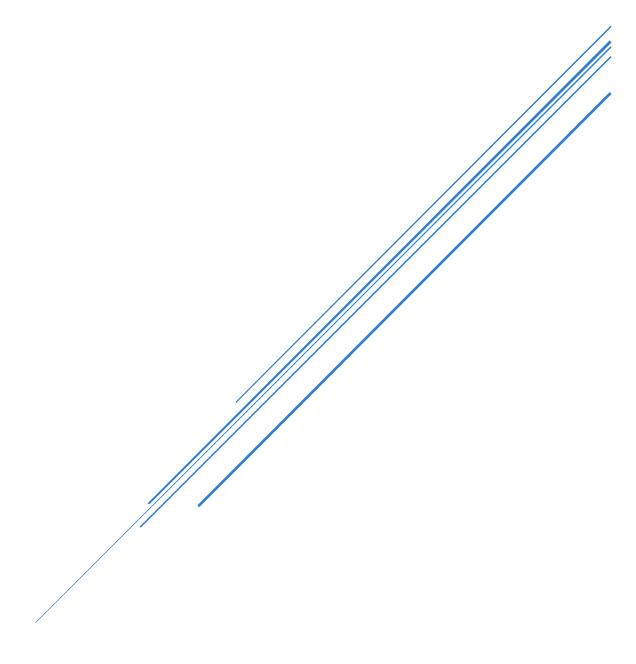
DESIGN AND IMPLEMENTATION OF A COMPANY/BUSINESS SYSTEM NETWORK DESIGN (PROJECT #6)

CCNA NETWORK PROJECT



SUBASH SUBEDI

Design and Implementation of a Company/Business System Network Design (Project #6)

A trading floor Support center employs 600 staff. They have recently expanded and as a result, need to move to a new building. A building has been identified but has no network. This means that before they can make to move out, new network service needs to be designed and implemented in the new building. Existing Network comprises of the following elements: The new building is expected to have three floors with two departments in each for example.

- 1. First floor- (Sales and Marketing Department-120 users expected, Human Resource and Logistics Department-120 users expected).
- 2. Second floor- (Finance and Accounts Department-120 users expected, Administrator and Public Relations Department-120 users expected).
- 3. **Third floor-** (ICT-120 users expected, Server Room-12 devices expected).

Therefore, as a key member of the Networks Team, you have been tasked to design a network for the new building. At this stage, logical design is required, which shows the measures that you would put in place to ensure that the network the business future-proofed: new meets current need is

- Use Cisco Packet Tracer to design and implement the network solution.
- Using hieratical model providing redundancy at every layer i.e. two routers and two multilayer switches are expected to be used to provide redundancy.
- The network is also expected to connect at least two ISPs to provide redundancy and each router to the connected to the two ISPs.
- Each department is required to have a wireless network for the users.
- Each department should be in a different VLAN and in different subnetwork.
- Provided a base network of 172.16.1.0, carry out subnetting to allocate the correct number of IP addresses to each department.
- The company network is connected to the static, public IP addresses (Internet Protocol) 195.136.17.0/30, 195.136.17.4/30, 195.136.17.8/30 and 195.136.17.12/30 connected to the two Internet providers.
- Configure basic device settings such as hostnames, console password, enable password, banner messages, disable IP domain lookup.
- Devices in all the departments are required to communicate with each other with the respective multilayer switch configured for inter-VLAN routing.
- The Multilayer switches are expected to carry out both routing and switching functionalities thus will be assigned IP addresses.
- All devices in the network are expected to obtain an IP address dynamically from the dedicated DHCP servers located at the server room.
- Devices in the server room are to be allocated IP address statically.
- Use OSPF as the routing protocol to advertise routes both on the routers and multilayer switches.
- Configure SSH in all the routers and layer three switches for remote login.
- Configure port-security for the Finance and Accounts department to allow only one device to connect to a switchport, use sticky method to obtain mac-address and violation mode shutdown.
- Configure PAT to use the respective outbound router interface IPv4 address, implement the necessary ACL rule.

Teels

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	JAPAN BUSHIES SYSTEM	

Technologies Implemented

1. Creating a network topology using Cisco Packet Tracer. Hierarchical Network Design.

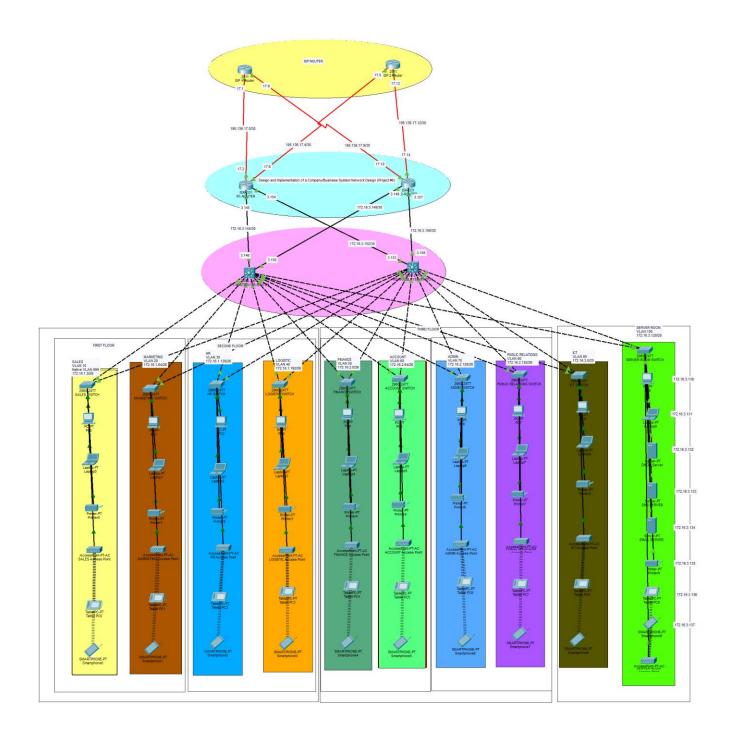


Figure 1

2. Connecting Networking devices with Correct cabling.

Copper Straight-Through

Copper Cross-Over

ISP Router Model: 2811

Core Router Model: ISR 4311

Multi-Layer Switch Model: 3650-24P

L2-Switch Model: 2960-24TT

Laptop-PT Printer-PT

Access Point PT-AC

Tablet PC-PT

SmartPhone-PT

Server-PT

3. Configuring Basic device settings.

R1 ROUTER **R2 ROUTER** enable enable configure terminal configure terminal hostname R1-ROUTER hostname R2-ROUTER do clock set 00:00:00 1 JANUARY 2025 do clock set 00:00:00 1 JANUARY 2025 banner motd \$ ONLY AUTHORIZED ACCESS \$ banner motd \$ ONLY AUTHORIZED ACCESS \$ service password-encryption service password-encryption enable secret cisco enable secret cisco username cisco secret cisco username cisco secret cisco no ip domain lookup no ip domain lookup line console 0 line console 0 motd-banner motd-banner password cisco password cisco exec-timeout 5 exec-timeout 5 login login exit exit

do wr do wr

FIRST MULTILAYER SWITCH

enable

configure terminal

hostname M1-MULTILAYER-SWITCH do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login

exit

do wr

SECOND MULTILAYER SWITCH

enable

configure terminal

hostname M2-MULTILAYER-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login

exit

do wr

enable

configure terminal

hostname SALES-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

ACCOUNT SWITCH

enable

configure terminal

hostname ACCOUNT-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption enable secret cisco so pi domain lookup line console 0 moi pi domain lookup line console 0 moi pi domain lookup line console 0 moid-banner password cisco exect-timeout 5 login exit do wr MARKETING SWITCH enable configure terminal hostname MARKETING-SWITCH do lock set 00:00:00 I JANUARY 2025 banner motd S ONLY AUTHORIZED ACCESS S service password-encryption enable secret cisco exec-timeout 5 login exif exif exit exit exit enable en		
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enable secret cisco username cisco secret cisco username cisco secret cisco username cisco secret cisco no ip domain lookup line console 0 motd-banner password cisco exec-timeout 5 login exit do wr HR SWITCH enable enable secret cisco username cisco		
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line console 0 motd-banner password cisco exec-timeout 5 login exit do wr HR SWITCH line console 0 motd-banner password cisco exec-timeout 5 login login exit do wr PUBLIC RELATIONS SWITCH enable	username cisco secret cisco	username cisco secret cisco
motd-banner password cisco exec-timeout 5 login exit do wr HR SWITCH enable motd-banner password cisco exec-timeout 5 exit exit	no ip domain lookup	no ip domain lookup
motd-banner password cisco exec-timeout 5 login exit do wr HR SWITCH enable motd-banner password cisco exec-timeout 5 exit exit		
password cisco exec-timeout 5 login exit do wr HR SWITCH enable password cisco exec-timeout 5 login exit do wr PUBLIC RELATIONS SWITCH enable	line console 0	line console 0
exec-timeout 5 login exit login exit do wr HR SWITCH enable exec-timeout 5 login exit do wr PUBLIC RELATIONS SWITCH enable	motd-banner	motd-banner
login exit login exit do wr do wr HR SWITCH enable login exit do wr do wr PUBLIC RELATIONS SWITCH enable	password cisco	password cisco
exit do wr HR SWITCH enable exit do wr PUBLIC RELATIONS SWITCH enable	exec-timeout 5	exec-timeout 5
do wr HR SWITCH enable enable do wr PUBLIC RELATIONS SWITCH	login	login
HR SWITCH enable PUBLIC RELATIONS SWITCH enable	exit	exit
PUBLIC RELATIONS SWITCH enable enable		
enable enable	do wr	do wr
	HR SWITCH	PUBLIC RELATIONS SWITCH
configure terminal configure terminal	enable	enable
	configure terminal	configure terminal

hostname HR-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login

exit

do wr

hostname PUBLIC-RELATIONS-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login

exit

do wr

LOGISTIC SWITCH

enable

configure terminal

hostname LOGISTIC-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5 login

exit

do wr

FINANCE SWITCH

ICT SWITCH

enable

configure terminal

hostname ICT-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login

exit

do wr

SERVER ROOM SWITCH

SUBASH SUBEDI

enable

configure terminal

hostname FINANCE-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login exit

do wr

enable

configure terminal

hostname SERVER-ROOM-SWITCH

do clock set 00:00:00 1 JANUARY 2025

banner motd \$ ONLY AUTHORIZED ACCESS \$

service password-encryption

enable secret cisco

username cisco secret cisco

no ip domain lookup

line console 0

motd-banner

password cisco

exec-timeout 5

login

exit

do wr

4. Creating VLANs and assigning ports VLAN numbers and Trunk.

FIRST MULTILAYER SWITCH	SECOND MULTILAYER SWITCH
enable	enable
configure terminal	configure terminal
interface range gigabitEthernet 1/0/1-2	interface range gigabitEthernet 1/0/1-2
no switchport	no switchport
exit	exit
	.0.
vlan 10	vlan 10
name SALES-DEPARTMENT	name SALES-DEPARTMENT
exit	exit
interface GigabitEthernet 1/0/3	interface GigabitEthernet 1/0/3
description **THIS IS TRUNK INTERFACES OF SALES **	description **THIS IS TRUNK INTERFACES OF SALES **
switchport mode trunk	switchport mode trunk
switchport trunk native vlan 999	switchport trunk native vlan 999
switchport trunk allowed vlan 10	switchport trunk allowed vlan 10
switchport nonegotiate	switchport nonegotiate
exit	exit
vlan 20	vlan 20
name MARKETING-DEPARTMENT	name MARKETING-DEPARTMENT
exit	exit
interface GigabitEthernet 1/0/4	interface GigabitEthernet 1/0/4
description **THIS IS TRUNK INTERFACES OF	description **THIS IS TRUNK INTERFACES OF
MARKETING **	MARKETING **
switchport mode trunk	switchport mode trunk
switchport trunk native vlan 999	switchport trunk native vlan 999
switchport trunk allowed vlan 20	switchport trunk allowed vlan 20
switchport nonegotiate	switchport nonegotiate
exit	exit
ylan 30	vlan 30
vlan 30 name HR-DEPARTMENT	
exit	name HR-DEPARTMENT exit
CAIL	CAIL

interface GigabitEthernet 1/0/5 interface GigabitEthernet 1/0/5 description **THIS IS TRUNK INTERFACES OF HR ** description **THIS IS TRUNK INTERFACES OF HR ** switchport mode trunk switchport mode trunk switchport trunk native vlan 999 switchport trunk native vlan 999 switchport trunk allowed vlan 30 switchport trunk allowed vlan 30 switchport nonegotiate switchport nonegotiate exit exit vlan 40 vlan 40 name LOGISTIC-DEPARTMENT name LOGISTIC-DEPARTMENT exit exit interface GigabitEthernet 1/0/6 interface GigabitEthernet 1/0/6 description **THIS IS TRUNK INTERFACES OF LOGISTIC description **THIS IS TRUNK INTERFACES OF LOGISTIC switchport mode trunk switchport mode trunk switchport trunk native vlan 999 switchport trunk native vlan 999 switchport trunk allowed vlan 40 switchport trunk allowed vlan 40 switchport nonegotiate switchport nonegotiate exit exit vlan 50 vlan 50 name FINANCE-DEPARTMENT name FINANCE-DEPARTMENT exit exit interface GigabitEthernet 1/0/7 interface GigabitEthernet 1/0/7 description **THIS IS TRUNK INTERFACES OF FINANCE ** description **THIS IS TRUNK INTERFACES OF FINANCE ** switchport mode trunk switchport mode trunk switchport trunk native vlan 999 switchport trunk native vlan 999 switchport trunk allowed vlan 50 switchport trunk allowed vlan 50 switchport nonegotiate switchport nonegotiate exit exit vlan 60 vlan 60 name ACCOUNT-DEPARTMENT name ACCOUNT-DEPARTMENT exit exit interface GigabitEthernet 1/0/8 interface GigabitEthernet 1/0/8 description **THIS IS TRUNK INTERFACES OF ACCOUNT description **THIS IS TRUNK INTERFACES OF ACCOUNT switchport mode trunk switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 60 switchport nonegotiate exit

vlan 70

name ADMIN-DEPARTMENT

exit

interface GigabitEthernet 1/0/9

description **THIS IS TRUNK INTERFACES OF ADMIN **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 70

switchport nonegotiate

exit

vlan 80

name PUBLIC-RELATIONS-DEPARTMENT

exit

interface GigabitEthernet 1/0/10

description **THIS IS TRUNK INTERFACES OF PUBLIC-

RELATIONS **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 80

switchport nonegotiate

exit

vlan 90

name ICT-DEPARTMENT

exit

interface GigabitEthernet 1/0/11

description **THIS IS TRUNK INTERFACES OF ICT **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 90

switchport nonegotiate

exit

switchport trunk native vlan 999

switchport trunk allowed vlan 60

switchport nonegotiate

exit

vlan 70

name ADMIN-DEPARTMENT

exit

interface GigabitEthernet 1/0/9

description **THIS IS TRUNK INTERFACES OF ADMIN **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 70

switchport nonegotiate

exit

vlan 80

name PUBLIC-RELATIONS-DEPARTMENT

exit

interface GigabitEthernet 1/0/10

description **THIS IS TRUNK INTERFACES OF PUBLIC-

RELATIONS **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 80

switchport nonegotiate

exit

vlan 90

name ICT-DEPARTMENT

exit

interface GigabitEthernet 1/0/11

description **THIS IS TRUNK INTERFACES OF ICT **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 90

switchport nonegotiate

exit

vlan 100

name SERVER-ROOM-DEPARTMENT

exit

name SERVER-ROOM-DEPARTMENT

exit

vlan 100

interface GigabitEthernet 1/0/12

description **THIS IS TRUNK INTERFACES OF SERVER

ROOM **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 100

switchport nonegotiate

exit

vlan 999

name NATIVE-VLAN

exit

interface GigabitEthernet 1/0/12

description **THIS IS TRUNK INTERFACES OF SERVER

ROOM **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 100

switchport nonegotiate

exit

vlan 999

name NATIVE-VLAN

exit

SALES SWITCH

enable

configure terminal

vlan 10

name SALES-DEPARTMENT

exit

vlan 999

name NATIVE-VLAN

exit

interface range FastEthernet 0/1-24

switchport mode access switch access vlan 10

no shutdown

exit

interface range GigabitEthernet 0/1-2

description **THIS IS TRUNK INTERFACES OF SALES **

switchport mode trunk

ACCOUNT SWITCH

enable

configure terminal

vlan 60

name ACCOUNT-DEPARTMENT

exit

vlan 999

name NATIVE-VLAN

exit

interface range FastEthernet 0/1-24

switchport mode access switch access vlan 60

no shutdown

exit

interface range GigabitEthernet 0/1-2

description **THIS IS TRUNK INTERFACES OF ACCOUNT

**

switchport trunk native vlan 999 switchport trunk allowed vlan 10 switchport nonegotiate exit

interface vlan 10

description **THIS VLAN IS DEFINE FOR SALES **DEPARTMENT** **

ip address 172.16.1.62 255.255.255.192

no shutdown

exit

ip default-gateway 172.16.1.1

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 60

switchport nonegotiate

exit

interface vlan 60

description **THIS VLAN IS DEFINE FOR ACCOUNT

DEPARTMENT **

ip address 172.16.2.126 255.255.255.192

no shutdown

exit

ip default-gateway 172.16.2.126

MARKETING SWITCH

enable

configure terminal

vlan 20

name MARKETING-DEPARTMENT

exit

vlan 999

name NATIVE-VLAN

exit

interface range FastEthernet 0/1-24

switchport mode access switch access vlan 20

no shutdown

exit

interface range GigabitEthernet 0/1-2

description **THIS IS TRUNK INTERFACES

MARKETING **

switchport mode trunk

switchport trunk native vlan 999

switchport trunk allowed vlan 20

switchport nonegotiate

exit

ADMIN SWITCH

configure terminal

vlan 70

enable

name ADMIN-DEPARTMENT

exit

vlan 999

name NATIVE-VLAN

exit

interface range FastEthernet 0/1-24

switchport mode access switch access vlan 70

no shutdown

exit

interface range GigabitEthernet 0/1-2

description **THIS IS TRUNK INTERFACES OF ADMIN **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 70

switchport nonegotiate

exit

interface vlan 20
description **THIS VLAN IS DEFINE FOR MARKETING
DEPARTMENT **
ip address 172.16.1.126 255.255.255.192
no shutdown
exit
ip default-gateway 172.16.1.65

interface vlan 70

description **THIS VLAN IS DEFINE FOR ADMIN

DEPARTMENT **

ip address 172.16.2.191 255.255.255.192

no shutdown

exit

ip default-gateway 172.16.2.129

HR SWITCH

enable

configure terminal

vlan 30

name HR-DEPARTMENT

exit

vlan 999

name NATIVE-VLAN

exit

interface range FastEthernet 0/1-24

switchport mode access switch access vlan 30

no shutdown

exit

interface range GigabitEthernet 0/1-2

description **THIS IS TRUNK INTERFACES OF HR **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 30

switchport nonegotiate

exit

interface vlan 30

description **THIS VLAN IS DEFINE FOR HR

DEPARTMENT **

ip address 172.16.1.190 255.255.255.192

no shutdown

PUBLIC RELATIONS SWITCH

enable

configure terminal

vlan 80

name PUBLIC-RELATIONS-DEPARTMENT

exit

vlan 999

name NATIVE-VLAN

exit

interface range FastEthernet 0/1-24

switchport mode access switch access vlan 80

no shutdown

exit

interface range GigabitEthernet 0/1-2

description **THIS IS TRUNK INTERFACES OF PUBLIC-

RELATIONS **

switchport mode trunk

switchport trunk native vlan 999 switchport trunk allowed vlan 80

switchport nonegotiate

exit

interface vlan 80

description **THIS VLAN IS DEFINE FOR PUBLIC-

RELATIONS DEPARTMENT **

ip address 172.16.2.254 255.255.255.192

exit	no shutdown
	exit
ip default-gateway 172.16.1.128	
p default gate may 1/2/10/11/20	ip default-gateway 172.16.2.193
LOGISTIC SWITCH	ICT SWITCH
LOGISTIC SWITCH	CI SWITCH
enable	enable
configure terminal	configure terminal
configure terminar	configure terminar
vlan 40	vlan 90
name LOGISTIC-DEPARTMENT	name ICT-DEPARTMENT
exit	exit
- CANV	
vlan 999	vlan 999
name NATIVE-VLAN	name NATIVE-VLAN
exit	exit
CAR	CAN'
interface range FastEthernet 0/1-24	interface range FastEthernet 0/1-24
switchport mode access	switchport mode access
switch access vlan 40	switch access vlan 90
no shutdown	no shutdown
exit	exit
interface range GigabitEthernet 0/1-2	interface range GigabitEthernet 0/1-2
description **THIS IS TRUNK INTERFACES OF LOGISTIC	description **THIS IS TRUNK INTERFACES OF ICT**
**	switchport mode trunk
switchport mode trunk	switchport trunk native vlan 999
switchport trunk native vlan 999	switchport trunk allowed vlan 90
switchport trunk allowed vlan 40	switchport nonegotiate
switchport nonegotiate	exit
exit	
	interface vlan 90
interface vlan 40	description **THIS VLAN IS DEFINE FOR ICT
description **THIS VLAN IS DEFINE FOR LOGISTIC	DEPARTMENT **
DEPARTMENT **	ip address 172.16.3.126 255.255.255.192
ip address 172.16.1.254 255.255.255.192	no shutdown
no shutdown	exit
exit	
	ip default-gateway 172.16.3.1
ip default-gateway 172.16.1.193	
FINANCE SWITCH	SERVER ROOM SWITCH

enable enable configure terminal configure terminal vlan 50 vlan 100 name FINANCE-DEPARTMENT name SERVER-ROOM-DEPARTMENT exit exit vlan 999 vlan 999 name NATIVE-VLAN name NATIVE-VLAN exit exit interface range FastEthernet 0/1-24 interface range FastEthernet 0/1-24 switchport mode access switchport mode access switch access vlan 100 switch access vlan 50 no shutdown no shutdown exit exit interface range GigabitEthernet 0/1-2 interface range GigabitEthernet 0/1-2 description **THIS IS TRUNK INTERFACES OF SERVERdescription **THIS IS TRUNK INTERFACES OF FINANCE ** ROOM** switchport mode trunk switchport trunk native vlan 999 switchport mode trunk switchport trunk native vlan 999 switchport trunk allowed vlan 50 switchport nonegotiate switchport trunk allowed vlan 100 exit switchport nonegotiate exit interface vlan 50 description **THIS VLAN IS DEFINE FOR FINANCE interface vlan 100 **DEPARTMENT **** description **THIS VLAN IS DEFINE FOR SERVER-ROOM ip address 172.16.2.62 255.255.255.192 **DEPARTMENT** ** no shutdown ip address 172.16.3.142 255.255.255.192 no shutdown exit exit ip default-gateway 172.16.2.1 ip default-gateway 172.16.3.129

5. Subnetting and IP Addressing.

Floor	DEPARTMENT	NETWORK ID	GATEWAYS / STARTING IP	LAST IP/VLAN IP	BROADCAST ID	SUBNET MASK
	SALES DEPARTMENT	172.16.1.0/26	172.16.1.1	172.16.1.62	172.16.1.63	255.255.255.192
1st Floor	MARKETING DEPARTMENT	172.16.1.64/26	172.16.1.65	172.16.1.126	172.16.1.127	255.255.255.192
2 nd	HR DEPARTMENT	172.16.1.128/26	172.16.1.129	172.16.1.190	172.16.1.191	255.255.255.192
Floor	LOGISTICS & STORE DEPARTMENT	172.16.1.192/26	172.16.1.193	172.16.1.254	172.16.1.255	255.255.255.192
	FINANCE DEPARTMENT	172.16.2.0/26	172.16.2.1	172.16.2.62	172.16.2.63	255.255.255.192
3 rd	ACCOUNT DEPARTMENT	172.16.2.64/26	172.16.2.65	172.16.2.126	172.16.2.127	255.255.255.192
Floor	ADMIN DEPARTMENT	172.16.2.128/26	172.16.2.129	172.16.2.190	172.16.2.191	255.255.255.192
	PUBLIC RELATIONS DEPARTMENT	172.16.2.192/26	172.16.2.193	172.16.2.254	172.16.2.255	255.255.255.192
4 th	ICT DEPARTMENT	172.16.3.0/25	172.16.3.1	172.16.3.126	172.16.3.127	255.255.255.128
Floor	SERVER DEPARTMENT	172.16.3.128/28	172.16.3.129	172.16.3.142	172.16.3.143	255.255.255.240

R1-ROUTER	Gig 0/0/0	172.16.3.145	255.255.255.252	M1-MULTILAYER-SWITCH Gig 1/0/1
KI-KOUTEK	Gig 0/0/1	172.16.3.154	255.255.252	M2-MULTILAYER-SWITCH Gig 1/0/1
R2-ROUTER	Gig 0/0/0	172.16.3.149	255.255.255.252	M1-MULTILAYER-SWITCH Gig 1/0/2
III III III III	Gig 0/0/1	172.16.3.157	255.255.255.252	M2-MULTILAYER-SWITCH Gig 1/0/2

	Gig 1/0/1	172.16.3.146	255.255.255.252	R1-ROUTER
M1-MULTILAYER-SWITCH		1,2110.01110	200.200.200.202	Gig 0/0/0
WI MODILLITER SWITCH	Gig 1/0/2	172.16.3.150	255.255.255.252	R2-ROUTER
	Gig 1/0/2	1/2.10.3.130	233.233.233.232	Gig 0/0/0
	Gig 1/0/1	172.16.3.153	255.255.255.252	R1-ROUTER
M2-MULTILAYER-SWITCH	Glg 1/0/1	1/2.10.3.133	233.233.233.232	Gig 0/0/1
WIZ-WIGHTEATER-SWITCH	Gig 1/0/2	172.16.3.158	255.255.255.252	R1-ROUTER
	Gig 1/0/2	1/2.10.3.136	233.233.232	Gig 0/0/2
			•	

6. Configuring Inter-VLAN Routing on the Multilayer switches (Switch Virtual Interface).

FIRST MULTILAYER SWITCH

interface vlan 10

description **THIS VLAN IS DEFINE FOR SALES

DEPARTMENT **

ip address 172.16.1.1 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 20

description **THIS VLAN IS DEFINE FOR MARKETING

DEPARTMENT **

ip address 172.16.1.65 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 30

**THIS VLAN IS DEFINE FOR description

DEPARTMENT **

ip address 172.16.1.129 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 40

description **THIS VLAN IS DEFINE FOR LOGISTIC

DEPARTMENT **

ip address 172.16.1.193 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 50

description **THIS VLAN IS DEFINE FOR FINANCE

DEPARTMENT **

SECOND MULTILAYER SWITCH

interface vlan 10

description **THIS VLAN IS DEFINE FOR SALES

DEPARTMENT **

ip address 172.16.1.1 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 20

description **THIS VLAN IS DEFINE FOR MARKETING

DEPARTMENT **

ip address 172.16.1.65 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 30

description **THIS VLAN IS DEFINE FOR HR

DEPARTMENT **

ip address 172.16.1.129 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 40

description **THIS VLAN IS DEFINE FOR LOGISTIC

DEPARTMENT **

ip address 172.16.1.193 255.255.255.192

ip helper-address 172.16.3.132

no shutdown

exit

interface vlan 50

description **THIS VLAN IS DEFINE FOR FINANCE

DEPARTMENT **

ip address 172.16.2.1 255.255.255.192 ip address 172.16.2.1 255.255.255.192 ip helper-address 172.16.3.132 ip helper-address 172.16.3.132 no shutdown no shutdown exit exit interface vlan 60 interface vlan 60 description **THIS VLAN IS DEFINE FOR ACCOUNT description **THIS VLAN IS DEFINE FOR ACCOUNT **DEPARTMENT** ** **DEPARTMENT** ** ip address 172.16.2.65 255.255.255.192 ip address 172.16.2.65 255.255.255.192 ip helper-address 172.16.3.132 ip helper-address 172.16.3.132 no shutdown no shutdown exit exit interface vlan 70 interface vlan 70 description **THIS VLAN IS DEFINE FOR ADMIN description **THIS VLAN IS DEFINE FOR ADMIN **DEPARTMENT** ** **DEPARTMENT** ** ip address 172.16.2.129 255.255.255.192 ip address 172.16.2.129 255.255.255.192 ip helper-address 172.16.3.132 ip helper-address 172.16.3.132 no shutdown no shutdown exit exit interface vlan 80 interface vlan 80 description **THIS VLAN IS DEFINE FOR PUBLICdescription **THIS VLAN IS DEFINE FOR PUBLIC-**RELATIONS DEPARTMENT ** RELATIONS DEPARTMENT **** ip address 172.16.2.193 255.255.255.192 ip address 172.16.2.193 255.255.255.192 ip helper-address 172.16.3.132 ip helper-address 172.16.3.132 no shutdown no shutdown exit exit interface vlan 90 interface vlan 90 description **THIS VLAN IS DEFINE FOR description **THIS VLAN IS DEFINE FOR **DEPARTMENT** ** **DEPARTMENT** ** ip address 172.16.3.1 255.255.255.128 ip address 172.16.3.1 255.255.255.128 ip helper-address 172.16.3.132 ip helper-address 172.16.3.132 no shutdown no shutdown exit exit interface vlan 100 interface vlan 100 description **THIS VLAN IS DEFINE FOR SERVER description **THIS VLAN IS DEFINE FOR SERVER **DEPARTMENT** ** **DEPARTMENT** ** ip address 172.16.3.129 255.255.255.240 ip address 172.16.3.129 255.255.255.240

	Company/Business System Network Design (Project s	FO)
no shutdown	no shutdown	
exit	exit	
	FEMALE IN ORKO ESCALA PROPERTY OF SUBJECT OF	
	18/2	
	-0/-	
5		
ONRANIBUSHIESSY		
1/85		
16 k		
· CAII.		
SUBASH SUBEDI		

7. Configuring Dedicated DHCP Server device to provide dynamic IP allocation & DNS.

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
ITC_Pool	172.16.3.1	172.16.3.133	172.16.3.3	255.255.255.128	120	0.0.0.0	0.0.0.0
PUBLIC_RELATIONS_Pool	172.16.2.193	172.16.3.133	172.16.2.196	255.255.255.192	60	0.0.0.0	0.0.0.0
Admin_Pool	172.16.2.129	172.16.3.133	172.16.2.132	255.255.255.192	60	0.0.0.0	0.0.0.0
HR_Pool	172.16.1.129	172.16.3.133	172.16.1.132	255.255.255.192	60	0.0.0.0	0.0.0.0
Account_Pool	172.16.2.65	172.16.3.133	172.16.2.68	255.255.255.192	60	0.0.0.0	0.0.0.0
Finance_Pool	172.16.2.1	172.16.3.133	172.16.2.3	255.255.255.192	60	0.0.0.0	0.0.0.0
Logistic_Pool	172.16.1.193	172.16.3.133	172.16.1.196	255.255.255.192	60	0.0.0.0	0.0.0.0
Marketing_Pool	172.16.1.65	172.16.3.133	172.16.1.68	255.255.255.192	60	0.0.0.0	0.0.0.0
Sales_Pool	172.16.1.1	172.16.3.133	172.16.1.3	255.255.255.192	60	0.0.0.0	0.0.0.0

Figure 2: DHCP CONFIGURATION

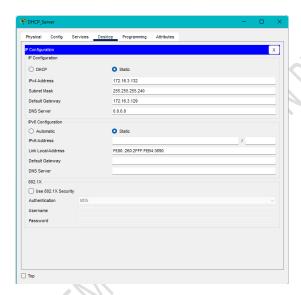


Figure 3: DHCP SERVER IP

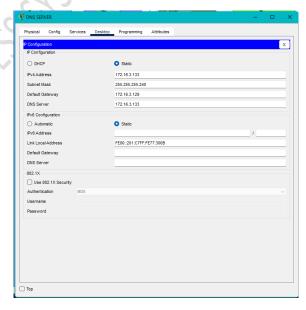
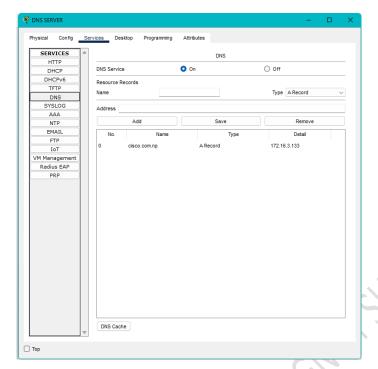


Figure 4: DNS SERVER IP



8. Configuring SSH for secure Remote access.

R1 ROUTER	R2 ROUTER
enable	enable
configure terminal	configure terminal
ip domain-name r1.com	ip domain-name r2.com
crypto key generate rsa	crypto key generate rsa
	, ch
1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin
line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3

FIRST MULTILAYER SWITCH	SECOND MULTILAYER SWITCH
enable	enable
configure terminal	configure terminal
1180	
ip domain-name mls1.com	ip domain-name mls2.com
crypto key generate rsa	crypto key generate rsa
1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin

line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3
login local transport input ssh exit ip ssh time-out 60	login local transport input ssh exit ip ssh time-out 60

SALES SWITCH	ACCOUNT SWITCH
enable	enable
configure terminal	configure terminal
ip domain-name sales.com	ip domain-name account.com
crypto key generate rsa	crypto key generate rsa
1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin
A)	
line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
1180	
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3
MARKETING SWITCH	ADMIN SWITCH
C(A)	
enable	enable
configure terminal	configure terminal
ip domain-name marketing.com	ip domain-name admin.com
crypto key generate rsa	crypto key generate rsa

1004	1004
1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin
11 0.15	11 0.15
line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3
HR SWITCH	PUBLIC RELATIONS SWITCH
in switch	TUBLIC RELATIONS SWITCH
enable	enable
configure terminal	configure terminal
configure terminar	comigure terminar
ip domain-name hr.com	ip domain-name pr.com
crypto key generate rsa	crypto key generate rsa
topped any general con-	
1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin
line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3
LOGISTIC SWITCH	ICT SWITCH
enable	enable
configure terminal	configure terminal
ip domain-name logistic.com	ip domain-name ict.com
crypto key generate rsa	crypto key generate rsa

1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin
line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
	,0,1,3
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3
FINANCE SWITCH	SERVER ROOM SWITCH
enable	enable
configure terminal	configure terminal
	OF A
ip domain-name finance.com	ip domain-name server.com
crypto key generate rsa	crypto key generate rsa
1024	1024
ip ssh version 2	ip ssh version 2
username cisco secret cisco	username cisco secret cisco
username admin secret admin	username admin secret admin
line vty 0 15	line vty 0 15
login local	login local
transport input ssh	transport input ssh
exit	exit
ONIT	
ip ssh time-out 60	ip ssh time-out 60
ip ssh authentication-retries 3	ip ssh authentication-retries 3

9. Configuring OSPF as the routing protocol.

R1 ROUTER	R2 ROUTER	

enable	enable
configure terminal	configure terminal
router ospf 50	router ospf 50
router-id 2.2.2.2	router-id 2.2.2.2
network 172.16.3.144 0.0.0.3 area 0	network 172.16.3.148 0.0.0.3 area 0
network 172.16.3.152 0.0.0.3 area 0	network 172.16.3.156 0.0.0.3 area 0
network 195.136.17.0 0.0.0.3 area 0	network 195.136.17.12 0.0.0.3 area 0
network 195.136.17.4 0.0.0.3 area 0	network 195.136.17.8 0.0.0.3 area 0

FIRST MULTILAYER SWITCH	SECOND MULTILAYER SWITCH
enable	enable
configure terminal	configure terminal
ip routing	ip routing
	-0/-
router ospf 50	router ospf 50
network 172.16.1.0 0.0.0.63 area 0	network 172.16.1.0 0.0.0.63 area 0
network 172.16.1.64 0.0.0.63 area 0	network 172.16.1.64 0.0.0.63 area 0
network 172.16.1.128 0.0.0.63 area 0	network 172.16.1.128 0.0.0.63 area 0
network 172.16.1.192 0.0.0.63 area 0	network 172.16.1.192 0.0.0.63 area 0
network 172.16.2.0 0.0.0.63 area 0	network 172.16.2.0 0.0.0.63 area 0
network 172.16.2.64 0.0.0.63 area 0	network 172.16.2.64 0.0.0.63 area 0
network 172.16.2.128 0.0.0.63 area 0	network 172.16.2.128 0.0.0.63 area 0
network 172.16.2.192 0.0.0.63 area 0	network 172.16.2.192 0.0.0.63 area 0
network 172.16.3.0 0.0.0.127 area 0	network 172.16.3.0 0.0.0.127 area 0
network 172.16.3.128 0.0.0.15 area 0	network 172.16.3.128 0.0.0.15 area 0
network 172.16.3.152 0.0.0.3 area 0	network 172.16.3.144 0.0.0.3 area 0
network 172.16.3.156 0.0.0.3 area 0	network 172.16.3.148 0.0.0.3 area 0
CO_{IA}	
network 172.16.3.144 0.0.0.3 area 0	network 172.16.3.156 0.0.0.3 area 0
network 172.16.3.148 0.0.0.3 area 0	network 172.16.3.152 0.0.0.3 area 0

10. Configuring NAT Overload(Port Address Translation PAT).

R1 ROUTER

enable

configure terminal

ip nat inside source list 1 interface serial 0/1/0 overload ip nat inside source list 1 interface serial 0/1/1 overload

access-list 1 permit 172.16.1.0 0.0.0.63
access-list 1 permit 172.16.1.64 0.0.0.63
access-list 1 permit 172.16.1.128 0.0.0.63
access-list 1 permit 172.16.1.192 0.0.0.63
access-list 1 permit 172.16.2.0 0.0.0.63
access-list 1 permit 172.16.2.64 0.0.0.63
access-list 1 permit 172.16.2.128 0.0.0.63
access-list 1 permit 172.16.2.192 0.0.0.63
access-list 1 permit 172.16.2.192 0.0.0.63
access-list 1 permit 172.16.3.192 0.0.0.127
access-list 1 permit 172.16.3.128 0.0.0.15

interface range gigabitEthernet 0/0/0-1 ip nat inside

interface Serial0/1/0 ip nat outside exit

exit

interface Serial0/1/1 ip nat outside exit

R2 ROUTER

enable

configure terminal

ip nat inside source list 1 interface serial 0/1/0 overload ip nat inside source list 1 interface serial 0/1/1 overload

access-list 1 permit 172.16.1.0 0.0.0.63
access-list 1 permit 172.16.1.64 0.0.0.63
access-list 1 permit 172.16.1.128 0.0.0.63
access-list 1 permit 172.16.1.192 0.0.0.63
access-list 1 permit 172.16.2.0 0.0.0.63
access-list 1 permit 172.16.2.64 0.0.0.63
access-list 1 permit 172.16.2.128 0.0.0.63
access-list 1 permit 172.16.2.192 0.0.0.63
access-list 1 permit 172.16.2.192 0.0.0.63
access-list 1 permit 172.16.3.0 0.0.0.127
access-list 1 permit 172.16.3.128 0.0.0.15

interface range gigabitEthernet 0/0/0-1 ip nat inside exit

interface Serial0/1/0 ip nat outside exit

interface Serial0/1/1 ip nat outside exit

11. Configure PAT to use the respective outbound router interface IPv4 address, implement the necessary ACL rule.

ip nat inside source list 1 interface serial 0/1/0 overload ip nat inside source list 1 interface serial 0/1/1 overload access-list 1 permit 172.16.1.0 0.0.0.63 access-list 1 permit 172.16.1.64 0.0.0.63 access-list 1 permit 172.16.1.128 0.0.0.63 access-list 1 permit 172.16.1.192 0.0.0.63 access-list 1 permit 172.16.2.0 0.0.0.63 access-list 1 permit 172.16.2.64 0.0.0.63 access-list 1 permit 172.16.2.128 0.0.0.63 access-list 1 permit 172.16.2.192 0.0.0.63 access-list 1 permit 172.16.3.0 0.0.0.127 access-list 1 permit 172.16.3.128 0.0.0.15 interface range gigabitEthernet 0/0/0-1 ip nat inside exit interface Serial 0/1/0 ip nat outside exit interface Serial0/1/1 ip nat outside exit

12. Configuring switchport security or Port-Security on the switches.

FIRST MULTILAYER SWITCH	SECOND MULTILAYER SWITCH
enable	enable
configure terminal	configure terminal
interface range gigabitEthernet 1/0/1-23	interface range gigabitEthernet 1/0/1-23
switchport port-security	switchport port-security
switchport port-security maximum 1	switchport port-security maximum 1
switchport port-security violation shutdown	switchport port-security violation shutdown
switchport port-security mac-address sticky	switchport port-security mac-address sticky
exit	exit

SALES SWITCH	ACCOUNT SWITCH
enable	enable
configure terminal	configure terminal
interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2	interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2
switchport port-security	switchport port-security
switchport port-security maximum 1	switchport port-security maximum 1
switchport port-security violation shutdown	switchport port-security violation shutdown
switchport port-security mac-address sticky	switchport port-security mac-address sticky
exit	exit
MARKETING SWITCH	ADMIN SWITCH
enable	enable
configure terminal	configure terminal
interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2	interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2
switchport port-security	switchport port-security
switchport port-security maximum 1	switchport port-security maximum 1
switchport port-security violation shutdown	switchport port-security violation shutdown
switchport port-security mac-address sticky	switchport port-security mac-address sticky
exit	exit
HR SWITCH	PUBLIC RELATIONS SWITCH
enable	enable

configure terminal	configure terminal
interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2	interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2
switchport port-security	switchport port-security
switchport port-security maximum 1	switchport port-security maximum 1
switchport port-security violation shutdown	switchport port-security violation shutdown
switchport port-security mac-address sticky	switchport port-security mac-address sticky
exit	exit
LOGISTIC SWITCH	ICT SWITCH
enable	enable
configure terminal	configure terminal
interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2	interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2
switchport port-security	switchport port-security
switchport port-security maximum 1	switchport port-security maximum 1
switchport port-security violation shutdown	switchport port-security violation shutdown
switchport port-security mac-address sticky	switchport port-security mac-address sticky
exit	exit
FINANCE SWITCH	SERVER ROOM SWITCH
enable	enable
configure terminal	configure terminal
interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2	interface range fastEthernet 0/1-23, gigabitEthernet 0/1-2
switchport port-security	switchport port-security
switchport port-security maximum 1	switchport port-security maximum 1
switchport port-security violation shutdown	switchport port-security violation shutdown
switchport port-security mac-address sticky	switchport port-security mac-address sticky
exit	exit

COMBERNIBO

13. Configuring WLAN or wireless network (Cisco Access Point).

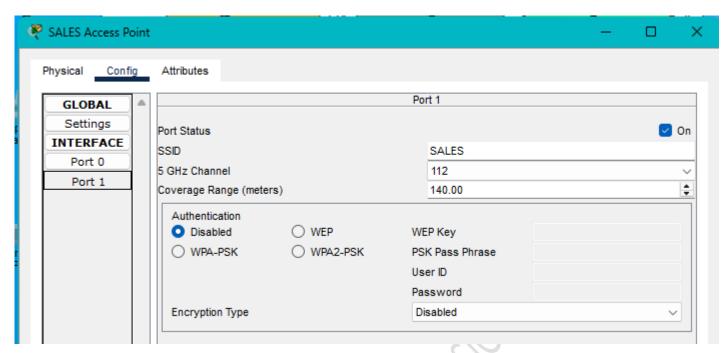


Figure 6: AP CONFIGURATION

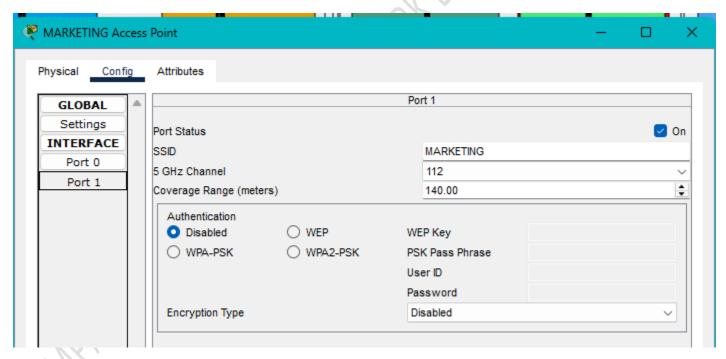


Figure 7: AP CONFIGURATION

14. Host Device Configurations.

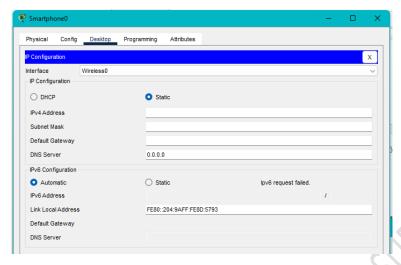


Figure 8

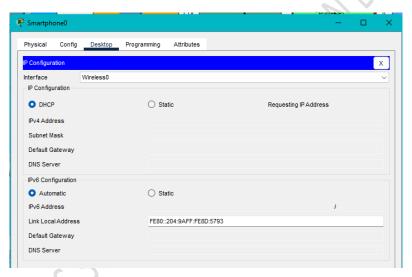


Figure 9

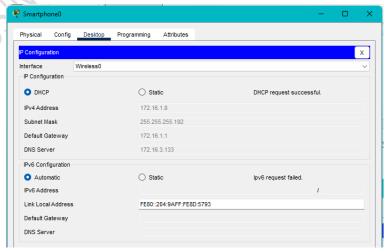


Figure 10

15. Test and Verifying Network Communication.

