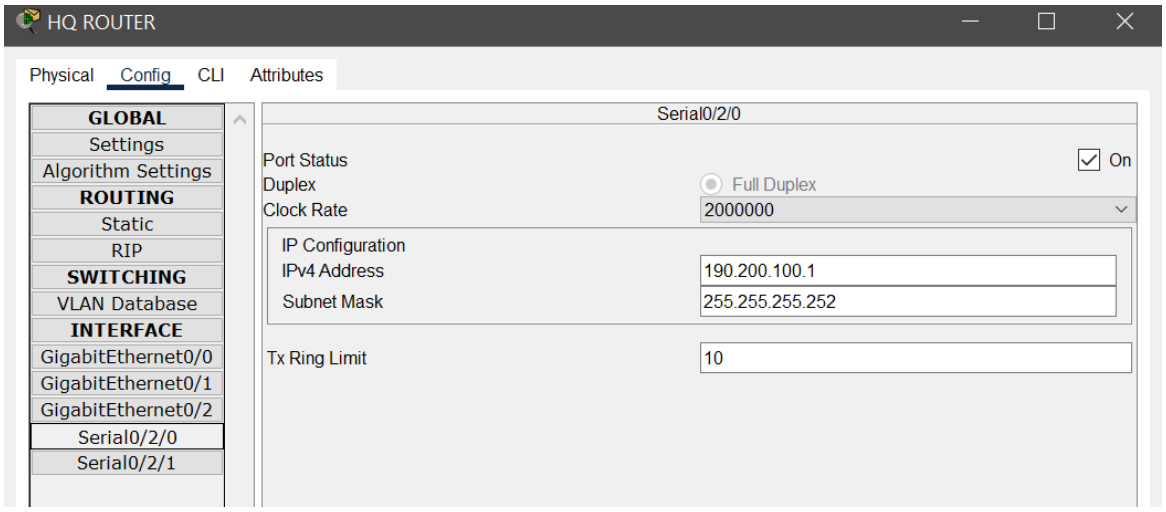
HQ Router IP configuration



HQ Router IP 2 configuration

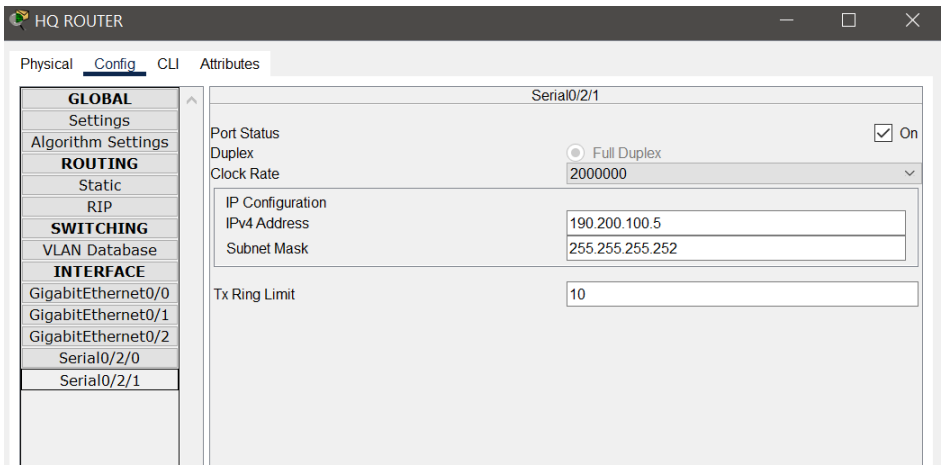


HQ Router Serial configuration



DOCUMENTATION - ROUTER CONFIGURATION

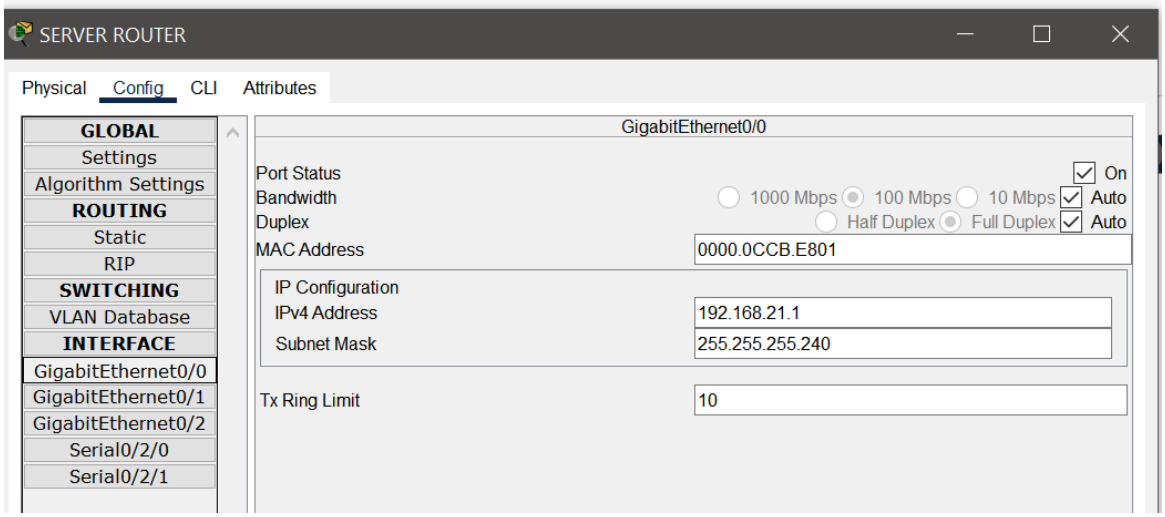
HQ Router Serial configuration



CLI HQ Router configuration

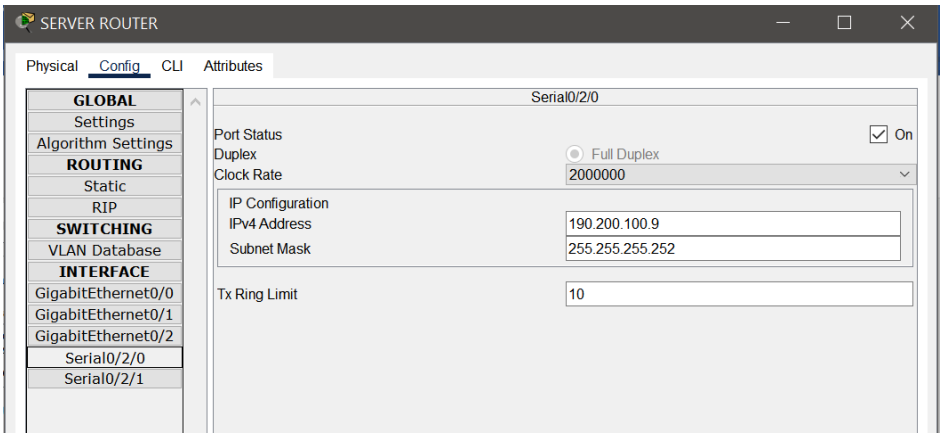
```
This is HQ-RT

User Access Verification

Password:
HQ-RT>enable
Password:
Password:
HQ-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
HQ-RT(config)#interface Serial0/2/1
HQ-RT(config-if)#
```

Server Router IP configuration

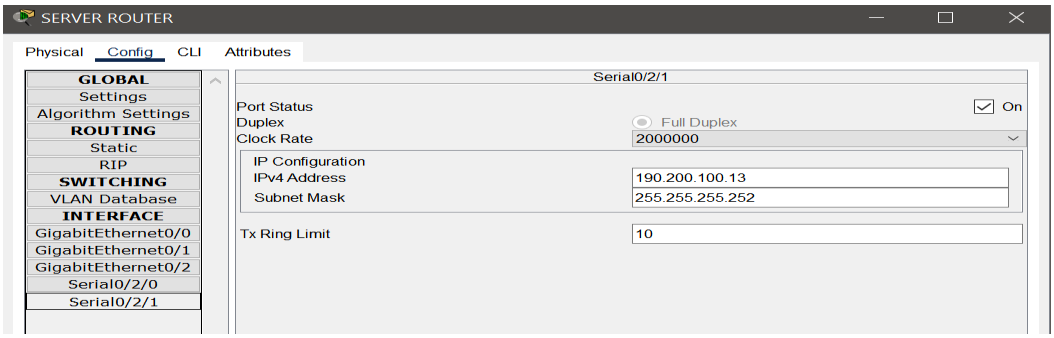


DOCUMENTATION - ROUTER CONFIGURATION

Server Router Serial configuration



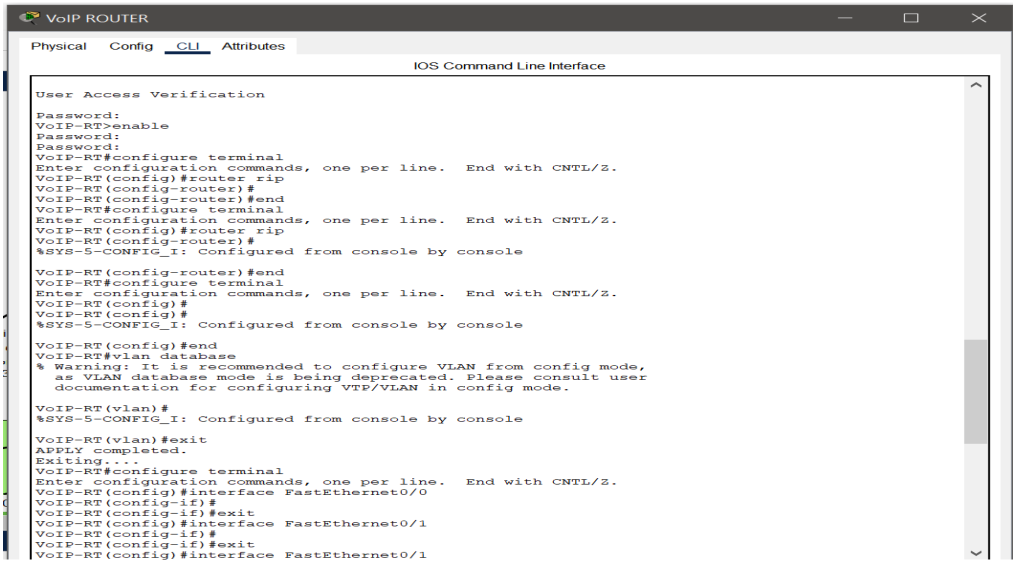
Server Router Serial configuration



CLI Server Router configuration

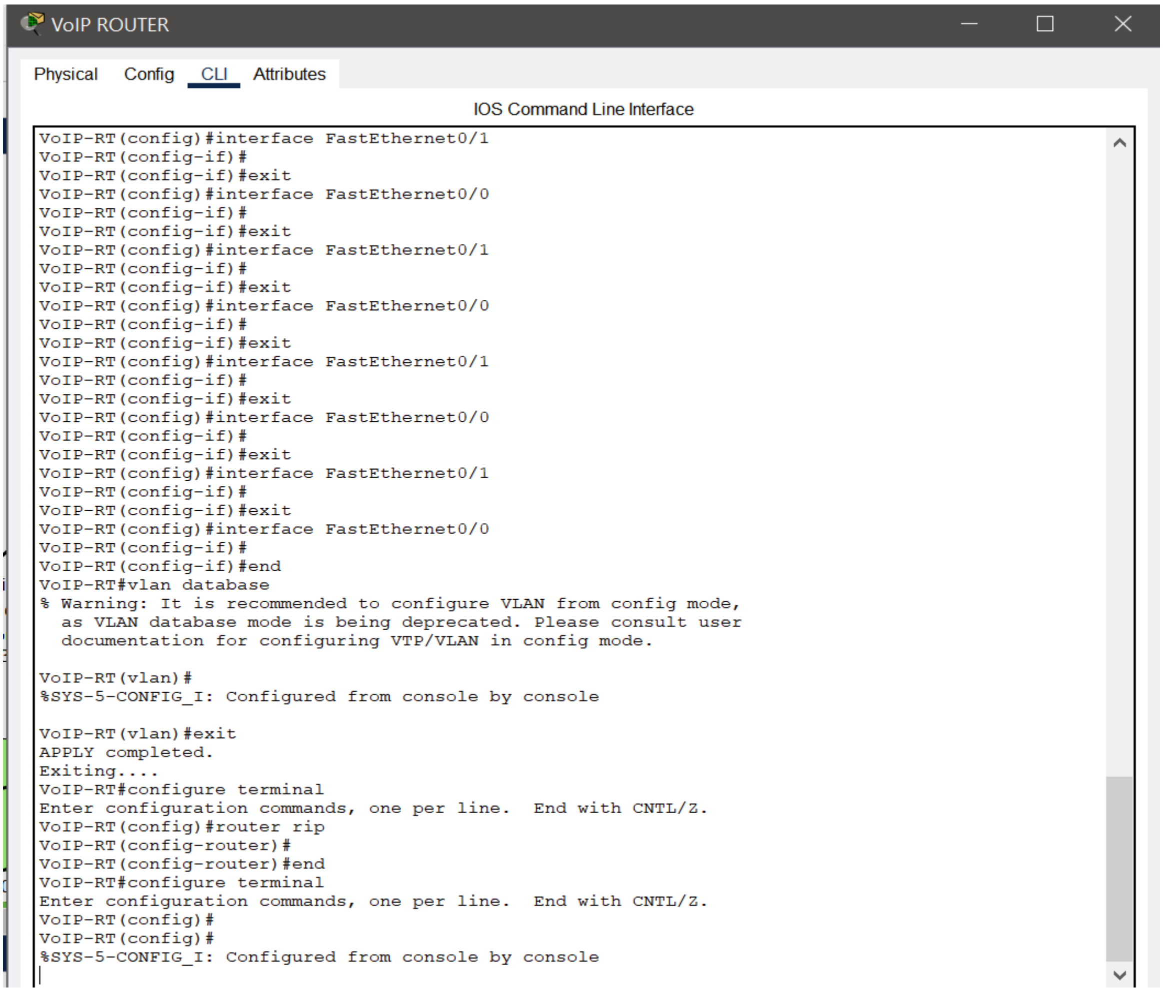
DOCUMENTATION - ROUTER CONFIGURATION

CLI VoIP Router configuration




```
User Access Verification

Password:
VoIP-RT>enable
Password:
Password:
VoIP-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
VoIP-RT(config)#router rip
VoIP-RT(config-router)#
VoIP-RT(config-router)#end
VoIP-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
VoIP-RT(config)#router rip
VoIP-RT(config-router)#
%SYS-5-CONFIG_I: Configured from console by console

VoIP-RT(config-router)#end
VoIP-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
VoIP-RT(config)#
VoIP-RT(config)#
%SYS-5-CONFIG_I: Configured from console by console

VoIP-RT(config)#end
VoIP-RT#vlan database
% Warning: It is recommended to configure VLAN from config mode,
  as VLAN database mode is being deprecated. Please consult user
  documentation for configuring VTP/VLAN in config mode.

VoIP-RT(vlan)#
%SYS-5-CONFIG_I: Configured from console by console

VoIP-RT(vlan)#exit
APPLY completed.
Exiting....
VoIP-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
VoIP-RT(config)#interface FastEthernet0/0
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/1
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/1
```

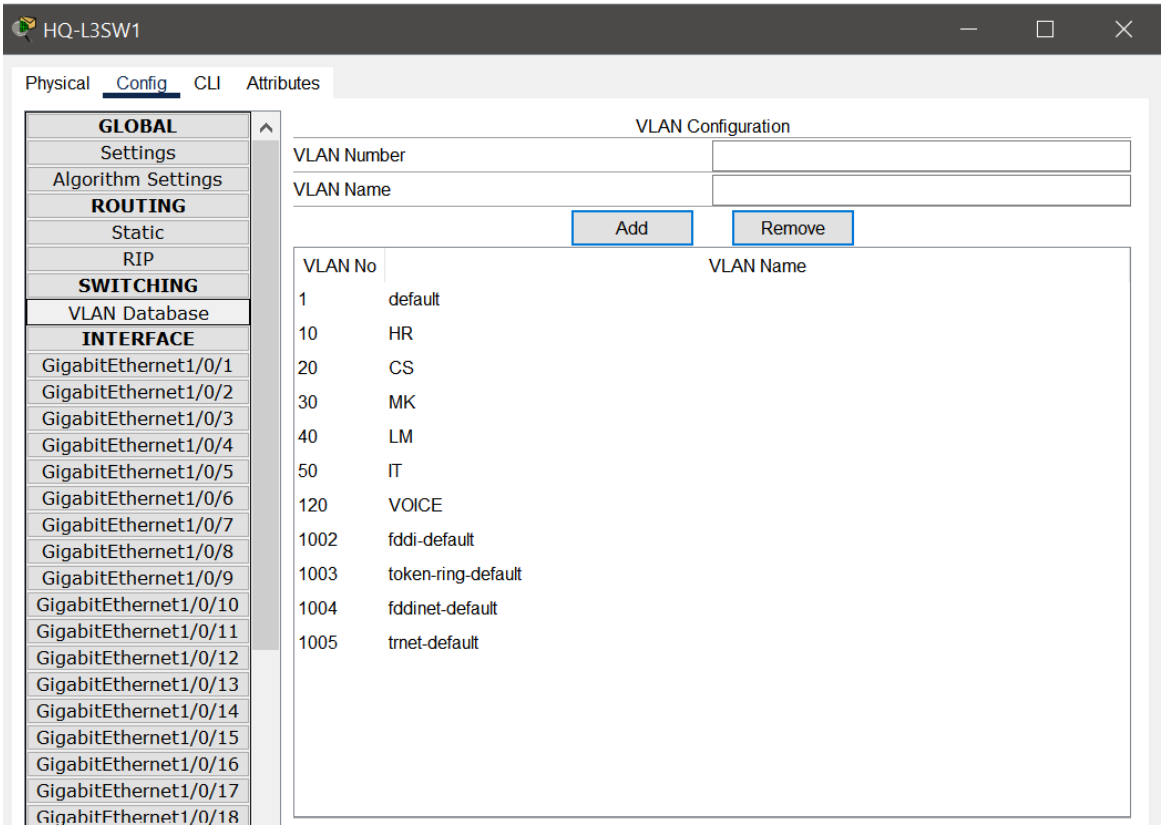
CLI VoIP Router configuration



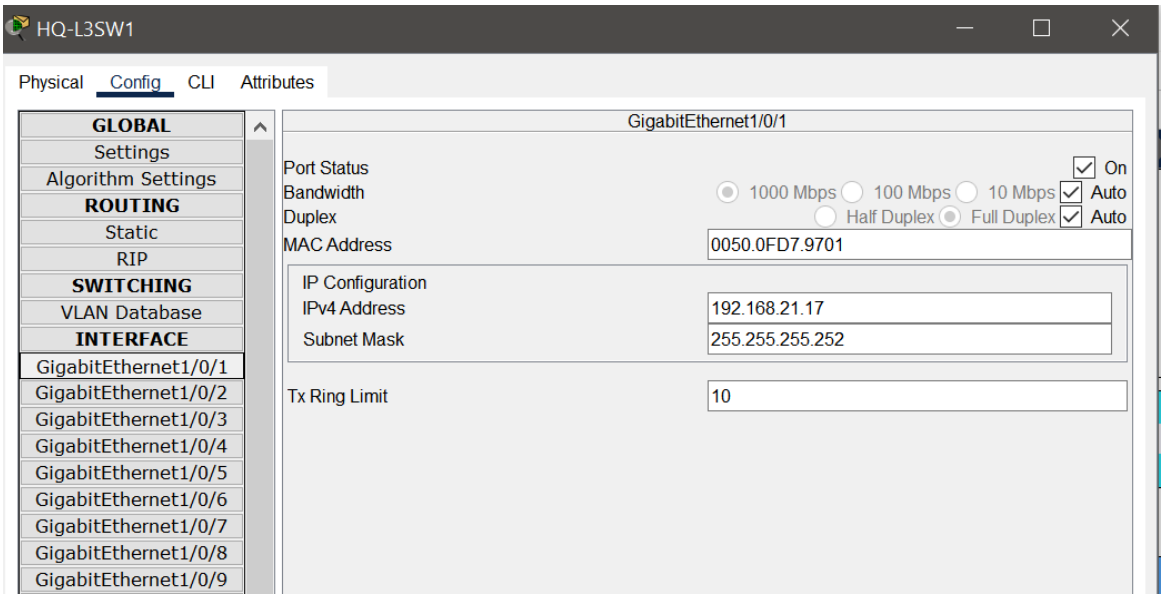

```
VoIP-RT(config)#interface FastEthernet0/1
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/0
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/1
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/0
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/1
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/0
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/1
VoIP-RT(config-if)#
VoIP-RT(config-if)#exit
VoIP-RT(config)#interface FastEthernet0/0
VoIP-RT(config-if)#
VoIP-RT(config-if)#end
VoIP-RT#vlan database
% Warning: It is recommended to configure VLAN from config mode,
  as VLAN database mode is being deprecated. Please consult user
  documentation for configuring VTP/VLAN in config mode.

VoIP-RT(vlan)#
%SYS-5-CONFIG_I: Configured from console by console

VoIP-RT(vlan)#exit
APPLY completed.
Exiting....
VoIP-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
VoIP-RT(config)#router rip
VoIP-RT(config-router)#
VoIP-RT(config-router)#end
VoIP-RT#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
VoIP-RT(config)#
VoIP-RT(config)#
%SYS-5-CONFIG_I: Configured from console by console
```

DOCUMENTATION - FIRST FLOOR CONFIGURATION

Multilayer Switch HQ-L3SW1 VLAN configuration

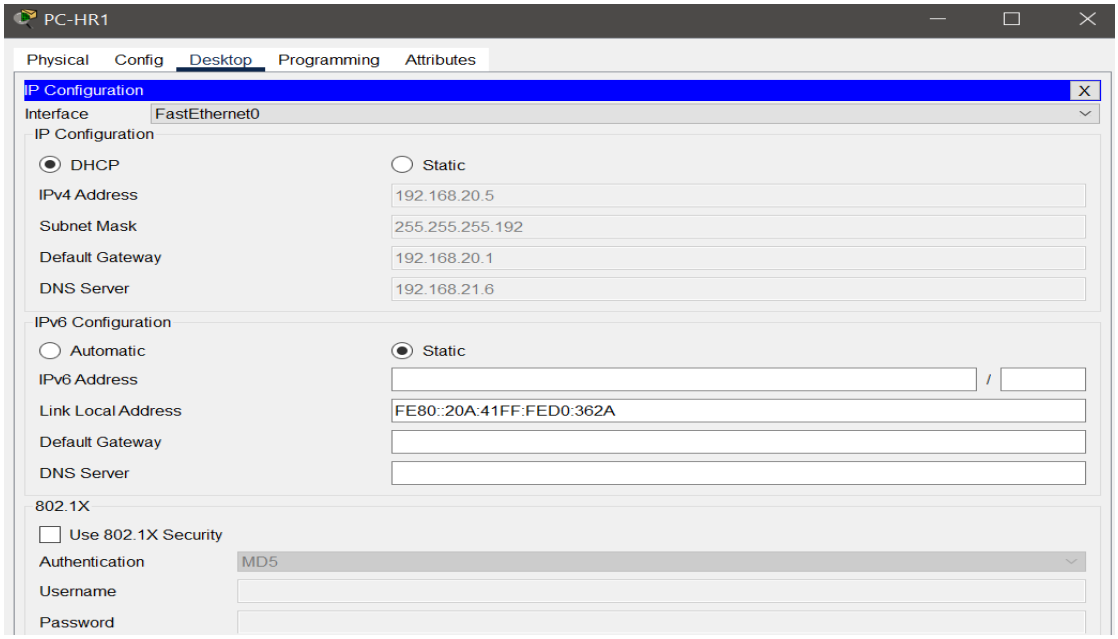


Multilayer Switch HQ-L3SW1 IP configuration

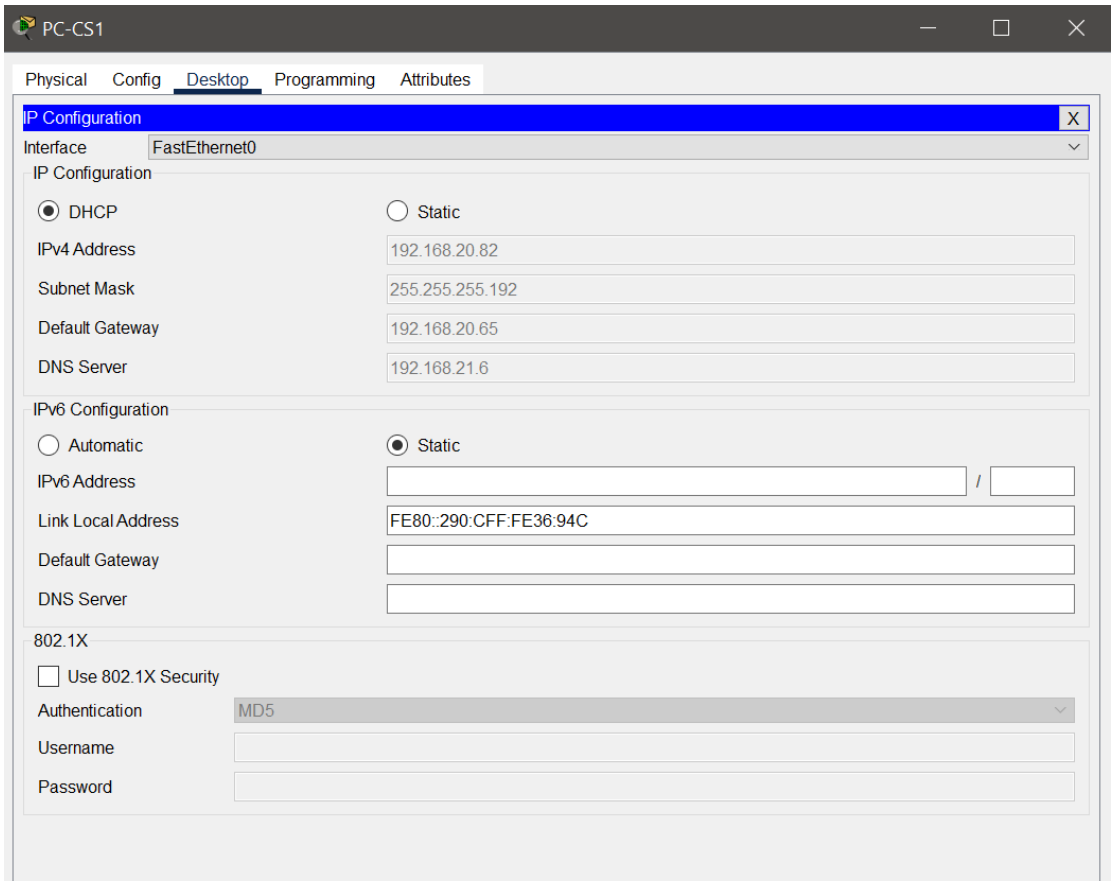


DOCUMENTATION - FIRST FLOOR CONFIGURATION

PC-HR1 DHCP IP configuration

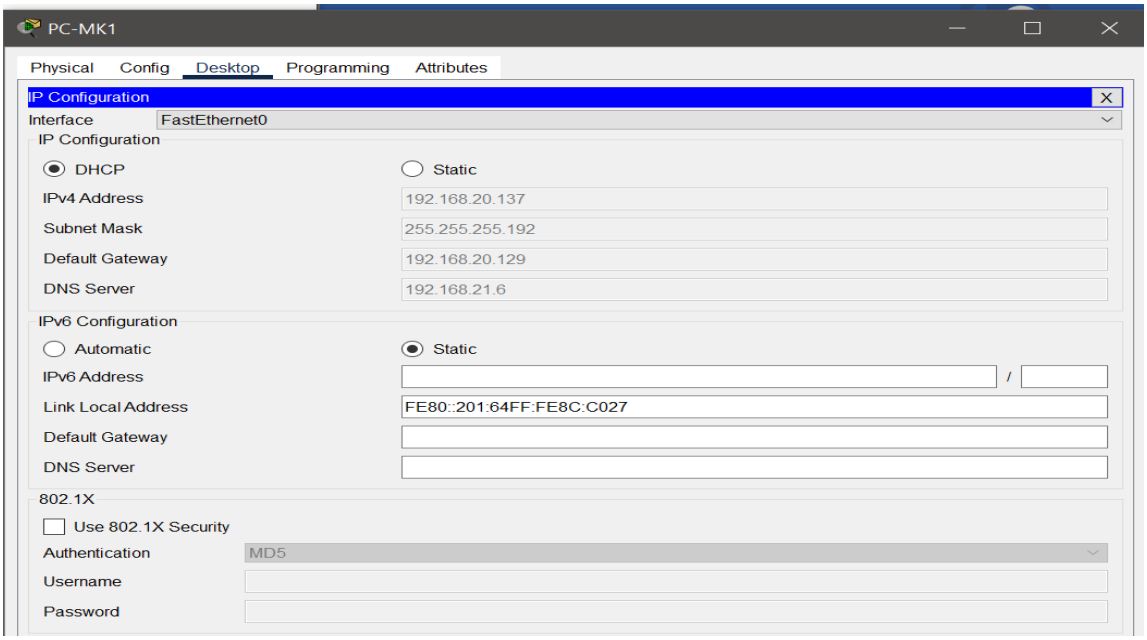


PC-CS1 DHCP IP configuration

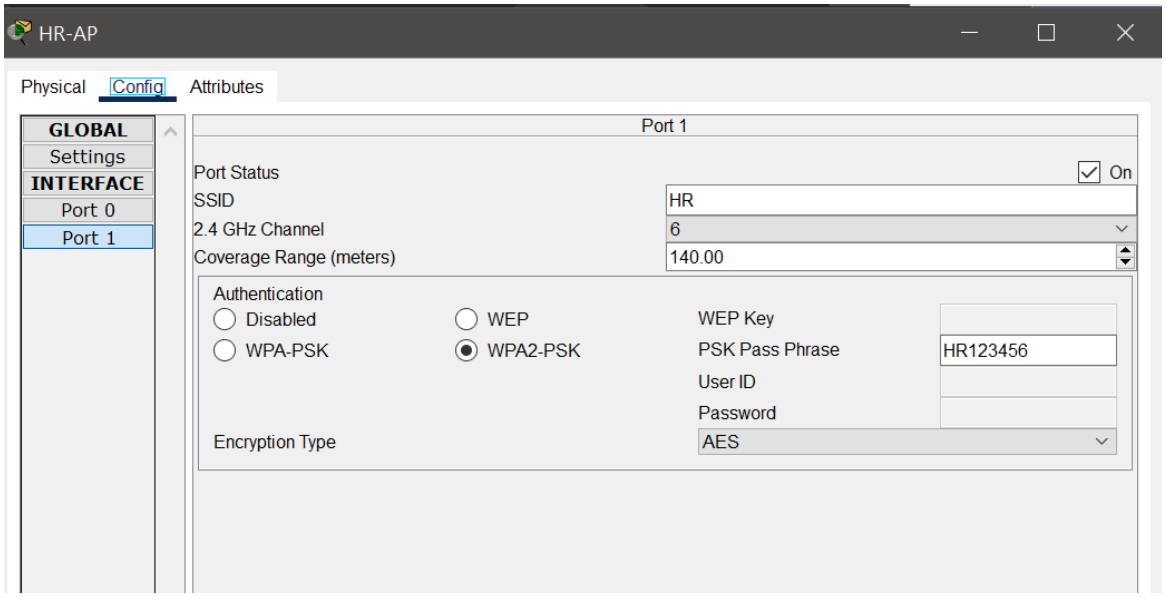


DOCUMENTATION - FIRST FLOOR CONFIGURATION

PC-MK1 DHCP IP configuration

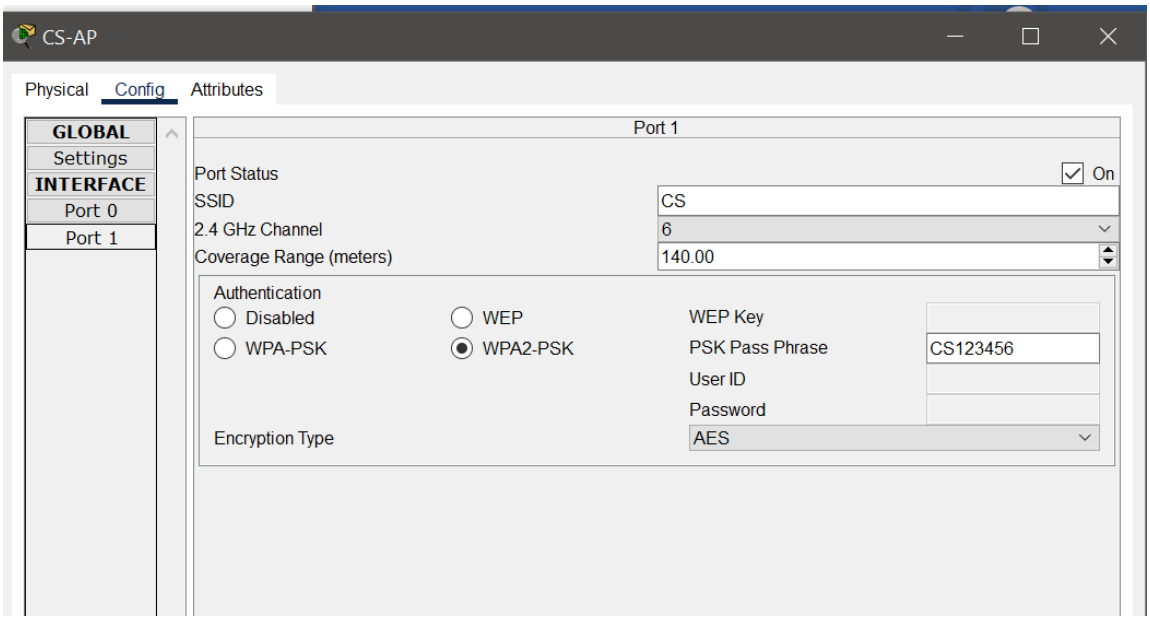


HR-AP IP configuration

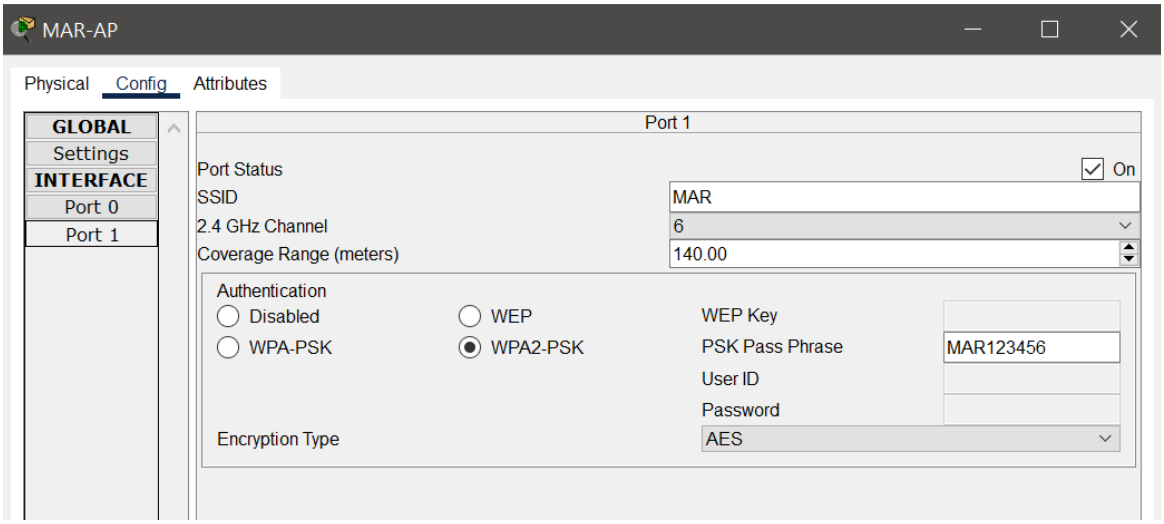


DOCUMENTATION - FIRST FLOOR CONFIGURATION

CS-AP IP configuration

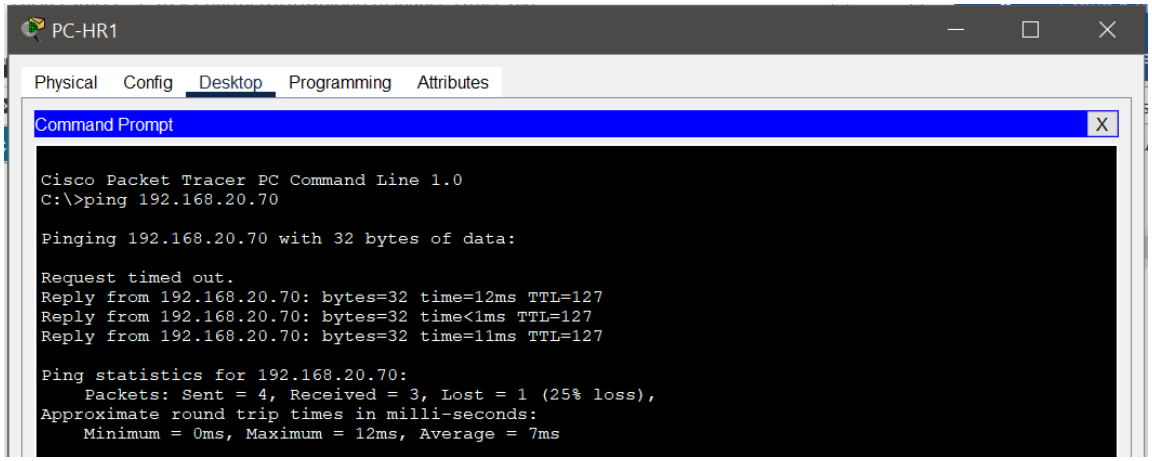


MAR-AP IP configuration



DOCUMENTATION - FIRST FLOOR CONFIGURATION

Ping PC-HR1 to Customer Service



Ping PC-HR1 to Marketing

```
C:\>ping 192.168.20.142

Pinging 192.168.20.142 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.142: bytes=32 time=10ms TTL=127
Reply from 192.168.20.142: bytes=32 time=87ms TTL=127
Reply from 192.168.20.142: bytes=32 time=9ms TTL=127

Ping statistics for 192.168.20.142:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 9ms, Maximum = 87ms, Average = 35ms
```

Ping PC-HR1 to Legal Management

```
C:\>ping 192.168.20.199

Pinging 192.168.20.199 with 32 bytes of data:

Reply from 192.168.20.199: bytes=32 time<1ms TTL=127
Reply from 192.168.20.199: bytes=32 time=44ms TTL=127
Reply from 192.168.20.199: bytes=32 time=44ms TTL=127
Reply from 192.168.20.199: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.199:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 44ms, Average = 22ms
```

DOCUMENTATION - FIRST FLOOR CONFIGURATION

Ping PC-HR1 to IT

```
C:\>ping 192.168.20.230

Pinging 192.168.20.230 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.230: bytes=32 time<1ms TTL=127
Reply from 192.168.20.230: bytes=32 time<1ms TTL=127
Reply from 192.168.20.230: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.230:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping PC-HR1 to DHCP Server

```
C:\>ping 192.168.21.5

Pinging 192.168.21.5 with 32 bytes of data:

Reply from 192.168.21.5: bytes=32 time=2ms TTL=124
Reply from 192.168.21.5: bytes=32 time=42ms TTL=124
Reply from 192.168.21.5: bytes=32 time=19ms TTL=124
Reply from 192.168.21.5: bytes=32 time=12ms TTL=124

Ping statistics for 192.168.21.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 42ms, Average = 18ms
```

Ping PC-HR1 to Web Server

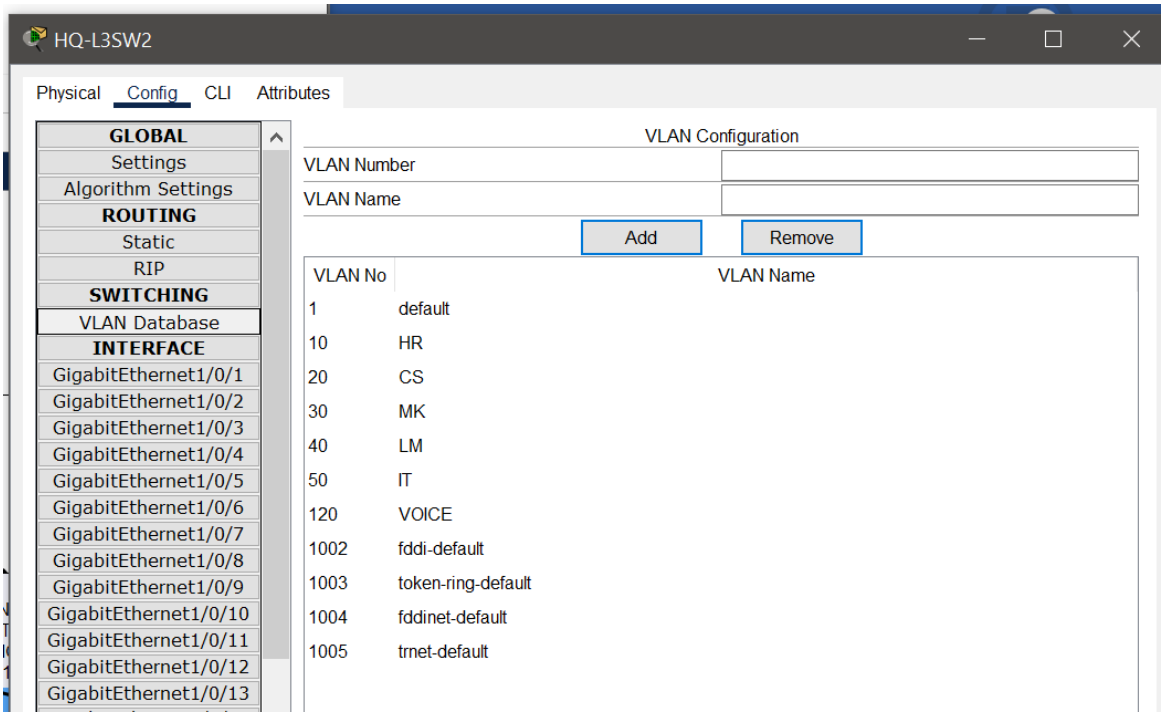
```
C:\>ping 192.168.21.7

Pinging 192.168.21.7 with 32 bytes of data:

Request timed out.
Reply from 192.168.21.7: bytes=32 time=3ms TTL=124
Reply from 192.168.21.7: bytes=32 time=3ms TTL=124
Reply from 192.168.21.7: bytes=32 time=3ms TTL=124

Ping statistics for 192.168.21.7:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 3ms, Average = 3ms
```

Ping PC-HR1 to DNS Server

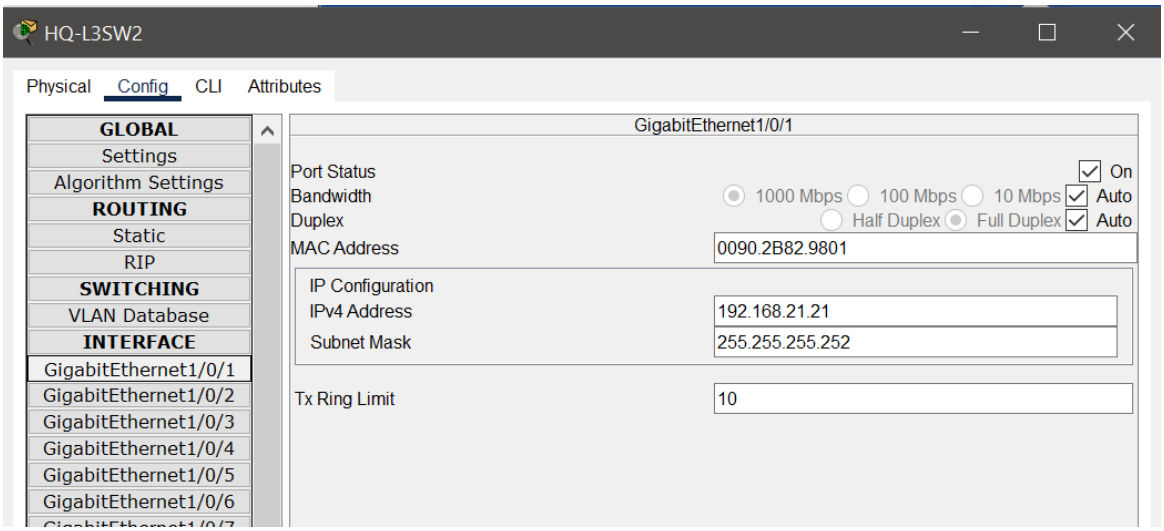
```
C:\>ping 192.168.21.6

Pinging 192.168.21.6 with 32 bytes of data:

Request timed out.
Reply from 192.168.21.6: bytes=32 time=4ms TTL=124
Reply from 192.168.21.6: bytes=32 time=21ms TTL=124
Reply from 192.168.21.6: bytes=32 time=2ms TTL=124

Ping statistics for 192.168.21.6:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 21ms, Average = 9ms
```

DOCUMENTATION - SECOND FLOOR CONFIGURATION

Multilayer Switch HQ-L3SW2 VLAN configuration

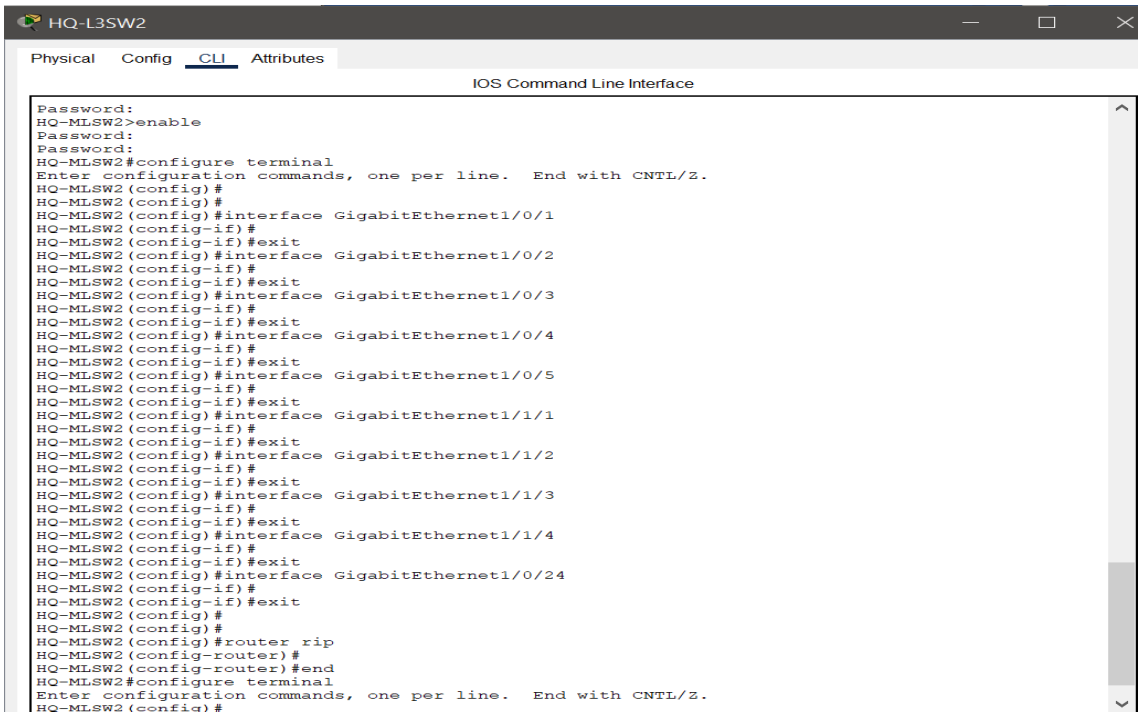


Multilayer Switch HQ-L3SW2 IP configuration

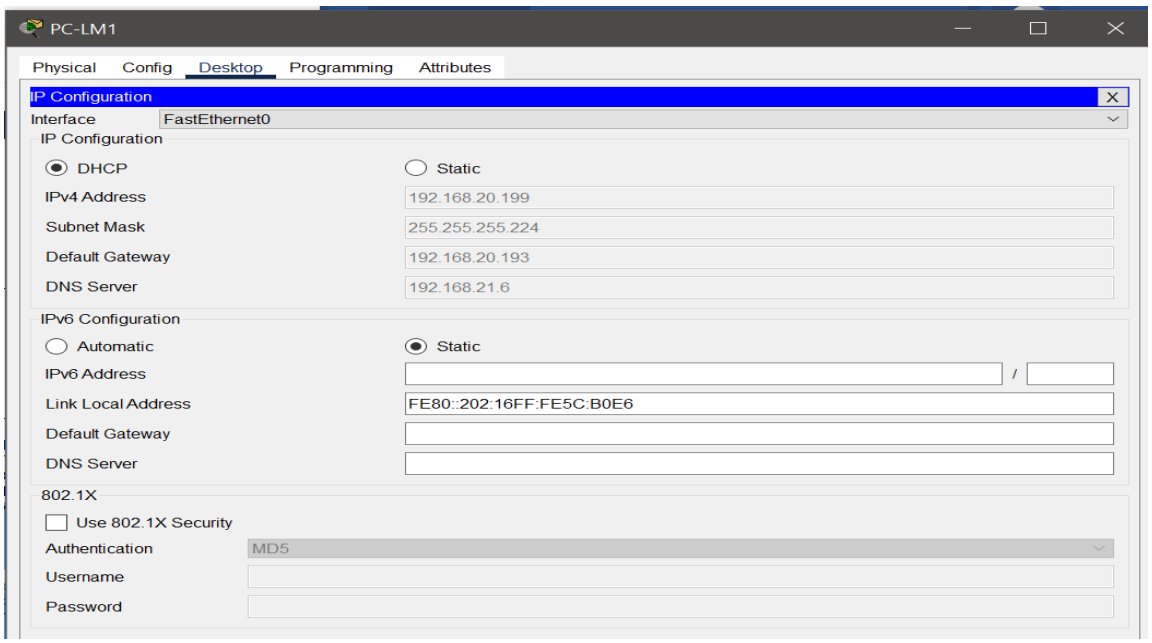


DOCUMENTATION - SECOND FLOOR CONFIGURATION

CLI Multilayer Switch HQ-L3SW2 configuration

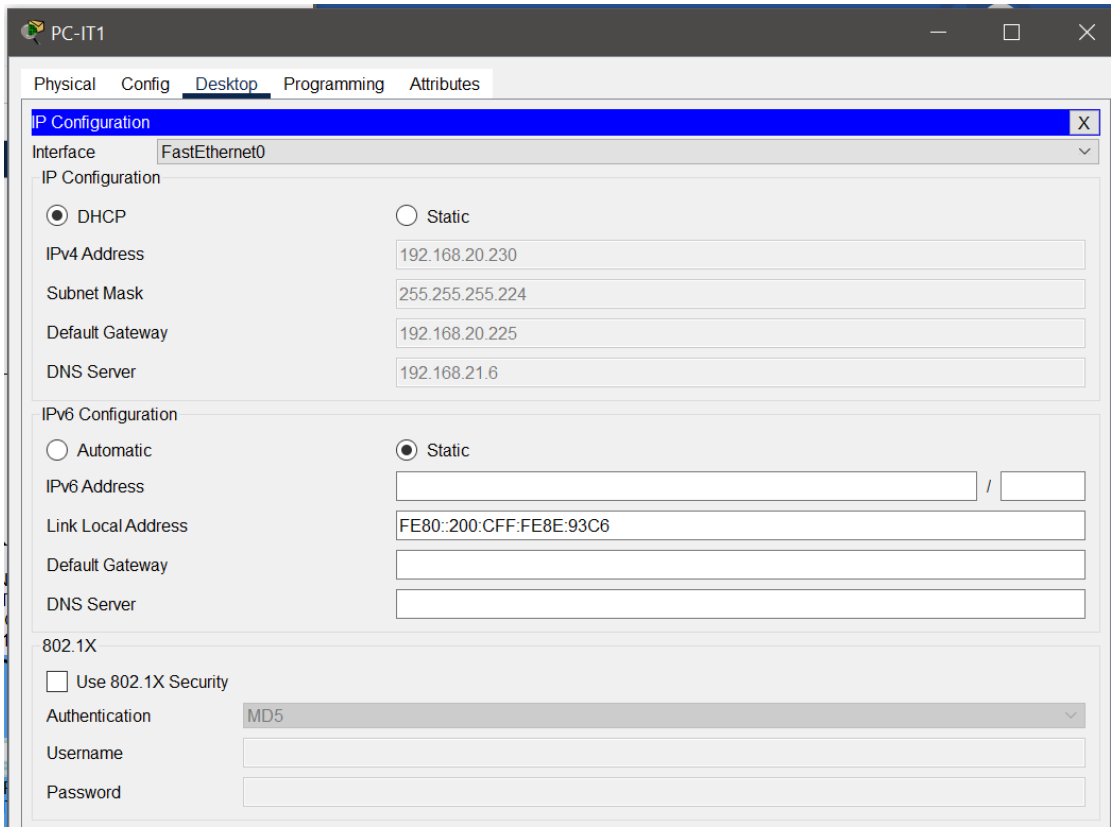


PC-LM1 DHCP IP configuration

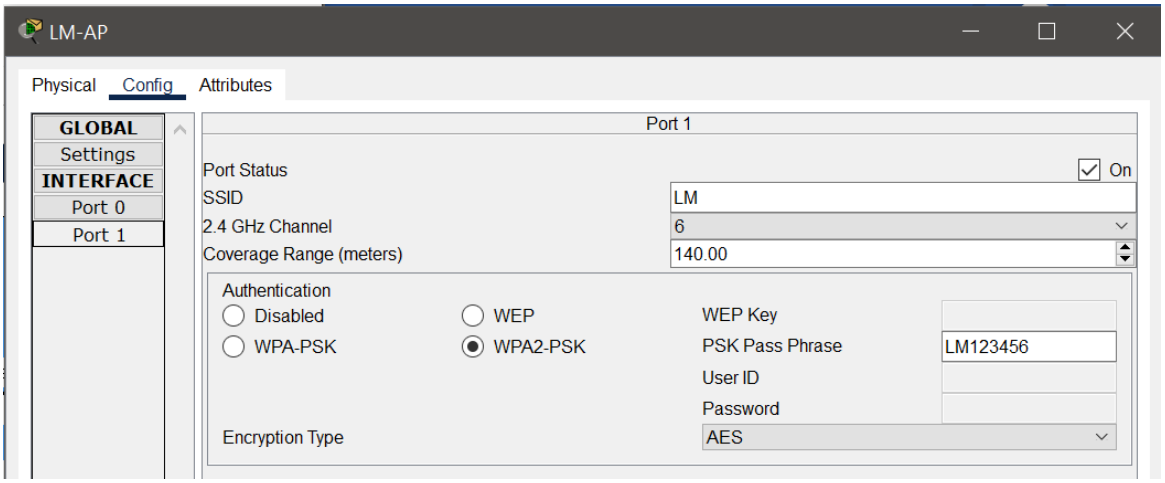


DOCUMENTATION - SECOND FLOOR CONFIGURATION

PC-IT1 DHCP IP configuration

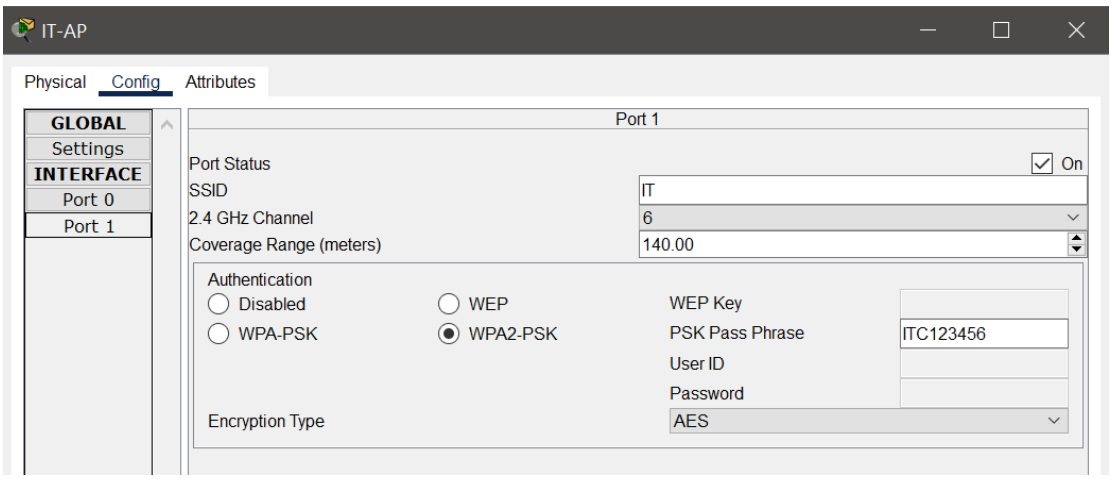


LM-AP IP configuration

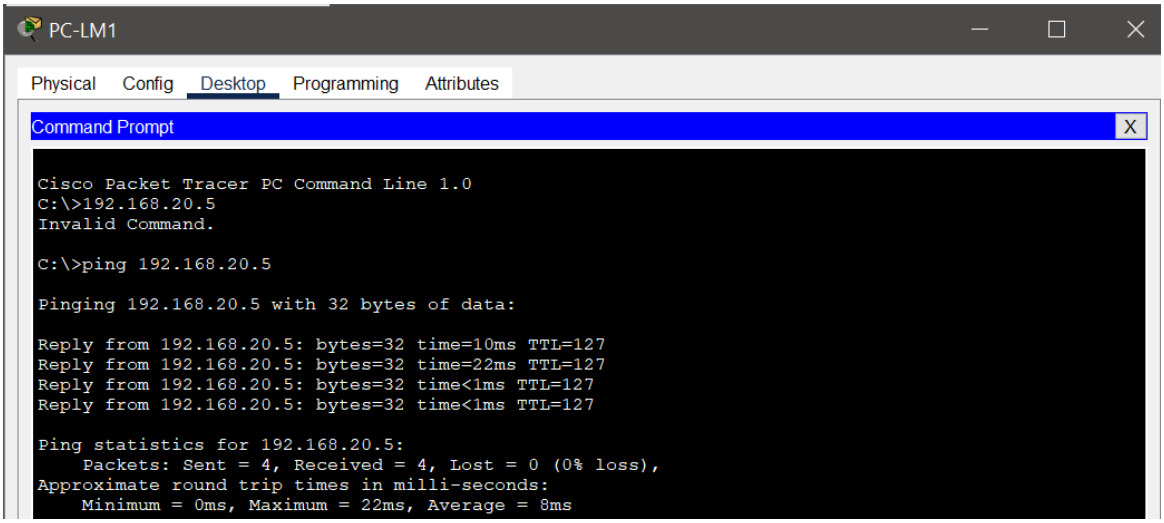


DOCUMENTATION - SECOND FLOOR CONFIGURATION

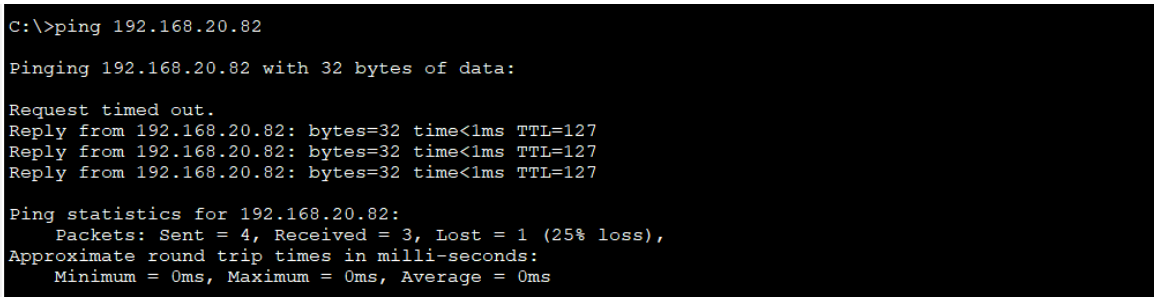
IT-AP IP configuration



Ping PC-LM1 to HR Department



Ping PC-LM1 to Customer Service



DOCUMENTATION - SECOND FLOOR CONFIGURATION

Ping PC-LM1 to Marketing

```
C:\>ping 192.168.20.137

Pinging 192.168.20.137 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.137: bytes=32 time<1ms TTL=127
Reply from 192.168.20.137: bytes=32 time<1ms TTL=127
Reply from 192.168.20.137: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.137:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping PC-LM1 to IT

```
C:\>ping 192.168.20.230

Pinging 192.168.20.230 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.230: bytes=32 time<1ms TTL=127
Reply from 192.168.20.230: bytes=32 time<1ms TTL=127
Reply from 192.168.20.230: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.230:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping PC-LM1 to DHCP Server

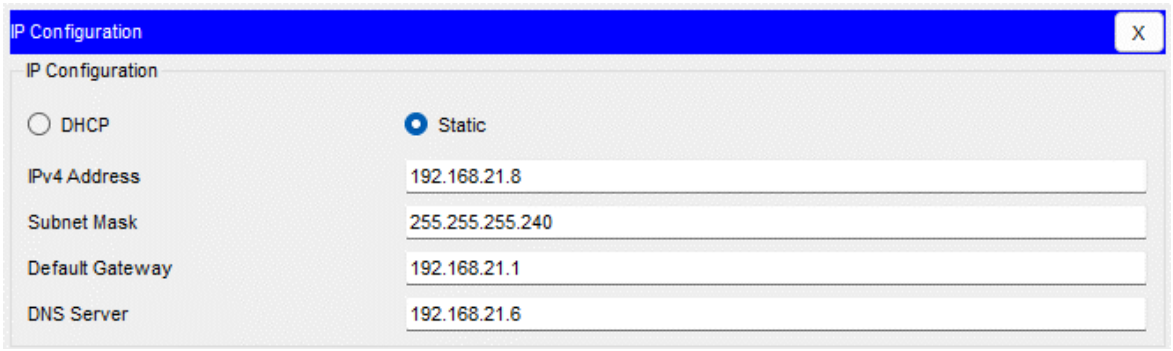
```
C:\>ping 192.168.21.5

Pinging 192.168.21.5 with 32 bytes of data:

Reply from 192.168.21.5: bytes=32 time=2ms TTL=124
Reply from 192.168.21.5: bytes=32 time=2ms TTL=124
Reply from 192.168.21.5: bytes=32 time=2ms TTL=124
Reply from 192.168.21.5: bytes=32 time=3ms TTL=124

Ping statistics for 192.168.21.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 3ms, Average = 2ms
```

Ping PC-LM1 to DHCP Server

```
C:\>ping 192.168.21.7

Pinging 192.168.21.7 with 32 bytes of data:

Reply from 192.168.21.7: bytes=32 time=2ms TTL=124
Reply from 192.168.21.7: bytes=32 time=2ms TTL=124
Reply from 192.168.21.7: bytes=32 time=2ms TTL=124
Reply from 192.168.21.7: bytes=32 time=2ms TTL=124

Ping statistics for 192.168.21.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 2ms, Average = 2ms
```

DOCUMENTATION - SERVER ROOM LAN CONFIGURATION

EMAIL SERVER IP Configuration



Ping EMAIL SERVER to WEB SERVER

```
C:\>ping 192.168.21.16

Pinging 192.168.21.16 with 32 bytes of data:

Reply from 190.200.100.5: bytes=32 time=16ms TTL=253
Reply from 190.200.100.1: bytes=32 time=11ms TTL=253
Reply from 190.200.100.5: bytes=32 time=14ms TTL=253
Reply from 190.200.100.1: bytes=32 time=11ms TTL=253
```

Ping EMAIL SERVER via ISP to FIRST FLOOR

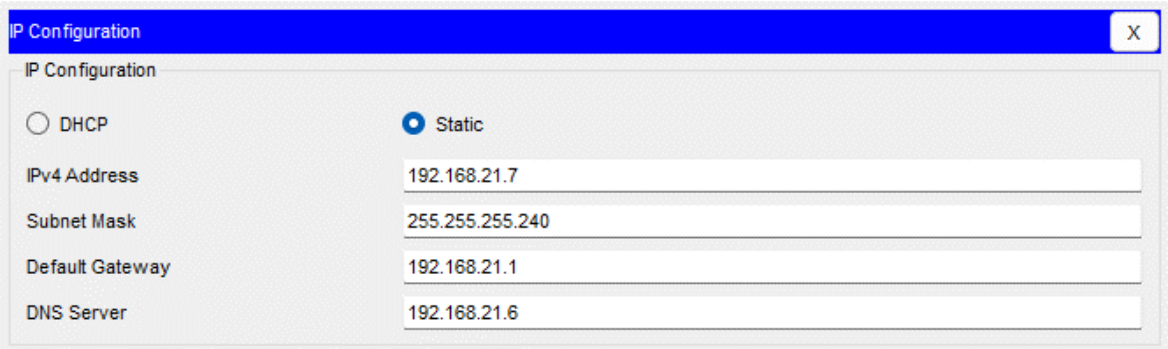
```
C:\>ping 192.168.21.17

Pinging 192.168.21.17 with 32 bytes of data:

Reply from 192.168.21.17: bytes=32 time=13ms TTL=252
Reply from 192.168.21.17: bytes=32 time=4ms TTL=252
Reply from 192.168.21.17: bytes=32 time=4ms TTL=252
Reply from 192.168.21.17: bytes=32 time=4ms TTL=252
```

Ping EMAIL SERVER via ISP to SECOND FLOOR

```
C:\>ping 192.168.21.21

Pinging 192.168.21.21 with 32 bytes of data:

Reply from 192.168.21.21: bytes=32 time=4ms TTL=252
Reply from 192.168.21.21: bytes=32 time=3ms TTL=252
Reply from 192.168.21.21: bytes=32 time=20ms TTL=252
Reply from 192.168.21.21: bytes=32 time=16ms TTL=252
```

DOCUMENTATION - SERVER ROOM LAN CONFIGURATION

WEB SERVER IP Configuration



Ping WEB SERVER to DHCP SERVER

```
C:\>ping 192.168.21.5

Pinging 192.168.21.5 with 32 bytes of data:

Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
```

Ping WEB SERVER via ISP to FIRST FLOOR

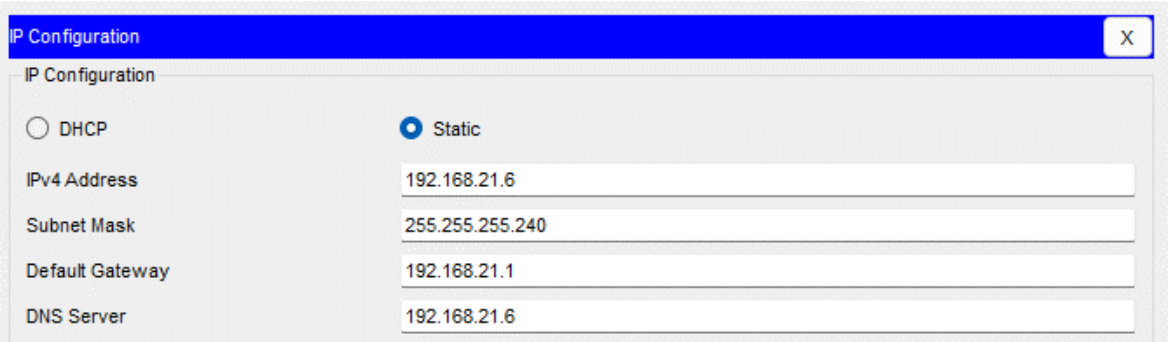
```
C:\>ping 192.168.21.17

Pinging 192.168.21.17 with 32 bytes of data:

Reply from 192.168.21.17: bytes=32 time=2ms TTL=252
Reply from 192.168.21.17: bytes=32 time=15ms TTL=252
Reply from 192.168.21.17: bytes=32 time=18ms TTL=252
Reply from 192.168.21.17: bytes=32 time=18ms TTL=252
```

Ping WEB SERVER via ISP to SECOND FLOOR

```
C:\>ping 192.168.21.22

Pinging 192.168.21.22 with 32 bytes of data:

Reply from 192.168.21.22: bytes=32 time=17ms TTL=253
Reply from 192.168.21.22: bytes=32 time=19ms TTL=253
Reply from 192.168.21.22: bytes=32 time=13ms TTL=253
Reply from 192.168.21.22: bytes=32 time=11ms TTL=253
```

DOCUMENTATION - SERVER ROOM LAN CONFIGURATION

DNS SERVER IP Configuration



Ping DNS SERVER to EMAIL SERVER

```
C:\>ping 192.168.21.8

Pinging 192.168.21.8 with 32 bytes of data:

Reply from 192.168.21.8: bytes=32 time=1ms TTL=128
Reply from 192.168.21.8: bytes=32 time<1ms TTL=128
Reply from 192.168.21.8: bytes=32 time<1ms TTL=128
Reply from 192.168.21.8: bytes=32 time<1ms TTL=128
```

Ping DNS SERVER via ISP to SECOND FLOOR

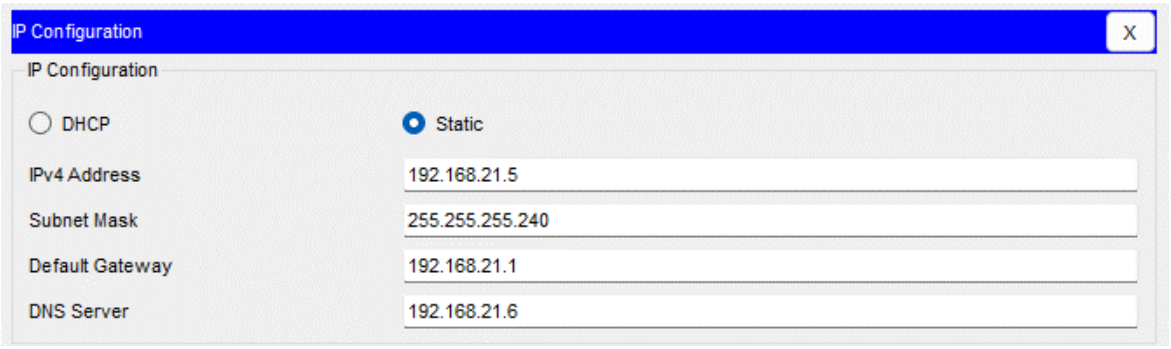
```
C:\>ping 192.168.21.21

Pinging 192.168.21.21 with 32 bytes of data:

Reply from 192.168.21.21: bytes=32 time=4ms TTL=252
Reply from 192.168.21.21: bytes=32 time=3ms TTL=252
Reply from 192.168.21.21: bytes=32 time=20ms TTL=252
Reply from 192.168.21.21: bytes=32 time=16ms TTL=252
```

Ping DNS SERVER via ISP to FIRST FLOOR

```
C:\>ping 192.168.21.17

Pinging 192.168.21.17 with 32 bytes of data:

Reply from 192.168.21.17: bytes=32 time=2ms TTL=252
Reply from 192.168.21.17: bytes=32 time=15ms TTL=252
Reply from 192.168.21.17: bytes=32 time=18ms TTL=252
Reply from 192.168.21.17: bytes=32 time=18ms TTL=252
```

DOCUMENTATION - SERVER ROOM LAN CONFIGURATION

DHCP SERVER IP Configuration



Ping DHCP SERVER to DHCP SERVER

```
C:\>ping 192.168.21.5

Pinging 192.168.21.5 with 32 bytes of data:

Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
Reply from 192.168.21.5: bytes=32 time<1ms TTL=128
```

Ping DHCP SERVER via ISP to SECOND FLOOR

```
C:\>ping 192.168.21.22

Pinging 192.168.21.22 with 32 bytes of data:

Reply from 192.168.21.22: bytes=32 time=17ms TTL=253
Reply from 192.168.21.22: bytes=32 time=19ms TTL=253
Reply from 192.168.21.22: bytes=32 time=13ms TTL=253
Reply from 192.168.21.22: bytes=32 time=11ms TTL=253
```

Ping DHCP SERVER via ISP to FIRST FLOOR

```
C:\>ping 192.168.21.17

Pinging 192.168.21.17 with 32 bytes of data:

Reply from 192.168.21.17: bytes=32 time=2ms TTL=252
Reply from 192.168.21.17: bytes=32 time=15ms TTL=252
Reply from 192.168.21.17: bytes=32 time=18ms TTL=252
Reply from 192.168.21.17: bytes=32 time=18ms TTL=252
```

REQUIREMENTS

Hardware :

1. Lenovo Slim 1

Operating System :

1. Windows 10

Software :

1. Cisco Packet Tracer
2. Microsoft Word
3. Google Drive

PROJECT FILE DETAILS		
No	File Name	Remarks
1	Group 6 Project 1.pdf	Paper File
2	Finance Office.pkt	Packet Tracer File
3	Project 1#6.pdf	Power Point File